

## SHORT COMMUNICATION

***Dendrobium lituiflorum* Lindl.– A Validation Report from Khasi Hills of Meghalaya****R Devadas<sup>1\*</sup>, D Barman and RP Medhi***National Research Centre for Orchids, ICAR, Pakyong-737 106, Sikkim*

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An unidentified flowering species belonging to genus *Dendrobium*, morphologically allied to *Dendrobium nobile* Lindl., was collected near lower Khasi hills of Meghalaya in 2007 and was characterized and discussed. Critical comparison was made with its allied group in the same geographical area of North East Hill (NEH) of India to distinguish from the others. Deciduous nature of pseudo-stems during flowering, dominant shining purple colour of sepals and petals, short peduncle traits and finally purple column colour as phenological markers, served as taxonomic identification traits for confirmation of this species as *Dendrobium lituiflorum* Lindl., from *D. nobile* Lindl., (also known as noble orchid).

**Key Words: Characterization, *Dendrobium lituiflorum* Lindl., Wild species**

The genus *Dendrobium* was established in 1799 by O. Swartz in *Nova Acta Regiae Societatis Upsaliensis*, which comprises 1,400 species distributed from India across to Japan, South to Malaysia, Indonesia and east to New Guinea, Australia, New Zealand and the Pacific Island (Lucksom, 2007). The beautiful species, *Dendrobium lituiflorum* Lindl., is similar to *Dendrobium nobile*, was native to the warm valleys throughout Arracan (presently a part of modern Myanmar) (James Veich and Sons, 1888). It was first reported in Burma during 1856, but also seen in Assam (at present, Asom, India), adjoining Khasi & Jaintia hills and Sikkim of India. This species first became known in British gardens in 1856 from the collections of late Mr. Robert Hanbury, at Poles, near Ware. The species name derived from *lituus*, “a sort of trumpet”, refers to the form of lip. Although John Lindley and John Dalton Hooker described the species taxonomically in 1856 and 1890 respectively, but the modern scholars often misquoted it because of its similarity and time of flowering like noble orchid and some times considered as variant of *D. nobile* Lindl. Even though, it is considered as a close ally with *D. nobile*, which is an endemic orchid species in North-East India and popularly recognized as the state flower of Sikkim, the taxonomical identity of both the species are different. Current species under report was collected (NRCO-Coll-1/2007) from the local vendors at lower Khasi hills of Meghalaya, as an ‘unidentified species’. It was studied for two consecutive years and characterized morphologically for validation of identity and application

in future research programmes. An effort was made critically to phenotypically distinguish the species from another with pictorial depiction. The major emphasis had been now given for multiplication of this species and collection for conservation in the capacity of ‘National Active Germplasm Site’ (NAGS) at ‘National Research Centre for Orchids’, ICAR, Sikkim under Germplasm Management Unit of Plant Breeding. Existence of this species in Khasi and Jaintia hills was earlier reported without depiction (Arora and Mukherjee, 1983) and current status of this species was reported as endangered, extremely rare and threatened category from north-east India (Chowdhery, 2001).

Taxonomical description used for identification of *D. lituiflorum*: Habit – epiphyte; Stem – long, slender, grayish white, pendulous with a knob-like base; Root – slender, whitish brown; Leaves – linear lanceolate, deciduous; Inflorescence - produced on older leafless stems, usually in pairs at the upper most joints of nodes on short and very large bracted peduncle; Flowers – deep purple, equal; Bract – white, scarious; Sepals – oblong lanceolate, acute, purple with much paler at the base; Petals – ovate oblong, broader, dark bright purple, mentum short saccate; Lip – white, convolute at the base with white and heavy purple transverse stripes, disc of limb/mouth orbicular concave turned up like trumpet shaped puberulous edged with purple color and margins slightly recurved, dark purple central blotch at centre of lip, claw

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broad, convolute over column; Column – purple, short; Anther – velvety purple, pollinia – 4 (group of two), *ca* 0.2 cm long and orange yellow (Lindley, 1856; Grant, 1895; Hooker, 1890).

Evaluation and characterization: The species, was evaluated and characterized at this centre as per ‘Common Descriptors of Orchids’ developed. Data was collected on only few surviving and flowering plants of the collection. The colour pattern of qualitative characters was recorded with help of ‘Royal Horticultural Society’ (RHS) colour charts. The general descriptions for the morphological characters of the collection was based on mean data (quantitative) and expressivity of qualitative characters like color pattern was observed for two years at Pakyong, Sikkim (Altitude 1,300 m) location (summarized in Table 1). The comparative description of species, *D. lituiflorum* Lindl. and *D. nobile* Lindl., for identification and differentiation is shown in Table 2. The differences of the species with *D. nobile* (NRCO-Coll-NATP/PD/15-10.09.04 of Arunachal Pradesh and IC439518 of Sikkim) for plant and as well as flower configuration along with lip differences was depicted in Fig. 1.

The species being monopodial epiphyte, the growth in terms of height has been recorded with range of 25–40 cm

during the past two years. Pseudo-stem was long, slender with deciduous nature at the time of flowering. Young and emerging shoots arise from the base of older pseudo-stems. At growing stage, leaves were in alternate, linear-lanceolate, sheathed (3.2 cm), smooth, green, measuring 7.2 cm x 1.3 cm with sub-obtuse tip. Inflorescence were 3–4 per plant, un-branched (no rachis) raceme, peduncle with deep purple colour measuring short 0.47 cm embedded with base in translucent embricate sheaths. Pedicel is terete, smooth, deep purple colour measuring 3.6 cm x 0.25 cm with floral bracts measuring 2 cm x 0.8 cm. The floral bracts were observed to be scarious having smaller sized bracts inside measuring 1 cm x 0.5 cm.

Flowers sized *ca.*, 3.5 cm x 6.0 cm, fragrant with shining purple sepals and petals (Fig. 1, b–2). The dorsal and lateral sepals were acute tipped measuring 3.85 cm x 1.0 cm, oblong-lanceolate shaped with moderately deep purple colour (RHS-N78 B). The basal end of lateral sepal in pair was adnate to the foot of column to form short conical blunt mentum. The petals were recorded a size of 3.6 cm x 2.1 cm, ovate-oblong shaped with deep purple colour with pale shading at base. The lip size recorded 3.2 cm x 1.8 cm having presence deep purple maroon blotch (RHS-N78 A) at centre surrounded by white disc. The trumpet shaped lip with convolute at the base with

**Table 1. Major morphological characters of the collection, *D. lituiflorum* Lindl.**

S. No	Characters	Observation
1	Plant height	37 cm
2	Number of leaves (new sprouted)	09
3	Leaf shape	Oblong-lanceolate, obtuse tipped
4	Leaf length	7.2 cm
5	Leaf width	1.3 cm
6	Rachis length	absent
7	Peduncle	Very short, with large bracted
8	Inflorescence type	Un-branched raceme
9	Position of flowers	Upper nodes
10	General appearance flower	Loose, spreading, incurved
11	Flower length in front view	3.5 cm
12	Flower breadth in front view	6.0 cm
13	Shape of sepals & petals	Oblong-lanceolate, acute tipped
14	Sepals size	3.85 cm x 1.0 cm
15	Color of sepals	Moderate deep purple color (RHS N78 B) #
16	Petal size	3.6 cm x 2.1 cm
17	Color of sepals	deep purple color (RHS N78 B) with pale at base #
18	Lip size	3.2 cm x 1.8 cm
19	Anterior lobe of lip	absent
20	Lip colour of throat	Deep purple botch (RHS N78 A) #
21	Column length	0.4 cm
22	Column colour of anther cap	Deep purple
23	Lip callus	present
24	Inflorescence emergence	February
25	Days to 1 <sup>st</sup> bud opening from inflorescence emergence	39 days
26	Days to 70 per cent flower withering from bud opening	21 days
27	Days to complete flower withering from bud opening	28 days

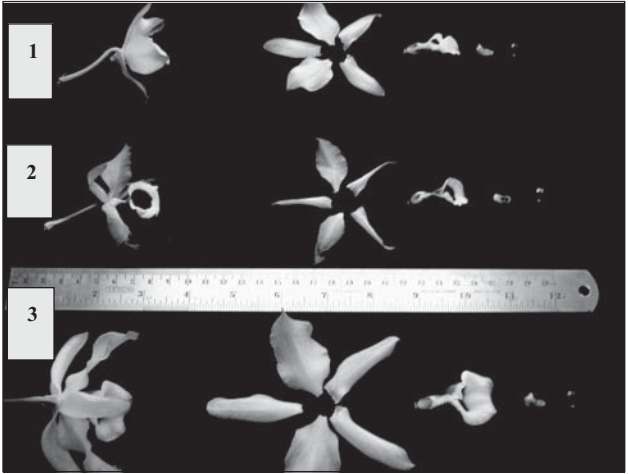
# indicates RHS (Royal Horticultural Society) colour charts for verification

Table 2. Comparative description of *D. lituiflorum* Lindl and *D. nobile* Lindl. for identification and differentiation

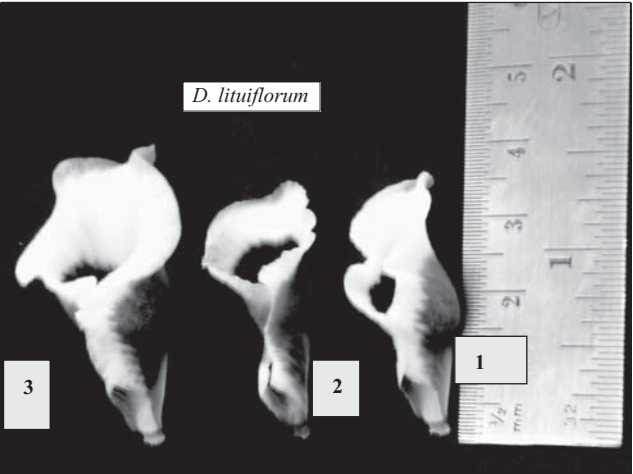
Characters	<i>Dendrobium lituiflorum</i> Lindl.	<i>Dendrobium nobile</i> Lindl.
Habitat	Epiphyte	Epiphyte or lithophyte
Pseudo-stem	Slender, long, pendulous, circular at base, more in number, white coloured, 15-24 nodes and nerved	Thicker, clustered, forming large clumps, laterally compressed, 7-12 nodes, thick at middle with tapering at ends, grooved and yellow with age, covered with old leaf sheath or blade
Leaves	Alternate, linear-lanceolate, leaf sheath with brownish spots	Distichous, oblong, apex unequally lobed
Inflorescence	Lateral, emerges from below nodes	Lateral, emerges from nodes in fascicles of 1-4 flowers below leaves
Rachis	Generally absent	Present
Peduncle	Very short covered with embricate sheaths	Short, terete, embedded in embricate sheaths
Pedice	3 cm long, dark purple	> 3.5 cm, whitish-purple
Flowers	Moderately deep purple, racemose, fragrant	Whitish-purple, sub-racemose, non-fragrant
Sepals	Thin, papery, deep purple to pale at base, spreading, 6-7 nerved,	Thin, fleshy, purplish-white, spreading, dorsal sepal erect
Petals	Oblong-lanceolate, broader, 4-5 nerved	Elliptic-ovate, broader, obtuse, 5-nerved
Lip	Curved like trumpet shaped, deep purple maroon blotch (RHS-N78 A) at center surrounded by white disc, mouth arbuticular, claw broad, convolute over column	Broadly ovate-oblong, base funnel shaped, lower half incurved, terminal half culcullate, acuminate tip, claw narrow
Column	Deep purple colour	Greenish colour
Mentum	Conical blunt	Broadly blunt



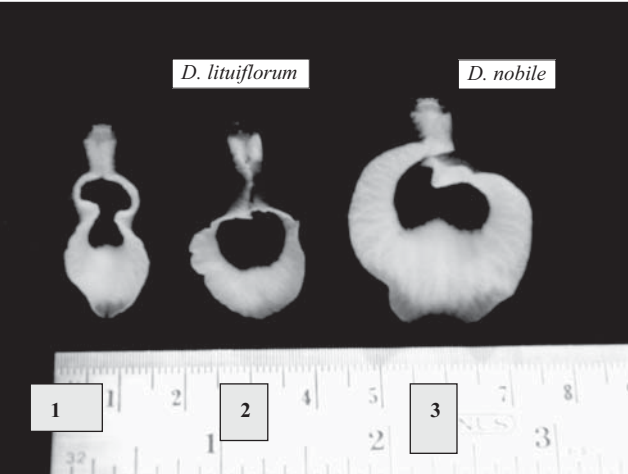
(a) Comparison of flowering plant of *D. lituiflorum* Lindl with *D. nobile* Lindl.



(b) Flower configuration of *D. lituiflorum* Lindl (2) and *D. nobile* Lindl. (1-Sikkim collection, 3-Arunachal Pradesh collection)



(c) Longitudinal view of lip of *D. lituiflorum* Lindl (2) and *D. nobile* Lindl. (1-Sikkim collection, 3-Arunachal Pradesh collection)



(d) Anterior view of lip of *D. lituiflorum* Lindl (2) and *D. nobile* Lindl. (1-Sikkim collection, 3-Arunachal Pradesh collection)

Fig. 1. Comparison of flowering plants of *D. lituiflorum* Lindl with *D. nobile* Lindl. with their flower configuration and lip differences

heavy purple transverse stripes having disc of limb/mouth orbicular in shape helped to clearly distinguish the species (Fig. 1, c and d). The column was small with purple colour serves as best phonological marker for quick identification (Fig. 1, b–2). The flowering traits like spike initiation, days to flower bud initiation, days to 1<sup>st</sup> flower opening (39 days) and days to 1<sup>st</sup> flower withering from bud opening (21 days) showed consistency for the two years.

The deciduous nature of pseudo-stems while flowering, dominant shining purple colour of sepals and petals, short peduncle traits and shape of lip from base helps for identification of this species. The shining purple colour of both sepals and petals look-alike flower colour and size of noble orchid (*Dendrobium nobile* Lindl.) are attributes of this species, that can be utilized in breeding programmes for developing new hybrids. This species can also be used as in-door planting and live hanging pots apart from *ex situ* conservation.

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