

LUPINUS MEXICANUS CERV. EX. LAG.

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Since *Lupinus mexicanus* Cerv. ex. Lag. (1816) was the first taxon in the genus *Lupinus* named for Mexico it is imperative to determine which lupine the name was applied to. As the earliest name it would take priority over all the later names. In all of Charles Piper Smith's works on the lupines of Mexico he literally ignored the name. In my own studies it has been a perplexing problem for quite a number of years. The curator of the herbarium at Madrid, Spain, searched, but was unable to locate a specimen of *Lupinus mexicanus* of any vintage. Since seeds were sent to England by Lagasca, and the plants grown were utilized to prepare a much more detailed and accurate description for Edwards Botanical Register (no. 457, in 1820) than that originally provided by Lagasca, Dr. Walters at Cambridge, England, also searched the herbarium there but was unable to find a specimen of the material used in either of the original descriptions provided by Lagasca and Edwards. In 1832, Maund was attempting to identify *Lupinus mexicanus* and stated that the species had been lost to science, but that he thought that it had been regained. He supplied an illustration as had Edwards. Edwards suggested that *L. mexicanus* was probably a biennial and that it had flowered in the "stove" (glass-house) in February, which suggests that they had planted the seeds the previous season, but flowering had not occurred until February. Maund's plant material is indicated as a perennial, which was probably another taxon, and nothing is given which helps identify *L. mexicanus*.

The curators of the herbaria of Kew, Paris, Berlin, Zurich and others searched but were unable to find any specimens of the period involved. Since there is apparently no type specimen and since the description of Lagasca could apply to several taxa it is necessary to select some element to fix the application of the name until such time as an

authentic specimen may be discovered. The illustration in Edwards Botanical Register (no. 457, 1820) serves this purpose and I select it to serve in lieu of a type specimen for *Lupinus mexicanus* Cerv. ex Lag. It should also be pointed out that there is no accurately labeled material of *Lupinus mexicanus* in any of the herbaria and the material distributed by Pringle as *L. mexicanus* has been a major source of error, since he applied the name to, at best, a variant of *L. aschenbornii*, which is an alpine perennial.

During the preparation of the treatment of *Lupinus* for the "Flora de Valle de Mexico" (for Dr. Rzedowski) the lupines of the area have been studied in considerable detail. Several field trips to the area have been conducted and numerous collections made. Among the collections are plants collected along the toll road between Mexico City and Queretaro, the latter, the site of the palace of the Emperor Maximilian. This route is probably not far from the original route the Spaniards traveled, since it is on the most direct route between the two early cities. In the area near Tula, a number of collections of lupines were made, which closely match the detailed description in Edwards Botanical Register. The collection made in July by Giles Wainess contained both flowering and fruiting specimens. Plants collected along the toll road a few miles northwest of the Tula turnoff by both Harmon and Dunn on three different years in late December were in full fruit, as well as having a few branches in flower. Seeds from both the Wainess collection and the Dunn collection were grown in the research greenhouse at the University of Missouri. What had been assumed to be the same taxon turned out to be two different taxa of the same complex — one an annual flowering in the fall and early winter and the second a biennial germinating at the same time as the annual but requiring cold treatment during the winter before flowering the following season. By planting the seeds of the annual in January and the biennial in the early fall of the previous year the two were brought into flower at the same time. Attempts to self-pollinate the biennial all failed, so the

taxon is obligate outcrossing. Most of the attempts to cross the annual and the biennial failed but a few produced some seeds. Thus there are two distinct breeding populations isolated primarily by their phenology, which remain distinct in nature, but which have not fully achieved intersterility, which is not uncommon in plants. After becoming aware of this difference, the colonies along the toll road were examined and found to contain many plants with only caespitose clusters of basal leaves with no flowering shoots, in late December, while the annuals were in fruit with the lateral branches still in flower. The biennial is *Lupinus mexicanus* and the annual is *Lupinus bilineatus* Benth.

The following translations of the Latin descriptions of both Lagasca and Edwards are given for determining the identity: "288. *Lupinus mexicanus* Cerv. ex. Lag. Gen. et Sp. Nov. 22, 1816.

Calyces alternately bracteolate (appendaged) upper-lip semibifid, lower lip obscurely tridentate.

Lupinus mexicanus Cerv., near *L. termis* L.

Leaves ternate at the base, remains of 5-7 leaflets; leaflets lanceolate, mucronate, upper surface glabrous, lower surface pilose. Stipules setaceous, pilose as the stems. Peduncles opposite the leaf, spicate-racemose above. Bracts setaceous, deciduous. Flowers alternate (scattered), short stalked, blue. Calyx bracteoles setaceous, short. Legumes pilose.

Habitat in New Spain (Mexico). Seeds sent with D. Vincent Cervantes."

From Edwards Bot. Reg. 457. 1820, the following translation: (Note, familial and generic portions are not given and interpretations are included in parentheses). "Plants, except for the corolla, entirely shaggy-pilose. Leaflets 3?-5?, 7-8, elongate-cuneate, narrow, short pointed, tapered for a considerable way down, glabrous above, rendered white beneath by shaggy-pilose pubescence, longest about 2 inches, shorter than the long-piled petioles; stipules linear-subulate, erect, long-piled. Racemes elongate spicate, laxly many-flowered, flowers scattered, sparse, la-

vender to purplish-blue, with darker streaks (veins), bracteose before anthesis; peduncles opposite the leaves (true of all lupines that have the top lateral bud elongate as a branch); pedicels hirsute, shaggy, ascending, shorter than the calyx, bracts linear-subulate, very narrow, filiform, longer than the calyx, caducous. Calyces shaggy-hirsute, green, with divaricate lips, the upper split at the end into a notch. Banners folded, reflexed, astride the upper margins of the wings by a deep sulcus; wings hatchet shaped, pointed, cohering by the front edges; keels pale ascending upward, narrow subulate-falcate, as long as the wings; with a long deep-purple tapered point, — etc.”

The distinctive traits from which *L. mexicanus* can be determined are the shaggy-pilose hairs, the upper surface of the leaflets glabrous, while the lower is shaggy-pilose, and the corolla is glabrous as intimated by Edwards, the long setaceous bracts and short setaceous bracteoles at the lateral sinuses of the calyx, the shaggy-hirsute pedicels, the deep sulcus of the banner, the narrow subulate-falcate keel with the long tapered point, and Edward's term of pointed hatchet-shaped wings. His discussion of flowering time and suggestion that the taxon is a biennial apply. The field location is that of the most direct route between the two early major cities of that time. All of the traits apply to the biennial plant material collected by Giles Wainess. The greenhouse plants grown from seed more closely resemble the illustration provided in Edwards, as would be expected, since greenhouse plants were used in preparing the description. The field material, in nature, has denser foliage and a denser raceme, which would represent the effects of high light intensity at high elevations.

The specimen collected by *Giles Wainess* Lupin #2 (UMO-88263) (Fig. 1) is considered as typical material of *Lupinus mexicanus* Cerv. ex. Lag. A field duplicate has been sent to Madrid (MA) and a duplicate grown in the greenhouse has been sent to Cambridge (CGE); others will be distributed as available. The close relatives are *Lupinus bilineatus*



Figure 1. A field specimen of *Lupinus mexicanus* Cerv. ex. Lag., a biennial collected in July by Giles Wainey, Lupine #2 (deposited at UMO; duplicate sent to MA; a greenhouse grown duplicate sent to CGE).

Benth (1839), *L. hartwegii* Lindl. (1839), and *L. persistens* Rose (1905).

The taxon which has been misinterpreted as *Lupinus mexicanus* by several authors is *Lupinus aschenbornii*. While the latter taxon has glabrous flowers and a glabrous upper leaflet surface and pilose hairs, the hairs do not match Edward's term of shaggy nor are the leaflets shaped right nor is the keel slender, long-falcate. The keel is almost straight on the upper edge and the banner is narrow and without the deep sulcus. In addition *L. aschenbornii* is alpine and it is a perennial, which goes dormant every winter. It is a most unlikely candidate for a greenhouse plant or a plant that could be grown outside in Madrid, Spain, at the Botanical Garden. In addition the flower size and shape are entirely wrong for the material illustrated by Edwards from seeds sent by Lagasca.

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