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Botanical Activities at UNM Herbarium

Botanical Activities at The University of New Mexico Herbarium (UNM)

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The UNM Herbarium (acronym UNM) is a division of the Museum of Southwestern Biology which is housed in the Department of Biology at the University of New Mexico. The herbarium was established in 1928 with the arrival of Edward F. Castetter, professor and chair of the Department of Biology. When Castetter arrived, there was a small collection of approximately 150 mounted specimens, mostly collected by E.O. Wooton, P.C. Standley and O.B. Metcalfe. Between 1928 and 1953, Castetter developed the herbarium in addition to conducting a series of studies in ethnobotany. Ray C. Jackson (curator from 1953-1958) worked in areas of cytogenetics and systematics. William C. Martin, during his term as curator (1958-1989) co-authored "A Flora of New Mexico". Since 1990, Timothy K. Lowrey has been curator while conducting biosystematic research on the Asteraceae. The herbarium contains more than 92,000 mounted specimens, providing researchers and students with a thorough representation of the floristic diversity in New Mexico and the Southwest. The majority of the division's holdings consist of flowering plants from the Southwest, with an emphasis on the vascular plants of New Mexico. Among the important collections are the Cactaceae, with more than 2,500 specimens. The herbarium also houses a seed, lichen, moss and teaching collection, in addition to a type collection of 125 specimens. The herbarium is the repository for voucher specimens of threatened and endangered plants collected by botanists from the New Mexico Heritage Program and the New Mexico State Forestry Department. Herbarium staff maintain a number of resources available on the World Wide Web, including the UNM Herbarium's home page and the Carnivorous Plant Archive (for the International Carnivorous Plant Society). Other resources developed by herbarium staff and available on the UNM Herbarium home page include directories containing e-mail and mailing addresses for Plant Taxonomists (PTO), Herbaria (HOL) and Collection Managers (CMO) throughout the world. The UNM Herbarium home page URL address is: http://biology.unm.edu/~herb/. The Museum of Southwestern Biology has outgrown its space and recently acquired a new location adjacent to the Department of Biology. Renovation is scheduled, and the herbarium and other divisions of the Museum of Southwestern Biology will relocate within the next two years. The renovated

facility will be equipped with compactors to accommodate the projected growth of each division for a minimum of 20 years. UNM Research Activities Herbarium staff and student research focuses on floristic research in New Mexico, genetic diversity analyses of rare and endangered plants, biosystematic and molecular systematic studies of vascular plants in the Pacific Basin including Oceania and Australasia, and evolutionary genetics of adaptive radiation in the Asteraceae. Tim Lowrey's research focuses on biosystematic and molecular studies of the Asteraceae, particularly on Tetramolopium and related genera in Australasia and the Pacific. Currently, Tim is involved in a number of studies, including evolutionary genetics of adaptive radiation in Tetramolopium (with R. Whitkus, UC Riverside), molecular systematics of Tetramolopium and Vittadinia (with C. Quinn, University of New South Wales), genetic diversity of Larrea in the Chihuahuan Desert, flora of the Sandia and Manzano Mountains, and biosystematic studies of Townsendia. Patricia Barlow's dissertation research involves the taxonomy of the Cirsium arizonicum complex (sensu Moore & Frankton). Despite the Arizona name, this group of thistles also grow in Colorado, Utah, Nevada, Texas, and New Mexico. This group is united by narrow capitula and short styles, which may be an adaptation to hummingbird pollination. Patricia's primary evolutionary question concerns the cause and maintenance of species complexes in nature. Chris Frazier has worked on conservation and community ecology of the chaparral, coastal sage scrub and vernal pool habitats in southern California. His dissertation research focuses on the ecological and evolutionary significance of natural hybridization. Currently, Chris is looking at the relationship between hybridization, reproductive biology and ecological specialization in tropical pitcher plants (Nepenthes). His New Mexico interests include the systematics of Philadelphus and the Onagraceae. Jane Mygatt's thesis research focuses on the conservation and population genetics of the western nettle, Hesperocnide, a genus of two morphologically similar but geographically disjunct annual species. The distribution pattern is unusual in that H. tenella is prevalent throughout much of California and northern Baja California, while H. sandwicensis is reported only on the big island of Hawaii. This research will assess the amount of genetic variation between these species, while exploring the origins of, and genetic variability in H. sandwicensis, a proposed endangered species on the island of Hawaii. Steven Yanoff's thesis research will focus on the present and past vegetation and geomorphology of the Chihuahuan Desert. Steven has been an employee of the New Mexico Natural Heritage Program for the past two years and has worked on a floristic inventory, vegetation community analysis and satellite image-based vegetation map of the mountains and lowlands of the Tularosa Basin. David Bleakly, a research associate of the herbarium, is working in conjunction with a variety of researchers on "A Flora of the Sandia and Manzano Mountains." David's thesis research centered on the floristics of El Malpais National Monument. In addition to an interest in the plants of El Malpais National Monument, current projects include a guide to the common plants of the Sandia Mountains and an illustrated guide to the plant families of the Southwest.

Key to the Taxa of Cercocarpus in New Mexico

[Editor's Note: Bob Denham is generously making available prior to publication some of his findings on New Mexico species of Cercocarpus. No new taxa or nomenclatural

combinations are formally proposed herein, but anticipated novelties are indicated as “var. nov. in prep.” and will be officially described in a later publication.]

KEY TO THE TAXA OF CERCOCARPUS (MOUNTAIN MAHOGANY) IN NEW MEXICO

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The author and James Henrickson (California State University at Los Angeles) have undertaken a revision of the genus Cercocarpus (Rosaceae), the first parts of which have been completed and are to be published shortly. This article for the "New Mexico Botanist" presents a key, excerpted and adapted from future publications, to the taxa which occur in New Mexico; five such taxa are recognized, four of which are common here. The fifth, Cercocarpus intricatus, more widespread in Utah and Nevada, has been collected in this state at only one location in San Juan County. The New Mexico distributions of the other four taxa generally coincide with the floristic provinces outlined in the introduction of Martin & Hutchins' "New Mexico Flora". Thus, we have a Chihuahuan taxon, C. breviflorus var. breviflorus; a Mogollon taxon, C. breviflorus var. nov. in prep.; a Great Plains taxon, C. montanus var. argenteus; and a taxon spanning the Rocky Mountain and Great Basin floristic provinces, C. montanus var. montanus. The taxon from the Mogollon floristic province, Cercocarpus breviflorus var. nov. in prep., is essentially equivalent to the entity which Kearney & Peebles (1951) refer to as C. breviflorus var. eximius. However, the epithet eximius is based on material that falls within the morphological and geographical range of C. breviflorus var. breviflorus and is therefore a synonym of that taxon. Since the epithet eximius has been misapplied to the more western variety of C. breviflorus, the publication of a new name for that variety is required; it will be named for its distribution in the Mogollon region of New Mexico and Arizona. Although the names C. paucidentatus and C. montanus var. paucidentatus have been used for New Mexico plants (Martin & Hutchins 1980, Wooton & Standley 1915), the epithet paucidentatus properly applies to a distinct third variety of C. breviflorus from San Luis Potosi and Hidalgo, Mexico, . The epithet argenteus has, at times, been misapplied to any Cercocarpus with denser than average leaf vestiture. For example, plants from the higher elevations in the Guadalupe Mts., treated as C. montanus var. argenteus in Correll & Johnston (1970), fall within the circumscription of C. montanus var. montanus. Correct to type, the combination C. montanus var. argenteus applies to a taxon whose range extends only into the northeastern part of New Mexico. When using the following key, it is important to keep in mind several trends in the vegetative variability of Cercocarpus in response to environmental factors. Leaves from plants in mesic and/or shaded situations are longer and proportionately broader than the norm. Leaves on long-shoots are usually longer and proportionately narrower than those on short-shoots. Leaves on drought-stressed individuals are small and relatively broad. The vestiture of the long-shoots is often more spreading than that of the mature growth. No hybridization between species has been observed in New Mexico, except possibly for one specimen from Lincoln County; where sympatric, species are elevationally segregated. Earlier reports of extensive hybridization in Cercocarpus (F. Martin 1950) have been the result of attributing variation in leaf size, shape and dentition to hybridization rather than

to environmental factors. In general, Cercocarpus montanus can be distinguished from C. breviflorus by its thin, winter-deciduous leaves and its relatively large flowers and fruits versus the thicker, sub-coriaceous leaves and the smaller flowers and fruits of C. breviflorus. The leaves of C. montanus are also usually larger, broader and more prominently toothed than those of C. breviflorus. In this key the couplets are longer than is standard, in lieu of full descriptions.

1a. Anthers glabrous. Leaves more than 4 times as long as wide, coriaceous, with revolute margins, often resinous. [North-western corner of the state in San Juan Co.] ..... C. intricatus S. Wats.

1b. Anthers hirsute. Leaves less than 4 times as long as wide; either sub-coriaceous and evergreen, or thin and winter-deciduous. [Widely distributed throughout the state.].

2a. Leaves thin and winter-deciduous; typically ± ovate-trullate, varying to obovate-orbicular; coarsely crenate or serrate-dentate on the apical half of the leaf; usually more than 1.8 cm. long. Flowers and fruits relatively large; hypanthial tube, in fruit, 9 to 15 mm long and 1.5 to 3.0 mm wide (before splitting); fruiting hypanthium plus pedicel 12 to 20 total length, if shorter (or near the short end of the range) then the hypanthium usually 3 or more times longer than the pedicel; fruiting style 4 to 8 cm. long. [Northern 2/5 of the state; also at higher elevations from the Sandia Mts. south-southeast to the Guadalupe Mts.] ..... C. montanus Raf.

3a. Fine, curled-twisted trichomes on intercostal areas of lower leaf surface long, numerous and ± ascending-spreading; thicker, straight trichomes on primary and secondary veins of lower leaf surface antrorsely appressed; trichomes on upper leaf surface and hypanthium ± antrorsely appressed, similar to trichomes on primary and secondary veins of lower leaf surface. [Northeastern corner of the state in Union, Quay and Harding Counties; west into San Miguel Co. in the lower elevations near Las Vegas; introgressing somewhat into var. montanus as far west as the Sandia Mts.] ..... C. montanus Raf. var. argenteus (Rydb.) F.L. Martin

3b. Fine, curled-twisted trichomes on intercostal areas of lower leaf surface short, appressed, forming a dense tomentum; thicker, straight trichomes on primary and secondary veins of lower leaf surface varying from spreading to antrorsely appressed (even within populations); longer hairs sometimes also present on intercostal areas of lower leaf surface, but when present, similar to the thicker, straight trichomes on primary and secondary veins; trichomes on upper leaf surface and hypanthium varying from spreading to antrorsely appressed, but matching the trichomes on primary and secondary veins of lower leaf surface. [Northwestern and north-central parts of the state; on the western side of the state, as far south as the Datil Mts. in northeastern Catron Co.; also at higher elevations from the Sandia Mts. south-southeast to the Guadalupe Mts.] ..... C. montanus Raf. var. montanus

2b. Leaves moderately thick, sub-coriaceous and evergreen, although sometimes drought deciduous; usually rhombic-elliptic or cuneate-oblanceolate, sometimes obovate; entire or shallowly crenate-dentate near the leaf apex; usually less than 2.5 cm. long. Flowers and fruits relatively small; hypanthial tube, in fruit, 5 to 8 mm long and 0.7 to 2.0 mm wide (before splitting); fruiting hypanthium plus pedicel 6 to 13 mm in total length, if longer (or near the long end of the range) then the hypanthium usually 2.5 or less times longer than the pedicel; fruiting style 2.0 to 4.5 cm. long. Sometimes with spinescent branchlets. [Mostly in the southern, central and west-central parts of the state; at lower elevations when sympatric with C. montanus]
..... C. breviflorus A. Gray

4a. Leaves rhombic-elliptic or cuneate-oblanceolate; entire, or sometimes shallowly crenate-dentate near the leaf apex; upper surface pale to bright green, the translucent upper epidermis dulling the colors of the bundle sheath extensions and parenchyma tissues. Vestiture of the mature leaves and hypanthia usually appressed, rarely spreading. Hypanthium plus pedicel, in fruit, 5 to 10 mm in total length; fruiting style 2.0 to 3.5 cm. long. Shrubs, in xeric habitats 0.5 to 1.5 m. tall and intricately branched, often with spinescent or sub-spinescent branchlets; in mesic habitats to 5 m. tall, with an open irregular branching pattern and much branched from base. [Southern part of the state, from Hidalgo Co. and southern Grant Co. east to Eddy Co.; central part of the state, mostly east of the Rio Grande, as far north as Bernalillo Co.]
..... C. breviflorus A. Gray var. breviflorus

4b. Leaves usually cuneate-oblanceolate or obovate, uncommonly elliptic; typically shallowly crenate-dentate near the leaf apex or on the apical half of the leaf; upper surface of leaves dark green, the transparent upper epidermis revealing the colors of the bundle sheath extensions and parenchyma tissues. Vestiture of the mature leaves and hypanthia usually spreading, rarely appressed. Hypanthium plus pedicel, in fruit, 8 to 13 mm in total length; fruiting style 3.0 to 4.5 cm. long. Shrubs, generally 1.5 to 3 m. tall, sometimes to 6 m. tall; branches erect-ascending with sparse lateral branching; bush form narrowly obovoid-obconic or sub-columnar in the largest individuals. [Mostly in the western part of the state, from Grant Co. and western Sierra Co. north to southern McKinley Co. and Sandoval Co.; east of the Rio Grand in Santa Fe Co. and western San Miguel Co.; intergrading with var. breviflorus in Bernalillo Co. and Hidalgo Co.]
..... the Mogollon taxon, C. breviflorus A. Gray var. nov. in prep.

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Note: The third variety of Cercocarpus breviflorus, to which the epithet paucidentatus properly applies, occurs further south in San Luis Potosi and Hidalgo, Mexico.

New Plant Distribution Records

New Plant Distribution Records

New records for New Mexico are documented by the county of occurrence and the disposition (herbarium) of a specimen.

— Kelly W. Allred (Box 3-I, New Mexico State Univ., Las Cruces, NM 88003) .

Centaurea diffusa Lam. (Asteraceae): San Miguel County (NMCR).

Chloris submutica Kunth (Poaceae): Dona Ana County (NMCR). [This is the first record of this adventive species in New Mexico since 1947.]

Euphorbia peplus L. (Euphorbiaceae): Dona Ana County (NMCR).

Isatis tinctoria L. (Brassicaceae): Santa Fe County (NMCR).

— Bob Denham (3609 W. Jasmine, Las Cruces, NM 88005).

Opuntia chihuahensis Rose (Cactaceae): Luna County (UTEP). [Verification of Wooton & Standley's (Fl. New Mex.) report of this species in southern New Mexico.]

— Mosyakin (1996; see literature reports).

Salsola collina P.S. Pallas (Chenopodiaceae): unspecified occurrence in New Mexico.

— Robert Sivinski (P.O. Box 1948, Santa Fe, NM 87504).

Salix taxifolia Kunth (Salicaceae): Hidalgo County (pers. observation). [Additional record for this little known species.]

— Sivinski, et al. (1995; see literature reports).

Artemisia pygmaea A.Gray (Asteraceae): McKinley County (UNM).

Berteroa incana (L.) DC. (Brassicaceae): Sandoval County (UNM).

Cleomella palmerana M.E. Jones (Capparaceae): San Juan County (UNM).

Eleocharis bella (Piper) Svenson (Cyperaceae): Rio Arriba County (UNM).

Epilobium lactiflorum Hausskn. (Onagraceae): Taos County (UNM).

Hackelia ursina (Greene ex Gray) I.M. Johnston var. pustulosa (Macbr.) J.L. Gentry (Boraginaceae): Hidalgo County (UNM).

Huperzia lucidula (Michx.) Trev. (Lycopodiaceae): Santa Fe County (UNM).

Hypoxis hirsuta (L.) Cov. (Liliaceae): Cibola County (UNM).

Lycopodium clavatum L. (Lycopodiaceae): Sandoval County (UNM).

Malacothrix glabrata (D.C. Eat. ex A.Gray) A.Gray (Asteraceae): Hidalgo County (UNM).

Senecio amplectens A.Gray var. holmii (Greene) Harrington (Asteraceae): Taos County (UNM).

Senecio integerrimus Nutt. var. integerrimus (Asteraceae): Rio Arriba County (UNM).

Solidago speciosa Nutt. var. pallida Porter (Asteraceae): Los Alamos County (UNM).

— Richard Spellenberg (Box 3AF, New Mexico St. Univ., Las Cruces, NM 88003).

Allowissadula holosericea (Scheele) Bates (Malvaceae): Eddy County (NMCR).

Momordica balsamina L. (Cucurbitaceae): Dona Ana County (NMC).

— Victor Steinmann (Rancho Santa Ana Botanic Garden, 1500 N. College Ave., Claremont, CA 91711).

Euphorbia cyathophora Murr. (Euphorbiaceae): county unspecified (RSA).

— Gordon Tucker (New York St. Museum, 3132 CEC, Albany, NY 12230).

Cyperus strigosus L. (Cyperaceae): county unspecified (GH).

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Allred, K.W. 1996. **A working index of New Mexico plant names: Supplement 1:3.** Available from the author (Box 3-I, New Mexico St. Univ., Las Cruces, NM 88003). [Includes mosses.]

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Journals, Newsletters, Etc.

Native Plant Society of New Mexico Newsletter. Tim McKimmie, 1105 Circle Drive, Las Cruces, NM 88005.