

# *Odisha bonaccordensis* (Orchidaceae), A new species from Western Ghats of Kerala, India

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## ओडिसा बोनाकोरडेंसिस (ऑर्किडेसी), भारत में केरल के पश्चिमी घाटों से प्राप्त एक नवीन प्रजाति

कोथारेड्डी प्रसाद, जीवन सिंह जलाल एवं डी.के. अग्रवाला

### सारांश

कुल ऑर्किडेसी एवं उपकुल ऑर्किडोइडी की एक नवीन प्रजाति ओडिसा बोनाकोरडेंसिस का अन्वेषण व वर्णन भारत स्थित केरल के पश्चिमी घाटों से प्राप्त संग्रह के आधार पर किया गया है। यह आलेख विशेषकर उचित सामग्रियों एवं लक्षणों के साथ प्रस्तावित नवीन प्रजाति पर आधारित है। इस नवीन प्रजाति के आकारिकी की व्याख्या हेतु सचित्र वर्णन तथा फोटो प्लेट भी प्रस्तुत किए गए हैं।

### ABSTRACT

A new species of *Odisha* (Orchidaceae), *O. bonaccordensis* is described from the Western Ghats of Kerala, India in the sub-family Orchidoideae. The article deliberates on the exclusivity of the proposed new species with pertinent material and diagnostics. Also, an illustration and photo plates are presented to depict the morphology of new species.

**Keywords:** Orchidaceae, New species, India, Kerala

## INTRODUCTION

Five sub-families are recognized under the family Orchidaceae (APG IV, 2016). The sub-family Orchidoideae is represented by about 3630 species, with larger concentration in tropical South Africa, Europe, Madagascar, North America, temperate South America and Australia. The sub-family was hitherto known consisting of six tribes namely, *Chloraeae*, *Codonorchideae*, *Cranichideae*, *Diseae*, *Diurideae* and *Orchideae* (Dressler, 1981; Pridgeon & al., 2001; 2003). Later based on molecular data Chase & al., 2015 recognised only 4 tribes namely, *Codonorchideae*, *Cranichideae*, *Diurideae* and *Orchideae*.

The monotypic genus *Odisha* S. Misra (Subtribe Odishinae: tribe Orchideae: Orchidaceae) was described by Misra (2007) and endemic to India. Its diagnostic characters are, completely closed and erect perianth;

rostellum with 3 free lobes at apex; lateral lobes neither produce pouches on their apices nor connected to the anther lobes; anther lobes 2-parted by a longitudinal septum and lacks any anther canal; pollinarium 2-lobed, each lobe consisting of two collateral pollinia; caudicle short, curved; viscidium absent (Misra 2019).

The first author (KP) collected few plants apparently similar to *Habenaria* and *Odisha* from southern Western Ghats of Kerala in November 2014. That time those specimens couldn't be examined since they got infected by fungus. The author again revisited the locality during 2015 and 2016 and collected few fresh samples. After examination of its reproductive morphology revealed that the column structure has different features like, stigma tongue like with rounded apex/very faintly lobed, the rostellum without any lobation and partially superposing on stigma and pollinaria 2, each with a single pollinium, *basally* united with anther and free

above. However, the flowers of the present collection are devoid of antherophores, auricles (staminodes) and viscidia. These features could be validated as the delicate columnar characters were studied in live material during the field survey before they were pressed for herbarium and lost the shape. These minute and delicate characters contradicts those for the genus *Odisha* and deserve a new generic status within subfamily Orchidoideae, but due to its gross similarity with floral morphology of *Odisha* we prefer to place it under the genus *Odisha*. The columnar characters in *Odisha* could not be verified from the pressed type specimens. The Genus *Odisha* is known to have two taxa so far and distributed as far as Karnataka in south, but this new discovery from Kerala further extends its distribution range.

An illustration, photo plates and a complete description of the new species reported has been presented.

## TAXONOMIC TREATMENT

***Odisha bonaccordensis*** K. Prasad, Jalal & Agrawala *sp. nov.* (Figs. 1, 2 & 3)

The new species can be differentiated from *Odisha cleistantha* in following characters: lip simple and without spur (vs. 3-lobed and with spur); anther chambers, antherophores and auricles absent (vs. anther chambers, antherophores and auricles present); pollinaria basally united with anther and free above (vs. pollinia present in anther chambers); stigma tongue like, rounded or faintly 3-lobed (vs. stigma not tongue like, two lobed); rostellum unlobed, superposed partly on stigma (vs. rostellum 3-lobed, erect and not superposed on stigma).

**Type:** India: Kerala, Thiruvananthapuram district, the Agasthyamala Biosphere Reserve, on way to Agasthyakudam from Bonaccord, elev. 641 m, 08.11.2016, K. Prasad 008445 (holo: CAL!; iso: CAL!).

Terrestrial herbs, perennials, 30–60 cm high. Root stem tuberosids 2, oblong or sub-globose or ellipsoid, 2–4 × 1.5–2.5 cm; roots few, cylindrical, 2–4 cm long, 1–2 mm thick, hairy. Stem erect, slender, cylindrical, 10–15 cm long; internodes entirely covered with sheathing leaf bases. Leaves 3–4, cauline, sessile, ovate, ovate-lanceolate or oblong-lanceolate, 4–6 × 2–2.5 cm, base contracted into amplexicaul sheath, margins translucent and denticulate, apex acute. Inflorescence 30–45 cm long; peduncle cylindric, with 1 or 2, clasping sterile bracts; sterile bracts ovate-lanceolate, 1–2 cm long, apex acuminate, margins denticulate; rachis densely flowered. Floral bracts green, shorter than ovary, oblong-lanceolate, 12–15 × 2.5–3 mm, apex acuminate, margins denticulate, 3-veined, veins branched. Flowers spirally arranged, yellowish-green, pale white at base, scented, partly opening.

Pedicle with ovary green, fusiform, strongly ribbed, shortly beaked, 18–25 mm long. Sepals, petals and lip sub-equal, erect, ovate-lanceolate or elliptic-lanceolate, margins denticulate; involute, 3-veined, veins branched, sparingly gland-dotted. Dorsal sepal 11–12 × 3.8–4 mm, apex acute, glabrous; lateral sepals 11–12 × 3.8–4.2 mm, apiculate, glabrous; petals falcate, 10–12 × 3.5–3.8 mm, apex obtuse or unequally bilobed, sparingly hairy. Lip 11–12 × 3.5–4 mm, curved upwards and then erect, apex acute, sparingly hairy. Anther hooded, 2.2–2.5 mm long; locules two, connected, without chambers; antherophores absent; auricles absent. Pollinia 2, at base of anther, each consisting of single pollinium, basally united with anther, free above, translucent; pollinium sectile, oblong, 0.8–1 mm long; caudicle linear, 1–1.2 mm long; viscidia absent. Sigma single, tongue like, glossy, bent, obovate-oblong, margins slightly curved in, usually rounded or very faintly lobed, 1.6–2 × 1–1.8 mm. Rostellum unlobed, partially superposing on stigma, oblong, 1–1.5 mm long, rounded, not connected to anther. Capsules obliquely fusiform, with persistent perianth, 2–2.5 cm long.

**Flowering & Fruiting:** October–December.

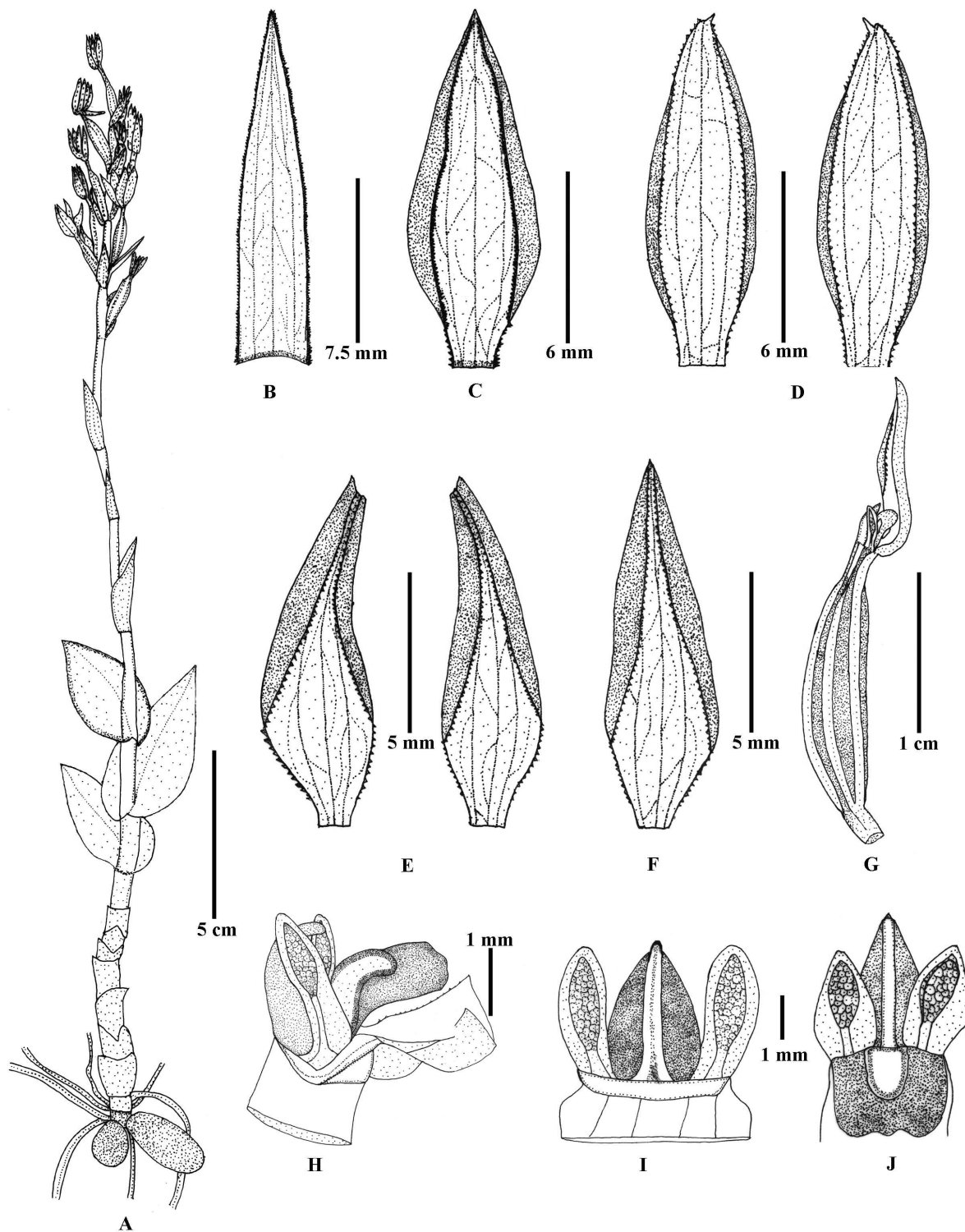
**Habitat:** It grows in open grasslands and along the margins of grass dominated moist deciduous forest at an elevation between 600–800 m. The common associates are *Habenaria longicorniculata* J. Graham and grasses etc.

**Distribution:** Known only from the Southern Western Ghats of Kerala.

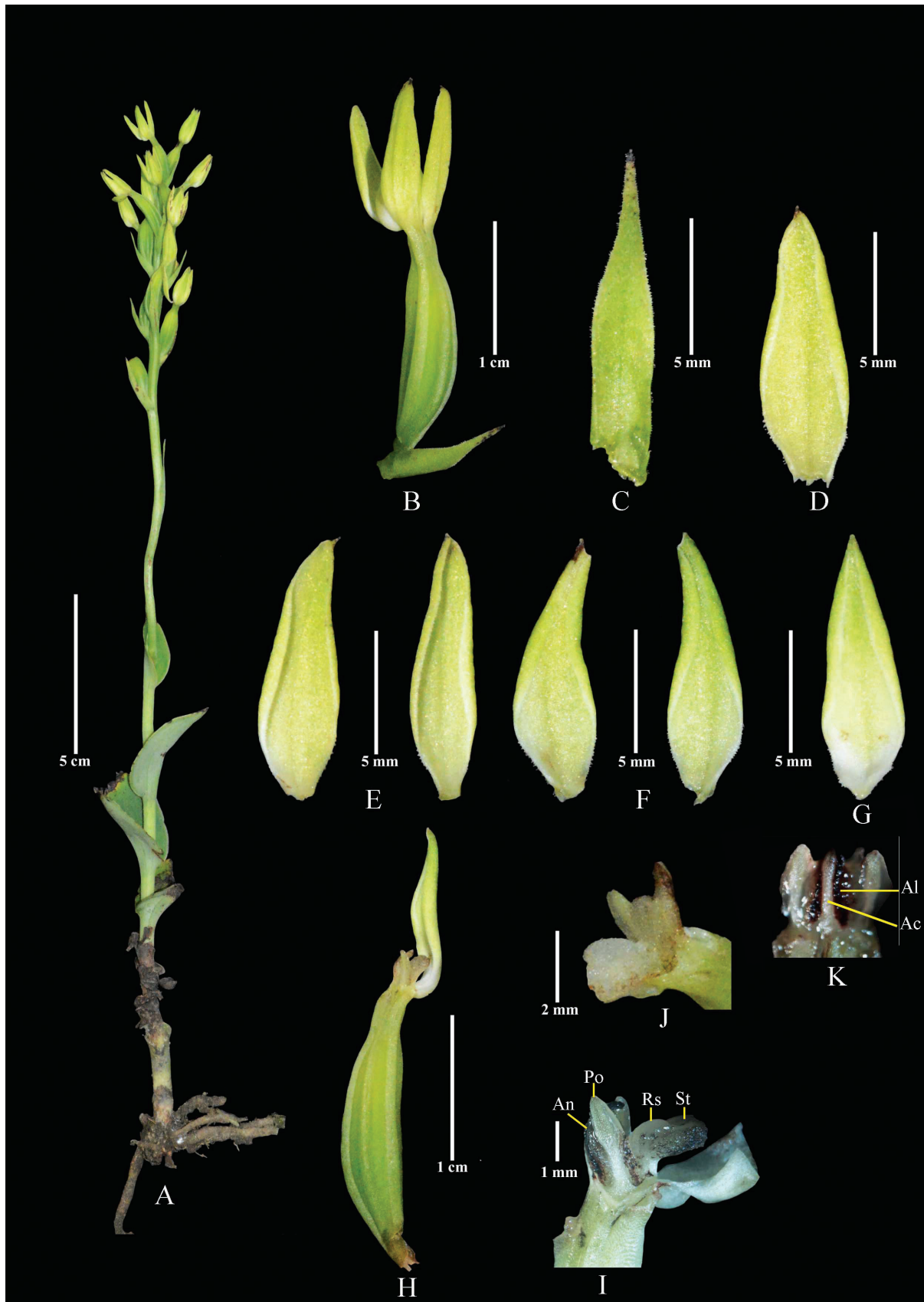
**Etymology:** Named after the type locality, Bonaccord, Kerala.

**Additional specimen examined:** India: Kerala, Agasthyamala Biosphere Reserve (Karamana), 20.10.1993, A. Ganga Prasad & S. William Decruse 18442 (TBGT!).

**Conservation status and threats:** The species has a restricted distribution with limited number of individuals in Agasthyamala Biosphere Reserve. It is so far known from a single sub-population. Based on present field observation and as per IUCN guidelines, the extent of occurrence and the area of occupancy was calculated as 4 km<sup>2</sup> with the minimum grid size of 2 km. However, the new species is under threat due to tourism activities and seasonal/anthropogenic forest fires. Based on 'Extent of Occurrence' (Criterion B1: EOO < 100 km<sup>2</sup>) and 'Area of Occupancy' (Criterion B2: AOO < 10 km<sup>2</sup>) together with the number of locations = 1 (sub criterion 'a') and projected decline in area, extent and/or quality of habitat (subcriterion 'b(iii)'), initially the new species is assessed here as 'Critically Endangered' [CR B1ab(iii)+2ab(iii)] (IUCN 2019). Further explorations and habitat management is recommended for its conservation.



**Fig. 1:** *Odisha bonaccordensis* K. Prasad, Jalal & Agrawala: **A.** Habit; **B.** Floral bract; **C.** Dorsal sepal; **D.** Lateral sepals; **E.** Petals; **F.** Lip; **G.** Ovary with pedicel, column and lip; **H–J.** Column side, back & front views.



**Fig. 2:** *Odisha bonaccordensis* K. Prasad, Jalal & Agrawala: **A.** Habit; **B.** Flower; **C.** Floral bract; **D.** Dorsal sepal; **E.** Lateral sepals; **F.** Petals; **G.** Lip; **H.** Ovary with pedicel, column and lip; **I-K.** Column side and back views (An. Anther; Po. Pollinium; Rs. Rostellum; St. Stigma; Ac. Anther connectivity; Al. Anther locule without chamber).





Fig. 3: *Odisha bonaccordensis* K. Prasad, Jalal & Agrawala: A. Habit; B. Raceme; C. Flowers.

**Notes:** Initially the species was collected by A. Ganga Prasad & S. William Decruse from Agasthyamala Biosphere Reserve in the year 1993 and they believed that their material might be a *Habenaria* species (TBGT!). The first author (KP) in his revisionary studies of South Indian *Habenaria*, has studied the above material which shown unique column characters. Based on the column morphology is difficult for interpretation in dried specimens. The first author has recollected the specimens from the same locality and studied the specimens in fresh condition. The presence of unique morphological characters like, absence of anther chambers, antherophores, auricles and viscidia; pollinaria basally united with anther and free above; stigma tongue like, rounded or faintly 3-lobed; rostellum unlobed, superposed partly on stigma, it is described here as a new species.

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