

A SYNOPSIS OF THE GENUS ENICOSTEMA BL., NOM. CONS.  
(GENTIANACEAE)

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In 1759 Linnaeus described an American species under *Gentiana*, as *G. verticillata*. In 1781 his son recorded (Suppl. 174) a specimen from India leg. D. D. Fabricius under the same name, without reference to the earlier *G. verticillata*, and gave a full description. Whether this was just a new record or whether he really intended to describe a new species, which then involves that he was not aware of the name his father had preoccupied, is difficult to prove. No references were mentioned though he gave these elsewhere under other species described before. Though Index Kewensis did not enter this homonym I am rather convinced that it was intended as a new species, also in connection with the fact that he based the description on an Indian specimen. Nomenclaturally this is anyway not very important, but taxonomically it is, because his name and description were made after an Old World species which already Vahl in 1794 (Symb. 3, 46—47) pointed out was different from the American species, without adjusting the necessary nomenclatural consequence. Before Vahl, Retzius had already hinted at this difference (Symb. 2, 1781, 15) in making two varieties under *G. verticillatum* L. ('*verticillaris*'). Even Burman f. (Fl. Ind. 1768, 73) had already remarked that the Coromandel plant differed from the American one figured by Plumier.

The distinction of two species was achieved by Willdenow in 1798, who, agreeing with Vahl, at the same time accommodated the two species in the genus *Exacum*, keeping the epithet *verticillatum* correctly for the American species and adopting a new epithet *hyssopifolium* for the Old World '*Gentiana verticillatum* L. f.'.

Unaware of these names Blume described from Java in 1826 a new monotypic genus *Enicostema* (*E. littorale* Bl.).

G. Don in his General History etc. (vol. 4, 1837, 200—201) had all three names: the New World *Gentiana verticillata* L. ('*verticillaris*') as *Coutoubea verticillata* (L.) G. Don in Loud., Hort. Brit. (1830) 48, and the Old World species both as *Enicostema littorale* Bl. and as a monotypic new genus *Adenema* with *A. hyssopifolium* (Willd.) G. Don, based on *Gentiana verticillata* L. f. = *Exacum hyssopifolium* Willd.

Grisebach in his monograph of the *Gentianaceae* (in DC., Prod. 9, 1845, 65—66) emphatically maintained two species under a special generic name created for them by H. Th. L. Reichenbach (Conspectus, 1828, no 3492), namely *Slevogtia* Rchb. He rejected the generic name *Hippion* Sprengel (Syst. Veg. 1, late 1824, 505) which had, he admitted, priority but could not be used because of *Hippia* L. which by its 'consonantium' he regarded as a homonym.

The name *Hippion*, however, dates already from F. W. Schmidt, Fl. Boem. 2 (1794) 18, and was a mixtum of *Gentiana* and various other gentianaceous genera; in 1796 F. W. Schmidt (in Roem. Arch. 1, 1, 1796, 8) added to his concept also *Gentiana verticillata* L. Sprengel (l.c.) restricted *Hippion* to our genus.

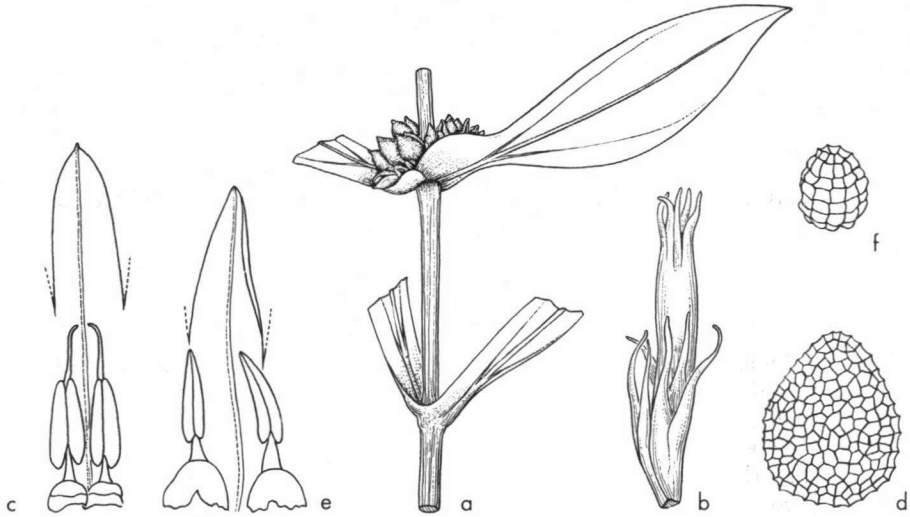


Fig. 1. *Enicostema elizabethae* Veldkamp. a. Habit in fruit,  $\times 1$ , b. flower,  $\times 5$ , c. anthers,  $\times 10$ , d. seed  $\times 20$  (2—c Hildebrandt 3313, d. d'Alleizette s.n.) — *E. hyssopifolium* (Willd.) Verdoorn. e. Anthers,  $\times 10$  (Backer 24336) — *E. verticillatum* (L.) Engl. f. Seed,  $\times 20$  (Eggers 5467).

To complicate matters further Borckhausen published an other generic name, viz. *Ericoila* Borckh. (in Roem. Arch. 1, 1, 1796, 27) which is except for our plant a synonym of *Gentiana*.

In 1891 O. Kuntze (Rev. Gen. Pl. 1, 428) tried to safeguard Sprengel's concept of *Hippion* by offering the new generic name *Hippionum* O.K. which is of course superfluous.

Fortunately, *Enicostema* is conserved against *Hippion* F. W. Schmidt; it should be pointed out that the reference of the rejected name in the Code should be followed by 'em. Spreng. 1824' as Sprengel is responsible for the typification of Schmidt's mixture.

Furthermore, Grisebach said that the specific epithets were so much confused that he coined entirely new names, *Slevogtia occidentalis* Gris. for the New World species, *S. orientalis* Gris. for the Old World species. He added the correct synonyms to both names, having examined of both dried material. Both epithets are of course illegitimate, by being superfluous.

*Enicostema* Blume he copied from Blume's description, without having had access to his material, adding that according to the characters this was hardly different from *Slevogtia*, not realizing its congenericity and even conspecificity with *Slevogtia orientalis*.

Subsequent authors did not accept *Slevogtia*, but used *Enicostema*, and mostly regarded it as monotypic, either using Linnaeus' epithet *verticillatum*, following Engler (1895) and Clarke (Fl. Br. Ind. 4, 1883, 100), or using Blume's epithet *littorale*, at least for the Old World species, and not always stating whether they found it different from the American species.

N.E. Brown in his revision of the African species for the Flora of Tropical Africa (1904) recognized, apart from *E. littorale* Bl. and the American species, a third species endemic in Africa, *E. latiloba*, whereas he added succinctly that a fourth new species would occur in Madagascar.

Miss I. C. Verdoorn (1961) who was apparently convinced that Vahl, Willdenow, Grisebach, etc. had been correct in distinguishing between an Old World species and

another one from the New World, realized that the Old World species was without a correct epithet, and made for the common African and Indo-Malesian species the new combination *E. hyssopifolium* (Willd.) I. C. Verdoorn, replacing *E. littorale* Bl. This has also been followed in the new Flora of Java by Dr. Bakhuizen van den Brink Jr. (1965).

Prof. van Steenis in checking this name was curious to know what were exactly the differences between the New and the Old World species; were they really sufficiently specific or merely racial in this pantropical affinity? Miss Verdoorn (in litt.) admitted not to have studied this, whereupon Dr van Steenis suggested me to examine the specimens at the Rijksherbarium, and later specimens kindly loaned to us by courtesy of Prof. Lanjouw from the Utrecht Herbarium and the type of *E. latiloba* N.E. Brown by the generous attitude of Dr Taylor, Director of the Royal Botanic Gardens, Kew.

The result is that four species can be distinguished and that N.E. Brown was correct in suggesting the presence of an endemic undescribed species in Madagascar. His *E. latilobum*<sup>1)</sup>, of which I had three sheets, is distinct, but closely allied to *E. hyssopifolium* differing only in the shape of the lobes of both calyx and corolla. These differences are obviously fewer than those found between the other three species. For the present it is maintained as a species, but it may appear in future that it only deserves varietal rank under *E. hyssopifolium*.

In this synopsis I have provided a key to the species and enumerated the accepted names. As the epithets of this very small genus have been assigned to not less than seven genera, the complete synonymy has become hydrocephalic. I have for reasons of economy restricted myself to cite only the basionyms and essential synonyms, referring for the Indo-Malesian species to Miss Verdoorn's account.

#### KEY TO THE SPECIES

1. Apex of connective acute to apiculate, not filiform. Calyx-lobes fleshy, midrib sometimes distinct, but not carinate,  $\pm$  as long as tube, erect to slightly patent. Base of bracts not dilated, not amplexicaul nor partly covering the inflorescence. Seeds  $\frac{1}{4}$ — $\frac{1}{2}$  mm in  $\emptyset$ , reticulate.
  2. Calyx-lobes ovate-lanceolate, acute to gradually acuminate, with narrowly hyaline, not imbricating margins. Corolla-lobes  $\pm$  triangular, acute . . . . . 1. *E. hyssopifolium*
  2. Calyx-lobes broadly ovate to suborbicular, obtuse to rounded, shortly and abruptly acuminate, with broadly hyaline, imbricating margins. Corolla-lobes elliptic, margins  $\pm$  parallel, abruptly acuminate . . . . . 2. *E. latilobum*
1. Apex of connective filiform. Calyx-lobes thin, carinate, narrow-lanceolate, 3—10 times as long as calyx-tube, not imbricate, with narrowly hyaline margins.
  3. Base of bracts dilated, amplexicaul, partly covering the inflorescence. Calyx-lobes c. 3 times as long as the tube, ovate-lanceolate, erect to patent. Corolla-lobes acute to slightly acuminate. Seeds c. 1 mm in  $\emptyset$ , reticulate. . . . . 4. *E. elizabethae*
  3. Base of bracts not dilated, not amplexicaul, not partly covering the inflorescence. Calyx-lobes 3—10 times as long as the tube, ovate- to linear-lanceolate, patent to recurved. Corolla-lobes abruptly acuminate or apiculate. Seeds  $\frac{1}{4}$ — $\frac{1}{2}$  mm in  $\emptyset$ , trabeculate . . . . . 3. *E. verticillatum*

**1. *Enicostema hyssopifolium*** (Willd.) I. C. Verdoorn, *Bothalia* 7 (1961) 462, nomencl.; Back. & Bakh. f., *Fl. Java* 2 (1965) 439. — *Exacum hyssopifolium* Willd., *Sp. Pl.* 1, 2 (1798) 640. — *Enicostema littorale* Bl., *Bijdr.* 14 (1826) 848. — *Enicostema verticillatum* auct., non L. — **Fig. 1 e.**

*Distribution:* Coasts of tropical and South Africa, along coasts of Indian Ocean to E. India, Malesia (Java, Madura, Lombok, Sumbawa, Sumba).

*Ecology:* On beaches in *pes-caprae* formation, sometimes inland near salt-lakes or

<sup>1)</sup> *Enicostema* is neutral.

in dry grassy places on line or rich alluvial deposits (black cotton soil) at the base or mountains, up to 500 m.

**2. *Enicostema latilobum*** N.E. Brown, Fl. Trop. Afr. IV, 1 (1904) 564 ('*latiloba*').

*Distribution*: Tropical East Africa.

*Note*: Brown refers to fig. 31 B—E in E. & P., Nat. Pfl. Fam. 4, 2 (1897) 68, given by Gilg for *E. verticillatum* (L.) Engl.

This species may well be only a variety of the preceding.

**3. *Enicostema verticillatum*** (L.) Engl., Pfl. Welt O. Afr. vol. C (1895) 313. — *Gentiana verticillatum* Linné, Syst. ed. 10, 2 (1759) 952; Sp. Pl. ed. 2, 1, 1 (1762) 333; Retz., Symb. 2 (1781) 15 ('*verticillaris*'). — **Fig. 1 f.**

*Distribution*: Hispaniola and Lesser Antilles from Porto Rico to Trinidad. Cuba?

**4. *Enicostema elizabethae*** Veldkamp, *sp. nov.* — **Fig. 1 a—d.**

Bracteae basi valde dilatatae, caulem et inflorescentiarum bases amplectentes. Calycis lobi  $\frac{2}{3}$  longitudinem tubi corollae aequantes, tenues, carinati, ovato-lanceolati, caudati, erecti vel parum patentes. Corollae lobi acuti vel breviter acuminati. Connectivum apice filiformi-elongatum. Semina globosa, 1 mm diam., minute reticulata.

Herb, woody at base, erect, glabrous. Stem terete, below each leaf with a decurrent ridge. *Leaves* narrowed into petiole, bases of opposite pairs fused by a small ridge, spatulate, 4—9 by  $1\frac{1}{2}$ — $2\frac{1}{2}$  cm, blade oblong, acute, trinerved. *Bracts* leaf-like, up to  $10\frac{1}{2}$  by 3 cm, bases of petioles much dilated, amplexicaul and partly encircling the inflorescences. Bracteoles  $\pm$  as long as the calyx, sepal-like, free to base. *Flowers* 4—5 (—6)-merous. *Calyx* c.  $\frac{2}{3}$  times as long as the corolla-tube, lobes ovate-lanceolate,  $4\frac{1}{2}$  by  $1$ — $1\frac{1}{2}$  mm, caudate, often minutely serrate, flat, carinate, c. 3 times as long as the tube. *Corolla* 7 by 2 mm, tubuliform, lobes patent at anthesis, triangular,  $1\frac{1}{2}$  by  $\frac{3}{4}$  mm, acute to slightly acuminate. *Stamens* inserted  $\pm$  halfway the corolla, connective filiformly elongated at the apex. *Fruit* ovoid, 5—7 by 3—4 mm, acute, longer than the calyx. *Seeds* many, globose, c. 1 mm in  $\varnothing$ , finely reticulate.

*Distribution*: Madagascar.

MADAGASCAR. Vavatoané, NW. Madagascar, fl., Febr. 1880, *Hildebrandt* 3313 (L, type); near Ankara, rocky forest along a rivulet, fl., fr., May 1909, *d'Alleizette s.n. in herb.* L 950. 340—470.

*Note*: This species is named after my wife, Elizabeth M. Dekker.