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## A BOUQUET OF DAISIES (*ERIGERON*, COMPOSITAE)

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

ABSTRACT. — Described as new are six critical species and one variety of *Erigeron* from Utah. They are *E. awapensis* Welsh, *E. canaani* Welsh, *E. carringtonae* Welsh, *E. goodrichii* Welsh, *E. maguirei* Cronq. var. *harrisonii* Welsh, *E. untermannii* Welsh and Goodrich, and *E. wahwahensis* Welsh.

*Erigeron* is perhaps the most complex of all genera within the Compositae of Utah. The genus is allied to both *Aster* and *Conyza*, but most of the problems lie within the genus itself. To make matters more difficult *Erigeron* is one of the largest genera in Utah, with more than 60 taxa. Morphological features used as diagnostic characters often involve pubescence and its position on the plants. Other vegetative features have been relied upon also, because of the uniformity of flowers and bracts. Shape of leaves, whether mainly basal, mainly cauline, or distributed along the stem constitute important diagnostic characters. Pubescence type on the involucre bracts is considered as diagnostic in many cases. The technical nature of the distinguishing characters have led to wide misunderstanding of the genus, and most botanists have avoided the members of the group, relying, where possible, on specialists for critical determinations.

Preparation of a manuscript of the Compositae for the Utah flora project has led me to study *Erigerons* of Utah and the surrounding states in some detail. That study has indicated the presence of several taxa whose descriptions appear to be beyond those previously known to occur within Utah. The specimens have been compared to all other materials at BRY, and duplicates of many have been examined by Arthur Cronquist at NY. I wish to acknowledge his suggestions and consideration, but wish not to share blame for problems created by this author alone in the following interpretations.

*Erigeron awapensis* Welsh, sp. nov. A *E. abajoensis* Cronq. in caulis erectis foliorum

basalis non vaginatis et floribus plus numerosis differt.

Perennial herbs from a branching caudex, the caudex branches clothed with ragged brown marcescent leaf bases; stems erect or nearly so, 10–24 cm long, strigose, the hairs ascending; basal leaves 1.5–7 cm long, 2–8 mm wide, not especially sheathing; cauline leaves well developed, oblong to linear, mostly 1–4 cm long, 2–4 mm wide; heads 2–4, rarely solitary; involucre 3–9 mm wide, 3.7–4.5 mm high, the bracts more or less imbricate, thickened near the base dorsally, greenish, strigulose, the hairs multicellular; rays 35–45, pink purple to pink (or white?), 5–6 mm long, 0.9–1.8 mm wide; pappus apparently simple, of 15–20 slender bristles, and with a few inconspicuous shorter setae in some; achenes 2-nerved, hairy. Pinyon-juniper and sagebrush communities at 2135 to 2260 m in Garfield and Wayne counties; endemic.

TYPE.—USA. Utah. Garfield County, T32S, R2W, S23, igneous bouldery slope in canyon, in *Artemisia* community, at milepost 26.5 south of Antimony, 4 September 1969, S. L. & S. L. Welsh 9388 (Holotype BRY; Isotypes, 4 distributed previously as *E. divergens* T. & G.). Additional specimen: Utah. Wayne County, T29 S, R4E, S20, 1 mi SE of Teasdale, sandy slope in pinyon-juniper community, 7 August 1980, M. E. Lewis 6657 (BRY).

The Awapa daisy is most similar to *E. abajoensis*, but stands apart from that taxon, which has become a catchall for all specimens that run to the end of the key. It seems apparent that the assemblage will be clarified only upon examination of much additional material not now available in collections.

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*Erigeron canaani* Welsh, var. nov. Similis *E. eatonii* Gray in aspectum et capitulum amplitudinem sed in foliis caulino et radicalibus ambo linearibus et involutis folio basalibus ampliatis et ciliatis et radiis paucioribus differt.

Perennial herbs from a simple (or branched?) caudex, this clothed with brown marcescent leaf bases, the taproot prominent; stems 7–20 cm tall, decumbent to ascending, sometimes purplish at the base, sparingly hairy with ascending hairs; leaves pubescent like the stem, the basal ones tufted, 1-nerved, 1.4–9 cm long, 0.7–1 mm wide, linear, involute, sharply acute, conspicuously expanded and long-ciliate basally; cauline leaves numerous, reduced upwards; heads 1–3; involucre 9–13 mm wide, 5.3–6.5 mm high; bracts imbricate, conspicuously glandular and sparingly to moderately villous-pilose with multicellular hairs, green or variously suffused with purple; rays 15–22, white or pinkish, 3.5–5 mm long, 1.8–2.1 mm wide; pappus single, of ca 20 slender bristles; achenes 2-nerved, hairy. Ponderosa pine community at 1585 to 2075 m in Washington County; endemic.

TYPE.—USA. Utah. Washington County, with *Petrophytum* and *Panicum*, in crevices in Navajo Sandstone, Canaan Mountain, T43S, R10W, S4, 11 June 1980, John Anderson sn (Holotype BRY; Isotype NY). Additional specimen: Utah. Washington County, Zion National Park, Clear Creek Canyon, T41S, R10W, S24, ponderosa pine community, on Navajo Sandstone, 25 Sept. 1982, S. L. Welsh 21398 (BRY).

The Canaan daisy is similar in general aspect to *E. eatonii*. The involute linear glaucous leaves and few ray flowers appear to be diagnostic.

*Erigeron carringtonae* Welsh, sp. nov. Affinis *E. untermannii* in foliis crassis sed in pilis involucrorum longioribus et tenuioribus et radiis longioribus differt.

Pulvinate perennial herbs with a pluricipital caudex, the branches clothed with conspicuous brown to straw colored or ashy marcescent leaf bases; leaves mainly basal, thickish, 0.6–3.5 cm long, 1–5 mm wide, spatulate to oblanceolate, strigose to pilosulose, obtuse to rounded apically; scapes 2.5–8 cm tall; heads solitary; involucre 9.8–15 mm

wide, 5.8–7 mm high, the bracts imbricate, suffused with purple or green, the inner greenish with scarious margins, spreading-villose with long multicellular hairs; rays 18–30, pink to pink purple, 6.8–8.2 mm long, 1.4–2.3 mm wide; pappus double, the inner of 25–35 barbellate bristles, the outer of short setae; achenes 2-nerved, pilose. Meadows and escarpment margins, commonly on Flagstaff Limestone at 3050 to 3355 m in Emery and Sanpete counties; endemic.

TYPE.—USA. Utah. Sanpete County, T18S, R4W, S33, Manti-La Sal NF, 10 mi 115 degrees from Manti, 3220 m, 3 July 1981, S. Goodrich 15780 (Holotype BRY; Isotypes 14, distributed as *E. simplex*). Additional specimens: Utah. Sanpete County. T20S, R4E, S33, ca 17 mi W of Ferron, 3355 m, Flagstaff Limestone barrens, 13 July 1977, S. L. Welsh and S. Clark 15393 (BRY); do, T18S, R4E, S22, 7 mi due NNW of Ferron Reservoir, 19 July 1977, E. Neese and S. White 3708 (BRY); do, Heliotrope Mountain, 13 July 1977, M. E. Lewis 4915 (BRY). Emery County, Big East Mountain, head of Rilda Canyon, 13 July 1979, M. E. Lewis 6009 (BRY); do, Big East Mountain, above Upper Joes Valley, 8 August 1977, M. E. Lewis 5129 (BRY).

The Carrington daisy has been identified with *E. simplex* by previous workers, but appears to be more clearly allied to *E. untermannii*, at least superficially. It has long, spreading multicellular hairs similar to those of *E. simplex*, but the pulvinate caespitose habit and thick obtuse to rounded leaves of *E. carringtonae* appear to be diagnostic.

The species is named in honor of the memory of Jane Carrington, evidently the first woman to collect Utah plant materials designated as types (Welsh 1982).

*Erigeron goodrichii* Welsh, sp. nov. Similis et affinis *E. clokeyi* Cronquist sed in caudicibus tenuioribus et capitulis majoribus differt.

Perennial herbs from a stout taproot and caudex, the caudex branches with dark brown marcescent leaf bases; stems 3–10 cm tall, decumbent-ascending to erect, spreading hairy; basal leaves 0.4–6 cm long, 1.2–5 mm wide, narrowly oblanceolate, the veins not apparent, pilosulose, obtuse apically; cauline leaves more or less developed, but much reduced upwards; heads solitary; involucre 10.5–18

mm wide, 6.4–7.8 mm high; bracts imbricate, spreading villous-pilose with multicellular hairs, thickened basally, green or the apices suffused purplish, the inner with scarious margins, the attenuate apices more or less glandular and sometimes spreading; rays 40–65, pink purple to pink or white, 6.8–10.4 mm long, 1.5–2 mm wide; pappus apparently single, of 20–30 minutely barbellate bristles; achenes 2-nerved, pilose. Engelmann spruce krummholz and meadow communities, often on rock outcrops or talus at 3050 to 3400 m in Duchesne, Summit, and Utah counties; endemic.

TYPE.—USA. Utah. Duchesne County, T2N, R8W, S22, Ashley NF, Uinta Mountains, S rim of South Fork of Rock Creek, 14 mi n of Tabiona, 3264 m, with clumps of Engelmann spruce krummholz, on gravelly ground, 29 July 1981, S. Goodrich & R. Jepson 15907 (Holotype BRY; Isotypes NY, CAS, POM, MO, US, UT, UTC, RM). Additional specimens: Utah. Duchesne County, divide between Log Hollow and Rock Creek, 12 mi 355 degrees from Tabiona, 31 July 1979, S. Goodrich 13550 (BRY); do, head of Log Hollow, T2N, R7W, S30, 12 mi N of Tabiona, 3 July 1978, S. Goodrich and L. Hart 11696 (BRY); do, above Wedge Hollow, 11.5 mi and 354 degrees from Tabiona, 1 August 1979, S. Goodrich 13579 (BRY). Summit County, T2N, R12 E, S24, 11.5 mi NW of Kings Peak, East Fork of Blacks Fork, 31 August 1981, S. Goodrich 16203 (BRY). Utah County, Mt. Timpanogos, Emerald Lake, 7 August 1941, E. Castle 101c (BRY).

This dwarf alpine species has been recognized as having affinities with *E. asperugineus* (D.C. Eaton) Gray and *E. clokeyi* Cronquist, each of them dwarf alpine species. The Goodrich daisy differs from the former by its more slender leaves and from the latter by the caudex which lacks the distinctive thatch of gray-brown marcescent leaf bases.

The specific epithet honors the enthusiastic collector of the type and other materials, Sherel Goodrich, student of western botany, whose energetic pursuit of Utah and Nevada plants is unsurpassed.

*Erigeron maguirei* Cronq. var. *harrisonii* Welsh, var. nov. Similis var. *maguirei* sed in capitulis plus numerosis, radiis angustioribus, et disci brevioribus differt.

TYPE.—USA. Utah. Wayne County, T29S, R6E, S14, ca 1 mi ENE of Fruita, ca 5700 ft elev., Navajo Sandstone, juniper community, 2 June 1982, S.L. & E.R. Welsh 21178 (Holotype BRY; Isotypes NY; CAS). Additional specimens: Wayne County, canyon near Natural Bridge, 6 April 1934, B.F. Harrison 7385 (BRY); do, Fruita (Hickman Bridge trail), 10 June 1938, D E. Beck s.n. (BRY). The *harrisonii* phase of the *E. maguirei* differs in minor technical ways from materials of the type variety. Both phases are plants of sandy canyon bottoms, and perhaps they represent nothing more than ecological variants of a common theme.

The variety is named in honor of its discoverer, Bertrand F. Harrison, collector, teacher, and student of Utah botany.

*Erigeron untermannii* Welsh & Goodrich, sp. nov. Similis *E. compactus* sed in foliis latioribus pilis ascendentibus vel patentibus et radius brevioribus differt.

Perennial pulvinate herbs with an intricately branched caudex, the caudex branches mainly basal, 0.8–3.3 cm long, 1–4 mm wide, narrowly oblanceolate to spatulate, pilosulose with ascending, often curved, hairs; scapes 2–6 cm tall; heads solitary; involucre 7–11 mm wide, 5–5.7 mm high, the bracts more or less imbricate, green, or the inner somewhat chartaceous, the margins hyaline, the tips suffused with purple (sometimes throughout), densely hispidulous with short spreading hairs; rays 14–26, white, 4–6.5 mm long, 1.5–2.1 mm wide; pappus apparently single, of ca 20 slender fragile bristles; achenes 2-nerved, pilose. Pinyon-juniper community on calcareous shales and sandstones of the Uinta and Green River formations at 2135 to 2380 m in Duchesne and Uintah counties; endemic.

TYPE.—USA. Utah. Duchesne Co., T5S, R6W, S22, Indian Canyon, 17 mi S Duchesne, pinyon-juniper community, on Green River Shale, 4 June 1980, N. D. Atwood 7554 (Holotype BRY; Isotype NY). Additional specimens: Utah. Duchesne County, Tavaputs Plateau, Uinta Formation, junction of Right Fork and Left Fork of Indian Canyon, ca 10 mi SW of Duchesne, steep slopes and narrow ridge tops, shale and marly limestone, 26 May 1976, S. Goodrich 5317 (BRY); do, 13 mi 220 degrees from Duchesne, T5S, R6W,

S21, ridge between Right Fork and Left Fork of Indian Canyon, 31 May 1979, S. Goodrich 12402 (BRY). Uintah County, Vernal District, Ashley National Forest, dry ridge top, S rim of Red Pine Canyon, 5 June 1976, S. Goodrich 5652 (BRY).

The Untermann daisy is compared to *E. compactus* Blake in the diagnosis, and it is probably allied to that taxon. However, the similarity to *E. nematophyllus* Rydb. cannot be ignored. It differs from that taxon in the broader leaves, generally harsher and more spreading hairs of the leaves, involucre, and achenes. The plant is named to honor the memory of the late G. E. and B. R. Untermann, an amazing husband and wife team who worked throughout their lives to understand the geology, natural history, and anthropology of the Uinta Basin. They influenced the lives of all persons whom they contacted.

*Erigeron wahwahensis* Welsh, sp. nov. Herbis similis *E. eatonii* in aspectus sed robustioribus caudicibus crassioribus pilis patentibus pro parte et bracteis crassioribus ad basim et dense vel sparse pilis patentibus differt.

Perennial herbs, from a branching caudex, the caudex branches with conspicuous fibrous brown to ash-colored marcescent leaf bases; stems 15–40 cm long, decumbent to ascending; basal leaves 3–18 cm long, 4–13 mm wide, linear-oblongate to oblanceolate or elliptic, 3-nerved, petiolate, appressed to spreading hairy with curved hairs; cauline leaves reduced, sessile, and bracteate above; heads solitary or 2 or 3; involucre 13–17 mm wide, 6–7 mm high, spreading-villous with

multicellular hairs, glandular apically; bracts imbricate, green, the tips reddish, thickened basally; rays 30–40, pink or white, 5.5–7 mm long, 1.7–2.2 mm wide; disk corollas 3.5–4.2 mm long, the tube ca 2 mm long, the lobes 0.4 mm long; pappus of 15–20 bristles, with inconspicuous outer setae; achenes 2-nerved, short-hairy. Sagebrush, oak-maple, and pinyon-juniper communities at 1670 to 2440 m in Beaver and Washington counties; endemic.

TYPE.—USA. Utah. Beaver County, T28S, R15W, S31, Wah Wah Mountains, ca 12 mi SSW of Wah Wah Spring, Pine Grove Pass, 2450 m elev, sagebrush and pinyon-juniper community, 12 June 1982, S.L. Welsh 21229 (Holotype BRY; Isotypes NY, CAS, POM, RM, UT, UTC, US, GH, MO, and others to be distributed). Additional specimens: Utah. Beaver County, T29S, R16W, S12. Willow Creek, Wah Wah Mountains, 8 June 1978, K. Ostler & D. Anderson 1274 (BRY); do, T28S, R15W, S31, Wah Wah Mountains, divide between Quartz Creek and Pine Grove Canyon, 22 May 1981, S.L. Welsh 20520 (BRY).

The Wah Wah daisy is more or less intermediate between phases of *E. eatonii* and *E. jonesii*, but has features not shared by either. The pubescence is similar to *E. jonesii*, but the general aspect is more like *E. eatonii*. The plants tend to be larger than either, and the thick caudex appears to be diagnostic.

#### LITERATURE CITED

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