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REMARKS ON THE IPOMOPSIS AGGREGATA GROUP

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In the study of the "*Gilia aggregata* group" (Wherry, 1946), seven taxa were recognized at the species level. When these were transferred to the genus *Ipomopsis* (Grant, 1956) the number was reduced to two. This divergence seems excessive, and the matter has been re-examined.

When pollen-transporting organisms visit flowers, their selective influence may change corolla characters relatively rapidly. Evolution in calyx features, on the other hand, is a less direct process and takes place more slowly. Marked difference in outline and extent of union of sepals is accordingly considered the more significant in deciding the status of individual members of the present group. The accompanying figures show the calyx, corolla, and position of the highest anther in the eight taxa involved; they were kindly drawn by Dr. Hsuan Keng, a Chinese taxonomist associated for a time with the Botany Department of the University of Pennsylvania.

There seems no reason to doubt that *Ipomopsis aggregata* (Pursh) Grant is the most primitive member of the group. Its sepals are broadly subulate and united less than half their total length of 6 to 9 mm. Corresponding to pollination by hummingbirds, its corolla-tube is moderately flaring and the limb is intense red with yellow flecks. The species type, which has a corolla-tube mostly 20 to 30 mm. long and the highest anther close to the tube-orifice, occurs chiefly along the Rocky Mountain axis. Its representative in more western regions differs in that the tube ranges from 25 to 45 mm. in length and the anthers are exserted up to 4 mm. beyond the orifice. A taxonomist who did not always practice what he preached assigned this latter taxon an epithet in species status on the basis of these corolla and stamen characters; although he had emphasized the significance of calyx features in the Polemoniaceae, he ignored the lack of divergence in this respect. Its different anther position and consequent pollination mechanism, as well as range, suggest that it deserves subspecies status, so it is herewith formally designated **Ipomopsis aggregata** (Pursh) Grant ssp. **formosissima** (Greene) Wherry, comb. nov.: basionym—*Callisteris formosissima* Green (1905); synonym—*Gilia aggregata* (Pursh) Spreng. ssp. *formosissima* (Greene) Wherry (1946).

Ipomopsis aggregata ssp. *attenuata,* an endemic in the mountains of Colorado and Wyoming, has a relatively short, narrow corolla-tube with a pink, yellow, or white limb; this corresponds to pollination by moths. Although it has been classed as a species, its calyx is like that of *I. aggregata,* so it is regarded as another subspecies. Its essential synonymy is: *Gilia aggregata* (Pursh) Spreng. var. *attenuata* Gray (1878); *Gilia attenuata* (Gray) Nelson (1898); *Ipomopsis aggregata* (Pursh) Grant ssp. *attenuata* (Gray) Grant (1956). A longer-tubed plant of eastern Nevada has been placed in this taxon (V. and A. Grant, 1957) but it seems indistinguishable from *I. tenuituba* discussed in the next paragraph.

In the intermountain region, from eastern California to western Colorado, occurs a striking, fragrant-flowered member of the group. Its corolla-tube, attracting long-tongued moths, is 35 to 60 mm. long and the limb is pink to white, at times with purple flecks. As its sepals tend to be united more than half their length and to be but inconspicuously awned, its specific distinctness is accepted: *Ipomopsis tenuituba* (Rydb.) Grant (1956); basionym—*Gilia tenuituba* Rydb. (1913).

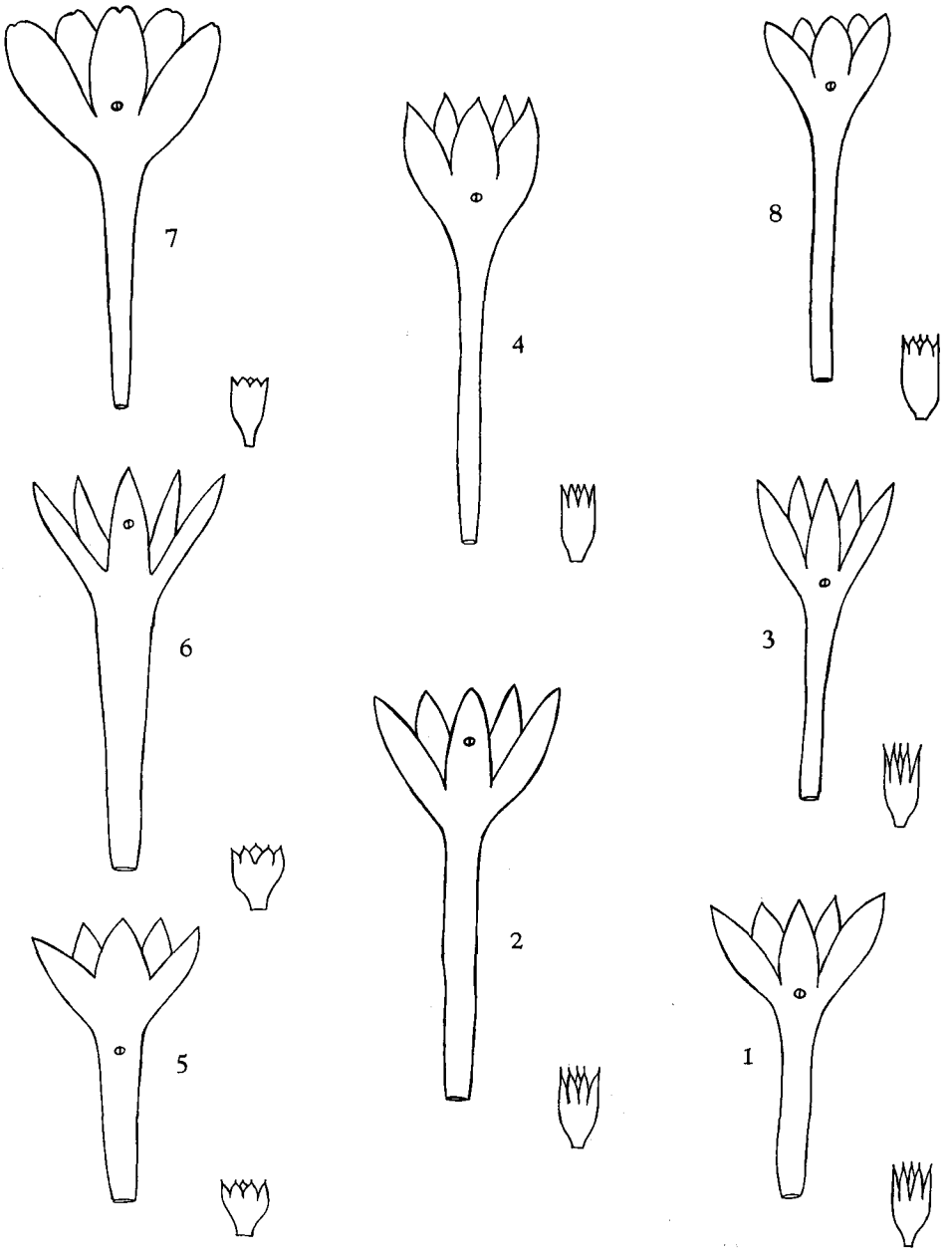

Fig. 1–8—Fig. 1. *Ipomopsis aggregata* (Pursh) Grant—Fig. 2. *I. aggregata* ssp. *formosissima* (Greene) Wherry.—Fig. 3. *I. aggregata* ssp. *attenuata* (Gray) Grant.—Fig. 4. *I. tenuituba* (Rydb.) Grant.—Fig. 5. *I. arizonica* (Greene) Wherry.—Fig. 6. *I. arizonica* ssp. *texana* (Greene) Wherry.—Fig. 7. *I. bridgesii* (Gray) Wherry.—Fig. 8. *I. candida* (Rydb.) Wherry.

The intermountain region also supports two taxa with the bright red corolla of *I. aggregata,* but a markedly dissimilar calyx; the sepals are only 4 to 6 mm. long with broad blades abruptly narrowed to subulate tips. One has a corolla-tube 20 to 30 mm. long with the anthers deep within. Being deemed worthy of species status, this is herewith named **Ipomopsis arizonica** (Greene) Wherry, comb. nov.; basionym—*Callisteris arizonica* Greene (1905); synonyms—*Gilia arizonica* (Greene) Rydb. (1913), *Ipomopsis aggregata* ssp. *arizonica* (Green) V. and A. Grant (Grant, 1956). The second has a corolla-tube 30 to 40 mm. long and the anthers are well-exserted. Its agreement in calyx-features with the preceding taxon is now regarded as disfavoring species segregation, but as it differs in range, extending from northeast California to western Texas and adjacent Mexico, it may well be classed as **Ipomopsis arizonica** ssp. **texana** (Greene) Wherry, status nov.: basionym—*Callisteris texana* Greene (1905); synonym—*Gilia texana* (Greene) Wooton and Standley (1913).

Centered in the California Sierras at latitude 37° 30′ there occurs an endemic member of the group. Its sepals are about 6 mm. long, united over half their length, and the blades are triangular without terminal awns. The corolla-tube is 30 to 45 mm. long and the pink petal-blades narrowly elliptic. In addition, the habit is lax and the leaf-segments are markedly obtuse. As these characters can have evolved from those of any other taxon only through a considerable series of steps, this form is deemed to deserve species status and becomes **Ipomopsis bridgesii** (Gray) Wherry, comb. nov.: basionym—*Gilia aggregata* var. *bridgesii* Gray (1870); synonyms—*Gilia bridgesii* (Gray) Wherry (1946), *Ipomopsis aggregata* ssp. *bridgesii* (Gray) V. and A. Grant (Grant, 1956).

The spectacular white-flowered taxon familiar to summer visitors in the Colorado Front Range also has a unique calyx: the sepals are 8 to 10 mm. long, united nearly ¾ their length, and yield a strikingly cylindric tube; their broad blades are abruptly narrowed to subulate-aristate tips. The corolla tube, corresponding to moth pollination, is 30 to 40 mm. long and the limb pure white—occasional pink forms would seem to represent hybrids, for their seeds yield mixed red and white flowered progeny. This form merits species status as fully as any other member of the group, so it may be known as **Ipomopsis candida** (Rydb.) Wherry, comb. nov.: basionym—*Gilia candida* Rydb. (1901); synonym—*Ipomopsis aggregata* ssp. *candida* (Rydb.) V. and A. Grant (Grant, 1956).

In accord with the view that calyx-characters are of fundamental taxonomic significance in this group, then, reduction of the number of species comprised to less than five is deemed unjustifiable.

TABLE 1. *The degree of change of the calyx and corolla of the taxa discussed in this paper may be summarized as follows*

	CALYX CHANGE	COROLLA CHANGE
A. With reference to *Ipomopsis aggregata,* regarded as the most primitive member of the group:		
1. Taxa interpreted as species:		
a. *I. arizonica*	extreme	moderate
b. *I. bridgesii*	extreme	moderate
c. *I. candida*	extreme	extreme
d. *I. tenuituba*	moderate	extreme
2. Taxa interpreted as sub-species of *I. aggregata*:		
a. *I. a.* ssp. *attenuata*	none	extreme
b. *I. a.* ssp. *formosissima*	none	moderate
B. With reference to *Ipomopsis arizonica*:		
1. Taxon interpreted as sub-species of *I. arizonica*:		
a. *I. a.* ssp. *texana*	none	moderate

LITERATURE CITED

Grant, V. 1956. A synopsis of *Ipomopsis*. Aliso 3: 351–362.
——— and A. Grant. 1957. Contrib. toward a flora of Nevada, No. 43, p. 86.
Gray, A. 1870. Proc. Am. Acad. Arts and Sci. 8: 276.
———. 1878. Syn. Fl. N. Am. 2(1): 145.
Greene, E. L. 1905. A proposed new genus, *Callisteris*. Leafl. Botan. Observation and Criticism 1: 159.
Nelson, A. 1898. Bull. Torrey Botan. Club 25: 278.
Rydberg, P. A. 1901. Bull. Torrey Botan. Club 28: 29.
———. 1913. Bull. Torrey Botan. Club 40: 472.
Wherry, E. T. 1946. The *Gilia aggregata* group. Bull. Torrey Botan. Club 73: 194–202.
Wooton, E. O. and Standley, P. C. 1913. Contrib. U. S. Nat. Herb. 16: 61.