



# Identity and distribution of *Croton hirtus* L'Herit (Euphorbiaceae) - A fast naturalizing invasive species in Tamil Nadu

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## ABSTRACT

*Croton hirtus* L'Herit is a poorly known exotic species naturalizing in Tamil Nadu with faster rate. Critical analysis of this taxon with recently described *Chrozophora baskarani* from Sirumalai hills proved that both of them are identical. Hence, the later is merged with *Croton hirtus*. The present communication throws light on the identity and distribution of this little known alien species.

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## Introduction

Tamil Nadu is one of the rich biodiversity states in India, which harbours diverse vegetation types viz., tropical semi evergreen forest, south montane wet temperate forest, tropical semi evergreen forests, tropical moist deciduous forest, tropical dry deciduous forest, tropical thorn forest, tropical dry evergreen type, littoral and swamp forest and grasslands (Narasimhan *et al.*, 2005). Of the estimated 19,395 flowering plants in India (Karthikeyan, 2005), 5239 species occur in Tamil Nadu that accounts nearly 1/3<sup>rd</sup> of the total flora of India.

The genus *Croton* L. has about 800 species (Philcox, 1997). In India, it is represented by 16 species (Balakrishnan & Chakrabarty, 2007) of which nine species are found in Tamil Nadu. The Madras Herbarium (MH), Coimbatore has only very few collections of *Croton hirtus*. Because of the poor representation in the herbaria, a detailed description, nomenclature and relevant notes are provided for the easy identification of the taxa in the field. Further, the author also compared the characters of *Croton hirtus* with recently described *Chrozophora baskarani* Karupusamy *et al.*, which shows much similarity with the former species. The type at Department of Biology, Gandhigram University, cited in the protologue could not be traced. However, the photo in flowering (Plate 14. F) given by the co-author in his thesis (Rajasekaran, 2004) was proved that the plant described by Karuppusamy *et al* (2001) was actually *Croton hirtus* hence *Chrozophora baskarani* was merged with *Croton hirtus* L'Herit.

Since *Croton hirtus* L' Herit is a little known alien species in Peninsular India a brief description, detailed nomenclature and relevant notes are provided for the easy identification of the taxa in the field.

## Materials and Methods

An extensive survey was under taken in different areas of Tamil Nadu for the collection of various species of *Croton*. All the collections were identified using standard literature (Balakrishnan & Chakrabarty, 2007; Chakrabarty & Balakrishnan, 1997; Philcox, 1997) and the identity was

confirmed by comparing with specimens housed at the Madras Herbarium (MH), Botanical Survey of India, Southern Circle, Coimbatore. All collections are deposited in the herbaria of Saraswathi Narayanan College (SNC), Madurai.

*Croton hirtus* L' Herit., Strip. Nov. 1: 17, t. 9. 1785; Fawcett & Rendle, Fl. Jamaica 4(3): 285. 1920; Standley & Steyermark, Fl. Guatemala 73. 1949; Sinclair in Gard. Bull. Sing. 15: 1. 1956; Hutchinson & Dalziel, Fl. West Trop. Africa 1(2): 393. 1958; Backer & Bakh. f., Fl. Java I: 476. 1963; Webster & Burch in Ann. Missouri Bot. Gard. 54: 262. 1967; Whitmore, Tree Fl. Malaya 2: 84. 1973; Amaratunga in Ceylon J. Sci. 12: 189. 1977; Philcox in Fl. Trinidad & Tobago 2: 648. 1979; Veldkamp in Fl. Males. Bull. 9/4 (40): 415. 1987; Radc.-Sm., Fl. Trop. East Afr., Euphorbiac. 1: 160. 1987; P.H. Hô, Cáyco Viêtnam 2, 1: 295, fig. 4467. 1992; Ramachandran *et al.*, in Ind. J. For. 15(2): 183. 1992; Burger & Huft, Fl. Costaricensis 91. 1995; Philcox in Rev. Handb. Fl. Ceylon 11: 88. 1997; Esser in Chayamarit & Welzen, Fl. Thailand 8, 1: 206. 2005; Preetha & Binoj Kumar in J. Econ. Tax. Bot. 30 (2): 294. 2006; Kottaimuthu & al. in Ethnobot. Leaflets 12: 398. 2008. *Podostachys hirta* (L'Hér.) Klotzsch, Arch. Naturgesch. 7: 194. 1841. *Croton glandulosus* L. var. *hirtus* (L'Herit) Muell.-Arg. in DC. Prodr. 15(2): 684. 1866; Chakrab. & N. P. Balakr., in Bull. Bot. Surv. India 34: 48. 1997; N. P. Balakr. & Chabkrab., The Family Euphorbiaceae in India 213. 2007. *Oxydectes glandulosa* var. *hirta* (L'Hér.) Kuntze, Revis. Gen. Pl. 2: 614. 1891. *Croton glandulosus* L. subsp. *hirtus* (L'Herit.) Croizat in Bull. Torrey Bot. Club 75: 401. 1948. *C. glandulosus* var. *subincanus* Müll.Arg. in A.P.de Candolle, Prodr. 15(2): 685. 1866. *C. aberrans* Müll.Arg. in C.F.P.von Martius, Fl. Bras. 11(2): 232. 1873. *Oxydectes aberrans* (Müll.Arg.) Kuntze, Revis. Gen. Pl. 2: 613. 1891. *Croton guaraniticus* Chodat & Hassl., Bull. Herb. Boissier, II, 5: 496. 1905. *C. guaraniticus* Chodat & Hassl., f. *genuinus* Chodat & Hassl., Bull. Herb. Boissier, II, 5: 497. 1905, nom. inval. *C. guaraniticus* Chodat & Hassl., f. *intermedius* Chodat & Hassl., Bull. Herb. Boissier, II, 5: 497. 1905. *C. guaraniticus* Chodat & Hassl., f. *latifolius* Chodat & Hassl.,

Bull. Herb. Boissier, II, 5: 497. 1905. *C. guaraniticus* Chodat & Hassl., f. *microphyllus* Chodat & Hassl., Bull. Herb. Boissier, II, 5: 497. 1905. *C. guaraniticus* Chodat & Hassl. var. *virgatus* Chodat & Hassl., Bull. Herb. Boissier, II, 5: 497. 1905. *Chrozophora baskarani* Karuppusamy, K. M. Rajasekaran & Karmegam in Plant Archives 2: 141. 2002, syn. nov.

Erect herbs, up to 80 cm high; stem terete, dichotomously branched; branchlets clothed with pale strigose – stellate hairs. Leaves alternate, ovate / oblong, 2.5 – 5 x 1.5 – 4 cm, margin serrate, apex acute, obliquely truncate at base; lateral nerves 3–5, obscure above, distinct below with 2 prominent glandular hairs at base of lamina; petioles 1 – 2 cm long; stipules linear, 0.2 cm long, caducous. Inflorescence a terminal, branched raceme with copious multibranched glandular hairs with globose tips, female flowers below, male flowers above; male flowers white; pedicels up to 0.5 cm long, stellate hairy; sepals 5, obovate, 0.2 cm long; petals 5, oblanceolate, 0.2 cm long, serrate along margin; stamens 9 – 11; filaments 0.1 cm long, glabrous; anthers ovoid-oblong / oblongoid, pale brown. Female flowers green; pedicels 0.5 – 1.5 cm long; bracts linear, fringed with 2 – 5 stalked capitate glands; sepals 5, unequal, linear – oblong, 0.3 cm long, dentate along margin; ovary ovoid, 0.1 cm across; styles 3, each divided in to two, 0.2 cm long, apex reflexed. Capsules globose, 0.5 cm across, bractetae; seeds three, trigonous, black.

Flowering & Fruiting: January – May.

Distribution: India (Tamil Nadu & Kerala), Ceylon, West Indies, Central & South America, Tropical Asia & Thailand.

*Specimens Examined*: Tamil Nadu: Dindigul District, On way to chinna malaiyur rice field, Karandamalai, 478m, 14-1-2007, R. Kottaimuthu & M. Vimala 370; On way to Mulaiyur, Perumalai, 502m, 3-5-2007, R. Kottaimuthu & K. Natarajan 3031; Puliampallam, Sirumalai, 665m, 7-7- 2007, R. Kottaimuthu & R. Ganesan 2014. Kanniyakumari District: Near forest guesthouse, 200m, 10-5-2005, R. Kottaimuthu 200051. Sivagangai District, Alagappa University Campus, 180m, 19-6-2011, R. Kottaimuthu 50004. Tirunelveli District, Near marshy areas of Canadian canal, 1-7-2005, R. Kottaimuthu 200205; Mundanthurai Tribal School, 10-8-2006, R. Kottaimuthu 200506.

Notes: *Croton hirtus* L'Herit is native to West Indies and Central and South America, which has become an aggressive weed in Tropical Asia and Africa. In India, it was first reported from Tirunelveli Hills of Western Ghats (Ramachandran *et al.*, 1992). Later it is reported to be common throughout the coastal regions of Kerala (Preetha & Binoj Kumar, 2006). Recently Kottaimuthu *et al* (2008) recorded this invasive species from Dindigul hills and reported as an addition to the flora of Eastern Ghats.

Over the years, much confusion has arisen over the taxonomic status of *Croton hirtus*. Many of the workers (Balakrishnan & Chakrabarty, 2007; Chakrabarty & Balakrishnan, 1997) follow Mueller's treatment in De Candolle's Prodrum (1866) in which he treated this species as a variety of *C. glandulosus*. However, Philcox (1997), Radcliffe-Smith (1978) and Webster & Huft (1988) consider that *C. hirtus* is distinct from *C. glandulosus* and deserves a species status. The former species can be easily distinguished from the later by the presence of sessile foliar or petiolar glands and the absence of long-stipitate glands on the floral bracts.

## Results And Discussion

The global extent and rapid increase in invasive species is homogenising the world's flora and fauna (Mooney & Hobbs, 2000) and is recognized as a secondary cause of global biodiversity loss. Bio-invasion may be considered as a form of biological pollution and Significant component on global change and one of the major causes of species extinction (Mooney & Drake, 1987; Drake *et al.*, 1989). The loss of biodiversity caused by invasive species is the result of competition from invasive and the resulting displacement of native species, as well as by predation and hybridization.

In the present study, it is observed that *Croton hirtus* L'Herit is aggressively spreading invariably in the disturbed forest areas and in the plains of Tamil Nadu. However, the impact of this little known alien species on the diversity of native plants and ecosystem is largely unknown. Hence, the entire Eastern Ghats, Western Ghats and plains of South India should be thoroughly explored and evaluated for the exact population status and distributional range of this little known alien species.

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