

DIPSACACEAE¹ (C. G. G. J. van Steenis, Leyden)

1. TRIPLOSTEGIA

WALL. in DC. Prod. 4 (1830) 642; in DC. Coll. Mém. 7, Valér. (1832) 19, t. 5.—*Hoeckia* ENGL. & GRAEBN. Bot. Jahrb. 29 (1901) 598.—Fig. 1.

Erect, perennial herbs; rootstock horizontal; stem-base (?always) provided with 2 elongated, spindle-shaped, subterranean tubers. *Leaves* decussate, dentate to pinnatifid, exstipulate, mostly crowded into a basal pseudo-rosette, cauline ones distant, gradually reduced; base decurrent into the petiole; petioles clasping the stem. Panicle terminal, bracteate, branches decussate, forked, cymose, outermost in triads; rachis and branches distinct from the stem by the presence of capitate-glandular hairs. *Flowers* ♀, articulated on a short pedicel, 5-merous, subactinomorphic. Base of the pedicel sustained by 2 narrow, ciliate, 1-nerved bracts ending in a thickened (?glandular), blunt nerve-tip. Ovary surrounded by 4 conspicuously capitate-glandular, persistent bracts connate at their extreme base and cuspidulate (in fruit hooked) at their apex (*outer epicalyx*) and a tubular, 8-ribbed, utricle-shaped, persistent *inner epicalyx* with a slight constriction at its apex below a minute, crenulate or toothed limb. Calyx minute, epigynous, 5-lobed. Corolla epigynous, gamophyllous, white, pink or red, caducous; tube funnel-shaped; lobes 5, equal, rounded, erect, imbricate in bud. Stamens 4, equal, alternating with the lobes; filaments free towards the apex of the tube; anthers introrse, dorsifixed. Style 1, terete, stigma capitate. Ovary 1-celled, narrow. Ovule 1, pendulous from the apex of the cell to halfway the ovary. *Fruit* 1-seeded, thin-walled, surrounded by the inner epicalyx, and this in turn by the hardened, 4-lobed, capitate-glandular outer epicalyx, the tips of which are hooked; fruit with epicalyces breaking off from the top of the pedicel as a diaspore. *Seed* oblong, subterete, acutish towards both ends, smooth but for two faint, longitudinal ridges; albumen plentiful; embryo scarcely shorter than the seed.

Distr. Two *spp.*, from the Sikkim-Himalaya, S. China and Formosa, to *E. Malaysia*.

Ecol. A decidedly microtherm genus with a most peculiar, apparently undescribed, 'double' adaptation for epizoic dissemination by the (probably sticky) glandular-capitate mucor-like hairs and the hooked tips of the lobes of the outer epicalyx which embrace the fruit and fall off with it from the articulation at the apex of the pedicel. The comparison I made formerly between distribution and dispersal methods in *Valeriana* and *Triplostegia* (cf. Bull. J.B.B. III, 13, p. 257, 403-404) loses much of its value by the detection of the above-described dispersal mechanism. '*Hoeckia*' was reported to smell of valerianic acid.

Anat. Acc. to GAGNEPAIN (Bull. Soc. Bot. Fr. 47, 1900, 333) the pollen resembles that of *Scabiosa*.

Notes. *Dipsacaceae* contain about 10 genera, all native to Europe and Asia, with some outliers in N. Africa & Ceylon; *Triplostegia* in Celebes and N. Guinea represents the single record on the S. hemisphere. The *Dipsacaceae* are undoubtedly allied to the *Valerianaceae*, which are distinct by their typically 3-celled ovary and absence of an epicalyx. ENGLER & GRAEBNER in describing the genus *Hoeckia* from China, assumed to have found a missing link between the two families in ascribing to *Hoeckia* a single epicalyx and a 3-celled ovary with 2 abortive cells. However, they clearly erred in the interpretation of the floral parts of *Hoeckia* and mistook the inner ribbed epicalyx for the pericarp. There is no doubt that *Hoeckia* is a true *Triplostegia*; it is clearly identical with *T. glandulifera* WALL., which I find confirmed by HANDEL-MAZZETTI (Symb. Sin. 7, 4, 1936, 1055).

Leaf-size and shape are, in *Triplostegia*, very variable and not fit for specific distinction. There is, also, variation in the subterranean parts dependent on habitat.

Three *Triplostegias* have been erratically described by LÉVEILLÉ (Bull. Géogr. Bot. 24, 1914, 282; *ibid.* 25, 1915, 13) which do not belong to the *Dipsacaceae*. According to the types kindly put at my disposal by Sir WILLIAM WRIGHT SMITH they represent:

T. epilobiifolia Lév. = *Inula* cf. *exsiccata* Lév. (det. Miss J. KOSTER).

(1) According to BAKHUIZEN VAN DEN BRINK Jr (in BACKER, Bekn. Fl. Java, em. ed. 8, 1949, fam. 177, p. 1) *Scabiosa atropurpurea* L., an annual from the E. Mediterranean, is sometimes cultivated as an ornamental in gardens in the mountains of Java.

T. mairi LÉV. = *Chrysosplenium henryi* FRANCH.
T. pinifolia LÉV. = *Sedum asiaticum* DC.

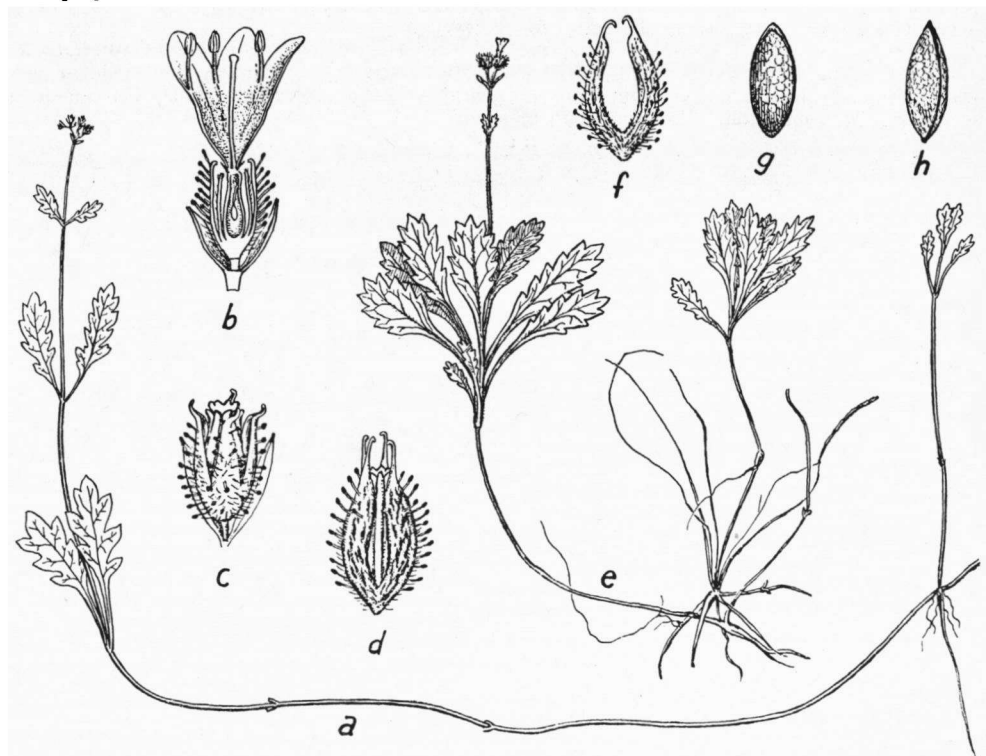


Fig. 1. *Triplostegia glandulifera* WALL. a. Habit (of type of *T. repens* HEMSL.), b. schematic section of a flower (after HÖCK, 1891), c. flower without corolla, on pedicel with two bracts (from type of *T. repens*), d. diaspore (WILSON 3776), e. habit of fresh New Guinean material (BRASS 9208), f. section of outer epicalyx in fruit (WILSON 3776), g-h. seed (from ditto). (a & e nat. size, others enlarged).

1. *Triplostegia glandulifera* WALL. in DC. Prod. 4 (1830) 642; DC. Coll. Mém. 7, Valér. (1832) 19, t. 5 (*T. glandulosa*); HOOK. f. Fl. Br. Ind. 3 (1881) 215; SASAKI, Cat. Govt Herb. Formosa (1930) 488.—*Hoeckia aschersoniana* ENGL. & GRAEBN. Bot. Jahrb. 29 (1901) 598.—*T. repens* HEMSL. Kew Bull. (1899) 101; DIELS, Bot. Jahrb. 62 (1929) 493; STEEN. Bull. J.B.B. III, 13 (1934) 257; MERR. & PERRY, J. Arn. Arb. 30 (1949) 55.—Fig. 1.

Fragile, 5–15 cm long, erect, mostly with a distinct rosette at the base of the stem or higher on the stem, above a creeping branched rootstock. Cauline leaves reduced, 1–2 pairs. *Leaves* spatulate to oblong-obovate, coarsely dentate or sub-pinnatifid in the upper portion, basal part entire, tapering into a distinct or indistinct petiole, 1–3 cm long, upper surface puberulous towards the margins, lower surface with scattered hairs on midrib and nerves. Inflorescence few-flowered and congested, stalks expanding in fruit. Bracts linear-spathulate, puberulous, margins ciliate, 2½–3 mm. *Flowers* white. Pedicels very short, in fruit to 1 mm. Lobes of outer epicalyx narrow-triangular, short-pubescent and capitate-glandular, 1½–1¾ mm,

the acute tip mucronate, hardening and hooked in fruit, slightly exceeding the calyx. Inner epicalyx pubescent on the ribs, 1½ mm long; limb consisting of 8 minute triangular teeth. Calyx cup-shaped, ± ¼ mm long, 5-lobed halfway down, lobes broad-triangular acute. Corolla 3–4 mm long, tube funnel-shaped, twice as long as the broadly elliptic, rounded, obliquely erect lobes; one vein in each lobe. Filaments erect, inserted just below the incisions, ½ mm long; anthers exerting from the tube. Style 2 mm long, straight; stigma capitate.

Distr. NW. India, Sikkim, Yunnan, E. Tibet, Szechuan, and Formosa, in *Malaysia*: Central Celebes (summit of Mt Kambuño) and New Guinea, 2000–3300 m, expected to occur also in Luzon and Ceram.

Ecol. Fl. March–August.

Notes. From a mixture of some mountain herbs collected by the late Dr P. J. EYMA in Central Celebes, 1937, I segregated one tiny, unintentionally collected specimen, which I assumed to be identical with the New Guinean specimens on the strength of the original, inadequate description and a crude drawing of the type I had made at Kew in

1934. This remarkable find, forming a transition station between Formosa and New Guinea, was, unfortunately, apparently lost after the war.

I can find no adequate specific characters for distinguishing the Papuan specimens from the continental Asiatic ones. They are all dwarfly, but dwarf specimens are also known from Yunnan. The Asiatic specimens attain mostly a length of

20-50 cm. According to MERRILL & PERRY the substratum is to be held responsible for the place on the stem (rootstock) where the basal rosette develops.

The closely allied *T. grandiflora* GAGN. (*syn. T. delavayi* FRANCH. *ex* DIELS), from Yunnan, can easily be distinguished by a tubular, 7-10 mm long corolla.