SPECIES

Does *Habenaria hollandiana* Santapau (Orchidaceae) Exists?

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ABSTRACT

Habenaria hollandiana Santapau is treated to be conspecific to *Pecteilis furcifera* Lindl. Detailed description, habitat, distribution, and photographs are provided and easy identification of two species of *Habenaria*.

Keywords: Hooked spur, Straight spur, Terrestrial orchid, Western Ghats.

1. INTRODUCTION

There are around 1256 species under 155 genera, of these 307 are endemic to India (Singh *et al*., 2019). The genus *Habenaria* Willdenow is the largest terrestrial in the World comprising 800 species. In India, 58 species and 3 varieties have been recorded (Choudhury *et al*., 2011). Dangat, (2015) has recorded 40 species of *Habenaria* from the Western Ghats out of which 24 species of *Habenaria* are endemic. Karnataka Biodiversity Board has recorded 197 wild orchids out of which 27 *Habenaria* species have been mentioned in the year 2019.

During our field survey in North Karnataka, collected two species of *Habenaria* which are different with habit, flower structure, size, labellum, etc. After the literature survey there has been a misconception with the three species of *Habenaria* in the Western Ghats, *Habenaria hollandiana* Santapu and *Habenaria furcifera* Lindl. have similar characters but exact photographs and type specimens of *H. hollandiana* Santapu is not clear up to identification level. And some of them confused it with *Habenaria ovalifolia* Wight with flower colour. *Habenaria furcifera* and *Habenaria ovalifolia* both are different in their characters and provided a key for identification with photographs in the present work. Past studies on *H. hollandiana* Santpau tell us that its morphological characters merge with *H. furcifera* Lindl.

Mr. Law from Belgaum collected a species and sent it to Robert-Wight in the year 1851 and named it *Habenaria affinis* Wight in *Icones Plantarum Indiae Orientalies* for the first time. Later this species is reported by Father Santapau from Purandhar fort, in the year 1944-1956 as *Habenaria hollandiana* Santapau. Then it has been named *Habenaria indica* by Kumar and Manilal, due to the homonym issue, in *Taxon* Journal Volume 35 issue 4 pages 719 published in the year 1986. The specimen has been examined at Peninsular, central and eastern India. Tamil Nadu: Coimbatore District, Anamalai Hills. Fischer s.n. (MH Acc. No. 50863). Andhra Pradesh: Kurnool District, way to Diguramettta, Nallamalais. J. L. Ellis 22195 (MH).

Pecteilis furcifera (Lindl.) M. A. Clem. & D. L. Jones was recorded earlier to *H. hollandiana* Santapau in 1835 at North-east India by Lindley, (1835) in *Genera*

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Plantarum. After that it has been misconfused or misconception with *Habenaria ovalifolia* Wight and kept as a synonym. Dangat, (2015) and Choudhury *et al*., (2011) recorded both species are different and are present in Western Ghats of India in their work. *Habenaria ovalifolia* Wight has been described by Robert-Wight, (1852) in *Icones Plantarum Indiae Orientalies* with illustrations from Malbar and Anamally Hills. So, the present work tells us about the detailed taxonomic treatment, photographic plating and parallel key for species *Pecteilis furcifera* (Lindl.) M. A. Clem. & D. L. Jones and *Habenaria ovalifolia* Wight.

2. TAXONOMIC TREATMENT

***Habenaria ovalifolia* Wight**, Icon. Pl. ind. Orient. 5: t. 1708. 1851; Hooker, (1879) Fl. Brit. India 6: 149. 1890; Gamble. Fl. Madras. 1471. 1928; Saldanha and Nicolson, (1976). Fl. Hassan. 833. 1976; B. D. Sharma *et al*., (1984) Fl. Karnataka Analysis. 271. 1984; *H. frucifera* Lindl. Laxminarasimhan *et al*., (2019) Fl. Karnataka, 3. 55. 2019; KBB. Fl. Karnataka Analysis, 2. 542. 2019.

Terrestrial herbs, 30-80 cm tall. Tubers 2, ellipsoid. Stem erect, terete with 3-5 sheathing bases. Leaves 3-5, clustered below the middle of the stem, 12-16 × 3 cm across, oblong, ovate-lanceolate, acute glabrous, entire. Inflorescence is 30 cm long, racemose, many-flowered. Flowers dull green, 1.8 × 0.8 cm across, Scentless. Bract 1.2 × 0.4 cm across, shining green, covering the ovary, elliptic-lanceolate, largely acuminate. Dorsal sepal dark green, hood-like, ovate-oblong, 1-nerved, 5 × 4 mm across. Lateral sepals light green, linear-lanceolate, ovate apex, 4 × 2 mm across. Petals green, boat-like structure, linear, ovate apex, 5-6 × 2 mm across. Labellum 3-partite, fleshy, light green, 4 × 5-6 mm across, midlobe does not open and is attached to dorsal sepal; lateral lobes straight, 3-4 × 1 mm across, acute apex; midlobe 4 × 2 mm across, broader with ridge-like structure; front lobe acute. Column 3-4 mm with staminodes, rostellum and anther locules; spur is attached to the base of the column, 1.5 cm long bent, greenish-white. Pollinarium 1 pair, cream yellow, 2 mm long, 1 mm caudicle with viscidium pad. Ovary is 1.1 cm long, green with ridges. Capsule 1.2 cm long, green, fusiform with ends tapering.

Habitat

Terrestrial orchids growing under tree shades within leaf litter of evergreen and semi-evergreen forests at 800-1200 meters altitude.

Flowering & Fruiting

July-August.

Distribution

Species Examined

India, Karnataka, Belgaum, Jamboti- kanakumbi Road, 15-07-2022, *Shreyas Betageri & K. Kotresha*, 0124 (HKSCD).

***Pecteilis furcifera* (Lindl.) M. A. Clem. & D.L. Jones,** Aust. Orchid Rev. 83: 6. 51. 2018; *Habenaria furcifera* Lindl., Gen. & Sp. Orchids: 319. 1835; Hooker, (1879). Fl. Brit. India 6: 149. 1890. Yadav and Sardesai, (2002). Fl. Kolhapur. 466. 2002. Jalal, (2018) Orchids Maharashtra. 127. 2018.

Terrestrial herbs, 40-50 cm tall. Tubers 1-2, ovate-ellipsoid. Stem short with sheathing leaf bases, 2-3 cm long. Leaves 5-6, 13-15 × 4-6 cm across, elliptic, shiny, linear, acute apex, with 7 nerves on both ventral and dorsal sides. Inflorescence 30-40 cm tall, terete, green, erect with many flowers, 8-10 foliar bracts. Bract 1.3 × 0.5 cm across, longer than buds, lanceolate, acuminate, 1-nerved. Flower green, 1.5 × 1 cm across, scentless. Dorsal sepal falcate to concave at base, 4 × 2 mm across, green. Lateral sepal pale green, 5 × 2 mm across, obtuse base with acute apex. Petals oblong-obtuse, acute apex, 1-nerved, 4 × 2 mm across. Labellum 3-petite, 8 × 4 mm across, pale green, base extends to form a curved spur; lateral lobes 7 × 1 mm across, linear, acute apex; midlobe 4 × 1 mm across, linear, with obtuse apex; labellum open throughout. Column 2-3 mm long, pale green with 2 staminodes, with anther sacks. Pollinarium 1 pair, 2 mm long with a transparent caudicle. Spur extends from the base of the spur, 1 cm long, flat, and curved at the tip. Ovary 1.1-1.5 cm long, green, with ridges. Capsule fusiform, 1.5 cm long.

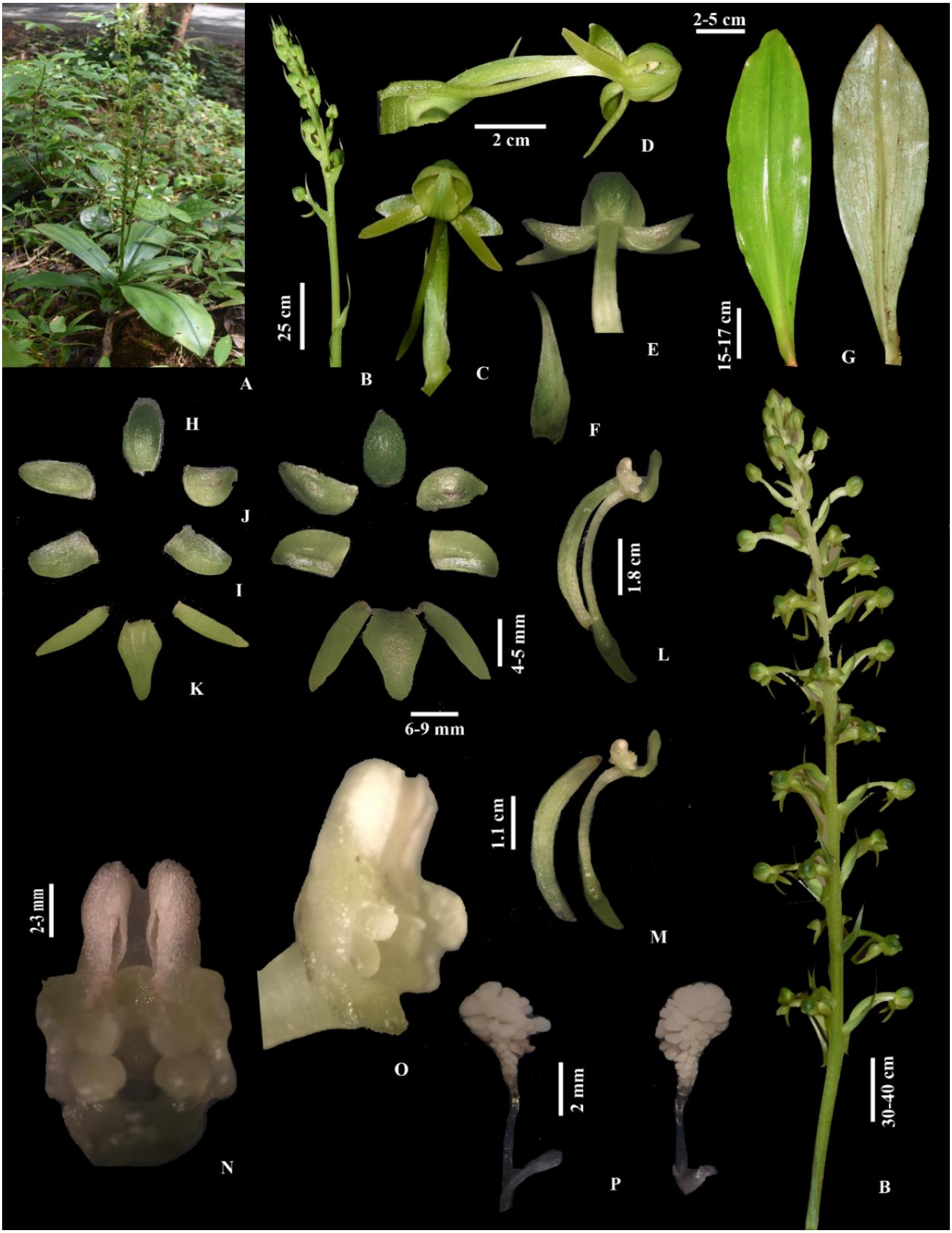

Figure 1 *Habenaria ovalifolia* Wight, A. Habit, B. Inflorescence, C. D. & E. Flower, F. Bract, G. Dorsal & Ventral Leaf, H. & I. Dorsal & Lateral Sepals, J. Petals, K. Labellum, L. & M. Column, Ovary, Straight spur, N. & O. Column P. Pollinarium

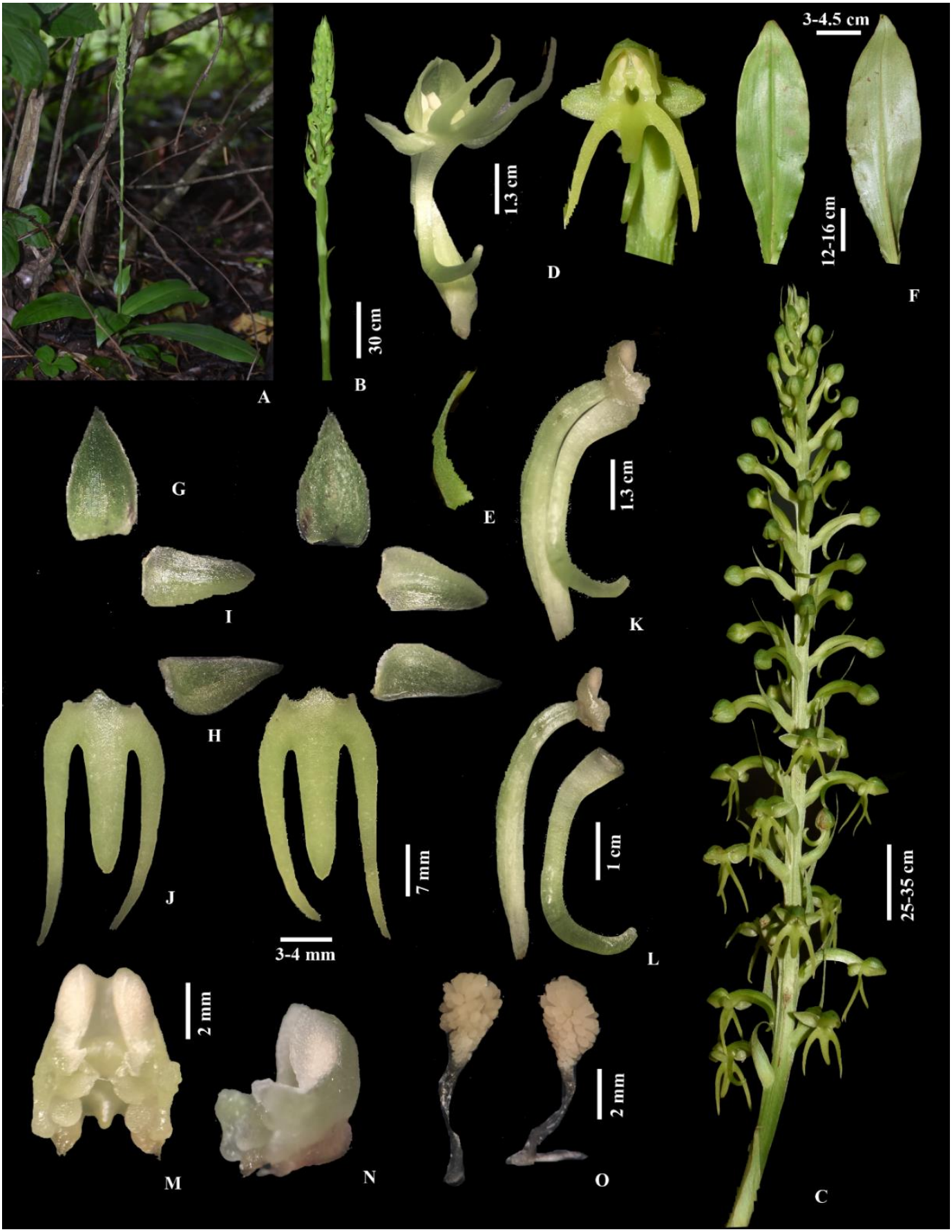

Figure 2 *Pecteilis furcifera* (Lindl.) M. A. Clem. & D.L. Jones, A. Habit, B. & C. Inflorescence D. Flower, E. Bract, F. Dorsal & Ventral Leaf, G. & H. Dorsal & Lateral Sepals, I. Petals, J. Labellum, K. & L. Column, Ovary, Hooked spur, M. & N. Column O. Pollinarium

Habitat

Terrestrial orchids growing under small shrubs within shades at 500 meters altitude.

Distribution

Flowering & Fruiting

August-September

Species Examined

India, Karnataka, Belgaum, Khanapur forest, Machigad, Ramteertha temple, 28-08-2022, *Shreyas Betageri & K. Kotresha*, 0141 (HKSCD).

Parallel Key for *Pecteilis furcifer*a and *Habenaria ovalifolia*

1. Leaves 3-4, flowers loosely arranged, bract smaller than ovary, lip attached to the sepals, spur straight, longer than ovary

…. *H. ovalifolia*

1. Leaves 4-6, flowers densely arranged, bract longer than ovary, lip not attached to sepals, spur hooked, shorter than ovary

…. *P. furcifera*

3. DISCUSSION

Table 1 deliberating the morphological characters first time described by the authors clears that *Pecteilis furcifera* (Lindl.) M. A. Clem. & D.L. Jones and *Habenaria hollandiana* Santapu are similar species, maybe they have misconceptions with the location. *Habenaria ovalifolia* Wight is different species with its characteristics.

Table 1 Discusses morphology described by Robert-Wight, (1852) (*H. ovalifolia* Wight), Lindley, (1835) and Santapu (*H. hollandiana* Santapu)

Characters	*Pecteilis furcifera* (Lindl.) M. A. Clem. & D.L. Jones	*H. ovalifolia* Wight	*H. hollandiana* Santapu
Habit	Stem 10-18 in. stout with Distant small sheaths above the leaves	Tall 1-2 feet	Stem 1-2 feet clothed above The leaves with many erect Lanceolate leaves
Leaves	Leaves elliptic, 4-6 x 1.5-2 in Base contracted, acute or Acuminate, not-petaloid	Leaves 2-3, 6-8 x 2-4.5 in. Sessile or sub-petaloid, acute or acuminate. Elliptic lanceolate Sub-Scapigerous	Leaves elliptic-lanceolate Acuminate, 4-6 x 2.5 in Hardly Petaloid not margined
Inflorescence	Spike 5-7 in. many flowered, Bract as long as the ovary, Ovate-lanceolate	Spike a raceme, 10 in. Bract as long as or half as ovary	Spike elongate cylindrical, bract Exceeding or equaling the Ovary
Ovary	Ovary 0.5 in. curved Hardly beaked		Ovary 0.5 in. with curved Beaked ovary
Petals & Sepals	Dorsal sepal ovate-oblong Obtuse, lateral sepal Falcately Oblong-lanceolate, sub-acute, Sepals 3-nerved. Petals long, 2-nerved	Dorsal sepal orbicular, long, Lateral sepals ovate-obtuse, Petals as long as lateral	Dorsal sepal ovate-oblong Obtuse, Sepals 3-nerved. Petals oblong-lanceolate Obtuse
Lip	Lip longer than sepals Trifurcate, side segments Filiform longer than linear Mid segment	Lip as long as sepals, 3-partite, Linear oblong-obtuse, incurved, Shorter than ovate mid lobe	Lip longer than sepals, 3-partite Side lobes narrower, longer than linear obtuse mid segment
Spur	Spur longer than ovary, very slender involute	The spur slender longer than the Slender beaked ovary incurved Tip thickened acute.	Spur half as long as ovary, Slender incurved.
Anther cap & Column	Anther rather small, tubes Upcurved; stigmatic Processes short	Anther short, cells diverging, Tubes short up curved, caudicles of pollinia short, glands small, Stigmatic process clavate, Rostellum short, broad	Anther broad, cells parallel, Tubes shortly up curved, Glands Pollinia small, stigmatic process Large, clavate
Capsule	Capsule fusiform, decurved Ridges thick, beak as long as the body		
Distribution in India	Tropical Himalaya, Bhutan, Assam, Orrisa, East Bengal	Deccan peninsular: on Ghats From Concan to Niligiris	Central India: Concan to Canara Travancore and Anamalyis

Figure 3 A. *Habenaria affinis* Wight. B. *Habenaria affinis* Wight. Herbarium C. *Habenaria ovalifolia* Wight. D. *Habenaria ovalifolia* Wight. Herbarium

As the Herbarium and illustration records by the above authors Robert-Wight, (1852), Lindley, (1835) and Santapu (Figure 3A, 3B) describe that *Habenaria hollandiana* Santapu (*Habenaria affinis* Wight) leaf has wavy margin with acuminate apex, 4-6 numbers, labellum trifurcate not attached to the sepals; midlobe of the labellum is not ovate and it is acute, hooked spur shorter than ovary. Herbarium and illustration (Figure 3C, 3D) of *Habenaria ovalifolia* Wight clearly shows that the leaf without a wavy margin and acute apex is slightly acuminate like 3-4 numbers, labellum trifurcate but attached to the sepals; midlobe of the labellum is ovate and somewhat equal in size of lateral lobes, spur straight and is longer than ovary.

4. CONCLUSION

From the above discussion, it clears that there are no species called *Habenaria hollandiana* Santapu and is conspecific to *Pecteilis furcifera* (Lindl.) M. A. Clem. & D.L. Jones with its characters like leaves 4-6, dense inflorescence, labellum not attached to sepals, hooked spur smaller than ovary.

Informed consent

Not applicable.

Ethical approval

The ethical guidelines for plants & plant materials are followed in the study for sample collection & identification.

Conflicts of interests

The authors declare that there are no conflicts of interest.

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The study has not received any external funding.

Data and materials availability

All data associated with this study are present in the paper.

REFERENCES AND NOTES

1. Choudhury S, Mukherjee S, Chowdhery HJ. Distribution and Diversity of Genus *Habenaria* Willdenow (Orchidaceae) in India. Recent Studies in Biodiversity and Traditional Knowledge in India, Gour Mahavidyalaya 2011; 81-90.
2. Dangat TB. Studies on Systematics of the Genus *Habenaria* Willd. (Orchidaceae) in the Western Ghats. Shivaji University, Kolhapur 2015.
3. Hooker JD. Flora of British India. Authority of Secretary of State for Indian Council 1879; 5, 6.
4. Jalal JS. Orchids of Maharashtra. Bot Surv India 2018; 123-128.
5. Kumar CS, Manilal KS. Nomenclatural Changes in Two Indian Orchids. Taxon 1986; 35:719-720.
6. Laxminarasimhan P, Dash SS, Singh P, Sing NP, Vasudeva MK, Rao PSN, Mao AA. Flora of Karnataka, Monocotyledons. Bot Surv India 2019; 3:55.
7. Lindley. Genera and Species of Orchidaceous Plants. The London 1835; 319.
8. Robert-Wight. Figures of Indian Plants or Icones Plantarum Indiae Orientalies. PR Hunt, American Mission Press 1852; 5: 13, 1707, 1708.
9. Saldanha CJ, Nicolson DH. Flora of Hassan District, Karnataka, India. Amerind Publishing 1976; 836.
10. Sharma BD, Singh NP, Raghavan RS, Deshpande UR. Flora of Karnataka Analysis. Bot Surv India 1984; 264-278.
11. Singh SK, Agrawala DK, Jalal JS, Dash SS, Mao AA, Singh P. Orchids of India, a Pictorial Guide. Bot Surv India 2019.
12. Yadav SR, Sardesai MM. Flora of Kolhapur. Shivaji University, Kolhapur 2002; 455-475.