

AIZOACEAE

A NEW SPECIES OF *GALENIA* FROM THE GREAT KAROO

The genus *Galenia* L. is placed in the subfamily Aizoioideae (Aizoaceae s. str.) and is generally characterized by androecial and gynoecial features (Bittrich & Hartmann 1988; Bittrich 1990). The genus is now divided into two subgenera, namely subgenus *Galenia* and subgenus *Kolleria* Fenzl emend. Adamson. The descriptions of the two subgenera, especially that of the subgenus *Galenia*, as given by Adamson (1956), are partly incorrect, and the monophyly of these taxa also still needs to be shown. Subgenus *Kolleria* Fenzl emend. Adamson now comprises about 20 species and, according to Adamson (1956), is characterized by obovate or spatulate, often grey or white leaves, secund cymose inflorescences, 4 or 5

perianth segments, 2–5 styles, and dehiscent fruits. These characters, however, can also be observed in most species of the closely related genus *Aizoon* L. They must therefore presumably be regarded as plesiomorphic, so that at present no synapomorphy can be named which might suggest the monophyly of subgenus *Kolleria*.

***Galenia glandulifera* Bittrich**, sp. nov., planta herba annua papulosa, species haec a *G. papulosa* (Eckl. & Zeyh.) Sond. indumento pilis glandulosis differt (in *G. papulosa* indumentum tantum eglandulosum). *Chromosomatum numerus* $2n = 16$.

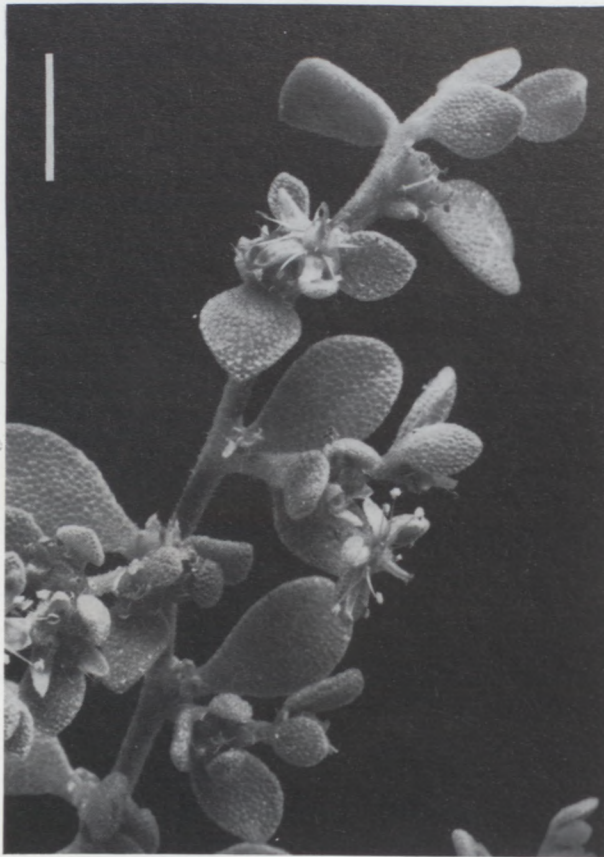


FIGURE 6.—*Galenia glandulifera* Bittrich. Flowering lateral branch. Plant raised from seeds of *Gerbaulet & Struck* 24236. Scale bar = 5 mm.

TYPE.—Cape 3323 (Willowmore): 1 km N Swartleege on foot of the Spioenkop (–BA), *Gerbaulet & Struck* 24236 (HBG, holo.; PRE).

Small annual glistening herb up to 100 mm tall and 100–600 mm in diameter, branching from the base; main axis erect, compressed, without flowers, lateral branches decumbent or ascending, elongate, ending in cymose inflorescences; leaves and stems densely covered with large water storing idioblasts (bladder cells) and more or less sparsely covered with oblong ovoid, bottle-shaped or pyriform, apically secretory glands with a multiseriate stalk. *Leaves* weakly succulent, opposite on main axis, alternate on lateral branches, exstipulate, petiolate; lamina obovate, obtuse, up to 20 × 8 mm on main axis and up to 8 × 5 mm on lateral branches, petioles 2–7 mm long. *Inflorescence* a dichasium, up to 300 mm long, terminating the lateral branches, the two side branches of each node very unequal in length, inflorescence thus appearing monopodial; bracts recaulescent with their axillary shoot up to the terminal flowers. *Flowers* protandrous, sessile, perigynous, 5-merous, 5 mm in diameter; tepals 5, triangular, green on outside, magenta or purple on inside. *Stamens* 10, in pairs, alternating with the tepals, inserted at the mouth of the perianth-stamen tube, light purple. *Styles* 5, whitish papillose on outside, purplish hairy-papillose on inside, free to the base. *Ovary* slightly convex, surface with large papillae, 5-locular with one, rarely two pendulous ovules per locule; placenta axile apical. *Disc* a flat green ring at the base of the filaments. *Fruit* a 5-angled loculicidal, hygrochastic capsule of up to 2 mm diameter, with expanding keels and sheets on the inner

side of the valves, depressed centrally; valves slightly opening outwards after wetting. *Seed* reniform, 0,75 × 0,5 × 0,4 mm, dark brown or black, with small tubercles. *Chromosome number* 2n = 16. Figure 6.

CAPE.—3121 (Fraserburg): 7 miles S of Fraserburg Station, Prince Albert Drive (–DC), *Zinn s.n.* (SAM). 3123 (Victoria West): prope Murraysburg (–DD), *Tyson s.n.* (SAM). 3221 (Merweville): Zwarts (–DD), *Pillans 16368* (SAM). 3223 (Rietbron): Nelspoort, Beaufort West Dist. (–AA), *Kingon s.n.* (NBG). 3224 (Graaff-Reinet): SW of Aberdeen (–AC), *Maguire 749* (NBG). 3320 (Montagu): Whitehill (–BA), *Compton 9296* (NBG). 3321 (Ladismith): 15 miles E of Laingsburg on road to Beaufort West (–AA), *Lewis 4172* (SAM). 3322 (Oudtshoorn): Karoo, Prince Albert (–AA), *Stokoe s.n.* (SAM); Tierberg (–AB), *Dean & Dean 677* (HBG). 3323 (Willowmore): 1 km N of Swartleege on foot of Spioenkop (–BA), *Gerbaulet & Struck 24236* (HBG, PRE).

Galenia glandulifera occurs only in the Great Karoo. Figure 7.

On account of its 5-merous flowers and broad leaves, this species at present must be placed in subgenus *Kolleria*. Specimens of *G. glandulifera* are often wrongly identified as *G. papulosa*. *G. glandulifera* has glandular trichomes (Figure 8), an extremely rare character in the Aizoaceae s. str. These trichomes are most probably a modification of the stalked bladder-hairs, which are typical for the Aizooideae/Tetragonioideae and presumably a synapomorphy of the clade comprising these subfamilies (Bittrich 1990). The glandular trichomes of *G. glandulifera* secrete very small droplets of a clear liquid at their apex, which on drying becomes yellow and later brownish and smells of coumarin.

In the plasma of the secretory cell at the tip of the trichomes, a large nucleus and some chloroplasts are visible (Figure 8). Chloroplasts (incidentally reported to occur in the hairs of various vascular plants) can generally also be found in the apical cells of the bladder hairs of species belonging to the Aizooideae/Tetragonioideae. They are also known to occur within the plasma of the epidermal bladder cell idioblasts of other Aizoaceae (Luettge *et al.* 1978). It is noteworthy that in subgenus *Galenia* some species, such as *G. africana* L., also have secretory stalked trichomes on leaves and stems. In contrast to *G. glandulifera*, these hairs are T-shaped (the most common and probably plesiomorphic hair form in the genera

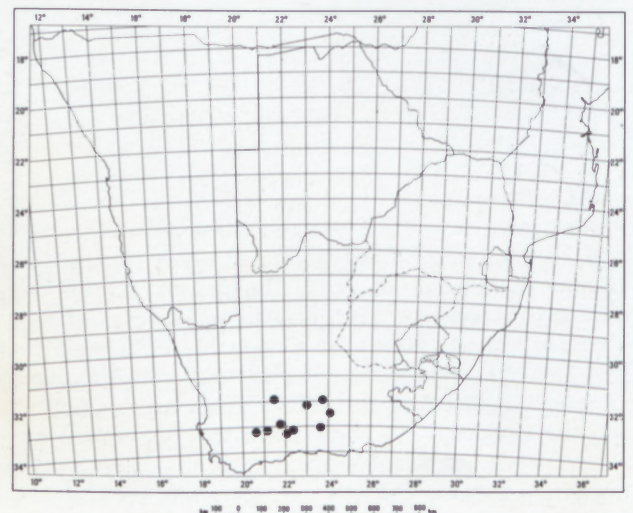


FIGURE 7.—Distribution of *G. glandulifera*.



FIGURE 8.—Stem epidermis of *G. glandulifera* in cross section with bladder cell idioblasts and a glandular trichome. Scale bar = 0,1 mm.

Aizoon L., *Galenia* L., and *Plinthus* Fenzl emend. Verdoorn). The secretion, which contains coumarin derivatives (*G. africana* is poisonous for cattle!), completely

covers the green parts of the plants with a yellow and sticky layer which on warm days often smells strongly. These differences may indicate on the one hand that the glandular trichomes have evolved independently in both subgenera, but on the other hand the extreme rarity of such trichomes in Aizoaceae *s. str.* suggests a close relationship between species of *Galenia* with this character. If the latter is true, subgenus *Kolleria* would be an unnatural taxon. A detailed analysis of the secretion might provide further evidence to decide between these two hypotheses.

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V. BITTRICH*

* Institut für Allgemeine Botanik und Botanischer Garten der Universität Hamburg, Ohnhorststr. 18, D-2000 Hamburg 52, Fed. Rep. Germany.