

The Report of *Curcuma kshonapatra* (Zingiberaceae) from Karnataka, India

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Attempt to explore and collect resources of germplasm of wild relatives of turmeric in India resulted in amassing of a total of 123 samples belonging to 11 accepted species and few unidentified entities of the section *Nontuberosa* of the genus *Curcuma*. One entity from Udupi, Karnataka happened to be distinct from its close ally *C. albiflora* Thwaites in having tall thin plant type, purple tint on leaf blade, dark purple spikes, highly exerted and showy flowers, is being reported therefore reported as a new species with some notes here.

Key Words: *Curcuma kshonapatra*, New species, *Nontuberosa*, Section, Taxonomy

Introduction

A total of 123 germplasm collections of the sect. *Nontuberosa* (Velayudhan *et al.* 1996) of the genus *Curcuma* L. were made-by NBPGR (ICAR) under the mission mode project on National Agricultural Technology Project (Plant Biodiversity) from various parts of India during 1999-2005. Collections from South-western coastal and hilly region of India included 11 presently accepted species (WCSP, 2014) and some unidentified entities. One of the entities was very distinct and was for years under studied *in situ* as well as *ex situ*. It can be grouped along with the white staminode bearing species of the genus such as *C. albiflora* Thwaites, *C. oligantha* Trimen, *C. karnatakensis* Amalraj, Velay. & Mural. and *C. mutabilis* Skornick. M. Sabu & Prasanthk; which were reported from Western Ghats. It is found to be associated with a large population of a dominant species which is suspected as *C. albiflora* Thwaites (Plate 1). It is being described here as a new species due to some characteristic features such as erect and thin tall plant type with few suckers that bear elliptic/ lanceolate leaf lamina without wavy margin and slender purplish petioles as against more robust and profuse suckering companion species. Leaf lamina has purple midrib and closely arranged prominent veins which radiates dark purple wash or purple violet tint below the juvenile leaves, which fade at maturity. The key character of the species i.e. purple midrib, is perhaps first of its kind in species (sect. *Nontuberosa*) having no sessile fingers from India. Usually, this character purple midrib is associated with the presence of sessile finger on the root-stock in the genus and hence it appears to have an

evolutionary significance and is associated with a group of sessile tuber bearing species under the genus *Curcuma* such as *C. zedoaria* (Christ.) Roscoe, *C. zanthorrhiza* Roxb; *C. ferruginea* Roxb; *C. comosa* Roxb; *C. latifolia* Roscoe; *C. amarissima* Roscoe, etc., falling under the sect. *Tuberosa* Velay., Amalraj & Mural. (Velayudhan *et al.* 1996). As the present species obviously falls under the sect. *Nontuberosa*. The purple colouration in the midrib region of the leaf and the purple tint of the tender leaves and petiole, purplish flower bracts, highly exerted and beaked flower buds are taken as the key character to delimit the present species from all other closely related species with white staminodes to propose a specific epithet '*kshonapatra*' which in Sanskrit means reddish purple tint on leaf similar to that of '*kshona*' meaning blood.

C. albiflorae Thwaites, *C. oliganthae* Trimen, *C. karnatakensis* Amalraj, Velay. & Mural. *C. mutabilis* Skornick. M. Sabu & Prasanthk. *C. inodora* Blatt., characteribus vegetativorum aeriorum; absentia dactylorum sessilium; floribus maxime exertis et staminodiis albis arte affinis, sed costa folii purpurea; basi folii juvenis purpureo- tincta; spicis magnis, compactis, globosis ad ovalibus clare differt.

Root-stock conical to cylindrical, 7.2 x 1.3 cm branched with one or two secondary (lateral) mother rhizomes bearing suckers which resemble mother rhizome in shape but smaller, rhizome cortex flesh whitish cream, core pale yellow, flesh odourless, taste slightly astringent, less aromatic in smell; roots terminating into stipitate tubers, 10-15 in number, fusiform, rarely beaded, 3.0-3.5 cm x 2.0-2.2 cm. in size, cortex dirty or transparent

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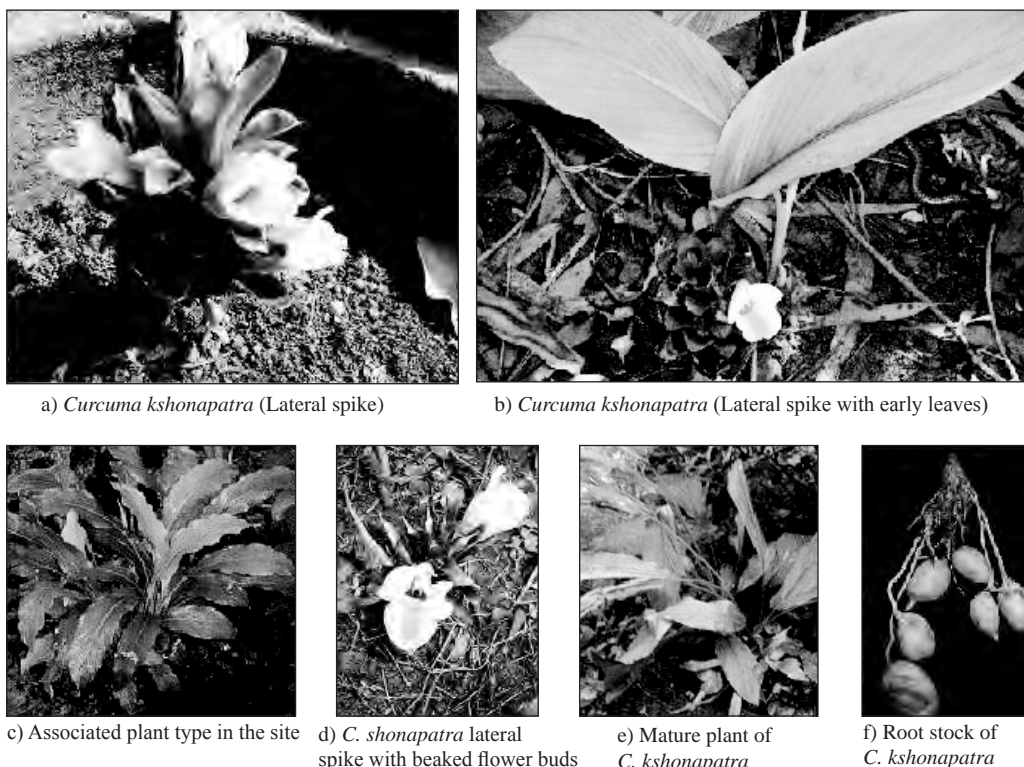
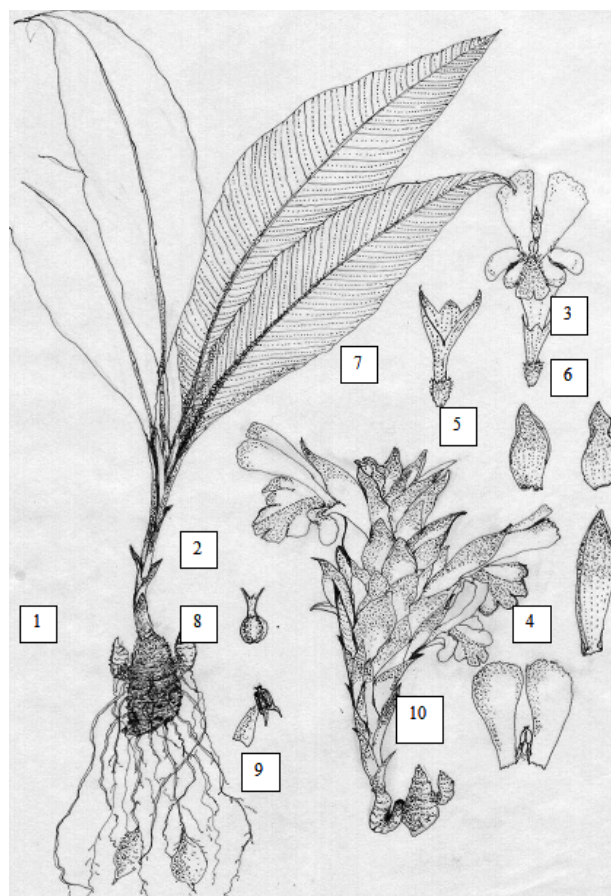


Plate 1 *C. kshonapatra* showing early plant type, lateral spikes and root stock along with the associated species

white, core white, without any smell and taste; plants erect, reaching up to 70 cm tall, bearing 2-4 suckers; petiole erect to semi-erect, 25-55 cm, sheath 15-30 cm long, margin purple extending to the leaf base, glabrous, ligule purple, pseudo-stem with 5-6 scale leaves at the base, 2.0 to 15.0 cm long; leaves 5-6, semi-erect to prostrate and drooping above middle at maturity, lamina 25-30 x 9-11 cm, elliptic – lanceolate, margin less wavy in tender ones and highly wavy in mature ones, veins arise from the midrib at 45° running closely parallel up to the margin, highly pronounced, young petiole with reddish tint, midrib is purple throughout along the channel spreading towards the leaf visible on the dorsal side towards the base especially in younger ones, base gradually tapering or acute, rarely oblique, acute-acuminate at the tip, obtuse or rounded at the base, green with reddish purple tint above middle, glabrous. Spike either lateral or central, the former arising from the side buds developing from the main root-stock or branches towards the top, each bud bifurcating into two, one being the inner one to form a spike and the other outer one which is usually in bud stage at the time of blooming to form a leafy shoot during the main season. Those associated with the shoot form scale leaves at the

base and the latter borne central spike arising from the tuft of leaves during the main growing season. Spike 9.0-12.5 cm long without coma, oblong and compact with greenish purple or purple flower bracts bearing highly exerted and showy flowers with white staminodes. It is showy, oval to oblong, varies in size with age of the plant; peduncle 8-12.0 cm long, covered by whitish scaly bracts that are oblong to ovate towards the tip, sterile bracts vary in length (2.5 cm in the case of lower ones and 6 cm in the upper ones and width from 1.5 to 1.6 cm), whitish at the base tinged with red, purple or pink towards the top, glabrous, no coma bracts seen (usually flower buds arise from axils of all bracts), flower bracts 4-5 in number, shape vary from ovate to slightly oblong, narrow linear towards top with acute tip, purple violet towards tip, bracts hairy on both sides, length varying 2.2 to 6.5 and width from 1.5- 1.6 cm, flowers 2 in a bract, highly exerted up to 7 cm long, buds whitish with light rose tinge and prominently beaked, calyx up to 2 cm long, hairy, three toothed, one side deeply cleft, middle tooth ovate and acute and shorter than the other lobes which are longer and acuminate, with purple tint, corolla tube up to 3.5 cm long, main lobe beaked, cucullate, shorter than the side lobes, whitish



1. Habit (1 cm = 4.8 cm) 2. spike (1 cm = 2.4 cm) 3. flower (1 cm = 2.9 cm), 4. Sterile bract (1 cm = 2 cm), 5. fertile bract (1 = 1 cm), 6. Comabract, 7. Calyx tube (1=1 cm), 8. Fruit (1=1 cm), 9. anther (1=0.6 cm), 10. Staminode side lobes (1=0.85 cm)

Fig. 1. *Curcuma kshonapatra*

with pinkish tinge on the tip, 1.6 x 1.5 cm; side lobes oblong, 1.1-1.3 cm x 0.8 - 0.9 cm in size, rounded tip, staminodes white, side lobes unusually very large and exerted and obovate, rounded, 3.0-3.5 cm long and 0.8-1 cm. wide; lip whitish, three lobed, mid lobe smaller than the side lobes in length and deeply emarginate, 1.7 x 1.5 cm in size, white with orange yellow median, stamen 1, anther basifixed, oblique, two celled, whitish, glabrous, 0.3 cm long, spurs 0.2 cm long, diverging, white, glabrous; ovary hairy, purple tinged, up to 4 mm long; stigma not exerted; fruit a capsule with persistent calyx, 1 cm long, globose, containing dark seeds with white translucent arils.

Type: *K. Velayudhan* V/03-48 (holo NHCP), India, Karnataka, Udupi, 10 m MSL, 18.05.2003, (NHCP15288).

Live collections IC329331 and IC397735 (collector's numbers VBB/01-74 and V/03-47-B respectively) were conserved in the field genebank at NBPGR Regional Station, Thrissur.

Distribution: Udupi Town, Udupi district, Karnataka, India.

Etymology: The specific epithet 'kshonapatra' is based on purple-red tint along the midrib region of leaf.

Notes: Only 3 plants were noticed having similar features and hence in the first instance the author thought of ignoring such an entity. However, during September 2002 and May 2003 the author visited the site again to observe flowering in the population. Though the summer rains at Udupi was scanty in 2003, almost all the plants, numbering around 100, in the population (belonging to *C. albiflora* and the new species) were noticed in bloom. One plant with leaves having purple midrib could be noticed in bloom and this belonged to the present entity. Another site was a private compound with ornamental garden shaded by mango trees. Two plants were noticed there under disturbed condition owing to occasional weeding and also by burning the grass and litter falling from mango and jack fruit trees. This species could not be located near the coastal and adjoining sandy alluvial soils.

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