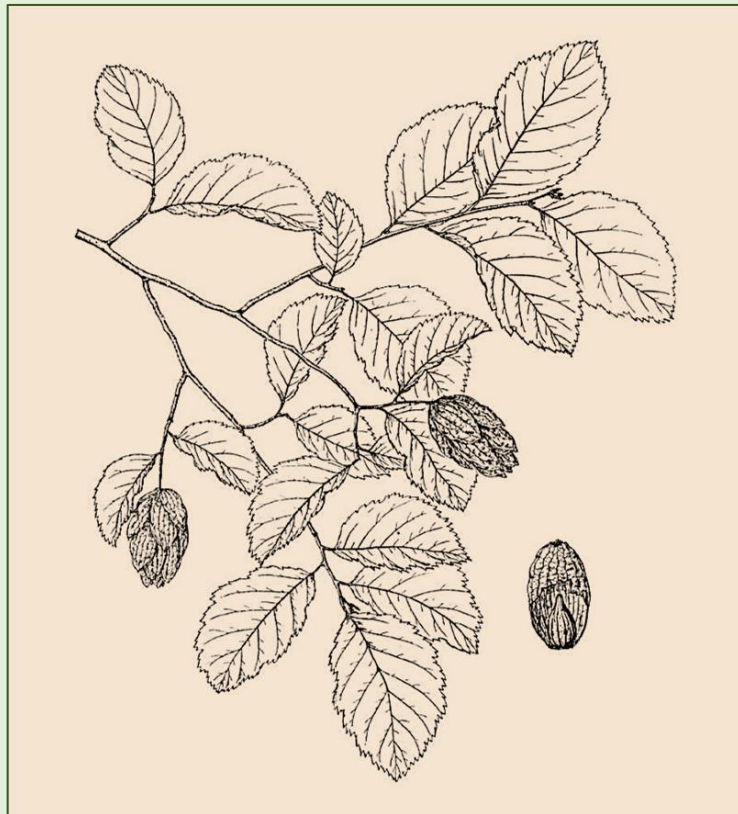


BIBLIOGRAPHY &
ANNOTATED CHECKLIST
of
LIVING ORGANISMS FIRST NAMED
from the GRAND CANYON *and* VICINITY
(NORTHWESTERN ARIZONA)

SECOND EDITION



compiled and edited by
EARLE E. SPAMER

COVER ILLUSTRATION *Ostrya knowltonii* Coville, 1894 (Betulaceae). Coville's original illustration of the holotype (US) from the top of the Old Hance Trail, Grand Canyon, Arizona, gathered by J. W. Toumey, 10 July 1892. (See No. 84 herein, pp. 43–44.)

BACK COVER General view of the type locality of *O. knowltonii*, looking downward at the top of the Old Hance Trail. Photo by Nancy Brian during the visit that rediscovered the locality, 23 May 1997.

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RAVEN'S PERCH MEDIA

BIBLIOGRAPHICAL AND HISTORICAL RESOURCES ON THE
GRAND CANYON AND LOWER COLORADO RIVER REGIONS OF THE
UNITED STATES AND MEXICO

Bibliography and Annotated Checklist of Living Organisms First Named from the Grand Canyon and Vicinity (Northwestern Arizona)

SECOND EDITION

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This publication is a resource manager's and historian's reference work documenting species-level taxa of living organisms that were first scientifically named based wholly or in part on collections made at, in, or near the Grand Canyon. This is not a work of systematics nor of taxonomic revision. Taxonomic combinations are those of the original authors or authorities, preserving original context; subsequent revisions of taxonomy and typification are not cited. Publications and pertinent taxa meeting the purpose of the checklist are as known to the compiler as of October 2024.

RAVEN'S PERCH MEDIA, Philadelphia, Pennsylvania <https://ravensperch.org>

Published 16 October 2024

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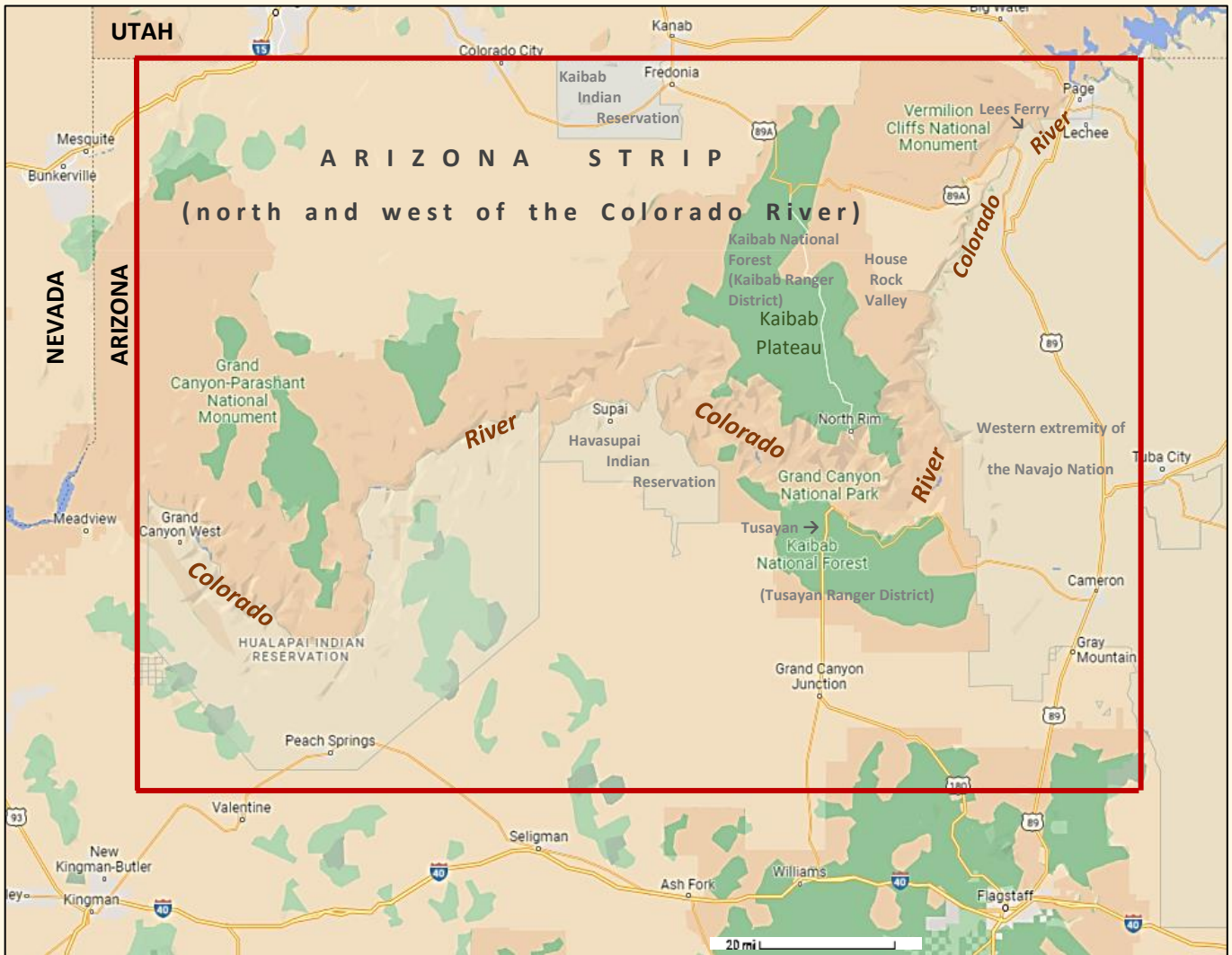
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APPROXIMATE AREA OF COVERAGE FOR THIS CHECKLIST



Base map from Google, emended

INTRODUCTION

This checklist provides federal and Native American resource managers and historians of the Grand Canyon region of northwestern Arizona with a census of living (neontological) organisms that had been scientifically named based on collections made wholly on, or in part from, the lands that these managers oversee. Their original scientific names are recorded in this checklist. It does not use updated or otherwise “current” names for taxa that have been scientifically reidentified (taxonomically synonymized) or that were systematically transferred to other supra-specific biological groups than those under which they were first named. Providing such information is beyond the scope of a historically- and administratively-directed document such as this one; its inclusion would soon make the records herein out of date. For the same reasons no data regarding the biological attributes (descriptions) of the organisms are included herein.

Federal administrative units to which this accounting may be of particular interest are:

U.S. Department of the Interior

National Park Service

Grand Canyon National Park

Glen Canyon National Recreation Area (in that area near where it shares a boundary with the Grand Canyon park at Lees Ferry)

Bureau of Land Management

Arizona Strip District

Joint management by NPS and BLM

Grand Canyon-Parashant National Monument

U.S. Department of Agriculture

U.S. Forest Service

Kaibab National Forest (Tusayan and North Kaibab Ranger Districts only)

Jurisdictions of Native American peoples addressed herein pertain to:

Havasupai Tribe [south side of the Grand Canyon]

Hualapai Indian Tribe [south side of the Grand Canyon]

Kaibab Band of Paiute Indians [on the Arizona Strip]

Navajo Nation [to the east of the Grand Canyon]

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A few of the collections cited herein seem to have come from privately held lands that are inholdings within the federal units, and from within the boundaries of particular municipalities in Arizona.

The bibliography/checklist includes 334 species-level taxa¹ named on type specimens² collected in the greater Grand Canyon region of northwestern Arizona; 225 of those taxa are based at least in part on specimens from within, or are with good probability from within, the current boundaries of Grand Canyon National Park. Five taxonomic kingdoms are represented among them—animals, plants, fungi, photosynthetic eukaryotes, and protists. Only the name-bearing types from within the geographical boundaries of this checklist are listed; referred specimens (those not selected to be types) are generally omitted.

There is far more beyond the geographical boundaries imposed here that might still be considered to be in the greater Grand Canyon region, which are ignored for the simple reason that there must be a limit. For example, there is an equal wealth of taxonomic neology from the vast lands of the Navajo Nation, which does nudge briefly across this checklist's eastern boundary; that area is accommodated herein. Then there is the wholly different zoo and garden of the Mohave Desert to the west, which, while it is decisively segregated from the Grand Canyon region by physiography and environment, does in fact sneak into the western part of the canyon along the lower elevations of the Colorado River corridor; so a few taxa more representative of those regions are included here. This bibliography and checklist finds its origin in my own researches in history, science and bibliography of the Grand Canyon vicinity in particular, thus the geographical bounds are about the same.

The checklist is also confined taxonomically to the *original names* of the organisms scientifically described for the first time by the authors cited in the bibliography. These names can disappear through taxonomic synonymy (and in many cases they have) when researchers in biological systematics have ascertained that one or another organism is actually the same as another, earlier named one, or if they move species-level taxa to

¹ "Species-level taxon" means any name that is at the taxonomic rank of species, subspecies, or variety. [The count in the first edition included No. 244a, added late, thus it is the 322nd taxon overall. The second edition adds Nos. 323–334.]

² "Type specimens," more generally called "types", are the very specimens that were selected by a species-level taxon's author as bearing the formal characteristics that uniquely identify the taxon. There may be just one, or even hundreds, and they can be from different localities (even beyond the geographical area of interest in this checklist).

INTRODUCTION

different taxa than those in which they were originally placed. And in turn, genera can be forever “fiddled with”, moving them from one Family to another and often carrying its contained species with it (though this explanation is a bit simplified); and similarly among the higher taxa, clear up to the Kingdom level. In some measure this is reflected in the higher-systematics listed with the taxa herein, which information may not be the same as that originally attributed by the authors of these taxa.

There is also a chance that some organisms can disappear actually, through extirpation or extinction; and this checklist thus would provide the original data that were communicated about their presence and scientific discovery. Ecological memory is ephemeral, but taxonomic memory—right, wrong, and revised—is forever, part of the resource manager’s treasury. Thus this checklist serves these managers as a documentary list of organisms first named from the lands that they oversee and the resources that have been used; and it serves as a contribution to the history of the Grand Canyon and adjacent areas of northwestern Arizona.

Commemorative Names

When a researcher names a new taxon they usually apply a “scientific” name that describes some feature or attribute of the organism to which the name is given. Other times, one or more persons are honored with the epithet, which customarily has one of the common Latin gender-specific suffixes, *-i*, *-ii*, *-ae*, or *-orum*. (For example, in this checklist see *Ostrya knowltoni* Coville, 1894 [No. 84 in the sequentially enumerated checklist, and also the cover illustration], an ironwood from the Old Hance Trail, named for Frank H. Knowlton.³

Often, a place is commemorated, usually with the suffix *-ensis* or another, grammatically figured suffix like *-ense*; other formulations are used, too. A few examples from this checklist are:

³ The epithet was later corrected to *knowltonii*. This was a grammatical correction only, which does not affect the author’s name. Grammatical corrections do not affect the epithet, being mandated alterations to the Latin suffix only, such as this change from *-i* to *-ii*, so the author’s name is not placed in parentheses. (When a species is moved to a different genus, or a subspecies to a different species, than the ones under which they were first named, the author’s name is placed within parentheses. An example of a transfer, from among the listings herein, is *Crotalus confluentus abyssus* Klauber, 1930 [No. 183], the “Grand Canyon Rattlesnake”, which was later redescribed as *Crotalus viridis abyssus* (Klauber), and has since also been placed in the genus *Oreganus*.)

INTRODUCTION

- 238 *Oreohelix yavapai* **angelica** Pilsbry & Ferriss, 1911; a land snail from Bright Angel Trail
- 77 *Sclerocactus havasupaiensis* Clover, 1942; a cactus from “Havasupai Canyon” (Havasupai Canyon)
- 158 *Opuntia hualpaensis* Hester, 1943; a cactus from Route 66 between Peach Springs and Hyde Park, the name denoting the Hualapai Indian Reservation
- 245 *Panicum mohavense* Reeder, 1991; a grass from Mohave County, on the Arizona Strip
- 109 *Echinocereus triglochidiatus* var. **toroweapensis** Fischer, 1991; a cactus from Toroweap Point

A specially commemorative name may also acknowledge a regional feature closely associated with the collecting locality; in these two examples, the Colorado River⁴:

- 179 *Astragalus kentrophyta* var. **coloradoensis** Jones, 1902; an herb from Lees Ferry
- 280 *Helix (Arionta) coloradoensis* Stearns, 1890, a land snail from the Old Hance Trail [the taxon is now *Sonorella coloradoensis* (Stearns)]

In the case of the Grand Canyon itself, seven species-level taxa have been erected with epithets that commemorate the canyon or denote the canyon’s attribute as an “abyss”:

- 235 *Rosa stellata* Wootton subsp. **abyssa** Phillips, 1992; a rose from Twin Point, Shivwits Plateau
- 159 *Opuntia abyssi* Hester, 1943; a cactus from Peach Springs Canyon
- 183 *Crotalus confluentus abyssus* Klauber, 1930; a rattlesnake from Tanner Trail (the “Grand Canyon Rattlesnake”)
- 270 *Melanoplus canonicus* Scudder, 1897; a grasshopper from Grand Canyon (no specific locale)
- 54 *Aphelonema convergens* var. **canyonensia** Bunn, 1930; a planthopper from Grand Canyon (no specific locale)
- 267 *Mentzelia canyonensis* Schenk, Hodgson & Hufford, 2013; a loasa from Manzanita Canyon
- 166 *Arenivaga grandiscanyonensis* Hopkins, 2014; a sand cockroach from Colorado River Mile 211.5 Right

⁴ When searching for examples like these, bear in mind that such names are contextual. While *Misumenops coloradensis* Gertsch, 1933 is listed in this checklist [No. 113] for its paratype specimens from the Grand Canyon, it is not included in this list of examples because the epithet, *coloradensis*, was based on the *primary* type material having come from the State of Colorado.

INTRODUCTION

The Kaibab Plateau is the most commonly commemorated place in this checklist, with 24 taxa named based on at least one type specimen. They are chiefly from the national forest, but a few are from within the boundary of Grand Canyon National Park. “Kaibab” is introduced into a Latinized epithet in various ways (not all of which may be in “good” Latin, depending upon the author’s decision or the context of the name). These are, in alphabetical order by species-level taxon:

- 117 *Loxosceles kaiba* Gertsch & Ennik, 1983
- 217 *Agave kaibabensis* McKelvey, 1949
- 253 *Andrena (Scaphandrena) kaibabensis* Ribble, 1974
- 48 *Branchinecta kaibabensis* Belk & Fugate, 2000
- 164 *Catilleja kaibabensis* N. Holmgren, 1973
- 172 *Cicindela pussila kaibabensis* Johnson, 1990
- 74 *Cordylanthus wrightii kaibabensis* Chuang & Heckard, 1986
- 108 *Coryphantha vivipara* var. *kaibabensis* Fischer, 1979
- 182 *Enderleinellus kaibabensis* Kim, 1966
- 227 *Felis concolor kaibabensis* E. Nelson & Goldman, 1931
- 258 *Lesquerella kaibabensis* Rollins, 1982
- 50 *Mischocyttarus flavitaris* var. *kaibabensis* Bequaert, 1932
- 42 *Morchella kaibabensis* Beug, T.A. Clem. & T.J. Baroni *in* Baroni *et al.*, 2018
- 248 *Morsea californica kaibabensis* Rehn & Grant, 1958
- 45 *Papilio indra kaibabensis* Bauer, 1955
- 115 *Phidippus kaibabensis* Gertsch, 1934b
- 155 *Polistes canadensis* var. *kaibabensis* Lynn, 1932
- 220 *Sciurus kaibabensis* Merriam, 1904
- 252 *Scutellaria potosina* var. *kaibabensis* Rhodes & Ayers, 2010
- 288 *Suillus kaibabensis* Thiers, 1976
- 123 *Thomomys fossor kaibabensis* Goldman, 1938
- 3 *Tipula (Lunatipula) kaibabensis* C. Alexander, 1946
- 223 *Saxinis saucia kaibabiae* Moldenke, 1970
- 180 *Astragalus kaibensis* Jones, 1902

INTRODUCTION

Conventions and Styles Used in This Checklist

The information given here is repeated at the heads of pertinent parts of this volume. Throughout the volume, **Red Numbers** indicate and cross-list the sequentially enumerated taxa in the bibliography.

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

In this checklist the species-level taxa are the names of organisms as originally erected by the authors. This is a historical record of nomenclature, not one of taxonomic revision.

For convenience, the systematic levels of phylum, class, order, and family are listed for each enumerated taxon. Refer to the Taxonomic List herein for other details.

➡ Arrow indicates taxa for which at least one locality reported for its types is in, or with good probability within, Grand Canyon National Park. Refer to the bibliography for all details.

Data were not often provided by the original authors in any concise or systematic fashion, thus *direct quotations have been preferred in this checklist*. By quoting, the user can grasp either the paucity or breadth of data that were conveyed in the original author's locality and collecting information for the taxon there named. The information has not been editorially revised herein to create an artificial sense of conformity; doing so might obscure original precision, inconsistencies, or confusing data.

Particular localities that lie within the geographical boundaries of this checklist are displayed in **bold** in order to bring attention to them, often amidst more detailed data. Refer to the respective separate lists of localities in this volume for other details.

Data regarding the collectors and dates of collection are provided as published by the original author, usually as part of the quoted information. However, take note that many nominate taxa are not necessarily erected based on collections by the author themselves, but on specimens sent to the researcher or are previously collected materials that were examined in museum collections. The published information thus records the data that appeared with the examined specimens—although this distinction is not always perfectly clear.

Information regarding the type specimens themselves is generally as published by the taxon's author. The particular codes of taxonomic nomenclature are followed here; there are independent codes for the animal and botanical kingdoms. In this checklist, zoological type specimens are indicated as holotype, paratype, allotype, and syntype; botanical type

INTRODUCTION

specimens are indicated as holotype, isotype, syntype, and paratype.⁵ Other terms (like topotype) are unessential and have no formal standing. Matters pertaining to lecto- or neotypifications and similar procedural acts, which are made after the original publication of a taxon, are beyond the scope of this checklist. In a few instances, older terminology was used by an author and is updated as needed herein as a parenthetical note; for example, cotype (= syntype in zoology, or used erroneously in botany to indicate an isotype or paratype).

Genus and higher taxonomic levels have no type material, although older literature may indicate such terms as “genotype”, which refers to the “type species” (one species on which the description of a genus is based); the term has occasionally been used incorrectly to denote a particular specimen.

When the checklist indicates only para- or isotypical material as having been collected at a locality within the bounds of the checklist, a note is usually prefixed to the quotation to indicate where the holotype (and if applicable, allotype) material was collected; so indicated for the informational value that indicates these primary types were collected elsewhere.

In the checklist’s quoted data, certain interpretive remarks are inserted within [square brackets], introduced by the compiler. These usually clarify that the term “Type” or “the type” refers to the holotype specimen; and when other specimens are cited they may be interpreted to be (though not specifically mentioned as) material that is paratypical (in zoology) or iso- or paratypical (in botany). In older literature, prior to the establishment of formal codes of taxonomic nomenclature, later researchers are generally more liberal in the acceptance of type status for material that supplements the holotype, except in those cases where the original author may have precisely identified which specimens are types.

⁵ “Type specimens,” more generally called “types”, are the very specimens that were selected by a species-level taxon’s author as bearing the formally defined physical characteristics that uniquely identify the taxon. In older published descriptions, prior to the creation of the various international conventions for taxonomic nomenclature, a time when types were not always specially designated, it is the surviving elements known to have been used by the author in the original description that now represent the type material for a given taxon. “Holotype,” allotype,” and “isotype” are so-called primary types; other types supplement them in defining a taxon’s characteristics in such a way that characteristics not well shown in one specimen may be exhibited by another. “Paratype” has different meanings in zoology and botany: in zoology it is applied to one or more specimens that supplement the description of the name-bearing holotype; in botany it is applied to one or more specimens that were not formally indicated to be type material but which were cited along with the type material. The latter procedure is more liberal and different from that followed in zoology, where specimens not formally identified as type material (usually listed as “examined” or “referred” specimens) have no status at all as types.

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Today the criteria are more rigorously applied; type material for new species-level taxa must be uniquely identified.

When repository catalog numbers were published by the original author, they appear as part of the quoted material. However, since this is a nomenclatural checklist only, no attempt has been made to canvass repositories to identify either the continued existence of specimens or their catalog numbers. Standard repository acronyms are not spelled out.

Throughout this checklist all text within [square brackets] has been inserted by the compiler, except where noted otherwise.

TAXONOMIC LIST

This is a nomenclatural record. Taxonomic combinations are *as named by the original authors*; later taxonomic reassignments, if any, are not generally noted herein.

There are 335 species-level taxa listed in this checklist. The count in the first edition included No. 244a, added late, thus it is the 322nd taxon overall. The second edition adds Nos. 323–335, the numerals for which are prefixed by a star (e.g., *323).

Higher systematics for the genus to which the nominate taxa were assigned are given here, as derived from the Integrated Taxonomic Information System (ITIS) online in 2022. Taxa not included in ITIS have had their higher systematics derived from other sources, including the National Center for Biotechnology Information Taxonomy Browser (National Library of Medicine) and the World Flora Online. The systematic placements listed here may not reflect the most current views, which are in any case bound to vary between researchers. Again, this is a resource manager's checklist to nominate taxa, not one of systematics or revised nomenclature. In any case, for a species to be reassigned to another family does not happen often, except in significant works of systematic revision, especially those that erect new families.

The taxonomic ranks cited in this list are: Phylum or Division: Class: Order: Family.

Users of this bibliography and checklist may note that in some titles certain systematic groups do not correspond to the groups that are listed for each of the taxa cited from a given publication. This generally reflects a revised perspective of familial and higher groupings; again, as usually derived for this checklist from ITIS and other sources.

➡ Arrow indicates taxa for which at least one locality reported for its types is within, or is with good probability from within, the boundaries of Grand Canyon National Park. Refer to the bibliography for all details.

The taxa are *not* listed in so-called “systematic order” because most users of this checklist will not likely be attuned to the scientifically proper ordering of taxa within each

INTRODUCTION

Phylum, Class, and so forth. To accommodate these more general users, who are more likely to be resource managers and not necessarily practicing biologists, *all higher taxa are listed strictly in alphabetical order* (the order of Kingdoms is arranged only for convenience). The nominate taxa within each category are listed in the order in which they appear in the checklist, arranged numerically to facilitate finding them in that bibliography/checklist.

Common names, mostly for the Families, are as listed by ITIS or other sources. They are not regularly adopted by all users and have been added here only a matter of convenience for those who might be more comfortable referring only to common names.

LOCALITY LISTS

Two lists of localities where type material was collected are provided herein; one for localities within the present boundaries of Grand Canyon National Park, the other for localities outside of the park and within the bounds defined for this checklist (see [map](#)).

Localities for the collection of type material are as identified by the authors of the taxa. The bibliography/checklist quotes the authors' data so as to record exactly how the data were reported. The arrangement of the localities in these lists are, however, in some measure modified for geographical and contextual sense; but specific determinants as communicated by the authors of the taxa are retained (for example, differences in altitude at the same general locality). In a few instances, sufficient historical or bibliographical data have made it possible to locate a place with greater precision, which information is appended to the basic locality data, and thus the data for a locality from which some type material came has been refined herein.

Many localities are identified only to very broad geographical constraints—simply “Grand Canyon”, for example, as indicated mostly in older literature—which reflects the original data. In such cases no specifically identifiable type localities can be discriminated. At the most general, the only locality information is “Grand Canyon”, which does not distinguish either rim or inner-canyon locales. Except for the earliest years, it is unfortunate that the records of “Grand Canyon, Ariz.” have not distinguished whether a collection was made at Grand Canyon village (the place name, “Grand Canyon, Arizona”, which unofficially sometimes also capitalizes “Village”) or more generally *the* “Grand Canyon of Arizona”; thus taxa with this information for locality are separately listed. Only when the village area is specifically stated, or inferred from other information such as “Bright Angel, Ariz.” (which refers to the old Bright Angel Hotel or Bright Angel Camp), are taxa listed specifically from that locale. Similarly, potentially misleading data are recorded in localities cited as “North Rim, Grand Canyon” or similar arrangement, because there is the sometimes unofficial community name, “North Rim”, which while it has been a postal address is otherwise the tourist conclave at Bright Angel Point on the North Rim. Another potentially confusing locale

INTRODUCTION

is “Vermilion Cliffs”, which may refer to the unofficial place name, a business called “Vermilion Cliffs”, which is along U.S. Route 89A along the base of the Vermilion Cliffs west of Marble Canyon.

INDEX TO NOMINATE TAXA

Names in **bold** indicate nominate taxa for which at least one locality reported for its types is within, or is with good probability from within, the present boundaries of Grand Canyon National Park. The names are original combinations, as published by the authors. The taxonomic phylum is appended to each name and author. Refer to the bibliography and annotated checklist for details.

Note on Paleontological Names

One may also ask about the record of new taxa named based on paleontological collections from the Grand Canyon and vicinity, the complement to the neontological record presented by this checklist. Those taxa are the intellectual antecedents of the living ark; in the Grand Canyon they are the lithologically embalmed life of the Proterozoic Eon to the Permian Period and the urologically indurated records of the Pleistocene, encroaching on the Recent Epoch (about 11,700 years before present). (There are also a few nearby records of fossils from the Triassic Period at Cedar Mountain, and a handful of Pliocene Epoch fossils from nearby Anita, south of the canyon.) These all have been accounted for in earlier bibliographies and checklists. Though now the publications are bit dated, lacking a comparatively small number of new taxa named since the early 1990s, they are itemized here for convenience and to alert interested users to their presence.

A general bibliography of Grand Canyon paleontology (recently updated):

Spamer, Earle E.

2019 *Bibliography of Paleontology of the Grand Canyon Region and in the Stratigraphic Continuity of Grand Canyon Formations : compiled to commemorate the centennial of Grand Canyon National Park and National Fossil Day 2019*. Raven's Perch Media, Philadelphia, 120 pp. (PDF). Occasionally updated online at Raven's Perch Media, <https://ravensperch.org/bibliography-of-paleontology-of-the-grand-canyon-region/>.

INTRODUCTION

Historical overviews of paleontological research in Grand Canyon National Park:

Spamer, Earle E.

- 1984 Paleontology in the Grand Canyon of Arizona: 125 years of lessons and enigmas from the late Precambrian to the present. *The Mosasaur* (Journal of the Delaware Valley Paleontological Society), Volume 2, pp. 45-128.
- 2020 History of paleontological work at Grand Canyon National Park. Up and down the long federal and NGO trails of paleontology in Grand Canyon National Park, 1858-2019. *Chapter 2 in: Santucci, Vincent L., and Tweet, Justin S. (eds.), Grand Canyon National Park: centennial paleontological resource inventory (non-sensitive version)*. Fort Collins, Colorado: U.S. National Park Service, Natural Resource Stewardship and Science, pp. 11-44. (Volume: Natural Resource Report NPS/GRCA/NRR—2020/2103.)
- 2021 History of paleontological work at Grand Canyon National Park—up and down the long federal and NGO trails of paleontology in Grand Canyon National Park, 1858-2019. *In: Santucci, Vincent L., and Tweet, Justin S. (eds.), Grand Canyon National Park centennial paleontological resource inventory; a century of fossil discovery and research. Utah Geological Association, Special Publication 1*, pp. 11-32. [The volume is a reset and bound reprinting of the Natural Resource Report by Santucci and Tweet (2020).]

Publications that contain information about paleontological taxa first named from collections made in the Grand Canyon and at nearby localities are listed below. These microform publications have since been made available as PDFs online by the Geological Society of America, <https://pubs.geoscienceworld.org/books/>.

Spamer, Earle E.

- 1983 Geology of the Grand Canyon: An annotated bibliography, 1857-1982, with an annotated catalogue of Grand Canyon type fossils. (Foreword by Edwin D. McKee.) *Geological Society of America, Microform Publication 13*, 543 [544] pp. on six 98-frame fiche.
- 1984 Geology of the Grand Canyon: An annotated bibliography, with an annotated catalogue of Grand Canyon type fossils. Volume 2. Supplement to the annotated bibliography (1857-1983), Supplement and revisions to the annotated catalogue. *Geological Society of America, Microform Publication 14*, 229 pp. on three 98-frame fiche. [The PDF available online is absent pp. 17-48.]
- 1988 Geology of the Grand Canyon: An annotated bibliography, with an annotated catalogue of Grand Canyon type fossils. Volume 3. Second supplement (to 1987) with an annotated bibliography of the world literature on the Grand Canyon type fossil *Chuarina circularis* Walcott, 1899, an index fossil for the late Proterozoic. *Geological Society of America, Microform Publication 17*, 343 [355] pp. on four 98-frame fiche.

INTRODUCTION

- 1990 Geology of the Grand Canyon: An annotated bibliography, with an annotated catalogue of Grand Canyon type fossils. Volume 4. Third supplement (to 1989), with supplement to the annotated bibliography of the world literature on the Grand Canyon type fossil *Chuarina circularis* Walcott, 1899. *Geological Society of America, Microform Publication 20*, 178 pp. on two 98-frame fiche.
- 1992 Geology of the Grand Canyon: An annotated bibliography, with an annotated catalogue of Grand Canyon type fossils. Volume 5. Fourth supplement (to 1991) with second supplement to the annotated bibliography of the world literature on the Grand Canyon type fossil *Chuarina circularis* Walcott, 1899. *Geological Society of America, Microform Publication 23*, 234 pp. on three 98-frame fiche.
- 1992 The Grand Canyon fossil record; a source book on paleontology of the Grand Canyon and vicinity, northwestern Arizona and southeastern Nevada. Bibliography; indexes to taxa, stratigraphic records, localities, and repositories of type, figured, and cited specimens. *Geological Society of America, Microform Publication 24*, 1,008 pp. on eleven 98-frame fiche.

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

In this checklist the itemized species-level names of organisms are as originally erected by the authors. This is a historical record of nomenclature, not one of taxonomic revision.

For convenience, the systematic levels of phylum/division, class, order, and family are listed for each enumerated taxon. Refer to the Taxonomic List herein for other details.

Repository data for type material are as published by the original authors. The standard acronyms for these repositories, when used, are not spelled out (again, as published).

Because locality data were not provided in any regular format by the original authors, with wide variances in the amount of data provided, *direct quotations have been preferred in this checklist*, which thus communicate the author's (or publisher's) style and the precision of data so conveyed. Some authors used the scientific symbols for male (♂) and female (♀), which uses are retained in the quotations. This information has not been editorially revised in the checklist; doing so would create an artificial sense of conformity that could obscure the original precision and overall quality of the data

Throughout this checklist all text within [square brackets] has been inserted by the compiler, except where noted otherwise.

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

FORMAT FOR THE ANNOTATED CHECKLIST

Author(s)

Year Bibliographical citation.

***SEQUENTIAL #** ➡ *Taxonomic name* [as published], TAXONOMIC LEVEL (page and illustration data, if from among many taxa in the publication)

Taxonomic Phylum: Class: Order: Family [placed before the sequential number if there are multiple taxa under the same family]

Data about types and localities, usually quoted from the original publication. Principal names of localities are highlighted in **bold**. (Refer to the respective separate lists of localities in this volume for other details.) Notes are added where appropriate.

* 335 species-level taxa are listed in this checklist. The first edition was sequentially enumerated 1–321, with No. 244a added late thus it is the 322nd taxon overall. The second edition here adds Nos. 323–335, the numerals for which are prefixed by a star (e.g., *323). The publications in which the second-edition taxa appear are interleaved in the bibliography herein, but they are also listed with sequential enumeration separately in the section, "[Publications and Taxa Added in the Second Edition](#)".

An arrow ➡ appears in this position if it is a taxon for which at least some of the type material recorded by the authors is from one or more localities that are within, or are with good probability from within, the present boundaries of Grand Canyon National Park.

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

Adams, C. F. [Charles Frederick]

1903 Dipterological contributions. *Kansas University Science Bulletin*, [series 2], 2(2) (June): 21-47.

1 ➔ ***Ceratopogon dimidiatus***, NEW SPECIES (p. 27); not illustrated

Arthropoda: Insecta: Diptera: Ceratopogonidae (biting midges)

Syntypes: "Four specimens; **Grand Canon, Arizona**"; all females.

Adams, James K., and Lafontaine, J. Donald

2009 A new species of *Plagiomimicus* Grote (Noctuidae: Stiriinae) from northern Arizona and southeastern Utah. *Journal of the Lepidopterists' Society*, 63(3): 173-176, figs. 3, 4, 7, 8, 10.

2 ***Plagiomimicus kathyae***, NEW SPECIES

Arthropoda: Insecta: Lepidoptera: Noctuidae (owlet moths)

Holotype male (CNC [Canadian National Collection]) and 18 paratypes (7 males, 11 females, CNC, personal collection of J. K. Adams, and USNM). Type material also includes specimens from Moab, Utah. "The precise location for collection of the Arizona specimens is the **Cameron Trading Post, Cameron, AZ**, at 35° 52' 30" N, 111° 24' 47" W, just south of the Little Colorado River and just W of Hwy. 89". Holotype collected by J. K. Adams, 7 September 1995; paratypes collected by Adams, 7 September 1995, 1 September 1996. Text of species description (p. 174) indicates that holotype male is illustrated in fig. 4, but figure legends (p. 175) indicate holotype is in fig. 3 and a female paratype is in fig. 4.

Alexander, Charles P.

1946 Records and descriptions of North American crane-flies (Diptera). Part VI. Tipuloidea of Arizona, New Mexico and Trans-Pecos Texas, 1. *American Midland Naturalist*, 35(2) (March): 484-531.

3 ➔ ***Tipula (Lunatipula) kaibabensis***, NEW SPECIES (pp. 506-508, fig. 7 [p. 507])

Arthropoda: Insecta: Diptera: Tipulidae (crane flies)

Holotype male from "**Kaibab Plateau, north rim of the Grand Canyon, Arizona** [undiscriminated], altitude 8,000 ft., June 18, 1942 (C. P. Alexander)". Three male "paratopotypes [paratypes] June 17-18, 1942 (C. P. & M. M. Alexander)".

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

Al-Shehbaz, Ihsan Ali

1973 The biosystematics of the genus *Thelypodium* (Cruciferae). *Contributions from the Gray Herbarium of Harvard University*, (204) (October 1): 3-148.

- 4 ➔ ***Thelypodium integrifolium* (Nuttall) Endlicher subsp. *longicarpum***, NEW SUBSPECIES (pp. 111-112, Pl. 7 [p. 36])

Trachyophyta: Magnoliopsida: Brassicales: Brassicaceae [Cruciferae] (mustards)

Holotype (G) from "ca. **0.5 mile below Indian Garden** [Havasupai Gardens] on **Bright Angel Trail**, Grand Canyon National Park", September 13, 1969, *Ihsan & Mona Al-Shehbaz 6991*; "isotypes to be distributed".

Atwood, N. Duane

2007 Six new species of *Phacelia* (Hydrophyllaceae) from Arizona and New Mexico. *Novon*, 17(4): 403-416.

Trachyophyta: Magnoliopsida: Boraginales: Hydrophyllaceae (waterleaves)

- 5 ***Phacelia furnissii***, NEW SPECIES (pp. 408-410, fig. 3 [p. 409])

Holotype and isotypes from "Mohave Co., Arizona Strip, **Grand Canyon-Parashant National Monument, Andrus Canyon** at rd. crossing, T32N, R10W, S6 & 7, 27 May 2003, *N. D. Atwood & L. C. Higgins 29469* (holotype, BRY; isotypes, ARIZ, ASU, BRY [5], K, MO, NY, OSC, RM, TEX, UNLV, UNM, US)", and paratypes from 22 locales on the Arizona Strip in the **vicinities of Andrus Canyon, Trail Canyon, Whitmore Wash, Parashant Canyon, and Hack Canyon**.

- 6 ***Phacelia higginsii***, NEW SPECIES (pp. 410-412, fig. 4 [p. 411])

Holotype and isotypes from "Mohave Co., Arizona Strip, **12.5 mi. SW from head of Trail Canyon toward Andrus Canyon, 36°11.48'N, 113°19.10'W**, 3 Sep. 2003, *N. D. Atwood, B. Furniss & L. C. Higgins 29729* (holotype, BRY; isotypes, ARIZ, ASU, BM, BRY [3], Dixie State College, K, MO, NY, RM, TEX, US)", and paratypes from four locales on the Arizona Strip in the **vicinities of Andrus Canyon, and Parashant Canyon**.

- 7 ***Phacelia hughesii***, NEW SPECIES (pp. 412-414, fig. 5 [p. 413])

Holotype and isotypes from "Mohave Co., Arizona Strip, T34N, R11W, S8, **E of Salt Spring S base of Poverty Mtn.**, 20 Sep. 2001, *N. D. Atwood & L. E. Hughes 27814* (holotype, BRY; isotypes, ARIZ, ASU, BRY [2], Dixie State College, MO, NY, US)", and numerous paratypes from various locales on the Arizona Strip.

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

Atwood, N. Duane, and Welsh, Stanley L.

2013 New plant taxa from Colorado, New Mexico, and Arizona. *Western North American Naturalist*, 73(1): 113-115.

- 8 ***Xylorhiza tortifolia* (Torrey & Gray) Greene var. *parashantensis***, NEW VARIETY (p. 115); not illustrated

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

Holotype from "**Grand Canyon–Parashant National Monument, Cunningham Canyon**, T33N, R14W, S30/SE, *Yucca*, *Acacia*, *Fouquieria*, *Ferrocactus* community, at 900 m elevation, on limestone ledges and talus, N.D. Atwood & M. Madsen 26586, 29 March 2001. Holotype BRY!"

Paratype from "**Grand Canyon–Parashant National Monument, 1.5 mi due west of Cane Spring, Sandstone Canyon**, with *Lycium*, *Yucca*, *Agave*, *Rhus*, and *Fraxinus*, at 1000 m elevation. N.D. Atwood & L.C. Higgins 26927, 12 April 2001, BRY!"

Augustson, G. F.

1943 A new subspecies of *Orchopeas sexdentatus* (Baker) (Siphonaptera: Dolichopsyllidae). *Bulletin of the Southern California Academy of Sciences*, 42(1): 49-51, Pl. 5 (p. 51).

- 9 ➔ ***Orchopeas sexdentatus neotomae***, NEW SUBSPECIES

Arthropoda: Insecta: Siphonaptera: Ceratophyllidae (rodent fleas)

"Holotype: a ♀ from *Neotoma lepida devia* Goldman, collected by R. L. Rutherford, **South Entrance Grand Canyon National Park**, Coconino Co., Arizona, June 5, 1942. Deposited in the Allan Hancock Foundation, University of Southern California, Los Angeles, California. Allotype: a ♂ collected and deposited with the holotype as above."

Ball, Carleton R.

1921 Undescribed willows of the section Cordatae. *Botanical Gazette*, 71(6) (June): 426-437.

- 10 ➔ ***Salix lutea ligulifolia***, NEW VARIETY (pp. 428-430); not illustrated

Trachyophyta: Magnoliopsida: Malpighiales: Salicaceae (willows)

"Referred specimens" [= isotypes] include "Grand Canyon, **Indian Gardens** [Havasupai Gardens], alt. 3800 ft., *E. A. Goldman* 2237, August 25, 1913 (N [U.S. National Herbarium], twig densely pubescent)."

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

Ball, E. D.

1933 The genus *Myndus* Stal in North America (Homoptera Fulgoridae). *Journal of the Washington Academy of Sciences* (Washington, D.C.), 23(10) (October 15): 478-484. [*Myndus* Stål.]

11 *Myndus yuccandus*, NEW SPECIES (p. 482); not illustrated

Arthropoda: Insecta: Hemiptera: Cixiidae (planthoppers)

"Holotype ♂ and one paratype male taken from *Yucca* at the **Grand Canyon Bridge**, Ariz., Aug. 30, 1930 by the writer."

[Note: Kramer (1979) examined the type material, with the following observations regarding the locality, without further specifics: "Holotype male, **Grand Canyon**, Arizona, 4 August 1930, E.D. Ball. The information published with the original description is slightly different from that on the labels of the holotype; this is probably due to a lapsus by Ball. The previously published locality was given as 'Grand Canyon Bridge' and the date of collection '30 August 1930'. One paratype male with same data. Both are in the collection of the USNM." (no further specifics by Kramer). Ball's particular note of "Grand Canyon Bridge" is surely **Navajo Bridge**, by which name it was also known. The dates, however, both may be correct, and may reflect a bridge crossing on both dates as a part of his travels in the field, although it does not resolve the immediate problem with the dates ascribed to the collection of *M. yuccandus*. Compare data with *Hysteropterum cornutum* var. *utahnum* Ball, 1935, and with *Yucanda miniata* Ball, 1937, below.] [Reference: Kramer, James P., 1979, Taxonomic study of the planthopper genus *Myndus* in the Americas (Homoptera: Fulgoroidea: Cixiidae). *American Entomological Society, Transactions*, 105 (September): 301-389. See *Myndus yuccandus* Ball (p. 328, figs. 54-56 [p. 327]; figure legend, p. 326, indicates illustrations from paratype specimen).]

1935 Some new Issidae, with notes on others—(Homoptera-Fulgoridae). *Bulletin of the Brooklyn Entomological Society*, 30(2) (April): 37-41.

12 *Hysteropterum cornutum* var. *utahnum*, NEW VARIETY (p. 38); not illustrated

Arthropoda: Insecta: Hemiptera: Issidae (planthoppers)

"Holotype ♀, allotype ♂, and 10 paratypes, taken by the writer **near the Grand Canyon**, August 1, 1930."

[Note: Regarding the locality and date of collection, compare the comments with *Myndus yuccandus* Ball, 1933, above, and with *Yucanda miniata* Ball, 1937, below, from which we glean that he was present at Navajo Bridge twice in August 1930. However, it is not possible to discern from these data whether "near the Grand Canyon" pertains to the North Rim or South Rim, or in fact just where in the area the specimens were taken.]

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

1937 Some new Fulgoridae from the western United States. *Bulletin of the Brooklyn Entomological Society, Bulletin*, 32(5) (December): 171-183.

13 *Yucanda miniata*, NEW SPECIES (p. 175); not illustrated

Arthropoda: Insecta: Hemiptera: Dictyopharidae (planthoppers)

"Holotype ♀, allotype ♂, and four paratypes, September 17, 1932, eight, August 4, 1930, and two, August 31, 1935, all taken by the writer from a small shrub that looks like a dwarf mesquite, at the **Grand Canyon Bridge**, Arizona."

[Note: Regarding the locality and date of collection, compare the comments with *Myndus yuccandus* Ball, 1933, and with *Hysteropterum cornutum* var. *utahnum* (above), from which we glean that he was present at **Navajo Bridge** twice in August 1930.]

Ball, E. D., and Beamer, R. H.

1939 A revision of the genus *Athysanella* and some related genera (Homoptera-Cicadellidae). *Kansas University Science Bulletin*, 26(1) (October 1): 5-82 (including Pls. 1-12).

Arthropoda: Insecta: Hemiptera: Cicadellidae (leafhoppers)

14 ➔ *Athysanella fredonia*, NEW SPECIES (pp. 12-13, Pl. II, fig. 3 [p. 71], Pl. IX, fig. 3 [p. 79])

"Holotype male, allotype female, and 3 males and 2 females, **Fredonia, Ariz.**, August 6, 1930, E. D. Ball; paratypes as follows: . . . 7 males and 8 females, **Grand Canyon, Ariz.**, E. D. Ball" [It is not clear whether "Grand Canyon, Ariz." refers to the canyon or to Grand Canyon village.]

15 ➔ *Athysanella globosa*, NEW SPECIES (pp. 18-19, Pl. II, fig. 13 [p. 72], Pl. X, fig. 13 [p. 80])

"Holotype male, allotype female, 1 male and 3 female paratypes, **Grand Canyon, Ariz.**, E. D. Ball, and in his collection." [It is not clear whether "Grand Canyon, Ariz." refers to the canyon or to Grand Canyon village.]

16 ➔ *Athysanella (Gladionura) casa*, NEW SPECIES (p. 48, Pl. VI, fig. 52 [p. 76], Pl. XI, fig. 52 [p. 81])

(Holotype, allotype, and paratypes are from Flagstaff, Ariz.) ". . . other paratypes as follows: 2 males, 3 females, **Grand Canyon, Ariz.**, August, 1930, E. D. Ball . . . numerous specimens [non-type], Grand Canyon, Ariz., August 11, 1927, R. H. Beamer" [It is not clear whether "Grand Canyon, Ariz." refers to the canyon or to Grand Canyon village.]

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

Baral, Hans-Otto; Weber, Evi; and Marson, Guy

2020 *Monograph of Orbiliomycetes (Ascomycota) based on vital taxonomy*. Luxembourg:
National Museum of Natural History Luxembourg, Parts I and II, pp. 1-952, 953-1752.

Ascomycota (sac fungi): Orbiliomycetes: Orbiliales: Orbiliaceae

This is a profusely documented and illustrated publication, chiefly comprising the descriptions of new species (date of publication 30 October 2020). This citation lists those taxa of interest to this checklist that are typified. Only page numbers are given; pertinent enumerated plates of illustrations are embedded within those page ranges so are not cited separately. Locality data are given here only in condensed format, documenting just the geographic locale, although each published description adds information such as altitude, host material, collector, date of collection, and repository and catalog number of the material.

In Baral *et al.*'s publication, "**included material**" is indicated to be distinct from the primary types, thus in terms of botanical type nomenclature they are "**PARATYPES**" (the term differs from the homonym used in zoological nomenclature). Take note as well that the authors also list material that is specifically "**not included**"; these references are omitted here. (The "not included" specimens "deviate from the established taxa only in some minor points . . . [though] mentioned under that taxon which appears to be most closely related, but they are not included in a description, nor are they proposed as a separate new species." [p. 17].)

All localities are specifically noted by Baral *et al.* as being in Arizona, although some locality references to "Grand Canyon" are, confusingly, neither within the physiographic canyon nor within the national park but are on adjacent national forest and other lands, sometimes at quite some distance from the canyon or the national park. In the tables of localities in the present volume, some interpretive statements have been included in order to clarify this; specifically, measurements have been made from a map that reveal that linear distances from geographic locales are mostly along the principal highways of the area, which information is added notationally to the original locality data. Also, a few localities northwest of Page, Arizona, when plotted on the map actually show that they are some distance into Utah, along U.S. Route 89; these records are thus omitted here as being extralimital to this checklist.

The authorities (authors) of each species are as given in the publication; each thus is in turn "*in*" Baral, Weber & Marson, as so noted in the taxonomic and locality lists herein. Species are listed here in the same order as in which they appear in the publication.

17 ➔ ***Orbilia purshiae*** Baral & G. Marson, NEW SPECIES (pp. 466-468)

Holotype from "Grand Canyon, **Kaibab Plateau, 28 km ESE of Fredonia, 13 km NNW of Jacob Lake**"; included material [paratype(s)] from "**93 km SSE of Fredonia, S of North Rim**", "Coconino Plateau, **7.5 km ESE of Grand Canyon Village, close to South Rim**".

18 ➔ ***Orbilia ocellata*** Baral, G. Marson & E. Weber, NEW SPECIES (pp. 476-481)

Included material [paratype(s)] from "Canyonlands, **45 km SW of Page, 26 km SW of Marble Canyon**" and "**Grand Canyon, Coconino Plateau, 3 km N of Tusayan**".

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- 19 ***Orbilina magnifica*** Baral & G. Marson, *NEW SPECIES* (pp. 509-511)
Holotype and isotypes from "Grand Canyon, **Kaibab Plateau, 37 km SE of Fredonia, S of Jacob Lake**"; included material [paratype(s)] from "**3 km N of Kaibab Lodge**".
- 20 ➔ ***Orbilina phanosoma*** Baral & G. Marson, *NEW SPECIES* (pp. 514-515)
Included material [paratype(s)] from "Grand Canyon, Coconino Plateau, **3 km N of Tusayan**" and "**3 km S of Tusayan**".
- 21 ➔ ***Orbilina multiphanosoma*** Baral & G. Marson, *NEW SPECIES* (pp. 515-517)
Holotype from "Grand Canyon, Coconino Plateau, **3 km N of Tusayan**".
- 22 ➔ ***Orbilina arizonensis*** Baral & G. Marson, *NEW SPECIES* (pp. 553-556)
Included material [paratype(s)] from "Grand Canyon, **Kaibab Plateau, 28 km ESE of Fredonia, 13 km NNW of Jacob Lake**", "**93 km SSE of Fredonia, S of North Rim**", and "Coconino Plateau, **7.5 km ESE of Grand Canyon Village**".
- 23 ➔ ***Orbilina navajoana*** Baral & G. Marson, *NEW SPECIES* (pp. 571-573)
Included material [paratype(s)] from "Grand Canyon, Coconino Plateau, **3.5 km N of Tusayan**" and "**3 km N of Tusayan**".
- 24 ➔ ***Orbilina spermoides*** Baral & G. Marson, *NEW SPECIES* (pp. 734-737)
Holotype from "Coconino Plateau, **3 km N of Tusayan**"; included material [paratype(s)] from "Grand Canyon, **Kaibab Plateau, 28 km ESE of Fredonia, 13 km NNW of Jacob Lake**", "Coconino Plateau, 8.5 km NNE of Tusayan, **Mather Point**" and "**3 km N of Tusayan**".
- 25 ➔ ***Orbilina ophiosoma*** Baral & G. Marson, *NEW SPECIES* (pp. 1050-1052)
Included material [paratype(s)] from "Grand Canyon, Coconino Plateau, **3.5 km N of Tusayan**" and "**3 km S of Tusayan**".
- 26 ➔ ***Orbilina maeandrina*** Baral & G. Marson, *NEW SPECIES* (pp. 1075-1078)
Included material [paratype(s)] from "Grand Canyon, **Kaibab Plateau, 28 km ESE of Fredonia, 13 km NNW of Jacob Lake**", "**93 km SSE of Fredonia, S of North Rim**", "**3 km N of Kaibab Lodge**", "Coconino Plateau, 15 km ESE of Grand Canyon Village, **Grandview Point**", and "**8.5 km ESE of Grand Canyon Village, close to South Rim**".
- 27 ***Orbilina multimaeandrina*** Baral & G. Marson, *NEW SPECIES* (pp. 1078-1082)
Included material [paratype(s)] from "Grand Canyon, **Kaibab Plateau, 28 km ESE of Fredonia, 13 km NNW of Jacob Lake**".
- 28 ➔ ***Orbilina flexisoma*** Baral & G. Marson, *NEW SPECIES* (pp. 1095-1098)
Holotype from "Coconino Plateau, **3 km S of Tusayan**"; included material [paratype(s)] from "Grand Canyon, **Kaibab Plateau, 93 km SSE of Fredonia, S of North Rim**", "Coconino Plateau, **3.5 km N of Tusayan**", and "**3 km N of Tusayan**".

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

- 29 ➡ ***Orbilina delphinus*** Baral & G. Marson, *NEW SPECIES* (pp. 1105-1110)
Included material [paratype(s)] from "Grand Canyon, **Kaibab Plateau, 93 km SSE of Fredonia, S of North Rim**", "Coconino Plateau, 15 km ESE of Grand Canyon Village, **Grandview Point**", and "**3 km N of Tusayan**".
- 30 ➡ ***Orbilina macrodelphinus*** Baral & G. Marson, *NEW SPECIES* (pp. 1113-1116)
Included material [paratype(s)] from "Grand Canyon, **Kaibab Plateau, 28 km ESE of Fredonia, 13 km NNW of Jacob Lake**" and "Coconino Plateau, **3.5 km N of Tusayan**".
- 31 ***Orbilina multitrapezoidea*** Baral & G. Marson, *NEW SPECIES* (pp. 1117-1120)
Holotype from "Grand Canyon, Coconino Plateau, **3 km S of Tusayan**".
- 32 ➡ ***Orbilina calyptrata*** Baral & G. Marson, *NEW SPECIES* (pp. 1187-1189)
Included material [paratype(s)] from "Grand Canyon, Coconino Plateau, **3.5 km N of Tusayan**" and "**3 km S of Tusayan**".
- 33 ➡ ***Orbilina subovoidea*** Baral, Matočec & E. Weber, *NEW SPECIES* (pp. 1257-1260)
Included material [paratype(s)] from "Grand Canyon, **Kaibab Plateau, 93 km SSE of Fredonia, S of North Rim**".
-

Barber, H. G. [Harry Gardner]

- 1938 A new genus and species of the subfamily Triatominae (Reduviidae: Hemiptera).
Proceedings of the Entomological Society of Washington (Washington, D.C.), 40(4)
(April): 104-105.

Paratriatoma, NEW GENUS

- 34 ➡ ***Paratriatoma hirsuta***, *NEW SPECIES*; not illustrated

Arthropoda: Insecta: Hemiptera: Reduviidae (assassin bugs)

(The "type male" [holotype] is from Mojave, Calif., USNM 52747; disposition of other material not indicated.) "Paratypes: Two males, Phantom Ranch [**Phantom Ranch** is consistently misspelled in this paper], Grand Canyon, Ariz., May, 1929 (Vernon Bailey) . . . one nymph, Phantom Ranch, Grand Canyon, Ariz., May 1929 (Vernon Bailey)"

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

Barneby, Rupert C.

1944 Alice Eastwood Semi-Centennial Publications. No. 3. Pugillus astragalorum alter. *Proceedings of the California Academy of Sciences, Series 4*, 25(3) (June 1): 147-170, Pl. 17.

35 ➔ ***Astragalus bryantii***, NEW SPECIES (pp. 156-157, Pl. 17, figs. 10-18 [pp. 168-169])

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

Type [holotype] from "the **head of Phantom Canyon** in the Grand Canyon of the Colorado River, Coconino Co., 15 Dec. 1939. Collected by Dr. H. C. Bryant of the National Park Service in whose honor it is named. Type in Herb. Calif. Acad. Sci. No. 293940. Also collected [= paratype] in sand at the **mouth of Hermit Creek** in the Grand Canyon, 10 April 1917, *Eastwood* 5991 (G, F)."

1945 Pugillus astragalorum IV: The Section *Diplocystium*. *Leaflets of Western Botany*, 4(5) (March): 65-147 [including Pls. 1-4].

36 ➔ ***Astragalus lentiginosus* Dougl. var. *oropedii***, NEW VARIETY (pp. 135-137); not illustrated

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

"Type [holotype]. **Kaibab Trail to Roaring Springs [North Kaibab Trail]**, Grand Canyon National Park, Coconino County, Arizona, 22 September 1938, fruct. *Eastwood & Howell* No. 7064 (Herb. Calif. Acad. Sci. No. 262056). Also *ibid.*, 23 June 1933, flor., *Eastwood & Howell* No. 1054 (Herb. Calif. Acad. Sci. No. 211208, cotype)." [Barneby's use of "cotype" is an older term often mistakenly used to indicate an isotype or paratype; in this case, the "ibid." specimen is an isotype.]

[Take note also of Jason Andrew Alexander (2009, The types of *Astragalus* Section *Diphysi* (Fabaceae), a complex endemic to western North America, Part I: Lectotypifications, epitypifications, and new combinations of several taxa. *Botanical Research Institute of Texas, Journal*, 3(1) (July): 211-218). Alexander indicates the following information regarding the type of *A. l.* var. *oropedii* from North Kaibab Trail: effective lectotypification later by Barneby (1989), epitype designated by Alexander from among Barneby's syntypes. However, note that Barneby, 1945, did indeed designate the "type" [holotype] and that Alexander may have mistakenly interpreted Barneby's "cotype" (an older, often misused term) to mean a syntype; thus the "effective lectotypification" by Barneby, as noticed by Alexander, likewise was a misinterpretation; see above.)] [Barneby, 1989, is cited by Alexander as in Cronquist, A., Holmgren, A. H., Holmgren, N. H., Reveal, J. L., and Holmgren, P. K. (eds.), *Intermountain Flora. Volume III, Part B* (New York Botanical Garden, Bronx, New York).]

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1948 Pugillus astragalorum IX: Novelties in *Batidophaca* Rydb. *Leaflets of Western Botany*, 5(5) (February): 82-89.

37 ➔ ***Astragalus cremnophylax***, NEW SPECIES (pp. 83-85); not illustrated

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes) [Sentry milkvetch; endemic and endangered.]

Type locality "**about 2 miles west of El Tovar**, Coconino Co., alt. 7050 ft., 3 June 1947, fr., *Ripley & Barneby No. 8473*. Type [holotype] in Herb. Calif. Acad. Sci., No. 336060. Grand Canyon ('at the end of the railroad on sandy ledges'), *Jones in 1903*, fl. (CAS, fragments, PO)." (p. 84). "In its type-locality, *A. cremnophylax* is confined to a narrow strip of limestone pavement immediately overlooking the Grand Canyon . . . Whence the name from the Greek, meaning watchman or overseer of the chasm."

1949 Pugillus astragalorum X: New species, varieties and combinations. *American Midland Naturalist*, 41(2) (March): 496-502.

38 ***Astragalus wootoni* var. *endopterus***, NEW VARIETY (p. 498); not illustrated

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

From "sandy bed of the **Little Colorado River, at Cameron**, Coconino Co., alt. 3700 ft., 5 June 1947, fl. & fr., *Ripley & Barneby No. 8491*. Type in herb. Calif. Acad. Sci. No. 337308."

1979 *Dragma hippomanicum* IV. New taxa of *Astragalus* sect. *Humillimi*. *Brittonia*, 31(4): 459-463.

39 ***Astragalus cremnophylax* Barneby var. *myriorrhaphis***, NEW VARIETY (p. 463, fig. 2 [p. 462])

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

"Type [holotype]: United States. Arizona. Coconino Co.: locally common in cracks and crevices of limestone cliff and rimrock, 1890 m (6200 ft), **Buckskin Mt. [Kaibab Plateau] S of Honeymoon Trail, 28 km (17.5 mi) airline distance E of Fredonia (T41N, R2E, S29/30)** [an area of Forest Service roads], 23 May 1979, *N. H. Holmgren, P. K. Holmgren & R. C. Barneby 9145* (HOLOTYPE: NY; ISOTYPES: BRY, UTC ad others to be distributed)."

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Barnes, William, and Benjamin, F. H.

1926 Notes on diurnal Lepidoptera, with additions and corrections to the recent "List of Diurnal Lepidoptera". *Bulletin of the Southern California Academy of Sciences*, 25(3) (September/December): 88-98.

40 ➔ *Coenonympha fureae*, NEW SPECIES (p. 90); not illustrated

Arthropoda: Insecta: Lepidoptera: Nymphalidae (admirals)

"Type locality: **Grand Canyon, Ariz.**" "Holotype ♂, Allotype ♀, 3 ♀ Paratypes; no dates except on one female, 1-7 June." [It is not clear whether "Grand Canyon, Ariz." refers to the canyon or to Grand Canyon village.]

41 ➔ *Cercyonis damei*, NEW SPECIES (p. 90); not illustrated

Arthropoda: Insecta: Lepidoptera: Nymphalidae (admirals)

"Type locality: **Grand Canyon, Ariz.**" "Holotype ♂, 1-7 June; 4 ♂ Paratypes, one only dated 8-15 June." [It is not clear whether "Grand Canyon, Ariz." refers to the canyon or to Grand Canyon village.]

Baroni, Timothy J.;

Beug, Michael W.; Cantrell, Sharon A.; Clements, Teresa A.; Iturriaga, Teresa; Læssøe, Thomas; Holgado Rojas, María E.; Aguilar, Frank M.; Quispe, Miguel O.; Lodge, D. Jean; and O'Donnell, Kerry

2018 Four new species of *Morchella* from the Americas. *Mycologia*, 110(6) (December): 1205-1221.

42 *Morchella kaibabensis* Beug, T.A. Clem. & T.J. Baroni, NEW SPECIES (pp. 1208-1213, figs. 3A-D)

Ascomycota: Pezizomycetes: Pezizales: Morchellaceae

"*Typification*: USA. Arizona: Coconino County, along **Forest Road 293, Kaibab Plateau, North Rim, Grand Canyon National Park, 36.40806, -112.26692**, 2700 m, with *Picea engelmannii* and *Picea pungens*, 21 May 2017, T.A. Clements & D.M. Fulton TAC-1708 (KOD1793) (holotype ARIZ AN043595). Ex-type culture: NRRL 66753. GenBank: ITS = MH014728; *TEF1* = MH014722; *RPB1* = MH014733; *RPB2_a* = MH014738; *RPB2-b* = MH014744." [Locality is ca. 7.3 miles west of Kaibab Lodge, on the Kaibab National Forest.]

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Barr, M. E.

1989 The Venturiaceae in North America: Revisions and additions. *Sydowia*, 41: 25-40.

43 ➔ ***Protoventuria arizonica***, NEW SPECIES (pp. 35, 37, fig. 17 [p. 36])

Ascomycota: Dothidiomycetes: Pleosporales: Venturiaceae

"Holotypus in foliis emortuis Cercocarpi ledifolii NUTT. 'North Rim of Grand Canyon, Arizona, 18 Aug. 1973' a M. E. BARR n. 6096a lectis in Herb. MASS depositus." [*translation*: Holotype from decaying leaves of *Cercocarpi ledifolii* Nutt., from "**North Rim of Grand Canyon, Arizona**, 18 Aug. 1973", by M. E. Barr n. 6096a deposited in Herb. MASS.] [It is not certain whether "North Rim of Grand Canyon" refers to the North Rim of the canyon or to North Rim, Arizona.]

Barr, William F.

1972 New species of North American *Acmaeodera* (Coleoptera: Buprestidae). *Arquivos do Museu Boçage* (Lisboa), Series 2, 3(7): 145-201.

44 ➔ ***Acmaeodera pletura***, NEW SPECIES (pp. 164-166, fig. 12 [p. 199])

Arthropoda: Insecta: Coleoptera: Buprestidae (jewel beetles)

(Holotype from Lee Canyon, Clark Co., Nevada; California Academy of Sciences.) Paratypes include ". . . **north rim, Grand Canyon National Park**, Arizona, June 15, 1930 (C. Kelley) 1 specimen; **south rim of Grand Canyon, Arizona**, July 8, 1967, on blossom of *Cowania stansburiana* (W. F. Barr), 1 specimen. [All] Paratypes in the collections of the California Academy of Sciences, R. L. Westcott and W. F. Barr."

Bauer, David L.

1955 A new race of *Papilio indra* from the Grand Canyon region. *The Lepidopterists' News*, 9(2/3): 49-54, plate (p. 52).

45 ➔ ***Papilio indra kaibabensis***, NEW SUBSPECIES

Arthropoda: Insecta: Lepidoptera: Papilionidae (swallowtails)

"Holotype male: (expanse 76 mm.) **Bright Angel Point**, Grand Canyon, Coconino Co., Ariz., August 1953, leg. Ernst Christensen. Allotype female: (expanse 86 mm.) same locality and collector as holotype, 14 August 1953. Paratypes: 9 males and 3 females. Data as follows (all but one male from the Grand Canyon National Park): 1 male, **North Rim**, 3 August 1938, leg. Louis Schellback [*sic*, Schellbach]; 1 male, **Yavapai Point**, South Rim, 22 August 1944, leg. Louis Schellback; 1 male, **Bright Angel Point**, North Rim, 13 August 1951, leg. Ernst Christensen; 1 male, **Bright Angel Point**, North Rim, 7 August 1953, leg. Ernst Christensen; 1 male, **Roaring Springs**, North Rim, 4 August 1953, leg. Ernst Christensen; 1 male, **near Ryan Ranger Station, Kaibab Plateau**, Coconino Co., Ariz., 1 July 1952, leg. D. L. Bauer; 1 female, data same as for allotype; 1 female, data same as for holotype."

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Allotype and holotype, respectively, are illustrated in the plate, the third pair of figures (upperside of specimens) and the fourth pair of figures (underside of specimens).

"The holotype and allotype and four male paratypes will be returned to the Naturalist Work Shop Collection, Grand Canyon National Park; from there I believe the holotype and allotype will be sent to the U. S. National Museum. One male and one female paratype will be returned to Dr. Rodeck and the University of Colorado Collection, one male paratype to the Yale Peabody Museum, and one male paratype to the Los Angeles County Museum. The remainder are in the author's collection."

Baxter, E. M.

- 1933 *Opuntia aurea*—a new species. *Cactus and Succulent Journal* (Cactus and Succulent Society of America), 5: 489-490.

46 *Opuntia aurea*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

"*Type Locality*: **½ mile north of Pipe Springs [Pipe Spring] on the Kaibab Indian Reservation**, Arizona. *Type Specimen* [holotype]: Two joints collected in 1930 by Percy and Helen McCabe at the type locality and placed in the Dudley Herbarium at Stanford University as No. 213750, October, 1933." [The illustration is a photo of a living plant, credited to "McCabe"; it is not indicated whether the photo depicts the source plant of the holotype. In addition to the type from Percy and Helen McCabe, Baxter also credits without further detail (p. 490) "Howard Gates for a specimen and much information on distribution."]

Discussion begins: "A new species, introduced first by the McCabe Gardens of San Diego, and later by Howard Gates of Anaheim, is here described for the first time. It has appeared in the McCabe catalog both under the name shown and as *Opuntia basilaris aurea*, and has been sold by Mr. Gates as 'yellow-flowered basilaris'. The McCabe name is taken as the specific name for the species, denoting the gold color of the flower."

Beamer, R. H.

- 1948 Some new species of *Delphacodes* (Homoptera, Fulgoridae, Delphacinae); Part IV. *Journal of the Kansas Entomological Society*, 21(3) (July): 96-110.

47 ➔ *Delphacodes apicata*, NEW SPECIES (pp. 100-101, Pl. VIII, figs. 37, 37a, 37b [p. 107; legend p. 106])

Arthropoda: Insecta: Hemiptera: Delphacidae (planthoppers)

(Under the heading, "Brachypterous Form" (pp. 100-101), Beamer designates a holotype, allotype, and two paratypes from "San Francisco Mt., Ariz."; deposited in "Snow Entomological Collections and United States National Museum".) Under the heading, "Macropterous Form" (p. 101), Beamer lists: "Holomorphotype, **Grand Canyon, Ariz.**, Aug. 11, 1927, R. H. Beamer" with an "allomorphotype" and "paramorphotypes" from San Francisco Mt. and Flagstaff, Ariz. It is

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unclear whether these may also be considered paratype material, based on provisions of earlier editions of the International Code of Zoological Nomenclature. The figures do not indicate which specimens are illustrated. [It is not clear whether "Grand Canyon, Ariz." refers to the canyon or to Grand Canyon village.]

Belk, Denton, and Fugate, Michael

- 2000 Two new *Branchinecta* (Crustacea: Anostraca) from the southwestern United States. *Southwestern Naturalist*, 45(2) (June): 111-117.

Arthropoda: Branchiopoda: Anostraca: Branchinectidae (brine shrimp)

- 48** *Branchinecta kaibabensis*, NEW SPECIES (pp. 115-117, figs. 2b [p. 114], 3a-e [p. 116])

"Holotype male (USNM 260875) and paratypes of both sexes (USNM 260876) from DB 232 are at the National Museum of Natural History, Smithsonian Institution, Washington, D.C."

"Type Locality—A natural pool **0.6 km east of Arizona Highway 67 just northeast of Forest Road 213 in the Kaibab National Forest . . . (36°30'38"N, 112°07'55"W)**. Forest Road 213 intersects Arizona Highway 67, 30.6 km south of the city of Jacob Lake." "DB 232 pool in depression 0.6 km east of AZ 67 on Forest Road 213, Kaibab National Forest, Coconino Co., Arizona, collector D. Belk, 22 May 1974."

Benson, Bernard W.

- 1957 A new cactus from Arizona. *Cactus and Succulent Journal* (Cactus and Succulent Society of America), 29(5) (September/October): 136-137.

- 49** *Pediocactus paradinei*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

Named as "*Pediocactus* (?) *paradinei* B. Benson, *sp. nov.*" From **House Rock Valley** (without further specific locale).

Holotype, "Boyce Thompson Southwestern Arboretum Herbarium, No. Bwb 8-1956-1". Isotype, "Herbarium of Pomona College, No. 286,120".

"Mr. N. A. Paradine collected the first plants in House Rock Valley, Coconino County, Arizona, in the spring of 1956. These were found under the protection of small sagebrush plants. Later others were found in clumps of perennial bunch grasses."

Benson adds: "In August of 1956, a description of this plant was sent to the editor of the *Cactus and Succulent Journal* for publication. In October of 1956, Mr. W. T. Marshall of the Desert Botanical Garden, Tempe, Arizona, described the same plant in the *Saguaroland Bulletin* 10: 89-91. The author appreciates Mr. Marshall's courtesy in stepping aside to permit the naming of *Pediocactus paradinei*." The item thus cited is "A New Genus of Cactuses for Arizona", unsigned but in *Saguaroland Bulletin* (W. Taylor Marshall, editor), 10(8) (October 1956): 89-91, wherein it

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appears only as *Pediocactus* sp., based on gatherings in House Rock Valley by Gus and Sylvia Hermann.

Bequaert, J. [Joseph C.]

1932 The Nearctic social wasps of the subfamily Polybiinae (Hymenoptera; Vespidae).
Entomologica Americana, 13(3) (December): 87-149 (pagination includes Pls. 27-29).

50 ➔ ***Mischocyttarus flavitarsis* var. *kaibabensis***, NEW VARIETY (p. 133); not illustrated [the plates and text-figs. do not pertain to this new variety]

Arthropoda: Insecta: Hymenoptera: Vespidae (hornets)

"**Bright Angel Trail**, Grand Canyon, Cococino [*sic*] Co., one female, holotype (Cornell Univ.) and one female paratype (M.C.Z[.]); both collected by R. C. Shannon, on the Cornell Biological Expedition, August 4, 1917." (The etymology of the varietal name is from its "perfect parallel in color (or 'mimic') of *Polistes canadensis* var. *kaibabensis* Hayward, which occurs in the same district.") [Refer to Hayward (1932, no. 155 herein).]

Beutenmüller, William

1907 Notes on a few North American Cynipidae, with descriptions of new species. *Bulletin of the American Museum of Natural History*, 23: 463-466, Pl. 37.

51 ➔ ***Andricus wheeleri***, NEW SPECIES (p. 464, Pl. 37, figs. 7-9)

Arthropoda: Insecta: Hymenoptera: Cynipidae (gall wasps)

"**Coconino Forest, rim of the Grand Cañon**, Arizona; altitude 7,000 feet. (William M. Wheeler.) Types [syntypes]. Coll. Am. Mus. Nat. Hist."

Bohart, R. M.

1958 A new *Priononyx* and a key to the North American species (Hymenoptera: Sphecidae).
Bulletin of the Brooklyn Entomological Society, 53(4) (October): 90-93.

52 ➔ ***Priononyx subatrata***, NEW SPECIES

Arthropoda: Insecta: Hymenoptera: Sphecidae (sphecid wasps)

(Holotype from Deep Springs, California.) Paratypes include specimens from "**Grand Canyon South Rim** (M. A. Evans), **Kaibab Forest** (M. Wasbauer)". The "Kaibab Forest" specimen may or may not be from Kaibab National Forest units near Grand Canyon.

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Bromley, Stanley W.

1940 New U.S.A. robber flies (Diptera: Asilidae). *Bulletin of the Brooklyn Entomological Society*, 35(1) (February): 13-21.

53 ➔ ***Erax benedicti***, NEW SPECIES (pp. 15-16, fig. 1 [p. 20])

Arthropoda: Insecta: Diptera: Asilidae (robber flies)

(Holotype from Winslow, Ariz.; allotype from Santa Rita Mountains, Ariz.; both in University of Kansas Collection.) Paratypes include "2 females, **Grand Canyon, Ariz.**, June 12, 1937 (W. Benedict)". No further data regarding these paratypes. [It is not clear whether "Grand Canyon, Ariz." refers to the canyon or to Grand Canyon village.]

Bunn, Ralph W.

1930 Notes on the genus *Aphelonema* Uhler with descriptions of new species (Homoptera, Fulgoridae). *Journal of the Kansas Entomological Society*, 3(3) (July): 73-77.

54 ➔ ***Aphelonema convergens var. canyonensia***, NEW VARIETY (p. 76); not illustrated

Arthropoda: Insecta: Hemiptera: Caliscelidae (planthoppers)

"Holotype; female, from **vicinity of Grand Canyon, Arizona** collected by Dr. [R. H.] Beamer August 11, 1927. Allotype; male, collected at the same time and place by Dr. Beamer. Paratypes; . . . one female from **Grand Canyon, Arizona**, taken August 11, 1927 by Dr. P. A. Readio; three females from **Grand Canyon, Arizona** taken August 11, 1927 by L. D. Anderson; and six females from the same locality and collected at the same time by Dr. Beamer. Types deposited in Snow Entomological Collection." [It is not clear whether "Grand Canyon, Arizona" refers to the canyon or to Grand Canyon village.]

Burke, H. E.

1907 A new buprestid enemy of *Pinus edulis*. (*Melanophila pini-edulis*, n. sp.) *Proceedings of the Entomological Society of Washington* (Washington, D.C.), 9(1/4) (March/December): 117-118.

55 ➔ ***Melanophila piniedulis***, NEW SPECIES; fig. 6

Arthropoda: Insecta: Coleoptera: Buprestidae (jewel beetles)

"Type [syntypes].— ♀ and ♂, No. 11350, U. S. National Museum."

One syntype is "One female taken by Mr. E. A. Schwarz from pinyon (*Pinus edulis*) at **Bright Angel Hotel (Grand Canyon P.O.)**, Arizona, on July 11, 1902."

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Casey, Thomas L.

- 1895 Coleopterological notices. VI. *Annals of the New York Academy of Sciences*, 8 (July): 435-838.
- Arthropoda: Insecta: Coleoptera: Melyridae (soft-winged flower beetles)
- 56** *Trichochrous incipiens*, NEW SPECIES (pp. 489-490); not illustrated
- "**Arizona (near the Grand Cañon of the Colorado)**. Dr. T. Mitchell Prudden. The single type [holotype] is a female"
- 57** *Trichochrous reversus*, NEW SPECIES (pp. 527-528); not illustrated
- "**Arizona (near the Grand Cañon of the Colorado)**. The single type [holotype] is a female . . . ; it was collected and kindly given to me by Dr. T. Mitchell Prudden, of New York."
-
- 1900 Review of the American Corylophidae, Cryptophagidae, Tritomidae and Dermestidae, with other studies. *Journal of the New York Entomological Society*, 8(2) (June): 51-172.
- Arthropoda: Insecta: Coleoptera: Dermestidae (dermestid beetles)
- 58** ➔ *Cryptorhopalum pruddeni*, NEW SPECIES (p. 156); not illustrated
- "**Arizona (Cañon of the Colorado River)**—Dr. T. Mitchell Prudden."
- 59** ➔ *Orphilus aequalis*, NEW SPECIES (p. 164); not illustrated
- "**Arizona (Cañon of the Colorado River)**—Dr. Prudden."
-
- 1907 Notes on *Chalcolepidius* and the Zopherini. *The Canadian Entomologist* (London), 39(2) (February): 29-46.
- Arthropoda: Insecta: Coleoptera: Tenebrionidae (darkling beetles)
- Zopherodes*, NEW GENUS (p. 38)
- 60** ➔ *Zopherodes lugubris*, NEW SPECIES (p. 41); not illustrated
- "**Arizona (Grand Canyon of the Colorado)**."
- 61** ➔ *Zopherodes pruddeni*, NEW SPECIES (p. 41); not illustrated
- "**Arizona (Grand Canyon of the Colorado)**, T. Mitchell Prudden."
-
- 1908 A revision of the tenebrionid subfamily Coniontinae. *Proceedings of the Washington Academy of Sciences* (Washington, D.C.), 10 (April 25): 51-166.
- Arthropoda: Insecta: Coleoptera: Tenebrionidae (darkling beetles)
- 62** ➔ *Discodemus brevipennis*, NEW SPECIES (p. 61); not illustrated
- "**Arizona (Grand Canyon of the Colorado)**,—T. Mitchell Prudden."
-

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1912 Studies in the Longicornia of North America. *In*: Casey, Thomas L., *Memoirs on the Coleoptera. III*. Lancaster, Pennsylvania: New Era Printing Co., pp. 215-386.

Arthropoda: Insecta: Coleoptera: Cerambycidae (long-horned beetles)

63 ➔ *Prionus spiculosus*, NEW SPECIES (p. 240); not illustrated

"Arizona (Grand Cañon of the Colorado),—T. Mitchell Prudden."

64 ➔ *Prionus angustulus*, NEW SPECIES (p. 241); not illustrated

"Arizona (Cañon of the Colorado River),—Prudden."

65 ➔ *Prionus terminalis*, NEW SPECIES (pp. 243-244); not illustrated

"Arizona (Cañon of the Colorado River),—Prudden."

66 ➔ *Stenosphenus pruddeni*, NEW SPECIES (pp. 346-347); not illustrated

"Arizona (Cañon of the Colorado),—T. Mitchell Prudden."

1918 A review of the North American Bembidiinae. *In*: Casey, Thomas L., *Memoirs on the Coleoptera. VIII. 1918*. Lancaster, Pennsylvania: New Era Printing Co., pp. 1-223.

Arthropoda: Insecta: Coleoptera: Carabidae (ground beetles)

67 ➔ *Bembidion (Cyclolopha) occultum*, NEW SUBGENUS, NEW SPECIES (p. 144); not illustrated

"Arizona (Grand Cañon of the Colorado),—T. Mitchell Prudden."

Chamberlin, Ralph V.

1940 New American tarantulas of the family Aviculariidae. *Bulletin of the University of Utah*, 30(13) (May 6), 39 pp.

Arthropoda: Euchelicerata: Areneae: Theraphosidae (tarantulas)

68 ➔ *Aphonopelma behlei*, NEW SPECIES (pp. 26-27); not illustrated

"Locality: Arizona: Coconino Co., **Grand Canyon Village**, 7000 ft. el., 15 Sept., 1939. Two males [syntypes] taken by Dr. W. H. Behle on a paved highway after a heavy rain." (Additional syntypes from Aztec, New Mexico.)

69 ➔ *Aphonopelma phasmus*, NEW SPECIES (p. 28); not illustrated

"Locality: Arizona: Grand Canyon, **Phantom Ranch**. 26 July. 1934. One male [holotype] collected by Dr. Lutz. American Museum collection."

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1948 On some American spiders of the family Erigonidae. *Annals of the Entomological Society of America*, 41(4): 483-562.

70 *Tapinocyba kesimba*, NEW SPECIES (pp. 552-553, Pl. 11, figs. 117-121 [p. 515, legend p. 514])

Arthropoda: Euchelicerata: Areneae: Linyphiidae (dwarf weavers)

"Type locality.—Arizona: **Kaibab Forest (V. T. Ranch)**, September 4, 1931, 2 ♂ 6 ♀ [syntypes], R. V. Chamberlin." ("Other records" include "Kaibab Forest, September 4, 1931, 2 ♂, 6 ♀, R. V. Chamberlin.)

Chamberlin, Ralph V., and Ivie, Wilton

1942 A hundred new species of American spiders. *Bulletin of the University of Utah*, 32(13) (June 30) [Biological Series, 7(1)], 117 pp.

71 *Neoantistea coconino*, NEW SPECIES (pp. 28-29, figs. 59, 60 [p. 95, legend p. 94])

Arthropoda: Euchelicerata: Areneae: Hahniidae (hahniid spiders)

"Type locality: W 112°:N 36°, **Kaibab Forest, Arizona**; ♂ holotype; June 14, 1934; W. Ivie and H. Rasmussen, collectors." [The overly generalized coordinates lie within Grand Canyon National Park, just west of Grandview Point; in fact, by coincidence on a cliff face(!) just over the rim of the canyon (<https://confluence.org/confluence.php?id=91>). The specific epithet and indication of "Kaibab Forest" may point either to a locality on the nearby Kaibab National Forest or is only a generalized term for the South Rim forest, sometimes called the Coconino forest, on the Coconino Plateau.]

Chandler, Peter

1993 The Holarctic species of the *Mycetophila fungorum* (De Geer) group (Diptera: Mycetophilidae). *British Journal of Entomology and Natural History*, 6: 5-11.

72 ➔ *Mycetophila neofungorum*, NEW SPECIES (pp. 7-9, figs. 7-9 [p. 8])

Arthropoda: Insecta: Diptera: Mycetophilidae (fungus gnats)

"Holotype male USA, Arizona, **Grand Canyon National Park (north rim)**, 15.vii.1954 (W. L. Downes, Natural History Museum, London)." [Based on a unique museum specimen.]

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Christy, Charlotte M.

1997 A new species of *Mentzelia* Section *Bartonia* (Loasaceae) from Arizona. *Novon*, 7(1): 25-26.

73 *Mentzelia collomiae*, NEW SPECIES; not illustrated

Trachyophyta: Magnoliopsida: Cornales: Losaceae (loasa)

("[A]n edaphic endemic species restricted to cinder areas of the San Francisco Volcanic Field", holotype and isotypes from "ca. 3.5 mi. due N of Sunset Crater National Monument".) Paratypes include various localities, the nearest of which pertinent to this bibliography (and at the limit of its coverage) is "**Red Mountain**, 35 mi. NW of Flagstaff on Hwy. 180".

Chuang, Tsan Iang, and Heckard, Lawrence R.

1986 Systematics and evolution of *Cordylanthus* (Scrophulariaceae—Pedicularieae) (including the taxonomy of subgenus *Cordylanthus*). *Systematic Botany Monographs*, Volume 10, 105 pp.

74 *Cordylanthus wrightii kaibabensis*, NEW SUBSPECIES (pp. 87-89, figs. 35i-n [p. 88])

Trachyophyta: Magnoliopsida: Lamiales: Orobanchaceae (broomrapes)

"TYPE: U.S.A. Arizona: Coconino Co., openings in *Juniperus monosperma*, occasional *Pinus ponderosa* with *Artemisia tridentata*, **7.5 mi E of Jacobs Lake [Jacob Lake]**, 6400 feet, Heckard, Bacigalupi & Chuang 3585 (holotype: JEPS!; isotypes: ARIZ! ASU! BRY! COLO! F! GH! ISU! MO! NY! TEX! US! UTC!)."

"Representative Specimens [= paratypes]. U.S.A. Arizona: Coconino Co., **House Rock Valley, Smith s.n.** (NY, PH); **Kaibab Plateau near Jacobs Lake, Eastwood & Howell 6441** (DS, POM)."

Clark, Curtis

1998 New names and combinations in *Encelia frutescens* sensu lato (Asteraceae: Heliantheae). *Aliso* (Rancho Santa Ana Botanic Garden, Claremont, California), 17(2): 201-202.

75 ➔ *Encelia resinifera subsp. tenuifolia*, NEW SUBSPECIES (p. 202); not illustrated

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

"TYPE: United States. Arizona. Coconino Co: **4 miles down Supai Trail, Havasupai Canyon [Havasu Canyon]**. 3 June 1961. C. and C. Dailey s.n., MNA 2256/ B12,747. holotype: MNA!."

[Note: The precise gathering locality may be within the boundaries of the Havasupai Indian Reservation.]

"Subspecies *tenuifolia* occurs almost entirely within the Grand Canyon of the Colorado River in northern Arizona, ranging from the Grand Wash Cliffs east to Marble Canyon, evidently following the 1200 m contour."

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Clarke, J. F. Gates

1947 Notes on Oecophoridae, with descriptions of new species. *Journal of the Washington Academy of Sciences* (Washington, D.C.), 37(1): 2-18.

76 ➔ *Depressaria schellbachi*, NEW SPECIES (pp. 10, 13; figs. 6-6a [p. 7], 13 [p. 12])

Arthropoda: Insecta: Lepidoptera: Oecophoridae (oecophorid moths)

"Type.— U.S.N.M. No. 58013. *Type locality*.—**Shoshone Point**, Grand Canyon, Ariz., elev. 7,050 feet. *Food plant*.—*Lomatium macdougali* Coult. and Rose."

"Described from the ♂ type [holotype], five ♂ and three ♀ paratypes from the Grand Canyon (June dates, 1944 and 1946, Louis Schellbach, 3d). Paratypes in the U.S. National and British Museums and in the Grand Canyon National Park Collection."

Clover, Elzada U.

1942 A new species and variety of *Sclerocactus* from Arizona. *American Journal of Botany*, 29(2) (February): 172-173.

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

77 ➔ *Sclerocactus havasupaiensis*, NEW SPECIES; illustrated [fig. 1 (p. 172) shows "Actual type specimen photographed in natural habitat at Havasupai Canyon, Arizona (Clover 5229 in part: there are several cotypes"]

"The type specimen [holotype] (fig. 1) was collected by William Belknap, Jr., April 26, 1941, on top of the Supai Formation in **Havasupai Canyon [Havasu Canyon]**, Arizona, where the species grows abundantly. Specimens [= paratypes] not in flower were previously collected by the author in July, 1940, in **Havasupai Canyon** (Clover 5229) **near Navajo Falls**, and in **Hualapai Canyon** [tributary to Havasu Canyon] (Clover 5100) on talus of the Supai Formation. A few plants were seen on the floor of Cataract Canyon above Supai, September, 1941."

Note: The precise gathering localities may be within the boundaries of the Havasupai Indian Reservation.

78 ➔ *Sclerocactus havasupaiensis* var. *roseus*, NEW VARIETY; illustrated [figs. 3, 4 (p. 173) show "Actual type specimen [holotype] (Clover 6403) photographed while alive at Botanical Garden, University of Michigan, now dried and preserved as a herbarium specimen. Additional plants of the same collection (cotypes [= istotypes]) are in the living collection (Bot. Gard. no. 18079)."]

"Specimen typicum [holotype] legit E. Clover & Wm. Belknap, Jr. (Clover 6403), in **Havasupai Canyon [Havasu Canyon]**, Arizona, siccatum est in Herbario, Universitatis Michiganensis." [comparable text in English not provided]. "This variety was found in association with *S. havasupaiensis* on top of the Supai Formation in the same location in May 1941, and are in the living collection (no. 18079) in the Botanical Gardens, University of Michigan."

Note: The precise gathering locality may be within the boundaries of the Havasupai Indian Reservation.

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Cockerell, T. D. A. [Theodore Dru Alison]

1905 New American bees. *Proceedings of the Biological Society of Washington* (Washington, D.C.), 18 (June 29): 177-184.

79 ➔ *Triepeolus hopkinsi*, NEW SPECIES (p. 184); not illustrated

Arthropoda: Insecta: Hymenoptera: Apidae (honey bees)

Apparently named on a single male specimen [holotype]. "**Grand Canyon of the Colorado**, Arizona, August 3, 1904. (Webb). Received from Mr. Viereck, to whom it has been returned. It is named after Professor Hopkins [A. D. Hopkins?], who sent it to Mr. Viereck, and who has done good work in the region of the Grand Canyon."

Cole, A. C., Jr.

1936 Descriptions of seven new western ants. (Hymenop.: Formicidae.) *Entomological News* (Academy of Natural Sciences of Philadelphia, Entomological Section), 47 (May): 118-121.

80 *Myrmecocystus melliger* subsp. *semirufus* Emery var. *romainei*, NEW VARIETY (p. 120). [Not valid as a quadrinomial taxon, and no identification of holotype; non *Myrmecocystus romainei* Snelling, 1975]

Arthropoda: Insecta: Hymenoptera: Formicidae (ants)

"Described from a series of 54 workers [= syntypes] taken by Miss Marjorie Romaine, at **Cameron, Arizona**. The *holotype* is in the author's collection, and *paratypes* are to be deposited in the collections of the U. S. National Museum and of Dr. C. H. Kennedy."

Coquillett, D. W.

1902 New acalyprate Diptera from North America. *Journal of the New York Entomological Society*, 10(4) (December): 177-191.

81 ➔ *Trypeta varipennis*, new species (p. 180); not illustrated

Arthropoda: Insecta: Diptera: Tephritidae (fruit flies)

"*Habitat*.—**Bright Angel Hotel, brink of Grand Canyon**, Coconino Co., Arizona. A female specimen collected July 10 by Mr. H. S. Barber. Type [holotype] No. 6635, U.S.N.M."

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Coulter, John M.

1896 Preliminary revision of the North American species of *Echinocactus*, *Cereus*, and *Opuntia*. *Contributions from the U.S. National Herbarium*, 3(7): 355-462, I-IV [index].

82 *Echinocactus polycephalus xeranthemoides*, NEW VARIETY (p. 358).

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

"Type, Siler of 1881 and 1883 [= syntypes] in Herb. Mo. Bot. Gard." [Herbarium of the Missouri Botanical Garden]. "Specimens examined: Utah (*Siler* of 1883, 'Kanab Mts.' [syntype]): Arizona (*Siler* of 1881, **near the Colorado 'on the Kanab wash'** [syntype]; *Rusby* 619, of 1883, at **Peach Springs** [paratype]; *Evans* of 1891, between Gila Bend and Yuma) [paratype]."

Coulter, John M., and Rose, J. N.

1900 Monograph of the North American Umbelliferae. *Contributions from the U.S. National Herbarium*, 7(1): 9-256, i-vii.

83 *Phellopterus multinervatus*, NEW SPECIES (pp. 169-170); not illustrated

Trachyophyta: Magnoliopsida: Brassicales: Apiaceae (parsleys)

"Type locality, **Peach Springs**, northern Arizona; collected by *Mr. and Mrs. J. G. Lemmon*, May, 1884 (distributed as *Cymopterus montanus*); type specimen [holotype] in U.S. Nat. Herb." (Paratypes indicated from San Francisco Mountains and Fort Huachuca, Arizona.)

[Although there is no further data on the locality, the Lemmons visited Peach Springs Canyon, descending to Diamond Creek and the Colorado River and remained in the vicinity of Peach Springs for a month. See J. G. Lemmon (1888, Grand Cañon of the Colorado. *Overland Monthly*, New Series, 12(69) (September): 244-256). Thus the precise type locality for this species must be considered to be generalized. Also note that the gathering is likely from what is now the Hualapai Indian Reservation.]

Coville, Frederick Vernon

1894 New or little-known plants. *Ostrya Knowltoni*, a new species of hop hornbeam. *Garden and Forest*, 7(317) (March 21): 114-116.

84 ➔ *Ostrya knowltoni*, NEW SPECIES, fig. 23.
(Subsequent grammatical correction of specific epithet to *Ostrya knowltonii*.)

Trachyophyta: Magnoliopsida: Fagales: Betulaceae (alders)

"Type specimen in the United States National Herbarium, collected July 10th, 1892 (No. 272) in Yavapai County [today Coconino Co.], Arizona, within the Grand Cañon of the Colorado River, by J. W. Toumey." Holotype illustrated in fig. 23 (p. 115). Type locality at **top of Old Hance Trail, Hance Canyon** (see below regarding its recovery). [The original holotype illustration and the recovered type locality are illustrated on the covers of the present checklist.]

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"In the year 1889 Mr. Frank H. Knowlton was occupied in making a collection of the plants of San Francisco Mountain, in northern Arizona, and spent a portion of his time in a side trip to the Grand Cañon at a point known as **Cañon Spring**, having traversed the road from San Francisco Mountain by the way of Hull Spring and Red Horse Spring. [. . .] In the vicinity of Cañon Spring Mr. Knowlton obtained a specimen of a tree which subsequently proved to be an *Ostrya*, but which was not at that time in fruit. In 1892 Professor J. W. Toumey, of Tucson, Arizona, botanist of the State University, visited the same locality and obtained fruiting specimens of this tree, which in January, 1894, came into the writer's hands."

"The following communication from Professor Toumey, under date of February 5th, 1894, will serve to direct others to the exact station of the original tree, which is, with little doubt, the same specimen from which Mr. Knowlton obtained his material:

"The *Ostrya*, which you inquire further in regard to, and specimens of which were sent to the Department of Agriculture a year ago, as found north of Flagstaff, on the rim of the Grand Cañon of the Colorado River. It is growing **at the left, a few rods after beginning the descent to the river over John Hance's trail.**"

Later researchers failed to locate the type locality, and the species was there presumed to have been extirpated. However, in 1997 Earle Spamer thought that the oversight was due to the misunderstanding of "John Hance's trail," portions of which were destroyed by landslides in 1895. Hance thereafter rerouted the upper part of his trail to descend into Red Canyon farther to the east, which is the "Hance Trail" as known today. The older trail at the head of Hance Canyon, if referred to at all, is called the "Old Hance Trail," although it is hardly even a route today. Spamer asked Nancy Brian (Grand Canyon National Park) to investigate whether the type locality could be identified at the head of the Old Hance Trail. As reported by Nancy J. Brian and Earle E. Spamer (2000, Knowlton hop-hornbeam revisited (*Ostrya knowltonii* Cov.), *Bartonia*, no. 60: 49-56), p. 54:

"On 23 May 1997, Brian located the head of the Old Hance Trail and descended into the canyon. She saw the distinctive dark yellow-green color of a deciduous tree nestled amongst the darker foliage of the surrounding Rocky Mountain Douglas-firs and white firs (Figs. 2A, B [of that paper]). Such a 'window box' habitat is frequently found just below the north-facing slope of the canyon wall. It is a shaded, moist, steep environment which allows forest-dwelling species to grow well below their usual elevational range. Scrambling down the steep slope, at ca. 6,800 feet (2,100 m) elevation, Brian located about 25 trees of *Ostrya knowltonii*. Other plants of the community include scattered shrubs such as snowberry and Utah serviceberry, along with an occasional pinyon pine, ponderosa pine, mutton grass, and phlox. No redbuds were in the immediate vicinity, as Tourney had described, although Gambel oak was found upslope on the canyon rim. Most of the Knowlton hop-hornbeams were shrub-like, with up to ten branches originating from ground level. A few trees were saplings, indicating a measure of reproductive success. Collections were made for the National Herbarium (US), the University of Arizona (ARIZ), the Desert Botanical Garden (DBG) in Phoenix, and the Academy of Natural Sciences of Philadelphia (PH; Fig. 3 [of Brian and Spamer])."

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Crawford, Richard A., and Rink, Glenn

2024 A novel species of *Nama* (Namaceae) from northern Arizona, U.S.A. *Botanical Research Institute of Texas, Journal*, 18(1): 1-5.

323 *Nana arizonica, NEW SPECIES (entire paper); illustrated

Trachyophyta: Magnoliopsida: Boraginales: Boraginaceae (borage)

(Type locality Coconino County, Babbitt Ranches north of Wupatki National Monument [extralimital to this checklist].) Specimens examined [comprising botanical paratypes] include “**east rim of the Little Colorado River gorge, 17 mi W of Cameron, 1.5 mi NE of the terminus of Lee Canyon, Navajo Nation**, 21 Aug 2012, *Crawford 927*; **Little Colorado River gorge, east rim, river mile 23.5 from the confluence, Navajo Nation**, 22 Aug 2012, *Crawford 571*; **south rim of Big Canyon 15 km E of its confluence with the Little Colorado River gorge, Navajo Nation**, 16 Aug 2013, *Crawford 1085*; **Little Colorado River Gorge, northeast rim, river mile 26.8 from confluence, Navajo Nation**, 20 Sep 2013, *Crawford 1090*; **Little Colorado River gorge, Hellhole Bend, northeast rim, River mile 33.5 from the confluence, Navajo Nation**, 20 Sep 2013, *Crawford 1099* . . . **Hot Na Na Wash, Marble Canyon, Navajo Nation**, 13 Oct 2013, *Rink 12411*”

Cresson, Ezra T., Jr.

1919 Dipterological notes and descriptions. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 71: 171-194.

85 ➔ ***Bombylius facialis***, NEW SPECIES (pp. 187-188); not illustrated

Arthropoda: Insecta: Diptera: Bombyliidae (bee flies)

“Type.—♂; **Rim of Grand Canyon, Arizona**, 7000 feet, alt., [*sic*] May 23, 1918, (F. M. Jones), [A. N. S. P. No. 6213].” [Square brackets around catalogue number data are part of quotation.]

Crosswhite, Frank S.

1967 Revision of *Penstemon* Section *Habroanthus* (Scrophulariaceae). III. Series *Virgati*. *American Midland Naturalist*, 77(1) (January): 28-41.

86 ***Penstemon virgatus pseudoptutus***, NEW SUBSPECIES (pp. 35-37) [the call-out for fig. 1 refers only to a map of distributions].

Trachyophyta: Magnoliopsida: Lamiales: Plantaginaceae (plantains)

“Typus [holotype]: *Mead 503* (US) from **DeMotte Park, Kaibab Plateau**, Coconino County, Arizona.”

Other “specimens examined” [paratypes] include: “**Bright Angel Point**, N rim of Grand Canyon, *Pilsbry s.n.* (PH). 19 mi N of Bright Angel Point at **V.T. Park, Richards s.n.** (NY). **V.T. Ranger Station**, Kaibab Plateau, *Collum s.n.* (US) . . . **Kaibab Plateau, Kraus s.n.** (WIS). **Kaibab Natl. Forest, Goodman & Hitchcock 1630** (F, NY, PH), *Johnson s.n.* (WIS). **Dry Park**, Kaibab N.F.,

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Eggleston 10227 (US). **Hwy. from Jacob Lake to Lodge, Kaibab Forest, Collom 944** (US). Roadside **near Grand Canyon N.P., Kaibab Forest, Kearney & Peebles 13744** (NY). **W of Jct. of Cape Royal & Point Imperial Rds., Kaibab Plateau, Collom s.n.** (US) [*i.e.* in Grand Canyon National Park]. **Marble Flat, N Rim of Grand Canyon, Collom 1049** (US)."

Davis, William T.

1921 Records of cicadas from North America with descriptions of new species. *Journal of the New York Entomological Society*, 29(1) (March): 1-16.

87 ➔ ***Tibicen apache***, NEW SPECIES (pp. 3-5, Pl. 1, figs. 4-6)

Arthropoda: Insecta: Hemiptera: Cicadidae (cicadas)

(Holotype and allotype from Florence, Arizona; illustrated.) "The following typical material [paratypes⁶; not illustrated] of *apache* from Arizona is in the writer's collection: . . . Grand Canyon, **Lower Bright Angel Trail**, August 2, 1917, three males (Dr. Knight) . . ."

DeLong, Dwight M.

1964 A monographic study of the North American species of the genus *Ballana* (Homoptera: Cicadellidae). *Ohio Journal of Science*, 64(5) (September): 305-370.

88 ➔ ***Ballana basala***, NEW SPECIES (p. 356, figs. 74 [p. 319], 193 [p. 327], 391 [p. 339])

Arthropoda: Insecta: Hemiptera: Cicadellidae (leafhoppers)

(Holotype and allotype from Walsenburg, Colorado.) Paratypes include ". . . 5 males, 6 females, **Grand Canyon, Arizona**, July 28, 1936, R. H. Beamer . . ." Holotype, allotype, and paratypes (not specified) in DeLong collection; other paratypes (not specified) in U.S. National Museum, University of Kansas collection, and Ohio State University collection.

⁶ Whereas it seems that Davis' use of the word "typical" may actually mean "usual", and not being an implication of paratypical material, I have always preferred in preparing catalogs and checklists such as this one to err subjectively on the side of types when they appear +in older literature prior to the established codes of nomenclature, because occasionally it can be demonstrated through ancillary evidence, if not simply inferred, that such material is in fact of type status. The checklist entries can always be dismissed. —*E.E.S.*

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Dempster, Lauramay T., and Ehrendorfer, Friedrich

1965 Evolution of the *Galium multiflorum* complex in western North America. II. Critical taxonomic revision. *Brittonia*, 17 (October): 289-334.

89 ➔ ***Galium munzii* Hilend & Howell subsp. *ambivalens***, NEW SUBSPECIES (pp. 309-310); not illustrated

Trachyophyta: Magnoliopsida: Gentianales: Rubiaceae (madders)

"Type from '**about Grand Canyon of the Colorado,**' *MacDougal 157* (UC 138660. Isotypes, ARIZ, F, GH, NY, US)"; distribution notes "Grand Canyon of the Colorado River, and eastward on the Little Colorado River."

Doering, Kathleen C.

1939 A contribution to the taxonomy of the subfamily Issinae in America North of Mexico (Fulgoroidea, Homoptera). *University of Kansas Science Bulletin*, 26(2) (October 1): 83-167 (including Pls. 13-22).

90 ➔ ***Bruchomorpha bunni***, NEW SPECIES pp. 119-121, Pl. 20, fig. 3, Pl. 21, fig. 15, Pl. 22, figs. 4, 4a

Arthropoda: Insecta: Hemiptera: Issidae (planthoppers)

"Holotype male, taken at **Grand Canyon, Arizona**, on August 11, 1927, by R. H. Beamer; allotype female, Grand Canyon, August 11, 1927, by P. A. Readio. Two female paratypes and nine male paratypes, same data." (Other paratypes from Arizona and New Mexico.) "The types are in Snow entomological Collection at the University of Kansas."

Durham, Floyd E.

1952 A new pocket gopher from the North Rim of the Grand Canyon, Arizona. *Journal of Mammalogy*, 33(4) (November): 498-499.

91 ➔ ***Thomomys bottae boreorarius***, NEW SUBSPECIES; not illustrated

Chordata: Mammalia: Rodentia: Geomyidae (pocket gophers)

"*Type*.—Adult female, skin and skull, number 1184, Hancock Foundation Collections, University of Southern California, taken at **Swamp Point**, 7522 ft. alt., 18½ mi. northwestward of Bright Angel Point, North Rim of the Grand Canyon, Coconino County, Arizona; July 10, 1947; Floyd E. Durham; original number, 2141."

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Eastwood, Alice

1902 New western plants. *Bulletin of the Torrey Botanical Club*, 29(8) (August): 523-525.

92 ➔ ***Corydalis wetherillii***, NEW SPECIES (p. 524); not illustrated

Trachyophyta: Magnoliopsida: Ranunculales: Papaveraceae (poppies)

Listed under the section, "New Species from Colorado and Utah [*sic*]." "This peculiar species was collected **near Bright Angel Creek**, one of the branches of the Colorado River which comes into the river nearly opposite Hans' Trail [Hance Trail]. This trail is that taken by tourists who go into the cañon from the Flagstaff side. It is named in honor of Mr. Alfred Wetherill who collected it in the summer of 1897." "The type [holotype] is in the herbarium of the California Academy of Sciences."

1903 New species of western plants. *Bulletin of the Torrey Botanical Club*, 30(9) (September): 483-502.

93 ➔ ***Fraxinus macropetala***, NEW SPECIES (pp. 494-495); not illustrated

Trachyophyta: Magnoliopsida: Lamiales: Oleaceae (olives)

"This was collected by E. O. Wooton, July 9, 1902, in the **Grand Cañon of the Colorado**, being no. 1102 of his collection; this specimen is in fruit. The flowers were collected at the same place [*i.e.*, Grand Canyon], on the **Bright Angel Trail**, by Dr. C. Hart Merriam, the middle of May, 1903. These specimens [syntypes] are both in the Herbarium of the California Academy of Sciences."

1937 New species of western plants. *Leaflets of Western Botany*, 2(1) (January): 7-9.

94 ➔ ***Oreocarya capitata***, NEW SPECIES (p. 9); not illustrated

Trachyophyta: Magnoliopsida: Boraginales: Boraginaceae (borage)

"Type [holotype]: No. 232041, Herb. Calif. Acad. Sci., collected by the author, *No. 5969*, on the **Hermit Trail**, Grand Canyon of the Colorado, Arizona, April 9, 1917. This specimen is in flower. A fruiting specimen, Herb Calif. Acad. Sci. No. 232040 [paratype], was collected by the author on the same trail, June 18, 1916. It was collected June 23, 1933, on the north side of the Grand Canyon on the **Kaibab Trail to Roaring Springs**, *Eastwood & Howell No. 1005*, Herb. Calif. Acad. Sci. No. 232039 [paratype]."

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Ehrhorn, Edw. M.

1899 Five new Coccidæ. *The Canadian Entomologist* (London), 31(1) (January): 5-7.

Arthropoda: Insecta: Hemiptera: Coccidae (soft scales)

95 ➔ *Ripersia arizonensis*, NEW SPECIES (p. 5); not illustrated

"*Hab.*—In ants' nest on the roots of *grass* and *Artemisia*, sp., **Camp Thurber [Hance Ranch]**, Grand Canyon of the Colorado, Arizona."

96 ➔ *Dactylopius formicarii*, NEW SPECIES (pp. 6-7); not illustrated

"*Hab.*—In *ants' nests* on the roots of *Artemisia*, sp. **Thurber's Camp [Hance Ranch]**, Grand Canyon of the Colorado, Arizona."

Ellis, Don E.

1946 Anthracnose of dwarf mistletoe caused by a new species of *Septogloeum*. *Journal of the Elisha Mitchell Scientific Society*, (June): 25-50, Pls. 4-6.

97 ➔ *Septogloeum gillii*, NEW SPECIES (pp. 30-38, text-fig. 2)

Ascomycota (sac fungi) incertae sedis

"Parasitic on shoots of *Aceuthobium campylopodum* and *A. douglasii* in Western United States."

"The following specimens in the herbarium of the Division of Forest Pathology at Albuquerque, New Mexico, were examined: (Instances in which the disease was found on herbarium collections of the host are indicated by an asterick [*sic*] (*))."

"On *A. campylopodum* f. *divaricatum* (Engelmann) Gill . . . **Grand Canyon**, Gill, June 6, 1932 (68234)*"

(Other host species examined from specimens gathered within the bounds of the present checklist did not exhibit the disease.)

Ellis, J. B., and Everhart, B. M.

1900 New species of fungi from various localities with notes on some published species. *Bulletin of the Torrey Botanical Club*, 27(2) (February): 49-64.

98 ➔ *Puccinia circinans*, NEW SPECIES (p. 61); not illustrated

Basidiomycota (club fungi): Pucciniomycetes: Pucciniales: Pucciniaceae

"On *Penstemon spectabilis*, **Grand Cañon of the Colorado** (Prof. J. W. Toumey)."

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Esslinger, Theodore L.

2000 A key for the lichen genus *Physconia* in California, with descriptions for three new species occurring within the state. *Bulletin of the California Lichen Society*, 7(1) (Summer): 1-6.

99 ➔ *Physconia isidiomuscigena*, new species (pp. 5-6, figs. 5, 6)

Ascomycota (sac fungi): Lecanoromycetes: Teloschistales: Physciaceae

"Type [holotype]: U.S.A. Arizona. Coconino Co.: Grand Canyon Natl. Park, **Grandview Trail, 36°00'N, 111°59'W**, 1980 m, *Nash 30843* (ASU, holotype; TLE, isotype)." Figs. 5, 6 depict "part of holotype specimen". [The geographic coordinates pinpoint a location on the upper part of Grandview Trail.]

"Selected additional specimens examined ([designated] Paratypes): . . . **Grand Canyon Natl. Park, N rim, junction of paved roads, ca. 6.5 km N of Kaibab Lodge, 36° 16' N, 112° 03' W** [*sic*, Grand Canyon Lodge, coordinates pinpoint a location just east of Arizona Route 67 north of the Cape Royal Road jct], 2470 m, *Nash 9943* (ASU, MIN, TLE); Grand Canyon Natl. Park, **South Kaibab Trail, 36° 03' 45" N, 112° 03' 30" W**, 1950 m, *Nash 30819* (ASU, MIN). . . ."

[In noting the paper's title, Esslinger comments, "This species is presently known from only two collections in California and is apparently much more common in the southern Rocky Mountains."]

Fall, H. C.

1905 Revision of the Ptinidæ of boreal America. *Transactions of the American Entomological Society*, 31(2/3): 97-296, Pl. 7.

Arthropoda: Insecta: Coleoptera: Ptinidae (spider beetles)

100 ➔ *Petalium bistriatum* Say var. *arizonense*, NEW VARIETY (p. 217); not illustrated. [*P. bistriatum* Say described, pp. 216-217.]

"A small series [syntypes] collected by Hubbard or Schwarz at Oracle and **Bright Angel, Arizona**"

101 ➔ *Catorama grande*, NEW SPECIES (p. 236); not illustrated

Species based on specimens [syntypes] seen from Texas and Arizona, including "**Bright Angel**".

102 ➔ *Catorama longulum*, NEW SPECIES (p. 244); not illustrated

"Described from four examples [syntypes] taken by Barber and Schwarz at Williams and **Bright Angel**. With these is included a nearly identical specimen taken by the same collectors Las Vegas, New Mexico."

103 ➔ *Catorama pingue*, NEW SPECIES (p. 250); not illustrated

Described on syntypes from "Arizona (Santa Rita Mountains, Oracle, **Bright Angel**, Pinal Mountains, Williams, Ash Fork)".

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1909 Revision of the species of *Diplotaxis* of the United States. *Transactions of the American Entomological Society*, 35(1) (January): 1-97.

104 ➔ *Diplotaxis conformis*, NEW SPECIES (p. 34); not illustrated

Arthropoda: Insecta: Coleoptera: Scarabaeidae (scarab beetles)

Described on syntypes "from Glenwood Springs, Colorado (Fenyés), and from Prescott and **Bright Angel**, Arizona. Specimens in Mr. Dury's collection are labeled 'Northern Arizona.' "

1910 Miscellaneous notes and descriptions of North American Coleoptera. *Transactions of the American Entomological Society*, 36(2): 89-197.

105 ➔ *Bruchus perplexus*, NEW SPECIES (p. 177); not illustrated

Arthropoda: Insecta: Coleoptera: Chrysomelidae (leaf beetles)

"The type [holotype] is from Albuquerque [*sic*], New Mexico (Wickham). With it are associated specimens [paratypes] from Highrolls, New Mexico, **Bright Angel, Arizona**, Palm Springs, California, and Claremont, California."

Fernald, M. L.

1934 A new *Primula* from the Grand Canyon of the Colorado. *Rhodora* (Journal of the New England Botanical Club), 36 (April): 117-118, Pl. 282.

106 ➔ *Primula (Section Farinosae) hunnewellii*, NEW SPECIES; Pl. 282, figs. 1, 2

Trachyophyta: Magnoliopsida: Ericales: Primulaceae (primroses)

"Arizona: limestone cliffs, **North Rim, Grand Canyon**, Coconino Co., August 19, 1928, *Francis Welles Hunnewell*, no. 10,883 (TYPE [holotype] in herb. F. W. Hunnewell, duplicate [isotype] in Gray Herb.)." (Fig. 3 of the plate illustrates a comparative species, *P. specuicola* Rydb. from its type locality, Bluff City, Utah.)

Ferris, Roxana Stinchfield

1918 Taxonomy and distribution of *Adenostegia*. *Bulletin of the Torrey Botanical Club*, 45(10) (October): 299-423.

107 ➔ *Adenostegia parviflora*, NEW SPECIES (p. 409, Pl. 10, fig. 8; Pl. 11, fig. 4 [plate legends p. 422])

Trachyophyta: Magnoliopsida: Lamiales: Orobanchaceae (broomrapes)

"TYPE LOCALITY: **Grand Canyon of the Colorado River**, near the San Francisco Mountains, Arizona, *Knowlton 270*. TYPE [holotype], No. 48859 of the U. S. National Herbarium."

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Fischer, Pierre C.

1979 *Coryphantha vivipara* var. *kaibabensis*, a new variety from northern Arizona. *Cactus and Succulent Journal* (Cactus and Succulent Society of America), 51(6): 286-287.

108 *Coryphantha vivipara* var. *kaibabensis*, NEW VARIETY. [Illustrations depict living specimens.]

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

"HOLOTYPE P.C. Fischer 4094, collected on 31/III/69 **northwest of Jacob Lake**, Coconino Co., Arizona. 1890 meters (6200 ft). Growing with Juniper, Pinyon Pine, Sagebrush (*Artemisia tridentata*) and Cliff Rose (*Cowania* sp.). Growing on dolomite and limestone. Deposited at the herbarium of the University of California (UC), Berkeley, CA."

1991 *Echinocereus triglochidiatus* variety *toroweapensis*, a new variety from the Grand Canyon. *Cactus and Succulent Journal* (Cactus and Succulent Society of America), 63(4) (July/August): 194-195.

109 ➔ *Echinocereus triglochidiatus* var. *toroweapensis*, NEW VARIETY; [live specimens illustrated]

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

"Holotype. P. C. Fischer 7196 collected April 7, 1990, **Toroweap Point**, Grand Canyon National Park, Mohave Co., Arizona; 1,340 meters (4,400 ft). [. . .] Deposited at the herbarium of the University of Arizona (Ariz.), Tucson."

Foissner, Ilse, and Foissner, Wilhelm

1993 Revision of the family Spironemidae Doflein (Protista, Hemimastigophora), with description of two new species, *Spironema terricola* n. sp. and *Stereonema geiseri* n. g., n. sp. *Journal of Eukaryotic Microbiology*, 40(4): 422-438.

110 ➔ *Spironema terricola*, NEW SPECIES (pp. 424-429, figs. 5-34, 59, 62, 65)

Hemimastigophora: Hemimastigea: Hemimastigida: Spironemidae (hemimastigid protist)

"Type location. Soil from the Grand Canyon, USA (**upper entrance to Bright Angel Trail**), 36° N, 112° E [*sic*]. Type specimens. One slide of holotype specimens and three slides of paratype specimens (all protargol-impregnated) have been deposited in the collection of microscope slides of the Oberösterreichische Landesmuseum in Linz, Austria. Accession numbers: 44, 45, 46, 47 /1992." [Not only are the coordinates in error ("E" instead of "W") but they are overly generalized, that geographical intersection being 8¾ miles southeast of the head of Bright Angel Trail.]

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Fox, William J.

1893 New species of fossorial Hymenoptera. *The Canadian Entomologist* (London), 25(5) (May): 113-117.

111 ➔ *Gorytes dentatus*, NEW SPECIES (pp. 116-117); not illustrated

Arthropoda: Insecta: Hymenoptera: Crabronidae (crabronid wasps)

Holotype male from "Grand Canyon, Arizona, '70 miles North of Flagstaff.' (C. H. Tyler Townsend)."

[Townsend visited the canyon in July 1892 at Hance Ranch and trail. For his general (non-scientific) account of the trip see Townsend, 1893, A wagon-trip to the Grand Cañon of the Colorado River, *Appalachia*, 7(1) (February): 48-63.]

[Note: Townsend (1896, Notes on New Mexico and Arizona Hymenoptera, *The Canadian Entomologist* (London), 28(5) (May): 138-142), p. 139 there lists "Gorytes dentatus Fox., n. sp. —Grand Canyon, Arizona; Hance trail, July 11. One specimen. [. . .] Det., Fox." It is of course not a new species therein but the record further substantiates the identification of the locality as the Old Hance Trail.]

Gandoger, Michel

1906 Le genre Eriogonum (Polygonaceae). *Société Royale de Botanique de Belgique, Bulletin*, 42: 183-200. [Introduction in French; the remainder in botanical Latin.]

Trachyophyta: Magnoliopsida: Caryophyllales: Polygonaceae (knotweeds)

***324** ➔ *Eriogonum juncinellum*, NEW SUBSPECIES (p. 187); not illustrated

"*Eriogonum juncinellum* Gdgr. sp. nova, est forma peculiaris ab *E. Baileyi* [Wats.] recedens caule minus ramoso glauco pauciflora, involucris parum costatis, floribus saltem duplo longius pedicellatis. Hab. Arizona, ad **Grand Canon of the Colorado**, alt. 7000' (Mac Dougal n. 182)."

[Data added here: 28 June 1898 "Collected **about Grand Canon of the Colorado**" isotypes: F, GH, NY, PH]

***325** ➔ *Eriogonum macdougalii*, NEW SPECIES (p. 191); not illustrated

"*Eriogonum microthecum* Nutt. Suffrutex admodum variabilis formis quasi innumeris induens inter quas sequentes saltem pro subspeciebus habueris: [. . .] Inflorescentia villosa-lanata. Fruticulus tortuosus basi decumbens toto foliosus, folia linearia 1 1/2 cent. longa 3 m. lata mucronata superne arancosa, cymae simplices trifurcatae pauciflorae, involucrum villosum vix costatum, bracteae ad apicem subulatae. Hab. Arizona, ad **Grand Canon of the Colorado** (Mac Dougal n. 176) *E. Macdougalii* Gdgr. n. sp."

[Data added here: 28 June 1898 "Collected **about Grand Canon of the Colorado**" isotypes: F, GH, NY, dupl. of type NY]

1908 *Eriogonum Polygonacearum* genus speciebus varietatibusque novis auctum. (Ex: Bull. Soc. Roy. Bot. Belgique, XLII [1906], pp. 183-200.) *In*: Fedde, Friedrich (ed.), *Repertorium*

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novarum specierum regni vegetabilis. Centralblatt für Sammlung und Veröffentlichung von Einzeldiagnosen neuer Pflanzen. Berlin-Wilmersdorf: Selbstverlag des Herausgebers (Kommissions-Verlag von Gebrüder Borntraeger, Berlin), pp. 169-179. [In botanical Latin.]

Reprinted from Gandoger (1906). Cited here in the event that a user is unable to locate the 1906 publication cited above.] [See *Eriogonum juncinellum* Gdgr. (p. 170), and *Eriogonum macdougallii* Gdgr. (pp. 172-173).]

Garth, John S.

1949 Studies in Arizona Lepidoptera. I. A new subspecies of *Speyeria atlantis* (Edwards) from the Kaibab Plateau, Grand Canyon National Park. *Bulletin of the Southern California Academy of Sciences*, 48 (Part 1): 1-4.

112 ➔ *Speyeria atlantis schellbachi*, NEW SUBSPECIES; illustrated

Arthropoda: Insecta: Lepidoptera: Nymphalidae (admirals)

"Type material: Male holotype, AHF No. 471, and female allotype, AHF No. 471a, from **Neal Spring**, North Rim, Grand Canyon National Park, Coconino County, Arizona, 8,175 feet, July 5, 1947, collected by John S. Garth, Allan Hancock Foundation survey party. Twenty paratypes as follows: 1 female, **North Rim**, Grand Canyon, July 29, 1939, Louis Schellbach, collector; 1 female, **North Rim**, Grand Canyon, August 19, 1942, H. C. Bryant, collector; 1 male, 1 female, **Two River Junction**, Grand Canyon, July 28, 1945, Louis Schellbach, collector, the preceding four paratypes on loan from the Naturalist Workshop, Grand Canyon National Park; 1 male, 1 female, **Neal Spring**, North Rim, Grand Canyon, August 16, 1946, J. S. Garth, collector; 2 females, **Kanabownits Spring**, North Rim, Grand Canyon, August 22, 1946, J. S. Garth, collector; 7 males, 2 females, **Neal Spring**, North Rim, Grand Canyon, July 5 to 18, 1947, J. S. Garth, collector; 1 male, **Robbers' Roost Spring**, North Rim, Grand Canyon, July 10, 1947, J. S. Garth, collector; 2 females, **Swamp Lake** and **Swamp Ridge**, North Rim, Grand Canyon, July 12 and 14, 1947, J. S. Garth, collector. The holotype, allotype, and ten paratypes are in the collection of the Allan Hancock Foundation, the University of Southern California. The remaining paratypes will be distributed as follows: one male and three females to the Naturalist Workshop, Grand Canyon National Park, one pair each to the United States National Museum, the American Museum of Natural History, and the Los Angeles County Museum."

[The type locality, Neal Spring, is by the junction of Cape Royal Road and Point Imperial Road.]

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Gertsch, Willis J.

1933 New genera and species of North American spiders. *American Museum Novitates*, (636), 28 pp.

113 ➔ *Misumenops coloradensis*, NEW SPECIES (p. 17, figs. 15 [p. 12], 46 [p. 24])

Arthropoda: Euchelicerata: Areneae: Thomisidae (crab spiders)

("Male holotype, female allotype, and paratypes of both sexes from Colorado.") "Female paratypes from **Grand Canyon (North Rim)**, Arizona, and Kanab, Utah."

1934a Notes on American Lycosidae. *American Museum Novitates*, (693), 25 pp.

114 ➔ *Arctosa mokiensis*, NEW SPECIES (p. 8); not illustrated [but see note below]

Arthropoda: Euchelicerata: Areneae: Lycosidae (wolf spiders)

Holotype male. "Type Locality.—Male holotype from **Indian Gardens** [Havasupai Gardens], Grand Canyon, Arizona, May 26, 1905."

In synonymy is "*Arctosa notuabanda* Gertsch, 1933, *American Museum Novitates*, No. 637, p. 8, fig. 11 (not *noctuabunda* Montgomery)", which was noted therein only by the name *Arctosa notuabunda* Montgomery in the legend for fig. 11 and is not mentioned in that text. [It is not clear whether this represents a figure of the type of *A. mokiensis*.]

1934b Further notes on American spiders. *American Museum Novitates*, (726), 26 pp.

115 *Phidippus kaibabensis*, NEW SPECIES (pp. 13-14, fig. 19 [p. 17])

Arthropoda: Euchelicerata: Areneae: Salticidae (jumping spiders)

"Male holotype from the Kaibab forest, near the north rim of the Grand Canyon, Arizona, July 8, 1931 (Gertsch)."

1960 The *fulva* group of the spider genus *Steatoda* (Araneae, Theridiidae). *American Museum Novitates*, (1982), 48 pp.

116 *Steatoda variata*, NEW SPECIES (pp. 24-29, figs. 22-25 [p. 13], 34-44 [pp. 17, 26])

Arthropoda: Euchelicerata: Areneae: Theridiidae (cobweb weavers)

"Type Locality: Male holotype from 25 miles north of **The Gap**, Navajo Indian Reservation, Arizona, July 21, 1949 (W. J. and J. W. Gertsch). (Non-type records include "Twenty-five males north of The Gap . . . male, many females.")"

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Gertsch, Willis J., and Ennik, Franklin

1983 The spider genus *Loxosceles* in North America, Central America, and the West Indies (Araneae, Loxoscelidae). *Bulletin of the American Museum of Natural History*, 175 (Article 3): 264-360.

117 ➔ *Loxosceles kaiba*, NEW SPECIES (p. 303, figs. 110-113 [p. 299], 133 [p. 300])

Arthropoda: Euchelicerata: Areneae: Sicariidae (recluse spiders)

"Type Data: Male holotype, female and four immatures [paratypes] from Thunder Cave [**Thunder River Cave**], 3900 feet, near Monument Point, north rim of Grand Canyon National Park, Coconino County, Arizona, 15 September 1977 (S. Peck, D. Carlile), deposited in AMNH. Other Record [non-type?]: Grand Canyon National Park, Cameron Cave, 5000 ft., 7 Dec. 1954 (R. de Saussure), ♂."

The specific epithet, *kaiba* [*sic*], is named "for Kaibab Plateau on north face of Grand Canyon" (p. 303).

Goldman, Edward A.

1924 Two new kangaroo rats from Arizona. *Journal of the Washington Academy of Sciences* (Washington, D.C.), 14(15) (September 19): 372-373.

Chordata: Mammalia: Rodentia: Heteromyidae (kangaroo rats)

118 *Dipodomys microps celsus*, NEW SUBSPECIES (p. 372); not illustrated. (Virgin Valley Kangaroo Rat)

"Type [holotype] from 6 miles north of **Wolf Hole**, Arizona (altitude 3,500 feet). No. 243101, ♂ adult, U. S. National Museum (Biological Survey Collection) collected by E. A. Goldman, October 16, 1922. Original number 23411."

119 *Dipodomys ordii cupidineus*, NEW SUBSPECIES (pp. 372-373); not illustrated. (Kaibab Kangaroo Rat)

Type [holotype] from **Kanab Wash, at southern boundary of Kaibab Indian Reservation**, Arizona. No. 243093, ♂ adult, U. S. National Museum (Biological Survey Collection), collected by E. A. Goldman, October 12, 1922. Original number 23384."

1929 A new antelope squirrel from Arizona. *Journal of the Washington Academy of Sciences* (Washington, D.C.), 19: 435-436.

120 ➔ *Ammospermophilus leucurus tersus*, NEW SUBSPECIES; not illustrated. (Grand Canyon Antelope Squirrel)

Chordata: Mammalia: Rodentia: Sciuridae (squirrels)

"Type [holotype].—From **lower end of Prospect Valley, Grand Canyon, Hualpai Indian Reservation [Hualapai Indian Reservation]**, Arizona (altitude 4,500 feet). No. 202645, ♂ young adult, U. S. National Museum (Biological Survey collection), collected by E. A. Goldman,

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October 3, 1913. Original number, 22269." "Specimens examined.—Ten, all from the type locality." [Examined specimens not itemized.]

1932 A new beaver from Arizona. *Journal of Mammalogy*, 13(3) (August): 266-267.

121 ➔ *Castor canadensis repentinus*, NEW SUBSPECIES; not illustrated. (Colorado River Beaver)

Chordata: Mammalia: Rodentia: Castoridae (beavers)

"Type [holotype] From **Bright Angel Creek**, Grand Canyon of the Colorado River, Arizona (altitude 4,000 feet); no. 161613, ♀ adult, U.S. National Museum (Biological Survey collection); collected by Clarence Birdseye, September 14, 1909; original number 72." Two specimens examined from type locality (no specimen or collecting data published for the second specimen).

"At the type locality the beavers inhabit Bright Angel Creek, which in short reaches descends the terraced north side, below the out rim, of the Grand Canyon. None are known from the Colorado River in that vicinity, and a measure of isolation would seem to be due to the rapids and heavy current through rock-bound gorges extending for many miles, and affording very few places suitable for beavers to establish homes."

1937 A new canyon mouse of the genus *Peromyscus* from Arizona. *Journal of Mammalogy*, 18(1) (February): 92-93.

122 ➔ *Peromyscus crinitus peridoneus*, NEW SUBSPECIES; not illustrated. (Grand Canyon Mouse)

Chordata: Mammalia: Rodentia: Cricetidae (deer mice)

"Type [holotype].—From **Bright Angel Trail, 4800 feet altitude**, south side of Grand Canyon, Coconino County, Arizona. No. 202,424, ♂ adult, skin and skull, U. S. National Museum (Biol. Surv. coll.); collected by E. A. Goldman, August 19, 1913. Original number 22,145." [Altitude on Bright Angel Trail indicates locality is at about the 2nd rest house descending.]

"Specimens examined [non-type].—Total number, 36, as follows: Arizona: Fredonia, 1; Grand Canyon (near Bass Camp, 3000-5200 feet), 3; near Grand Canyon Spring, 4000-7500 feet, 9; Betatakin Canyon, 3; Bright Angel Creek, 3 miles above mouth, 1; Bright Angel Trail, south side, 4800-6500 feet, 2; Shinumo Creek, 3000 feet, 12; Nankoweap Valley, 1. Utah: Beaver River, near Fort Cameron, 3; Parowan, 1."

1938 New pocket gophers of the genus *Thomomys* from Arizona and Utah. *Journal of the Washington Academy of Sciences* (Washington, D.C.), 28(7) (July 15): 333-343.

Chordata: Mammalia: Rodentia: Geomyidae (pocket gophers)

123 *Thomomys fossor kaibabensis*, NEW SUBSPECIES (pp. 333-334); not illustrated. (Common name given by the author, "Kaibab Pocket Gopher")

"Type [holotype].—From **DeMotte Park, Kaibab Plateau**, Coconino County, Arizona (altitude 9,000 feet). No. 262891, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection), collected by Luther C. Goldman, September 10, 1937. Original number 443."

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"*Specimens examined* [non-type].—Total number, 23, all from Kaibab Plateau, Arizona, as follows: Bright Angel Spring, 3; DeMotte Park (type locality), 18; Greenland Spring, 1; Jacob Lake, 1."

- 124 *Thomomys bottae nicholi*, NEW SUBSPECIES (pp. 337-338); not illustrated. (Common name given by the author, "Shivwits Plateau Pocket Gopher")

"*Type* [holotype].—From **20 miles south of Wolf Hole** (road to Parashouts), Shivwits Plateau, Mohave County, Arizona (altitude 5,000 feet). No. 262864, ♂ adult, skin and skull, U. S. National Museum (Biological Survey Collection), collected by Luther C. Goldman, August 6, 1937. Original number 363."

"*Specimens examined* [non-type].—Total number, 19, as follows: Arizona: Diamond Butte (3 miles northwest), 1; Wolf Hole, 6 (20 miles south, 4; 6 miles north, 2). Utah: St. George, 12."

Gray, Asa

- 1878 Contributions to the botany of North America. *Proceedings of the American Academy of Arts and Sciences*, 13: 361-374.

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

- 125 *Astragalus subcinereus*, NEW SPECIES (p. 366); not illustrated

"**Mokiak Pass** in the northwestern part of Arizona, near the Utah boundary, Dr. E. Palmer, 1877."

- 126 *Astragalus scaposus*, NEW SPECIES (p. 366); not illustrated

"Among rocks in dry creek-bottoms, in **Mokiak Pass**, near the northeastern [*sic*] corner of Arizona, Dr. E. Palmer, 1877." [Gray correctly cites the location of Mokiak Pass elsewhere.]

- 127 *Astragalus mokiacensis*, NEW SPECIES (p. 367); not illustrated

"Rocky ravines, **Mokiak Pass**, on the borders of Utah and N. W. Arizona, Dr. Palmer, 1877."

- 128 *Astragalus artipes*, NEW SPECIES (p. 370); not illustrated

"**Mokiak Pass**, northwest corner of Arizona, in ravines, Dr. E. Palmer, 1877."

- 129 *Actinella biennis*, NEW SPECIES (p. 373); not illustrated

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

"S. Utah and Arizona, **Mokiak Pass** south of St. George, Palmer (no. 260 of coll. 1877)" [syntype; another from Richfield, Utah].

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1886 Contributions to American botany. *Proceedings of the American Academy of Arts and Sciences*, 21: 363-413.

130 *Mirabilis bigelovii*, NEW SPECIES (p. 413); not illustrated

Trachyophyta: Magnoliopsida: Caryophyllales: Nyctaginaceae (four o'clocks)

"Arizona, and perhaps in California on the Colorado. Common in the **Grand Cañon of the Colorado, below Peach Spring [Peach Springs]**, collected May 5, 1885, A. G." [indicating syntypes].

[Gray descended into Grand Canyon in Peach Springs Canyon to Diamond Creek and the Colorado River. Today the Grand Canyon localities "below Peach Spring" are in the Hualapai Indian Reservation.]

Gray, Asa

in Professors Gray, Torrey, Thurber, and Dr Engelmann

[*in Gray, Asa; Torrey, John; Thurber, George; and Engelmann, George*]

1861 Botany. ("By Professors Gray, Torrey, Thurber, and Dr Engelmann".) *In*: Ives, Joseph C., *Report upon the Colorado River of the West, explored in 1857 and 1858 by Lieutenant Joseph C. Ives, Corps of Topographical Engineers, under the direction of the Office of Explorations and Surveys, A. A. Humphreys, Captain Topographical Engineers, in charge. By order of the Secretary of War. U.S. 30th Congress, 1st Session, House and Senate Executive Document 90.* Washington, D.C.: U.S. Government Printing Office [1861], Part 4, 30 pp. [Botany section, with 1860 date printed on title leaf, apparently arranged or edited by John Strong Newberry; see p. 20, footnote.]

The collecting localities noted here are now within the Hualapai Indian Reservation.

131 *Phacelia (Coreanthus) ivesiana*, NEW SPECIES (p. 21); not illustrated

Trachyophyta: Magnoliopsida: Boraginales: Hydrophyllaceae (waterleafs)

One of three localities noted is "**Diamond river**; April 3" (entire note) [indicating syntypes]. Not illustrated.

132 "*Gilia dactylophyllum*, (n. sp.?)" (p. 22); not illustrated

Trachyophyta: Magnoliopsida: Ericales: Polemoniaceae (phlox)

[It is unclear whether this entry refers to *G. dactylophyllum* Torr. (which itself is now in another genus), or whether Gray had questionably introduced the name or left his specimens open to receive a new name in the future (*see his remarks below*); and so retained here with question as well.]

"**Mouth of Diamond river**; April 3. The specimens [syntypes] are scarcely sufficient for description. A slender plant, about 3 inches high. Corolla twice as long as the calyx, white; ovules about 7 in each cell." (entire entry).

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Greene, Edward Lee

1890 Bibliographical notes on well known plants.—X. *Bulletin of the Torrey Botanical Club*, 17(1) (January 15): 13-14.

133 ➔ *Rhus canadensis* Marsh. var. *simplicifolia*, NEW VARIETY, p. 13 (footnote); not illustrated
Trachyophyta: Magnoliopsida: Sapindales: Anacardiaceae (cashews)

"In the **deep cañons of Northern Arizona which lead down to the Grand Cañon of the Colorado**". [Identity of these canyons uncertain and not resolved here based on ecological potential, which could well include the side canyons in which the more famous trails descend into the canyon—Hance Trail, Grandview Trail, Bright Angel Trail.]

1900 Studies in the Cruciferae.—III. *Pittonia*, 4 [1899-1901]: 187-207.

Trachyophyta: Magnoliopsida: Brassicales: Brassicaceae [Cruciferae] (mustards)

134 *Arabis eremophila*, NEW SPECIES (pp. 194-195); not illustrated

"Common about **Peach Springs**, northern Arizona . . ." [No further details. Syntypic material from this locality and from Aztec, New Mexico.]

135 *Arabis recondita*, NEW SPECIES (p. 195); not illustrated

"**Diamond Creek Cañon**, a tributary of the Colorado, in northern Arizona, N. C. Wilson, April 1893." [Syntypic material from this locality and from Glenwood Springs, Colorado.]

[It is unclear whether "Diamond Creek Cañon" refers to Diamond Creek or more generally to Peach Springs Canyon, to which Diamond Creek is a tributary close to its confluence with the Colorado River, the former being the long principal route into Grand Canyon from Peach Springs.]

1905 Segregates of the genus *Rhus*. *Leaflets of Botanical Observation and Criticism*, 1: 114-144. [Date of publication for pp. 129-144, November 29, 1905 (see p. 129).]

Trachyophyta: Magnoliopsida: Sapindales: Anacardiaceae (cashews)

136 ➔ *Schmaltzia cissodes*, NEW SPECIES (p. 136); not illustrated

"Grand Cañon of the Colorado, Ariz., **near Indian Garden** [Havasupai Gardens], **Bright Angel Trail**, C. H. Merriam, 10 May, 1903."

137 ➔ *Schmaltzia hirtella*, NEW SPECIES (p. 137); not illustrated

"**Grand Cañon of the Colorado**, Ariz., 10 July, 1892, E. O. Wooton."

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- 1906 The genus *Ptelea* in the western and southwestern United States and Mexico.
Contributions from the U.S. National Herbarium, 10(2) (July 16): 149-179.
- Trachyophyta: Magnoliopsida: Sapindales: Rutaceae (ruess)
- 138** *Ptelea palida*, NEW SPECIES (p. 70); not illustrated
- "Arid rocky hills **above Peach Springs**, northern Arizona, collected by the writer July 3, 1889; type in the National Herbarium."
- 139** *Ptelea straminea*, NEW SPECIES (p. 70); not illustrated
- "Rocky slopes of the **Virgin Mountains** in extreme northwestern Arizona, C. A. Purpus, 1898; his no 6165 as in the national Herbarium."
- 140** ➔ *Ptelea nitida*, NEW SPECIES (p. 71); not illustrated
- "Species known to me only as in the Herbarium of the California Academy from somewhere in the **Grand Canyon of the Colorado** in Arizona, collected by E. O. Wooton, July 8, 1892."
- 141** ➔ *Ptelea argentea*, NEW SPECIES (p. 71); not illustrated
- "This species . . . is known to me only as collected by Dr. F. H. Knowlton, somewhere in the **Grand Canyon of the Colorado**, September 10, 1889, the specimens filling two sheets in the national Herbarium (one the type)."
- 142** ➔ *Ptelea triptera*, NEW SPECIES (pp. 71-72); not illustrated
- "**Grand Canyon of the Colorado**, Arizona, excellent specimen in the National Herbarium, collected by J. W. Toumey, July 11, 1892."
- [Very probably gathered **near Hance Ranch**; compare date and remarks with *Ostrya knowltonii* Coville, 1894.]
- 143** ➔ *Ptelea lutescens*, NEW SPECIES (p. 72); not illustrated
- "Species of northwestern Arizona, inhabiting canyons tributary to the Grand Canyon of the Colorado, the best specimen from **Red Canyon Trail [Hance Trail]**, collected June 10, 1901, by Lester F. Ward (type [holotype] in the National Herbarium). Younger material, with fruit not mature, from **Bright Angel Trail**, by Dr. C. Hart Merriam, May 10, 1903. These last imperfect specimens have smaller relatively broader leaflets, and may possibly represent another species [paratypes, uncertainly]."
- 144** ➔ *Ptelea elegans*, NEW SPECIES (p. 72); not illustrated
- "**Grand Canyon of the Colorado, Arizona**, June 14, 1891, D. T. McDougal [*sic*], the shrub said to grow 'in rich soil and in water.' The only specimens seen are in the National Herbarium [syntypes]."
- [Daniel Trembly MacDougal visited Hance Ranch in June 1891 and signed the Hance guest book. He likely also descended into the canyon on the **Old Hance Trail**, down which probably is the type locality for this species, in as much as there is no standing water on the rim of the canyon except at a reservoir maintained by John Hance for the use of his hotel and riding stock. (The upper portion of this trail was destroyed by landslides in 1895, after which Hance rerouted his

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trail into Red Canyon, which today is the "Hance Trail", which should not be confused with the original trail, now barely not even a route and referred to as the Old Hance Trail.) See record of MacDougal's guestbook signature in G[eorge]. K. Woods, 1899, *Personal impressions of the Grand Cañon of the Colorado River near Flagstaff, Arizona, as seen through nearly two thousand eyes, and written in the private visitors' book of the world-famous guide Capt. John Hance, guide, storyteller, and path-finder* San Francisco: Whitaker and Ray Co., for G. K. Woods, Flagstaff, Arizona Territory. MacDougal added no comments to his signature.]

145 ➔ *Ptelea confinis*, NEW SPECIES (p. 72); not illustrated

". . . inhabiting the **region of the Grand Canyon of the Colorado** in northwestern Arizona and adjacent Utah. The material examined is on four sheets in the National Herbarium, among which I would name that on sheet 15254 as the type [holotype]."

146 *Ptelea saligna*, NEW SPECIES (p. 73); not illustrated

"**Nagle's Ranch, Arizona**, altitude 2,240 meters, M. E. Jones, September 15, 1894, no. 6048, as in the National Herbarium (type) and the Herbarium of the California Academy. [. . .] The locality is in northern Arizona, north of the Grand Canyon."

1909 New plants from Arizona. *Leaflets of Botanical Observation and Criticism*, 2: 20-24.
[Date of publication for pp. 1-24, 6 February 1909 (see p. 1).]

147 *Senecio stygius*, NEW SPECIES (p. 21); not illustrated

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

"**Grand Cañon of the Colorado**, J. G. Lemmon, May, 1884. In U. S. Herb., the sheet [holotype] not numbered."

[Lemmon, with his wife, spent a month in the Peach Springs area in May 1884. For a general (non-scientific) account of their visit, see J. G. Lemmon, 1888, *Grand Cañon of the Colorado, Overland Monthly*, new series, 12(69) (September): 244-256.]

1911 Some southwestern mulberries. *Leaflets of Botanical Observation and Criticism*, 2: 112-121. [Date of publication for pp. 105-120, 6 October 1910 (see p. 105); date for pp. 121-152, 11 May 1911 (see p. 121).]

148 *Morus grisea*, NEW SPECIES (p. 121); not illustrated

Trachyophyta: Magnoliopsida: Rosales: Moraceae (mulberries)

"This fine specimen of this is on U. S. Herb. sheet 41506, and purports to have been collected forty years ago, by Dr. Edw. Palmer, at '**Hell Cañon, Arizona**'; I presume in the northwestern part of the State, in some arm or tributary of the Grand Cañon." [Date of publication for pp. 105-120, 6 October 1910 (see p. 105); date for pp. 121-152, 11 May 1911 (see p. 121).]

["Hell Canyon" could have been an informal name for Palmer's locality, and it is not clear why Greene would have supposed it to be "in some arm or tributary of the Grand Cañon" other than through some familiarity with Palmer's collecting activities. Consulting *Will C. Barnes' Arizona*

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Place Names, revised and enlarged by Byrd H. Granger (University of Arizona Press, 1960), p. 346, the only "Hell Canyon" recognized therein is in the present Yavapai County, which notes, "this canyon was part of the route from the old Beale Trail into Chino Valley in the early days" (i.e. between Ash Fork and Prescott). Greene's record is retained herein in the event that Palmer's "Hell Canyon" is in fact elsewhere in northwestern Arizona.]

Grijseels, Sietske;

Nielsen, Jens Christian; Randelovic, Milica; Nielsen, Jens; Nielsen, Kristian Fog; Workman, Mhairi; and Frisvad, Jens Christian

2016 *Penicillium arizonense*, a new, genome sequenced fungal species, reveals a high chemical diversity in secreted metabolites. *Scientific Reports* (Springer Nature), 6(35112), doi:10.1038/srep35112, 13 pp.

149 ➔ ***Penicillium arizonense*** Frisvad, Grijseels & J.C. Nielsen, NEW SPECIES

Ascomycota (sac fungi): Eurotiomycetes: Eurotiales: Trichocomaceae (saprobe fungi)

"A new soil-borne species belonging to the *Penicillium* section *Canescentia* is described, *Penicillium arizonense* sp. nov. (type strain CBS 141311^T=IBT 12289^T)."

"Type: Herb. C-F-101845, cultures ex type IBT 12289=CBS 141311, from a sample of dry red soil, south rim of Grand Canyon, **Grand Canyon Village, Arizona, USA (36° 3' 22.31" N; 112° 7' 30.73" W)**, Per V. Nielsen [Per Væggemose Nielsen], July 1990"; additional cultures "from same source as the culture ex type, but not of the same clone."

[Map coordinates pinpoint a locality just to the west of the footpath between Park Headquarters and the Rim Trail, at a point half-way between those two places (<https://www.findlatitudeandlongitude.com/>, accessed 28 October 2022).]

Grissell, E. E.

1983 *Boharticus*, n. gen., with a review of *Rhopalicus* Foerster and *Dinotiscus* Ghesquiere (Hymenoptera: Pteromalidae). *Pan-Pacific Entomologist*, 59(1/4): 78-102.

150 ***Boharticus margaretae***, NEW SPECIES (pp. 86-87, figs. 2 [p. 81], 13 [p. 85], 17 [p. 85])

Arthropoda: Insecta: Hymenoptera: Pteromalidae (pteromalid wasps)

(Holotype female from Garden of the Gods, El Paso Co., Colorado; USNM 100593.) "Paratypes: 8 ♀, same data a holotype, 1 ♀, ARIZONA, **Mohave Co., 8 miles SW Peach Springs**, 4500', 7 September 1964, C. W. O'Brien, ex *Juniperus*. All specimens in USNM, except 1 ♀ in British Museum (Natural History)." [The locality is in the vicinity of Truxton, Arizona.]

The type species of *Boharticus* Grissell, new genus, is designated as *B. richardi* Grissell, new species (which is not pertinent to this checklist).

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

Hall, E. Raymond, and Davis, William B.

1934 Notes on Arizona rodents. *Proceedings of the Biological Society of Washington* (Washington, D.C.), 47(5): 51-56.

151 ➔ *Thomomys bottae trumbullensis*, NEW SUBSPECIES (pp. 51-53); not illustrated

Chordata: Mammalia: Rodentia: Geomyidae (pocket gophers)

"*Type* [holotype].—Male, adult, skin-and-skull; no. 58588, Mus. Vert. Zool.; three miles south of Nixon Spring, Mt. Trumbull, Mohave Co., Arizona; May 26, 1933; collected by Seth B. Benson, original no. 2005." [The locality, "three miles south of Nixon Spring", is just to the south of Mount Trumbull itself, today within the Grand Canyon–Parashant National Monument, about 2¾ miles north of the boundary of Grand Canyon National Park.]

"*Specimens examined* [non-type]. — Total number, 31, as follows: From Mohave County, Arizona: Nixon Spring, 6250 ft., Mt. Trumbull, 8; three miles south of Nixon Spring (volcanic sand), Mt. Trumbull (type locality), 3; four miles south of Nixon Spring (volcanic sand), Mt. Trumbull, 13; head of Toroweap Valley, 2; six miles north of Wolf Hole, 4900 ft., 3; south side Virgin River, St. George, Washington County, Utah, 2."

Hall, Jack C., and Evenhuis, Neal L.

2003 Review of the subgenus *Geron* (*Geron*) Meigen in the Nearctic region (Diptera: Bombyliidae: Toxophorinae). *Zootaxa*, (181): 1-72.

152 ➔ *Geron prosopidis*, NEW SPECIES

Arthropoda: Insecta: Diptera: Bombyliidae (bee flies)

Paratypes include 11 taken at "**S Rim Grand Canyon**, 21-22.vii.1932 (R.H. Painter)".

Harvey, Mark S., and Wynne, J. Judson

2014 Troglomorphic pseudoscorpions (Arachnida: Pseudoscorpiones) of northern Arizona, with the description of two new short-range endemic species. *Journal of Arachnology*, 42(3): 205-219.

Arthropoda: Euchelicerata: Pseudoscorpiones (pseudoscorpions): Chernetidae

153 *Hesperochernes bradybaughi*, NEW SPECIES (pp. 211-214, figs. 15-26)

"*Types*. U.S.A.: Arizona: Mohave County: holotype male, **PARA-1001 Cave, Grand Canyon-Parashant National Monument, ca. UTM 0264500 N, 4060700 E**, Zone 12S, baited pitfall trap 3B, 20 August 2007, J.J. Wynne (MNA); 1 female, same data as holotype except baited pitfall trap 5A (MNA); 1 female, same data as holotype except opportunistic, mid cave, 13 August 2005 (NMA [*sic*])."

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154 *Tuberochernes cohni*, NEW SPECIES (pp. 214-217)

"Type: U.S.A.: Arizona: Mohave County: holotype male, **PARA-1001 Cave, Grand Canyon-Parashant National Monument, ca. UTM 0264500 N, 4060700 E**, Zone 12S, the deeper extent of the twilight zone (near the dark zone), opportunistic collecting, 13 August 2005, J.J. Wynne (MNA)."

Hayward, C. Lynn

1932 The paper wasps of Utah; including a description of a new variety of *Polistes canadensis* Linn. *Proceedings of the Utah Academy of Sciences*, 9: 85-101 (pagination includes Pl. 9).

155 ➔ *Polistes canadensis var. kaibabensis*, NEW VARIETY (pp. 89-90, Pl. IX, figs. 4, 12, 14, 16 [p. 101, legend p. 100])

Arthropoda: Insecta: Hymenoptera: Vespidae (hornets)

"HOLOTYPE: Female; Number 28, collection of Brigham Young University, Provo, Utah. Collected at **Point Sublime**, north rim of Grand Canyon of the Colorado River, Arizona, July 19, 1927 by Vasco M. Tanner. ALLOTYPE: Male; Number 29, collection of Brigham Young University, Provo, Utah. Collected at **North Rim, Grand Canyon of the Colorado**, Arizona, July 9, 1929 by Lowell Woodbury. PARATYPES: 22 females; all in collection of Brigham Young University, Provo, Utah; collected at **Point Sublime**, Rim of Grand Canyon of the Colorado River, Arizona, July 19, 1927 (Vasco M. Tanner, Clarence Cottom, Irvin Rasmussen, Anson Call). TYPE LOCALITY: **Point Sublime**, Rim of Grand Canyon of Colorado River, Arizona."

The author notes: "The variety *kaibabensis* is at present known only from the immediate vicinity of the type locality. I have had the privilege of examining a considerable series from the collection of the University of Utah, Salt Lake City, which were taken in the type locality and could well be designated paratypes. I have also seen a very typical specimen from the San Diego Natural History Museum which was collected at El Tovar, South Rim of the Grand Canyon. This specimen is now in that museum."

[In consideration of the fact that the new variety is recorded only from the vicinity of Point Sublime, the reference to the allotype's locality as "at North Rim, Grand Canyon of the Colorado" seems to imply that it is from the place, North Rim, as opposed to generically the canyon's North Rim. It seems that the "considerable series" of specimens in the University of Utah should be excluded as paratypes; and the El Tovar specimen is a referred specimen only.]

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Henderson, Junius

1914 A new *Sonorella* from the Grand Canyon, Arizona. *The Nautilus* (Philadelphia), 27(11) (March): 122-124.

156 ➔ *Sonorella betheli*, NEW SPECIES; not illustrated

Mollusca: Gastropoda: Stylommatophora: Helminthoglyptidae (shoulderbands)

NOTE: *The locality is in error, not of the Grand Canyon, but this species is included in this nomenclator to account for the published record of a new taxon named upon material ostensibly collected at Grand Canyon. The type specimens, though also subsequently reidentified taxonomically, still are the name-bearing types of the taxon Sonorella betheli. Refer to the information below.*

"Type [holotype] (in Univ. Colo. Museum) Cotype [paratype] (in Acad. Nat. Sci. Phila.) Type locality, **Bright Angel Trail**, Grand Canyon, Arizona."

Henderson: "Among some shells recently received from Mr. Ellsworth Bethel, of East Denver High School, were four dead specimens of *Sonorella* collected by him on Bright Angel Trail, at Grand Canyon, Arizona, in 1913. He was collecting fungi, and unfortunately did not note the exact locality of the snail find, but writes that he followed the trail closely, and thinks he got the shells 'about one hundred yards west of the upper limit of the trail and not more than twenty feet below the top,' though he cannot be certain and 'may have gotten them as far down as the half way house.' He supposed them to be common and made no note of the place. They are much larger than the common *S. coloradoensis* [refer to *Helix (Arionta) coloradoensis* Stearns, 1890, No. 280 in the present checklist] of that region, and differ in other respects. They did not seem to fit the description of any other species, but the finding of so large a species along a trail which has been searched by some of our ablest conchologists and most thorough collectors made me doubt that it could be new, so I sent two specimens to Dr. Pilsbry, who pronounced them undescribed."

Under the description for *Helminthoglypta traski* (Newcomb), Henry A. Pilsbry (1939, Land Mollusca of North America (North of Mexico), *Academy of Natural Sciences of Philadelphia, Monograph 3, Volume 1, Part 1*, p. 174), made the following comments on this species: "Misled by a mistaken locality given by the collector, Junius Henderson described rather small specimens . . . as *Sonorella betheli*. In 1913 after visiting the Grand Canyon, where he thought that this shell was picked up, the late Prof. Ellsworth Bethel spent some time in California. His chief interest was botanical. Probably these shells were taken near Los Angeles; the type in University of Colorado Museum and a cotype, 109733 A.N.S.P., both of which I have seen, agree fully with *traski* from that vicinity."

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Hershler, Robert; Liu, Hsiu-Ping; and Stevens, Lawrence E.

2016 A new springsnail (Hydrobiidae: *Pyrgulopsis*) from the lower Colorado River basin, northwestern Arizona. *Western North American Naturalist*, 76(1): 72-81.

157 *Pyrgulopsis hualapaiensis*, NEW SPECIES; illustrated (including a color photo of the type locality, fig. 5)

Mollusca: Gastropoda: Neotaenioglossa: Hydrobiidae (spring snails)

"Types.—Holotype, USNM 1248611 (a dry shell), **Upper Peach Springs, outflow just below concrete weir, Hualapai Indian Reservation, Mohave County, Arizona, 35.55786°N, 113.4314°W**, 1280 m elevation, coll. RH and LS, 16 May 2014. Paratypes (from same lot), USNM 1266144 (approximately 250 dry shells and alcohol-preserved specimens)."

"Referred material [non-type].—Arizona. Mohave County: topotypes, USNM 1247929 (dry shells), coll. LS, 28 May 2010; USNM 1248612 (dry shells and alcohol-preserved specimens), coll. LS, 9 January 2014; USNM 1259458 (dry shells and alcohol-preserved specimens), coll. LS, 24 July 2014."

Hester, J. Pinckney

1943 Two new *Opuntias* from the Grand Canyon region in Arizona. *Cactus and Succulent Journal* (Cactus and Succulent Society of America), 15: 191-194.

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

158 *Opuntia hualpaensis*, NEW SPECIES (pp. 191, 193, fig. 94, upper right [p. 192])

"Type [holotype]: Deposited in the Dudley Herbarium, Stanford University, No. 285575, collected **along U. S.-Arizona Highway No. 66, 11 or 12 miles east of Peach Springs and 2 or 3 miles west of Hyde Park, Arizona**, by J. Pinckney Hester, July, 1942." ["Hyde Park", near mile marker 117 on Historic Route 66, no longer exists. The gathering locality is near the present-day Grand Canyon Caverns tourist attraction.]

159 *Opuntia abyssi*, NEW SPECIES (pp. 193-194, fig. 94, upper left and lower [p. 192])

"Type [holotype]: Deposited in the Dudley Herbarium, Stanford University, No. 285624, collected in **Peach Springs Canyon** . . . by J. Pinckney Hester, in 1939."

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Higgins, Larry C.

1974 *Cryptantha atwoodii* (Boraginaceae); a new species from Arizona. *Southwestern Naturalist*, 19(2) (July 26): 127-130.

160 *Cryptantha atwoodii*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Boraginales: Boraginaceae (borage)

"TYPE. Arizona: **Coconino County, 7 mi N of junction of hwy 89 and 164 on hwy 89**, 20 May 1970. N. D. Atwood 2624. Holotype deposited at BRY. Isotype at WTS." "Apparently confined to the type locality **near [T]he Gap . . .**"

Hochstätter, Fritz

1995 The *genera* *Pediocactus*—*Navajoa*—*Toumeyia* : *revised : in the shadow of the Rocky Mountains*. (Chris Holland, translator.) Mannheim, Germany: Fritz Hochstätter, 168 pp.

[It is not determined here whether this title was originally published as this English translation, or if it was translated from another item thus far not identified.]

161 *Sclerocactus whipplei* (Englemann & Bigelow) Britton & Rose *ssp. busekii*, NEW SUBSPECIES (pp. 132-134)

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

House Rock Valley, Arizona.

Hodgson, Wendy C.

2001 Taxonomic novelties in American *Agave* (Agavaceae). *Novon*, 11(4) (Winter): 410-416.

162 ➔ *Agave phillipsiana*, NEW SPECIES (pp. 410-413, fig. 1 ["Drawn from *Hodgson 8357B* and *Brian s.n.*"])

Trachyophyta: Magnoliopsida: Asparagales: Asparagaceae (agaves)

"TYPE: U.S.A. Arizona: Coconino County, Grand Canyon National Park, **Clear Creek Canyon**, ca [0].7 mi. upstream from camping area, 1140 m, 36°07.381'N, 112°00.568'W, 13 Sep. 1999, *W. C. Hodgson 11861* (holotype, DES 44332; isotypes, GCNP, MO photo)." "Paratypes. U.S.A. Arizona: Coconino County, Grand Canyon National Park, **Deer Creek Canyon**, 36°23'52.2"N, 112°30'32"W, 731 m, 11 June 1994, *Hodgson et al. 8357B* (DES, GCNP, MO photo), 14 Aug. 1995, *Hodgson 8357A and Brian* (DES, GCNP), 26 Sep. 1995, *Brian s.n.* (ASU, DES, GCNP, MO); Grand Canyon National Park, **Clear Creek Canyon**, ca. 0.7-1 mi. upstream from camping area, 36°07.381'N, 112°00.568'W, 1140 m, 29 Apr. 1999, *Hodgson et al. 11472* (DES, GCNP, MO photo); same area only 100 m further upstream, 37°[sic]07.592'N, 112°00.324'W, 1145 m, 29 Apr. 1999, *Hodgson et al. 11473* (DES, GCNP, MO photo)."

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Note: The discovery of this species was first noted, without name, in Hodgson (1996, Field work and leg work; finding a new species, *The Sonoran Quarterly* (Desert Botanical Garden, Phoenix), 50(4) (December): 10-11).

Holmgren, Arthur H., and Holmgren, Noel H.

1988 *Euphorbia aaron-rossii* (Euphorbiaceae), a new species from Marble and Grand Canyons of the Colorado River, Arizona. *Brittonia*, 40(4) (October/December): 357-362.

163 ➔ *Euphorbia aaronrossii*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Malpighiales: Euphorbiaceae (spurge)

"Type: U.S.A. ARIZONA. Coconino Co.: **Marble Canyon, along the Colorado River, 12 river miles below Lees Ferry, Salt Water Wash**, among boulders, 930 m (3050 ft), 5 May 1971, A. Holmgren, N. Holmgren, P. Holmgren, D. Holmgren & A. Ross 15558 (HOLOTYPE: NY; ISOTYPES: ARIZ, ASU, BRY, F, TEX, UTC)."

Holmgren, Noel H.

1973 Five new species of *Castilleja* (Scrophulariaceae) from the Intermountain Region. *Bulletin of the Torrey Botanical Club*, 100(2): 83-93.

164 *Castilleja kaibabensis*, NEW SPECIES (pp. 89-91, fig. 4 [p. 88])

Trachyophyta: Magnoliopsida: Lamiales: Scrophulariaceae (figworts)

"Type: Arizona, Coconino County, **Kaibab Plateau, V T Meadows, 6.5 km south of Kaibab Lodge, T.34 N., R.3 E., Sec. 7**, elevation 2680 m, 7 August 1970, N. Holmgren & P. Holmgren 4682 (Holotype: NY; Isotypes: ARIZ, BRY, C, DAO, JEPS, KANU, NCU, RSA, TENN, US, UTC, WTU)."

"Paratypes: All on the Kaibab Plateau, Coconino County, Arizona: **Marble Flat, just north of North Rim Ranger Station**, elevation 2500 m, 17 July 1941, *Collom s.n.* (US, GCNP [herbarium at Grand Canyon National Park Headquarters]); **DeMotte Park**, 7 August 1929, *Mead 998* (GCNP); **House Rock Canyon to Jacob Lake**, elevation 2400 m, 14 August 1941, *Kearney & Peebles 13648* (US); **V T Ranger Station**, elevation 2800 m, 12 July 1940, *Collom s.n.* (GCNP); **V T Park**, 30 km north of Bright Angel Point, 14 August 1938, *Richards s.n.* (NY); **Ariz. Highway 67, 3.2 km north of Grand Canyon National Park boundary, T.34 N., R.3 E., Sec. 7**, elevation 2650 m, 12 August 1966, *Holmgren & Reveal 2995* (ARIZ, BRY, C, DAO, JEPS, KANU, NCU, NY, RSA, TENN, US, UTC, WTU); **Lookout Canyon Road (422D), 5.6 km from (northwest of) Grand Canyon Highway (Ariz. 67), T.35 N., R.2 E., Sec. 15**, elevation 2700 m, 6 August 1970, N. Holmgren & P. Holmgren 4668 (ARIZ, BRY, C, DAO, JEPS, KANU, NCU, NY, RSA, TENN, US, UTC, WTU)."

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Holmgren, Noel H., and Holmgren, Patricia K.

2002 New mentzelias (Loasaceae) from the Intermountain Region of western United States. *Systematic Botany*, 27(4) (October/December): 747-762.

165 *Mentzelia memorabilis*, new species (pp. 753-756; fig. 4)

Trachypophyta: Magnoliopsida: Cornales: Losaceae (loasa)

"TYPE: U.S.A. Arizona. Mohave Co., **Uinkaret Plateau, just N of the Navajo Trail Road, 1.1 km W of the Clayhole Wash crossing, 27.5 km air distance SSW of Colorado City, 36°49'09"N, 113°11'21"W, T40N R8W S31**, 1480 m, in partially barren gypsum-clay soil, 17 Sep 2001, *N. H. Holmgren & P. K. Holmgren 14580* (holotype: NY; isotypes: ASC, ASU, BRY, COLO, RM, RSA, UTC)."

Hopkins, Heidi

2014 *A review of the genus Arenivaga (Rehn) (Blattodea, Corydiidae), with descriptions of new species and key to the males of the genus.* Sofia, Bulgaria; and Moscow, Russia: Pensoft Publishers, 256 pp. (*ZooKeys*, 384: 1-256 (Special Issue).)

Arthropoda: Insecta: Blattodea: Polyphagidae (sand cockroaches)

166 ➔ *Arenivaga grandiscanyonensis*, NEW SPECIES (pp. 108-111, figs. 69, 70)

[*Note*: "rm" indicates Colorado River Mile, by convention measured downstream from Lees Ferry, Arizona, with Right or Left bank indicated. Localities downstream from RM 164.7, on the left, could actually be within the boundaries of Hualapai Indian Reservation.]

"Type locality. USA, Arizona, Mohave Co., Colorado River, Grand Canyon."

"Material examined. Holotype: ♂ in NAUF labeled 'Mohave Co. AZ, **Colorado R. GC, rm211.5R**, 4/13/02, Coll. R.J.Delph, Ex: Light, Old High Water, blue label with "3", ' 'HOLOTYPE *Arenivaga grandiscanyonensis* Hopkins, 2012 [*sic*]' [red label with black border]." [Square brackets are part of the quotation.]

"Paratypes (2): USA: AZ, Coconino Co., Colorado River GC, 5/10/2001, J Rundall, **rm160.5L**, ex.light old high water, blue label '3', 1 specimen—NAU 106 (2, NAUF). All paratypes labeled 'Paratype *Arenivaga grandiscanyonensis* Hopkins 2012 [*sic*]' [blue label with black border]." [Square brackets other than "*sic*" are part of the quotation.]

Also 169 specimens examined (non-type).

167 ➔ *Arenivaga impensa*, NEW SPECIES (pp. 138-141, figs. 93, 94)

(Holotype from Kingman, Arizona.) "Paratypes (14): . . . AZ, **Indian Garden** [Havasupai Gardens], Grand Canyon, 7/24/1934, 3800 ft., EL Bell & FE Lutz (2, AMNH); AZ, Coconino Co., **Grand Canyon**, 6/18/1954, M Cazier (1, AMNH) . . . All paratypes labeled 'Paratype *Arenivaga impensa* Hopkins 2012 [*sic*]' [blue label with black border]." [Square brackets other than "*sic*" are part of the quotation.]

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- 168 ➔ ***Arenivaga pagana***, NEW SPECIES (pp. 177, 182, figs. 120 [p. 180], 121 [p. 181])

"Type locality. USA, Arizona, Mohave Co., Colorado River, Grand Canyon."

"Material examined. Holotype: ♂ in NAUF labeled 'Mohave Co. AZ, **Colorado R. GC**, blue label with "3", **rm202.5L**, 9/4/03, Coll. R.J.Delph, Ex: Light, New High Water' 'HOLOTYPE *Arenivaga pagana* Hopkins, 2012 [*sic*]' [red label with black border]." [Square brackets other than "*sic*" are part of the quotation.]

"Paratypes (9): USA: AZ, Mohave Co., **Colorado River GC**, 9/4/2003, RJ Delph, blue label with "3", **rm 202.5L**, ex.light, new high water (2, NAUF); AZ, Mohave Co., Colorado River GC, 9/9/2001, J Rundall, blue label with "3", **rm 198.0R**, ex.light, old high water (1, NAUF); AZ, Mohave Co., Colorado River GC, 9/9/2002, RJ Delph, blue label with "3", **rm 186.5L**, ex.light, old high water, NAU 107 (1, NAUF); . . . AZ, Coconino Co., Colorado River GC, 9/1/2002, RJ Delph, blue label with "3", **rm37.3L**, ex.light, old high water (1, NAUF); AZ, Coconino Co., Colorado River GC, 10/18/1982, 855 m, LE Stevens, blue label with "3", **M:53R**, Nankowap [*sic*], sand dunes at night, Polyphagidae, *Arenivaga* det. D.Lightfoot (1, NAUF) . . . All paratypes labeled 'Paratype *Arenivaga pagana* Hopkins 2012 [*sic*]' [blue label with black border]." [Square brackets other than "*sic*" are part of the quotation.]

Horn, George H.

- 1893 The Galerucini of boreal America. *Transactions of the American Entomological Society*, 20(2) (April/June): 57-136.

- 169 ***Luperodes wickhami***, NEW SPECIES (pp. 114-115); not illustrated

Arthropoda: Insecta: Coleoptera: Chrysomelidae (leaf beetles)

"Occurs in Arizona at **Peach Springs** (Wickham)."

Hottes, F. C.

- 1956 Two new species of *Cinara* from northern Arizona with illustrations of hitherto unfigured species and notes on *Schizolachnus flocculosa* (Williams) (Aphidae). *Proceedings of the Biological Society of Washington* (Washington, D.C.), 69: 219-224.

Arthropoda: Insecta: Hemiptera: Aphididae (aphids)

- 170 ➔ ***Cinara grande***, NEW SPECIES (pp. 219-220; text-figs. on p. 223)

"Host *Abies concolor*. Taken on the **North Rim of the Grand Canyon**, Arizona June 7, 1954. Collected by J. W. Bongberg. Holotype apterous viviparous female returned to the collection of The United States National Museum."

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171 *Cinara poketa*, NEW SPECIES (pp. 220-221; text-figs. on p. 222)

"Holotype apterous viviparous female. Host, *Pinus edulis* Aug. 24, 1956. Taken at point **where road to Anita, Arizona branches from Highway 64 leading to Grand Canyon, Arizona.**" [Locality is on the Kaibab National Forest, Tusayan Ranger District, ca. 35.861° N, 112.134° W.]

Johnson, Walter N.

1990 A new subspecies of *Cicindela pusilla* Say from northern Arizona. *Cicindela*, 22(1) (March): 1-12.

172 *Cicindela pusilla kaibabensis*, NEW SUBSPECIES (description pp. 4-10, including right elytra of various subspecies illustrated pp. 8-9 [*C. p. kaibabensis*, figs. 16-21])

Arthropoda: Insecta: Coleoptera: Carabidae (ground beetles)

"TYPE MATERIAL: Holotype (male) collected **8 miles north of Kaibab Lodge**, Coconino Co., Arizona, on August 2, 1977, along with 11 male and 13 female paratypes, collected by author (Walter N. Johnson). Allotype (female) collected **4 miles north of Kaibab Lodge**, Coconino Co., Arizona, along with 4 male and 2 female paratypes on August 2, 1977, collected by author. Seven male and 2 female paratypes collected **8 miles north of Kaibab Lodge**, Coconino Co., Arizona, on July 27, 1981, by author. Forty-eight male and 34 female paratypes collected **8 miles north of Kaibab Lodge**, Coconino Co., Arizona, on July 22, 1987, by author. Thirty male and 14 female paratypes collected **8 miles north of Kaibab Lodge**, Coconino Co., Arizona, on July 22, 1987, by Todd Lawton."

Johnston, M. Andrew

2019 Phylogenetic revision of the psammophilic *Trogloderus* Leconte (Coleoptera: Tenebrionidae), with biogeographic implications for the Intermountain Region. *PeerJ*, 7: e8039, doi:10.7717/peerj.8039, 45 pp. + Supplemental Information online.

173 *Trogloderus skillmani*, NEW SPECIES (pp. 24-26, figs. 6D [p. 16], 7F [p. 17])

Arthropoda: Insecta: Coleoptera: Tenebrionidae (darkling beetles)

"Type material. Holotype: 'USA: AZ: Mohave Co./**6m E Colorado City/Rosy Canyon Road/1.5 m S UT state line**/12-VII-2016/F.W. & S.A. Skillman,' 'ARTSYS0007053,' bearing red holotype label. Deposited in the ASUHIC, catalog number ASUHIC0101565. Paratypes: A total of 920 specimens from the western regions of the Colorado Plateau around the Coral Pink Sand Dunes, Hurricane, and Toquerville Utah, bearing blue paratype labels (see Data S1 and S2 or SCAN for full specimen data)." The 920 paratypes are listed in the Supplemental Information online.

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Jones, Marcus E.

1895 Contributions to western botany. No. VII. *Proceedings of the California Academy of Sciences*, Series 2, 5: 611-732.

174 *Astragalus humistratus* var. *tenerrimus*, NEW VARIETY (p. 649); not illustrated

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

[Syntypes]: "No. 6052f. September 17, 1894, **Buckskin Mountains**, Arizona, 9000° [sic] alt., in gravel, under conifers. No. 6064. September 20, 1894, **road to Nagle's Ranch, Buckskin Mountains**, Arizona, 9000° [sic] alt., in gravel. No. 6056gm. Same locality and date."

175 *Oenothera triloba* var. *ecristata*, NEW VARIETY (pp. 681-682); not illustrated

Trachyophyta: Magnoliopsida: Myrtales: Onagraceae (evening primroses)

[Syntypes], all from Utah except for: "No. 6056ah. September 18, 1894, **De Motte Park, Buckskin Mountains**, Arizona, 9000° [sic] alt., in gravel."

176 *Bigelovia howardi* var. *attenuata*, NEW VARIETY (pp. 691-692); not illustrated

Trachyophyta: Magnoliopsida: Lamiales: Oleaceae (olives)

[Syntypes], all from Utah except for: "No. 6052k. September 17, 1894, **Buckskin Mountains**, Arizona, 9000° [sic] alt., in gravel."

177 *Laphamia congesta*, NEW SPECIES (p. 703); not illustrated

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

[Holotype]: "No. 6063. September 21, 1894, in clefts of rocks on the **mesa below the Buckskin Mountains**, Arizona, 7000° [sic] alt."

178 *Laphamia gracilis*, NEW SPECIES (pp. 703-704)

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

[Holotype]: "No. 6050c. September 15, 1894, **below Nagle's Ranch, on edge of Buckskin Mountains**, in crevices of limestone rocks, at 7000° [sic] alt., in very dry places."

1902 *Contributions to western botany. No. 10.* Robinson, Utah: Mammoth Record Print, 90 pp.; [17], 16 plates.

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

179 *Astragalus kentrophyta* var. *coloradoensis*, NEW VARIETY (p. 63, Pl. 1 [top row, 5th figure])

"**Lee's Ferry**, Arizona, on the Colorado river, June 16, 1890."

180 *Astragalus kaibensis*, NEW SPECIES (pp. 64-65, Pl. 2 [center row, 2nd figure])

"Gathered at **House Rock**, near Lee's Ferry, northern Arizona, June 18, 1890, Jones."

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Kavanaugh, David H.

2008 A new species of *Nebria* Latreille (Coleoptera: Carabidae: Nebriini) from the Grand Canyon, Arizona. *Annals of the Carnegie Museum of Natural History*, 77(1) (July): 1-5.

181 ➔ *Nebria (Reductonebria) georgei*, NEW SPECIES; illustrated

Arthropoda: Insecta: Coleoptera: Carabidae (ground beetles)

"Types.—HOLOTYPE, a male, deposited in MSBC, labeled: 'USA AZ Coconino Co Grand Canyon Natl. Park, **N36.102, W112.163 RM92.3L** 06-07 May 2001 coll. Cobb, Brantley, Lightfoot'/ 'shore zone pitfall trap'/ 'COL CAR 001 006'/ 'Nebria n. sp. ? det G.E. Ball 2004'/ 'UNM-29'/ 'HOLOTYPE *Nebria georgei* Kavanaugh n. sp. des. by D.H. Kavanaugh 2007 [*sic*]' [red label]. One paratype, a female, deposited in CAS, labeled: "USA AZ Coconino Co Grand Canyon Natl. Park, N36.187, **W113.107 RM180.8R** 01-02 Sept 2003 coll. Cobb, Brantley, Lightfoot'/ 'shore zone pitfall trap'/ 'COL CAR 001 006'/ 'UNM-30'/ 'PARATYPE *Nebria georgei* Kavanaugh n. sp. des. by D. H. Kavanaugh 2007 [*sic*]' [yellow label." [Square brackets except for "*sic*" are part of the quotation.] "Type Locality.—Colorado River, Grand Canyon National Park, Coconino County, Arizona."

Kim, Ke Chung

1966 The species of *Enderleinellus* (Anoplura, Hoplopleuridae) parasitic on the Sciurini and Tamiasciurini. *Journal of Parasitology*, 52(5) (October): 988-1024.

182 *Enderleinellus kaibabensis*, NEW SPECIES (pp. 1000-1002, 1022; figs. 12 [p. 999, legend p. 998], 29 [p. 1001], 54-59 [p. 1005, legend p. 1004])

Arthropoda: Insecta: Psocodea: Enderleinellidae (sucking lice)

"Type data: Holotype male, allotype female, and 6 paratypes (3 males and 3 females), ex *Sciurus kaibabensis* Merriam, **Kaibab National Forest**, Arizona, USA, Ferris Coll. 906 (USNM 168301), G.F.F. All type specimens except for 2 paratypes deposited in UCB; 1 male and 1 female paratype (on 1 slide) are deposited in UM." [Inasmuch as the host is the endemic Kaibab squirrel, the type locality must be on the North Kaibab Ranger District.]

Klauber, Laurence M.

1930 New and renamed subspecies of *Crotalus confluentus* Say, with remarks on related species. *Transactions of the San Diego Society of Natural History*, 6(3) (February 28): 95-144, Pls. 9-12.

183 ➔ *Crotalus confluentus abyssus*, NEW SUBSPECIES (pp. 114-117, Pl. 11, fig. 1 [legend p. 142]). (Common name given by the author, "Grand Canyon Rattlesnake")

Chordata: Reptilia: Squamata: Viparidae (rattlesnakes)

"Type [holotype].—No. 2216 in collection of L.M.K. Captured alive on the **Tanner Trail** 300 ft. below the south rim of the Grand Canyon, Coconino County, Arizona; altitude approximately 7000

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ft. Collected Sept. 15, 1929, by E. D. McKee." The holotype is illustrated in Pl. 11, fig. 1. Subspecies also studied on two other living specimens and ten other specimens from the South Rim and the inner canyon [= paratypes]: "GCNP R37, **Tonto Platform near Bright Angel Trail** Alt. 4000 ft.; GCNP R38 [Coconino] Plateau **near Navajo Point**, Alt. 7000 ft.; GCNP R49 **Phantom Ranch**, north of Bright Angel Creek [*sic*] [seen as a skin]; GCNP R50 **Desert View Point** [specimen in poor condition]; GCNP R51 **Desert View Point** [specimen in poor condition]; LMK 2093 **Roaring Springs Power Plant**; LMK 2215 **Roaring Springs Power Plant** [specimen seen alive]; LMK 2272 **Grand View Trail, 2000 ft. below South Rim** [specimen seen alive]; USNM 32725 **Grand Canyon** [seen as a skin]; USNM 59747 Shimuno Creek [*sic*, **Shinumo Creek**] [seen as a skin]; USNM 78477 **Bright Angel Canyon** [seen as a skin]; USNM 78478 **Burro Spring** [North Rim; seen as a skin].

[Edwin D. McKee wrote of his 1929 sighting and capture of the holotype on Tanner Trail. (McKee, 1976, Discovery of the Grand Canyon Rattlesnake. *Journal of Arizona History*, 17(1) (Spring): 47-49.)]

Knight, Harry H.

- 1921 Monograph of the North American species of *Deraeocoris* (Heteroptera, Miridae). *Minnesota State Entomologist, 18th Report to the Governor*, pp. 77-210, Pl. 8. [Published June 18, 1921.] [Also published June 19, 1921 as *University of Minnesota, Agricultural Experiment Station, Technical Bulletin 1*, retaining original pagination, 77-210.]

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

- 184 ➔ *Deraeocoris fulvus*, NEW SPECIES (pp. 144-145; fig. 18)
(Holotype and allotype from Williams, Arizona.) Paratypes include: "2 ♀ Aug 3 [1917], **Grand View**, Grand Canyon".
- 185 ➔ *Deraeocoris bullatus*, NEW SPECIES (pp. 147-148; fig. 20)
"Holotype: ♂ August 3 [1917], **Grand View**, Grand Canyon, Arizona (H. H. Knight); Cornell University collection. Allotype: taken with the type."
- 186 ➔ *Deraeocoris navajo*, NEW SPECIES (pp. 155-156; fig. 24)
"Holotype: ♂ August 3 [1917], **Grand View**, Grand Canyon, Arizona (H. H. Knight); Cornell University collection."

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- 1925 Descriptions of thirty new species and two new genera of North American Miridae (Hemiptera). *Bulletin of the Brooklyn Entomological Society*, 20(1) (February): 33-58.

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

- 187** ➔ *Ceratocapsus clavicornis*, NEW SPECIES (pp. 47-48)

"*Holotype*: ♂ August 3, 1917, **Grand View**, Grand Canyon, Arizona (H. H. Knight); author's collection. *Allotype*: same data as the type. *Paratypes*: 30 ♂ ♀, taken with the types on *Cowanina mexicana*."

- 188** ➔ *Phytocoris mellarius*, NEW SPECIES (pp. 56-57)

"*Holotype*: ♂ August 3, 1917, **Grand View**, Grand Canyon, Arizona (H. H. Knight); author's collection. *Allotype*: same data as the type. *Paratypes*: 3 ♂ 6 ♀, taken with the types. This species was probably collected on some conifer although I do not find the remarks in my notes."

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- 1926 Descriptions of seven new species of *Pilophorus* (Hemiptera, Miridae). *Bulletin of the Brooklyn Entomological Society*, 21(1/2) (February/April): 18-26.

- 189** ➔ *Pilophorus fuscipennis*, NEW SPECIES (pp. 23-24); not illustrated

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

(Holotype and allotype from near Trinidad, Colorado.) "*Paratypes*: . . . ♂ ♀, Aug. 3, 1917, **Grand View**, Grand Canyon, Arizona (H. H. Knight). Paratypes in collections of Iowa State college and Colorado Agricultural College."

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- 1928 New species of *Phytocoris* from North America (Hemiptera, Miridae). *Bulletin of the Brooklyn Entomological Society*, 23(1) (February): 28-46.

- 190** ➔ *Phytocoris hesperius*, NEW SPECIES (pp. 44-45); not illustrated

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

(Holotype from near Trinidad, Colorado; allotype from Chiricahua Mountains, Arizona.) Paratype specimens include "2♂ 1♀ Aug. 2, 1917, at **top of Bright Angel trail**, Grand Canyon (H. H. Knight)"

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- 1929 Descriptions of five new species of *Plagiognathus* from North America (Hemip.: Miridae). *Entomological News* (Academy of Natural Sciences of Philadelphia, Entomological Section), 40 (March): 69-74.

- 191** ➔ *Plagiognathus tenellus*, NEW SPECIES (p. 73); not illustrated

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

"*Holotype*: ♂ August 2, 1917, top of **Bright Angel trail**, Grand Canyon, ARIZONA (H. H. Knight); author's collection. *Allotype*: taken with the type. *Paratypes*: 12 ♂ ♀, taken with the types"

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1934 *Phytocoris* Fallen—twelve new species from the western United States (Hemiptera, Miridae). *Bulletin of the Brooklyn Entomological Society*, 29(1) (February): 1-16.

192 ➔ *Phytocoris varius*, NEW SPECIES (pp. 9-11); not illustrated

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

"Holotype: ♂ September 6, 1931, **Grand Canyon** (H. H. Knight); author's collection. Allotype: ♀, taken with the type. Paratypes: ♂, 3♀, taken with the types by beating on large cedar trees (*Juniperus* sp.) which were found growing **behind the cabin camp located at the entrance gate of the Grand Canyon National Park.**" (Additional paratypes from Durango, Colorado and Chiricahua Mountains, Arizona.)

1968 Taxonomic review: Miridae of the Nevada Test Site and the western United States. *Brigham Young University Science Bulletin* (Biological Series), 9(3), 282 pp.

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

193 ➔ *Parthenicus cowaniae*, NEW SPECIES (pp. 148-149, fig. 211 [p. 147])

"Holotype: ♂ Aug. 3, 1917, **Grand View**, Grand Canyon, Arizona (H. H. Knight), taken on cliff rose, *Cowania stansburiana*, which is the host plant of the species. Allotype: ♀ taken with the type. Paratypes: "26 ♂ 20 ♀ taken with the types on cliff rose . . . ♂ ♀ Sept. 6, 1931, **Grand View**, Grand Canyon (H. H. Knight) . . . ♂ ♀ Aug. 1, 1914, **Hermit Rim road**, Grand Canyon, Arizona (L. C. Bradley)."

194 *Bolteria juniperi*, NEW SPECIES (pp. 202-203, fig. 253)

(Holotype, allotype, and paratypes from Scipio, Utah.) Other paratypes include ". . . ♂ June 16, alt 8000 ft, **near Grand Canyon**, Arizona." [Given the altitude data for this paratype, and the fact that the primary types are from Utah, it is presumably on the northern side of the canyon.]

195 ➔ *Phytocoris flaviatus*, NEW SPECIES (p. 241, fig. 297 [p. 242])

"Holotype: ♂ Sept. 6, 1931, **above Bright Angel Trail**, Grand Canyon, Arizona (H. H. Knight)."
[No other type material.]

Knoll, Josef N.

1957 Three new species of *Aphricus* with a note on *Ctenicera* (Coleoptera: Elateridae). *Ohio Journal of Science*, 57(4) (July): 200-202.

196 *Aphricus knowltoni*, NEW SPECIES (pp. 200-201); not illustrated

Arthropoda: Insecta: Coleoptera: Elateridae (click beetles)

(Holotype and paratypes from Washington, Utah.) Another paratype from "**Cameron, Arizona**, Aug. 19, 1950, D. J. and J. N. Knoll, all in collection of author."

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Kruidenier, Francis J., and Mehra, Krishna N.

1958 *Wellcomia perognathi* n. sp. (Nematoda: Oxyuridae) from pocket mice, *Perognathus intermedius* (Merriam, 1889) of the Grand Canyon, Arizona. *Transactions of the Illinois State Academy of Science*, 51(3/4) (July 10): 20-25.

197 ➔ *Wellcomia perognathi*, NEW SPECIES; illustrated

Nematoda: Chromadorea: Ascaridida: Oxyuridae (pinworms)

"Host: *Perognathus intermedius* (Merriam, 1889). Habitat: Intestine (cecum). Locality: Coconino County, Arizona (**Grand Canyon National Park**). Holotypes [*sic*]: U.S. Nat'l. Mus. Helm. Coll. No. 38306." [Limited data, thus. Collection made in 1954; see note with no. 198, *below*.]

1959 *Aspiculuris ackerti*, n. sp, (Nematoda: Oxyruidae) from the wood rats of Arizona. *Proceedings of the Helminthological Society*, 26(2) (July): 147-150.

198 ➔ *Aspiculuris ackerti*, NEW SPECIES; illustrated

Nematoda: Chromadorea: Ascaridida: Oxyuridae (pinworms)

"Hosts: *Neotoma albigula*—U. of Ill. Museum #11650 [and] *N. cinerea*—U. of Ill. Museum #11688. Habitat: Intestine. Locality: **Coconino County, Arizona**. Holotype: U.S. Nat'l Mus. Helm. Coll. #56163."

". . . recovered from a series of neotomid rats examined during a 1954 expedition to the Grand Canyon, Coconimo [*sic*] County, Arizona (see Kruidenier and Peebles, 1958)." The cited item does not appear in the Literature Cited section of this paper, but is identified (*here*) as the citation with no. 199, *below*, which there provides locality data only as "Grand Canyon National Park".

Kruidenier, Francis J., and Peebles, C. R.

1958 *Gongylonema* of rodents: *G. neoplasticum* (redefinition); *G. dipodomysis* n. sp.; and *G. peromyski* n. sp. *Transactions of the American Microscopical Society*, 77(3) (July): 307-315.

199 ➔ *Gongylonema peromysci*, NEW SPECIES (pp. 310-312, Pl. 2, figs. 1-6 [p. 313])

Nematoda: Chromadorea: Spiurida: Gongylonematidae (spuriid gullet worms)

"Host: Type: *Peromyscus maniculatus rufinus* (Merriam, 1890) Osgood, 1909. Univ. Ill. Mus. No. 10832 Habitat: Mucosa of cardiac stomach. Locality: **Grand Canyon National Park**, Coconimo [*sic*] County, Arizona. Holotypes [*sic*]: U.S. National Museum Helminthological Collection No. 38202." [Collection made in 1954; see note with no. 198, *above*.]

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LaBerge, Wallace E.

1967 A revision of the bees of the genus *Andrena* of the western hemisphere. Part I. *Callandrena*. (Hymenoptera: Andrenidae). *Bulletin of the University of Nebraska State Museum*, 7 (October): 1-318.

200 ➔ *Andrena (Callandrena) utahensis*, NEW SPECIES (pp. 258-260, figs. 292-296 [p. 314])

Arthropoda: Insecta: Hymenoptera: Andrenidae (andrenid bees)

(Holotype and allotype from Duchesne, Utah.) Additional paratypes include: "ARIZONA: . . . **Grand Canyon**. 5 ♀♀, 1 ♂, June 5, 1940, G. E. Bohart"

Levine, Norman D.; Ivens, Virginia; and Kruidenier, Francis J.

1957a New species of *Eimeria* from Arizona rodents. *Journal of Protozoology*, 4(2) (May): 80-88.

Apicomplexa: Conoidasida : Eucoccidiorida: Eimeriidae (coccid parasites)

201 ➔ *Eimeria tamiasciuri*, NEW SPECIES (pp. 80-81, fig. 1 [p. 82])

"Host: *Tamiasciurus hudsonicus mogollonensis* (U. of Ill. Mus. #10,432) (red or spruce squirrel). Location: Intestinal contents. Locality: The host animal was trapped by Mr. Woodrow Goodpaster on Aug. 7, 1954 on **Road W-3 on the north rim of Grand Canyon near the entrance to Grand Canyon National Park**, Arizona."

202 ➔ *Eimeria cutamiae*, NEW SPECIES (pp. 82-83, fig. 3)

"Host: *Eutamias dorsalis dorsalis* (U. of Ill. Mus. #10,386) (cliff chipmunk). Location: Intestinal contents. Locality: This species was found in one of two *Eutamias d. dorsalis* examined in the Grand Canyon National Park, Arizona. The host chipmunk was trapped by Mr. K. R. Nelson on July 4, 1954 at **Hull Tank**, on the south rim of Grand Canyon."

203 ➔ *Eimeria thomomysis*, NEW SPECIES (p. 83, fig. 4 [p. 82])

"Host: *Thomomys bottae fulvus* (U. of Ill. Mus. #10,568 and #7990) (pocket gopher). Location: Intestinal contents. Locality: This species was found in two out of five *T. bottae* examined in Arizona. One animal was trapped by Mr. Donald Hoffmeister on July 4, 1954 at **Hearst Ranch [Grandview]** on the south rim of Grand Canyon in Grand Canyon National Park."

204 ➔ *Eimeria perognathi*, NEW SPECIES (pp. 83-84, fig. 5 [p. 82])

"Host: *Perognathus intermedius* subsp. (U. of Ill. Mus. #10,640) (rock pocket mouse). Location: Intestinal contents. Locality: This species was found in one out of two *P. intermedius* examined from the Grand Canyon National Park, Arizona. The host animal was trapped by Dr. Donald F. Hoffmeister on July 23, 1954 along the **Plateau Point Trail** one mile below [sic] Indian Garden [Havasupai Gardens] inside Grand Canyon on the south side of the Colorado River."

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205 ➔ *Eimeria albigulae*, NEW SPECIES (p. 84, fig. 6 [p. 85])

"Host: *Neotoma albigula* subsp. (U. of Ill. Mus. #11,650) (white-throated woodrat). *Location*: Intestinal contents. *Locality*: This species was found in a *N. albigula* in Grand Canyon National Park, Arizona. The host woodrat was collected by Mr. K. R. Nelson on July 11, 1954 on the **east side of Cedar Mountain**, on the south rim of Grand Canyon [*sic*]." [The precise collecting locality may be within the boundaries of the Navajo Indian Reservation.]

206 ➔ *Eimeria operculata*, NEW SPECIES (pp. 84-85); not illustrated

"Host: *Neotoma stephensi stephensi* (U. of Ill. Mus. #11,636) (Stephens' woodrat). *Location*: Intestinal contents. *Locality*: This species was found in one out of two *N. s. stephensi* examined in Grand Canyon National Park, Arizona. The host woodrat was collected by Mr. K. R. Nelson on July 5, 1954 at **Zuni Point**, on the south rim of Grand Canyon."

207 ➔ *Eimeria peromysci*, NEW SPECIES (pp. 85-86, fig. 7)

"Host: *Peromyscus truei truei* (U. of Ill. Mus. #11,249) (piñon mouse). *Location*: Intestinal contents. *Locality*: This species was found in one out of four *P. t. truei* examined in Grand Canyon National Park, Arizona. The host mouse was collected by Dr. Donald F. Hoffmeister on July 5, 1954 on the **west side of Zuni Point**, which is on the south rim of Grand Canyon."

208 ➔ *Eimeria arizonensis*, NEW SPECIES (p. 86, fig. 8 [p. 85])

"Host: *Peromyscus truei truei* (U. of Ill. Mus. #11,220 and 11,249) (piñon mouse). *Location*: Intestinal contents. *Locality*: This species was found in two of four *P. t. truei* examined in Grand Canyon National Park, Arizona. The host mouse from which the larger series of oocysts was obtained was collected by Dr. Donald F. Hoffmeister on August 5, 1954 at **Cape Royal** on the north rim of Grand Canyon. The host mouse from which the smaller series of oocysts was obtained was collected by Dr. Hoffmeister on July 5, 1954 on the **west side of Zuni Point**, which is on the south rim of Grand Canyon. This same individual was infected with *E. peromysci* [see no. 207, above]."

209 ➔ *Eimeria eremici*, NEW SPECIES (pp. 86-87, fig. 9 [p. 85])

"Host: *Peromyscus eremicus eremicus* (U. of Ill. Mus. #11,354) (cactus mouse). *Location*: Intestinal contents. *Locality*: This species was found in one out of two *P. eremicus* Grand Canyon National Park, Arizona. The host mouse was collected by Dr. Donald F. Hoffmeister on July 23, 1954 on the Tonto Plateau along the **Plateau Point Trail** one mile below [*sic*] Indian Garden [Havasupai Gardens]; this location is inside the Grand Canyon, on the south side of the Colorado River."

210 ➔ *Eimeria onychomysis*, NEW SPECIES (p. 87, fig. 10 [p. 85])

"Host: *Onychomys leucogaster* subsp. (U. of Ill. Mus. #10,666) (northern grasshopper mouse). *Location*: Intestinal contents. *Locality*: This species was found in one out of two *O. leucogaster* examined in Grand Canyon National Park, Arizona. The host mouse was collected by Dr. Donald F. Hoffmeister on July 19, 1954 along **State Highway 64 at the southeast boundary of the park**, south of the canyon."

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1957b *Isopora citolli* n. sp. from the rock squirrel, *Citellus variegatus utah*. *Journal of Protozoology*, 4(3) (August): 143-144.

211 ➔ *Isopora citolli*, NEW SPECIES (p. 87, fig. 1)

Apicomplexa: Conoidasida : Eucoccidiorida: Eimeriidae (coccid parasites)

"The host rock squirrel was trapped by Dr. Hoffmeister on August 9, 1954 **one-half mile from Swamp Point, near Powell Saddle**, on the north rim of Grand Canyon at an elevation of 7500 feet. Its skin and skull were preserved by Dr. Hoffmeister, and are in the University of Illinois Natural History Museum (Museum No. 10220)."

Lindsay, Dale R.

1938 New species of *Norvellina* (Homoptera, Cicadellidae). *Journal of the Kansas Entomological Society*, 11(4) (October): 113-123.

212 ➔ *Norvellina bicolorata* (Ball) **var. inflata**, NEW VARIETY (pp. 113-114); not illustrated

Arthropoda: Insecta: Hemiptera: Cicadellidae (leafhoppers)

(Holotype and allotype from White Sands, New Mexico.) "Numerous paratypes from the following localities: **Grand Canyon, Ariz.** . . . Types and paratypes in the Snow Entomological Collection. Paratypes in collection of Dr. Ball and U. S. N. M."

Liu, Tong-Xian, and Kosztarab, Michael

1987 Two new species of *Chionaspis* (Homoptera: Coccoidea: Diaspididae) from North America. *Florida Entomologist*, 70(4) (December): 512-520.

213 ➔ *Chionaspis gilli*, NEW SPECIES (pp. 516-519, fig. 2)

Arthropoda: Insecta: Hemiptera: Diaspididae (armored scales)

(Holotype from Las Cruces, New Mexico.) "Paratypes: On *Tamarix chinensis*, 5 on 4 slides, **Grand Canyon National Park, Colorado River**, Coconino Co., Arizona (AZ), VII-23-1984 collected by L. E. Stevens, deposited in USNM . . ."

Marshall, William B.

1929 Three new land shells of the genus *Oreohelix* from Arizona. *Proceedings of the U.S. National Museum*, 76(2802), 3 pp.

214 *Oreohelix yavapai vauxae*, NEW SUBSPECIES (pp. 1-2, Plate1, figs. 1-3, 11).

Mollusca: Gastropoda: Stylommatophora: Oreohelicidae (mountain snails)

"The study of a collection of *Oreohelix* made by Mrs. Mary Vaux Walcott in the canyon at Supai, Coconino County, Ariz., in 1928, and presented by her to the United States National Museum, not

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only proved that they belonged to a new subspecies, but their examination entailed a close scrutiny of forms long since contained in our collection but not previously adequately studied.”

“The type [holotype] and 14 paratypes come from the **Canyon at Supai, Coconino County, Ariz.**, and were collected and presented by Mrs. Charles D. Walcott, whose maiden name has been bestowed upon it.”

A table provides measurements for the “type and those of the paratypes which are adult”, giving the USNM catalog numbers: 380687 (type), 380688 (eight adult paratypes in one lot; presumably the sub-adult paratypes are in the same lot).

Massey, Calvin L.

1974 Biology and taxonomy of nematode parasites and associates of bark beetles in the United States. *U.S. Forest Service, Agriculture Handbook 446*, 233 pp.

215 ➔ *Parasitorhabditis gracilis*, NEW SPECIES (p. 69, fig. 41 [p. 70])

Nematoda: Chromadorea: Rhabditida : Rhabditidae (rhabditid roundworms)

“*Type habitat*.—Associated with *Pseudohylesinus grandis* Sw. in white fir. *Type locality*.—**Grand Canyon, Arizona**. *Type specimens*.—Collection No. 84-J.”

McAtee, W. L. [Waldo Lee]

1919 Notes on Nearctic Heteroptera. *Bulletin of the Brooklyn Entomological Society*, 14(1) (February): 8-15.

216 ➔ *Chelinidea vittiger* Uhler *var. artuflava*, NEW VARIETY (pp. 11-12); not illustrated

Arthropoda: Insecta: Hemiptera: Coreidae (leaf-footed bugs)

Syntypes include “**Grand Cañon, Ariz.**, July 10 (U. S. N. M.)”. [No further data about this specimen.]

McKelvey, Susan Delano

1949 A new *Agave* from Arizona. *Journal of the Arnold Arboretum*, 30(3) (July): 227-230, 2 plates.

217 ➔ *Agave kaibabensis*, NEW SPECIES (pp. 227-228, Pl. 1)

“ARIZONA, Coconino County, **Kaibab Plateau** on the north side of the Grand Canyon of the Colorado River, *McKelvey 4381* (Arnold Arboretum, TYPE [holotype]), *4381A* (Arnold Arboretum) [paratype], May 15, 1934.” [Apparently in Grand Canyon National Park. See notes below, which suggest the author’s casualness with geographical and records concerning the gathering.]

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McKelvey is not specific about the locality of the type, although she offers somewhat confusing additional data in her text from which one may infer that the type is from Grand Canyon National Park and not from the Kaibab National Forest north of the park.

"On May 15, 1934, while visiting the Kaibab Plateau on the northern side of the Grand Canyon of the Colorado, Coconino County, Arizona, the writer first saw the *Agave* here described. Two plants had been collected by the Park authorities at some previous date, but their leaf-rosettes and long fruiting stalks were still intact. It was not possible to make the descent into the gorge, but a few scattered plants were discernible some distance below the rim. Flowers were promised at a later date but were never forthcoming, unfortunately. [¶]The two plants are shown in the included photograph (McKelvey 152-12); although one was considerably smaller than the other it was undoubtedly the same species. The dimensions are from the larger plant." (p. 227).

"The smaller plant of the picture [which is posed (!?) beside the type in Pl. I] is *McKelvey 4381A*. The plant, as noted [p. 227?], came originally from some distance below the rim on the north wall of the Canyon. The date of actual collection is not known; it must have been in the season of 1933; the writer made her specimens on May 15, 1934. Her photographs 152-11, 12, and 153-1, 2 are of these plants; reproduced here is 153-2 (Pl. I)" (p. 229). Note that on p. 227 McKelvey indicates that the photograph of the two plants is her photo 152-12. [Pl. II of this paper depicts a comparative specimen of *Agave utahensis* Engelm., gathered by McKelvey in 1929 "some 13 miles east of Peach Springs, Mohave County, Arizona, in the extreme northwestern corner of Yavapai County."]

Merriam, C. Hart [Clinton Hart]

- 1890 *Results of a biological survey of the San Francisco Mountain region and the desert of the Little Colorado River, Arizona. U.S. Department of Agriculture, North American Fauna, (3), 136 pp., 13 plates, 5 maps.*

Regarding the localities noted at Grand Canyon, Merriam describes the trip to the canyon thusly (p. 4, in its entirety): "TRIP TO THE GRAND CAÑON OF THE COLORADO, SEPTEMBER 9 TO 16, INCLUSIVE. The usual road was followed from Little Spring to Hull Spring and Red Horse Tank, and thence to the tank known as Cañon Spring on the Cocanini [*sic*] Plateau, close to the cañon, which is here about 1,800 meters (6,000 feet) in depth. Mr. Bailey and myself climbed down into the cañon and remained in it two days and two nights." This information is enough to identify the locale as John Hance's accommodations at the head of the **Old Hance Trail**, down which Merriam and Bailey descended.

- 218 ➔ *Hesperomys megalotis*, NEW SPECIES (pp. 63-64, Pl. III, figs. 1-4; Pl. IV) [holotype illustrated]

Chordata: Mammalia: Rodentia: Crecitidae (deer mice)

(Type [holotype] from Black Tank, Desert of the Little Colorado River.) Paratype specimens include USNM 17930/24841 (original no. 469), "**Grand Cañon, Arizona**, Sept. 11, 1889, ♀ ad."

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- 219 ➔ *Spilogale gracilis*, NEW SPECIES (pp. 83-84); not illustrated. (Common name given by the author, "Little Striped Skunk")

Chordata: Mammalia: Carnivora: Mephitidae (skunks)

"Type [holotype] No. 17986/24897 ♂ ad. U. S. National Museum (Department of Agriculture collection). From **Grand Cañon of the Colorado** (altitude 3,500 feet), Arizona, north of San Francisco Mountain, September 12, 1889. Collected by C. Hart Merriam (Original number 451)." Also lists USNM 18598/25368 "♂ im." [paratype] also from Grand Canyon.

Merriam remarked (p. 83): "While asleep near a small spring in the Grand Canon of the Colorado, September 12, 1889, I was awakened at midnight by a sniffing noise about my head. Rising suddenly on my elbow, a small animal scampered hurriedly away over the rocks. His form was only dimly outlined in the dark, but a hasty shot left no doubt as to his identity, and a moment later I held in my hand the type of a new species of Little Striped Skunk. A day or two afterward a younger individual was captured among the cliffs at the top of the Cañon. The stomachs of both contained remains of the cliff mouse *Hesperomys erenicus*."

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- 1904 Two new squirrels of the *aberti* group. *Proceedings of the Biological Society of Washington* (Washington, D.C.) 17: 129-130.

- 220 ➔ *Sciurus kaibabensis*, NEW SPECIES (pp. 129-130); not illustrated.

Chordata: Mammalia: Rodentia: Sciuridae (squirrels)

"Type [holotype] from **head of Bright Angel Creek, top of Kaibab Plateau**, north side of Grand Canyon of Colorado [*sic*], Arizona. Adult male, No. 130,932, U. S. National Museum, Biological Survey Collection. December 1, 1903. John T. Stewart." [This is the widely known "Kaibab Squirrel".]

Miller, Robert Rush

- 1946 *Gila cypha*, a remarkable new species of cyprinid fish from the Colorado River in Grand Canyon, Arizona. *Journal of the Washington Academy of Sciences* (Washington, D.C.), 36(12): 409-415.

- 221 ➔ *Gila cypha*, NEW SPECIES; illustrated

Chordata: Teleostei: Cypriniformes: Cyprinidae (carps)

"*Holotype*.—The holotype (U.S.N.M. no. 131389) is a specimen about 305 mm in standard length and was taken by N. N. Dodge near Phantom Ranch in the western end of Grand Canyon National Park [old boundaries], Arizona. It was caught in swift water on hook and line, presumably in the nearby **Colorado River at or near the mouth of Bright Angel Creek**." [This is the widely known "Humpback Chub".]

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Miller, Walter B.

1984 Three new species of *Sonorella* (Gastropoda: Pulmonata: Helminthoglyptidae) from Arizona. *Proceedings of the Biological Society of Washington* (Washington, D.C.), 97(4): 681-687.

222 ➔ *Sonorella reederi*, NEW SPECIES (pp. 681-684, figs. 1A-C, 2)

Mollusca: Gastropoda: Stylommatophora: Helminthoglyptidae (shoulderbands)

"Disposition of types.—Holotype: USNM 792406. Paratypes: ANSP 356004; CAS 033405; FMNH 206235; UTEP 9051; RLR 298; WBM 5241 & 6307."

"Type-locality.—Mohave Co., Arizona. Lower Granite Gorge of the Colorado River, in limestone rockslide **just west and below Rampart Cave**; elevation ca. 1700 ft., 36°06'N, 113°56'W."

Moldenke, Andrew R.

1970 *A revision of the Clytrinae of North America north of the Isthmus of Panama (Coleoptera: Chrysomelidae)*. Stanford, California: Stanford University, 310 pp.

223 *Saxinis saucia kaibabiae*, NEW SUBSPECIES (pp. 182- ; illustrated)

Arthropoda: Insecta: Coleoptera: Chrysomelidae (leaf beetles)

Jacob Lake, Kaibab Forest.

Monod, M. [Michel]

1983 Monographie taxonomique des Gnomoniaceae (ascomycètes de l'ordre des Diaporthales). I. *Beihefte zur Sydowia* (Horn, Niederösterreich, Austria), (Annales Mycologici, Ser. II), IX. Beiheft, 315 pp. [This publication originally was Monod's doctoral dissertation, Université de Lausanne".] [Monograph is in French; species descriptions are in botanical Latin and in French.]

224 ➔ *Gnomonia quercusgambellii*, NEW SPECIES (pp. 98-99, fig. 13.5 [p. 278])

Ascomycota (sac fungi): Sordariomycetes: Diaporthales: Valsaceae

". . . sous *Gnomonia fasciculata*: *Quercus gambellii*: **North Rim of Grand Canyon**, Arizona, 18 août 1973, Barr, 6095 (MASS, Holotype)."

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Muchmore, William B.

1981 Cavernicolous species of *Larca*, *Archeolarca*, and *Pseudogarypus* with notes on the genera, (Pseudoscorpionida, Gaypidae and Pseudogarypidae). *Journal of Arachnology*, 9(1): 47-60.

225 ➔ *Archeolarca cavicola*, new species (pp. 55-56, figs. 11, 12 [p. 53])

Arthropoda: Euchelicerata: Pseudoscorpiones (pseudoscorpions): Larcidae

"Holotype female (WM 5398.01001) from **Cave of the Domes** [Horseshoe Mesa], Grand Canyon National Park, Coconino County, Arizona, 15 April 1978 (W. Calvin Welbourn). The type is in the Florida State Collection of Arthropods, Gainesville."

Nabokov, Vladimir

1942 Some new or little known Nearctic *Neonympha* (Lepidoptera: Satyridae). *Psyche*, 49(3/4) (September/December): 61-80.

Neonympha dorothea NEW SPECIES (pp. 62-63)

226 ➔ *Neonympha dorothea dorothea*, NEW SUBSPECIES (pp. 64-66); not illustrated

Arthropoda: Insecta: Lepidoptera: Nymphalidae (admirals)

"Male, holotype, female, allotype, and two males, paratypes, placed in the American Museum of Natural History. Taken during a brief visit to **Grand Cañon, Ariz., South Rim**, on June 9th, 1941 (bright cold morning after snow and rain). They were weakly fluttering beside the trail together with a few *Coen[onympha]. tullia furcae* almost no other butterflies about. Named in honor of Miss Dorothy Leuthold who kindly kicked up the first specimen. Female, paratype, labelled 'Grand Cy., June 11th '30', ex Coll. of C.F. dos Passos, Am. Mus. Nat. Hist."

[Two additional subspecies of *N. dorothea* also named therein, which are not pertinent to the present checklist.]

Nelson, Aven

1934 Rocky Mountain Herbarium studies. II. *American Journal of Botany*, 21: 573-582.

***326** ➔ *Purpusia osterhoutii*, NEW SPECIES (p. 574); not illustrated

Trachyophyta: Magnoliopsida: Rosales: Rosaceae (roses)

"The type of this novelty is Mr. George E. Osterhout's no. 7103, **Bright Angel Trail**, Grand Canyon, Arizona, June 22, 1928."

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Nelson, Edward W., and Goldman, Edward A.

1931 Three new pumas. *Journal of the Washington Academy of Sciences* (Washington, D.C.), 21(10) (May 19): 209-212.

227 ➔ *Felis concolor kaibabensis*, NEW SUBSPECIES (pp. 209-210); not illustrated. (Common name given by the author, "Kaibab Mountain Lion")

Chordata: Mammalia: Carnivora: Felidae (cats)

"Type [holotype].—From **Powell Plateau**, Grand Canyon National Park, Arizona (altitude 8,700 feet). No. 171186 ♂ adult, U. S. National Museum (Biological Survey collection), collected by J. T. Owens, April 15, 1911. X number 8432."

Nelson, G. H., and Westcott, R. L.

1995 Three new species of *Acmaeodera* Eschscholtz (Coleoptera: Buprestidae) from the United States and Mexico. *The Coleopterists Bulletin*, 49(1): 77-87.

228 *Acmaeodera navajo*, NEW SPECIES (pp. 82-84; figs. 2 [p. 78], 7 [p. 80])

Arthropoda: Insecta: Coleoptera: Buprestidae (jewel beetles)

"The holotype ♀ (USNM) and 90 paratypes, Arizona: Coconino Co., **9 mi NW Page**, 3-VI-70, R. L. Westcott, on either purple-flowered *Opuntia* or flowers *Sphaeralcea*. Other paratypes are as follows: . . . Arizona: Coconino Co., Vermillion [*sic*] Cliffs [**Vermilion Cliffs**], 9-VII-67, J. H. & J. M. Davidson, M. Cazier (1)."

Non-type specimens examined include "Navajo Indian Reservation, Hwy. 89, 15 mi S Page, 26-VI-80, L. L. Lampert, on *Linum lewisii*; 8 mi. SW Cliff Dwellers Lodge, 11-VII-67, M. A. Cazier, J. H. and J. M. Davidson, on *Sphaeralcea* sp. . . ."

[It is unclear whether "Vermillion Cliffs" refers to the geographical feature or to the place name, Vermilion Cliffs, although note that the authors also specially mention nearby Cliff Dwellers Lodge.]

Nielson, M. W.

1965 A revision of the genus *Cuerna* (Homoptera, Cicadellidae). *U.S. Department of Agriculture, Agricultural Research Service, Technical Bulletin 1318*, 48 pp.

***327** ➔ *Cuerna kaloostiani*, NEW SPECIES (pp. 24-26, fig. 12)

Arthropoda: Insecta: Hemiptera: Cicadellidae (sharpshooter)

(Male holotype and female allotype from Flagtaff, Arizona.) Paratypes include: "4 male paratypes, **Grand Canyon**, July 28, 1936, R. H. Beamer and D. R. Lindsay; 1 female paratype, **Grand Canyon National Park**, July 16, 1947, R. H. Beamer", "1 female, **Bright Angel** [probably Grand Canyon village], July 14 (no year given), Barber and Swartz; in the U.S. National Museum; 4

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females, **Grand Canyon**, August 19, 1939, E. P. Van Duzee . . . and 1 male, **Bright Angel Camp**, 6,900 feet, Wickham; in the California Academy of Sciences”.

Oberholser, Harry C.

1937 Descriptions of three new screech owls from the United States. *Journal of the Washington Academy of Sciences* (Washington, D.C.), 27(8) (August 15): 354-357.

229 ➔ ***Otus asio mychophilus***, NEW SUBSPECIES (pp. 356-357); not illustrated. (Common name given by the author, “Grand Canyon Screech Owl”)

Chordata: Aves: Strigiformes: Strigidae (typical owls)

“Type [holotype].—Adult female, No. 340593, U. S. National Museum, Biological Survey collection; south rim of Grand Canyon, 6,900 feet altitude, **Grand Canyon Village**, Arizona; January 28, 1935; Russell K. Grater, original number, 23.”

Ownbey, Gerald B.

1958 Monograph of the genus *Argemone* for North America and the West Indies. *Torrey Botanical Club, Memoirs*, 21(1), 159 pp.

328** ➔ ***Argemone arizonica, NEW SPECIES (pp. 91-93, fig. 14)

Trachyophyta: Magnoliopsida: Ranunculales: Papaveraceae (poppies)

“Holotype: *Alice Eastwood & John T. Howell* 1003, from Grand Canyon National Park, ‘**Kaibab Trail to Roaring Springs**,’ Arizona, June 23, 1933 (CAS; isotype, POM).”

Pape, Robert B.; Thomas, Donald B.; and Aalbu, Rolf L.

2007 A revision of the genus *Eschatomoxys* Blaisdell (Tenebrionidae: Pimeliinae: Edrotini) with notes on the biology. *The Coleopterists Bulletin*, 61(4): 519-540.

230 ➔ ***Eschatomoxys pholeter*** Thomas & Pape, NEW SPECIES (pp. 525-527, figs. 1 [p. 521], 5 [p. 523], 8A,B [p. 526])

Arthropoda: Insecta: Coleoptera: Tenebrionidae (darkling beetles)

“Holotype. Male. ARIZONA: Mohave Co., Grand Canyon N.P., **Bat Cave**, 29-III-96, R.B. Pape coll. Allotype. Female. Labeled same data as holotype. Paratypes: Three males, one female, labeled same data as holotype; Four males, six females: AZ. Mohave Co., **Bat Cave**, Gr. Canyon, GRTCA Cave SCI-0043, 26-X-01, R.B. Pape (deposited CAS and DB Thomas collection). One female: AZ. Mohave Co., **Eldel Cave** [Grand Canyon–Parashant National Monument], twilight, IX-23-05, J. Judson Wynne col[[]]. Three females: ARIZONA: Mohave Co., Grand Canyon N.P., **Rampart Cave**, teneb on 7,200 yr old sloth shit [*sic!*].”

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Parfitt, Bruce D.

1997 *Opuntia pinkavae* (Cactaceae), a new species from Arizona and Utah. *Rhodora* (Journal of the New England Botanical Club), 99(899) (Summer): 223-228.

231 ➔ *Opuntia pinkavae*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

"HOLOTYPE: USA, Arizona: Mohave Co., **northwest of Bulrush Canyon south of Pipe Spring**, 1400 m, *n* =44, 30 May 1980, *B. D. Parfitt 2874* (ASU 111287!)."

"PARATYPES: United States. Arizona: Coconino Co., **House Rock Valley, N of Rock Canyon, Parfitt 2859** (ASU!); **1 mi N of Fredonia, Brown 651 & Parfitt** (ASU!); Mohave Co., **1.2 mi N of hwy 389 on road to Moccasin, Brown 657 & Parfitt** (ASU!); **W of Kaibab Indian Reservation, Parfitt 3958 & Roberts** (ASU!); **Main Street Valley, W of Hurricane Cliffs, Palmer & Hodgson 4620** (ASU!, DES); **Navaho Trail near Hurricane Rim, Gierisch 5132** (ASU!); **4.2 mi SW of Wolf Hole, Brown 851 & Parfitt** (ASU!)." (Additional paratypes from southern Utah.)

Payson, Edwin Blake

1921 A monograph of the genus *Lesquerella*. *Missouri Botanical Garden, Annals*, 8(2) (April): 103-236.

***329** *Lesquerella arizonica* *Watson var. nudicaulis*, NEW VARIETY (p. 208, fig. 25)

Trachyophyta: Magnoliopsida: Brassicales: Brassicaceae [Cruciferae] (mustards)

"Specimens examined: Arizona: **Buckskin Mountains** [Kaibab Plateau], June 19, 1890, *Jones* (U. S. Nat. Herb. TYPE)." [Marcus E. Jones gathering in US designated as type (= holotype). No other specimens examined.]

Peck, Stewart Blaine

1973 A systematic revision and the evolutionary biology of the *Ptomaphagus* (*Adelops*) beetles of North America (Coleoptera; Leiodidae; Catopinae), with emphasis on cave-inhabiting species. *Bulletin of the Museum of Comparative Zoology*, 145(2): 29-162.

232 ➔ *Ptomaphagus cocytus*, NEW SPECIES (p. 106, figs. 39, 40 [both p. 93, legend p. 92], 117 [p. 99, legend p. 98], 164 [p. 103, legend p. 102], 199 [p. 105, legend p. 104])

Arthropoda: Insecta: Coleoptera: Leiodidae (round fungus beetles)

"Holotype male and allotype female in MCZ (no. 31893). Type locality: Arizona, Coconino County, Kaibab Plateau, **Roaring Springs Cave**. Type data: 1.i.1965, Gregory Lane leg. Paratypes, 2 females, same locality, 16.iv.1965, L. Ball and G. T. Lane leg., in SBP."

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Peck, Stewart B., and Wynne, J. Judson

- 2013 *Ptomaphagus parashant* Peck and Wynne, new species (Coleoptera: Leiodidae: Cholevinae: Ptomaphagini): the most troglomorphic cholevine beetle known from western North America. *The Coleopterists Bulletin*, 67(3): 309-317.

233 *Ptomaphagus parashant*, NEW SPECIES; illustrated

Arthropoda: Insecta: Coleoptera: Leiodidae (round fungus beetles)

"Type Specimens. Holotype female and allotype male deposited in Canadian Museum of Nature (CMN), Ottawa, Canada. Type locality: USA, Arizona, Mohave County, **Parashant National Monument [Grand Canyon-Parashant National Monument], PARA-1001 cave, N36°39', W113°37'**. Type label data: female holotype; 2.ix.2011, J.J. Wynne, sweet potato bait #4, site 2, deep zone; and male allotype, same area but chicken liver bait #1. Our red label states '*Ptomaphagus parashant* Peck & Wynne, holotype.' Paratypes, all with yellow paratype labels, seven with same locality data and five from site 2, direct intuitive searching, and two from 'sweet potato bait #4' are deposited at the CMN, the Los Angeles County Museum, California Academy of Sciences, and the U.S. National Museum of Natural History (Smithsonian Institution)."

Pennell, Francis W.

- 1940 New species of Scrophulariaceae from Arizona. *Notulae Naturae of the Academy of Natural Sciences of Philadelphia*, (43) (May 15), 10 pp.

234 ➔ *Cordylanthus tenuifolis*, NEW SPECIES (pp. 9-10); not illustrated

Trachyophyta: Magnoliopsida: Lamiales: Orobanchaceae (broomrapes)

"Type [holotype].—**Grand Canyon**, Coconino County, Arizona, collected in flower August 24, 1919, by W. W. Eggleston, no. 15677a; in Herb. Academy of Natural Sciences of Philadelphia."

Phillips, Arthur M., III

- 1992 A new subspecies of *Rosa stellata* (Rosaceae) from northwestern Arizona. *Madroño*, 39(1): 31-35.

235 ➔ *Rosa stellata* Wooton **subsp. abyssa**, NEW SUBSPECIES; illustrated

Trachyophyta: Magnoliopsida: Rosales: Rosaceae (roses)

"TYPE: USA, Arizona, Mohave Co.: SW edge of Shivwits Plateau, along **W rim of Twin Point, 18 km S of Oak Grove, T30N R12W NW¼ sect. 7, 36°01'N, 113°37'W**, 1823 m, in sandy to gravelly soils with limestone chips, derived from Kaibab limestone, in first 100 m from edge of plateau, open Great Basin conifer woodland, 15 Jun 1980, A. M. Phillips, III, 80-103 (holotype, ARIZ; isotypes, ASC, ASU, DES, MNA, MO, NY, UNLV, UNM, US, Lake Mead National Recreation Area herbarium)." [The locality is today within Grand Canyon-Parashant National Monument.]

"Paratypes. USA, AZ, Mohave Co.: type locality . . . ; 27 Jul 1975, *Holland 690* (UNLV); **W rim of Kanab Canyon**, gravelly soil, **T38N R3W sect. 30**, 1585 m., 2 Aug 1977, *Gierisch 3978* (ASC,

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ASU); 8 Jun 1978, *Gierisch 4388* (ARIZ, ASU, USDA Forest Service Herb., Albuquerque, NM); **W rim of Kanab Canyon in small drainage 30 m from edge**, restricted to Kaibab limestone conglomerate, **T38N R3W NW¼ sect. 29**, 1550 m, 13 Jun 1979, *A. Phillips and B. Phillips 79-624* (MNA); **W rim of Kanab Canyon S of Water Canyon, in depression caused by breccia pipe collapse, T38N R3W NW¼ SW¼ sect. 8**, 1525 m, 22 May 1980, *A. Phillips 80-91* (ARIZ, ASC, ASU, MNA, UNLV, UNM, BLM Arizona Strip District herbarium); Grand Canyon National Monument (Park) [now in the enlarged Grand Canyon National Park], **head of SB Trail**, 1372 m, 24 May 1958, *Riffey s.n.* (UNLV, COLO); **between SB Point and Hades Knoll, side canyon**, 1675 m, 30 May 1978, *Reichhardt 123* (MNA). Coconino Co.: **Mesa Eremita [Eremita Mesa]** S rim of Grand Canyon, 1980 m, 12 Jun 1935, *Hawbecker s.n.* (Grand Canyon National Park Study Collection); **Dutton Point**, N rim of Grand Canyon, dry ledge overlooking canyon, 2285 m, 17 Jul 1947, *Bryant and Cooper s.n.* (Grand Canyon National Park Study Collection, 2 specimens)."

Pilsbry, Henry A., and Ferriss, James H.

- 1911 Mollusca of the southwestern states, V: The Grand Canyon and northern Arizona. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 63: 174-199.
- 236** ➔ ***Oreohelix yavapai profundorum***, NEW SUBSPECIES (pp. 182-184, text-fig. 4; Pl. XII, figs. 1-14 [legend p. 198])
- Mollusca: Gastropoda: Stylommatophora: Oreohelicidae (mountain snails)
- "Grand Canyon, in 'Spectacle Cove,' Station A, **the head of a recess in the cross-bed sandstone [Coconino Sandstone] south of where the Mystic Spring or Bass Trail [South Bass Trail] zigzags down, in a talus resting on the red sandstone forming the Le Conte Plateau**. Elevation about 5,700 feet. Cotypes [syntypes], No. 103,234 A. N. S. P., collected by Ferriss and Pilsbry, October, 1906." (Text-fig. 5 is a sketch view of "Spectacle Cove (Station A), from opposite side below Bass Trail. Type locality of *Oreohelix yavapai profundorum* on the mound at left end of talus slope.")
- 237** ➔ ***Oreohelix yavapai extremitatis***, NEW SUBSPECIES (pp. 184-185, Pl. XII, figs. 15-21 [legend p. 198])
- "At Station 2, **near Bass's Trail [South Bass Trail], about 200 feet below the rim of the Grand Canyon** [. . .] Cotypes [syntypes] are No. 103,236 A. N. S. P., collected by Ferriss and Pilsbry, 1906."
- 238** ➔ ***Oreohelix yavapai angelica***, NEW SUBSPECIES (pp. 185-186, Pl. XII, figs. 22-25 [legend p. 198])
- "On the **Bright Angel Trail, at Grand Canyon, from 100 to 400 feet below the rim** [. . .] Cotypes [syntypes] are No. 103,239 A. N. S. P., collected by Ferriss and Pilsbry, 1906."

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239 ➔ *Pupilla syngenes avus*, NEW SUBSPECIES (p. 196, text-fig. 9)

Mollusca: Gastropoda: Stylommatophora: Pupillidae (chrysalis snails)

"Types [syntypes] No. 94,220 A. N. S. P., from upper slope of the Grand Canyon **along the Mystic Spring or Bass Trail [South Bass Trail], about 200 feet below the rim**, Station 2"

Pogue, Michael G.

2004 A new species of *Schinia* Hübner from riparian habitats in the Grand Canyon (Lepidoptera: Noctuidae: Heliethinae). *Zootaxa*, (788): 1-4.

240 ➔ *Schinia immaculata*, NEW SPECIES; illustrated

Arthropoda: Insecta: Lepidoptera: Noctuidae (owlet moths)

"Type material. HOLOTYPE: ♂, Arizona, Coconino Co., Colorado River, Grand Canyon, **river mile 23.0 L, shore, 36.6003° N, 111.7668° W**, May 2, 2003, R. J. Delph, genitalia slide USNM 47867, USNM ENT 00219964. The holotype is provisionally deposited at the USNM, Washington, DC, pending mutual resolution and agreement with the National Park Service regarding specimen deposition."

"PARATYPES (3°): U.S.A.: ARIZONA: COCONINO CO. 1° same data as holotype except: USNM ENT 00210120 (NAU); **river mile 166.5 L, old high water, 36.2542 N, 112.8996 W**, 14 Apr. 2003 (1°), R. J. Delph, USNM ENT 00219965 (USNM); **river mile 202 R, new high water, 36.0526 N, 113.3489 W**, 15 May 2001 (1°), J. Rundall, USNM ENT 00210119 (NAU). Paratypes deposited in the National Museum of Natural History, Washington, DC (USNM) and Northern Arizona University, Flagstaff, AZ (NAU)." [Note: The symbol ° as which appears in this list of paratypes may be a typographical error for ♂ (the female of the species being "unknown"); note as well that it is omitted from the geographical coordinates and that these symbols are correctly printed in the data for the holotype (*above*).]

Poppius, B. [Bertil Robert]

1914 Übersicht der *Pilophorus* Arten nebst Beschreibung verwandter Gattungen (Hem. Het.). *Annales de Société Entomologique de Belgique*, 58: 237-254. [Article is in German.] [Volume 58, 1914-1919; signature 16 of this volume, which includes the two species listed here, is dated 20 August 1914.]

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

[The localities for the type specimens, cited peculiarly, refer to Williams, Arizona, and **Bright Angel, Arizona (Grand Canyon village)**.]

241 ➔ *Pilophorus americanus*, NEW SPECIES (p. 243)

"Ver. Staaten von N. Amerika : Williams, Ar.!, 21.VII; Br't Angel, Ar.!, 12.VII, H. S. Barber, 2 ♂♂ (U. S. Nat. Mus.)." [Syntypes.]

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242 ➔ ***Pilophorus exiguus***, NEW SPECIES (pp. 246-247)

"Vereinigte Staaten von N. Amerika : Br't Angel, Ar.!, 10 VII, Barber, 1 ♀, 2 ♂♂ (U. S. Nat. Mus., Mus. Helsingf.)" [Syntypes.]

Pratt, Harry Davis

1945 Taxonomic studies of Nearctic Cryptini (Ichneumonidae, Hymenoptera). *American Midland Naturalist*, 34(3) (November): 549-661.

*330 ➔ ***Cryptus asymmetricus***, NEW SPECIES (pp. 587-589); not illustrated

Arthropoda: Insecta: Hymenoptera: Ichneumonidae (scorpion wasp)

Paratypes examined include "Grand Canyon" (without further data).

Raven, Peter H.

1962 The systematics of *Oenothera* subgenus *Chylismia*. *University of California Publications in Botany*, 34(1): 1-122.

Trachyophyta: Magnoliopsida: Myrtales: Onagraceae (evening primroses)

243 ➔ ***Oenothera confertiflora***, NEW SPECIES (pp. 80-81); not illustrated

"Type.—In cinder soil, on east side, base of Vulcan's Throne, Toroweap Valley, at about 4,200 feet elevation, Grand Canyon National Monument [now in the enlarged Grand Canyon National Park], Mohave County, Arizona, April 30, 1952, *E. McClintock* 52-294 (CAS 373,481; isotypes, ARIZ, NY, WS)." "Known only from the type locality."

244 ➔ ***Oenothera specuicola***, NEW SPECIES (p. 87); not illustrated

➔ ***Oenothera specuicola* subsp. *specuicola***, NEW SUBSPECIES (p. 87); not illustrated

"Type [holotype].—Debris slides and crevices of Redwall limestone, Kaibab Trail [South Kaibab Trail] at 5,300 feet elevation, south rim of Grand Canyon, Coconino County, Arizona, June 8, 1958, *P. H. Raven* 13119 (RSA; isotypes to be distributed)."

244a ***Oenothera specuicola* subsp. *hesperia***, NEW SUBSPECIES (p. 88); not illustrated

"Type [holotype].—Near Mooney Falls, Havasu Canyon, Coconino County, Arizona, May 23, 1950, *J. T. Howell* 26486 (CAS 359,774); isotype, ARIZ)." [Locality is in the Havasupai Indian Reservation.]

[No. 244a added late to this checklist.]

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Reeder, John R.

1991 A new species of *Panicum* (Gramineae) from Arizona. *Phytologia*, 71(4) (October): 300-303.

245 *Panicum mohavense*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Poales: Poaceae (grasses)

"TYPE: UNITED STATES. Arizona: Mohave Co., Arizona Strip: **Main Street Valley, ca. 1.5 km S of the jct. of the Colorado City road with the Main Street Valley road**. Low hills with limestone terraces, ca. 1525 m, 11 Oct 1990, J.R. & C.G. Reeder 8630 (HOLOTYPE: ARIZ; Isotypes: US,K,MO).

Rehder, Alfred

1917 The genus *Fraxinus* in New Mexico and Arizona. *Proceedings of the American Academy of Arts and Sciences*, 53(2) (October): 199-212.

Trachyophyta: Magnoliopsida: Lamiales: Oleaceae (olives)

246 ➔ *Fraxinus cuspidata var. macropetala*, NEW VARIETY (pp. 201-202); not illustrated

[Syntypes include:] "Arizona. Coconino Co.: **Grand Canyon**, July 9, 1892, E. O. Wooton (U. S. Nat. Herb. No. 738265), July 13, 1892, J. W. Tourney (No. 273), June 1905, C. A. Purpus, June 13, 1913, A. E. Hitchcock (Nos. 76, 78); **Red Canyon Trail [Hance Trail]**, June 10, 1901, L. F. Ward (U. S. Nat. Herb. No. 410119); **Bright Angel Trail**, alt. 1400-2200 m., 1909, E. W. Nelson (No. 108), May 31 and August 19, 1913, E. A. Goldman (Nos. 2067, 2223), alt. 1400-2000 m., July 19, 1914, A. Rehder (No. 106); **Hermit Trail**, June 18, 1916, Alice Eastwood (No. 5822); **Grand View Trail**, June 16, 1916, Alice Eastwood (No. 5693)."

247 ➔ *Fraxinus lowellii* Sargent, NEW SPECIES (p. 211); not illustrated

(Type [holotype] from Oak Creek Canyon, Arizona.) [Paratype material includes:] "Mohave Co.: **Peach Springs**, 1884, J. G. Lemmon (No. 3242)."

[This species description in Rehder is separately signed by C[harles]. S[prague]. Sargent, thus *Fraxinus lowellii* Sargent in Rehder, 1917.] [J. G. Lemmon, with his wife, spent a month in the Peach Springs area in May 1884. For a general (non-scientific) account of their visit, see J. G. Lemmon, 1888, Grand Cañon of the Colorado, *Overland Monthly*, new series, 12(69) (September): 244-256.]

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Rehn, James A. G., and Grant, Harold J., Jr.

1958 A revision of the genus *Morsea* (Orthoptera; Acridoidea; Eumastacidae). *Transactions of the American Entomological Society*, 84(3/4) (September/December): 217-259.

248 *Morsea californica kaibabensis*, NEW SUBSPECIES; (pp. 250-254, text-figs. 23-26)

Arthropoda: Insecta: Orthoptera: Eumastacidae (monkey grasshoppers)

"Type [holotype].— ♂; **Northwest escarpment slope of Kaibab Plateau**, Coconino County, Arizona. Elevation, 6700 feet. September 3, 1926. (Rehn and Hebard.) [Academy of Natural Sciences of Philadelphia, Type no. 5810]." [square brackets are part of quotation].

Rehn, James A. G., and Hebard, Morgan

1908 An orthopterological reconnaissance of the southwestern United States. Part I: Arizona. *Academy of Natural Sciences of Philadelphia, Proceedings*, 60: 365-402.

Arthropoda: Insecta: Orthoptera: Acrididae (short-horned grasshoppers)

***331** ➔ *Parapomala perpallida*, NEW SPECIES (pp. 373-375, figs. 5, 6)

"Type: ♂; **near Bright Angel Trail**, elevation 3,750 feet, Grand Canyon of the Colorado, Coconino County, Arizona. September 12, 1907. Collected by M. Hebard."

***332** ➔ *Amphitornus nanus*, NEW SPECIES (pp. 376-378, fig. 7)

"Type: ♂; **Grand Canyon of the Colorado**, Coconino County, Arizona, altitude 7,000 feet, in conifer forest. September 11, 1907. Collected by Morgan Hebard."

Reinhard, H. J.

1953 New muscoid Diptera from the western United States. *Pan-Pacific Entomologist*, 29(1) (January): 49-59.

249 *Fabriciella evanida*, NEW SPECIES (pp. 53-54); not illustrated

Arthropoda: Insecta: Diptera: Tachinidae (tachinid flies)

(Holotype and allotype from Lake City, Colorado.) Paratypes include: "1 ♂, **S. Grand Canyon, Ariz.**, August 17, 1949 (P. R. Fitzgerald)."

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

Reveal, James L.

1974a Two shrubby novelties in *Eriogonum* (Polygonaceae) from the deserts of Utah and Arizona. *Brittonia*, 26 (January/March): 90-94.

250 *Eriogonum mortonianum*, NEW SPECIES (pp. 91-92, fig. 1)

Trachyophyta: Magnoliopsida: Caryophyllales: Polygonaceae (knotweeds)

"Type: UNITED STATES: ARIZONA: Mohave Co.: **along Arizona Hwy. 389, 4.5 mi SW of U.S. Hwy. 89A** at Fredonia (Coconino Co.) and **ca. 9 mi ENE of Pipe Springs [Pipe Spring]**, on red clay hills, associated with *Eriogonum corymbosum* and *Atriplex*, at 4650 ft (1420 m), 16 Aug 1972, *Reveal 2904* (HOLOTYPE: US!; ISOTYPES: ARIZ, ASU, BRY, CAS, GH, K, MO, NY, OKL, RM, RSA, SMU, TEX, UC, UTC, WTU, and elsewhere).

1974b Two new varieties of *Eriogonum* (Polygonaceae) from the Intermountain Region. *Great Basin Naturalist*, 34(3): 245-246.

251 *Eriogonum thompsonae* S. Wats. **var. atwoodii**, NEW VARIETY (pp. 245-246); not illustrated

Trachyophyta: Magnoliopsida: Caryophyllales: Polygonaceae (knotweeds)

"Typus: Arizona: Mohave Co.: **Along Arizona Highway 389, 4.3 miles west of the junction of U.S. Highway 89A** at Fredonia, on rolling reddish clay hills, associated with *Atriplex*, *Ephedra*, *Stanleya*, and *Eriogonum mortonianum*, at about 4700 feet elevation, 15 August 1973, *Reveal & Reveal 5211*. Holotypus, US! Isotypi, 15 duplicates to be distributed from US."

Rhodes, S. L., and Ayers, T. J.

2010 Two new taxa of *Scutellaria* Section *Resinosa* (Lamiaceae) from northern Arizona. *Journal of the Botanical Research Institute of Texas*, 4(1): 19-26.

252 *Scutellaria potosina* **var. kaibabensis**, NEW VARIETY (pp. 20, 24, figs. 2A-E, 3A-C)

Trachyophyta: Magnoliopsida: Lamiales: Lamiaceae (mints)

"Type: U.S.A. Arizona: Coconino Co.: East rim of the Kaibab Plateau, **North Canyon Trail #4, 36°25'04"N 112°04'17"W** (NAD 27), 2133 m (7000 ft), 9 Jul 1998, *Suzanne Rhodes 9811 with Tina Ayes* (holotype ASC; isotypes: ARIZ, ASU)." "Paratype: U.S.A. Arizona. Coconino Co.: Kaibab Plateau, **East Rim View Point along Trail #7 ca. 2¼ mi down from trailhead, in North Canyon; 36°25'18"N, 112°04'22"W**, 2133 m (7000 ft); 1 Jul 1993, *W. Hodgson 7334* (DES, ASU)."

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Ribble, D. W.

1974 A revision of the bees of the genus *Andrena* of the western hemisphere; subgenus *Scaphandrena*. *Transactions of the American Entomological Society*, 100(2) (June): 101-189.

253 ➔ *Andrena (Scaphandrena) kaibabensis*, NEW SPECIES (pp. 160-161); not illustrated

Arthropoda: Insecta: Hymenoptera: Andrenidae (andrenid bees)

"*Type Material*.—The holotype female (UCD) and 3 ♀♀ paratypes (UCS, INHS) were collected on the **North Rim of Grand Canyon National Park**, June 21, 1949, by W. H. Lang. One female paratype (AMNH) was collected **20 miles south of Jacob Lake, Arizona** [in the Kaibab National Forest], June 19, 1958, by W. J. and J. W. Gertsch." (Also another paratype from Red Canyon, Garfield Co., Utah.)

Roberts, Roland P.; Urbatsch, Lowell E.; and Anderson, John

2005 New species and new combinations in *Ericameria* (Asteraceae: Astereae). *Sida*, 21(3) (August 5): 1557-1564.

***333** ➔ *Ericameria arizonica*, NEW SPECIES (pp. 1558-1560; fig. 1 [p. 1559])

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

Type from "Grand Canyon National Park, South Rim, Mather Point, eastern edge of view point E of paved walkways, north facing Kaibab Limestone cliff edges shaded by pinyon pine, 1 Oct 1998, N. Brian 98-291 (HOLOTYPE: ASC!)."

Robinson, Benjamin Lincoln

1899 Three new Choripetalae from North America and Mexico. *Botanical Gazette*, 28(2) (August): 134-136.

254 ➔ *Silene rectiramea*, NEW SPECIES (p. 134); not illustrated

Trachyophyta: Magnoliopsida: Caryophyllales: Caryophyllaceae (pinks)

"Collected by Professor D. T. MacDougal **about the Grand Cañon** of the Colorado in Arizona, altitude 2150^m, 28 June, 1898, no. 181. Type in herb. Gray."

Robinson, Benjamin Lincoln, and Fernald, M. L.

1894 Contributions from the Gray Herbarium of Harvard University, New Series, No. VIII. New plants collected by Messrs. C. V. Hartman and C. E. Lloyd upon an archæological

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expedition to northwestern Mexico under the direction of Dr. Carl Lumholtz. *Proceedings of the American Academy of Arts and Sciences*, 30: 114-123.

255 ➔ ***Crossosoma parviflora***, NEW SPECIES (p. 114); not illustrated

Trachyophyta: Magnoliopsida: Crossosomatales: Crossosomataceae (crossomas)

[Syntypes:] "Collected in the **Grand Cañon of the Colorado**, by Dr. Gray, February to May, 1885, but referred to *Glossopetalon Nevadense*, Gray; and at La Tinaja, Sonora, at 3,700 feet, by Mr. Hartman, 19 November, 1890 (no. 245)."

[In May 1885 Gray descended into Grand Canyon in Peach Springs Canyon to Diamond Creek and the Colorado River.]

Robinson, Benjamin Lincoln, and Greenman, Jesse More

1895 Contributions from the Gray Herbarium of Harvard University, New Series, No. IX. *American Journal of Science*, Series 3, 50 [Whole Number, 150(296)] (August): 135-176.

*334 ➔ ***Laphamia toumeyi***, NEW SPECIES (p. 176); not illustrated

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

See under "Miscellaneous New Species". "Collected by Prof. J. W. Toumey, in the **Grand Cañon**, 12 July, 1892 (No. 645)."

Robinson, Harold

1967 New species of Dolichopodidae from the United States and Mexico (Diptera). *Proceedings of the Entomological Society of Washington* (Washington, D.C.), 69(2) (June): 114-127.

256 ➔ ***Chrysotimus arizonicus***, NEW SPECIES (p. 125, fig. 29 [p. 118])

Arthropoda: Insecta: Diptera: Dolichopodidae (longlegged flies)

"Holotype ♂, allotype ♀, and 1 ♀ paratype, from **Grand Canyon National Park (north rim)**, Arizona, July 15, 1954, W. L. Downes, Jr. Holotype (no. 69341) and allotype in USNM, paratype in the Downes collection at the Department of Entomology, University of Illinois."

Rollins, Reed C.

1953 A new *Sisymbrium* from Arizona. *Leaflets of Western Botany*, 7(1): 15-16.

257 ➔ ***Sisymbrium kearneyi***, NEW SPECIES; not illustrated

Trachyophyta: Magnoliopsida: Brassicales: Brassicaceae [Cruciferae] (mustards)

"Type in the Gray Herbarium, collected along trail into **S. B. Canyon, Grand Canyon National Monument** [now in the enlarged Grand Canyon National Park], Arizona, May 8, 1952, *Elizabeth McClintock 481a*. Another collection (in flower) from the same locality but found growing under

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shelter of overhanging cliffs is *Elizabeth McClintock 52-481* (OH). Duplicates in Herb. Calif. Acad. Sci.”

1982 Species of *Draba*, *Lesquerella* and *Sibara* (Cruciferae). *Contributions from the Gray Herbarium of Harvard University*, (211) (January 15): 107-113.

258 *Lesquerella kaibabensis* Rollins, NEW SPECIES (pp. 110-111); not illustrated

Trachyophyta: Magnoliopsida: Brassicales: Brassicaceae [Cruciferae] (mustards)

“Holotype in the Gray Herbarium, collected on a limestone-clay knoll, **18.6 miles south of Jacob Lake on road to the north entrance of Grand Canyon National Park**, Coconino County, Arizona, June 8, 1979, *Reed C. and Kathryn W. Rollins 79191*. (Isotypes to be distributed.)”

Rydberg, Per Axel

1909 Studies on the Rocky Mountain flora—XX. *Bulletin of the Torrey Botanical Club*, 36(12) (December): 675-698.

259 ➔ *Penstemon coccinatus*, NEW SPECIES (p. 691); not illustrated

Trachyophyta: Magnoliopsida: Lamiales: Plantaginaceae (plantains)

“Arizona: **Grand Cañon of the Colorado**, 1898, *MacDougal 173* (type [holotype], in herb. N. Y. Bot. Gard.)” Paratype material includes: “**Red Cañon Trail [Hance Trail]**, June 10, 1901, *L. F. Ward*”. (Other paratypes from Oak Creek, Arizona, and localities in Utah.)

1913 Studies on the Rocky Mountain flora—XXIX. *Bulletin of the Torrey Botanical Club*, 40(9) (September): 461-485.

260 *Amsonia eastwoodiana*, NEW SPECIES (p. 465)

Trachyophyta: Magnoliopsida: Gentianales: Apocynaceae (dogbane)

(Type [holotype] from Moab, Utah.) Paratype material includes “**Lee’s Ferry**, 1890, *M. E. Jones*”. (Other paratype material from east of Holbrook, Arizona, and from Willow Creek Canyon, Utah.)

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Rydberg, Per Axel, and Pennell, Francis Whittier

- 1919 North American flora. Volume 24, Part 1. (Rosales) Fabaceae, Psoraleae. Per Axel Rydberg. *Eysenhardtia*. Francis Whittier Pennell. New York: New York Botanical Garden, pp. 1-64. [Pennell's contribution on the genus *Eysenhardtia* restricted to pp. 34-40.]

Pedimelum Rydberg, NEW GENUS (p. 17)

- 261** ***Pedimelum retrorsum*** Rydberg, NEW SPECIES (p. 22); not illustrated

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

"Type [holotype] collected at **Peach Spring [Peach Springs]** near Big Bend of the Colorado, Arizona, June, 1884, J. G. Lemmon & wife (herb. Columbia Univ.)."

[Lemmon, with his wife, spent a month in the Peach Springs area in May 1884. For a general (non-scientific) account of their visit, see J. G. Lemmon, 1888, Grand Cañon of the Colorado, *Overland Monthly*, new series, 12(69) (September): 244-256.]

Sargent, C. S. [Charles Sprague]

- 1919 Notes on North American trees. IV. *Botanical Gazette*, 67(3): 208-242.

- 262** ➔ ***Juniperus utahensis* var. *megalocarpa***, NEW VARIETY (p. 208); not illustrated

Trachyophyta: Pinopsida: Pinales: Cupressaceae (cypress)

[Syntypes include:] "Arizona: **rim of the Grand Canyon**, C. S. Sargent, September 9, 1904; **Angel, near Flagstaff**, Percival Lowell, September 4." [Inasmuch as there seems to be no separate place name in Arizona by the simple name of "Angel", Lowell's gathering is presumably from "**Bright Angel**" (Grand Canyon village).]

- 263** ➔ ***Populus fremontii* var. *toumeyii***, NEW VARIETY (p. 214); not illustrated

Trachyophyta: Magnoliopsida: Malpighiales: Salicaceae (willows)

(Type [holotype] from Tucson, Arizona.) Paratype material includes "**Hermit Creek**, Grand Canyon of the Colorado, Coconino County, Alice Eastwood, April 10, 1917 (no. 6002)".

Scarborough, Aubrey G.; Stevens, Lawrence E.; and Nelson, C. Riley

- 2012 The *albibarbis*-complex of *Efferia* Coquillett, 1910 from the Grand Canyon region, southwestern U.S.A., with three new species and new distribution records (Diptera: Asilidae). *Pan-Pacific Entomologist*, 88(1) (January): 58-86.

- 264** ➔ ***Efferia tapeats***, NEW SPECIES (pp. 75-78, figs. 25-30)

Arthropoda: Insecta: Diptera: Asilidae (robber flies)

[In this entry all square brackets are part of the quotation, with awkward typography thus. "GCNP" = Grand Canyon National Park. "HualapIR/Peach Spr. Wash" = Hualapai Indian Reservation/ Peach Springs Wash.]

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"Types. Arizona: Coconino Co., GCNP/**Clear Cr., 4 km up [from confluence with Colorado River]**/12.ix.2005; 775 m/L.E. Stevens (holotype ♂, MNA). Paratypes: same data as holotype (1 ♀, MNA); GCNP/**Colo. R. [Colorado River] Mi 108R** [north bank] resting on *Aster [Chloracantha] spinosus* flower; 20.ix.2009; 670 m/L.E. Stevens (1 ♂, MNA); GCNP/S. [**South Bass Tr [Trail] in Supai Fmn. [Formation]**]/8.vii.2009; 1500 m/L.E. Stevens (1 ♀, MNA); GCNP/**Colo. R. Mi 108R/Shinumo Cr. Mouth**/21.ix.2009; 665 m/L.E. Stevens (1 ♀, MNA); GCNP/**Colo. R. M. 108 L**/12.vii.2007; 670 m/L.E. Stevens (1 ♂, MNA); **Awatubi/Canyon (RM 58.2R)** in Grand/Canyon Natl. Pk. 8.v.[19]92: M.E. Douglas, ASU (1 ♂, ASUT); GCNP/S. [**South Bass Trail, base of Tapeats (Fmn) [formation]**]/12.vii.2007; 900 m/L.E. Stevens (1 ♀, MNA); GCNP/**Shinumo Cr. 3 km fr mouth**/11.vii.2007; 810 m/L.E. Stevens (3 ♀, MNA); GCNP/S. [**South Bass Trail in Redwall Fmn**]/12.vii.2007; 1200 m/L.E. Stevens (1 ♀, MNA); same data except 13.vii.2007 (1 ♀, MNA); Mohave Co., **HualIR/Peach Spr. Wash 4 km fr. CR [from Colorado River]**/08.x.2008; 380 m/L.E. Stevens (1 ♀, MNA)." (Also a paratype from San Juan Spring, Glen Canyon National Recreation Area, Utah.)

EMENDED IN THE 2ND EDITION

Schell, Dorothydean Viets

1943 The Ochteridae (Hemiptera) of the western hemisphere. *Journal of the Kansas Entomological Society*, 16(1) (January): 29-36, (2) (April): 37-47.

265 ➔ *Ochterus barberi*, NEW SPECIES (p. 32, Pl. 1, fig. 8 [p. 35]; pp. 41-42)

Arthropoda: Insecta: Hemiptera: Ochteridae (velvety shore bugs)

Species description and figure appear in the January issue; additional descriptive data and itemization of type materials appear in the April issue.

"The holotype and allotype are deposited in the United States National Museum. The holotype, a male, was taken at **Colorado Canyon, Arizona**; the allotype at Hot Springs, Arizona. Another specimen in the National Museum bears the label, Orizaba, Mexico. Two specimens, paratypes, were received from the American Museum of Natural History, collected at **Grand Canyon, Arizona**. A series of 61 paratypes were collected at Indian Hot Springs and Castle Hot Springs, Arizona by Doctor R. H. Beamer and his collecting party in August, 1941. They are now in the Francis Huntington Snow collection." [No further itemized data regarding type material; data quoted in their entirety here in order to embrace the disparate locality and collecting data as published.]

Take note of the following:

Kment, Petr; Carapezza, Attilio; AND Jindra, Zdeněk

2020 Taxonomic catalogue of the family Ochteridae with description of *Ochterus papaceki* sp. nov. from Socotra Island and Tanzania (Hemiptera: Heteroptera). *Acta Entomologica (Musei Nationalis Pragae)*, 60(1): 23-64.

See *Ochterus barberi* Schell (p. 35), with rectification of holotype as lectotype; the species was erected in Schell's (1943) January installment, with types (from Grand Canyon)

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designated in the April installment, for which Schell's holotype from Grand Canyon is redesignated a lectotype. [The newly described species of Kment *et al.*'s paper is not pertinent to this checklist nor to the Grand Canyon generally.]

Schenk, John J.; Hodgson, Wendy; and Hufford, Larry

2010 A new species of *Mentzelia* section *Bartonia* (Loasaceae) from the Grand Canyon, Arizona. *Brittonia*, 62(1): 1-6.

266 ➔ *Mentzelia hualapaiensis*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Cornales: Loasaceae (loasa)

"Type: U.S.A. Arizona: Mohave County, Grand Canyon National Park, **along the Colorado River near the Mile 158 camp site on river right, 339451 E, 4018170 N, NAD 83, 36°, 17', 42.6" N; 112°, 47', 16.6" W**, 990 m, 19 Apr 2008, L. Makarick, D. Hall, and J. Cipra 2008-13 (holotype: DES; isotype: GCNP)."

2013 *Mentzelia canyonensis* (Loasaceae), a new species endemic to the Grand Canyon, Arizona, U.S.A. *Brittonia*, 65(4) (December): 408-416.

267 ➔ *Mentzelia canyonensis*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Cornales: Loasaceae (loasa)

"Type: U.S.A. Arizona. Coconino Co.: Grand Canyon National Park, **Manzanita Canyon, within ¼ mile of Bright Angel Creek and North Kaibab Trail, UTM 12S 4005015 N, 407532 E**, 4830 ft, 27 Sep. 2010, W. Hodgson 25718 (holotype: DES; isotypes: GCNP, NY, WS)."

Scudder, Samuel Hubbard

1878 Notice of the butterflies collected by Dr. Edward Palmer in the arid regions of southern Utah and northern Arizona during the summer of 1877. *U.S. Geological and Geographical Survey of the Territories, Bulletin*, 4: 253-258.

268 ➔ *Neominois dionysus*, NEW SPECIES (p. 254); not illustrated

Arthropoda: Insecta: Lepidoptera: Nymphalidae (admirals)

Syntype material comprises eight males and five females from "Juniper Mountains [extralimital to this checklist] June 4; **Mount Trumbull**, June 7-10".

269 *Synchlœ thoosa*, NEW SPECIES (p. 257); not illustrated

Arthropoda: Insecta: Lepidoptera: Pieridae (orange-tips)

"A single female [holotype] was taken at **Mokiak Pass**, April 28-30 or June 2."

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1897 Revision of the orthopteran group Melanopli (Acridiidae), with special reference to North American forms. *Proceedings of the U.S. National Museum*, 20: 1-421, plates 1-26. [Family Acrididae spelled Acridiidae in title.]

270 ➔ *Melanoplus canonicus*, NEW SPECIES (pp. 300-301, Pl. 20, fig. 1)

Arthropoda: Insecta: Orthoptera: Acrididae (short-horned grasshoppers)

"One male, 1 female. **Grand Canyon of the Colorado**, Arizona, July 10 (L. Bruner)."

Shaw, F. R.

1951 Some new Mycetophilidae from the western United States. *Bulletin of the Brooklyn Entomological Society*, 46(3) (June): 65-70.

271 ➔ *Mycetophila denningi*, NEW SPECIES (p. 67, Pl. 3, fig. 4)

Arthropoda: Insecta: Diptera: Mycetophilidae (fungus gnats)

"Described from one male [holotype] collected by D. G. Denning at **Grand Canyon, Arizona** on June 18, 1949."

Shear, William A.; Taylor, Steven J.; Wynne, J. Judson; and Krejca, Jean K.

2009 Cave millipeds of the United States. VIII. New genera and species of polydesmidan millipeds from caves in the southwestern United States (Diplopoda, Polydesmida, Macrosterodesmidae). *Zootaxa*, (2151): 47-65.

Pratherodesmus Shear, NEW GENUS (p. 50)

272 *Pratherodesmus voylesi* Shear, NEW SPECIES (pp. 51-54, figs. 2, 6, 9, 11-14, 19 [p. 56], 33 [p. 61])

Arthropoda: Diplopoda: Polydesmida: Macrosterodesmidae (presumed troglobitic polydesmidan millipeds)

"Types: Male holotype, five male and seven female paratypes from **Millipede Cave**, Mojave [sic] Co., Arizona, collected 16 February 2003 by K. Voyles, J. Jasper, M. Porter and K. Dittmar de la Cruz, deposited in FMNH. Four male and sixteen female paratypes from **October Gyp Cave**, collected 27 March 2004 by same collectors. All specimens deposited in FMNH and CPMAB."

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Sinclair, B. J.

2006 A new species of *Wiedemannia* Zetterstedt from Grand Canyon National Park, with notes on additional Nearctic species (Diptera: Empididae). *Journal of the Entomological Society of Ontario*, 137: 25-30.

273 ➔ *Wiedemannia digna*, NEW SPECIES (pp. 27-29, fig. 1)

Arthropoda: Insecta: Diptera: Empididae (balloon flies)

"Type Material. Holotype male labelled: 'USA:AZ:Grand Canyon NP/ **Vasey's Paradise**/ 10.v.1998/ J.F. MacDonald' (USNM). Paratype: Same data as holotype, ♂, USNM."

Small, John Kunkel

1906 Studies in North American Polygonaceae—II. *Bulletin of the Torrey Botanical Club*, 33(1) (January): 51-57.

274 *Eriogonum fusiforme*, NEW SPECIES (p. 56); not illustrated

Trachyophyta: Magnoliopsida: Caryophyllales: Polygonaceae (knotweeds)

(Type [holotype] from Grand Junction, Colorado.) Paratype material includes "ARIZONA: **Peach Springs**, June 28, 1887, *Tracy & Evans 315*."

Smiley, Robert L., and Moser, John C.

1974 New tarsonemids associated with bark beetles (Acarina: Tarsonemidae). *Annals of the Entomological Society of America*, 67(4) (July): 639-665.

275 ➔ *Heterotarsonemus nakaharai*, NEW SPECIES (pp. 645-647, figs. 24, 25)

Arthropoda: Euchelicerata: Trombidiformes: Tarsonemidae (tarsonemid mites)

"*Holotype*.—Female, Canadian National Collection no. 13177, collected from *Ips knausi* Swaine in *Pinus ponderosa* Douglas at **Grand Canyon, Arizona**. The collector and date collected are unknown."

Stacey, J. W.

1937 Notes on *Carex*—VIII. *Leaflets of Western Botany*, 2(1) (January): 13-16.

276 ➔ *Carex curatorium* [*sic*], NEW SPECIES (pp. 13-14); not illustrated. ***Carex curatorium***.

[The species was named for the collectors, Alice Eastwood, curator, and J. T. Howell, assistant curator (Department of Botany, California Academy of Sciences); accordingly noticed thereafter in literature with the Latin suffix of the specific epithet grammatically corrected, as *Carex curatorum* Stacey.]

Trachyophyta: Magnoliopsida: Poales: Cyperaceae (sedges)

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"Types: staminate plant, Herb. Calif. Acad. Sci., No. 204973, *Eastwood and Howell No. 1101*; pistillate plant, Herb. Calif. Acad. Sci., No. 204974, *Eastwood and Howell No. 1100*, collected June 23, 1933, on **Kaibab Trail to Roaring Springs [North Kaibab Trail]**, Grand Canyon National Park, Arizona. Two other collections made with the type of the pistillate plant bear the numbers 1045 and 1089. Duplicates of some of these collections were distributed as *C. pseudoscirpoidea* Rydb., an early determination reported in the literature (Leaflet West. Bot. 1: 142, 1934)."

Stahnke, Herbert L.

1940 The scorpions of Arizona. *Iowa State College Journal of Science*, 15 (October): 101-103.

277 *Vaejovis* [sic] *aquilonalis*, NEW SPECIES (p. 101); not illustrated. *Vaejovis aquilonalis*.

Arthropoda: Euchelicerata: Scorpiones: Vaejovidae (vaejovid scorpions)

"The specimen, a male, was taken 37 miles south of the Grand Canyon on highway 64." [see note below].

The type locality is probably a typographical error, as clarified by W. David Sissom and Oscar F. Francke (1981), Scorpions of the genus *Paruroctonus* from New Mexico and Texas (Scorpiones, Vaejovidae), *Journal of Arachnology*, 9(1) (Winter): 93-108, under their discussion of *Paruroctonus aquilonalis* (Stahnke), p. 94: "Type data.—Holotype male from **30 miles south of the Grand Canyon, Arizona**, 8 August 1938 (Kay Anderson). Deposited in the collection of H. L. Stahnke; examined. [. . .] The discrepancy in the type locality data seems to be a typographical error, for the label with the holotype clearly reads '30 mi. South.'" [Note: There is no indication that the label with the specimen is a field label; if written for the collection drawer, it could itself be in error, obfuscating everything. —E.E.S.]

Stallings, Don B., and Turner, J. R.

1957 Four new species of *Megathymus* (Lepidoptera, Rhopalocera, Megathymidae). *Entomological News* (Academy of Natural Sciences of Philadelphia, Entomological Section), 68(1) (January): 1-16.

278 *Megathymus alliae*, NEW SPECIES (pp. 1-5, Pl. 1)

Arthropoda: Insecta: Lepidoptera: Hesperidae (skippers)

"Described from 62 specimens (35 males and 27 females) collected **15 miles west of Cameron, Ariz., along the canyon of the Little Colorado River**, elevation 5000 ft. All ex-larvae or ex-pupae emerging from Aug. 25 to Oct. 5, during 1953, 1954 and 1955. Collected by Dr. and Mrs. R. C. Turner, Dee, Jack, Don, and Viola Stallings." [Quite probably the type locality is at or near the Little Colorado River Gorge Overlook, along Arizona Route 64.]

"*Holotype*, female, Sept. 23, 1955, 15 miles west of Cameron, ARIZONA, el. 5000 ft. (Turner); *allotype*, male, Sept. 17, 1954, 15 miles west of Cameron, Ariz., el. 5000 ft. (Turner) are in the collection of the authors. *Paratypes* of both sexes will be placed in the following collections: H. A. Freeman, C. L. Remington, U. S. Nat. Museum, American Mus. of Nat. History, Los Angeles County Museum."

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Standley, Paul C.

1909 The Allioniaceae of the United States with notes on Mexican species. *Contributions from the U.S. National Herbarium*, 12(Part 8): 303-389, plates. (As part of the *Bulletin of the U.S. National Museum*.)

279 ➔ *Allionia pachyphylla*, NEW SPECIES (p. 346); not illustrated

Trachyophyta: Magnoliopsida: Caryophyllales: Nyctaginaceae (four o'clocks)

"Type [holotype] U. S. National Herbarium no. 211717, collected in Arizona at the **Grand Canyon**, 1892, *Toumey* 485 [see note following]; cotype [isotype] in the herbarium of the University of Arizona. *Other specimens seen* [paratypes]: Arizona: **Red Canyon Trail [Hance Trail]**, Grand Canyon, 1901, *Ward*; **Grand Canyon**, 1892, *Wooton*; Camp Verde, 1891, *MacDougal*."

[*Toumey* 485 is very likely from the Old Hance Trail, which locality he visited in 1892; see notes accompanying Coville (1894) in the present volume. Similarly, the *Wooton* gathering is likely from the same locale, inasmuch as *Wooton* accompanied *Toumey* and company on the trip to the Grand Canyon. For a general (non-scientific) account of the expedition, see C. H. Tyler Townsend (1893), A wagon-trip to the Grand Cañon of the Colorado River, *Appalachia*, 7(1) (February): 48-63. Note that the *Ward* gathering in 1901 is from the newer Hance Trail, which replaced the Old Hance Trail that was destroyed by landslides in 1895.]

Stearns, Robert E. C.

1890 Scientific results of explorations by the U.S. Fish Commissions [*sic*] steamer Albatross. No. XVII.—Descriptions of new west American land, fresh-water, and marine shells, with notes and comments. *Proceedings of the U.S. National Museum*, 13: 205-225.

280 ➔ *Helix (Arionta) coloradoensis*, NEW SPECIES (p. 206, Pl. XV, figs. 6, 8, 12 [not 6-8; see note below], legend p. 225)

Mollusca: Gastropoda: Stylommatophora: Helminthoglyptidae (shoulderbands)

"**Grand Cañon of the Colorado**, opposite the Kaibab plateau, at an elevation of 3,500 feet. (Mus. No. 104100.)"

[The collection was made during the 1889 biological survey of C. Hart Merriam, thus the locality is the Old Hance Trail; also note that the elevation indicates the collection was made along the trail inside the canyon. See remarks with C. Hart Merriam in the present volume. The species was later reassigned to the helminthoglyptid genus *Sonorella*.]

[Figures 7 and 12 of Pl. XV were transposed (*vide* H. A. Pilsbry, 1893, *Manual of conchology : structural and systematic. Second series: Pulmonata. Vol. VIII, Part 4, Helicidæ, Vol. VI*. Philadelphia: Academy of Natural Sciences of Philadelphia, Conchological Section, p. 226).]

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Stickel, William H.

1938 The snakes of the genus *Sonora* in the United States and Lower California. *Copeia*, 1938: 182-190.

281 ➔ *Sonora semiannulata gloydi*, NEW SUBSPECIES (pp. 186-187); not illustrated

Chordata: Reptilia: Squamata: Colubridae (typical snakes)

"Type [holotype].—MZUM 83754, collected by Mr. William Holzmark in 1936 on the **Bright Angel Trail, Lower Sonoran level** of the Grand Canyon, Grand Canyon National Park, Arizona. Paratypes.—Grand Canyon National Park, Arizona: Grand Canyon National Park collection 107, **vicinity of Indian Gardens** [Havasupai Gardens]; UCLA 32, **mouth of Garden Creek**; MVZ 1758, **Bright Angel Trail**."

Stutz, Howard C.; Chu, Ge-Lin; and Sanderson, Stewart C.

1994 *Atriplex asterocarpa* (Chenopodiaceae), a new species from southern Utah and northern Arizona. *Madroño*, 41(3): 199-204.

282 ➔ *Atriplex asterocarpa*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Caryophyllales: Amaranthaceae (pigweed)

(Holotype from Garfield Co., Utah.) Paratypes include: "Arizona, Coconino Co., **vic. Vermilion Lodge [Vermilion Cliffs]**, steep rocky south slope, 4200 ft elevation, 18 Apr 1978, R. K. Gierish 4194 (ASC); **Lee's Ferry**, south-facing slope, Chinle Formation, 23 May 1993, H. C. Stutz 95792 (BRY)."

Suksdorf, Wilhelm

1931 Untersuchungen in der Gattung *Amsinckia*. *Werdenda* (Beiträge zur Pflanzenkunde) (Bingen, Washington), 1(5/8) (December 31): 47-113. [In German.]

Trachyophyta: Magnoliopsida: Boraginales: Boraginaceae (borage)

283 ➔ *Amsinckia nana*, NEW SPECIES (pp. 84-85); not illustrated

Based on a single specimen (holotype): "Ariz.; **Hermit Creek**, Grand Canyon of the Colorado River, 10. April 1917, *Alice Eastwood*, nr. 6016 (C. A.)"

284 ➔ *Amsinckia macrosepala*, NEW SPECIES (p. 108); not illustrated

Syntypes include: "**Grand Canyon**, 1885, *Gray* (G. H.)".

[Gray descended into Grand Canyon in Peach Springs Canyon to Diamond Creek and the Colorado River.]

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Tanner, Wilmer W.

1953 A study of taxonomy and phylogeny of *Lampropeltis pyromelana* Cope. *Great Basin Naturalist*, 13(1/2) (September 12): 47-66.

285 ➔ *Lampropeltis* [sic] *pyromelana* Cope *infralabialis* [sic], NEW SUBSPECIES (pp. 56-60, Pl. 2, fig. 1). (Common name given by the author, "Utah Ringed Snake") *Lampropeltis pyromelana infralabialis*.

Chordata: Reptilia: Squamata: Colubridae (typical snakes)

(Holotype from Beaver Co., Utah.) Paratypes include: "Arizona: Coconino County, Grand Canyon Collection R3, R260-2, R291, R372, and UU 21 all **from or near Bright Angel Point**, North Rim of Grand Canyon."

[The misspelled generic and subspecific epithets are unfortunate and do not affect the taxonomy of this snake, in no way forcing a new taxon into existence with these spellings. The genus "*Lampropeltis*" is simply a typographical error and is in fact spelled correctly (*Lampropeltis*) in the title of the paper and elsewhere. The subspecies "*infralabialis*" is spelled correctly (*infralabialis*) in the key to subspecies (p. 60) and elsewhere throughout the paper.]

Theroux, Michael E.; Pinkava, D. J.; and Keil, D. J.

1977 A new species of *Flaveria* (Compositae: Flaveriinae) from Grand Canyon, Arizona. *Madroño*, 24(1): 13-17.

286 ➔ *Flaveria mcdougallii*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

"Type: United States, Arizona, Mohave Co., Grand Canyon National Park, **Cove Canyon (174.2 mi below Lee's Ferry)**, 27 Jan 1976, *M. E. Theroux 1675* (Holotype: US; isotypes: ARIZ, ASC, ASU, DES, GCNP, GH, MNA, NY, RSA, SRSC, TEX, UC). Paratypes: United States, Arizona, Coconino Co., Grand Canyon National Park, **Matkatamiba Canyon (148.8 [sic, 147.8] mi below Lee's Ferry)**, 1 Oct 1975, *M. E. Theroux 1519* (MNA); Mohave Co., Grand Canyon National Park, **Cove Canyon**, 5 Oct 1975, *M. E. Theroux 1567* (MNA)."

Thiers, Harry D.

1976 Boletes of the southwestern United States. *Mycotaxon*, 3(2) (January/March): 261-273.

[In this paper the type information is provided only within the portion written in botanical Latin. No English equivalent was published.]

287 *Boletus barrowsii* Thiers & Smith ex Thiers, NEW SPECIES (pp. 262-264); not illustrated. [Smith = Alexander H. Smith.]

Basidiomycota (club fungi): Agaricomycetes: Boletales: Boletaceae

"Holotypus (Thiers 27816) lectus prope **Jacob Lake, Kaibab National Forest**, Coconino County, Arizona, Aug. 21, 1971; in herbario San Francisco State University (SFSU) conservatus."

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

- 288 ***Suillus kaibabensis*** Thiers, NEW SPECIES (pp. 266-268); not illustrated

Basidiomycota (club fungi): Agaricomycetes: Boletales: Suillaceae

"Holotypus (Thiers 27813) lectus prope **Jacob Lake, Kaibab National Forest**, Coconino County, Arizona, Aug. 21, 1971; in herbario San Francisco State University (SFSU) conservatus."

- 289 ➔ ***Suillus occidentalis*** Thiers, NEW SPECIES (pp. 268-270); not illustrated

Basidiomycota (club fungi): Agaricomycetes: Boletales: Suillaceae

"Holotypus (Thiers 27775) lectus prope **Point Sublime**, North Rim, Grand Canyon National Park, Coconino County, Arizona, Aug. 19, 1971; in herbario San Francisco State University (SFSU) conservatus."

Tilden, J. W. [Tilden, James Wilson]

- 1955 A revision of *Tharsalea* Scud. (s. str.), with description of a new subspecies (Lepid., Lyc.).
Southern California Academy of Sciences, Bulletin, 54(Part 2): 67-77.

- *335 ➔ ***Tharsalea arota schellbachi***, NEW SUBSPECIES (pp. 72-76; holotype male illustrated Pl. 24, fig. 4 [p. 73])

Arthropoda: Insecta: Lepidoptera: Lycaenidae (gossamer-winged butterflies, etc.)

"Type locality, North Rim, Grand Canyon National Park, Arizona". [Note: The indication of the primary types collected on "Bright Angel Trail" pertains to the Old Bright Angel Trail in upper Bright Angel Canyon; further corroborated by the fact that all secondary types are from North Rim localities and thus the designation of the type locality.]

"Holotype male, **Bright Angel Trail [Old Bright Angel Trail; see note above]**, Grand Canyon, Ariz., VI.11.43 (Schellbach); allotype female, same locality, VI.22.43 (Schellbach), bearing identification label reading 'Tharsalea virginiensis (Edw.) pos. dist. sub. sp det. W. D. Field'; twenty-three designated paratypes as follows: four males, same data as holotype; two males and two females, same data as allotype; one male, **North Rim**, Grand Canyon, Ariz., VII. 18.34 (Lutz); three males, same locality, VIII 18.38 (E. L. Bell); one male and one female, same locality, VIII. 18.46 (J. S. Garth); one male, **Kaibab Trail, North Rim**, Grand Canyon, Ariz., VII. 9. 47 (Garth); six males, same locality, VII. 19.47 (Garth); one female, **River View, North Rim**, Grand Canyon, Ariz., VII. 14.52 (Christensen); one female, **Neal's Spring, North Rim**, Grand Canyon, VII.9.53 (Tilden)."

"Type material distributed as follows: Holotype male and allotype female deposited in the United States National Museum, Washington, D. C; Six males and one female in the collection of the Allan Hancock Foundation, University of Southern California, Los Angeles; one male and one female in the collection of the author; three males in the collection of the American Museum of Natural History; eight males and three females in the collection of the Naturalist's Work Shop, Grand Canyon, Ariz."

"I take pleasure in dedicating this subspecies to Mr. Louis Schellbach, Park Naturalist, Grand Canyon National Park."

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Timberlake, P. H. [Philip H.]

- 1928 Bees of the genus *Perdita* Smith in the American Museum of Natural History (Hymenoptera). *American Museum Novitates*, (321), 13 pp.
- 290** ➔ *Perdita wheeleri*, new species (pp. 5-7); not illustrated
Arthropoda: Insecta: Hymenoptera: Andrenidae (andrenid bees)
"1 ♂ (holotype) collected in May, 1905, in **Indian Gardens** [Havasupai Gardens] in the Grand Cañon, Arizona (W. M. Wheeler)."
-
- 1956 A revisional study of the bees of the genus *Perdita* F. Smith, with special reference to the fauna of the Pacific coast (Hymenoptera, Apoidea); Part II. *University of California Publications in Entomology*, 11(5): 247-350.
- 291** *Perdita opacella*, NEW SPECIES (p. 324)
Arthropoda: Insecta: Hymenoptera: Andrenidae (andrenid bees)
A single female, holotype, from Marble Canyon, **near Lee's Ferry**, Arizona (collected by G. D. Butler, June 5, 1953, on *Stanleya*).
-
- 1962 A revisional study of the bees of the genus *Perdita* F. Smith, with special reference to the fauna of the Pacific coast (Hymenoptera, Apoidea); Part V. *University of California Publications in Entomology*, 28(1), 123 pp. [including 13 plates].
Arthropoda: Insecta: Hymenoptera: Andrenidae (andrenid bees)
- 292** ➔ *Perdita inornata*, NEW SPECIES (pp. 49-50, figs. 787, 788 [p. 115], 872 [p. 122])
(Holotype, allotype, and paratypes from Inyo Co., California.) "Additional paratypes [include] ARIZONA, Coconino Co.: 4 females, 14 males, **South Rim of the Grand Canyon**, July 26, 1934 (H. E. and M. A. Evans); 1 male, **Grand Canyon**, July 28, 1949 (W. H. Lange)." "Types at present in collection of the Citrus Experiment Station, Riverside; paratypes in collections of the University of Kansas, the University of California at Berkeley and Davis, and Cornell University."
-
- 1968 A revisional study of the bees of the genus *Perdita* F. Smith, with special reference to the fauna of the Pacific coast (Hymenoptera, Apoidea); Part VII (including index to Parts I to VII). *University of California Publications in Entomology*, (49), 196 pp.
- 293** *Perdita depressa*, NEW SPECIES (pp. 48-50, plate figs. 1217, 1218 [p. 167], 1312 [p. 175])
Arthropoda: Insecta: Hymenoptera: Andrenidae (andrenid bees)
(Holotype and allotype from Monument Valley, Utah.) Paratypes include: "1 female, **Supai, 3,500 feet, Havasu Canyon**, Grand Canyon National Park, Coconino Co., Arizona, Aug. 2, 1934 (F. C.

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Lutz).” “Types in collection of the University of California, the female paratype in collection of the American Museum of Natural History.”

Townsend, C. H. Tyler [Charles Haskins Tyler]

1915 New western and southwestern Muscoidea. *Journal of the New York Entomological Society*, 23(4) (December): 216-234. [Item signed “Charles H. T. Townsend”.]

Microsciasma NEW GENUS (p. 234)

294 ➔ **Microsciasma minuta**, NEW SPECIES (p. 234); not illustrated

Arthropoda: Insecta: Diptera: Tachinidae (tachinid flies)

“One male, Grand Canyon, Arizona, near Colorado River on **Hance Trail [Old Hance Trail]**, about 3,500 ft., July 10, 1892 (Townsend).” “Holotype, No. 19579 U. S. N. M.”

[Regarding the 1892 expedition see a general (non-scientific) account by Townsend (1893), A wagon-trip to the Grand Cañon of the Colorado River, *Appalachia*, 7(1) (February): 48-63.]

Triplehorn, Charles A.

1975 A subgenus of *Eleodes* with three new cave-inhabiting species (Coleoptera: Tenebrionidae). *The Coleopterists Bulletin*, 29(1): 39-43.

Caverneleodes, NEW SUBGENUS (p. 39)

295 ➔ **Eleodes (Caverneleodes) leptoscelis**, NEW SPECIES (pp. 42-43); not illustrated

Arthropoda: Insecta: Coleoptera: Staphylinidae (rove beetles)

“Types: holotype (female) and 2 paratypes: Arizona: Coconino County, **Cave of Domes [Cave of the Domes, Horseshoe Mesa]**, 16-X-1953; 1 paratype, same data except 14-X-1954; 2 paratypes, Coconino County, **Cave 68-Olje [Tse’an Olje, Cremation Canyon]**, 14-X-1954; 1 paratype, Coconino County, **Tse-an-cho [Tse’an Cho, Horseshoe Mesa]**, 7-XI-1953. Holotype (USNM #73090) and paratypes in United States National Museum; paratypes in The Ohio State University Collection of Insects and Spiders. The following information on cave locations was supplied by Paul S. Bartholomew in 1957: Cave of Domes and Tse-an-Cho are both caves on Horseshoe Mesa, about 12 miles east of South Village, which is on the south rim of the Grand Canyon; Cave 68-Olje (also called Tse-an-Olje) is a cave east of South Village [Grand Canyon village]; the 3 caves are at approximately 4500 feet elevation (T. J. Spilman, in litt.).”

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Triplehorn, Charles A., and Brown, Kirby W.

1971 A synopsis of the species of *Asidina* in the United States with description of a new species from Arizona (Coleoptera: Tenebrionidae). *The Coleopterists Bulletin*, 25(3): 73-86.

296 ➔ *Asidina rugicollis*, NEW SPECIES (pp. 76-77, figs. 1, 7)

Arthropoda: Insecta: Coleoptera: Tenebrionidae (darkling beetles)

"Holotype, male . . . Allotype, female . . . U. S. A., ARIZONA, COCONINO Co., **Grand Canyon National Park, South Rim**, 19-VII-68, W. E., C. A., and B. W. Triplehorn [Ohio State University Collection of Insects and Spiders]. Paratypes [include]: 33 specimens, all from ARIZONA: Coconino Co.: same data as holotype, 3 males, 2 females [OSUC]; 3 males, 3 females [KWBC]; 1 male, 1 female [USNM]; **Grand Canyon**, 26-27-VII-26, E. C. Van Dyke, 3 males, 5 females, [CASC]; 1 male, 1 female [ASUT]; 1 male, 1 female [BMNH]; 1 male, 1 female [MHNP] . . . **northwest slope of Kaibab Plateau**, 3-IX-26, 6700', R. & H., 1 female [ANSP]" [Square brackets are part of the quotation.]

Troubridge, J. T., and Crabo, L. G.

2002 A review of the Nearctic species of *Hadena* Schrank, 1802 (Lepidoptera: Noctuidae) with descriptions of six new species. *Fabrerries* (Association des Entomologistes Amateurs du Québec), 27(2) (December): 109-154 ("Section en français", pp. 135-145). [Article is principally in English, with an abbreviated section (not an abstract) in French.]

297 *Hadena (Hadena) lafontainei*, NEW SPECIES (pp. 114-117, figs. 3 [p. 146], 17 [p. 148], 33 [p. 153])

Arthropoda: Insecta: Lepidoptera: Noctuidae (owlet moths)

(Holotype from Albany Co., Wyoming.) Paratype material of 85 specimens includes "2 ♀♀, **Kaibab Plateau, nr. Jacob Lk.**, 8,300 ft [2,550 m], 18.VII.1980, D.C. Ferguson" (square brackets are part of quotation). ["nr. Jacob Lk." = near Jacob Lake.]

Tuthill, L. D.

1939 New species of Psyllidae from the western United States. *Iowa State College Journal of Science*, 13(2) (January): 181-186.

298 ➔ *Trioza rubra*, NEW SPECIES (pp. 185-186); not illustrated

Arthropoda: Insecta: Hemiptera: Psyllidae (jumping plantlice)

(Holotype female, allotype male, and nine paratypes from Creede, Colorado.) Additional paratypes include: "one male, **Grand Canyon, Arizona**, Aug. 11, 1927, R. H. Beamer". Holotype and allotype in author's collection; paratypes in author's collection and in Snow Collection, University of Kansas, and U.S. National Museum (not specified).

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Usinger, Robert L.

1931 A new species of *Platylygus* (Miridae, Hemiptera). *Pan-Pacific Entomologist*, 7(3) (January): 129-130.

299 ➔ *Platylygus vanduzeei*, NEW SPECIES; text-fig.

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

"*Holotype*, male. No. 2997, Mus. Calif. Acad. Sciences, collected by C. D. Duncan, June 17, 1921, at the **Grand Canyon, Arizona**, and *allotype*, female. No. 2998, Mus. Calif. Acad. Sciences, collected by the author in **Grand Canyon National Park, Arizona, South Rim**, June 29, 1930." (Also 12 paratype females from Mesa Verde National Park, Colorado.)

Van Duzee, M. C.

1927 North American species of *Polymedon*. (Diptera Dolichopodidae). *Annals of the Entomological Society of America*, 20(1) (March): 123-126.

Arthropoda: Insecta: Diptera: Dolichopodidae (longlegged flies)

300 ➔ *Polymedon dilaticosta*, NEW SPECIES (pp. 124-125); not illustrated

"Described from nine males and three females, taken on the **Bright Angel Trail**, Grand Canon, Arizona, and one female taken in Oak Creek Canon, Arizona, August, at an elevation of 6,000 feet; the last one was taken by F. H. Snow. Type and allotype in the Canadian National Collection." [Distinguishing data for primary types not indicated, thus all specimens are originally syntypes.]

301 ➔ *Polymedon nitidus*, NEW SPECIES (p. 125); not illustrated

"Described from one female [holotype], taken on the **Bright Angel Trail**, Grand Canon, Arizona. Type in the Canadian National Collection."

Wang, Daqing, and Holsinger, John R.

2001 Systematics of the subterranean amphipod genus *Stygobromus* (Crangonyctidae) in western North America, with emphasis on species of the *hubbsi* group. *Amphipacifica* (Journal of Aquatic Systematic Biology), 3(2) (November 15): 39-147.

302 ➔ *Stygobromus blinni*, new species (pp. 74-76, fig. 21)

Arthropoda: Malacostraca: Amphipoda: Crangonyctidae (crangonyctid amphipods)

Female holotype and two female paratypes from "**Roaring Springs Cave**, on the north rim of the Grand Canyon near Bright Angel Trail and Bright Angel Creek" [*sic*] (p. 74), "about 1.6 km inside the cave" (p. 76); collected by Dean Blinn, 28 September 1994.]

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Watson, Sereno

- 1873 New plants of northern Arizona and the region adjacent. *American Naturalist*, 7(5) (May): 299-303. [Also published as offprint, with header, "Contributions to American Botany. I.", "Printed at the Salem Press. May, 1873.", 7 pp.]

"In the botanical collections made in 1871-'72, mainly in the southern portion of the Great Basin, in northwestern Arizona and the adjacent desert section of California, by Mr. Ferd. Bischoff and others, under the direction of Lieut. G. M. Wheeler, Corps of Engineers, in the course of his exploration of that region, several new species have been found which are here described, by consent, in anticipation of the fuller report now in preparation. With these are given some others occurring in a small collection made by Mrs. Ellen P. Thompson near Kanab, Southern Utah, during the last summer while accompanying her brother, Maj. [John Wesley] Powell, in his survey of the Colorado." [Below are listed only those specimens gathered by Thompson in "**Northern Arizona**", inasmuch as these were clearly obtained while on relatively short journeys into the **Arizona Strip** from her base in Kanab, Utah.]

- 303** *Dalea amoena*, NEW SPECIES (p. 300); not illustrated

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

"**Northern Arizona** (Mrs. E. P. Thompson). In damp places; April."

- 304** *Oenothera (Chylisma) multijuga*, NEW SPECIES (p. 300); not illustrated

Trachyophyta: Magnoliopsida: Myrtales: Onagraceae (evening primroses)

"**Northern Arizona** (Mrs. E. P. Thompson). In dry places; March."

- 305** *Cymopterus purpureus*, NEW SPECIES (pp. 300-301); not illustrated

Trachyophyta: Magnoliopsida: Brassicales: Apiaceae (parsleys)

"**Northern Arizona** (Mrs. E. P. Thompson). In damp, shaded soil; March."

- 306** *Peucedanum newberryi*, NEW SPECIES (p. 301); not illustrated

Trachyophyta: Magnoliopsida: Brassicales: Apiaceae (parsleys)

"**Northern Arizona**, on stony soil (Mrs. E. P. Thompson). April."

- 307** *Brickellia (Clavigera) longifolia*, NEW SPECIES (p. 301); not illustrated

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

"**Northern Arizona** (Mrs. E. P. Thompson). In a damp cañon; April."

- 308** *Calochortus flexuosus*, NEW SPECIES (p. 303); not illustrated

Trachyophyta: Magnoliopsida: Liliales: Liliaceae (lilies)

"Southern Utah and **Northern Arizona** (Mrs. E. P. Thompson); April and May. The bulbs, as of other species, are eaten by the Indians."

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309 *Androstephium breviflorum*, NEW SPECIES (p. 303); not illustrated

Trachyophyta: Magnoliopsida: Asparagales: Asparagaceae (agaves)

"Southern Utah and **Northern Arizona** (Mrs. E. P. Thompson); April and May. Bulbs also eaten."

1888 Contributions to American botany. *Proceedings of the American Academy of Arts and Sciences*, 23(2): 249-287.

310 *Lesquerella arizonica*, NEW SPECIES (p. 254); not illustrated

Trachyophyta: Magnoliopsida: Brassicales: Brassicaceae [Cruciferae] (mustards)

Syntypic material includes "Arizona . . . at **Peach Springs** (4177 *Lemmon*, 64 *Jones*), and at **Mokiak Pass** (43 *Palmer*, 1877)."

[J. G. Lemmon, with his wife, spent a month in the Peach Springs area in May 1884. For a general (non-scientific) account of their visit, see J. G. Lemmon, 1888, Grand Cañon of the Colorado, *Overland Monthly*, new series, 12(69) (September): 244-256.]

Welsh, Stanley L., and Atwood, N. Duane

2001 New taxa and nomenclatural proposals in miscellaneous families—Utah and Arizona. *Rhodora* (Journal of the New England Botanical Club), 103: 71-95.

311 *Astragalus lentiginosus* Douglas ex Hook. var. *trumbullensis*, NEW VARIETY (pp. 81-82, fig. 3 [p. 83])

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

[Localities are within the present boundaries of Grand Canyon-Parashant National Monument.]

"Type: U.S.A. Arizona: Mohave Co., Mohave Strip, **Andrus Canyon, 3 mi. W of Andrus Pt., T32N R10W S6, wash bottom** with *Mortonia*, *Purshia*, *Ephedra*, *Agave*, etc., 26 Apr 1999, *N. D. Atwood & B. Furniss 24293* (HOLOTYPE: BRY; six isotypes to be distributed)."

"Additional specimens (paratypes; all BRY!): Arizona: Mohave Co., **Parashant (Trail) Canyon, 11 mi. S of Mt. Trumbull Village**, 26 Apr 1974, *Atwood 6029, 6029a*; ditto, **Whitmore Canyon, 1.25 km (7.8 mi.) [sic] S of Mount Trumbull (abandoned town), T34N R9W S29**, 25 May 1979, *Holmgren & Barneby 9172*; **Daneill Canyon W of Andrus Canyon, 3 mi. W of Andrus Pt., T32N R11W S12**, 26 Apr 1999, *Atwood & Furniss 24300*; ditto, **Andrus Canyon, 1 mi. W of Andrus Pt., T32N R10W S10**, 26 Apr 1999, *Atwood & Furniss 24302*; ditto, **Whitmore Canyon, T32N R9W S1**, 27 May 1999, *Higgins 20226*; ditto, **2 mi. S of Mt. Trumbull school house, near Griffith Knoll, T34S R10W S1-2**, 27 May 1999, *Higgins 20277*."

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Welsh, Stanley L., and Licher, Max

2010 *Pediomelum* Rydberg (Leguminosae) in Arizona and two previously undescribed species. *Western North American Naturalist*, 70(1): 9-18.

312 *Pediomelum pauperitense* S.L. Welsh, M. Licher, & N. D. Atwood, NEW SPECIES (pp. 14-15, fig. 3). (Common name given by the author, "Poverty Mountain Breadroot")

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

"Type.—USA, Arizona, Mohave Co., **T35N, R12W, Sec. 35/36, SW of Poverty Mountain, near Dewdrop Spring**; 1756 m, in gravelly lime- stone soil in pinyon-juniper community, *L.C. Higgins 23135*, 25 May 2001, holotype BRY, isotypes distributed previously as *P. mephiticum*."

"Paratypes.—Arizona, Mohave Co., **T34N, R11W, Sec 4, SE of Poverty Mountain, Arizona Strip, SW of Mt. Trumbull**, 5500 ft, *Atwood & Franklin 18901*, 16 May 1993, BRY! — . . . — **BLM Road, S of Poverty Mountain and SW of Salt Spring, T34N, R11W** [*sic*], 5000-5500 ft, *Salywon et al. 1107*, 21 May 2001, BRY!"

[The abstract of this paper erroneously indicates *P. pauperitense* is from Coconino County, Arizona.]

Welsh, Stanley L., and Thorne, K. H.

1977 Plants of Arizona: a new species of *Astragalus* from the Kaibab Plateau. *Great Basin Naturalist*, 37(1): 103-104.

313 *Astragalus pinionis*, NEW SPECIES; illustrated

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

"Holotype: Arizona, Coconino County, **17 miles southeast of Fredonia Sawmill, along logging road to Ryan**, pinyon-juniper-cowania-big sagebrush community, N. D. Atwood 6794, 15 June 1976 (BRY, isotypes to be distributed)."

Wheeler, William Morton

1899 New species of Dolichopodidæ from the United States. *Proceedings of the California Academy of Sciences*, Series 3, Zoology, 2(1), 85 pp. [including 4 plates].

314 ➔ *Polymedon castus*, NEW SPECIES, pp. 6-8, Pl. 1, fig. 8.

Arthropoda: Insecta: Diptera: Dolichopodidae (longlegged flies)

"One specimen labelled '**Grand Cañon, Arizona**,' from the collections of the University of Kansas." Specimen (holotype) is a female.

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- 1906 The ants of the Grand Cañon. *Bulletin of the American Museum of Natural History*, 22: 329-345.

Arthropoda: Insecta: Hymenoptera: Formicidae (ants)

Pheidole desertorum, NEW SPECIES (pp. 337-339). [Type material from Fort Davis, Texas.]

- 315 ➔ ***Pheidole desertorum var. maricopa***, NEW VARIETY (pp. 339-340); not illustrated

"Described from several soldiers and workers taken from a single colony under a stone in the **Grand Cañon just above the Indian Garden** [Havasupai Gardens] (3876 feet.)" [Syntypes?]

- 316 ➔ ***Formica moki***, NEW SPECIES (pp. 343-344); not illustrated

"Described from 25 workers taken from a small colony under a stone on the **wall of the Grand Cañon at an altitude of about 5500 feet** and 2 workers taken **on the rim in the Kohonino [sic] Forest (7000 feet) about three miles west of the Bright Angel Hotel.**" [The "wall of the Grand Cañon" locale is in all probability on Bright Angel Trail.] [Syntypes?]

(Note: Wheeler, 1913, p. 343 [see citation below], placed the species *Formica moki* in ***Neoformica***, NEW SUBGENUS [pp. 400-401].)

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- 1913 A revision of the ants of the genus *Formica* (Linné) Mayr. *Bulletin of the Museum of Comparative Zoology*, 53(10): 379-565.

- 317 ➔ ***Formica fusca fusca var. gelida***, NEW VARIETY (pp. 505-507); not illustrated. [Not valid as a quadrinomial taxon.]

Arthropoda: Insecta: Hymenoptera: Formicidae (ants)

("Type locality.—[State of] Colorado: Ward, 9,000 ft. (T. D. A. Cockerell).") Other material (= paratypes) from numerous, widespread continental localities, including: "**Arizona: Coconino Forest, Grand Canyon, 7,000 ft.** (Wheeler)."

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- 1914 New and little known harvesting ants of the genus *Pogonomyrmex*. *Psyche*, (October): 149-157.

- 318 ➔ ***Pogonomyrmex californicus* Buckley subsp. maricopa**, NEW SUBSPECIES (pp. 155-156); not illustrated

Arthropoda: Insecta: Hymenoptera: Formicidae (ants)

[Based on syntypes although with the indication, "New Mexico: Alamogordo, type locality (G. von Krockow)", without further correlation to specimens.] Other material noted from New Mexico, Arizona, California, Texas, and Mexico, including from Arizona "**Grand Canyon** (Wheeler)".

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1915 Some additions to the North American ant-fauna. *Bulletin of the American Museum of Natural History*, 34: 389-421.

319 ➔ *Camponotus acutirostris* Wheeler *clarigaster*, NEW VARIETY (p. 420); not illustrated

Arthropoda: Insecta: Hymenoptera: Formicidae (ants)

"A single specimen [holotype] taken at an **altitude of about 3000 ft. on the Bright Angel Trail** in the Grand Cañon, Arizona."

Wickham, Henry Frederick

1899 The habits of American Cicindelidae. *Proceedings of the Davenport Academy of Natural Sciences*, 7: 206-228.

320 ➔ *Cicindela rufiventris* var. *arizonae*, NEW VARIETY (pp. 226-227); not illustrated

Arthropoda: Insecta: Coleoptera: Carabidae (ground beetles)

[Syntypes:] "Mr. Roland Hayward sent me specimens labelled '**Grand Cañon of the Colorado**' and I have since received the same thing collected by Professor Townsend, who writes [underscored for emphasis in this checklist]: 'I collected the species in the Grand Cañon during the first two weeks of July, 1892. It occurred on sandy places or along paths by a stream going down a side cañon, from 2500 feet above, down to the level of the Colorado River. Or from 5000 feet above sea (at Hance's stone cabin, 2500 feet below the rim and about two or two and a half miles down the trail from river) quite to the bottom of the cañon, which is here 2500 feet above the sea. The insect is not especially wary.'"

[Regarding the 1892 expedition see a general (non-scientific) account by Townsend (1893), A wagon-trip to the Grand Cañon of the Colorado River, *Appalachia*, 7(1) (February): 48-63. The locality was on the Old Hance Trail, the upper portion of which was destroyed in 1895 by landslides after which John Hance re-routed his trail down Red Canyon (the present Hance Trail).]

Wilcox, J.

1965 New *Heteropogon* Loew, with a key to the species and the description of a new genus (Diptera: Asilidae). *Bulletin of the Southern California Academy of Sciences*, 64(4): 207-222.

321 ➔ *Heteropogon stonei*, NEW SPECIES (pp. 220-222); not illustrated

Arthropoda: Insecta: Diptera: Asilidae (robber flies)

(Holotype and allotype from Hualapai Mountains, Arizona.) "Paratypes: . . . one ♀, **Grand Canyon, Arizona**, 4 June 1963 (J. Wilcox)"

PUBLICATIONS AND TAXA ADDED IN THE SECOND EDITION

No. 244a in the 1st Edition was added late, thus it was the 322nd taxon in the checklist. The 2nd Edition restarts the taxon count with No. 323.

Each publication in this 2nd Edition list is also inserted in its correct alphabetical sequence in the Bibliography and Annotated Checklist. A star is prefixed to the number to indicate it is a 2nd Edition addition.

Crawford, Richard A., and Rink, Glenn

2024 A novel species of *Nama* (Namaceae) from northern Arizona, U.S.A. *Botanical Research Institute of Texas, Journal*, 18(1): 1-5.

323 *Nana arizonica, NEW SPECIES (entire paper); illustrated

Trachyophyta: Magnoliopsida: Boraginales: Boraginaceae (borage)

(Type locality Coconino County, Babbitt Ranches north of Wupatki National Monument [extralimital to this checklist].) Specimens examined [comprising botanical paratypes] include “**east rim of the Little Colorado River gorge, 17 mi W of Cameron, 1.5 mi NE of the terminus of Lee Canyon, Navajo Nation**, 21 Aug 2012, *Crawford 927*; **Little Colorado River gorge, east rim, river mile 23.5 from the confluence, Navajo Nation**, 22 Aug 2012, *Crawford 571*; **south rim of Big Canyon 15 km E of its confluence with the Little Colorado River gorge, Navajo Nation**, 16 Aug 2013, *Crawford 1085*; **Little Colorado River Gorge, northeast rim, river mile 26.8 from confluence, Navajo Nation**, 20 Sep 2013, *Crawford 1090*; **Little Colorado River gorge, Hellhole Bend, northeast rim, River mile 33.5 from the confluence, Navajo Nation**, 20 Sep 2013, *Crawford 1099* . . . **Hot Na Na Wash, Marble Canyon, Navajo Nation**, 13 Oct 2013, *Rink 12411*”

Gandoger, Michel

1906 Le genre *Eriogonum* (Polygonaceae). *Société Royale de Botanique de Belgique, Bulletin*, 42: 183-200. [Introduction in French; the remainder in botanical Latin.]

Trachyophyta: Magnoliopsida: Caryophyllales: Polygonaceae (knotweeds)

324 ➡ *Eriogonum juncinellum, NEW SUBSPECIES (p. 187); not illustrated

“*Eriogonum juncinellum* Gdgr. sp. nova, est forma peculiaris ab *E. Baileyi* [Wats.] recedens caule minus ramoso glauco pauciflora, involucris parum costatis, floribus saltem duplo longius pedicellatis. Hab. *Arizona*, ad **Grand Canon of the Colorado**, alt. 7000' (Mac Dougal n. 182).”

[Data added here: 28 June 1898 “Collected **about Grand Canon of the Colorado**” isotypes: F, GH, NY, PH]

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*325 ➔ *Eriogonum macdougallii*, NEW SPECIES (p. 191); not illustrated

"*Eriogonum microthecum* Nutt. Suffrutex admodum variabilis formis quasi innumeris induens inter quas sequentes saltem pro subspeciebus habueris: [. . .] Inflorescentia villosa-lanata. Fruticulus tortuosus basi decumbens toto foliosus, folia linearia 1 1/2 cent. longa 3 m. lata mucronata superne arancosa, cymae simplices trifurcatae pauciflorae, involucrum villosum vix costatum, bracteae ad apicem subulatae. Hab. Arizona, ad **Grand Canon of the Colorado** (Mac Dougal n. 176) *E. Macdougallii* Gdgr. n. sp."

[Data added here: 28 June 1898 "Collected **about Grand Canon of the Colorado**" isotypes: F, GH, NY, dupl. of type NY]

1908 *Eriogonum Polygonacearum* genus speciebus varietatibusque novis auctum. (Ex: Bull. Soc. Roy. Bot. Belgique, XLII [1906], pp. 183-200.) *In*: Fedde, Friedrich (ed.), *Repertorium novarum specierum regni vegetabilis. Centralblatt für Sammlung und Veröffentlichung von Einzeldiagnosen neuer Pflanzen*. Berlin-Wilmersdorf: Selbstverlag des Herausgebers (Kommissions-Verlag von Gebrüder Borntraeger, Berlin), pp. 169-179. [In botanical Latin.]

Reprinted from Gandoger (1906). Cited here in the event that a user is unable to locate the 1906 publication cited above.] [See *Eriogonum juncinellum* Gdgr. (p. 170), and *Eriogonum macdougallii* Gdgr. (pp. 172-173).]

Nelson, Aven

1934 Rocky Mountain Herbarium studies. II. *American Journal of Botany*, 21: 573-582.

*326 ➔ *Purpusia osterhoutii*, NEW SPECIES (p. 574); not illustrated

Trachyophyta: Magnoliopsida: Rosales: Rosaceae (roses)

"The type of this novelty is Mr. George E. Osterhout's no. 7103, **Bright Angel Trail**, Grand Canyon, Arizona, June 22, 1928."

Nielson, M. W.

1965 A revision of the genus *Cuerna* (Homoptera, Cicadellidae). *U.S. Department of Agriculture, Agricultural Research Service, Technical Bulletin 1318*, 48 pp.

*327 ➔ *Cuerna kaloostiani*, NEW SPECIES (pp. 24-26, fig. 12)

Arthropoda: Insecta: Hemiptera: Cicadellidae (sharpshooter)

(Male holotype and female allotype from Flagstaff, Arizona.) Paratypes include: "4 male paratypes, **Grand Canyon**, July 28, 1936, R. H. Beamer and D. R. Lindsay; 1 female paratype, **Grand Canyon National Park**, July 16, 1947, R. H. Beamer", "1 female, **Bright Angel** [probably Grand Canyon village], July 14 (no year given), Barber and Swartz; in the U.S. National Museum; 4

BIBLIOGRAPHY AND ANNOTATED CHECKLIST

females, **Grand Canyon**, August 19, 1939, E. P. Van Duzee . . . and 1 male, **Bright Angel Camp**, 6,900 feet, Wickham; in the California Academy of Sciences”.

Ownbey, Gerald B.

1958 Monograph of the genus *Argemone* for North America and the West Indies. *Torrey Botanical Club, Memoirs*, 21(1), 159 pp.

328** ➔ ***Argemone arizonica, NEW SPECIES (pp. 91-93, fig. 14)

Trachyophyta: Magnoliopsida: Ranunculales: Papaveraceae (poppies)

“Holotype: *Alice Eastwood & John T. Howell* 1003, from Grand Canyon National Park, ‘**Kaibab Trail to Roaring Springs**,’ Arizona, June 23, 1933 (CAS; isotype, POM).”

Payson, Edwin Blake

1921 A monograph of the genus *Lesquerella*. *Missouri Botanical Garden, Annals*, 8(2) (April): 103-236.

329** ***Lesquerella arizonica* Watson var. *nudicaulis, NEW VARIETY (p. 208, fig. 25)

Trachyophyta: Magnoliopsida: Brassicales: Brassicaceae [Cruciferae] (mustards)

“Specimens examined: Arizona: **Buckskin Mountains** [Kaibab Plateau], June 19, 1890, *Jones* (U. S. Nat. Herb. TYPE).” [Marcus E. Jones gathering in US designated as type (= holotype). No other specimens examined.]

Pratt, Harry Davis

1945 Taxonomic studies of Nearctic Cryptini (Ichneumonidae, Hymenoptera). *American Midland Naturalist*, 34(3) (November): 549-661.

330** ➔ ***Cryptus asymmetricus, NEW SPECIES (pp. 587-589); not illustrated

Arthropoda: Insecta: Hymenoptera: Ichneumonidae (scorpion wasp)

Paratypes examined include “**Grand Canyon**” (without further data).

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Rehn, James A. G., and Hebard, Morgan

1908 An orthopterological reconnoissance of the southwestern United States. Part I: Arizona. *Academy of Natural Sciences of Philadelphia, Proceedings*, 60: 365-402.

Arthropoda: Insecta: Orthoptera: Acrididae (short-horned grasshoppers)

*331 ➔ ***Parapomala perpallida***, NEW SPECIES (pp. 373-375, figs. 5, 6)

"Type: ♂; near **Bright Angel Trail**, elevation 3,750 feet, Grand Canyon of the Colorado, Coconino County, Arizona. September 12, 1907. Collected by M. Hebard."

*332 ➔ ***Amphitornus nanus***, NEW SPECIES (pp. 376-378, fig. 7)

"Type: ♂; **Grand Canyon of the Colorado**, Coconino County, Arizona, altitude 7,000 feet, in conifer forest. September 11, 1907. Collected by Morgan Hebard."

Roberts, Roland P.; Urbatsch, Lowell E.; and Anderson, John

2005 New species and new combinations in *Ericameria* (Asteraceae: Astereae). *Sida*, 21(3) (August 5): 1557-1564.

*333 ➔ ***Ericameria arizonica***, NEW SPECIES (pp. 1558-1560; fig. 1 [p. 1559])

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

Type from "Grand Canyon National Park, South Rim, Mather Point, eastern edge of view point E of paved walkways, north facing Kaibab Limestone cliff edges shaded by pinyon pine, 1 Oct 1998, N. Brian 98-291 (HOLOTYPE: ASC!)."

Robinson, Benjamin Lincoln, and Greenman, Jesse More

1895 Contributions from the Gray Herbarium of Harvard University, New Series, No. IX. *American Journal of Science*, Series 3, 50 [Whole Number, 150(296)] (August): 135-176.

*334 ➔ ***Laphamia toumeyi***, NEW SPECIES (p. 176); not illustrated

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

See under "Miscellaneous New Species". "Collected by Prof. J. W. Toumey, in the **Grand Cañon**, 12 July, 1892 (No. 645)."

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Tilden, J. W. [Tilden, James Wilson]

1955 A revision of *Tharsalea* Scud. (s. str.), with description of a new subspecies (Lepid., Lyc.).
Southern California Academy of Sciences, Bulletin, 54(Part 2): 67-77.

*335 ➡ *Tharsalea arota schellbachi*, NEW SUBSPECIES (pp. 72-76; holotype male illustrated Pl. 24,
fig. 4 [p. 73])

Arthropoda: Insecta: Lepidoptera: Lycaenidae (gossamer-winged butterflies, etc.)

"Type locality, North Rim, Grand Canyon National Park, Arizona". [Note: The indication of the primary types collected on "Bright Angel Trail" pertains to the Old Bright Angel Trail in upper Bright Angel Canyon; further corroborated by the fact that all secondary types are from North Rim localities and thus the designation of the type locality.]

"Holotype male, **Bright Angel Trail [Old Bright Angel Trail; see note above]**, Grand Canyon, Ariz., VI.11.43 (Schellbach); allotype female, same locality, VI.22.43 (Schellbach), bearing identification label reading 'Tharsalea virginicensis (Edw.) pos. dist. sub. sp det. W. D. Field'; twenty-three designated paratypes as follows: four males, same data as holotype; two males and two females, same data as allotype; one male, **North Rim**, Grand Canyon, Ariz., VII. 18.34 (Lutz); three males, same locality, VIII 18.38 (E. L. Bell); one male and one female, same locality, VIII. 18.46 (J. S. Garth); one male, **Kaibab Trail, North Rim**, Grand Canyon, Ariz., VII. 9. 47 (Garth); six males, same locality, VII. 19.47 (Garth); one female, **River View, North Rim**, Grand Canyon, Ariz., VII. 14.52 (Christensen); one female, **Neal's Spring, North Rim**, Grand Canyon, VII.9.53 (Tilden)."

"Type material distributed as follows: Holotype male and allotype female deposited in the United States National Museum, Washington, D. C; Six males and one female in the collection of the Allan Hancock Foundation, University of Southern California, Los Angeles; one male and one female in the collection of the author; three males in the collection of the American Museum of Natural History; eight males and three females in the collection of the Naturalist's Work Shop, Grand Canyon, Ariz."

"I take pleasure in dedicating this subspecies to Mr. Louis Schellbach, Park Naturalist, Grand Canyon National Park."

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U.S. Forest Service Agriculture Handbook
U.S. Geological and Geographical Survey of the Territories, Bulletin
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Zootaxa

TAXONOMIC LIST

This is a nomenclatural record. Taxa are *as named by the original authors*; later taxonomic reassignments, if any, are not generally noted herein.

There are 335 species-level taxa listed in this checklist. The count in the first edition included No. 244a, added late, thus it is the 322nd taxon overall. The second edition adds Nos. 323–335, the numerals for which are prefixed by a star (e.g., *323).

Higher systematics for the original genus are given here, as derived from the Integrated Taxonomic Information System (ITIS) online in 2022. Taxa not included in ITIS have had their higher systematics derived from other sources, including the National Center for Biotechnology Information Taxonomy Browser (National Library of Medicine) and the World Flora Online. The systematic placements listed here may not reflect the most current views, which are in any case bound to vary between researchers and over time. Again, this is a resource manager's historical checklist to nominate taxa, not one of systematics or revised nomenclature.

The taxonomic ranks cited in this list are: Phylum or Division: Class: Order: Family.

The taxa in this list are *not* in so-called “systematic order” because some users of the checklist will not be accustomed to the methodical order of taxa within Phyla, Classes, and so forth. To accommodate these users, who are more likely to be resource managers and historically inclined users who are not necessarily scientists, ***all higher taxa are listed strictly in alphabetical order*** (the order of Kingdoms is arranged only for convenience based on the relative number of entries). The nominate taxa within each category are listed in the order in which they appear in the checklist, arranged numerically to facilitate finding them in the bibliography/ checklist.

Common names are mostly as listed by ITIS or other sources. They should not be taken to be names regularly adopted by all users, who will understand other common names for these taxa. The names have been added here only a matter of convenience for those users, principally non-scientists, who prefer or need to refer in some way to common names.

➡ Arrow indicates taxa for which at least one locality reported for its types is within, or is with good probability from within, the present boundaries of Grand Canyon National Park. Refer to the bibliography for all details.

Red Numbers along the left margin of the Taxonomic List indicate and cross-list the sequentially enumerated taxa in the bibliography (they reflect the alphabetical order by publication author).

TAXONOMIC LIST

TOTAL NUMBERS OF NOMINATE TAXA / NO. FROM GRAND CANYON NATIONAL PARK

[In the PDF all lines below are hyperlinks to those categories in the Taxonomic List]

	<u>Total</u>	<u>GRCA</u>	<i>Page</i>
Kingdom Animalia (animals)	177	138	129
Phylum Arthropoda (arthropods)	141	107	129
Class Branchiopoda (branchiopod crustaceans)	1		129
Class Diplopoda (millipedes)	1		129
Class Euchelicerata (spiders/mites/scorpions/etc.)	14	7	129
Class Insecta (insects)	129	104	130
Class Malacostraca (malacostracan crustaceans)	1	1	138
Phylum Chordata (vertebrates)	18	14	138
Class Aves (birds)	1	1	138
Class Mammalia (mammals)	13	9	138
Class Reptilia (reptiles)	3	3	139
Class Teleostei (fishes)	1	1	140
Phylum Mollusca (mollusks)			140
Class Gastropoda (snails)	9	7	140
Phylum Nematoda (roundworms)			
Class Chromadorea (chromadorid roundworms)	4	5	141
Kingdom Plantae (plants)	119	55	142
Phylum (Division) Trachyophyta (vascular plants)			
Class Magnoliopsida (flowering plants)	118	54	142
Class Pinopsida (conifers)	1	1	147
Kingdom Fungi (fungi)	27	22	148
Phylum (Division) Ascomycota (sac fungi)	23	20	148
Phylum (Division) Basidiomycota (club fungi)	4	2	149
Kingdom Chromista (photosynthetic eukaryotes)	11	11	150
Phylum Apicomplexa (parasitic alveolates)	11	11	150
Kingdom Protista (protists)	1		150
"Phylum" Hemimastigophora (single-celled eukaryotes)	1		150

TAXONOMIC LIST

KINGDOM ANIMALIA
(animals)

Phylum ARTHROPODA
(arthropods)

Class Branchiopoda
(branchiopod crustaceans)

Arthropoda: Branchiopoda: Anostraca: Branchinectidae (brine shrimp)

48 *Branchinecta kaibabensis* Belk & Fugate, 2000

Class Diplopoda
(millipedes)

Arthropoda: Diplopoda: Polydesmida: Macrosternodesmidae (presumed troglotic polydesmidan millipeds)

272 *Pratherodesmus voylesi* Shear in Shear, Taylor, Wynne & Krejca, 2009

Class Euchelicerata
(spiders/mites/scorpions/etc.)

Arthropoda: Euchelicerata: Areneae: Hahniidae (hahniid spiders)

71 *Neoantistea coconino* Chamberlin & Ivie, 1942

Arthropoda: Euchelicerata: Areneae: Linyphiidae (dwarf weavers)

70 *Tapinocyba kesimba* Chamberlin, 1948

Arthropoda: Euchelicerata: Areneae: Lycosidae (wolf spiders)

114 ➔ *Arctosa mokiensis* Gertsch, 1934a

Arthropoda: Euchelicerata: Areneae: Salticidae (jumping spiders)

115 *Phidippus kaibabensis* Gertsch, 1934b

TAXONOMIC LIST

Arthropoda: Euchelicerata: Areneae: Sicariidae (recluse spiders)

117 ➔ *Loxosceles kaiba* Gertsch & Ennik, 1983

Arthropoda: Euchelicerata: Areneae: Theraphosidae (tarantulas)

68 ➔ *Aphonopelma behlei* Chamberlin, 1940

69 ➔ *Aphonopelma phasmus* Chamberlin, 1940

Arthropoda: Euchelicerata: Areneae: Theridiidae (cobweb weavers)

116 *Steatoda variata* Gertsch, 1960

Arthropoda: Euchelicerata: Areneae: Thomisidae (crab spiders)

113 ➔ *Misumenops coloradensis* Gertsch, 1933

Arthropoda: Euchelicerata: Pseudoscorpiones (pseudoscorpions): **Chernetidae**

153 *Hesperochnes bradybaughi* Harvey & Wynne, 2014

154 *Tuberochnes cohni* Harvey & Wynne, 2014

Arthropoda: Euchelicerata: Pseudoscorpiones (pseudoscorpions): **Larcidae**

225 ➔ *Archeolarca cavicola* Muchmore, 1981

Arthropoda: Euchelicerata: Scorpiones: Vaejovidae (vaejovid scorpions)

277 *Vaejovis aquilonalis* Stahnke, 1940

Arthropoda: Euchelicerata: Trombidiformes: Tarsonemidae (tarsonemid mites)

275 ➔ *Heterotarsonemus nakaharai* Smiley & Moser, 1974

Class Insecta (insects)

Arthropoda: Insecta: Blattodea: Polyphagidae (sand cockroaches)

166 ➔ *Arenivaga grandiscanyonensis* Hopkins, 2014

167 ➔ *Arenivaga impensa* Hopkins, 2014

168 ➔ *Arenivaga pagana* Hopkins, 2014

TAXONOMIC LIST

Arthropoda: Insecta: Coleoptera: Buprestidae (jewel beetles)

- 44 ➔ *Acmaeodera pletura* W. Barr, 1972
 - 55 ➔ *Melanophila piniedulis* Burke, 1907
 - 228 *Acmaeodera navajo* G. Nelson & Westcott, 1995
-

Arthropoda: Insecta: Coleoptera: Carabidae (ground beetles)

- 67 ➔ *Bembidion (Cyclolopha) occultum* Casey, 1918
 - 172 *Cicindela pusilla kaibabensis* Johnson, 1990
 - 181 ➔ *Nebria (Reductonebria) georgei* Kavanaugh, 2008
 - 320 ➔ *Cicindela rufiventris* var. *arizonae* Wickham, 1899
-

Arthropoda: Insecta: Coleoptera: Cerambycidae (long-horned beetles)

- 63 ➔ *Prionus spiculosus* Casey, 1912
 - 64 ➔ *Prionus angustulus* Casey, 1912
 - 65 ➔ *Prionus terminalis* Casey, 1912
 - 66 ➔ *Stenosphenus pruddeni* Casey, 1912
-

Arthropoda: Insecta: Coleoptera: Chrysomelidae (leaf beetles)

- 105 ➔ *Bruchus perplexus* Fall, 1910
 - 169 *Luperodes wickhami* Horn, 1893
 - 223 *Saxinis saucia kaibabiae* Moldenke, 1970
-

Arthropoda: Insecta: Coleoptera: Dermestidae (dermestid beetles)

- 58 ➔ *Cryptorhopalum pruddeni* Casey, 1900
 - 59 ➔ *Orphilus aequalis* Casey, 1900
-

Arthropoda: Insecta: Coleoptera: Elateridae (click beetles)

- 196 *Aphricus knowltoni* Knull, 1957
-

Arthropoda: Insecta: Coleoptera: Leiodidae (round fungus beetles)

- 232 ➔ *Ptomaphagus cocytus* Peck, 1973
 - 233 *Ptomaphagus parashant* Peck & Wynne, 2013
-

TAXONOMIC LIST

Arthropoda: Insecta: Coleoptera: Melyridae (soft-winged flower beetles)

- 56 *Trichochrous incipiens* Casey, 1895
 - 57 *Trichochrous reversus* Casey, 1895
-

Arthropoda: Insecta: Coleoptera: Staphylinidae (rove beetles)

- 295 ➔ *Eleodes (Caverneleodes) leptoscelis* Triplehorn, 1975
-

Arthropoda: Insecta: Coleoptera: Tenebrionidae (darkling beetles)

- 60 ➔ *Zopherodes lugubris* Casey, 1907
 - 61 ➔ *Zopherodes pruddeni* Casey, 1907
 - 62 ➔ *Discodemus brevipennis* Casey, 1908
 - 173 *Trogloderus skillmani* Johnston, 2019
 - 230 ➔ *Eschatomoxys pholeter* Thomas & Pape in Pape, Thomas & Aalbu, 2007
 - 296 ➔ *Asidina rugicollis* Triplehorn & Brown, 1971
-

Arthropoda: Insecta: Coleoptera: Ptinidae (spider beetles)

- 100 ➔ *Petalium bistriatum* Say var. *arizonense* Fall, 1905
 - 101 ➔ *Catorama grande* Fall, 1905
 - 102 ➔ *Catorama longulum* Fall, 1905
 - 103 ➔ *Catorama pingue* Fall, 1905
-

Arthropoda: Insecta: Coleoptera: Scarabaeidae (scarab beetles)

- 104 ➔ *Diploptaxis conformis* Fall, 1909
-

Arthropoda: Insecta: Diptera: Asilidae (robber flies)

- 53 ➔ *Erax benedicti* Bromley, 1940
 - 264 ➔ *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012
 - 321 ➔ *Heteropogon stonei* Wilcox, 1965
-

Arthropoda: Insecta: Diptera: Bombyliidae (bee flies)

- 85 ➔ *Bombylius facialis* Cresson, 1919
 - 152 ➔ *Geron prosopidis* Hall & Evenhuis, 2003
-

TAXONOMIC LIST

Arthropoda: Insecta: Diptera: Ceratopogonidae (biting midges)

- 1 ➔ *Ceratopogon dimidiatus* C. Adams, 1903
-

Arthropoda: Insecta: Diptera: Dolichopodidae (longlegged flies)

- 256 ➔ *Chrysotimus arizonicus* H. Robinson, 1967
300 ➔ *Polymedon dilaticosta* Van Duzee, 1927
301 ➔ *Polymedon nitidus* Van Duzee, 1927
314 ➔ *Polymedon castus* Wheeler, 1899
-

Arthropoda: Insecta: Diptera: Empididae (balloon flies)

- 273 ➔ *Wiedemannia digna* Sinclair, 2006
-

Arthropoda: Insecta: Diptera: Mycetophilidae (fungus gnats)

- 72 ➔ *Mycetophila neofungorum* Chandler, 1993
271 ➔ *Mycetophila denningi* Shaw, 1951
-

Arthropoda: Insecta: Diptera: Tachinidae (tachinid flies)

- 249 *Fabriciella evanida* Reinhard, 1953
294 ➔ *Microsciasma minuta* Townsend, 1915
-

Arthropoda: Insecta: Diptera: Tephritidae (fruit flies)

- 81 ➔ *Trypeta varipennis* Coquillett, 1902
-

Arthropoda: Insecta: Diptera: Tipulidae (crane flies)

- 3 ➔ *Tipula (Lunatipula) kaibabensis* C. Alexander, 1946
-

Arthropoda: Insecta: Hemiptera: Aphididae (aphids)

- 170 ➔ *Cinara grande* Hottes, 1956
171 *Cinara poketa* Hottes, 1956
-

TAXONOMIC LIST

Arthropoda: Insecta: Hemiptera: Cicadellidae (leafhoppers)

- 14 ➔ *Athysanella fredonia* Ball & Beamer, 1939
 - 15 ➔ *Athysanella globosa* Ball & Beamer, 1939
 - 16 ➔ *Athysanella (Gladionura) casa* Ball & Beamer, 1939
 - 88 ➔ *Ballana basala* DeLong, 1964
 - 212 ➔ *Norvellina bicolorata* (Ball) var. *inflata* Lindsay, 1938
 - *327 ➔ *Cuerna kaloostiani* Nielson, 1965
-

Arthropoda: Insecta: Hemiptera: Cicadidae (cicadas)

- 87 ➔ *Tibicen apache* Davis, 1921
-

Arthropoda: Insecta: Hemiptera: Cixiidae (planthoppers)

- 11 *Myndus yuccandus* E. Ball, 1933
-

Arthropoda: Insecta: Hemiptera: Caliscelidae (planthoppers)

- 54 ➔ *Aphelonema convergens* var. *canyonensia* Bunn, 1930
-

Arthropoda: Insecta: Hemiptera: Coccidae (soft scales)

- 95 ➔ *Ripersia arizonensis* Ehrhorn, 1899
 - 96 ➔ *Dactylopius formicarii* Ehrhorn 1899
-

Arthropoda: Insecta: Hemiptera: Coreidae (leaf-footed bugs)

- 216 ➔ *Chelinidea vittiger* Uhler var. *artuflava* McAtee, 1919
-

Arthropoda: Insecta: Hemiptera: Delphacidae (planthoppers)

- 47 ➔ *Delphacodes apicata* Beamer, 1948
-

Arthropoda: Insecta: Hemiptera: Diaspididae (armored scales)

- 213 ➔ *Chionaspis gilli* Liu & Kosztarab, 1987
-

Arthropoda: Insecta: Hemiptera: Dictyopharidae (planthoppers)

- 13 *Yucanda miniata* E. Ball, 1937
-

TAXONOMIC LIST

Arthropoda: Insecta: Hemiptera: Issidae (planthoppers)

- 12 *Hysteropterum cornutum* var. *utahnum* E. Ball, 1935
90 ➔ *Bruchomorpha bunni* Doering, 1939
-

Arthropoda: Insecta: Hemiptera: Miridae (jumping tree bugs)

- 184 ➔ *Deraeocoris fulvus* Knight, 1921
185 ➔ *Deraeocoris bullatus* Knight, 1921
186 ➔ *Deraeocoris navajo* Knight, 1921
187 ➔ *Ceratocapsus clavicornis* Knight, 1925
188 ➔ *Phytocoris mellarius* Knight, 1925
189 ➔ *Pilophorus fuscipennis* Knight, 1926
190 ➔ *Phytocoris hesperius* Knight, 1928
191 ➔ *Plagiognathus tenellus* Knight, 1929
192 ➔ *Phytocoris varius* Knight, 1934
193 ➔ *Parthenicus cowaniae* Knight, 1968
194 *Bolteria juniperi* Knight, 1968
195 ➔ *Phytocoris flaviatus* Knight, 1968
241 ➔ *Pilophorus americanus* Poppius, 1914
242 ➔ *Pilophorus exiguus* Poppius, 1914
299 ➔ *Platylygus vanduzeei* Usinger, 1931
-

Arthropoda: Insecta: Hemiptera: Ochteridae (velvety shore bugs)

- 265 ➔ *Ochterus barberi* Schell, 1943
-

Arthropoda: Insecta: Hemiptera: Psyllidae (jumping plantlice)

- 298 ➔ *Trioza rubra* Tuthill, 1939
-

Arthropoda: Insecta: Hemiptera: Reduviidae (assassin bugs)

- 34 ➔ *Paratriatoma hirsuta* Barber, 1938
-

Arthropoda: Insecta: Hymenoptera: Andrenidae (andrenid bees)

- 200 *Andrena (Callandrena) utahensis* LaBerge, 1967
253 ➔ *Andrena (Scaphandrena) kaibabensis* Ribble, 1974
290 ➔ *Perdita wheeleri* Timberlake, 1928
291 *Perdita opacella* Timberlake, 1956
292 ➔ *Perdita inornata* Timberlake, 1962
293 ➔ *Perdita depressa* Timberlake, 1968
-

TAXONOMIC LIST

Arthropoda: Insecta: Hymenoptera: Apidae (honey bees)

79 ➔ *Triepeolus hopkinsi* Cockerell, 1905

Arthropoda: Insecta: Hymenoptera: Crabronidae (crabronid wasps)

111 ➔ *Gorytes dentatus* Fox, 1893

Arthropoda: Insecta: Hymenoptera: Cynipidae (gall wasps)

51 ➔ *Andricus wheeleri* Beutenmüller, 1907

Arthropoda: Insecta: Hymenoptera: Formicidae (ants)

80 *Myrmecocystus melliger* subsp. *semirufus* Emery var. *romainei* Cole, 1936 [not valid as a quadrinomial taxon, and no identification of holotype; non *Myrmecocystus romainei* Snelling, 1975]

315 ➔ *Pheidole desertorum* var. *maricopa* Wheeler, 1906

316 ➔ *Formica moki* Wheeler, 1906

317 ➔ *Formica fusca fusca* var. *gelida* Wheeler, 1913 [not valid as a quadrinomial taxon]

318 ➔ *Pogonomyrmex californicus* Buckley subsp. *maricopa* Wheeler, 1914

319 ➔ *Camponotus acutirostris* Wheeler *clarigaster* Wheeler, 1915

Arthropoda: Insecta: Hymenoptera: Ichneumonidae (scorpion wasp)

*330 ➔ *Cryptus asymmetricus* Pratt, 1945

Arthropoda: Insecta: Hymenoptera: Pteromalidae (pteromalid wasps)

150 *Boharticus margaretae* Grissell, 1983

Arthropoda: Insecta: Hymenoptera: Sphecidae (sphecid wasps)

52 ➔ *Priononyx subatrata* Bohart, 1958

Arthropoda: Insecta: Hymenoptera: Vespidae (hornets)

50 ➔ *Mischocyttarus flavitarsis* var. *kaibabensis* Bequaert, 1932

155 ➔ *Polistes canadensis* var. *kaibabensis* Lynn, 1932

TAXONOMIC LIST

Arthropoda: Insecta: Lepidoptera: Hesperidae (skippers)

278 *Megathymus alliae* Stallings & Turner, 1957

Arthropoda: Insecta: Lepidoptera: Lycaenidae (gossamer-winged butterflies, etc.)

*335 ➔ *Tharsalea arota schellbachi* Tilden, 1955

Arthropoda: Insecta: Lepidoptera: Noctuidae (owlet moths)

2 *Plagiomimicus kathyae* J. Adams & Lafontaine, 2009

240 ➔ *Schinia immaculata* Pogue, 2004

297 *Hadena (Hadena) lafontainei* Troubridge & Crabo, 2002

Arthropoda: Insecta: Lepidoptera: Nymphalidae (admirals)

40 ➔ *Coenonympha fureae* Barnes & Benjamin, 1926

41 ➔ *Cercyonis damei* Barnes & Benjamin, 1926

112 ➔ *Speyeria atlantis* Edwards *schellbachi* Garth, 1949

226 ➔ *Neonympha dorothea dorothea* Nabokov, 1942

268 ➔ *Neominois dionysus* Scudder, 1878

Arthropoda: Insecta: Lepidoptera: Oecophoridae (oecophorid moths)

76 ➔ *Depressaria schellbachi* Gates, 1947

Arthropoda: Insecta: Lepidoptera: Papilionidae (swallowtails)

45 ➔ *Papilio indra kaibabensis* Bauer, 1955

Arthropoda: Insecta: Lepidoptera: Pieridae (orange-tips)

269 *Synchlœ thoosa* Scudder, 1878

Arthropoda: Insecta: Orthoptera: Acrididae (short-horned grasshoppers)

270 ➔ *Melanoplus canonicus* Scudder, 1897

*331 ➔ *Parapomala perpallida* Rehn & Hebard, 1908

*332 ➔ *Amphitornus nanus* Rehn & Hebard, 1908

TAXONOMIC LIST

Arthropoda: Insecta: Orthoptera: Eumastacidae (monkey grasshoppers)

248 *Morsea californica kaibabensis* Rehn & Grant, 1958

Arthropoda: Insecta: Psocodea: Enderleinellidae (sucking lice)

182 *Enderleinellus kaibabensis* Kim, 1966

Arthropoda: Insecta: Siphonaptera: Ceratophyllidae (rodent fleas)

9 ➔ *Orchopeas sexdentatus neotomae* Augustson, 1943

Class Malacostraca (malacostracan crustaceans)

Arthropoda: Malacostraca: Amphipoda: Crangonyctidae (crangonyctid amphipods)

302 ➔ *Stygobromus blinni* Wang & Holsinger, 2001

Phylum CHORDATA

Class Aves (birds)

Chordata: Aves: Strigiformes: Strigidae (typical owls)

229 ➔ *Otus asio mychophilus* Oberholser, 1937

Class Mammalia (mammals)

Chordata: Mammalia: Carnivora: Felidae (cats)

227 ➔ *Felis concolor kaibabensis* E. Nelson & Goldman, 1931

Chordata: Mammalia: Carnivora: Mephitidae (skunks)

219 ➔ *Spilogale gracilis* Merriam, 1890

TAXONOMIC LIST

Chordata: Mammalia: Rodentia: Castoridae (beavers)

121 ➔ *Castor canadensis repentinus* Goldman, 1932

Chordata: Mammalia: Rodentia: Crecitidae (deer mice)

122 ➔ *Peromyscus crinitus peridoneus* Goldman, 1937

218 ➔ *Hesperomys megalotis* Merriam, 1890

Chordata: Mammalia: Rodentia: Geomyidae (pocket gophers)

91 ➔ *Thomomys bottae boreorarius* Durham, 1952

123 *Thomomys fossor kaibabensis* Goldman, 1938

124 *Thomomys bottae nicholi* Goldman, 1938

151 ➔ *Thomomys bottae trumbullensis* Hall & Davis, 1934

Chordata: Mammalia: Rodentia: Heteromyidae (kangaroo rats)

118 *Dipodomys microps celsus* Goldman, 1924

119 *Dipodomys ordii cupidineus* Goldman, 1924

Chordata: Mammalia: Rodentia: Sciuridae (squirrels)

120 ➔ *Ammospermophilus leucurus tersus* Goldman, 1929

220 ➔ *Sciurus kaibabensis* Merriam, 1904

Class Reptilia **(reptiles)**

Chordata: Reptilia: Squamata: Colubridae (typical snakes)

281 ➔ *Sonora semiannulata gloydi* Stickel, 1938

285 ➔ *Lampropeltis pyromelana Cope infralabialis* Tanner, 1953

Chordata: Reptilia: Squamata: Viparidae (rattlesnakes)

183 ➔ *Crotalus confluentus abyssus* Klauber, 1930

TAXONOMIC LIST

Class Teleostei **(fishes)**

Chordata: Teleostei: Cypriniformes: Cyprinidae (carp)

221 ➔ *Gila cypha* R. Miller, 1946

Phylum MOLLUSCA **(mollusks)**

Class Gastropoda **(snails)**

Mollusca: Gastropoda: Neotaenioglossa: Hydrobiidae (spring snails)

157 *Pyrgulopsis hualapaiensis* Herschler, Liu & Stevens, 2016

Mollusca: Gastropoda: Stylommatophora: Helminthoglyptidae (shoulderbands)

156 ➔ *Sonorella betheli* Henderson, 1914 [an erroneous account; see details in the bibliography herein]

222 ➔ *Sonorella reederi* W. Miller, 1984

280 ➔ *Helix (Arionta) coloradoensis* Stearns, 1890

Mollusca: Gastropoda: Stylommatophora: Oreohelicidae (mountain snails)

214 *Oreohelix yavapai vauxae* Marshall, 1929

236 ➔ *Oreohelix yavapai profundorum* Pilsbry & Ferriss, 1911

237 ➔ *Oreohelix yavapai extremitatis* Pilsbry & Ferriss, 1911

238 ➔ *Oreohelix yavapai angelica* Pilsbry & Ferriss, 1911

Mollusca: Gastropoda: Stylommatophora: Pupillidae (chrysalis snails)

239 ➔ *Pupilla syngenes avus* Pilsbry & Ferriss, 1911

TAXONOMIC LIST

Phylum NEMATODA (roundworms)

Class Chromadorea (chromadorid roundworms)

Nematoda: Chromadorea: Ascaridida: Oxyuridae (pinworms)

197 ➔ *Wellcomia perognathi* Kruidenier & Mehra, 1958

198 ➔ *Aspiculuris ackerti* Kruidenier & Mehra, 1959

Nematoda: Chromadorea: Rhabditida : Rhabditidae (rhabditid roundworms)

215 ➔ *Parasitorhabditis gracilis* Massey, 1974

Nematoda: Chromadorea: Spiurida: Gongylonematidae (spiurid gullet worms)

199 ➔ *Gongylonema peromysci* Kruidenier & Peebles, 1958

TAXONOMIC LIST

KINGDOM PLANTAE (plants)

Phylum (Division) TRACHYOPHYTA (vascular plants)

Class Magnoliopsida (flowering plants)

Trachyophyta: Magnoliopsida: Asparagales: Asparagaceae (agaves)

- 162 ➔ *Agave phillipsiana* Hodgson, 2001
 - 217 ➔ *Agave kaibabensis* McKelvey, 1949
 - 309 *Androstegium breviflorum* Watson, 1873
-

Trachyophyta: Magnoliopsida: Asterales: Asteraceae (sunflowers)

- 8 *Xylorhiza tortifolia* (Torrey & Gray) Greene var. *parashantensis* Atwood & Welsh, 2013
 - 75 ➔ *Encelia resinifera* subsp. *tenuifolia* Curtis, 1998
 - 129 *Actinella biennis* A. Gray, 1878
 - 147 *Senecio stygius* Greene, 1909
 - 177 *Laphamia congesta* Jones, 1895
 - 178 *Laphamia gracilis* Jones, 1895
 - 286 ➔ *Flaveria mcdougallii* Theroux, Pinkava & Keil, 1977
 - 307 *Brickellia (Clavigera) longifolia* Watson, 1873
 - *333 ➔ *Ericameria arizonica* Roberts, Urbatsch & Anderson, 2005
 - *334 ➔ *Laphamia toumeyii* Robinson & Greenman, 1895
-

Trachyophyta: Magnoliopsida: Boraginales: Boraginaceae (borage)

- 94 ➔ *Oreocarya capitata* Eastwood, 1937
 - 160 *Cryptantha atwoodii* Higgins, 1974
 - 283 ➔ *Amsinckia nana* Suksdorf, 1931
 - 284 ➔ *Amsinckia macrosepala* Suksdorf, 1931
 - *323 *Nana arizonica* Crawford & Rink, 2024
-

TAXONOMIC LIST

Trachyophyta: Magnoliopsida: Boraginales: Hydrophyllaceae (waterleafs)

- 5 *Phacelia furnissii* Atwood, 2007
 - 6 *Phacelia higginsii* Atwood, 2007
 - 7 *Phacelia hughesii* Atwood, 2007
 - 131 *Phacelia (Coreanthus) ivesiana* A. Gray in Gray et al., 1861
-

Trachyophyta: Magnoliopsida: Brassicales: Apiaceae (parsleys)

- 83 *Phellopterus multinervatus* Coulter & Rose, 1900
 - 305 *Cymopterus purpureus* Watson, 1873
 - 306 *Peucedanum newberryi* Watson, 1873
-

Trachyophyta: Magnoliopsida: Brassicales: Brassicaceae [Cruciferae] (mustards)

- 4 ➔ *Thelypodium integrifolium* (Nuttall) Endlicher subsp. *longicarpum* Al-Shehbaz, 1973
 - 134 *Arabis eremophila* Greene, 1900
 - 135 *Arabis recondita* Greene, 1900
 - 257 ➔ *Sisymbrium kearneyi* Rollins, 1953
 - 258 *Lesquerella kaibabensis* Rollins, 1982
 - 310 *Lesquerella arizonica* Watson, 1888
 - *329 *Lesquerella arizonica* Watson var. *nudicaulis* Payson, 1921
-

Trachyophyta: Magnoliopsida: Caryophyllales: Amaranthaceae (pigweed)

- 282 ➔ *Atriplex asterocarpa* Stutz, Chu & Sanderson, 1994
-

Trachyophyta: Magnoliopsida: Caryophyllales: Cactaceae (cacti)

- 46 *Opuntia aurea* Baxter, 1933
 - 49 *Pediocactus paradinei* Benson, 1957
 - 77 ➔ *Sclerocactus havasupaiensis* Clover, 1942
 - 78 ➔ *Sclerocactus havasupaiensis* var. *roseus* Clover, 1942
 - 82 *Echinocactus polycephalus* var. *xeranthemoides* Coulter, 1896
 - 108 *Coryphantha vivipara* var. *kaibabensis* Fischer, 1979
 - 109 ➔ *Echinocereus triglochidiatus* var. *toroweapensis* Fischer, 1991
 - 158 *Opuntia hualpaensis* Hester, 1943
 - 159 *Opuntia abyssii* Hester, 1943
 - 231 ➔ *Opuntia pinkavae* Parfitt, 1997
-

Trachyophyta: Magnoliopsida: Caryophyllales: Caryophyllaceae (pinks)

- 254 ➔ *Silene rectiramea* Robinson, 1899

TAXONOMIC LIST

Trachyophyta: Magnoliopsida: Caryophyllales: Nyctaginaceae (four o'clocks)

- 130 *Mirabilis bigelovii* A. Gray, 1886
279 ➔ *Allionia pachyphylla* Standley, 1909
-

Trachyophyta: Magnoliopsida: Caryophyllales: Polygonaceae (knotweeds)

- 250 *Eriogonum mortonianum* Reveal, 1974a
251 *Eriogonum thompsonae* S. Wats. var. *atwoodii* Reveal, 1974b
274 *Eriogonum fusiforme* Small, 1906
*324 ➔ *Eriogonum juncinellum* Gandoger, 1906
*325 ➔ *Eriogonum macdougallii* Gandoger, 1906
-

Trachyophyta: Magnoliopsida: Cornales: Losaceae (loasa)

- 73 *Mentzelia collomiae* Christy, 1997
165 *Mentzelia memorabilis* N. Holmgren & P. Holmgren, 2002
266 ➔ *Mentzelia hualapaiensis* Schenk, Hodgson & Hufford, 2010
267 ➔ *Mentzelia canyonensis* Schenk, Hodgson & Hufford, 2013
-

Trachyophyta: Magnoliopsida: Crossosomatales: Crossosomataceae (crossomas)

- 255 ➔ *Crossosoma parviflora* B. Robinson & Fernald, 1894
-

Trachyophyta: Magnoliopsida: Ericales: Polemoniaceae (phlox)

- 132 "*Gilia dactylophyllum*, (n. sp.?)", A. Gray in Gray *et al.*, 1861 [see note in bibliography herein]
-

Trachyophyta: Magnoliopsida: Ericales: Primulaceae (primroses)

- 106 ➔ *Primula* (Section *Farinosae*) *hunnewellii* Fernald, 1934
-

TAXONOMIC LIST

Trachyophyta: Magnoliopsida: Fabales: Fabaceae (legumes)

- 35 ➔ *Astragalus bryantii* Barneby, 1944
36 ➔ *Astragalus lentiginosus* Dougl. var. *oropedii* Barneby, 1945
37 ➔ *Astragalus cremnophylax* Barneby, 1948
38 *Astragalus wootoni* var. *endopterus* Barneby, 1949
39 *Astragalus cremnophylax* Barneby var. *myriorrhaphis* Barneby, 1979
125 *Astragalus subcinereus* A. Gray, 1878
126 *Astragalus scaposus* A. Gray, 1878
127 *Astragalus mokiensis* A. Gray, 1878
128 *Astragalus artipes* A. Gray, 1878
174 *Astragalus humistratus* var. *tenerrimus* Jones, 1895
179 *Astragalus kentrophyta* var. *coloradoensis* Jones, 1902
180 *Astragalus kaibensis* Jones, 1902
261 *Pediomelum retrorsum* Rydberg in Rydberg & Pennell, 1919
303 *Dalea amoena* Watson, 1873
311 *Astragalus lentiginosus* Douglas ex Hook. var. *trumbullensis* Welsh & Atwood, 2001
312 *Pediomelum pauperitense* S.L. Welsh, M. Licher, & N. D. Atwood in Welsh & Licher, 2010
313 *Astragalus pinionis* Welsh & Thorne, 1977
-

Trachyophyta: Magnoliopsida: Fagales: Betulaceae (birches)

- 84 ➔ *Ostrya knowltonii* Coville, 1894
-

Trachyophyta: Magnoliopsida: Gentianales: Apocynaceae (dogbane)

- 260 *Amsonia eastwoodiana* Rydberg, 1913
-

Trachyophyta: Magnoliopsida: Gentianales: Rubiaceae (madders)

- 89 ➔ *Galium munzii* Hilend & Howell subsp. *ambivalens* Dempster & Ehrendorfer, 1965
-

Trachyophyta: Magnoliopsida: Lamiales: Lamiaceae (mints)

- 252 *Scutellaria potosina* var. *kaibabensis* Rhodes & Ayers, 2010
-

Trachyophyta: Magnoliopsida: Lamiales: Oleaceae (olives)

- 93 ➔ *Fraxinus macropetala* Eastwood, 1903
176 *Bigelovia howardi* var. *attenuata* Jones, 1895
246 ➔ *Fraxinus cuspidata* var. *macropetala* Rehder, 1917
247 ➔ *Fraxinus lowellii* Sargent in Rehder, 1917
-

TAXONOMIC LIST

Trachyophyta: Magnoliopsida: Lamiales: Orobanchaceae (broomrapes)

- 74 *Cordylanthus wrightii kaibabensis* Chuang & Heckard, 1986
107 ➔ *Adenostegia parviflora* Ferriss, 1918
234 ➔ *Cordylanthus tenuifolis* Pennell, 1940
-

Trachyophyta: Magnoliopsida: Lamiales: Plantaginaceae (plantains)

- 86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967
259 ➔ *Penstemon coccinatus* Rydberg, 1909
-

Trachyophyta: Magnoliopsida: Lamiales: Scrophulariaceae (figworts)

- 164 *Castilleja kaibabensis* N. Holmgren, 1973
-

Trachyophyta: Magnoliopsida: Liliales: Liliaceae (lilies)

- 308 *Calochortus flexuosus* Watson, 1873
-

Trachyophyta: Magnoliopsida: Malpighiales: Euphorbiaceae (spurge)

- 163 ➔ *Euphorbia aaronrossii* A. Holmgren & N. Holmgren, 1988
-

Trachyophyta: Magnoliopsida: Malpighiales: Salicaceae (willows)

- 10 ➔ *Salix lutea* var. *ligulifolia* C. Ball, 1921
263 ➔ *Populus fremontii* var. *toumeyi* Sargent, 1919
-

Trachyophyta: Magnoliopsida: Myrtales: Onagraceae (evening primroses)

- 175 *Oenothera triloba* var. *ecristata* Jones, 1895
243 ➔ *Oenothera confertiflora* Raven, 1962
244 ➔ *Oenothera specuicola* subsp. *specuicola* Raven, 1962
244a *Oenothera specuicola* subsp. *hesperia* Raven, 1962
304 *Oenothera (Chylisma) multijuga* Watson, 1873
-

Trachyophyta: Magnoliopsida: Poales: Cyperaceae (sedges)

- 276 ➔ *Carex curatorum* Stacey, 1937
-

Trachyophyta: Magnoliopsida: Poales: Poaceae (grasses)

- 245 *Panicum mohavense* Reeder, 1991

TAXONOMIC LIST

Trachyophyta: Magnoliopsida: Ranunculales: Papaveraceae (poppies)

92 ➔ *Corydalis wetherillii* Eastwood, 1902

*328 ➔ *Argemone arizonica* Ownbey, 1958

Trachyophyta: Magnoliopsida: Rosales: Moraceae (mulberries)

148 *Morus grisea* Greene, 1911

Trachyophyta: Magnoliopsida: Rosales: Rosaceae (roses)

235 ➔ *Rosa stellata* Wootton subsp. *abyssa* Phillips, 1992

*326 ➔ *Purpusia osterhoutii* A. Nelson, 1934

Trachyophyta: Magnoliopsida: Sapindales: Anacardiaceae (cashews)

133 ➔ *Rhus canadensis* Marsh. var. *simplicifolia* Greene, 1890

136 ➔ *Schmaltzia cissodes* Greene, 1905

137 ➔ *Schmaltzia hirtella* Green, 1905

Trachyophyta: Magnoliopsida: Sapindales: Rutaceae (rues)

138 *Ptelea palida* Green, 1906

139 *Ptelea straminea* Green, 1906

140 ➔ *Ptelea nitida* Green, 1906

141 ➔ *Ptelea argentea* Green, 1906

142 ➔ *Ptelea triptera* Green, 1906

143 ➔ *Ptelea lutescens* Green, 1906

144 ➔ *Ptelea elegans* Green, 1906

145 ➔ *Ptelea confinis* Green, 1906

146 *Ptelea saligna* Green, 1906

Class Pinopsida (conifers)

Trachyophyta: Pinopsida: Pinales: Cupressaceae (cypress)

262 ➔ *Juniperus utahensis* var. *megalocarpa* Sargent, 1919

TAXONOMIC LIST

KINGDOM FUNGI

(fungi)

Phylum (Division) ASCOMYCOTA

(sac fungi)

Ascomycota: Dothidiomycetes: Pleosporales: Venturiaceae

43 ➔ *Protoventuria arizonica* M. Barr, 1989

Ascomycota: Eurotiomycetes: Eurotiales: Trichocomaceae (saprobe fungi)

149 ➔ *Penicillium arizonense* Frisvad, Grijseels & J.C. Nielsen in Grijseels et al., 2016

Ascomycota: Lecanoromycetes: Teloschistales: Physciaceae

99 ➔ *Physconia isidiomuscigena* Esslinger, 2000

Ascomycota: Orbiliomycetes: Orbiliales: Orbiliaceae

- 17 ➔ *Orbilia purshiae* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 18 ➔ *Orbilia ocellata* Baral, G. Marson & E. Weber in Baral, Weber & Marson, 2020
 - 19 *Orbilia magnifica* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 20 ➔ *Orbilia phanosoma* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 21 ➔ *Orbilia multiphanosoma* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 22 ➔ *Orbilia arizonensis* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 23 ➔ *Orbilia navajoana* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 24 ➔ *Orbilia spermoides* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 25 ➔ *Orbilia ophiosoma* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 26 ➔ *Orbilia maeandrina* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 27 *Orbilia multimaeandrina* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 28 ➔ *Orbilia flexisoma* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 29 ➔ *Orbilia delphinus* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 30 ➔ *Orbilia macrodelfinus* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 31 ➔ *Orbilia multitrapezoidea* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 32 ➔ *Orbilia calyptrata* Baral & G. Marson in Baral, Weber & Marson, 2020
 - 33 ➔ *Orbilia subovoidea* Baral, Matočec & E. Weber in Baral, Weber & Marson, 2020
-

TAXONOMIC LIST

Ascomycota: Pezizomycetes: Pezizales: Morchellaceae

42 *Morchella kaibabensis* Beug, T.A. Clem. & T.J. Baroni *in* Baroni *et al.*, 2018

Ascomycota: Sordariomycetes: Diaporthales: Valsaceae

224 ➔ *Gnomonia quercusgambellii* Monod, 1983

Ascomycota incertae sedis

97 ➔ *Septogloeum gillii* D. Ellis, 1946

Phylum (Division) BASIDIOMYCOTA (club fungi)

Basidiomycota: Agaricomycetes: Boletales: Boletaceae

287 *Boletus barrowsii* Thiers & Smith *in* Thiers, 1976

Basidiomycota: Agaricomycetes: Boletales: Suillaceae

288 *Suillus kaibabensis* Thiers, 1976

289 ➔ *Suillus occidentalis* Thiers, 1976

Basidiomycota: Pucciniomycetes: Pucciniales: Pucciniaceae

98 ➔ *Puccinia circinans* J. Ellis & Everhart, 1900

TAXONOMIC LIST

KINGDOM CHROMISTA

(photosynthetic eukaryotes)

Phylum APICOMPLEXA

(parasitic alveolates)

Apicomplexa: Class : Eucoccidiorida: Eimeriidae (coccid parasites)

- 201 ➔ *Eimeria tamiasciuri* Levine, Ivens & Kruidenier, 1957a
 - 202 ➔ *Eimeria cutamiae* Levine, Ivens & Kruidenier, 1957a
 - 203 ➔ *Eimeria thomomysis* Levine, Ivens & Kruidenier, 1957a
 - 204 ➔ *Eimeria perognathi* Levine, Ivens & Kruidenier, 1957a
 - 205 ➔ *Eimeria albigulae* Levine, Ivens & Kruidenier, 1957a
 - 206 ➔ *Eimeria operculata* Levine, Ivens & Kruidenier, 1957a
 - 207 ➔ *Eimeria peromysci* Levine, Ivens & Kruidenier, 1957a
 - 208 ➔ *Eimeria arizonensis* Levine, Ivens & Kruidenier, 1957a
 - 209 ➔ *Eimeria eremici* Levine, Ivens & Kruidenier, 1957a
 - 210 ➔ *Eimeria onychomysis* Levine, Ivens & Kruidenier, 1957a
 - 211 ➔ *Isopora citolli* Levine, Ivens & Kruidenier, 1957b
-

KINGDOM PROTISTA

(protists)

"Phylum" HEMIMASTIGOPHORA

(single-celled eukaryotes)

Hemimastigophora: Hemimastigea: Hemimastigida: Spironemidae (hemimastigid protist)

- 110 *Spironema terricola* Foissner & Foissner, 1993
-

LOCALITIES FOR TYPE MATERIAL FROM GRAND CANYON NATIONAL PARK *

[In the PDF document the lines immediately below are hyperlinks]

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“Grand Canyon” not discriminated	153
South Rim	154
North Rim	160
Inner Canyon	165
Colorado River Locales	172

Locality data are as described in the original publications; thus some minor variances will be noted for specific sites or areas that are otherwise in very close proximity to each other. Refinements or special notes appear within [non-bold square brackets].

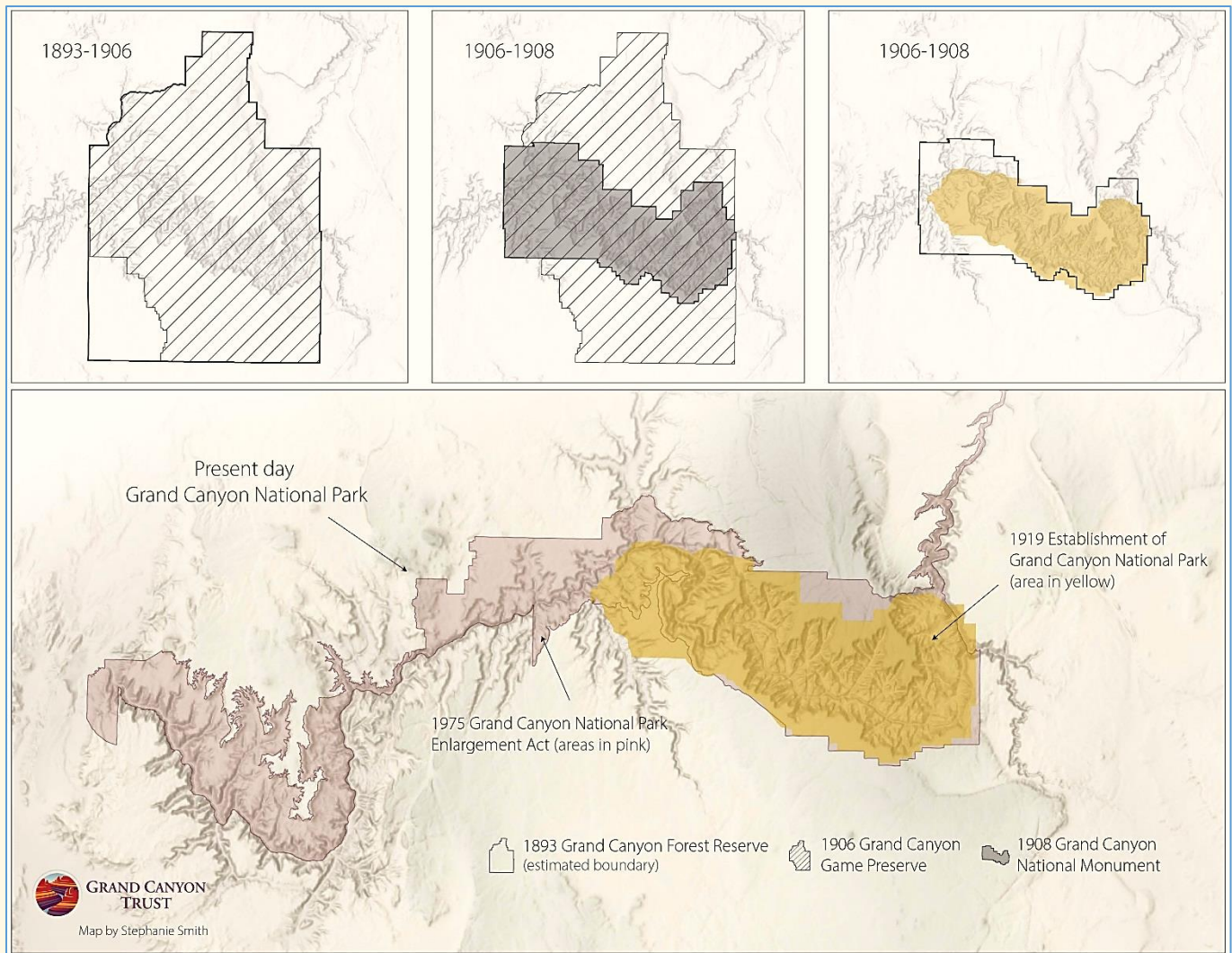
Red Numbers indicate and cross-list the sequentially enumerated taxa in the bibliography (thus they reflect the alphabetical order by publication author). There are 335 species-level taxa listed in this checklist. The count in the first edition included No. 244a, added late, thus it is the 322nd taxon overall. The second edition adds Nos. 323–335, the numerals for which are prefixed by a star (e.g., ***323**). The publications in which the second-edition taxa appear are interleaved in the bibliography herein, but they are also listed separately in the section, [“Publications and Taxa Added in the Second Edition”](#).

* Regarding localities that are today within the Havasupai Indian Reservation or the Hualapai Indian Reservation, but which lie within the physiographic Grand Canyon, see pertinent entries in the LOCALITIES FOR TYPE MATERIAL FROM NEAR GRAND CANYON list.

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

**Federally-Designated Boundaries of
Grand Canyon National Park and Predecessor Units
1893–Present**

map by Stephanie Smith, Grand Canyon Trust, 2019



Grand Canyon Trust

<https://www.grandcanyontrust.org/grand-canyon-historic-boundaries-map>

non-commercial permission to use indicated on webpage; last accessed 29 November 2022

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

"GRAND CANYON"

Grand Canyon or **Grand Canyon of the Colorado** or **Colorado Canyon** [without specific locale] ⁷

- 1 *Ceratopogon dimidiatus* Adams, 1903
- 58 *Cryptorhopalum pruddeni* Casey, 1900
- 59 *Orphilus aequalis* Casey, 1900
- 60 *Zopherodes lugubris* Casey, 1907
- 61 *Zopherodes pruddeni* Casey, 1907
- 62 *Discodemus brevipennis* Casey, 1908
- 63 *Prionus spiculosus* Casey, 1912
- 64 *Prionus angustulus* Casey, 1912
- 65 *Prionus terminalis* Casey, 1912
- 66 *Stenosphenus pruddeni* Casey, 1912
- 67 *Bembidion (Cyclolopha) occultum* Casey, 1918
- 79 *Triepeolus hopkinsi* Cockerell, 1905
- 93 *Fraxinus macropetala* Eastwood, 1903
- 97 *Septogloeum gillii* D. Ellis, 1946
- 98 *Puccinia circinans* J. Ellis & Everhart, 1900
- 107 *Adenostegia parviflora* Ferriss, 1918
- 111 *Gorytes dentatus* Fox, 1893
- 133 *Rhus canadensis* Marsh. var. *simplicifolia* Greene, 1890
- 137 *Schmaltzia hirtella* Green, 1905
- 140 *Ptelea nitida* Greene, 1906
- 141 *Ptelea argente* Greene, 1906
- 167 *Arenivaga impensa* Hopkins, 2014
- 183 *Crotalus confluentus abyssus* Klauber, 1930
- 192 *Phytocoris varius* Knight, 1934
- 234 *Cordylanthus tenuifolis* Pennell, 1940
- 246 *Fraxinus cuspidata* var. *macropetala* Rehder, 1917
- 259 *Penstemon coccinatus* Rydberg, 1909
- 265 *Ochterus barberi* Schell, 1943
- 270 *Melanoplus canonicus* Scudder, 1897
- 292 *Perdita inornata* Timberlake, 1962
- 298 *Trioza rubra* Tuthill, 1939
- 314 *Polymedon castus* Wheeler, 1899
- 318 *Pogonomyrmex californicus* Buckley subsp. *maricopa* Wheeler, 1914

⁷ Most of these undiscriminated "Grand Canyon" records are likely based on collections on the far more usually visited South Rim but are listed thusly for their lack of further data. See also "Grand Canyon, Arizona" and (under the "South Rim" heading below) "Grand Canyon village". Many taxa are represented by material collected prior to the creation of the national monument or park.

For localities described as in the "vicinity of", "near", or "about" the Grand Canyon, see the LOCALITIES OF TYPE MATERIAL NEAR GRAND CANYON list.

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

- *327 *Cuerna kaloostiani* Nielson, 1965
 - *330 *Cryptus asymmetricus* Pratt, 1945
 - *332 *Amphitornus nanus* Rehn & Hebard, 1908
 - *334 *Laphamia toumeyi* Robinson & Greenman, 1895
-

"Grand Canyon National Park" [without specific locale]

- 197 *Wellcomia perognathi* Kruidenier & Mehra, 1958
 - 199 *Gongylonema peromysci* Kruidenier & Peebles, 1958
 - *327 *Cuerna kaloostiani* Nielson, 1965
-

"Grand Canyon, Arizona" [the canyon or Grand Canyon village not discriminated]

- 14 *Athysanella fredonia* Ball & Beamer, 1939
 - 15 *Athysanella globosa* Ball & Beamer, 1939
 - 16 *Athysanella (Gladionura) casa* Ball & Beamer, 1939
 - 40 *Coenonympha fureae* Barnes & Benjamin, 1926
 - 41 *Cercyonis damei* Barnes & Benjamin, 1926
 - 47 *Delphacodes apicata* Beamer, 1948
 - 53 *Erax benedicti* Bromley, 1940
 - 54 *Aphelonema convergens* var. *canyonensia* Bunn, 1930
 - 88 *Ballana basala* DeLong, 1964
 - 90 *Bruchomorpha bunni* Doering, 1939
 - 200 *Andrena (Callandrena) utahensis* LaBerge, 1967
 - 212 *Norvellina bicolorata* (Ball) var. *inflata* Lindsay, 1938
 - 215 *Parasitorhabditis gracilis* Massey, 1974
 - 216 *Chelinidea vittiger* Uhler var. *artuflava* McAtee, 1919
 - 271 *Mycetophila denningi* Shaw, 1951
 - 275 *Heterotarsonemus nakaharai* Smiley & Moser, 1974
 - 299 *Platylygus vanduzeei* Usinger, 1931
-

SOUTH RIM

[Grand Canyon National Park]

"Grand Canyon South Rim" [without specific locale]

- 44 *Acmaeodera pletura* W. Barr, 1972
- 52 *Priononyx subatrata* Bohart, 1958
- 152 *Geron prosopidis* Hall & Evenhuis, 2003
- 226 *Neonympha dorothea dorothea* Nabokov, 1942
- 292 *Perdita inornata* Timberlake, 1962

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

"Grand Canyon National Park, South Rim" [without specific locale]

299 *Platylygus vanduzeei* Usinger, 1931

"Rim of Grand Canyon" [without specific locale]

85 *Bombylius facialis* Cresson, 1919

262 *Juniperus utahensis* var. *megalocarpa* Sargent, 1919

Arizona Route 64 at southeast boundary of Grand Canyon National Park

[near Desert View]

210 *Eimeria onychomysis* Levine, Ivens & Kruidenier, 1957a

Bright Angel [probably Grand Canyon village]

*327 *Cuerna kaloostiani* Nielson, 1965

Bright Angel, Arizona [Grand Canyon village]

see also Grand Canyon village

100 *Petalium bistriatum* Say var. *arizonense* Fall, 1905

101 *Catorama grande* Fall, 1905

102 *Catorama longulum* Fall, 1905

103 *Catorama pingue* Fall, 1905

104 *Diplotaxis conformis* Fall, 1909

105 *Bruchus perplexus* Fall, 1910

241 *Pilophorus americanus* Poppius, 1914

242 *Pilophorus exiguus* Poppius, 1914

262 *Juniperus utahensis* var. *megalocarpa* Sargent, 1919

Bright Angel Hotel or Bright Angel Camp [Grand Canyon village]

see also Grand Canyon village

55 *Melanophila piniedulis* Burke, 1907

81 *Trypeta varipennis* Coquillett, 1902

*327 *Cuerna kaloostiani* Nielson, 1965

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Bright Angel Trail (upper entrance)

see also Bright Angel Trail under "Inner Canyon" listings

110 *Spironema terricola* Foissner & Foissner, 1993

Bright Angel Trail (above)

195 *Phytocoris flaviatus* Knight, 1968

Bright Angel Trail (at top)

190 *Phytocoris hesperius* Knight, 1928

191 *Plagiognathus tenellus* Knight, 1929

Bright Angel Trail (near)

*331 *Parapomala perpallida* Rehn & Hebard, 1908

Cataract Canyon, above Supai

[The precise locality may be within the boundaries of the Havasupai Indian Reservation]

77 *Sclerocactus havasupaiensis* Clover, 1942

Cedar Mountain, east side

[The precise locality may be within the boundaries of the Navajo Nation]

205 *Eimeria albigulae* Levine, Ivens & Kruidenier, 1957a

Coconino Forest, Grand Canyon (7000 feet)

317 *Formica fusca fusca* var. *gelida* Wheeler, 1913 [not valid as a quadrinomial taxon]

"on the rim in the Kohonino [Coconino] Forest (7000 feet) about three miles west of the Bright Angel Hotel"

316 *Formica moki* Wheeler, 1906

Coconino Forest, rim of Grand Canyon

51 *Andricus wheeleri* Beutenmüller, 1907

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Desert View Point

183 *Crotalus confluentus abyssus* Klauber, 1930

El Tovar (ca. 2 miles west of)

37 *Astragalus cremnophylax* Barneby, 1948

Eremita Mesa

235 *Rosa stellata* Wooton subsp. *abyssa* Phillips, 1992

Grand Canyon village

see also listings under "Bright Angel, Arizona" and "Bright Angel Hotel" above

68 *Aphonopelma behlei* Chamberlin, 1940

229 *Otus asio mychophilus* Oberholser, 1937

Grand Canyon village, 36° 03' 22.31" N; 112° 07' 30.73" W

[coordinates pinpoint a locality just to the west of the footpath between Park Headquarters and the Rim Trail, at a point half-way between those two places]

149 *Penicillium arizonense* Frisvad, Grijseels & J.C. Nielsen in Grijseels *et al.*, 2016

Grand Canyon village (7.5 km east-southeast of), close to South Rim

[Grand Canyon National Park, along Arizona Route 64]

17 *Orbilina purshiae* Baral & G. Marson in Baral, Weber & Marson, 2020

22 *Orbilina arizonensis* Baral & G. Marson in Baral, Weber & Marson, 2020

Grand Canyon village (8.5 km east-southeast of), close to South Rim

[Grand Canyon National Park, along Arizona Route 64]

26 *Orbilina maeandrina* Baral & G. Marson in Baral, Weber & Marson, 2020

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Grand View [Grandview]

see also Hearst Ranch

- 184 *Deraeocoris fulvus* Knight, 1921
185 *Deraeocoris bullatus* Knight, 1921
186 *Deraeocoris navajo* Knight, 1921
187 *Ceratocapsus clavicornis* Knight, 1925
188 *Phytocoris mellarius* Knight, 1925
189 *Pilophorus fuscipennis* Knight, 1926
193 *Parthenicus cowaniae* Knight, 1968
-

Grandview Point

- 26 *Orbilina maeandrina* Baral & G. Marson in Baral, Weber & Marson, 2020
29 *Orbilina delphinus* Baral & G. Marson in Baral, Weber & Marson, 2020
-

Hance Ranch

see also Thurber's Camp

- 142 *Ptelea triptera* Green, 1906 [type locality for this species refined here; see entry in bibliography]
-

Hearst Ranch

see also Grandview

- 203 *Eimeria thomomysis* Levine, Ivens & Kruidenier, 1957a
-

Hermit Rim Road

- 193 *Parthenicus cowaniae* Knight, 1968
-

Hualapai Canyon (tributary of Havasu Canyon)

[The precise gathering locality may be within the boundaries of the Havasupai Indian Reservation.]

- 77 *Sclerocactus havasupaiensis* Clover, 1942
-

Hull Tank

- 202 *Eimeria cutamiae* Levine, Ivens & Kruidenier, 1957a
-

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Mather Point

- 24 *Orbilina spermoides* Baral & G. Marson, in Baral, Weber & Marson, 2020
*333 *Ericameria arizonica* Roberts, Urbatsch & Anderson, 2005
-

Navajo Point (near) (Coconino Plateau)

- 183 *Crotalus confluentus abyssus* Klauber, 1930
-

Shoshone Point

- 76 *Depressaria schellbachi* Gates, 1947
-

South entrance to Grand Canyon National Park

- 9 *Orchopeas sexdentatus neotomae* Augustson, 1943
-

“behind the cabin camp located at the entrance gate of the Grand Canyon National Park”

- 192 *Phytocoris varius* Knight, 1934
-

Thurber’s Camp [Hance Ranch]

- 95 *Ripersia arizonensis* Ehrhorn, 1899
96 *Dactylopius formicarii* Ehrhorn 1899
-

Tusayan (3.5 km north of)

[Grand Canyon National Park, on Arizona Route 64]⁸

- 23 *Orbilina navajoana* Baral & G. Marson in Baral, Weber & Marson, 2020
25 *Orbilina ophiosoma* Baral & G. Marson in Baral, Weber & Marson, 2020
28 *Orbilina flexisoma* Baral & G. Marson in Baral, Weber & Marson, 2020
30 *Orbilina macrodelphinus* Baral & G. Marson in Baral, Weber & Marson, 2020
32 *Orbilina calyptrata* Baral & G. Marson in Baral, Weber & Marson, 2020
-

⁸ See the TYPE LOCALITIES NEAR GRAND CANYON list for localities south of Tusayan, Arizona.

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Tusayan (3 km north of)

[Grand Canyon National Park, on Arizona Route 64]⁸

- 18 *Orbilina ocellata* Baral, G. Marson & E. Weber *in* Baral, Weber & Marson, 2020
 - 19 *Orbilina cucumispora* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 19 *Orbilina magnifica* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 20 *Orbilina phanosoma* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 21 *Orbilina multiphanosoma* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 23 *Orbilina navajoana* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 24 *Orbilina spermoides* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 28 *Orbilina flexisoma* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 29 *Orbilina delphinus* Baral & G. Marson *in* Baral, Weber & Marson, 2020
-

Yavapai Point

- 45 *Papilio indra kaibabensis* Bauer, 1955
-

Zuni Point

- 206 *Eimeria operculata* Levine, Ivens & Kruidenier, 1957a
-

Zuni Point, west side

- 207 *Eimeria peromysci* Levine, Ivens & Kruidenier, 1957a
 - 208 *Eimeria arizonensis* Levine, Ivens & Kruidenier, 1957a
-

NORTH RIM
[Grand Canyon National Park]

Grand Canyon (North Rim of) [without specific locale]

- 44 *Acmaeodera pletura* W. Barr, 1972
 - 72 *Mycetophila neofungorum* Chandler, 1993
 - 170 *Cinara grande* Hottes, 1956
 - 224 *Gnomonia quercusgambellii* Monod, 1983
 - 253 *Andrena (Scaphandrena) kaibabensis* Ribble, 1974
 - 256 *Chrysotimus arizonicus* H. Robinson, 1967
-

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Grand Canyon (North Rim)

["Grand Canyon North Rim" or place name "North Rim, Arizona", not discriminated]

see also "North Rim"

- 43 *Protoventuria arizonica* M. Barr, 1989
45 *Papilio indra kaibabensis* Bauer, 1955
106 *Primula* (Section *Farinosae*) *hunnewellii* Fernald, 1934
112 ➔ *Speyeria atlantis schellbachi* Garth, 1949
113 *Misumenops coloradensis* Gertsch, 1933
-

Kaibab Plateau [within Grand Canyon National Park]

- 217 *Agave kaibabensis* McKelvey, 1949 [see entry in bibliography herein for notes concerning the locality]
-

Kaibab Plateau, North Rim of Grand Canyon [undiscriminated]

- 3 *Tipula (Lunatipula) kaibabensis* C. Alexander, 1946
-

Bright Angel Creek (head of), Kaibab Plateau

- 220 *Sciurus kaibabensis* Merriam, 1904
-

Bright Angel Point

- 45 *Papilio indra kaibabensis* Bauer, 1955
86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967
-

Bright Angel Point ("from or near")

- 285 *Lampropeltis pyromelana Cope infralabialis* Tanner, 1953
-

Burro Spring

- 183 *Crotalus confluentus abyssus* Klauber, 1930
-

Cape Royal

- 208 *Eimeria arizonensis* Levine, Ivens & Kruidenier, 1957a
-

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Cape Royal Road and Point Imperial Road, W of junction

86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967

Grand Canyon National Park, North Rim, junction of paved roads, ca. 6.5 km north of Kaibab Lodge, 36° 16' N, 112° 03' W

[actually Grand Canyon Lodge in Grand Canyon National Park; coordinates pinpoint a location just east of Arizona Route 67 north of the Cape Royal Road junction]

99 *Physconia isidiomuscigena* Esslinger, 2000

Dutton Point

235 *Rosa stellata* Wootton subsp. *abyssa* Phillips, 1992

Mount Trumbull

268 *Neominois dionysus* Scudder, 1878

Neal Spring

[junction of Cape Royal Road and Point Imperial Road]

112 ➡ *Speyeria atlantis schellbachi* Garth, 1949

*335 *Tharsalea arota schellbachi* Tilden, 1955

North Rim [locality undefined]

*335 *Tharsalea arota schellbachi* Tilden, 1955

North Rim [the place, "North Rim, Arizona"]

155 ➡ *Polistes canadensis* var. *kaibabensis* Lynn, 1932 [see note in bibliography]

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

North Rim (S of) (93 km south-southeast of Fredonia)

[Grand Canyon National Park, North Rim, Arizona]

- 17 *Orbilina purshiae* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 22 *Orbilina arizonensis* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 26 *Orbilina maeandrina* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 28 *Orbilina flexisoma* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 29 *Orbilina delphinus* Baral & G. Marson *in* Baral, Weber & Marson, 2020
 - 33 *Orbilina subovoidea* Baral, Matočec & E. Weber *in* Baral, Weber & Marson, 2020
-

Phantom Canyon (head of)

- 35 *Astragalus bryantii* Barneby, 1944
-

Point Sublime

- 155 *Polistes canadensis* var. *kaibabensis* Lynn, 1932
 - 289 *Suillus occidentalis* Thiers, 1976
-

Powell Plateau

- 227 *Felis concolor kaibabensis* E. Nelson & Goldman, 1931
-

River View

- *335 *Tharsalea arota schellbachi* Tilden, 1955
-

Road W-3 on the north rim of Grand Canyon near the entrance to Grand Canyon National Park

- 201 *Eimeria tamiasciuri* Levine, Ivens & Kruidenier, 1957a
-

Robbers' Roost Spring

- 112 ➔ *Speyeria atlantis schellbachi* Garth, 1949
-

S B Canyon, Grand Canyon National Monument

[now in the enlarged Grand Canyon National Park]

- 257 *Sisymbrium kearneyi* Rollins, 1953
-

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

S B Point and Hades Knoll (side canyon between)

235 *Rosa stellata* Wooton subsp. *abyssa* Phillips, 1992

S B Trail (head of)

235 *Rosa stellata* Wooton subsp. *abyssa* Phillips, 1992

Swamp Lake

112 ➔ *Speyeria atlantis schellbachi* Garth, 1949

Swamp Point

91 *Thomomys bottae boreorarius* Durham, 1952

112 ➔ *Speyeria atlantis schellbachi* Garth, 1949

Swamp Point (1/2 mile from) (near Powell Saddle)

211 *Isopora citolli* Levine, Ivens & Kruidenier, 1957b

Swamp Ridge

112 ➔ *Speyeria atlantis schellbachi* Garth, 1949

Toroweap Point

109 *Echinocereus triglochidiatus* var. *toroweapensis* Fischer, 1991

Two River Junction

112 ➔ *Speyeria atlantis schellbachi* Garth, 1949

Vulcan's Throne, Toroweap Valley

243 *Oenothera confertiflora* Raven, 1962

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

INNER CANYON
[Grand Canyon National Park]

Bat Cave [interior]

230 *Eschatomoxys pholeter* Thomas & Pape in Pape, Thomas & Aalbu, 2007

Bright Angel Canyon

183 *Crotalus confluentus abyssus* Klauber, 1930

Bright Angel Creek

121 *Castor canadensis repentinus* Goldman, 1932

Bright Angel Creek (near)

92 *Corydalis wetherillii* Eastwood, 1902

Bright Angel Trail [without specific locale]

see also Bright Angel Trail under "South Rim" listings (*above*); and "Garden Creek" and "Indian Garden" (*below*); see also Old Bright Angel Trail [= upper Bright Angel Canyon]

50 *Mischocyttarus flavitarsis* var. *kaibabensis* Bequaert, 1932

93 *Fraxinus macropetala* Eastwood, 1903

143 *Ptelea lutescens* Greene, 1906

156 *Sonorella betheli* Henderson, 1914 [an erroneous account; see details in the bibliography]

281 *Sonora semiannulata gloydi* Stickel, 1938

300 *Polymedon dilaticosta* Van Duzee, 1927

301 *Polymedon nitidus* Van Duzee, 1927

*326 *Purpusia osterhoutii* A. Nelson, 1934

Bright Angel Trail, 100-400 feet below rim

238 *Oreohelix yavapai angelica* Pilsbry & Ferriss, 1911

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

“wall of the Grand Cañon at an altitude of about 5500 feet”

[in all probability on Bright Angel Trail]

316 *Formica moki* Wheeler, 1906

Bright Angel Trail, 4800 ft altitude

[altitude indicates locality is at about the 2nd rest house descending]

122 *Peromyscus crinitus peridoneus* Goldman, 1937

Bright Angel Trail, 1400-2200 m altitude

246 *Fraxinus cuspidata* var. *macropetala* Rehder, 1917

Bright Angel Trail, 1400-2000 m altitude

246 *Fraxinus cuspidata* var. *macropetala* Rehder, 1917

Bright Angel Trail, about 3000 ft altitude

319 *Camponotus acutirostris* Wheeler *clarigaster* Wheeler, 1915

Bright Angel Trail, near Indian Garden [Havasupai Gardens]

136 *Schmaltzia cissodes* Greene, 1905

Bright Angel Trail, ca. 0.5 mile below Indian Garden [Havasupai Gardens]

4 *Thelypodium integrifolium* (Nuttall) Endlicher subsp. *longicarpum* Al-Shehbaz, 1973

Bright Angel Trail, lower

87 *Tibicen apache* Davis, 1921

Bright Angel Trail, Lower Sonoran level

281 *Sonora semiannulata gloydi* Stickel, 1938

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Cave of the Domes [interior]

[on Horseshoe Mesa]

225 *Archeolarca cavicola* Muchmore, 1981

295 *Eleodes (Caverneleodes) leptoscelis* Triplehorn, 1975

Clear Creek, 4 km up from Colorado River confluence

264 *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012

Clear Creek Canyon

162 *Agave phillipsiana* Hodgson, 2001

Deer Creek Canyon

162 *Agave phillipsiana* Hodgson, 2001

Garden Creek (mouth)

= Colorado River Mile 88.9 Left

281 *Sonora semiannulata gloydi* Stickel, 1938

Grandview Trail

99 *Physconia isidiomuscigena* Esslinger, 2000

246 *Fraxinus cuspidata* var. *macropetala* Rehder, 1917

Grandview Trail, 2000 feet below rim

183 *Crotalus confluentus abyssus* Klauber, 1930

Hance Trail, Red Canyon [not Old Hance Trail]

143 *Ptelea lutescens* Green, 1906

246 *Fraxinus cuspidata* var. *macropetala* Rehder, 1917

259 *Penstemon coccinatus* Rydberg, 1909

279 *Allionia pachyphylla* Standley, 1909

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Havasu Canyon, 4 miles down "Supai Trail"

[The precise gathering locality may be within the boundaries of the Havasupai Indian Reservation.]

75 *Encelia resinifera* subsp. *tenuifolia* Curtis, 1998

Havasu Canyon, near Navajo Falls

[The precise gathering locality may be within the boundaries of the Havasupai Indian Reservation.]

77 *Sclerocactus havasupaiensis* Clover, 1942

Havasu Canyon, on top of Supai formation

[The precise gathering locality may be within the boundaries of the Havasupai Indian Reservation.]

77 *Sclerocactus havasupaiensis* Clover, 1942

78 *Sclerocactus havasupaiensis* var. *roseus* Clover, 1942

Hermit Creek

263 *Populus fremontii* var. *toumeyii* Sargent, 1919

283 *Amsinckia nana* Suksdorf, 1931

Hermit Creek (mouth)

35 *Astragalus bryantii* Barneby, 1944

Hermit Trail

94 *Oreocarya capitata* Eastwood, 1937

246 *Fraxinus cuspidata* var. *macropetala* Rehder, 1917

Indian Garden [Havasupai Gardens]

10 *Salix lutea* var. *ligulifolia* C. Ball, 1921

114 *Arctosa mokiensis* Gertsch, 1934a

167 *Arenivaga impensa* Hopkins, 2014

290 *Perdita wheeleri* Timberlake, 1928

Indian Garden (just above) [Havasupai Gardens]

315 *Pheidole desertorum* var. *maricopa* Wheeler, 1906

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Indian Garden (vicinity) [Havasupai Gardens]

see also "Bright Angel Trail, near Indian Garden"

281 *Sonora semiannulata gloydi* Stickel, 1938

**Manzanita Canyon, within ¼ mile of Bright Angel Creek and North Kaibab Trail, UTM 12S
4005015 N, 407532 E**

267 *Mentzelia canyonensis* Schenk, Hodgson & Hufford, 2013

North Kaibab Trail

36 *Astragalus lentiginosus* Dougl. var. *oropedii* Barneby, 1945

94 *Oreocarya capitata* Eastwood, 1937

276 *Carex curatorum* Stacey, 1937

*328 *Argemone arizonica* Ownbey, 1958

*335 *Tharsalea arota schellbachii* Tilden, 1955

Old Bright Angel Trail [= upper Bright Angel Canyon]

*335 *Tharsalea arota schellbachii* Tilden, 1955

Old Hance Trail [not Hance Trail, Red Canyon]

[the published type localities for these taxa are more precisely identified *herein* as Old Hance Trail;
see main entries in bibliography]

84 *Ostrya knowltonii* Coville, 1894

144 *Ptelea elegans* Greene, 1906

218 *Hesperomys megalotis* Merriam, 1890

219 *Spilogale gracilis* Merriam, 1890

279 *Allionia pachyphylla* Standley, 1909

280 *Helix (Arionta) coloradoensis* Stearns, 1890

294 *Microsciasma minuta* Townsend, 1915

320 *Cicindela rufiventris* var. *arizonae* Wickham, 1899

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Phantom Ranch

- 34 *Paratriatoma hirsuta* Barber, 1938
69 *Aphonopelma phasmus* Chamberlin, 1940
183 *Crotalus confluentus abyssus* Klauber, 1930
-

Plateau Point Trail

- 204 *Eimeria perognathi* Levine, Ivens & Kruidenier, 1957a
209 *Eimeria eremici* Levine, Ivens & Kruidenier, 1957a
-

Rampart Cave [interior]

- 230 *Eschatomoxys pholeter* Thomas & Pape *in* Pape, Thomas & Aalbu, 2007
-

Rampart Cave (just west of and below)

- 222 *Sonorella reederi* W. Miller, 1984
-

Roaring Springs

- 45 *Papilio indra kaibabensis* Bauer, 1955
-

Roaring Springs Cave [interior]

- 232 *Ptomaphagus cocytus* Peck, 1973
-

Roaring Springs Cave, ca. 1.6 km inside

- 302 *Stygobromus blinni* Wang & Holsinger, 2001
-

Roaring Springs Power Plant

- 183 *Crotalus confluentus abyssus* Klauber, 1930
-

Shinumo Creek

- 183 *Crotalus confluentus abyssus* Klauber, 1930
-

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Shinumo Creek, 3 km from confluence with Colorado River

264 *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012

South Bass Trail, about 200 feet below the rim

237 *Oreohelix yavapai extremitatis* Pilsbry & Ferriss, 1911

239 *Pupilla syngenes avus* Pilsbry & Ferriss, 1911

South Bass Trail (“the head of a recess in the cross-bed sandstone [Coconino Sandstone] south of where the Mystic Spring or Bass Trail [South Bass Trail] zigzags down, in a talus resting on the red sandstone forming the Le Conte Plateau”)

[Pilsbry & Ferris 1911 also illustrate the appearance of the locality in a sketch]

236 *Oreohelix yavapai profundorum* Pilsbry & Ferriss, 1911

South Bass Trail, in Supai formation

264 *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012

South Bass Trail, in Redwall Formation

264 *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012

South Bass Trail, base of Tapeats Formation

264 *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012

South Kaibab Trail, 5300 feet elevation, in debris slides and crevices of Redwall Limestone

244 *Oenothera specuicola* subsp. *specuicola* Raven, 1962

South Kaibab Trail, 36° 03' 45" N, 112° 03' 30" W

99 *Physconia isidiomuscigena* Esslinger, 2000

Tanner Trail

183 *Crotalus confluentus abyssus* Klauber, 1930

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

Thunder River Cave [interior]

117 *Loxosceles kaiba* Gertsch & Ennik, 1983

Tonto Plateau, near Bright Angel Trail

183 *Crotalus confluentus abyssus* Klauber, 1930

Tse'an Cho [interior]

[cave on Horseshoe Mesa]

295 *Eleodes (Caverneleodes) leptoscelis* Triplehorn, 1975

Tse'an Olje [interior]

[cave in Cremation Canyon]

295 *Eleodes (Caverneleodes) leptoscelis* Triplehorn, 1975

COLORADO RIVER LOCALES
[Grand Canyon National Park]

Colorado River [without specific locale]

213 *Chionaspis gilli* Liu & Kosztarab, 1987

Marble Canyon, along the Colorado River, 12 river miles below Lees Ferry, Salt Water Wash

163 *Euphorbia aaronrossii* A. Holmgren & N. Holmgren, 1988

River Mile 23.0 Left

240 *Schinia immaculata* Pogue, 2004

Vasey's Paradise [River Mile 31.8 Right]

273 *Wiedemannia digna* Sinclair, 2006

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

River Mile 37.3 Left

168 *Arenivaga pagana* Hopkins, 2014

River Mile 53 Right, Nankoweap

168 *Arenivaga pagana* Hopkins, 2014

River Mile 58.2 Right, Awatubi Canyon

264 *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012

Colorado River, at or near mouth of Bright Angel Creek

[Bright Angel Creek confluence is at River Mile 87.7 Right]

221 *Gila cypha* R. Miller, 1946

River Mile 88.9 Left see "Garden Creek (mouth)" under "Inner Canyon" listings, *above*

River Mile 92.3 Left

181 *Nebria (Reductonebria) georgei* Kavanaugh, 2008

River Mile 108 Right, Shinumo Creek (mouth)

264 *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012

River Mile 108 Left

264 *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012

River Mile 147.8 Left, Matkatamiba Canyon

286 *Flaveria mcdougallii* Theroux, Pinkava & Keil, 1977

**River Mile 158 Right (campsite near), 339451 E, 4018170 N, NAD 83, 36°17'42.6" N;
112°47'16.6" W**

266 *Mentzelia hualapaiensis* Schenk, Hodgson & Hufford, 2010

LOCALITIES FOR TYPE MATERIAL FROM
GRAND CANYON NATIONAL PARK

River Mile 160.5 Left

166 *Arenivaga grandiscanyonensis* Hopkins, 2014

**Note: Localities between River Miles 164.7 and 273.3, on the left,
could be within the boundaries of the Hualapai Indian Reservation**

River Mile 166.5 Left

240 *Schinia immaculata* Pogue, 2004

River Mile 174.2 Right, Cove Canyon

286 *Flaveria mcdougallii* Theroux, Pinkava & Keil, 1977

River Mile 180.8 Right

181 *Nebria (Reductonebria) georgei* Kavanaugh, 2008

River Mile 186.5 Left

168 *Arenivaga pagana* Hopkins, 2014

River Mile 198.0 Right

168 *Arenivaga pagana* Hopkins, 2014

River Mile 202.5 Left

168 *Arenivaga pagana* Hopkins, 2014

River Mile 202 Right

240 *Schinia immaculata* Pogue, 2004

River Mile 211.5 Right

166 *Arenivaga grandiscanyonensis* Hopkins, 2014

LOCALITIES FOR TYPE MATERIAL FROM NEAR GRAND CANYON NATIONAL PARK

See also various headings within this list for further refinements

[In the PDF document the lines immediately below are hyperlinks]

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LOCALITIES FOR TYPE MATERIAL FROM NEAR GRAND CANYON NATIONAL PARK

Locality data are as described in the original publications; thus some minor variances will be noted for specific sites or areas that are otherwise in very close proximity to each other. Refinements or special notes appear within [non-bold square brackets].

Red Numbers indicate and cross-list the sequentially enumerated taxa in the bibliography (thus they reflect the alphabetical order by publication author).

Some taxa listed here may have been collected from the physiographic Grand Canyon, but outside of the national park boundaries.

Note: Baral et al. (2020) did not demonstrate a precise understanding of the geography of the Grand Canyon region. All of their localities are listed as being in Arizona (a few actually are in Utah), but some locality references to “Grand Canyon” are, confusingly, neither within the physiographic canyon nor within the national park but are on adjacent national forest and other lands, sometimes at quite some distance from the canyon or the national park. Some interpretive statements have been included in this locality list in order to clarify these discrepancies; specifically, measurements have been made from a map that reveal that linear distances from geographic locales are mostly along the principal highways of the area, which information is added notationally to the original locality data.

CAMERON, ARIZONA and vicinity

Cameron

- 80** *Myrmecocystus melliger* subsp. *semirufus* Emery var. *romainei* Cole, 1936 [not valid as a quadrinomial taxon]
196 *Aphricus knowltoni* Knull, 1957
-

Cameron Trading Post

- 2** *Plagiomimicus kathya* J. Adams & Lafontaine, 2009
-

Little Colorado River (bed of) at Cameron

- 38** *Astragalus wootoni* var. *endopterus* Barneby, 1949
-

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Cameron (15 miles W of, along the canyon of the Little Colorado River)

[quite probably at or near the Little Colorado River Gorge Overlook, along Arizona Route 64]

278 *Megathymus alliae* Stallings & Turner, 1957

ARIZONA STRIP⁹

"Northern Arizona" [general vicinity nearest to Kanab, Utah; without specific locale]

303 *Dalea amoena* Watson, 1873

304 *Oenothera (Chylisma) multijuga* Watson, 1873

305 *Cymopterus purpureus* Watson, 1873

306 *Peucedanum newberryi* Watson, 1873

307 *Brickellia (Clavigera) longifolia* Watson, 1873

308 *Calochortus flexuosus* Watson, 1873

309 *Androstephium breviflorum* Watson, 1873

Arizona Route 389, 4.3 mi west of U.S. Route 89A

[near Fredonia, Arizona]

251 *Eriogonum thompsonae* S. Wats. var. *atwoodii* Reveal, 1974b

Arizona Route 389, 4.5 mi southwest of U.S. Route 89A

[near Fredonia, Arizona]

250 *Eriogonum mortonianum* Reveal, 1974a

Bulrush Canyon (northwest of, south of Pipe Spring)

231 *Opuntia pinkavae* Parfitt, 1997

Colorado City (6 miles east of; Rosy Canyon Road, 1.5 miles south of Utah state line)

173 *Trogloderus skillmani* Johnston, 2019

⁹ Refer also separately in this list to: Grand Canyon-Parashant National Monument; House Rock Valley; Kaibab Indian Reservation; Kaibab National Forest; Kaibab Plateau; Kanab Canyon; Lees Ferry.

LOCALITIES FOR TYPE MATERIAL FROM NEAR GRAND CANYON NATIONAL PARK

Fredonia, Arizona

14 *Athysanella fredonia* Ball & Beamer, 1939

Fredonia (1 mile north of)

231 *Opuntia pinkavae* Parfitt, 1997

Hack Canyon (vicinity)

6 *Phacelia higginsii* Atwood, 2007

"Hell Canyon"

[see bibliography for comments on the locality]

148 *Morus grisea* Greene, 1911

Kaibab Indian Reservation (west of)

231 *Opuntia pinkavae* Parfitt, 1997

Millipede Cave [interior]

[Bureau of Land Management lands]

272 *Pratherodesmus voylesi* Shear in Shear, Taylor, Wynne & Krejca, 2009

Mokiak Pass

[20 miles southeast of St. George, Utah ¹⁰]

125 *Astragalus subcinereus* A. Gray, 1878

126 *Astragalus scaposus* A. Gray, 1878

127 *Astragalus mokiacensis* A. Gray, 1878

128 *Astragalus artipes* A. Gray, 1878

129 *Actinella biennis* A. Gray, 1878

269 *Synchloe thoosa* Scudder, 1878

310 *Lesquerella arizonica* Watson, 1888

¹⁰ Location of Mokiak Pass is as identified by S. H. Scudder (1878, Notice of the butterflies collected by Dr. Edward Palmer in the arid regions of southern Utah and northern Arizona during the summer of 1877, *U.S. Geological and Geographical Survey of the Territories, Bulletin*, 4).

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Main Street Valley, ca. 1.5 km south of the junction of the Colorado City road with the Main Street Valley road

245 *Panicum mohavense* Reeder, 1991

Main Street Valley, west of Hurricane Cliffs

231 *Opuntia pinkavae* Parfitt, 1997

Navaho Trail, near Hurricane Rim

231 *Opuntia pinkavae* Parfitt, 1997

North Canyon (Kaibab Plateau, East Rim View Point along Trail #7 ca. 2¼ mi down from trailhead, in North Canyon; 36°25'18"N, 112°04'22"W)

252 *Scutellaria potosina* var. *kaibabensis* Rhodes & Ayers, 2010

North Canyon Trail #4, 36°25'04"N 112°04'17"W

[east rim of Kaibab Plateau]

252 *Scutellaria potosina* var. *kaibabensis* Rhodes & Ayers, 2010

October Gyp Cave [interior]

[Bureau of Land Management lands]

272 *Pratherodesmus voylesi* Shear in Shear, Taylor, Wynne & Krejca, 2009

Page (9 miles northwest of)

228 *Acmaeodera navajo* G. Nelson & Westcott, 1995

Pipe Spring (ca. 9 miles east-northeast of)

see also Kaibab Indian Reservation

250 *Eriogonum mortonianum* Reveal, 1974a

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Uinkaret Plateau, just north of the Navajo Trail Road, 1.1 km W of the Clayhole Wash crossing, 27.5 km air distance south-southwest of Colorado City, 36°49'09"N, 113°11'21"W, T40N R8W S31

165 *Mentzelia memorabilis* N. Holmgren & P. Holmgren, 2002

Vermilion Cliffs [geographical feature or place name undiscriminated¹¹]

228 *Acmaeodera navajo* G. Nelson & Westcott, 1995

Vermilion Lodge (vicinity) [Vermilion Cliffs]

282 *Atriplex asterocarpa* Stutz, Chu & Sanderson, 1994

Virgin Mountains

139 *Ptelea straminea* Green, 1906

Wolf Hole

118 *Dipodomys microps celsus* Goldman, 1924

Wolf Hole (4.2 miles southwest of)

231 *Opuntia pinkavae* Parfitt, 1997

Wolf Hole (20 miles south of)

124 *Thomomys bottae nicholi* Goldman, 1938

¹¹ In their paper, Nelson & Westcott also specially mention "Cliff Dwellers Lodge", which is not far from another business by the name of Vermilion Cliffs, thus it is unclear whether "Vermilion Cliffs" refers to that place, or to the natural geographical feature Vermilion Cliffs that align in this area along U.S. Route 89 Alternate.

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

GRAND CANYON VICINITY¹²
undiscriminated

“about Grand Canyon” or “region of the Grand Canyon”

- 89 *Galium munzii* Hilend & Howell subsp. *ambivalens* Dempster & Ehrendorfer, 1965
145 *Ptelea confinis* Greene, 1906
254 *Silene rectiramea* Robinson, 1899
*324 *Eriogonum juncinellum* Gandoger, 1906
*325 *Eriogonum macdougalii* Gandoger, 1906
-

Grand Canyon (“near”)

- 12 *Hysteropterum cornutum* var. *utahnum* E. Ball, 1935
56 *Trichochrous incipiens* Casey, 1895
57 *Trichochrous reversus* Casey, 1895
194 *Bolteria juniperi* Knight, 1968
-

Grand Canyon, Ariz. (“vicinity of”)

- 54 *Aphelonema convergens* var. *canyonensia* Bunn, 1930
-

Grand Canyon (south of)

- 249 *Fabriciella evanida* Reinhard, 1953
-

Grand Canyon (30 miles south of)

- 277 *Vaejovis aquilonalis* Stahnke, 1940
-

¹² It is not clear whether materials collected with the indefinite locality descriptions here include among all specimens many, several, or one that may have come from the Grand Canyon itself. Because of this uncertainty, the taxa listed here are included in the “near Grand Canyon National Park” list of type specimens rather than in the national park list itself.

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

GRAND CANYON-PARASHANT NATIONAL MONUMENT¹³

**12.5 miles southwest from head of Trail Canyon toward Andrus Canyon, 36°11.48'N,
113°19.10'W**

6 *Phacelia higginsii* Atwood, 2007

Andrus Canyon, 1 mile west of Andrus Point, T32N R10W S10

311 *Astragalus lentiginosus* Douglas ex Hook. var. *trumbullensis* Welsh & Atwood, 2001

Andrus Canyon, 3 miles west of Andrus Point, T32N R10W S6, wash bottom

311 *Astragalus lentiginosus* Douglas ex Hook. var. *trumbullensis* Welsh & Atwood, 2001

Andrus Canyon at road crossing, T32N, R10W, S6 & 7

5 *Phacelia furnissii* Atwood, 2007

Cunningham Canyon

8 *Xylorhiza tortifolia* (Torrey & Gray) Greene var. *parashantensis* Atwood & Welsh, 2013

Daneill Canyon, west of Andrus Canyon, 3 miles west of Andrus Pt., T32N R11W S12

311 *Astragalus lentiginosus* Douglas ex Hook. var. *trumbullensis* Welsh & Atwood, 2001

Eldel Cave [interior]

230 *Eschatomoxys pholeter* Thomas & Pape in Pape, Thomas & Aalbu, 2007

¹³ Localities are as determined based on boundaries at the time of publication of this checklist. Prior to the creation of Grand Canyon-Parashant National Monument (in 2000), and depending upon original dates of collection, some material may originally be said to have been from Grand Canyon National Monument, Lake Mead National Recreation Area (that is, its northeastern section), or the Arizona Strip generally.

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Mount Trumbull, 3 miles south of Nixon Spring

[The locality, "three miles south of Nixon Spring", is just to the south of Mount Trumbull itself, today within the Grand Canyon-Parashant National Monument, about 2¾ miles north of the boundary of Grand Canyon National Park.]

151 *Thomomys bottae trumbullensis* Hall & Davis, 1934

Mt. Trumbull school house (2 miles south of), near Griffith Knoll, T34S R10W S1-2

311 *Astragalus lentiginosus* Douglas ex Hook. var. *trumbullensis* Welsh & Atwood, 2001

PARA-1001 Cave, ca. UTM 0264500 N, 4060700 E [interior]

153 *Hesperoernes bradybaughi* Harvey & Wynne, 2014

154 *Tuberoernes cohni* Harvey & Wynne, 2014

233 *Ptomaphagus parashant* Peck & Wynne, 2013

Parashant (Trail) Canyon, 11 miles south of Mount Trumbull Village

311 *Astragalus lentiginosus* Douglas ex Hook. var. *trumbullensis* Welsh & Atwood, 2001

Poverty Mountain (south base)

7 *Phacelia hughesii* Atwood, 2007

Poverty Mountain (southeast of), southwest of Mt. Trumbull, T34N, R11W, Sec 4

312 *Pediomelum pauperitense* S.L. Welsh, M. Licher, & N. D. Atwood *in* Welsh & Licher, 2010

Poverty Mountain (southwest of) near Dewdrop Spring, T35N, R12W, Sec. 35/36

312 *Pediomelum pauperitense* S.L. Welsh, M. Licher, & N. D. Atwood *in* Welsh & Licher, 2010

Poverty Mountain (BLM road south of) and southwest of Salt Spring, T34N, R11W [sic]

312 *Pediomelum pauperitense* S.L. Welsh, M. Licher, & N. D. Atwood *in* Welsh & Licher, 2010

Sandstone Canyon (1.5 mile due west of Cane Spring)

8 *Xylorhiza tortifolia* (Torrey & Gray) Greene var. *parashantensis* Atwood & Welsh, 2013

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Twin Point (west rim of) (18 km south of Oak Grove, T30N R12W NW¼ sect. 7, 36°01'N, 113°37'W)

235 *Rosa stellata* Wooton subsp. *abyssa* Phillips, 1992

Whitmore Canyon, T32N R9W S1

311 *Astragalus lentiginosus* Douglas ex Hook. var. *trumbullensis* Welsh & Atwood, 2001

Whitmore Canyon, 1.25 km (7.8 miles) [*sic*] south of Mount Trumbull (abandoned town), T34N R9W S29

311 *Astragalus lentiginosus* Douglas ex Hook. var. *trumbullensis* Welsh & Atwood, 2001

HAVASUPAI INDIAN RESERVATION

See also entries under "Havasu" in the LOCALITIES FOR TYPE MATERIAL IN GRAND CANYON NATIONAL PARK list noted as possibly being within the Havasupai Reservation. These localities are within the physiographic Grand Canyon.

"Canyon at Supai, Coconino County, Ariz."

214 *Oreohelix yavapai vauxae* Marshall, 1929

Mooney Falls, near

244a *Oenothera specuicola* subsp. *hesperia* Raven, 1962

Supai, Havasu Canyon

293 *Perdita depressa* Timberlake, 1968

HOUSE ROCK and HOUSE ROCK VALLEY

House Rock, near Lees Ferry

180 *Astragalus kaibensis* Jones, 1902

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

House Rock Valley [without specific locale]

- 49 *Pediocactus paradinei* Benson, 1957
74 *Cordylanthus wrightii kaibabensis* Chuang & Heckard, 1986
161 *Sclerocactus whipplei* (Englemann & Bigelow) Britton & Rose ssp. *busekii* Hochstätter, 1995
-

House Rock Valley, north of Rock Canyon

- 231 *Opuntia pinkavae* Parfitt, 1997
-

45 km southwest of Page, 26 km southwest of Marble Canyon

[House Rock valley vicinity]

- 18 *Orbilina ocellata* Baral, G. Marson & E. Weber in Baral, Weber & Marson, 2020
-

HUALAPAI INDIAN RESERVATION

These localities, with the exception perhaps of some collections from the “vicinity” of, or southerly from, Peach Springs are within the physiographic Grand Canyon.

Diamond Creek Canyon

- 135 *Arabis recondita* Greene, 1900
-

Diamond River [Diamond Creek]

- 131 *Phacelia (Coreanthus) ivesiana* A. Gray in Gray et al., 1861
-

Diamond River [Diamond Creek] (mouth of)

- 132 "*Gilia dactylophyllum*, (n. sp.?)", A. Gray in Gray et al., 1861 [see remarks in bibliography]
-

Grand Cañon of the Colorado, below Peach Springs

- 130 *Mirabilis bigelovii* A. Gray, 1886
-

LOCALITIES FOR TYPE MATERIAL FROM NEAR GRAND CANYON NATIONAL PARK

Peach Springs

- 169 *Luperodes wickhami* Horn, 1893
247 *Fraxinus lowellii* Sargent in Rehder, 1917
274 *Eriogonum fusiforme* Small, 1906
310 *Lesquerella arizonica* Watson, 1888
-

Peach Springs (above)

- 138 *Ptelea palida* Green, 1906
-

Peach Springs (vicinity)

- 82 *Echinocactus polycephalus* var. *xeranthemoides* Coulter, 1896
83 *Phellopterus multinervatus* Coulter & Rose, 1900
134 *Arabis eremophila* Greene, 1900
147 *Senecio stygius* Greene, 1909 [type locality for this species refined here; see main entry in bibliography]
261 *Pediomelum retrorsum* Rydberg in Rydberg & Pennell, 1919
-

Peach Springs Canyon (Peach Springs Wash)

- 159 *Opuntia abyssii* Hester, 1943
255 *Crossosoma parviflora* B. Robinson & Fernald, 1894 [type locality for this species refined here; see entry in bibliography]
284 *Amsinckia macrosepala* Suksdorf, 1931 [type locality for this species refined here; see entry in bibliography]
-

Peach Springs Wash, 4 km from confluence with Colorado River

- 264 *Efferia tapeats* Scarbrough, Stevens & Nelson, 2012
-

Prospect Valley (lower end)

- 120 *Ammospermophilus leucurus tersus* Goldman, 1929
-

Upper Peach Springs, outflow just below concrete weir, 35.55786°N, 113.4314°W

- 157 *Pyrgulopsis hualapaiensis* Herschler, Liu & Stevens, 2016
-

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

HUALAPAI INDIAN RESERVATION vicinity (off reservation)

Peach Springs (8 miles southwest of) [vicinity of Truxton, Arizona]

150 *Boharticus margaretae* Grissell, 1983

U.S.-Arizona Highway No. 66, 11 or 12 miles east of Peach Springs and 2 or 3 miles west of Hyde Park, Arizona

[“Hyde Park”, near mile marker 117 on historic Route 66, no longer exists; the gathering locality is near the present-day Grand Canyon Caverns tourist attraction.]

158 *Opuntia hualpaensis* Hester, 1943

“KAIBAB FOREST” (north, indiscriminated)

[see also “Kaibab Plateau”]

“Kaibab forest, near the north rim of the Grand Canyon”

115 *Phidippus kaibabensis* Gertsch, 1934b

“KAIBAB FOREST” (south, indiscriminated)

[see also “Kaibab National Forest, Tusayan Ranger District”]

“W 112°:N 36°, Kaibab Forest, Arizona”

[The overly generalized coordinates lie within Grand Canyon National Park, just west of Grandview Point; the precise intersection is in fact, by coincidence, on a cliff face(!) just over the rim of the canyon (<https://confluence.org/confluence.php?id=91>). The specific epithet of the taxon noted here, and indication of “Kaibab Forest,” may point either to a locality on the nearby Kaibab National Forest or is only a generalized term for the South Rim forest, sometimes called the Coconino forest, on the Coconino Plateau.]

71 *Neoantistea coconino* Chamberlin & Ivie, 1942

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

KAIBAB INDIAN RESERVATION

Kanab Wash, at southern boundary of Kaibab Indian Reservation

119 *Dipodomys ordii cupidineus* Goldman, 1924

Pipe Spring (½ mile north of)

46 *Opuntia aurea* Baxter, 1933

KAIBAB NATIONAL FOREST, TUSAYAN RANGER DISTRICT

[see also "Kaibab Forest (south, indiscriminated)"]

Arizona Route 64, junction of road to Anita

[road junction coordinates ca. 35.861° N, 112.134° W]

171 *Cinara poketa* Hottes, 1956

Tusayan (3 km south of)

[locality is on the Kaibab National Forest on Arizona Route 64]¹⁴

20 *Orbilina phanosoma* Baral & [G.] Marson *in* Baral, Weber & Marson, 2020

25 *Orbilina ophiosoma* Baral & G. Marson *in* Baral, Weber & Marson, 2020

28 *Orbilina flexisoma* Baral & G. Marson *in* Baral, Weber & Marson, 2020

31 *Orbilina multitrapezoidea* Baral & G. Marson *in* Baral, Weber & Marson, 2020

32 *Orbilina calyptrata* Baral & G. Marson *in* Baral, Weber & Marson, 2020

¹⁴ See the LOCALITIES FOR TYPE MATERIAL IN GRAND CANYON NATIONAL PARK list for localities north of Tusayan that are within Grand Canyon National Park.

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

KAIBAB PLATEAU

[also as **Buckskin Mountains**]

including **KAIBAB NATIONAL FOREST, NORTH KAIBAB RANGER DISTRICT**

[see also "Kaibab Forest (north, indiscriminated)"]

Kaibab Plateau or **Buckskin Mountains** [without specific locale]

- 112 *Speyeria atlantis schellbachi* Garth, 1949
174 *Astragalus humistratus* var. *tenerrimus* Jones, 1895
176 *Bigelovia howardi* var. *attenuata* Jones, 1895
*329 *Lesquerella arizonica* Watson var. *nudicaulis* Payson, 1921
-

Kaibab National Forest [without specific locale but on North Kaibab Ranger District]

- 182 *Enderleinellus kaibabensis* Kim, 1966
-

Kaibab Plateau, North Rim of Grand Canyon [undiscriminated]

- 3 *Tipula (Lunatipula) kaibabensis* C. Alexander, 1946
-

Buckskin Mountains (mesa below)

- 177 *Laphamia congesta* Jones, 1895
-

Kaibab Plateau (northwest escarpment slope, 6700 feet)

- 248 *Morsea californica kaibabensis* Rehn & Grant, 1958
296 *Asidina rugicollis* Triplehorn & Brown, 1971
-

**Arizona Route 67, 3.2 km north of Grand Canyon National Park boundary, T.34 N., R.3 E.,
Sec. 7**

- 164 *Castilleja kaibabensis* N. Holmgren, 1973
-

DeMotte Park

- 86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967
123 *Thomomys fossor kaibabensis* Goldman, 1938
164 *Castilleja kaibabensis* N. Holmgren, 1973
175 *Oenothera triloba* var. *ecristata* Jones 1895
-

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Dry Park

86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967

Fredonia (28 km (17.5 miles) airline distance east of), T41N, R2E, S29/30

[an area of Forest Service roads]

39 *Astragalus cremnophylax* Barneby var. *myriorrhaphis* Barneby, 1979

Fredonia (28 km east-southeast of Fredonia, 13 km NNW of Jacob Lake)

[along U.S. Route 89A]

17 *Orbilina purshiae* Baral & G. Marson in Baral, Weber & Marson, 2020

22 *Orbilina arizonensis* Baral & G. Marson in Baral, Weber & Marson, 2020

24 *Orbilina spermoides* Baral & G. Marson in Baral, Weber & Marson, 2020

26 *Orbilina maeandrina* Baral & G. Marson in Baral, Weber & Marson, 2020

27 *Orbilina multimaeandrina* Baral & G. Marson in Baral, Weber & Marson, 2020

30 *Orbilina macrodelphinus* Baral & G. Marson in Baral, Weber & Marson, 2020

Fredonia Sawmill (17 miles southeast of), along logging road to Ryan

313 *Astragalus pinionis* Welsh & Thorne, 1977

Hwy. from Jacob Lake to Lodge, Kaibab Forest

[Arizona Route 67, between Jacob Lake and Kaibab Lodge]

86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967

House Rock Canyon to Jacob Lake

164 *Castilleja kaibabensis* N. Holmgren, 1973

Jacob Lake

223 *Saxinis saucia kaibabiae* Moldenke, 1970

287 *Boletus barrowsii* Thiers & Smith in Thiers, 1976

288 *Suillus kaibabensis* Thiers, 1976

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Jacob Lake (near)

- 74 *Cordylanthus wrightii kaibabensis* Chuang & Heckard, 1986
297 *Hadena (Hadena) lafontainei* Troubridge & Crabo, 2002
-

Jacob Lake (northwest of)

- 108 *Coryphantha vivipara* var. *kaibabensis* Fischer, 1979
-

Jacob Lake (7.5 miles east of)

- 74 *Cordylanthus wrightii kaibabensis* Chuang & Heckard, 1986
-

Jacob Lake (south of), 37 km southeast of Fredonia

[on Arizona Route 67]

- 19 *Orbilina magnifica* Baral & G. Marson in Baral, Weber & Marson, 2020
-

Jacob Lake (18.6 miles south of, on Arizona Route 67)

- 258 *Lesquerella kaibabensis* Rollins, 1982
-

Jacob Lake (20 miles south of)

- 253 *Andrena (Scaphandrena) kaibabensis* Ribble, 1974
-

Kaibab Forest, near Grand Canyon National Park

- 86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967
-

Kaibab Lodge (3 km north of)

[on Arizona Route 67]

- 26 *Orbilina maeandrina* Baral & G. Marson in Baral, Weber & Marson, 2020
-

Kaibab Lodge (4 miles north of)

- 172 *Cicindela pusilla kaibabensis* Johnson, 1990
-

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Kaibab Lodge (8 miles north of)

172 *Cicindela pusilla kaibabensis* Johnson, 1990

Kaibab National Forest, 0.6 km east of Arizona Highway 67 just northeast of Forest Road 213 (36°30'38"N, 112°07'55"W)

[FR 213 intersects AZ 67 30.6 km south of Jacob Lake]

48 *Branchinecta kaibabensis* Belk & Fugate, 2000

Kaibab National Forest, Forest Road 293, 36.40806° N, 112.26692° W

[ca. 7.3 miles west of Kaibab Lodge]

42 *Morchella kaibabensis* Beug, T.A. Clem. & T.J. Baroni *in* Baroni *et al.*, 2018

Lookout Canyon Road (422D), 5.6 km from (northwest of) Grand Canyon Highway (Arizona Route 67), T.35 N., R.2 E., Sec. 15

164 *Castilleja kaibabensis* N. Holmgren, 1973

Marble Flat

86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967

Marble Flat, just north of North Rim Ranger Station

164 *Castilleja kaibabensis* N. Holmgren, 1973

Nagle's Ranch¹⁵

146 *Ptelea saligna* Green, 1906

Nagle's Ranch¹⁵ (below, on edge of Buckskin Mountains)

178 *Laphamia gracilis* Jones, 1895

¹⁵ "Nagle's Ranch was about 60 miles south of Kanab, Utah, on the west slope of the Buckskin Mountains (i. e. the Kaibab Plateau), and was the first watering place on the old wagon road to the Grand Canyon from Kanab. [...] The present wagon road now ascends the plateau many miles

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Nagle's Ranch¹⁵ (road to)

174 *Astragalus humistratus* var. *tenerrimus* Jones, 1895

Ryan Ranger Station (near)

45 *Papilio indra kaibabensis* Bauer, 1955

VT Meadows, 6.5 km south of Kaibab Lodge, T.34 N., R.3 E., Sec. 7

164 *Castilleja kaibabensis* N. Holmgren, 1973

VT Park

86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967

164 *Castilleja kaibabensis* N. Holmgren, 1973

VT Ranch

70 *Tapinocyba kesimba* Chamberlin, 1948

VT Ranger Station

86 *Penstemon virgatus pseudoptutus* Crosswhite, 1967

164 *Castilleja kaibabensis* N. Holmgren, 1973

KANAB CANYON

Kanab Canyon (west rim, south of Water Canyon, in depression caused by breccia pipe collapse, T38N R3W NW¹/₄ SW¹/₄ sect. 8)

235 *Rosa stellata* Wooton subsp. *abyssa* Phillips, 1992

Kanab Canyon (west rim, in small drainage 30 m from edge, T38N R3W NW¹/₄ sect. 29)

235 *Rosa stellata* Wooton subsp. *abyssa* Phillips, 1992

farther north." (Kearney, Thomas H., and Peebles, Robert H. (and collaborators), 1942, Flowering plants and ferns of Arizona, *U.S. Department of Agriculture, Miscellaneous Publication 423*, p. 986.)

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

Kanab Canyon (west rim, T38N R3W sect. 30)

235 *Rosa stellata* Wootton subsp. *abyssa* Phillips, 1992

Kanab Wash "near the Colorado" [Arizona]

82 *Echinocactus polycephalus* var. *xeranthemoides* Coulter, 1896

LEES FERRY

Lees Ferry

179 *Astragalus kentrophyta* var. *coloradoensis* Jones, 1902

260 *Amsonia eastwoodiana* Rydberg, 1913

282 *Atriplex asterocarpa* Stutz, Chu & Sanderson, 1994

Lees Ferry (near)

291 *Perdita opacella* Timberlake, 1956

MARBLE CANYON

Navajo Bridge

11 *Myndus yuccandus* E. Ball, 1933

13 *Yucanda miniata* E. Ball, 1937

NAVAJO NATION (westernmost)

See also entries for Cameron (*above*). See also "Cedar Mountain" in the LOCALITIES FOR TYPE MATERIAL IN GRAND CANYON NATIONAL PARK list, noted as possibly being within the boundaries of the Navajo Nation.

The Gap

116 *Steatoda variata* Gertsch, 1960

LOCALITIES FOR TYPE MATERIAL FROM
NEAR GRAND CANYON NATIONAL PARK

The Gap (near)

160 *Cryptantha atwoodii* Higgins, 1974

Hot Na Na Wash, Marble Canyon

*323 *Nana arizonica* Crawford & Rink, 2024

Little Colorado River gorge

East rim of the Little Colorado River gorge, 17 mi W of Cameron, 1.5 mi NE of the terminus of Lee Canyon

East rim, river mile 23.5 from the confluence

South rim of Big Canyon 15 km E of its confluence with the Little Colorado River gorge, Navajo Nation

Northeast rim, river mile 26.8 from confluence

Hellhole Bend, northeast rim, River mile 33.5 from the confluence

*323 *Nana arizonica* Crawford & Rink, 2024

RED MOUNTAIN

Red Mountain, 35 miles northwest of Flagstaff on U.S. Route 180

73 *Mentzelia collomiae* Christy, 1997

INDEX TO NOMINATE TAXA

Names in **bold** indicate nominate taxa for which at least one locality reported for its types is within, or is with good probability from within, the present boundaries of Grand Canyon National Park.

The names are original combinations, as published by the authors. The taxonomic phylum is appended to each name and author. Refer to the bibliography and annotated checklist for details.

Red numbers at left indicate and cross-list the sequentially enumerated taxa in the bibliography (thus they reflect the alphabetical order by publication author). There are 335 species-level taxa listed in this checklist. The count in the first edition included No. 244a, added late, thus it is the 322nd taxon overall. The second edition adds Nos. 323–335, the numerals for which are prefixed by a star (e.g., ***323**). The publications in which the second-edition taxa appear are interleaved in the bibliography herein, but they will be found more quickly where they are listed separately in the section, "[Publications and Taxa Added in the Second Edition](#)".

- 163 **aaronrossii, Euphorbia** A. Holmgren & N. Holmgren, 1988 (Trachyophyta)
- 235 **abyssa, Rosa stellata** Wootton **subsp.** Phillips, 1992 (Trachyophyta)
- 159 *abyssi, Opuntia* Hester, 1943 (Trachyophyta)
- 183 **abyssus, Crotalus confluentus** Klauber, 1930 (Chordata)
- 198 **ackerti, Aspicularis** Kruidenier & Mehra, 1959 (Nematoda)
- 59 **aequalis, Orphilus** Casey, 1900 (Arthropoda)
- 278 *alliae, Megathymus* Stallings & Turner, 1957 (Arthropoda)
- 89 **ambivalens, Galium munzii** Hilend & Howell **subsp.** Dempster & Ehrendorfer, 1965 (Trachyophyta)
- 241 **americanus, Pilophorus** Poppius, 1914 (Arthropoda)
- 303 *amoena, Dalea* Watson, 1873 (Trachyophyta)
- 238 **angelica, Oreohelix yavapai** Pilsbry & Ferriss, 1911 (Mollusca)
- 64 **angustulus, Prionus** Casey, 1912 (Arthropoda)
- 87 **apache, Tibicen** Davis, 1921 (Arthropoda)
- 47 **apicata, Delphacodes** Beamer, 1948 (Arthropoda)
- 277 *aquilonalis, Vaejovis* Stahnke, 1940 (Arthropoda)
- 141 **argentea, Ptelea** Green, 1906 (Trachyophyta)
- 320 **arizonae, Cicindela rufiventris** **var.** Wickham, 1899 (Arthropoda)
- 149 **arizonense, Penicillium** Frisvad, Grijseels & J.C. Nielsen *in* Grijseels *et al.*, 2016 (Ascomycota)
- 100 **arizonense, Petalium bistratum** Say **var.** Fall, 1905 (Arthropoda)
- 22 **arizonensis, Orbilia** Baral & G. Marson *in* Baral, Weber & Marson, 2020 (Ascomycota)

INDEX TO NOMINATE TAXA

- 95 **arizonensis, Ripersia** Ehrhorn, 1899 (Arthropoda)
- *328 **arizonica, Argemone** Ownbey, 1958 (Trachyophyta)
- *333 **arizonica, Ericameria** Roberts, Urbatsch & Anderson, 2005
- 310 *arizonica, Lesquerella* Watson, 1888 (Trachyophyta)
- *323 *arizonica, Nana* Crawford & Rink, 2024 (Trachyophyta)
- 43 **arizonica, Protoventuria** M. Barr, 1989 (Ascomycota)
- 256 **arizonicus, Chrysotimus** H. Robinson, 1967 (Arthropoda)
- 128 *artipes, Astragalus* A. Gray, 1878 (Trachyophyta)
- 216 **artuflava, Chelinidea vittiger** Uhler **var.** McAtee, 1919 (Arthropoda)
- 282 **asterocarpa, Atriplex** Stutz, Chu & Sanderson, 1994 (Trachyophyta)
- *330 **asymmetricus, Cryptus** Pratt, 1945 (Arthropoda)
- 176 *attenuata, Bigelovia howardi* var. Jones, 1895 (Trachyophyta)
- 160 *atwoodii, Cryptantha* Higgins, 1974 (Trachyophyta)
- 251 *atwoodii, Eriogonum thompsonae* S. Wats. var. Reveal, 1974b (Trachyophyta)
- 46 *aurea, Opuntia* Baxter, 1933 (Trachyophyta)
- 239 **avus, Pupilla syngenes** Pilsbry & Ferriss, 1911 (Mollusca)
- 265 **barberi, Ochterus** Schell, 1943 (Arthropoda)
- 287 *barrowsii, Boletus* Thiers & Smith *in* Thiers, 1976 (Basidiomycota)
- 88 **basala, Ballana** DeLong, 1964 (Arthropoda)
- 68 **behlei, Aphonopelma** Chamberlin, 1940 (Arthropoda)
- 53 **benedicti, Erax** Bromley, 1940 (Arthropoda)
- 156 **betheli, Sonorella** Henderson, 1914 (Mollusca)
- 129 *biennis, Actinella* A. Gray, 1878 (Trachyophyta)
- 130 *bigelovii, Mirabilis* A. Gray, 1886 (Trachyophyta)
- 302 **blinni, Stygobromus** Wang & Holsinger, 2001 (Arthropoda)
- 91 **boreorarius, Thomomys bottae** Durham, 1952 (Chordata)
- 153 *bradybaughi, Hesperoernes* Harvey & Wynne, 2014 (Arthropoda)
- 309 *breviflorum, Androstephium* Watson, 1873 (Trachyophyta)
- 62 **brevipennis, Discodemus** Casey, 1908 (Arthropoda)
- 35 **bryantii, Astragalus** Barneby, 1944 (Trachyophyta)
- 185 **bullatus, Deraeocoris** Knight, 1921 (Arthropoda)
- 90 **bunni, Bruchomorpha** Doering, 1939 (Arthropoda)
- 32 **calyptrata, Orbilia** Baral & G. Marson *in* Baral, Weber & Marson, 2020 (Ascomycota)
- 270 **canonicus, Melanoplus** Scudder, 1897 (Arthropoda)
- 54 **canyonensia, Aphelonema convergens** **var.** Bunn, 1930 (Arthropoda)
- 267 **canyonensis, Mentzelia** Schenk, Hodgson & Hufford, 2013 (Trachyophyta)
- 94 **capitata, Oreocarya** Eastwood, 1937 (Trachyophyta)
- 16 **casa, Athysanella (Gladionura)** Ball & Beamer, 1939 (Arthropoda)
- 314 **castus, Polymedon** Wheeler, 1899 (Arthropoda)
- 225 **cavicola, Archeolarca** Muchmore, 1981 (Arthropoda)
- 118 *celsus, Dipodomys microps* Goldman, 1924 (Chordata)
- 98 **circinans, Puccinia** J. Ellis & Everhart, 1900 (Basidiomycota)

INDEX TO NOMINATE TAXA

- 136 **cissodes, Schmaltzia** Greene, 1905 (Trachyophyta)
- 319 **clarigaster, Camponotus acutirostris** Wheeler, 1915 (Arthropoda)
- 187 **clavicornis, Ceratocapsus** Knight, 1925 (Arthropoda)
- 259 **coccinatus, Penstemon** Rydberg, 1909 (Trachyophyta)
- 71 *coconino, Neoantistea* Chamberlin & Ivie, 1942 (Arthropoda)
- 232 **cocytus, Ptomaphagus** Peck, 1973 (Arthropoda)
- 154 *cohni, Tuberochernes* Harvey & Wynne, 2014 (Arthropoda)
- 73 *collomiae, Mentzelia* Christy, 1997 (Trachyophyta)
- 113 **coloradensis, Misumenops** Gertsch, 1933 (Arthropoda)
- 179 *coloradoensis, Astragalus kentrophyta* var. Jones, 1902 (Trachyophyta)
- 280 **coloradoensis, Helix (Arionta)** Stearns, 1890 (Mollusca)
- 243 **confertiflora, Oenothera** Raven, 1962 (Trachyophyta)
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BACK COVER General view of the type locality of *Ostrya knowltonii* Coville, 1894 (Betulaceae), looking downward at the top of the Old Hance Trail. Photo by Nancy Brian during the visit that rediscovered the locality, 23 May 1997. (See front cover for Coville's original illustration of the type specimen.)

