

Nomenclatural status of *Exacum wightianum* var. *uniflorum* Henry & Swaminathan and *Exacum klackenbergii* Gopalan-little known endemics from Southern India

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Abstract: *Exacum wightianum* Arn. var. *uniflorum* Henry & Swaminathan reported from Agasthyamalai hills, Tirunelveli District of Tamil Nadu has been elevated to specific status and a new combination of *E. uniflorum* is made. *E. klackenbergii*, a species proposed by Gopalan (2002) is found to be conspecific and hence treated as synonym. Descriptions, photographs and distinguishing characters of both the taxa are provided.

Key Words: New Combination, Gentianaceae, *Exacum uniflorum*, Agasthyamalai hills, Endemic.

Introduction

Exacum L., a paleotropic genus of the family Gentianaceae with about 65 species is distributed from tropical regions of Asia, Philippines, New Guinea, Northern Australia, Madagascar and S. Africa (Klackenberg, 1983; Sunita Garg, 1987). In India, it is represented by 22 species of which 15 are reported to occur in Kerala (Henry & Swamin., 1984; Klackenberg, 1985; Sunita Garg, 1987; Gopalan, 2002; Nayar *et al.*, 2006; Biswal *et al.*, 2011).

During the course of taxonomic studies of the family Gentianaceae in Kerala, the authors collected an interesting specimen of *Exacum* from Chemunji in western slopes of Agasthyamalai hill ranges of Thiruvananthapuram district, which did not match any of the known species reported from Kerala. On critical study with protologue and type specimens housed at Madras Herbarium (Isotypes MH 16335!), it has been identified as *Exacum wightianum* Arn. var. *uniflorum* Henry & Swaminathan. This variety was reported only from the eastern slopes of Agasthyamalai region of Tirunelveli in Tamil Nadu. The typical variety, *Exacum wightianum* var. *wightianum* is characteristically distinct from the variety *uniflorum* by the winged and angular stem with many flowers, whereas the latter is

terete and wingless stems with mostly solitary and rarely upto 3 flowers.

Gopalan (2002) described *E. klackenbergii* from Sangumuthirai, Pothigaimalai (Agasthyamalai) in Tirunelveli district of Tamil Nadu. While examining the type specimens of *Exacum* it has been observed that *E. klackenbergii* Gopalan (Isotype MH 88726!) also shares the same characters as that of *E. wightianum* var. *uniflorum* Henry & Swaminathan. He distinguished the species from its allies by the stem being woody, terete, leaves distinctly petioled, elliptic, ensiformly acuminate at apex and anthers oblong with sagittate base. Perusal of protologue and critical examination of type specimens of both the taxa, it has been concluded that *E. klackenbergii* is nothing but *E. wightianum* var. *uniflorum* Henry & Swaminathan. However, close observation of these specimens revealed striking differences between the typical *wightianum* and var. *uniflorum* in many morphological and reproductive characters that are strong enough to attribute a higher status equivalent to a species and hence elevated and proposed *E. uniflorum* as follows.

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Taxonomic Treatments

Exacum uniflorum (A. N. Henry & Swaminath.) Geetha Kum., Pandur. et Ravichandran *comb. et stat. nov.*

E. wightianum Arn. var. *uniflorum* A. N. Henry & Swaminath., J. Bombay Nat. Hist. Soc. 80: 459. 1984; Ramamurthy in Henry et al., Fl. Tamil Nadu Analysis 2: 95. 1987. Type: India: Tamil Nadu, Tirunelvely district, Agasthyamalai Hills, Henry 16335 (Holotype CAL; Isotype MH!). *E. klackenberghii* Gopalan, J. Bombay Nat. Hist. Soc. 99(2): 271. 2002. syn. nov. Type: India: Tamil Nadu, Tirunelvely district, Sangumuthirai, Pothigaimalai (Agasthyamalai), Gopalan 88726 (Holotype CAL; Isotype MH!)

Type India: Tamil Nadu, Tirunelvely district, Agasthyamalai Hills, Henry 16335 – Type of *E. wightianum* Arn. var. *uniflorum* A.N. Henry & Swaminath (Holotype CAL; Isotype MH!)

Subshrubs; stems woody, terete at base, striate towards apex; internodes 2.5-6 cm long. Leaves opposite; elliptic-lanceolate, 3.6-10 x 1.8-2.7 cm, attenuate to cuneate at base slightly merging into the petiole, acuminate at apex, acumen to 1cm long, glabrous, black on drying, 3 nerved; petioles ca. 1cm long. Flowers in terminal solitary or 1 - 3 flowered cyme; peduncles and pedicels 4-angled; pedicels to 1.3 - 2 cm long,

slender. Calyx 5-lobed, united at base, lobes ovate-lanceolate, 0.8 - 1 x 0.4 - 0.6 mm, acuminate, truncate to subcordate at base, gradually narrowing towards the apex, distinctly nerved. Corolla blue, 5-lobed, lobes broadly elliptic, 2.8 - 4 x 3.8 - 5 cm, membranous, acute to obtuse at apex, nerved. Stamens 5, ca 12 mm long, anthers 6 - 9 mm long, oblong, sagittate at base, opening by longitudinal slits, basifixed, with a prominent papilla near the apex on the dorsal side. Ovary subglobose or ovoid, 0.8 - 1 x 0.5 - 0.7 cm; style terete, to 1.8 - 1 x 0.5 - 0.7 cm long; stigma capitate. Capsules subglobose, septicidally 2-valved. Seeds numerous, small.

Flowering & fruiting: January - November

Distribution: Endemic and Critically Endangered (Gopalan & Henry, 2000) restricted to the higher altitudes of southern Western Ghats of India, i.e., Agasthyamalai hills of Kerala and Tamil Nadu. It is found at an elevation of 1200 - 1800 m asl in grasslands adjacent to montane vegetation.

Notes: Distinguishing characters of *E. wightianum* and *E. uniflorum* are provided for an easy distinction of the taxa (Table. 1, Fig. 1)

Table 1: Distinguishing characters of *E. wightianum* and *E. uniflorum*

S.No.	Character	<i>E. wightianum</i>	<i>E. uniflorum</i>
1	Stem	4-angular, winged	Terete, wingless
2	Leaf	Ovate to Ovate lanceolate, base rounded to cordate, apex acute	Elliptic-lanceolate, base cuneately merging into the petiole or narrowed attenuate, apex acuminate, 3.6 - 9 x 1.3 -3.2 cm
3	Petiole	Absent	Distinctly petioled, 0.5 - 1 cm long, slender
4	Inflorescence	Terminal, many flowered in branched cyme	Terminal, 1 - 3 flowered (mostly solitary)
5	Bract	Linear-lanceolate	Ovate, cuneate at base, acuminate at apex
6	Pedicel	Recurved especially in fruiting	Straight, 0.5 - 2.3 cm long
7	Calyx lobes	Narrow, acuminate, nerves faint	Ovate-lanceolate, winged, wings truncate to sub-cordate at base, narrowing towards apex; distinctly nerved
8	Corolla lobes	Elliptic to obovate, apex apiculate	Broadly elliptic, apex acute to obtuse
9	Stamens	Oblong, subcordate at base	Oblong, sagittate at base, to 0.6cm, filament 1 mm
10	Capsule	Broadly elliptic to globose	Sub-globose



Fig. 1. A-C. *Exacum wightianum* Arn. **A.** Habit; **B.** Inflorescence; **C.** Flower; **D-F.** *Exacum uniflorum* (A.N. Henry & Swaminath.) Geetha Kum., Pandur. et Ravichandran comb. et stat. nov. **D.** Habit; **E.** Inflorescence; **F.** Flower.

Specimens examined: INDIA, Kerala, Thiruvananthapuram Distr., Pongalpara, 1400 m, 07-02-1988, N. Mohanan 9508; Chemunji, 1200 m, N. Mohanan 10343; *ibid.*, 1200 m, 11-08-2011, Geethakumary 71128; Agasthyamala, 1600 m, 30-03-1989, N. Mohanan 5165 & 19-01-1993, N. Mohanan 11218 (TBGT). TAMIL NADU: Tirunelveli Distr., Agasthyamalai, 1800 m, 27-05-1963, A. N. Henry 16335 (Isotype MH!), Agasthyamalai peak, 1200 m, 01-06-1964, A. N. Henry 19181 & Kalivayalpil near Agasthyamalai, 01-06-1901, Barber 3023B (Paratype MH!); Sangumuthirai, Pothigaimalai (Agasthyamalai), Gopalan 88726 (Isotype MH!).

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References

1. Biswal AK, Rout NC, Dhal NK, Nair MV, *Exacum tenue* (Gentianaceae): A new record for India, *Rheedea*, 2011, 21(2), 174-176
2. Gopalan R, Henry AN, Endemic plants of India, CAMP Workshop for the strict endemics of Agasthiyamalai hills, Southern Western Ghats, Bishen Singh Mahendrapal Singh Dehradun, 2000, 201-204.
3. Gopalan R, A new species of *Exacum* L., Gentianaceae from Agasthiyamalai (Pothigai), southern Western Ghats India, *Journal of Bombay Natural History Society*, 2002, 99(2), 271-273.
4. Henry AN, Swaminathan, Rare or new *Exacum* L. (Gentianaceae) from southern India, *Journal of Bombay Natural History Society*, 1984, 80, 456-459.
5. Klackenberg J, A reevaluation of the genus *Exacum* (Gentianaceae) in Ceylon, *Nordic Journal of Botany*, 1983, 3, 355-370.
6. Klackenberg J, The genus *Exacum* (Gentianaceae), *Opera Botanica*, 1985, 84, 1-144.
7. Nayar TS, Raziya Beegam A, Mohanan N, Rajkumar G, Flowering Plants of Kerala, Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, 2006, 338-340.
8. Sunitha Garg, Gentianaceae of the North West Himalaya (A revision), Today and Tomorrow's Printers and Publishers, New Delhi, 1987, pp 342.

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