

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DIAGNOSES ARAGALLORUM.

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Responding to a request lately made that I would name some newly gathered specimens of *Aragallus* from New Mexico, I found it needful to examine with care a copious supply of old material resting chiefly in the National Herbarium, from various parts of the Southwest all the way from the Rio Colorado to the Rio Grande; material that had been accumulating from the days of Lindheimer and Charles Wright more than a half-century ago, down to our own time; most of it labelled *Oxytropis Lamberti*.

When, some seven years since, I was demonstrating the necessity of adopting the generic name *Aragallus*, I came also to a realization of the fact that the species of the genus in North America were more numerous than had ever yet been indicated, and in the mean time, besides several proposed as new by myself,* Mr. Nelson, of Wyoming,† and Mr. Rydberg, of New York,‡ have added quite a number, theirs mostly from the northern Rocky Mountain region within the United States.

In the course of my own newly resumed study of the genus, I found that in the Texano-Neo-Mexican region there was much more waiting to be done than I had anticipated; and I begin this series of diagnoses with the essential characters of some species belonging to this well defined geographic and climatic region.

* Pittonia, iii, 212, and iv, 69.

† Erythea, vii, 57-64.

‡ Fl. Montana, 250-255.

Aragallus Metcalfei sp. nov.

A foot high, stout both as to the branches of the caudex and the scapes, the whole plant silky-glossy with a long appressed pilose-villous pubescence; leaflets in about 7 to 9 pairs, closely approximate, often alternate rather than in pairs, oblong-lanceolate, acute, $\frac{1}{2}$ to 1 inch long; spikes 2 or 3 inches long, dense above the middle, the lower flowers scattered; bracts lanceolate-subulate, conspicuous; calyx cylindric, the subulate teeth hardly half as long as the tube, the whole 4 lines long; corolla more than twice as long, red-purple; pods about 1 inch long, sessile, very erect, nearly glabrous, thinnish, the texture only firmer than that of parchment.

In the Black Range, southern New Mexico, at 10,000 feet, O. B. Metcalfe, 1904. Type in my herbarium.

Aragallus Knowltonii sp. nov.

Barely a foot high but stout, rigidly erect, canescently short-silky, both faces of the leaflets about equally so, these in about 7 to 9 pairs, elliptic-oblong, acute $1\frac{1}{2}$ inches long; scapes bearing the spikes barely above the leaves; spikes 3 to 5 inches long and rather lax, at least never dense; bracts very short and broad, ovate, acuminate; corolla red, hardly $\frac{3}{4}$ inch long; calyx not densely invested with a villous closely appressed pubescence, cylindric and with short subulate teeth; pods long and very erect, more than an inch long, coriaceous, minutely and not densely silky-hairy, obcompressed.

In the vicinity of Flagstaff and the San Francisco Mountain, northern Arizona; on Mt. Humphreys by Rusby, July 2, 1883; then by myself in 1889 among the woods near Flagstaff; also in the same year by Mr. F. H. Knowlton, whose specimen in the U. S. Herb. is the type.

Aragallus majusculus sp. nov.

Branches of the caudex short, stout, the mature plant 12 or 14 inches high, the short pointing spikes borne hardly beyond the very long and erect leaves; scanty pubescence of the very stout striate scapes villous, that of the foliage dense, silvery-silky, of the calyx and pods more tomentulose; leaflets in 5 to 7 pairs, or alternate, oblong-elliptical, about an inch long; flowering spikes thick, only $1\frac{1}{2}$ or 2 inches long; bracts reduced and inconspicuous; corollas yellowish, or perhaps pinkish; pods hardly $\frac{3}{4}$ inch long but very thick, commonly only oblong-ovoid, sessile, erect; fruiting calyx showing subulate teeth almost as long as the short campanulate tube.

Henry Mountains, southern Utah, July, 1894, M. E. Jones, in U. S. Herb., his No. 5674 a fine fruiting specimen, being the type; while No. 5695, from which caudex and flowers are described, is, with hardly a doubt, the same species.

Aragallus abbreviatus sp. nov.

Compared with *A. Lamberti* low, and with leaflets crowded, flowers large and spike short; scapiform peduncles only 4 to 8 inches high including the

spike; flowers $\frac{3}{4}$ inch long; calyx with very short teeth broad at base; villous-strigose coriaceous pods erect, sessile, little more than $\frac{1}{2}$ inch long, hardly twice the length of the calyx.

Near Dallas, Texas, collected by Reverchon, and distributed by him and also by A. H. Curtiss, for *A. Lamberti*, from which it is abundantly distinct. The spikes of flowers are commonly 2 inches long and nearly as broad. Named in reference to the characteristically short calyx-teeth and short pods. Type in my herbarium.

***Aragallus articulatus* sp. nov.**

Erect, slender, 10 inches high, with pale glaucescent herbage sparingly pilose; leaves 6 inches long, with 4 or 5 remote pairs of linear leaflets about $\frac{3}{4}$ inch long, shorter than the internodes of the rachis upon which they are inserted by a distinct white callosity; flowers unknown; pods $\frac{1}{2}$ inch long, sessile acute, strigulose.

Collected on the Canadian River, perhaps within the limits of what is now Colorado, by Dr. J. M. Bigelow, on Whipple's Expedition; referred by Dr. Torrey to *A. Lamberti* as a variety, as the label in his handwriting in U. S. Herb. demonstrates. It is doubtless the specimen (there are two on the sheet) of which he speaks in Whipple's Report, p. 80, as having "pods shorter and thicker, and strigose-hirsute." Both this and the other "*Oxytropis Lamberti*" of Bigelow's collecting on the Canadian may be supposed to have been included in Grays' var. *Bigelovii*. But the foliage in *A. articulatus* is very peculiar, and the pods in *A. Bigelovii* are stipitate.

***Aragallus aboriginum* sp. nov.**

Very stout, large-leaved but low, scarcely a foot high, whitish and glossy with a dense long appressed pubescence; leaves 7 or 8 inches long, of 7 to 9 pairs of $1\frac{1}{2}$ -inch-long leaflets all acute and inclining to lanceolate from oblong; stout scapes shorter than the leaves, bearing only a part of the long spike above them; short-cylindric calyx with triangular-subulate short teeth; flowering spike 5 inches long, not dense; pods $\frac{3}{4}$ inch long, hard-cartilaginous, densely villous-tomentose.

Cimarron River, Oklahoma, June, 1891, M. H. Carleton in U. S. Herb. Very large and low white-flowered species.

***Aragallus falcatus* sp. nov.**

Rather slender, a foot high; mature herbage green, when very young slightly glossy with a not dense appressed villous pubescence; leaves 6 or 8 inches long, of 7 to 9 pairs of acutely lance-linear subfalcate firm leaflets 1 inch long or more; peduncles about equalling the leaves; spikes of red-purple flowers about 3 inches long, not dense; bracts slender-subulate; calyx subcampanulate, densely villous-tomentulose, the slender-subulate teeth short; densely tomentulose pod barely $\frac{1}{2}$ inch long, erect, sessile, little if at all exceeding the calyx-teeth.

Watson, Missouri, June 1, 1894, B. F. Bush; sent to U. S. Herb. for *A. Lamberti*.

The next four species are of the northerly Rocky Mountain regions, from western Dakota to Wyoming and Montana; all but the fourth having passed with some for *A. Lamberti*.

Aragallus formosus sp. nov.

Stout, multicapitous, the decumbent scapes 6 to 10 inches high; herbage neither silvery nor canescent, green, though far from glabrous, all the parts clothed with a comparatively coarse appressed pilose pubescence; leaflets thinnish, $1\frac{1}{4}$ inches long, oblong-linear, very acute; scapes little surpassing the foliage; spikes of large red flowers $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, $1\frac{1}{2}$ in diameter; bracts lanceolate, hardly equalling the cylindric densely pilose calyx, this with triangular-subulate acute teeth half as long as the tube; pods not known.

Black Hills near Fort Meade, South Dakota, June 7, 1887, Dr. W. H. Forwood, U. S. A.; specimens in U. S. Herb. Dr. Forwood describes the large corollas as being cardinal red; and this is not improbable, though in the dried state they are purple.

Aragallus invenustus sp. nov.

Multicapitous and decumbent, low, stoutish, villous-hirsute throughout; leaflets very many, small and crowded, elliptic-oblong, $\frac{1}{4}$ to $\frac{1}{2}$ inch long; scapes 5 or 6 inches high, bearing the short spikes of whitish flowers a little above the foliage; bracts linear, much shorter than the calyx, this with long cylindric tube and short, broadly subulate teeth; pods nearly an inch long, ascending, the apiculation spreading, the whole villous-tomentose, texture coriaceous.

Known only from about Fort Meade, South Dakota, where it was collected, in both flower and fruit, by Dr. W. H. Forwood, in 1887; types in U. S. Herb.

Aragallus rigens sp. nov.

Rigidly erect, 8 inches high, rather slender, pale-green but not silvery, the pubescence scanty and strigulose; leaves rather long-petioled and erect; the leaflets in about 5 or 6 pairs and remote, though longer than the internodes of the rachis, subcoriaceous, linear, acute, $\frac{1}{2}$ to 1 inch long, not callos at base, yet inserted each in a conspicuous hollow of the rachis which is thus notably articulated; flowers not seen; pods hard-coriaceous, oblong, abruptly beaked, the whole $\frac{3}{4}$ inch long, strigulose; calyx under the mature pods campanulate and with very short triangular teeth.

Cedar Creek, twelve miles above Glendive, Montana, July 15, 1884, L. F. Ward, in U. S. Herb. In the emphasized articulation of its leaflets with their rachis this must be regarded as a near ally of the geographically far removed and otherwise distinct *A. articulatus* defined above.

***Aragallus ventosus* sp. nov.**

Low and multicapitous, canescently silky-villous; leaves long-petioled and slender, the 3 pairs of oblong-elliptical leaflets approximate at the end of the petiole, so to speak, about $\frac{1}{2}$ inch long; slender peduncles twice the height of the leaves and about 5 or 6 inches long including the short capitiform spike; bracts lance-linear, villous-strigose, as are also the calyx-tube and its rather long linear teeth; keel of corolla with a short straight blunt point; pod unknown.

Dry ground in the valley of the North Fork of Wind River, Wyoming July 12, 1882, Dr. W. H. Forwood; type in U. S. Herb., labelled *Oxytropis Lagopus*, and doubtless related thereto, though a plant of slender habit, of few long leaflets as it were at the end only of a long petiole; also wholly destitute of the woolly-hairiness of *A. lagopus*.

Northward beyond the borders of the United States occur several more species proposed as new; several of these so manifestly allied to *A. Lamberti* as to have been labelled so in the herbaria. These have all been collected by the efficient and zealous botanists of the Canadian Geological Survey, and as distributed bear the numbers of that collection.

***Aragallus Albertinus* sp. nov.**

Rather slender, 6 to 12 inches high, silvery-silky only as to the young and growing parts, when maturer glabrate, the green-looking upper face of leaflets only sparsely villous-pilose under a lens, these in numerous closely approximated pairs, hardly $\frac{3}{4}$ inch long, oblong-lanceolate, very acute; spikes of whitish or purplish flowers narrow and dense, borne well above the foliage; bracts subulate-linear, nearly equalling the calyx, this villous-tomentose and white, the subulate teeth almost as long as the subcampanulate tube; pods short, conspicuously acuminate, the beak-like point spreading, and only this surpassing the calyx-teeth.

A rather elegant and certainly well marked species, of which the type is from near Prince Albert, Saskatchewan, by Mr. John Macoun, July, 1896, sent me under the Geol. Survey No. 12,540; also in flower only, under No. 12,535. Earlier specimens referred here are from two localities in Alberta taken in 1895. Types in my herbarium.

***Aragallus melanodontus* sp. nov.**

Stout, low, multicapitous, the erect scapes 5 inches high; plant villous-canescenscent, the hairs partly appressed, partly spreading; leaflets in 5 to 7 pairs, oval to oblong-lanceolate, acute, $\frac{1}{4}$ to $\frac{1}{2}$ inch long; flowers large, white, in spikes little longer than broad; bracts subulate, not half as long as the rather large short-cylindric calyx, this villous with short dark-colored and

longer white hairs, the oblong obtuse teeth of half the length of the tube and wholly black-hairy; pods unknown.

Species very well marked by its peculiarly obtuse black calyx-teeth. It is known to me by a sheet in my own herbarium collected by Mr. John Macoun at Elbow River, Alberta, in 1897; the label bearing the Geol. Surv. No. 18,513.

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Aragallus Macounii sp. nov.

Growing parts silky-canescens, maturer herbage greener, the erect or slightly decumbent scapes a foot high or more, the as nearly upright leaves more than half as high, rather long-petioled; leaflets in 11 to 15 pairs, ovate-oblong or oblong-lanceolate, acute, often $\frac{3}{4}$ inch long, approximate but not crowded; spikes $1\frac{1}{2}$ to $2\frac{1}{2}$ inches high; bracts lanceolate, equalling the calyx-tube, herbaceous; calyx-teeth broadly and somewhat obtusely subulate, of much less than half the length of the villous-tomentulose subcylindric tube; corollas $\frac{3}{4}$ inch long, white; pods villous, small for the plant, little more than the beak exerted beyond the calyx-teeth.

Plains of Alberta, about Calgary, June and July, 1897, Mr. John Macoun, Nos. 18,516 and 18,517 Herb. Geol. Surv., Canad., named "*O. Lamberti*" but allied to *A. monticola* rather. Type in my herbarium.

Aragallus cervinus sp. nov.

Slender and rather low, the tallest scapes 8 inches high, these and the leaves erect; herbage silvery-silky, the upper face of leaflets least so, their lower most so, these very numerous and almost crowded, narrowly lance-linear, $\frac{1}{2}$ inch long or more, acute; flowers white, very few, 5 to 12 in each short capitiform spike; bracts subulate-linear, shorter than the calyx, this cylindric with short teeth; pods not seen.

At Deer Park, Lower Arrow Lake, British Columbia, June 8, 1890, J. M. Macoun, No. 5358 as in my herbarium.

Aragallus galioides sp. nov.

Slender, 12 to 18 inches high, young parts silvery-silky, otherwise cinereous-villous; leaves upright, 4 to 10 inches long, the small oblong acute thin leaflets in whorls of 4, approximate but not crowded or imbricate; slender spikes of small flowers 4 to 6 inches long, not dense; bracts linear, nearly equalling the cylindric calyx, this densely villous, its subulate teeth more than half as long as the tube; pods short, oval with a long beak-like apex, the whole scarcely $\frac{3}{4}$ inch long, thin-walled, villous-tomentulose.

Meadows along Bow River, near Banff, B. C., at 4,500 feet, July and September, 1899, W. C. McCalla, in U. S. Herb. Elegant small flowered species related to *A. splendens*; the long leaves with whorled leaflets recalling leafy stems of *Galium*.

The three concluding the series are, as will be seen, from widely sundered stations, and variously allied.

Aragallus luteolus sp. nov.

Tufted, stoutish, 6 to 10 inches high, scapes well surpassing the foliage, both minutely silky-villous, almost silvery; leaflets lance-oblong, $\frac{1}{2}$ inch long or more, closely approximate, of thinnish texture; scapes flexible, not striate; spikes short and broad, not dense, $1\frac{1}{2}$ or 2 inches long, 8 to 15-flowered; bracts lanceolate, shorter than the calyx-tube, this cylindrical, villous-tomentose with white and black hairs intermixed, teeth short, obtusish; corolla about $\frac{3}{4}$ inch long, yellowish.

Subalpine on the Olympic Mountains, Washington, July, 1900, A. D. E. Elmer; type in U. S. Herb.; fruit not known.

Aragallus bryophilus sp. nov.

Branches of caudex stout, erect, 2 or 3 inches high, apparently embedded in mosses, heavily clothed with the stipules of leaves of former seasons, these yellowish-scarious, triangular, acutish, sparsely pilose toward the apex; leaves long-petioled, $1\frac{1}{2}$ inches long, the 7 to 9 leaflets oval to elliptical, hardly $\frac{1}{4}$ inch long, soft-pilose on both faces, more emphatically so beneath; scapes slender, 1 inch long, 2-flowered, the flower $\frac{3}{4}$ inch long or more; calyx dark-ferruginous-villous, cleft to the middle, the teeth lanceolate-subulate; corolla purple, the large banner deeply emarginate.

St. Matthew's Island, Bering Sea, July 10, 1891, Mr. J. M. Macoun; distributed from Herb., Canad. Geol. Surv., under No. 18,510 and the name *Oxytropis nigrescens*, but by habit and stipules extremely different from the Asian plant of Pallas and of Fischer. Type in my herbarium.

Aragallus Hudsonicus sp. nov.

Branches of the chaffy caudex and tufts of leaves and peduncles of about equal length, the whole 2 to 4 inches high; stipules tapering to a scarcely acute apex, rather densely hirsute; leaves short-petioled, the whole less than an inch long, of 27 to 33 closely approximate minute oblong leaflets, the rachis villous, leaflets sparingly pilose; scapes with a short capitiform spike of 8 to 16 middle-sized bluish flowers; cylindrical calyx blackish-villous, its somewhat triangular but obtusish teeth very short; corolla $\frac{1}{2}$ inch long.

Whale River, Hudson's Bay, June 24, 1896, Mr. A. P. Low; No. 14,272 of Canad. Geol. Surv., as distributed by Mr. Macoun. Type in my herbarium.