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## NEW TAXA AND COMBINATIONS IN THE UTAH FLORA

Stanley L. Welsh<sup>1</sup>

ABSTRACT.— New taxa include: *Cryptantha cinerea* (Torr.) Cronq. var. *arenicola* Higgins & Welsh; *Physaria chambersii* Rollins var. *sobolifera* Welsh (Cruciferae); *Placelia demissa* Gray var. *minor* N. D. Atwood (Hydrophyllaceae); *Iris pariensis* Welsh (Iridaceae); *Astragalus preussii* var. *cutleri* Barneby and *Pediomelum aromaticum* (Payson) Welsh var. *tuliyi* Welsh (Leguminosae); *Abronia nana* Wats. var. *harrisii* Welsh (Nyctaginaceae); *Camissonia atwoodii* Cronq. (Onagraceae); *Habenaria zothecina* Higgins & Welsh (Orchidaceae); *Aquilegia formosa* Fisch. in DC. var. *fosteri* Welsh (Ranunculaceae). New nomenclatural combinations include: *Rhus aromatica* Ait. var. *simplicifolia* (Greene) Cronq. (Anacardiaceae); *Lomatium kingii* (Wats.) Cronq., *L. kingii* var. *alpinum* (Wats.) Cronq. (Apiaceae); *Cryptantha cinerea* (Torr.) Cronq. var. *laxa* (Macbr.) Higgins; *Mertensia lanceolata* (Pursh) DC. var. *nivalis* (Wats.) Higgins (Boraginaceae); *Opuntia erinacea* Engelm. var. *aurea* (Baxter) Welsh (Cactaceae); *Arenaria fendleri* Gray var. *aculeata* (Wats.) Welsh, *A. fendleri* var. *eastwoodiae* (Rydb.) Welsh, *Lychnis apetala* L. var. *kingii* (Wats.) Welsh, *Stellaria longipes* Goldie var. *monantha* (Hulten) Welsh (Caryophyllaceae); *Draba densifolia* Nutt. ex T. & G. var. *apiculata* (C. L. Hitchc.) Welsh, *D. oligosperma* Hook. var. *juniperina* (Dorn) Welsh, *Physaria acutifolia* Rydb. var. *stylosa* (Rollins) Welsh, *Thelypodopsis sagittata* (Nutt.) Schulz var. *ovalifolia* (Rydb.) Welsh (Cruciferae); *Lotus plebeius* (T. Brandg.) Barneby, *Lupinus polyphyllus* Lindl. in Edwards var. *annophilus* (Greene) Barneby, *L. polyphyllus* var. *humicola* (A. Nels.) Barneby, *L. argenteus* Pursh var. *fulvomaculatus* (Payson) Barneby, *L. argenteus* var. *palmeri* (Wats.) Barneby, *Pediomelum aromaticum* (Payson) Welsh, *P. epipsilum* (Barneby) Welsh, *Psoralidium lanceolatum* (Pursh) Rydb. var. *stenophyllum* (Rydb.) Welsh, and *P. lanceolatum* var. *stenostachyus* (Rydb.) Welsh (Leguminosae); *Mirabilis linearis* (Pursh) Hieron var. *decipiens* (Standl.) Welsh (Nyctaginaceae); *Camissonia boothii* var. *condensata* (Munz) Cronq., *C. boothii* var. *villosa* (Wats.) Cronq., *C. claviformis* (Torr. & Frem.) Raven var. *purpurascens* (Wats.) Cronq., *C. scapoidea* (T. & G.) var. *utahensis* (Raven) Welsh, *Oenothera caespitosa* var. *macroglottis* (Rydb.) Cronq., *Oe. caespitosa* var. *navajoensis* (Wagner, Stockhouse, & Klein) Cronq., *Oe. flava* (A. Nels.) Garrett var. *acutissima* (W. L. Wagner) Welsh, and *Oe. priniveris* Gray var. *bufonis* (Jones) Cronq. (Onagraceae); *Papaver radicans* Rottb. var. *pygmaeum* (Rydb.) Welsh (Papaveraceae); *Dodecatheon pulchellum* (Raf.) Merr. var. *zionense* (Eastw.) Welsh (Primulaceae); *Aquilegia flavescens* Wats. var. *rubicunda* (Tidestr.) Welsh, *Delphinium andersonii* Gray var. *scaposum* (Greene) Welsh, *D. occidentale* (Wats.) Wats. var. *barbeyi* (Huth) Welsh, and *Ranunculus andersonii* Gray var. *juniperinus* (Jones) Welsh (Ranunculaceae); *Purshia mexicana* (D. Don) Welsh and *P. mexicana* var. *stansburji* (Torr.) Welsh (Rosaceae); *Galium mexicanum* H. B. K. var. *asperrimum* (Gray) Higgins & Welsh (Rubiaceae); *Castilleja parvula* Rydb. var. *revelii* (N. Holmgren) N. D. Atwood and *C. rhexifolia* Rydb. var. *sulphurea* (Rydb.) N. D. Atwood (Scrophulariaceae).

Nomenclatural changes are a bookkeeping chore that precedes the publication of most floras. The following changes of names and newly proposed taxa are published here prior to the publication of the Utah Flora, a work that has been in progress for some 25 years. The names published here are the products of the authors of the proposed taxa and nomenclatural combinations. Dr. N. Duane Atwood, Dr. Larry C. Higgins, Dr. Arthur Cronquist, and Dr. Rupert C. Barneby have kindly consented to having names and taxa currently in ongoing manuscripts published here so as to facilitate their use in the Utah Flora, which is nearing completion. The names are to be cited under the authorship of the person providing the combination, and are not to be

cited as either "in" or "ex" Welsh. Each citation is considered as a separate proposal by the author of the constituent taxon or combination.

### ANACARDIACEAE

*Rhus aromatica* Ait. var. *simplicifolia* (Greene) Cronq. comb. nov. [based on *Rhus canadensis* var. *simplicifolia* Greene Bull. Torrey Bot Club 17: 13. 1890 (Greene sn., Peach Springs, Arizona, in 1889, at HDG!, may be presumed to be the holotype)].

### APIACEAE

*Lomatium kingii* (Wats.) Cronq. comb. nov. [based on: *Peucedanum graveolens*

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Wats. in King, Rep. Geol. Explor. 40th Parallel 5: 128. 1871; not Benth. & Hook. 1867. *Peucedanum kingii* Wats. Proc. Amer. Acad. Arts 22: 474. 1887 (Watson 463, Wahsatch and Uinta Mts.; holotype at US!; isotype at NY!).

*Lomatium kingii* (Wats.) Cronq. var. *alpinum* (Wats.) Cronq. comb. nov. [based on: *Peucedanum graveolens* var. *alpinum* Wats. in King, Rep. Geol. Explor. 40th Parallel 5: 129. 1871. (Watson 464, East Humboldt Mts., Nev.; isotype at NY!).]

## BORAGINACEAE

*Cryptantha cinerea* (Greene) Cronq. var. *arvicola* Higgins & Welsh var. nov. Ab *Cryptantha cinerea* var. *abortiva* et al. in caule simplici et inflorescentia capitato vel subcapitato differt.

TYPE: USA: Utah. Kane Co. T41S, R5W, S26, Johnson Canyon, Lone Pine Point, at 1830 m, in Navajo blow-sand, in a pinyon-juniper, ponderosa pine, manzanita, and yucca community, 6 June 1984, L. C. Higgins, S. L. Welsh, & K. Thorne 14296 (Holotype BRY; 2 isotypes previously distributed as *C. cinerea*).

ADDITIONAL REPRESENTATIVE SPECIMENS: Utah. Kane County, ca 22 or 23 mi S of Alton, 27 May 1965, A. Cronquist 10191; *ibid.*, Coral Pink Sand Dunes, 15 May 1984, N. D. Atwood 9636; *ibid.*, 5 May 1966, S. L. Welsh 5299. Washington Co., Pocket Mesa, 8 June 1983, L. C. Higgins and A. H. Barnum 13615 (all BRY).

Much material of this taxon passed previously under the epithet *multicaulis*, a name that is synonymous with var. *jamesii*. The name provided above allows recognition of this distinctive phase of the species.

*Cryptantha cinerea* (Greene) Cronq. var. *laxa* (Macbr.) Higgins comb. nov. [based on: *Oreocarya multicaulis* var. *laxa* Macbr. Contr. Gray Herb. 48: 35. 1916].

*Mertensia lanceolata* (Pursh) DC. var. *nivalis* (Wats.) Higgins comb. nov. based on *Mertensia paniculata* var. *nivalis* Wats. Rep. Geol. Explor. 40th Parallel 5: 239. 1871].

## CACTACEAE

*Opuntia erinacea* Engelm. var. *aurea* (Baxter) Welsh comb. nov. [based on: *Opuntia aurea* Baxter Calif. Cactus 27, 28, 1933].

## CARYOPHYLLACEAE

*Arenaria fendleri* Gray var. *aculeata* (Wats.) Welsh stat. nov. [based on: *Arenaria aculeata* Wats. in King, Rep. U. S. Geol. Explor. 40th Parallel 5: 40. 1871].

*Arenaria fendleri* Gray var. *eastwoodiae* (Rydb.) Welsh comb. nov. [based on: *Arenaria eastwoodiae* Rydb. Bull. Torrey Bot. Club 31: 406. 1904, and the autonym var. *eastwoodiae* established by A. *eastwoodiae* var. *adenophora* Kearney & Peebles J. Washington Acad. 29: 475. 1939].

*Lychnis apetala* L. var. *kingii* (Wats.) Welsh comb. nov. [based on: *Lychnis kingii* Wats. Proc. Amer. Acad. 12: 247. 1877].

*Stellaria longipes* Goldie var. *monantha* (Hulten) Welsh comb. nov. [based on: *Stellaria monantha* Hulten Bot. Notiser 1943: 265. 1943, and the autonym var. *monantha* established by *Stellaria monantha* var. *altocaulis* Hulten Bot. Notiser 1943: 267. 1943].

## CRUCIFERAE

*Draba densifolia* Nutt. ex T. & G. var. *apiculata* (C. L. Hitchc.) Welsh comb. nov. [based on: *Draba apiculata* C. L. Hitchc. Univ. Washington Publ. Biol. 11: 72. 1941, and the autonym var. *apiculata* established by *Draba apiculata* var. *daviesiae* (C. L. Hitchc. Univ. Washington Publ. Biol. 17 (2): 489. 1964].

*Draba oligosperma* Hook. var. *juniperina* (Dorn) Welsh stat. nov. [based on: *Draba juniperina* Dorn Madrono 25: 101. 1978].

*Physaria acutifolia* Rydb. var. *stylosa* (Rollins) Welsh stat. nov. [based on: *Physaria stylosa* Rollins, Contr. Gray Herb. 214: 14. 1984].

*Physaria chambersii* Rollins var. *sobolifera* Welsh var. nov. A *Physaria chambersii* Rollins sensu stricto in caudicibus ramificantibus evolutis et foliis angustioribus et acutis differt.

TYPE: USA: Utah. Garfield Co., Escalante Mtns., head of Sweetwater Creek, above (east) of Widtsoe, bristlecone pine community on Wasatch Limestone Formation, 2 Aug. 1981, N. D. Atwood 8164 (Holotype BRY; Isotype, one distributed previously as *P. chambersii*).

ADDITIONAL SPECIMENS: Garfield Co., T34S, R1W, S22, center of S1/4, Dixie NF,

Escalante Mtns., head of Escalante Canyon, 27.5 km 288 degrees from Escalante, 2,898 m, 60 degree slope, S exposure, with scattered Douglas-fir on raw, white, marl limestone, 20 June 1981, S. Goodrich 15666 (BRY); *ibid.*, T35S, R4/2W, S22, Pink Wasatch Formation, at west end of Red Canyon, road to Bryce Canyon National Park, in ponderosa pine-limber pine community, 8 June 1982, Mutz and Zarneske 82-70 (BRY).

This variety is partially sympatric with both varieties *chambersii* and *membranacea*, and the soboliferous condition might be an ecological response to creeping substrates. The recognition here calls attention of other workers to these plants and allows for further work.

*Thelypodopsis sagittata* (Nutt.) Schulz var. *ovalifolia* (Rydb.) Welsh comb. nov. [based on: *Thelypodium ovalifolium* Rydb. Bull. Torrey Bot. Club 30: 253. 1903].

#### HYDROPHYLLACEAE

Material of *Phacelia demissa* Gray from the Uinta Basin differs subtly in several ways from that elsewhere in Utah. The plants are finely but not densely glandular-puberulent throughout, not densely glandular-villous to glandular-puberulent; the corolla tube is bright yellow, not pale yellow; the sepals are fully twice as long as the capsule, not less than twice as long; the seeds are 4-12, not 10-16; and the plants average smaller. They are here designated as follows:

*Phacelia demissa* Gray var. *minor* N. D. Atwood var. nov. Similis var. *demissae* in forma sed in pubescentibus, corollae tubis flavis, sepalis longioribus, seminibus paucioribus et minoribus differt.

TYPE: USA: Utah, Uintah Co., T3S, R23E, S4, ca 1.6 km E of Red Fleet Dam, at 1,891 m, in a desert shrub community, on clay hills, 31 May 1979, N. D. Atwood 7247 (Holotype BRY; isotypes 2, distributed previously as *Phacelia demissa* Gray).

ADDITIONAL REPRESENTATIVE SPECIMENS: Utah, Uintah Co., Uinta Basin, Utah Highway 121, 10.6 km east of Lapoint, T5S, R20E, S4, 1,675 m, abundant on gravelly hills, 25 May 1978, N. H. Holmgren, P. K. Holmgren, and R. C. Barneby 8758 (BRY); *ibid.*, Orchard Creek, Dinosaur National Monument, Mancos Shale, Clay soil, Atriplex-Sarcobatus association, ca 1,455 m, 8 May 1955, S. L. Welsh 159 (BRY).

#### IRIDACEAE

*Iris pariensis* Welsh sp. nov. Planta similis *Iride missouriensis* sensu latissimo sed in foliis angustioribus (2.5-5 mm nec 3-12 mm) bracteas suboppositis et angustioribus (2-3 mm nec 6-12 mm) et rhizomatibus gracilioribus (5-10 nec 10-20 mm) differt.

Rhizomes less than 10 mm thick, clothed with shredded fibrous leaf bases; leaves several to many on both fertile stems and innovations, 2-5 mm wide, (4) 7-24 cm long, stramineous to brownish or purplish basally; flower stem 4 cm tall, with several sheathing leaves free almost throughout; flower 1; spathaceous bracts linear-attenuate, 2-3 mm wide, 5-6 cm long, parallel, subopposite, herbaceous; ovary ca 12 mm long; perianth apparently white, the tube 15 mm long; sepals ca 6 cm long and 1 cm wide; petals narrowly oblanceolate, ca 6 cm long and 8 mm wide; style branches ca 2.8 cm long, the crests ca 7 mm long; anthers ca 13 mm long; capsule unknown.

TYPE: USA: Utah, Kane Co., T43S, R1E, East Clark Bench, south of US Highway 89, sandy soil, found in a semidesert grass shrub community at 1,403 m, May 1976, Vane O. Campbell 42 (Holotype BRY).

This distinctive narrow-leaved *Iris* species is compared to *I. missouriensis* in the diagnosis, but its relationships apparently lie with those far to the west in the coastal states. More material will provide both a better description and a better possibility of determining probable relationships.

#### LEGUMINOSAE

*Astragalus preussii* Gray var. *cutleri* Barneby, var. nov., cum var. *preussii* legumine stipitato congruens sed ab ea statura pumila (caulibus 2-11 nec 10-40 cm altis) e radice annua ortis, foliolis paucis majusculis 5-11 et 12-20 x 7-12 mm usque, petalisque albidis pallide coeruleiscentibus (nec praeter alas saturate purpureis) diversa.

TYPE: U.S.A. Utah, San Juan Co.: common gravel outwash, Copper Canyon, 1 mi from mouth, 18 June 1938, Hugh C. Cutler 2283 (Holotype NY; isotypes, CAS, WIS); *ibid.*, bench between Copper Canyon and No Man's Mesa, 22 May 1985, N. D. Atwood 11073 (Paratypes BRY, NY).

In my monograph (Mem. New York Bot. Gard. 13: 576. 1964) the type of var. *cutleri* was noticed as unusual in the species as represented in Utah Canyonlands for few and large leaflets but was passed over as a set of seedlings showing only juvenile foliage. The rediscovery by Duane Atwood of the same plant, found in a uniform population of small monocarpic individuals such as are never seen elsewhere in the range of var. *preussi*, show that I misjudged the significance of the differences. Moreover, the flowers were described by Cutler as varying from white to pale blue and by Atwood as white when fresh, acquiring a bluish keel-tip when dried. In southeastern Utah the petals of var. *preussii* are consistently vivid purple except for pallid wingtips. In the same region the leaflets of the longer leaves are at once more numerous (17–23) and smaller (6–15 x 3–6 mm) than those of var. *cutleri*. Leaves of allopatric var. *laxiflorus* Gray may be similar to those of var. *cutleri* in size and number, but its pod is sessile, its stems taller, and its range of dispersal different.

*Lotus plebeius* (T. Brandg.) Barneby [based on: *Hosackia plebeia* T. Brandg., Proc. Calif. Acad. Sci. II, 2: 144. 1889 (Brandege s.n. 30 Apr 1889, "El Rancho Viejo" [near Calmalli, Baja California Norte, +/- 28° 15' N]].

*Lupinus polyphyllus* Lindl. in Edwards var. *ammophilus* (Greene) Barneby stat. nov. [based on: *Lupinus ammophilus* Greene Pitonia 4: 136. 1900].

*Lupinus polyphyllus* Lindl. in Edwards var. *humicola* (A. Nels.) Barneby comb. nov. [based on: *Lupinus humicola* A. Nels. Bull. Torrey Bot. Club 25: 204. 1898].

*Lupinus argenteus* Pursh var. *fulvomaculatus* (Payson) Barneby comb. nov. [based on: *Lupinus fulvomaculatus* Payson Bot. Gaz. (Crawfordsville) 60: 376. 1915].

*Lupinus argenteus* Pursh var. *palmeri* (Wats.) Barneby stat. nov. [based on: *Lupinus palmeri* Wats. Proc. Amer. Acad. Arts 8: 530. 1873].

*Pediomelum aromaticum* (Payson) Welsh comb. nov. [based on: *Psoralea aromatica* Payson Bot. Gaz. 60: 379. 1915, type from Bedrock Colorado, 17 June 1914, E. Payson 451 RM!].

*Pediomelum aromaticum* (Payson) Welsh var. *tuhyi* Welsh var. nov. Ab *Pediomelum*

*aromaticum* sensu stricto in floribus minoribus (6–7.3 mm nec 10–13 mm), calyce et dentibus minoribus (3.5–5.3 nec 10–11 mm et 1.6–2.9 mm nec 5–7 mm respecte), et caulibus decumbentibus differt.

TYPE: USA: Utah, San Juan Co., Rone Bailey Mesa, ca 17 km W of La Sal, T30S, R23E, S19, at 1,900 m, pinyon-juniper community, on mesa summit red siltstone of the Entrada Formation, 4 June 1985, S. L. Welsh & E. Neese 23500 (Holotype BRY, 4 isotypes to be distributed).

ADDITIONAL SPECIMENS: Utah, San Juan Co., T31S, R21E, S6, South Sixshooter Peak platform, Davis Canyon, at 1,708 m, on Moenkopi Formation in a shadscale community, 11 May 1982, S. L. Welsh, B. T. Welsh, and M. Chatterley 21092; *ibid.*, Rone Bailey Mesa, 1 July 1984, J. S. Tuhy 1580; *ibid.*, 4 June 1985, E. Neese & S. L. Welsh 16990; *ibid.*, 19 June 1985, L. C. & E. Higgins 15812 (all BRY).

This phase of *P. aromaticum* is remote from the known populations near Bedrock, Colorado (the type locality), and in the Fisher Towers area vicinity east of Moab. The plants differ in subtle ways besides those cited in the diagnosis. When viewed from afar they appear grasslike in patches between sparse junipers on a rimrock situation atop Rone Bailey Mesa. The plants tend to sprawl, rather than stand erect as in the typical variety. The extensive rhizome system is similar, however, to the typical material. The variety is named in honor of its discoverer atop Rone Bailey Mesa, Mr. Joel Tuhy.

*Pediomelum epipsilum* (Barneby) Welsh comb. nov. [based on: *Psoralea epipsila* Barneby Leaflet. W. Bot. 3: 193. 1943, type from 17 mi E of Kanab toward Jepson Spring, 6 June 1942, Ripley & Barneby 4832 CAS!].

*Pediomelum pariense* (Welsh & Atwood) Welsh comb. nov. [based on: *Psoralea pariensis* Welsh & Atwood Great Basin Nat. 35: 353. 1975, type from Bryce Canyon, 26 June 1975, S. L. Welsh & J. R. Murdock 12859 BRY!].

*Psoralidium lanceolatum* (Pursh) Rydb. var. *stenophyllum* (Rydb.) Welsh comb. nov. [based on: *Psoralea stenophylla* Rydb. Bull. Torrey Club 40: 46. 1913].

*Psoralidium lanceolatum* (Pursh) Rydb. var. *stenostachys* (Rydb.) Welsh comb. nov. [based on: *Psoralea stenostachys* Rydb. Bull. Torrey Club 40: 46. 1913].

## NYCTAGINACEAE

Most specimens of *Abronia nana* Wats. are strictly acaulescent and have best developed leaves mainly less than twice as long as broad. These represent var. *nana*. However, in the San Rafael Swell, Emery County, Utah, there occur caulescent plants with main leaves 2–4 times longer than broad. These are named as follows:

*Abronia nana* Wats. var. *harrisii* Welsh var. nov. Similis *Abroniae nanae* Wats var. *nanae* in anthocarpis floribus et bracteis sed in caulibus et foliis longioribus differt.

TYPE: USA: Utah. Emery Co., T20S, R11E, S22, San Rafael Swell, ca 1 mi S of San Rafael River campground, 1,586 m elev., Eriogonum-Astragalus-Hilaria community, 9 June 1979, J. Harris 364 (Holotype BRY; Isotypes, two distributed previously as *A. elliptica* A. Nels.).

ADDITIONAL SPECIMENS: Utah. Emery Co., T19S, R10E, S35, San Rafael Swell, on road to Wedge Overlook, ca 4 mi S of Buckhorn Flat crossroads, pinyon-juniper community, 13 June 1979, K. Despain 517 (BRY); do, T20S, R11E, S22, San Rafael Swell, Bottleneck Peak area, off the west side of Cottonwood Draw road, ca 2 mi S of Bridge Campground, 14 June 1979, K. Despain 564 (BRY). The plant is named after Dr. James Harris, student of the San Rafael Swell flora.

*Mirabilis linearis* (Pursh) Heimer var. *decipiens* (Standl.) Welsh stat nov. [based on: *Allionia decipiens* Standl. N. Amer. Fl. 21: 223. 1918].

## ONAGRACEAE

*Camissonia atwoodii* Cronq. sp. nov. Species sectionis Chylismae; herba annua, glandulosa-puberula, rotusta, usque ad 15 dm alta, caule excurrenter ramosa, foliis leviter basin versus dispositis, laminis subrotundis, irregulariter denticulatis, 4–6 x 2.5–5 cm; inflorescentia terminalis, laxa ramosa, floribus pedicellatis, petalis purpureis 7–14 mm longis leviter versus axem dispositis, staminibus 4 + 4, inaequalibus, declinatis; fructus 12–25 mm longi, divaricato-deflexi, pedicellis divaricato-deflexis 3–5 mm longis, seminibus 1.5–8 mm longis, in quoque loculo biseriatis.

TYPE: USA: Utah. Kane Co., Smoky Creek Dugway, ca 17 mi NE of Glen Canyon City, Straight Cliffs Formation, 28 August 1973, N. D. Atwood 5957 (holotype NY!; isotype BRY!).

Robust, taprooted annual to 15 dm tall, with a single erect, excurrently branched stem; leaves scattered along the stem but somewhat basally disposed, at least some of the cauline ones evidently petiolate, with broadly ovate to ovate-oblong or elliptic, basally rounded to truncate or subcordate, irregularly denticulate blade 4–6 x 2.5–5 cm; herbage glandular-puberulent; flowers axillary to small bracts on the lateral branches and toward end of the main stem, in bud crowded, erect, and nearly sessile, but becoming more widely spaced and evidently pedicellate at anthesis, fairly showy and adapted to cross-pollination; petals purple, 7–14 mm long, somewhat asymmetrically (adaxially) disposed; stamens 4 + 4, unequal, declined; anthers ca 1.5–2 mm long; fruits 12–25 mm long, spreading-deflexed, on spreading-deflexed pedicels 3–5 mm long; seeds biseriata in each locule, plumply obovate from a substipitate base, 1.5–1.8 mm long, very finely cellular-reticulate.

This species is known only by several collections by Duane Atwood from the type locality on open slopes on the southwest side of the Kaiparowits Plateau, ca 27 km by road northeast of Glen Canyon City, Kane Co., Utah. Flowering is from August to October.

*Camissonia boothii* var. *condensata* (Munz) Cronq. comb. nov. [based on: *Oenothera decorticans* var. *condensata* Munz Bot. Gaz. 85: 247. 1928].

*Camissonia boothii* var. *villosa* (Wats.) Cronq. comb. nov. [based on: *Oenothera alyssoides* var. *villosa* Wats., Proc. Amer. Acad. Arts 8: 591. 1873; not *Oe. villosa* Thunb. 1794; typification will be discussed in the forthcoming treatment in the Intermountain Flora.].

*Camissonia clavaeformis* (Torr. & Frem.) Raven var. *purpurascens* (Wats.) Cronq. comb. nov. [based on: *Oenothera scapoidea* var. *purpurascens* Wats. Proc. Amer. Acad. 8: 595. 1973].

*Camissonia scapoidea* (T. & G.) Raven var. *utahensis* (Raven) Welsh comb. nov. [based on: *Oenothera scapoidea* ssp. *utahensis* Raven Univ. California Publ. Bot. 34: 96. 1962].

*Oenothera caespitosa* Nutt. var. *macroglottis* (Rydb.) Cronq. stat. nov. [based on: *Pachylophus macroglottis* Rydb. Bull. Torrey Bot. Club 30: 259. 1903].

*Oenothera caespitosa* Nutt. var. *navajoensis* (Wagner, Stockhouse, & Klein) Cronq. stat. nov. [based on: *Oenothera caespitosa* ssp. *navajoensis* Wagner, Stockhouse, & Klein Monogr. Syst. Bot. Missouri Bot Gard. In press 1985].

*Oenothera flava* (A. Nels.) Garrett var. *acutissima* (W. L. Wagner) Welsh comb. nov. [based on: *Oe. acutissima* W. L. Wagner Syst. Bot. 6: 153. 1981, type from Flaming Gorge vicinity, Daggett County, Utah].

*Oenothera primiveris* Gray var. *bufonis* (Jones) Cronq. comb. nov. [based on: *Oe. bufonis* Jones, Contr. W. Bot. 8: 28. 1898].

## ORCHIDACEAE

*Habenaria zothecina* Higgins & Welsh sp. nov. Planta *Habenaria sparsiflora* affinis et similis sed in calcaribus 1.5 longiore et floribus paucioribus differt.

TYPE: USA: Utah. Grand Co., ca 1.6 km N of Moab, T25S, R21E, S25, at ca 1,281 m, in a hanging garden community, 10 July 1985, S. L. Welsh & L. C. Higgins 23629 (Holotype BRY; 4 isotypes to be distributed).

ADDITIONAL COLLECTIONS: Utah. Grand Co., Arches National Monument, 28 Sept. 1963, S. L. Welsh & G. Moore 2735; *ibid.*, Negro Bill Canyon vicinity, 3 August 1984, B. Franklin 1108. San Juan Co., Natural Bridges National Monument, 13 August 1963, S. L. Welsh & G. Moore 2410; *ibid.*, 15 August 1963, S. L. Welsh & G. Moore 2503; *ibid.*, The Neck vicinity, 31 Oct. 1964, S. L. Welsh & G. Moore 3840 (all BRY).

This peculiar, few-flowered bog orchid with its very long spurs has been known for many years. It has always been placed previously within an expanded version of *H. sparsiflora* but differs as outlined in the diagnosis and in other salient features. The leaves are broadly rounded initially, becoming obtuse and finally acute upward. The orchid grows in the vegetative assemblages known as hanging gardens along the canyons of the Colorado River in southeastern Utah. They occur there with maidenhair fern, sheathed death camas, and other shade-tolerant mesophytes. They occur

mainly along the margin of the detrital slope adjacent to the back wall of the alcoves. Additional work is necessary to determine the total distribution.

## PAPAVERACEAE

*Papaver radiculatum* Rottb. var. *pygmaeum* (Rydb.) Welsh stat. nov. [based on: *Papaver pygmaeum* Rydb. Bull. Torrey Bot Club 29: 159. 1902].

## PRIMULACEAE

*Dodecatheon pulchellum* (Raf.) Merr. var. *zionense* (Eastw.) Welsh stat. nov. [based on: *Dodecatheon zionense* Eastw. Leaflet W. Bot. 2: 37. 1937, type from Zion Canyon].

## RANUNCULACEAE

*Aquilegia flavescens* Wats. var. *rubicunda* (Tidestr.) Welsh stat. nov. [based on: *Aquilegia rubicunda* Tidestr. Amer. Midl. Nat. 1: 168. 1910].

A peculiar specimen of *Aquilegia* taken by Dr. Robert Foster from Zion Canyon in 1977 requires description. It has the habit and flower color of *A. formosa* but is glandular throughout and both petal spur and blade are longer than in that taxon. A search of the herbarium at Zion National Park yielded two specimens of the same taxon taken many years ago by Dr. Angus Woodbury. Initial efforts to relocate the area of collection of the type have been fruitless. There are many areas to be investigated, however, and the Hidden Canyon locality of the Woodbury specimens has not been searched recently. Possibly the specimens result from introgression between *A. formosa* and *A. chrysantha* Gray, both abundant in the canyon. The longer spurs and petal blades suggest such a possibility, but neither of the potential parents are glandular below the inflorescence. The plant is named after Dr. Robert Foster, enthusiastic collector and plant geographer.

*Aquilegia formosa* Fisch. in DC. var. *fosteri* Welsh var. nov. A var. *formosa* in petali laminis et calcaribus longioribus et herba glandulosis diversa.

TYPE: USA: Utah. Washington Co., T41S, R10W, S21, W of Tunnel, 1,373 m, N slope of

Bridge Mt., mountain brush community, on Wingate detritus, 25 May 1977, R. & R. Foster 3939 (Holotype BRY).

ADDITIONAL SPECIMENS: Utah. Washington Co., Zion National Park, Hidden Canyon, in 1924, A. Woodbury s.n. (ZNP herbarium, 2 specimens).

*Delphinium andersonii* Gray var. *scaposum* (Greene) Welsh stat. nov. [based on: *Delphinium scaposum* Greene Bot. Gaz. 6: 156. 1881].

*Delphinium occidentale* (Wats.) Wats. var. *barbeyi* (Huth) Welsh comb. nov. [based on: *Delphinium exaltatum* var. *barbeyi* Huth Helios 10: 35. 1892].

*Ranunculus andersonii* Gray var. *juniperinus* (Jones) Welsh stat. nov. [based on: *Ranunculus juniperinus* Jones Proc. Calif. Acad. II. 5: 616. 1895].

*Ranunculus acris* L. var. *aestivalis* (L. Benson) Welsh comb. nov. [based on: *Ranunculus acrifolius* var. *aestivalis* L. Benson Amer. Midl. Naturalist 40: 43. 1948], type from 8.3 mi N of Panguitch].

## ROSACEAE

*Purshia mexicana* (D. Don) Welsh comb. nov. [based on: *Cowania mexicana* D. Don Trans. Linnaean Soc. 14: 575. 1825].

*Purshia mexicana* (D. Don) Welsh var. *stansburyi* (Torr.) Welsh stat. nov. [based on: *Cowania stansburiana* Torr. in Stansbury Expl. Surv. Utah 386. 1852].

## RUBIACEAE

*Galium mexicanum* H.B.K. var. *asperrium* (Gray) Higgins & Welsh stat. nov. [based on: *Galium asperrium* Gray Mem. Amer. Acad. Arts II. 4: 60. 1849].

## SCROPHULARIACEAE

*Castilleja parvula* Rydb. var. *revealii* (N. Holmgren) N. D. Atwood stat. nov. [based on: *Castilleja revealii* N. Holmgren Bull. Torrey Bot. Club 100: 87. 1973].

*Castilleja rhexifolia* Rydb. var. *sulphurea* (Rydb.) N. D. Atwood stat. nov. Based on: *Castilleja sulphurea* Rydb. Mem. New York Bot. Gard. 1: 359. 1900].