

INDEX CALIFORNICAE  
<https://herbarium.ucdavis.edu/crosswalk.aspx>

## INTRODUCTION

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This database is an update and expansion of the California plant synonymy called 'Hrusa's Crosswalk' (or "XWalk") that has for the past two decades been searchable via the Herbarium of the University of California Berkeley Jepson Interchange. 'Index Californicae' is first and foremost a "Crosswalk" update of "accepted names" that would more closely comport with those in the Jepson Manual, ed. 2. Divergences are discussed below.

The first iteration, begun in 1993, was compiled mostly from printed secondary sources. By 2011 when this update was begun, the greatly increased availability of online data and literature allowed a name update to become a more comprehensive review. It was now electronically possible to confirm publication, type citations, synonym or replacement name citations, and track type and name citations back as necessary to their original applications. It was also possible to view a large number of the type specimens to which these plant names were attached.

The result is, hopefully, a resource for systematists, plant ecologists, and others whose work brings them into contact with older plant nomenclature. For systematists doing revisionary studies, it provides useful information about available epithets, nomenclatural priorities, and the location of type specimens. As to the study of intraspecific variation, it can provide not only potential available epithets, but a window into the geographic patterns of noticed and described regional variants.

The 'Index Californicae' has its information gleaned from multiple non-associated sources. These were examined, interpreted, and hand entered by the author. It is thus inevitable that this 'Index' contains some incorrect, or confusingly worded statements. Due diligence should be taken before citing verbatim any statements found herein. The author encourages those with deeper knowledge of particular groups to contact him by email to discuss corrections, suggestions, or updates.

Brackets [ ] are here and there used in both the TYPES and NOTES to indicate information provided by the author. These may be clarifications, additions or corrections to the data such as a corrected county etc., or other comments.

An information PDF that discusses the sources of and criteria used to establish a names inclusion in the 'Index', along with other explanatory materials is available on request.

The 'Index Californicae' currently contains 35,859 records.

## SOURCES

The 'Index Californicae' contains a 'SOURCE' reference at the end of each name record. Each is of course not the only, or even a complete, source of information available for that name. As cited, the 'SOURCE' reference was a place where the name was found, or other useful information was found about that name (and probably others), but it is not a synopsis for that name.

## "CURRENT" or "ACCEPTED" NAMES

The primary source of these names is 'The Jepson Manual ed. 2, 2012', followed by updates given in The Jepson Globe, or in the Jepson eFlora. Other names cited as "accepted", that are not used as 'currently accepted' in one of those three references, are infrequent, but are, 1: The result of

nomenclatural analysis in the course of this compilation that indicated a correction was necessary, 2: New taxa. These are mostly the result of new finds or proposals. Names proposed post-Jepson Manual ed. 2 and updates, are usually, but not always, included among the “accepted” names. A critical analysis may have found distinction of the newly proposed taxon less than convincing. Authorship corrections are more frequent, although still rare.

#### THE TYPE DATA

Type citations in the Index are generally straightforward, copied or slightly paraphrased from the type specimen label, or the protologue if the specimen was not visible electronically. However, many 18th and 19th century references, although not exclusively the older ones (e.g. E.L. Greene in *Flora Franciscana*, 1891) proposed names without citation of specimens or collectors, but instead gave habitat or regional occurrence information. If still extant the original specimens from which the descriptive and distributional data were taken may be inseparable from other specimens of the proposed species in the author’s herbarium or elsewhere. Alternatively the original plant material may have been dispersed, lost, or destroyed. Types whose absence may be the result of known destructive instances are often noted, and for these names, lectotypes or neotypes may or may not have been subsequently designated. Because it is not feasible in a project of this scope to examine all the potentially pertinent literature for citations of or designations of a lectotype choice, there are syntype or original material lists for some names without a type specimen identified. For Linnaean names listed in the Linnaean Plant Name Typification Project, Nat. History Museum, London, [[www.nhm.ac.uk/research/projects/linnaean-typification/database](http://www.nhm.ac.uk/research/projects/linnaean-typification/database)] a lectotype and sometimes epitype is given. Some lectotypes cited may have been preceded by a published typification of the same or other gathering, unknown to this author.

**HOLOTYPES:** An herbarium is cited if a specific specimen can be interpreted to be the holotype. In this catalogue that is the specimen cited at the herbarium first listed - if the remainder of the herbarium abbreviations are listed as “isotypes”. For example, “(A.A. Heller BKL, isotypes GH, NY)”. The sheet at BKL is considered the holotype. If no isotypes are indicated for a list of herbaria, it means it is not clear what herbarium houses the holotype, or a step 2 lectotypification has not been identified. Even if not cited with enough detail to unequivocally indicate a specific specimen, material at the herbarium where the author primarily worked and that matches the collector and protologue, is considered the ‘holotype’. Accession numbers are associated with herbarium citations only if it is necessary and possible to separate the isotype(s) and the holotype. This was done inconsistently and when present is generally provided only if a third party has so designated or cited specific specimens.

**SYNTYPES:** Listed individually as cited in the protologue. Where specimens can be located those herbaria are also given. In exceptional cases where a long list of exsiccata comprise the syntype material, a selection only may be listed. These will generally be those syntypes from one of the states for which plant names are generally included in this ‘Index’ (California, Oregon, Washington, Nevada, Arizona), or sometimes only those from California – depending upon the number of specimens listed. These are to be distinguished from original materials clearly used, but were not cited in the descriptive protologue. If a lectotype has been designated, that specimen is cited as such. In that case, all associated syntypes, if known, are also listed. If there is information as to the actual identities of individual syntypes, (if different than the lectotype), this is generally provided under the ‘NOTES’. Conflicts between different lectotypifications are also discussed under NOTES.

**ORIGINAL MATERIAL:** These are specimens found in the taxon author’s herbarium or annotated as type material, and where no type material was designated in the protologue. These are specimens that were likely available to the author, (although these may or may not have been annotated by the author), and were collected and (probably) in front of the author before the protologue was written or published.

LECTOTYPES and NEOTYPES: These designated specimens are cited as such, and the place of lecto- or neotypification (where known) is given under NOTES. It is unfortunate that annotations on syntype, original, or other specimen material that appears to indicate a specific sheet as lectotype or isolectotype, frequently do not include the published place of lectotypification. In some cases these publications were located independently, but for many names the published place of lectotypification remains unknown. These are nevertheless cited in the 'TYPE' data as "lectotype", but in the 'NOTES' it is indicated that the annotation was "without ref." Some of these are genuine lectotypes; others may have indicated intent on the part of the annotator but the lectotypification was never formally completed. Some also may have been cited only in a dissertation or thesis. As indicated in the International Code of Nomenclature (Melbourne), Art. 9.9, citations of individual syntype or original materials as "holotype" are correctable as lectotypifications. These are usually indicated.

AUTONYMS: Autonyms are excluded from the synonym list. Where the priority of a name is determined by the creation of an autonym (ICN Art. 26.3), the date and place of the autonym production is given. Otherwise, the binomial when first proposed is considered to represent the typical form.

MISCELLANEOUS: If the synonymized name was proposed as a quadrinomial (e.g. Aster Q subsp. X var. Y) two trinomials are listed: "Aster Q subsp. X" and "Aster Q var. Y".

**"Not located"** in this work means simply that an image or other data derived from an actual specimen known to be present in an herbarium, has not been located. It does not mean that the type material has been lost or even that the electronic information does not exist. This compiler may have simply overlooked it.

#### MISAPPLIED NAMES

These are cited, following the specific or intraspecific epithet, as "auct., non". Misapplications are derived from various sources. First and foremost are those cited in a recent major work, such as The Jepson Manual ed. 1 (1993) or ed. 2 (2012). The majority of misapplications cited in one of the recent Jepson Manual eds., can generally be tracked back to P.A. Munz & D.D. Keck, "A California Flora", 1959. Misapplications cited in Munz frequently go back to W.L. Jepson's "Manual of Flowering Plants of California" (1923-25), or his "Flora of California" (1909-1943). In those references, cited misapplications may go back to Brewer and Watson's "Botany of California", 1876-1880. Such old misapplications are not as consistently cited. The largest number from the 'Botany of California' are in the genus Carex, where W. Boott attempted, more or less successfully, to name the Californian species known at that time. As some of Boott's misapplied names have continued to appear in synonym lists or as current names, they are here included. An attempt was made to provide at least one place of misapplication for every cited misapplied name, although many have been misapplied serially. Exceptions are a few names given as misapplied in Munz' A California Flora; these are included even though the place of use of that name could not be identified. Even more rarely cited are misapplications from earlier uses such as Torrey and Gray's two volume Flora of North America (1838-1842).

Frequently names are both "current or accepted" and have been misapplied to another taxon (or taxa) also present in California. This is generally commented upon in the "NOTES". Such a situation usually reflects a recently segregated or described taxon that would have earlier been included [in the cited reference] under the broader name.

#### ACKNOWLEDGEMENTS

There are many institutions whose databases were critical to the completion of the Index. These are:

Biodiversity Heritage Library ([www.biodiversitylibrary.org](http://www.biodiversitylibrary.org)).

JSTOR, Global Plants ([about.jstor.org/content/global-plants](http://about.jstor.org/content/global-plants)).  
Google Books (<https://play.google.com/books>).  
HathiTrust Digital Library ([babel.hathitrust.org/cgi/mb](http://babel.hathitrust.org/cgi/mb)).  
Biblioteca Digital, Real Jardín Botánico CSIC ([bibdigital.rjb.dsic.es/ing/](http://bibdigital.rjb.dsic.es/ing/)).  
Missouri Botanical Garden Tropicos ([www.tropicos.org/Home.aspx](http://www.tropicos.org/Home.aspx)).  
International plant names index, "IPNI". ([www.ipni.org/ipni/plantnamesearchpage.do](http://www.ipni.org/ipni/plantnamesearchpage.do)).  
Kew Royal Botanical Gardens. Type data and images: ([apps.kew.org/herbcat/gotoSearchPage.do](http://apps.kew.org/herbcat/gotoSearchPage.do)).  
The Linnaean type project, Natural History Museum of London. Type data, some images: ([www.nhm.ac.uk/research-curation/research/projects/linnaean-typification/database/](http://www.nhm.ac.uk/research-curation/research/projects/linnaean-typification/database/)).

Additional critical type or bibliographic data came through the following. For type specimens, images and data are usually also in JSTOR Global Plants.

Thank you to:

The Brooklyn Botanic Garden Herbarium (BKL), for providing a list of Heller's type collections housed there.

California Academy of Sciences, including the Dudley Herbarium (DS/CAS). Type images: ([researcharchive.calacademy.org/research/botany/coll\\_db/index.asp](http://researcharchive.calacademy.org/research/botany/coll_db/index.asp))

Consortium of California Herbaria ([ucjeps.berkeley.edu/consortium/](http://ucjeps.berkeley.edu/consortium/)); contains type data for holdings at GH, NY, RM, UTC, UNM, POM, RSA, DAV, DS, CAS, US. Except for UNM and UTC, those institutions images are also in JSTOR Global Plants.

Gray Herbarium, Harvard University Herbaria (GH). Type data & images: ([kiki.huh.harvard.edu/databases/specimen\\_index.html](http://kiki.huh.harvard.edu/databases/specimen_index.html))

New York Botanical Garden, (NY). Type images: ([sciweb.nybg.org/science2/hcol/vasc/index.asp.html](http://sciweb.nybg.org/science2/hcol/vasc/index.asp.html))

Yale University type catalog, (YU). Type data & images: ([peabody.yale.edu/collections/search-collections?bot](http://peabody.yale.edu/collections/search-collections?bot)).

Smithsonian Institution Herbarium (US). Type images: ([collections.mnh.si.edu/search/botany/?ti=3](http://collections.mnh.si.edu/search/botany/?ti=3)).

University of California, Berkeley Herbarium (UC). Type images: ([ucjeps.berkeley.edu/db/types/imaged\\_types/html](http://ucjeps.berkeley.edu/db/types/imaged_types/html)).

University of Colorado, Boulder. Type data: (<https://cumuseum.colorado.edu/Research/Botany/Databases/typeSpecimens>).

Rocky Mountain Herbarium, (RM) Type images: ([www.rmh.uwyo.edu/data/search.php](http://www.rmh.uwyo.edu/data/search.php)).

Consortium of Northwest Herbaria ([www.pnwherbaria.org/data/search.php](http://www.pnwherbaria.org/data/search.php)). Type data and some images.

Naturalis Biodiversity Center, Seed Lists, Guide to the plant species descriptions published in seed lists from Botanic Gardens ([seedlists.naturalis.nl/content/](http://seedlists.naturalis.nl/content/)).

Although the author frequently consulted with specialists on both nomenclatural and taxonomic matters there were many situations where the taxonomic or nomenclatural decision rested upon the judgment of the author. It is certain that in some instances there are alternative interpretations to that provided here. Individuals who provided advice and/or information are thanked profusely. Some tolerated repeated queries over many years. Kanchi Gandhi kindly informed the author when his application of nomenclatural rules ran afoul, but he was nevertheless not consulted for every unclear instance, and errors are to be attributed to the Index author. In the early months Jeff Greenhouse advised on some nomenclatural matters. Robert Rhode provided considerable assistance in the acquisition of hard-to-access literature. Thank you to Dick Moe, for his implementation of the web interface for the original XWalk data. Michael Vincent assisted with interpretation of *Trifolium* types. Bruce Baldwin kindly reviewed parts of the Asteraceae. Dan Potter and Ellen Dean at UC Davis were instrumental in providing for the author after leaving the university and joining State of California botanical service, a continuing status that allowed access to the UC electronic resources – a necessary status that was denied through the State. Hannah Begley at JSTOR Global Plants was particularly helpful in providing the author with access to their type image databases, and also

assisted in the process of incorporating the author's own types, and others at CDA, into Global Plants. Robert Price (Brassicaceae, Coniferophyta) provided discussion about these particularly complicated groups, in addition to general nomenclatural advice.

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