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NEW VARIETY OF ASTRAGALUS CONJUNCTUS S. WATSON
FROM BENTON COUNTY, WASHINGTON

Stanley L. Welsh1, Florence Caplow2, and Kathryn Beck2

ABSTRACT.—Discussed are relationships of the species within Astragalus section Conjuncti; A. conjunctus var. rickardii Welsh, Beck, & Caplow var. nov. is proposed.

Key words: Astragalus conjunctus, Conjuncti, Washington.

In 1984 a collection of plants from the Hanford Atomic Energy Plant, taken by Gary Baird, arrived at the herbarium at BRY. Among the specimens were several collections of an Astragalus obviously belonging to the section Conjuncti as proposed by Barneby (1964). The section is characterized by having stipules connate at the lowermost nodes and greatly shortened lower internodes with the upper one or few elongating, the leaves thus disposed in a subbasal tuft (Barneby 1964, Isely 1996). Commonly, most of the plant height is attributable to elongated peduncles and racemes. The Hanford specimens have erect, sessile pods similar to those of all other members of the Conjuncti except for A. leibergii, in which the pods are stipitate.

However, the plants from Hanford have strigulose pods, merely strigose vesture otherwise, banner reflexed through about 45°, and rather short-cylindric calyces. Thus, they do not fit exactly within any of the species outlined in the Atlas of North American Species of Astragalus (Barneby 1964). Dr. Barneby graciously examined the plants and indicated their close relationship with A. conjunctus S. Walton. The present writers concur, though the collections by Baird from 1984 and more recent collections taken by Kathryn Beck and Florence Caplow in 1995 represent a slight northward extension of that species into Washington. Both the Baird and Beck and Caplow materials represent relatively uniform plants taken in 2 main localities in Benton County, Washington, one southwest of Kiona and the other north-northwest of Benton City, on Rattlesnake Ridge in the Hanford Reservation, U.S. Department of Energy (Fig. 1).

Rattlesnake Ridge is within an area established as the Fitzner-Eberhardt Arid Lands Ecology Reserve, a high-quality native shrub-steppe environment.

The Benton County plants were subsequently compared with materials obtained on loan from Oregon State University (OSC, including WILU) through the kindness of Dr. Aaron Liston. The OSC and WILU collections include specimens of all species of section Conjuncti and demonstrate the considerable range of variation within the individual species. Main variation within the species complex involves flower size, pod length/width ratio, and degree of elongation of the upper internodes. The stipe of A. leibergii easily distinguishes it from all other taxa within the Conjuncti, and from such look-alikes as A. sheltonii (Rydberg) Barneby and A. reventus A. Gray, both of which occur adjacent to the range of the Conjuncti phalanx. These latter, both relegated to section Reventi-arrecti (subsection Reventi-arrecti), have similar overall habit, but lowermost stipules are distinct.

A single specimen from OSC (Lawrence 99, 26 June 1917) is similar to the Benton County materials. It is from Wasco County, Oregon, 12 miles southeast of The Dalles, near Rice Station, in a bunchgrass prairie and transition scabland, with the notation “protected from grazing this season.” It is in fruit only. The pods are strigulose as in the Benton County plants and bear the notations A. reventus and A. hoodii. The specimen’s features are mainly those of A.
conjectus sens. lat., and the collection is tentatively identified as belonging to the Benton County plants here regarded as var. rickardii. Certainly the collection site should be revisited.

A key to the species of Conjectus, differing considerably from that published by Barneby (1964), is presented below. Following the species key is a description of A. conjunctus and a key to the closely related taxa as herein interpreted.

Section Conjectus
1. Pods (and ovaries) stipitate, the stipe at least 3 mm long; plants of Kittitas, Chelan, and Douglas counties, Washington. .......... A. leibergii M.E. Jones

Fig. 1. Portions of Washington and Oregon, showing locations of Astragalus conjunctus var. rickardii Welsh, Bock & Caplow.

2. Pods (and ovaries) sessile; plants of various distribution in Oregon, Washington, and adjacent Idaho

2. Pods evidently villous (sometimes glabrous in age); calyx (10) 11–15 mm long, the teeth (2.6) 4.6–6.7 (7.5) mm long; plants within and near the Columbia Gap, Wasco and Hood River counties, Oregon, and Klickitat Co., Washington. ........ A. hoodiius Howell

3. Banner recurred through ca 45°, oblanceolate or broadly rhombic-oblanceolate, emarginate, 16–25.5 mm long, 6.7–10 mm wide; calyx teeth 1.3–3 (4) mm long; pods 5–8 mm thick; plants of Benton Co., Washington, and transmontane Oregon, mostly above 610 m where its range approaches the Wasco River and Kittitas counties, crossing to the south bank of the Columbia in Sherman Co., Oregon. .......... A. reventifolius (Rydberg) Barneby

4. Pods glabrous or strigulose; calyx and teeth of various length; plants variously distributed

3. Banner strongly recurved through 90°, oblanceolate, rhombic-oblanceolate, -elliptic, oblong-ovate, or somewhat quadrately ovato-cuneate, usually deeply notched, (13.2) 14–20.7 mm long, 5–9.8 mm wide; calyx teeth (2.4) 2.7–5.1 mm long; pods (4.5) 6–11 mm thick; plants of Klickitat, Yakima, and Kittitas counties, crossing to the south bank of the Columbia in Sherman Co., Oregon. .......... A. reventifolius (Rydberg) Barneby

1. Pods evidently villous

1. Pods obviously villous (sometimes glabrous in age); calyx (7) 8.5–12 mm long, the tube (5.7) 6–9.2 mm long, 2.5–4 mm wide, cylindric or subcylindric, strigulose-pilosulous, the teeth 1.3–3 (4) mm long, subulate. Flowers 16–25.5 mm long, whitish with keel tip and other petals tipped with purple, the banner recurved through ca 45°. Pods erect, sessile, oblong-ellipsoid to narrowly oblone-ovoid, straight or slightly incurved, 12–25 mm long, 5–8 mm thick, obcompressed, glabrous or strigulose, subbilocular, the septum to 1.4 mm wide; ovules 23–30.

1. Calyx tube cylindric to subcylindric, 4.9–9.2 mm long; pods glabrous, 5–8 mm thick; plants widespread .......... var. conjunctus

1. Calyx tube campanulate to subcylindric, 4.9–6.2 mm long; pods strigulose, 4.3–5 mm thick; plants local in Benton Co., Washington, and Wasco Co., Oregon. .......... var. rickardii

Astragalus conjunctus S. Watson, Proc. Amer. Acad. Arts 17: 371. 1882. Basalt milkvetch. Moderate, subcaulescent or shortly caulescent perennial, 15–65 cm tall, from a superficial branching caudex. Pubescence strigulose, basifixed. Stems erect or ascending, several to numerous in bushy clumps. Stipules 3–10 (11) mm long, at least the lowermost conattaseathing. Leaves (6) 10–30 cm long, mostly in a subbasal cluster; leaflets (9) 13–25 (31), 3–23 mm long, linear-oblong, -elliptic, lanceolate or subbiliform, obtuse, acute, or retuse, the terminal one continuous with the rachis, pubescent below and above. Peduncles 10–33 cm long; racemes 7–17 (20)-flowered, the flowers ascending to spreading at anthesis, the axis (3) 4–12 (15) cm long in fruit; bracts 2–4.5 mm long; pedicels 1–4.5 mm long; bracteoles 2; calyx (7) 8.5–12 mm long, the tube (5.7) 6–9.2 mm long, 2.5–4 mm wide, cylindric or subcylindric, strigulose-pilosulous, the teeth 1.3–3 (4) mm long, subulate. Flowers 16–25.5 mm long, whitish with keel tip and other petals tipped with purple, the banner recurved through ca 45°. Pods erect, sessile, oblong-ellipsoid to narrowly oblone-ovoid, straight or slightly incurved, 12–25 mm long, 5–8 mm thick, obcompressed, glabrous or strigulose, subbilocular, the septum to 1.4 mm wide; ovules 23–30.

Astragalus conjunctus var. conjunctus

[A. reventus var. conjunctus (S. Watson) M.E. Jones; Phaca conjuncta (S. Watson) Piper; Tium conjunctum (Watson) Rydberg].

1. Calyx tube campanulate to subcylindric, 4.9–6.2 mm long; pods strigulose, 4.3–5 mm thick; plants local in Benton Co., Washington, and Wasco Co., Oregon. .......... var. rickardii

Astragalus conjunctus var. conjunctus

[A. reventus var. conjunctus (S. Watson) M.E. Jones; Phaca conjuncta (S. Watson) Piper; Tium conjunctum (Watson) Rydberg].

Peduncles 10–33 cm long; racemes 7–17 (20)-flowered, the axis (3) 4–12 (15) cm long in fruit; pedicels 1–4.5 mm long; calyx (7) 8.5–12 mm long, the tube (5.7) 6–9.2 mm long, cylindric or subcylindric, the teeth 1.3–3 (4) mm long. Flowers 16–25.5 mm long. Pods 12–25
mm long, 5–8 mm thick, glabrous; ovules 23–30. Type: "In John Day Valley, Oregon (J. Howell, in May, 1880) and on sterile rocky ridges in Baker County, by W. C. Cusick, 1881"; holotype GH!; isotypes ORE, WS; paratypes GH!, ORE.

Meadows, brushy slopes, grasslands, sagebrush desert, and pine forests, on basaltic bedrock, at 485 to 1555 m, from the Blue Mountains, Baker Co., west to the Deschutes River, and south to the Malheur Valley, Steens Mountain, Oregon, and east to Owyhee Co., Idaho.

*Astragalus conjunctus* var. *rickardii* Welsh, Beck, & Caplow, var. nov.

Similis *A. conjuncti* var. *conjuncti* in habitu, sed in leguminibus pubescentibus et angustioribus, et floribus minoribus generaliter differt.

**Peduncles** 5–26 cm long; racemes 10- to 19-flowered, the axis 4–13 cm long in fruit; pedicels 1–2.5 mm long; calyx 7–9 mm long, the tube 4.9–6.2 mm long, campanulate, the teeth 1.5–3 mm long. **Flowers** (13.2) 14–20.7 mm long. **Pods** 13–20 mm long, 4.3–5 mm thick, strigulose; ovules 15–20.

**Type.**—Washington, Benton Co.; T11N, R26E, S30, NW/SW, on northeast-facing slopes of Rattlesnake Mountain, with sagebrush and Sandberg bluegrass, at ca 1006 m, 29 May 1995, Kathryn Beck & Florence Caplow 95083, holotype BRY!, isotypes NY!, US!, WTU!, WS!


Washington, Wasco Co. (see Lawrence 99, cited above).


Relationships within the Conjunctus are problematical, all taxa being closely alike. The taxon proposed here appears to share features of both *A. conjunctus* and *A. reventiformis*. The calyx tube proportions are similar to those of the only slightly disjunct *A. reventiformis*, but the calyx measurements are smaller than for that taxon. Furthermore, proportions of the calyx tube length-width ratio within *A. conjunctus* in a strict sense differ only in degree from those of var. *rickardii*. The presence of pubescence in pods within the genus rises and falls but is apparently uniform in the Benton County plants. Pod pubescence is herein considered diagnostic and seems to be correlated with relatively shorter calyces and narrower pods. Some specimens assigned to *A. reventiformis* from nearby Yakima County (Caplow & Beck 95075, 96003, and Baird 633) have pods absolutely and proportionately as narrow as those of the proposed new variety. The pods in those specimens are, however, glabrous.

The taxon is named in honor of Dr. Bill Rickard, one of those responsible for establishment of the Fitzner-Eberhardt Arid Lands Ecological Reserve.

**LITERATURE CITED**


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