

## THE GENUS ANETANTHUS (GESNERIACEAE)

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THE GENUS *Anetanthus* was described in Bentham and Hooker's *Genera Plantarum* (2: 1025. 1876), where it was attributed to Hiern with the reference "Pl. Bras. Warm. ined." Species were reported to be four or five from Brazil, Peru, and Mexico, with a numbered but unnamed collection, *Lechler 2723*, cited from Peru. No specific names or combinations were used, although three additional taxa, *Dicyrta parviflora*, *Russelia alata*, and *Tapina villosa*, were said to be included in the new genus.

The following year Hiern published a comparable generic description for *Anetanthus* (Warming, *Symb. Fl. Bras.* 23: 93. 1877) and cited the reference to *Genera Plantarum*. He described a single species as *Anetanthus gracilis* and referred to a Warming collection, without number, from Lagoa Santa, Brazil. In addition, Hiern noted the fact that Bentham and Hooker assigned three other species to the genus, but he also did not use the specific names in combination with *Anetanthus*. Jackson (*Ind. Kew.* 1: 133. 1893) attributed *Anetanthus gracilis* to Hiern and the binomials *Anetanthus parviflorus*, *Anetanthus alatus*, and *Anetanthus villosus* to Bentham and Hooker. The fifth supplement to *Index Kewensis* also listed *Anetanthus pusillus* Glaziov as a *nomen nudum*.

The four validly published species of "*Anetanthus*" should be assigned to three genera in two families, as the following notes will indicate.

***Anetanthus alatus*** (Chamisso & Schlechtendal) Bentham & Hooker ex Jackson, *Ind. Kew.* 1: 133. 1893.

*Russelia alata* Chamisso & Schlechtendal, *Linnaea* 3: 3, 4. 1828; J. A. Schmidt in Martius, *Fl. Bras.* 8: 269. t. 44. 1862.

I have seen but one specimen of this taxon, that in the herbarium at Kew. A single flower, previously dissected, was in a packet; however, pollen could be obtained from the single anther present for the accompanying SEM photograph. The illustration in *Flora Brasiliensis* must have been drawn from an additional specimen. The type is a Sellow collection, without number, from Brazil.

Carlson, when considering this taxon in her monograph of *Russelia* (*Fieldiana Bot.* 29: 285. 1957), correctly rejected it as a *Russelia* but referred it to *Anetanthus* without comment. Few morphological details are available in the material on hand for an adequate comparison with *Anetanthus gracilis* except the larger stature, alate stems, and longer calyx.

Chamisso and Schlechtendal (1828) referred *Russelia alata* to the Scrophulariaceae, as did Schmidt (1862). Bentham (in *DC. Prodr.* 10: 332. 1846) listed *Russelia alata* as a *species dubia* in the Scrophulariaceae be-



fore associating it with *Anetanthus* in the Gesneriaceae in *Genera Plantarum* (1876).

*Anetanthus gracilis* Hiern in Warming, *Symb. Fl. Bras.* 23: 93. 1877.

The type collection, made by Warming in Lagoa Santa, Brazil, is represented by three unnumbered sheets in the herbarium at Copenhagen. A drawing of a dissected flower accompanies one of these sheets and a single flower is in a packet. This specimen has been designated as the lectotype, for the other specimens are in fruit. Other specimens of *Anetanthus gracilis* have been seen from Brazil (Lagoa Santa, Minas Gerais, and Distrito Federál); Colombia (Dept. El Cauca and Meta); Peru (San Martin and Cusco); and Bolivia (San Carlos).

*Anetanthus parviflorus* (Hooker & Arnott) Benth. & Hooker ex Jackson, *Ind. Kew* 1: 133. 1893. (Cited as *Anetanthus parviflora*.)

*Trevirania parviflora* Hooker & Arnott, *Bot. Beech. Voy.* 302. 1840.

*Dicyrta parviflora* (Hooker & Arnott) Seemann, *Bot. Voy. Herald* 326. t. 69. 1856.

This species was originally described from material collected by Lay and Collie in Mexico. The genus *Trevirania* Willd. was considered a synonym of *Achimenes* P. Br. by Benth. & Hooker (*Gen. Pl.* 2: 998. 1876). The genus *Dicyrta* Regel was recognized as related to *Achimenes* by Benth. & Hooker (*Gen. Pl.* 2: 1000. 1876), and it is listed as a genus of two species in the Gesneriaceae by Willis (*Dict. Fl. Plants & Ferns*, 8th. ed. 361. 1973).

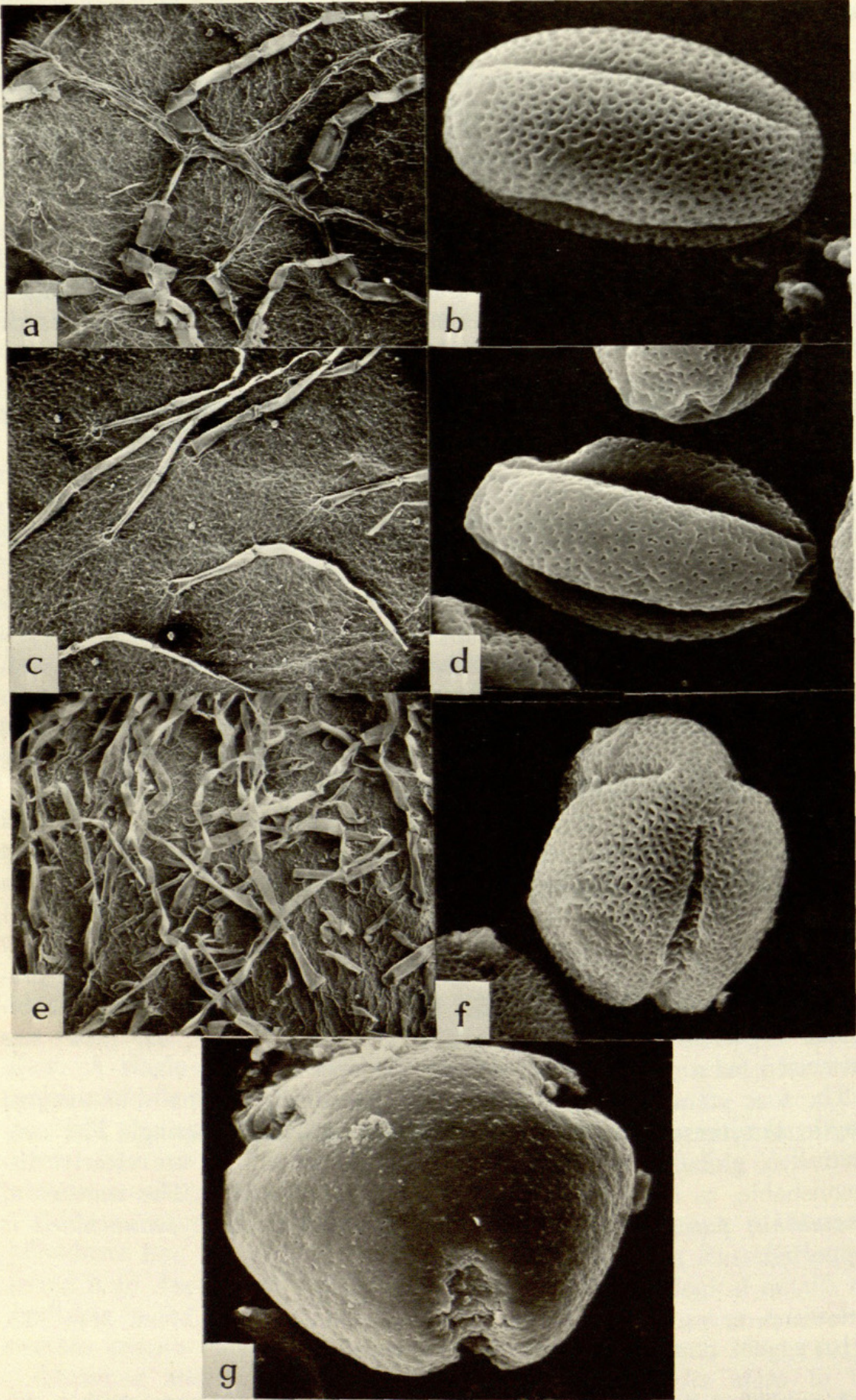
In the treatment of the Scrophulariaceae for the Flora of Guatemala (Fieldiana Bot. 24(Part IX): 406. 1973), Standley and Williams list *Anetanthus parviflorus* in the synonymy of *Stemodia peduncularis* Benth. in DC. (*Prodr.* 10: 382. 1846). Dr. L. O. Williams reported (pers. comm.) that he added the synonym to a partially completed manuscript left by Standley, since Standley had so annotated a specimen. The name *Stemodia peduncularis* Benth. must be used for this taxon, since the binomial *Stemodia parviflora* Aiton (*Hort. Kew.* ed. 2. 4: 52. 1812) has been used for a different species.

The four stamens of *Anetanthus parviflorus* occur in pairs of unequal length, but these are independent, the anthers not adhering. The connective is globular and the two halves of the anther are clearly distinguishable, as is characteristic of species of *Stemodia*. The transfer of *Anetanthus parviflorus* to *Stemodia* as a synonym of *S. peduncularis* is supported.

*Anetanthus pusillus* Glaziov, *Bull. Soc. Bot. Fr.* 58(Mem. 3f): 515. 1911.

A published list of Glaziov collections associated this name with a collection numbered 19586 from Alto Macahé of Nova Friburgo. A very







brief description of the plant as herbaceous with violet flowers has led subsequent workers to consider this name as a *nomen nudum* (Ind. Kew. Suppl. 5: 16. 1921). In spite of the discordant reference to the flower color, I believe the Glaziou collection to be a depauperate specimen of *Anetanthus gracilis*.

*Anetanthus villosus* (Gardner in Hooker) Benth. & Hooker ex Jackson, Ind. Kew. 1: 133. 1893. (Cited as *Anetanthus villosa*.)

*Tapina villosa* Gardner in Hooker, Icon. t. 469. 1842.

The genus *Tapina* Martius was placed in the synonymy of *Sinningia* (Gesneriaceae) by Benth. & Hooker (Gen. Pl. 2: 1004. 1876), but the species *Tapina villosa* was associated with the new genus *Anetanthus*. I have seen two sheets of the original collection (Gardner 3875). Data on a sheet in the British Museum indicated that the collection was made from dry cliffs of the rocky summit of the Serra de Natividade, Goyaz Province, Brazil, in February, 1840. The specimens examined differed from *Anetanthus gracilis* in the shape and lobing of the corolla, the adherence of all four anthers, the pubescent ovary, and the scaly rhizomes.

The genus *Goyazia*, described by Taubert (Engler, Bot. Jahrb. 21: 451, 452. f. B. 1896) with a single species, *G. rupicola*, was based on a collection (Ule 3180) from Serra Dourado, Brazil. *Anetanthus villosus* shares with it the characteristics of calyx, corolla, adhering anthers, pubescent ovary, and scaly rhizomes and should be transferred to this formerly monotypic genus as *Goyazia villosa* (Gardner in Hooker) Howard, comb. nov. (BASIONYM: *Tapina villosa* Gardner in Hooker, Icon. t. 469. 1842.)

Neither *Anetanthus* nor *Goyazia* were mentioned by Ivanina in her paper "Applications of the carpological method to the taxonomy of the Gesneriaceae" (Notes Roy. Bot. Gard. Edinb. 26: 383-403. 1965). Although *Goyazia* is not known in fruit or with mature seeds, the pubescence type, stomata, and scaly rhizomes suggest that it is a member of the Gesneriaceae. The familial association of *Anetanthus* is more difficult. Fritsch, in a treatment of the Gesneriaceae (Engler & Prantl, Nat. Pflanzenfam. IV. 3b: 156, 157. 1895), placed the genus alone in his Cyrtandroideae-Anetantheae, distinguishing the section from the Beslerieae on the basis of the dry two-lobed or two-valved capsule. The fruits and seeds of *Anetanthus gracilis* are unlike any illustrated by Ivanina.

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FIGURE 1. a, *Anetanthus alatus*, pubescence of lower leaf surface,  $\times 25$ ; note the pattern of collapsed cells of the top hair; type, *Sellow s.n.* (K). b, *Anetanthus alatus*, pollen grain,  $\times 2500$ ; type, *Sellow s.n.* (K). c, *Anetanthus gracilis*, pubescence of lower leaf surface,  $\times 25$ ; type, *Warming s.n.* (C). d, *Anetanthus gracilis*, pollen grain,  $\times 2500$ ; *Irwin et al.* 14055 (NY). e, *Goyazia villosa*, pubescence of lower leaf surface,  $\times 25$ ; type of *Tapina villosa*, *Gardner s.n.* (K). f, *Goyazia villosa*, pollen grain,  $\times 2500$ ; type of *Tapina villosa*, *Gardner s.n.* (K). g, *Stemodia peduncularis*, pollen grain from "*Anetanthus parviflorus*,"  $\times 2500$ ; type of *Trevirania parviflora*, *Beechey s.n.* (K).



Dr. Umesh Banerjee kindly prepared pollen grains for the accompanying SEM photographs and compiled the descriptions which follow. The distinctness of "*Anetanthus parviflorus*" is evident and the similarity of *Anetanthus gracilis*, *A. alatus*, and *Goyazia villosa* is equally apparent.

*Anetanthus gracilis* (FIGURE 1d). Pollen grains spheroidal or prolate, tricolpate, colpi long tapering, colpus membrane with warty structures, pores absent, exine sculpture foveolate to reticulate, exine thickness 1.0  $\mu\text{m}$ .

*Anetanthus alatus* (FIGURE 1b). Pollen grains prolate, tricolpate, colpi narrow and tapering toward the polar region, pores absent, exine sculpture typically reticulate, occasionally luminal areas consisting of small spherical structures, exine thickness 1.0  $\mu\text{m}$ .

*Goyazia villosa* (FIGURE 1f). Pollen grains prolate to prolate-spheroidal, tricolpate, colpi long tapering, colpus membrane showing distinct spherical warty projections in the pore region of the equatorial plane, pores absent, exine sculpture distinctly reticulate, exine thickness 1.0  $\mu\text{m}$ .

"*Anetanthus parviflorus*" (FIGURE 1g). Pollen grains oblate, tricolporate, colpi short with weakly defined pores in the equatorial plane, colpus membrane with warty structures, exine sculpture foveolate, exine thickness 1.5  $\mu\text{m}$ .

The pubescence of these taxa consists of uniseriate multicellular hairs. Upon drying, adjacent cells commonly collapse at right angles to each other (FIGURE 1a). This characteristic hair type and method of drying has been seen in a great many genera of the Gesneriaceae. In the Scrophulariaceae the same hair type is common, but numerous other types of hairs from simple unicellular to multicellular-stellate or multicellular-uniseriate hairs are found.

On the basis of the material available to me, both *Anetanthus* and *Goyazia* seem appropriately placed in the Gesneriaceae if this family is to be considered as distinct from the Scrophulariaceae.

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Howard, Richard A. 1975. "The Genus *Anetanthus* (Gesneriaceae)." *Journal of the Arnold Arboretum* 56(3), 364–368. <https://doi.org/10.5962/p.185855>.

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