

Notes on an endemic genus *Odisha* (Orchidaceae) and its two subspecies from Odisha, India

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आर्किडेसी कुल के स्थानिक वंश ओडिशा पर वर्गिकी टिप्पणी एवं भारत के ओडिशा राज्य से इसकी दो उपजातियां

शरत मिश्र

सारांश

प्रस्तुत शोधपत्र में ओडिशा एस. मिश्र वंश एवं इसकी उपजाति ओडिशा क्लेस्टेन्था उपजाति क्लेस्टेन्था (उपगण ओडिशिनेई : गण ऑर्किडी : आर्किडेसी) को पुनःस्थापित किया गया है। ओडिशा वंश के विशिष्ट लक्षणों जो एक जीवनक्रम (बायोटाइप) में क्रमिक रूप से स्थिर देखे गये हैं, को सारगर्भित रूप से विवेचित किया गया है, जिन माध्यमिक महत्वपूर्ण लक्षणों के आधार पर इस वंश का त्रुटिवश वंश हेबेनेरिया विल्लड. में विलय किया गया था। भारत के ओडिशा राज्य में हमारे द्वारा इस वंश के बड़ी संख्या में जीवनक्रमों (बायोटाइपों) के अध्ययन उपरांत इसके तुलनात्मक वर्णन को शोधपत्र में सविस्तार रखा गया है। इस वंश की दो उपजातियां ओडिशा क्लेस्टेन्था उपजाति क्लेस्टेन्था एवं प्लावलाटा की वर्गिकी कुंजी को भी प्रस्तुत किया गया है।

ABSTRACT

The present communication reinstates the genus *Odisha* S. Misra and the subspecies *Odisha cleistantha* subsp. *cleistantha* (Subtribe Odishinae: tribe Orchideae: Orchidaceae). An in-depth discussion of the typical characters (which is observed as constant in series of biotypes) of the genus *Odisha* has also been provided here to counter for its erroneous merger in the genus *Habenaria* Willd. based on characters of secondary importance. Comparative illustrations have also been provided in support of our finding revealed from study of a large number of biotypes from Odisha state, India. A key to both the subspecies of *Odisha cleistantha* i.e., *Odisha cleistantha* subsp. *cleistantha* and subsp. *flabellata* has been also given here.

Keywords: Endemic, Odisha, Orchids, *Habenaria*

INTRODUCTION

The genus *Odisha* S. Misra (Subtribe Odishinae: tribe Orchideae: Orchidaceae) was described by Misra (2007) based on its diagnostic uncommon characters, especially in the reproductive parts. For example the completely closure of perianth; petaloid erect rostellum with 3 free lobes at apex; the lateral lobes neither produce pouches on their apices nor connected to the anther lobes. Each

of the anther lobes 2-parted by a longitudinal septum and lacks any anther canal; the pollinarium was 2-lobed, each lobe consisting of two collateral pollinia; the short caudicle was curved, acicular and lacked a viscidium. This herbaceous terrestrial orchid with root-stem tuberosities, typical terminal inflorescence with green flowers was observed in several localities in the moist deciduous forests of Odisha. Its floral morphology having a 3-lobed labellum with a basal spur, union of the two anther lobes

to the base of the column, sectile pollinia, etc. supports its placement in tribe Orchideae (Orchidaceae). Study of the live specimens of genus *Odisha* S. Misra collected from different localities of Odisha, during last 30 years (between 1975 to 2004) revealed that its floral structure was always constant with minor variations in the shape of the lobes of the labellum, rostellum and the stigma. Therefore, a new species *Odisha cleistantha* S. Misra and two subspecies *cleistantha* and subsp. *flabellata* were described (Misra, 2007, 2018) under a new genus *Odisha* S. Misra and a new subtribe Odishinae S. Misra (Misra 2007).

DISCUSSION

Kumar & al. (2018) on their taxonomic note of an east-Asiatic species *Habenaria malintana* (Blanco) Merrill, mentioned it as a highly variable species with peloric forms. They have weighed more on characters like the opening of perianth, varying degree of deformity in the lip, and the presence or absence of a spur in it. Accordingly they have reduced the closed – or partially closed – flower forms in *Habenaria* Willd. like *Habenaria pelorioides* Par. & Rchb. f. and *Odisha cleistantha* S. Misra, as synonyms of *Habenaria malintana*. They mistakenly opined that, closed or partially closed flower forms were nothing but peloric forms of the latter species. As regards to *Odisha cleistantha*, their findings were based on study of only one herbarium sheet lodged at CAL (Sarat Misra 2464).

An in-depth discussion of floral form diversity of *Odisha cleistantha* has been discussed in detail (Misra 2011) with several illustrations of the labellum and the gynostemium, which show the variability in this interesting species. Most importantly, a character of 2-parted anther lobes separates the genus *Odisha* from other known genera of Orchidaceae. It is pertinent to mention here that, only study of herbarium specimens cannot reveal the intricate floral structures, especially in the members of family Orchidaceae, which has the most complex floral morphology among the angiosperms. Unless, one has not studied the floral morphology in living materials of a large number of biotype species in nature, it would be difficult to ascertain a specific delimitation. Kumar & al. have mixed up ‘peloric forms’ with the ‘variability in forms’. This is evident from their quoting another Asiatic species *Habenaria reniformis* (D. Don) Hook. f. “in which plants have been seen to bear 1-3-lobed labellum with or

without a distinct spur”. Variability in the floral forms of *Habenaria reniformis* has been elaborately discussed by the present author (Misra 2004).

Variation in floral forms is not uncommon in Orchidaceae, while peloric form – an infraspecific mutation, is a quite different feature and is rather uncommon. Peloric forms usually cover variation in structure of the perianth including the labellum and its spur, but not in the structure of the anther, pollinarium and the rostellum. The 2-parted anther lobe; short acicular caudicle without viscidium; the remarkable structure of the erect, petaloid rostellum with 3 short apical lobes, with the lateral lobes devoid of pouches at their extremities and not connected to the anther lobes (Unlike with a massive dome-shaped central lobe, slender lateral lobes, provided with pouches and are closely placed below the anther canals in *Habenaria*) in the genus *Odisha* cannot certainly be attributed to mere peloric forms. These characters are quite unique in the tribe Orchideae.

While dealing with taxonomic study focus should be kept on the basic premise that characters of a genus or even a section must be derived from that of its type species. Moreover, much care must be taken to separate the characters of primary and secondary importance (Garay & al., 1994). The undue emphasis on the secondary characters often leads to chaotic situations. This has exactly happened for the new genus and its species *Odisha cleistantha*. Primary characters of the genus like the 2-parted anther locules; short caudicle without viscidium; erect petaloid rostellum, apically 3-lobed without bursicle, and without any attachment to the anther lobes, as provided in the protologue for the, type species *Odisha cleistantha* have been overlooked, and characters of secondary importance like opening of the flowers, shape of the lip, spur etc. have been over-emphasized by Kumar & al., (2018). This is not well founded and therefore not acceptable.

What is even equally important in our finding as has been mentioned earlier, that the characters attributed to the new genus/species are always found constant, and not arbitrary or accidental to be termed it as peloric form of some other species. This is revealed from study of a large number of biotypes as has been already mentioned. Study from several other areas in Odisha subsequently during 2004-2010 not only extended the range of this species, but also led to the finding (Misra 2018) of a new subspecies *Odisha cleistantha* subsp. *flabellata* S. Misra,

from materials collected in the Koraput district of the state. The range of subsp. *flabellata* now extends further to Kandhamala district - Daringbadi, Dangamala, {S. Misra 2515, 14.08.2010 (flowered on 06.11.10)}. The new subtribe, genus and the subspecies *cleistantha* are reinstated here with citations; citation for the new subspecies too is provided.

Odishinae S. Misra, *Orchids of India – A glimpse*: 250 & 162. 2007; *Misra, Orchids of India – A handbook*: 74. 2019.

Odisha S. Misra, *Orchids of India – A glimpse*: 251 & 162. 2007; *Misra, Orchids of India – A handbook*: 74 & 220. 2019.

Odisha cleistantha S. Misra, *Orchids of India – A glimpse*: 252. 2007; *Misra, J. Orchid Soc. India* 25(1-2): 14. 2011; *Misra, Orchids of India – A handbook*: 520. 2019.

Odisha cleistantha S. Misra subsp. **flabellata** S. Misra, *Nelumbo* 60(2): 99-103. 2018; *Misra, Orchids of India – A handbook*: 520. 2019.

Notes: Figures of *Odisha cleistantha* showing the lip, column, stigma, rostellum as provided in the protologue, are reproduced here. A second set of figures of the flower, lip, column showing the anther lobes, stigma, rostellum, and the cross section of the anther lobes showing the partition, of the subspecies *flabellata* is also reproduced here for ready reference. An additional figure of *Habenaria malintana* showing the flower, anther lobes, stigma lobes, the rostellum with its dome-shaped central lobe and the forwardly narrowing and upwardly pointing lateral lobes, as also the pollinarium is provided here for comparison. These figures depict the structural details, especially of the anther lobes and its connection with the rostellar arms. The figures in the preceding paragraphs highlight the primary characters of the new genus and the way it is separated out from the secondary ones. It shows how boldly the new taxa are distinct from any other species under *Habenaria* or other genus under Orchideae.

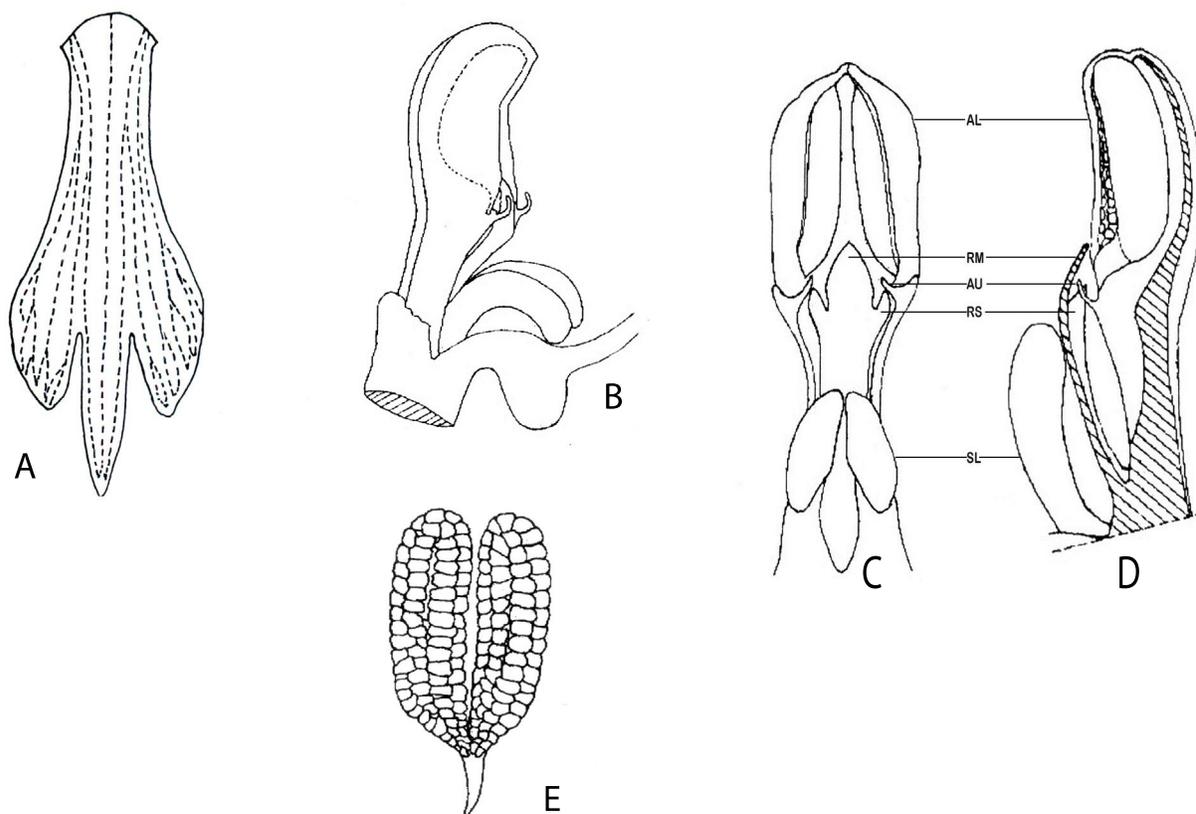


Fig. 1: *Odisha cleistantha* subsp. *cleistantha* S. Misra. **A.** lip, **B.** column side view, **C.&D.** column front view and in longitudinal section, **E.** pollinarium – After S. Misra 2434, holotype, Misra 2007.

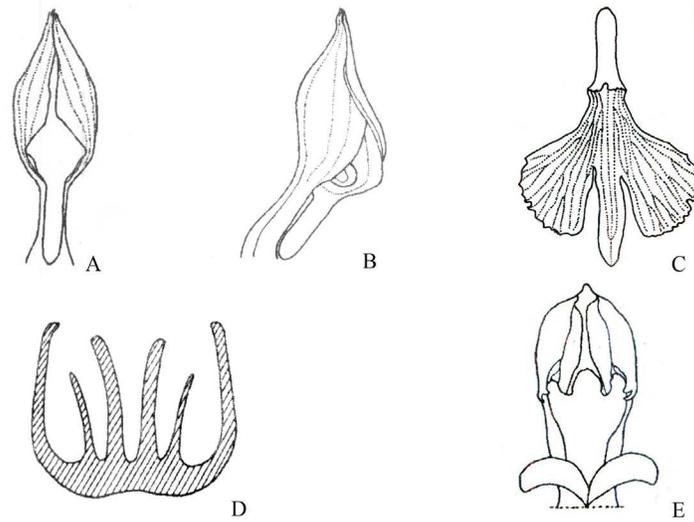


Fig. 2: *Odisha cleistantha* subsp. *flabellata* S. Misra. **A.&B.** flowers, front and side views, **C.** labellum, **D.** column, front view, **E.** anther lobes in cross section – After S. Misra 2510, holotype, Misra 2011.

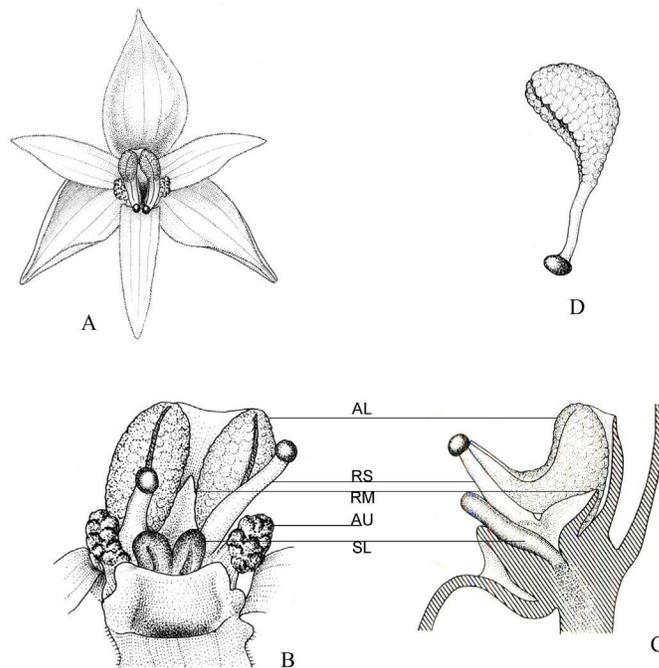


Fig. 3: *Habenaria malintana* (Blanco) Merrill. **A.** flower, **B.&C.** column, front view and in longitudinal section, **D.** pollinarium - After Seidenfaden (fig. 79). (**AL.** anther lobe, **AU.** auricle, **RM.** rostellum, midlobe, **RS.** rostellum, side lobe, **SL.** stigma lobe).

A key to the subspecies under *Odisha cleistantha* is provided below

- 1a. Labellum narrowly ovate in outline; lateral lobes obliquely ovate-lanceolate, margins entire; spur short, with a broad truncate apex; stigma lobes parallel to each other

Odisha cleistantha* subsp. *cleistantha

- 1b. Labellum flabelliform in outline, lateral lobes obliquely fimbriate, outer margins crenulate; spur elongate, apex rounded; stigma lobes divergent from the base, apically decurved

Odisha cleistantha* subsp. *flabellata

So far *Habenaria malintana* is concerned, Seidenfaden (1977) has provided excellent sketches of it based on collection of J. F. Maxwell from Thailand. It shows the well opened perianth, an entire lanceolate lip, the broad, dome-shaped rostellum with long, upturned canals and bursicles; the anther locules having long antherophores; the long caudicle ending in a prominent viscidium. It is recorded in India from Sikkim, Nagaland and West Bengal-Darjeeling (Seidenfaden, 1977; Hynniewta, 2000; Swami, 2016). Swami has provided photograph for this, which shows the immaculate white flowers with well opening perianth. Flowers of *Odisha cleistantha*, on the contrary, are invariably verdant green coloured and its perianth always remains closed.

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