

THE CALCEOLARIA PALUSTRIS COMPLEX IN VENEZUELA

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In an attempt to identify specimens of a *Calceolaria* collected on Cerro Avila above Caracas by Mr. Bruno José Manara, it has been necessary to evaluate all the material of the *Calceolaria palustris* complex in the Herbario Nacional de Venezuela. It soon became apparent, after dissection of flowering material of this complex, which included specimens identified by Pennell as *C. palustris* subsp. *palustris* and subsp. *santanderensis*, *C. chelidonioides*, and *C. tripartita*, that the characters which Pennell assigned to these taxa could not be correlated with the herbarium material. Moreover, no agreement has been found among various authors as to the limits existing between *C. palustris*, *C. chelidonioides*, and *C. tripartita*.

HISTORY

Kränzlin (Das Pflanzenreich IV (257-C): 27. 1907) published Sodirol's manuscript name, *C. palustris*, on the basis of a specimen which lacked a corolla. Nevertheless, Kränzlin assigned the species to a group of taxa related to *C. tripartita* and *C. chelidonioides* in which the antical cell of the anther is mostly much smaller than the

postical cell. Pennell (Proc. Acad. Nat. Sci. Phila. **CIII**: 187. 1951) placed *C. palustris*, together with *C. conocarpa* Pennell, in a group having both anther cells fertile, contrasting them with *C. chelidonioides* and *C. tripartita*, in which the lower (antical) anther cell is sterile. In Macbride's Flora of Perú (Field Mus. Nat. Hist. Bot. Ser. **13**, pt. V-B, no. 3: 644. 1971), *Calceolaria palustris* is differentiated from *C. tripartita* chiefly on the basis of the sterile lower anther cell of *C. tripartita* and the fertile lower anther cell of *C. palustris*.

CRITERIA OF ANTHER CELLS

By the criteria adopted by Pennell, the lower anther cell of *C. palustris* is fertile, whereas that of *C. chelidonioides* is sterile. It is on this basis that Pennell classified the specimen of *Lasser* 432 from Venezuela as *C. chelidonioides*, while *Pittier* 13263, *Steyermark* 57125 and 62737, also from Venezuela, are classified as *C. palustris* subsp. *santanderensis*. Careful dissection of the above specimens from VEN reveals not only variation in the character of the anther cells, but also in size of corolla and capsule. The *Pittier* 13263 specimen has the lower anther cell fertile and more or less equaling the upper anther cell (character of *C. palustris*), whereas the specimens of *Steyermark* 57125 and 62737 have the lower anther cell sterile and reduced in size (character of *C. chelidonioides*). The *Steyermark* specimens, with their sterile and reduced lower anther cell, cannot be distinguished from the specimen of *Lasser* 432, identified by Pennell as *C. chelidonioides*.

When additional available herbarium material of the *Calceolaria palustris* complex in VEN is studied, it is found that although the possession of the sterile lower anther cell is the condition which is usually encountered, this character is not always present and cannot be relied on in separating *C. palustris* from *C. chelidonioides*. For example, *Aristeguieta* 3329 from La Mucuy, Edo. Mérida, Venezuela, shows the lower anther cell fertile and nearly equal in size to the upper fertile anther cell, but *Aristeguieta* 3326 from the same locality has the lower anther cell sterile and reduced in size as in *C. chelidonioides*. Since both types of variations of the lower anther

cell may be found even in the same locality and apparently in the same population, the use of this single character for separating the two taxa, *C. palustris* and *C. chelidonioides*, is, at the least, suspect.

CRITERIA OF ADDITIONAL CHARACTERS

The question now arises as to not only whether *C. chelidonioides* is actually distinct from *C. palustris* and its subspecies, as delimited by Pennell, but also how and if these taxa may be differentiated from *C. tripartita*. In Macbride's Flora of Perú (loc. cit. p. 644), *C. chelidonioides* is treated by Edwin as a synonym of *C. tripartita* R. & P., but by Pennell (loc. cit. p. 187) they are separated as two taxa on the basis of supposed differences in the larger size of the corolla (15-25 mm. long) of *C. tripartita*, the more knob-like lower anther cell of *C. tripartita*, and the one or two pairs of more widely based lobes of the segments of the leaf-blades.

Kränzlin (loc. cit. p. 22), moreover, attempted to separate *C. chelidonioides* from *C. tripartita* on the basis of the non-connate petioles of the former as contrasted with the connate petioles of the latter. However, Edwin (in Macbride's Fl. Perú, loc. cit., p. 645), found this character to be unreliable and noted that the petioles vary "from up to half as long as and thinly winged by the blade to almost or quite lacking, when present connate across the nodes". In the Venezuelan specimens examined, the bases of the petioles are usually connate, but this character may not be apparent at all on the pairs of upper cauline leaves.

In short, no real differences can be found in leaf lobing and connation of petioles, nor between the possession of a flattened, ribbon-like, lower sterile anther cell of *C. chelidonioides* as contrasted with a more knob-like one of *C. tripartita*, as proposed by Pennell.

SUBSPECIES OF *CALCEOLARIA PALUSTRIS*

Pennell described several new subspecies (loc. cit. pp. 188-191) of *C. palustris*, based on presence or absence of glandular hairs on the pedicels, size of capsules, and extent of lobing and toothing of the leaf-blades. The Venezuelan specimens which he segregated as *Calceolaria palustris* subsp. *santanderensis* were supposed to have the "hairs of pedicels not or scarcely glandular". However, an examination of the material he cited shows the pedicels glandular to a greater or lesser extent, but obviously glandular hairs mixed with non-glandular ones. Moreover, all the other Venezuelan specimens examined show predominantly glandular pedicels. Also, capsules of the Venezuelan specimens vary in size from 5-10 mm. long and from a conic, longer than broad type to one depressed-ovoid-globose and about as broad as long, additional characters employed by Pennell to differentiate subspecies of *C. palustris*.

In the Flore Perú (loc. cit. 553), *C. palustris* is differentiated on the basis of "flowers solitary, axillary" from *C. pinnata*, which has "flowers borne in terminal or less often lateral dichasia". This differentiation is probably based on Kränzlin's statement in Das Pflanzenreich (loc. cit. p. 27) in which the flowers are described as "in axillis foliorum singuli". However, this statement is not substantiated by specimens identified by Pennell as *C. palustris*. Pennell describes (loc. cit. p. 188) the inflorescence of *C. palustris* subsp. *palustris* as "of lax few-flowered cymes, the peduncles appearing axillary", and the specimens identified by him all show a few to several-flowered inflorescence.

In view of the above discrepancies and variations in characters used by the above authors, it has been found unacceptable to maintain *C. chelidonioides* HBK. and *C. palustris* Sodiro ex Kränzlin as distinct from one another. Moreover, the differences between *C. tripartita* R. & P., *C. palustris*, and *C. chelidonioides*, are, at most, weak and suspect of being based on questionably unstable characters. For a more realistic solution at present, all three taxa would appear best united under the oldest epithet available for the group, namely, *Calceolaria tripartita* R. & P., the nomenclature as follows:

Calceolaria tripartita R. & P., Fl. Peruv. 1: 14. t. 20A. 1798.

Calceolaria chelidonioides HBK., Nov. Gen. et Sp. 2: 378. 1817.

Calceolaria palustris Sodiro ex Kränzlin, Pflanzenr. 4: (257C): 27. 1907.

Calceolaria concarpa Pennell, Proc. Acad. Nat. Sci. Phila. 97: 172. 1945.

STATUS OF THE *CALCEOLARIA* FROM CERRO AVILA

The leaves of the taxa distinguished as *Calceolaria tripartita*, *C. chelidonioides*, *C. conocarpa*, and *C. palustris*, are all ovate and variously pinnatifid to pinnately lobed. However, the specimens collected by Mr. Manara from Cerro Avila, Distrito Federal, show leaf-blades uniformly lanceolate-elliptic with coarsely serrate margins. In contrast to the *C. tripartita* - *C. palustris* - *C. chelidonioides* group of species, the leaves of the Avila plants are not pinnatifid nor pinnately lobed. Both anther cells of the Avila specimens are fertile, the upper one slightly larger than the lower one, and separated by elongated connective arms 0.8-1 mm. long. In all other respects, however, the floral details (size of corolla and calyx, size of capsule, glandular pedicels) approach or coincide with some of the subspecies of the *C. tripartita* (*C. palustris*) complex.

The Avila plants appear to be identical or nearly identical with the recently described *Calceonaria yuparum* Steyermark (Acta Bot. Venez. 10: 243-245. fig. 2. 1975) of Sierra, Estado Zulia, which has similarly coarsely incised-dentate, lanceolate leaves, and small corollas, calyx, and capsules. Since the plant from Avila cannot be separated from the Perijá specimens, it must be considered as conspecific, with its status as follows:

***Calceolaria tripartita* R. & P. subsp. *yuparum* (Steyermark) Steyermark, stat. nov. *Calceolaria yuparum* Steyermark, Acta Bot. Venez. 10: 243. fig. 2. 1975.**

Kränzlin described a plant with coarsely dentate, lanceolate leaves from Venezuela, doubtfully collected by Schwarz, as *Calceolaria prostrata* (loc. cit. p. 31). This closely resembles the plants of

Cerro Avila as well as those from Perijá (*Calceolaria yuparum*). It is possible that *C. yuparum* may eventually prove to be conspecific with *C. prostrata* when the type specimen, if extant, of that taxon has been checked.

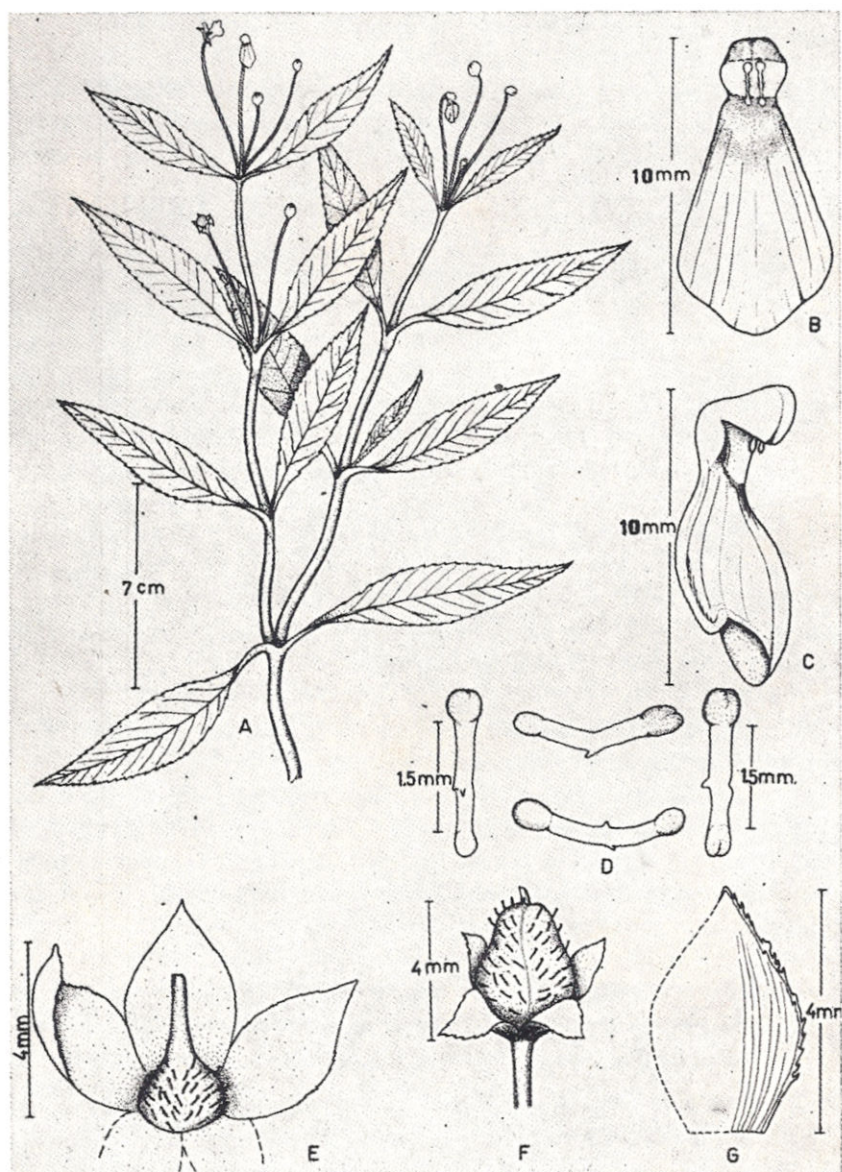


Fig. 1. - *Calceolaria tripartita* subsp. *yuparum* Steyermark. A. Habit; B. Corolla, front view; C. Corolla, side view; D. Anther cells with connective arms; E. Ovary, showing some of the calyx lobes; F. Capsule with calyx lobes; G. Calyx lobe.