

## A NEW SPURLESS *HABENELLA* SPECIES (ORCHIDACEAE) FROM NEPAL

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**Abstract.** A new species of the genus *Habenella* Small is described based on material collected in Nepal. The novelty resembles *H. anomaliflora* Kurzweil & Chantanaorr., from which it differs by the presence of a single leaf, oblong-lanceolate lip, ovate lateral sepals with a somewhat oblique base, and oblong-lanceolate petals. An identification key for representatives of *Habenaria s.l.* reported from Nepal is included.

**Key words:** Asia, biodiversity, Habenariinae, taxonomy

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### INTRODUCTION

The cosmopolitan genus *Habenaria* Willd. is one of the largest within Orchidaceae. It was described in the beginning of the 19th century (Willdenow 1805) but the characters given by the author as diagnostic for this taxon – a spurred lip and the presence of two processes at the base of the terminal anther – were too general, and over the years *ca* 2000 specific epithets have been applied to this genus. Many of the species included in *Habenaria* based on overall flower appearance are currently classified in different subtribes such as *Amitostigma* Schltr., *Dactylorhiza* Neck. ex Nevski, *Galearis* Raf., *Gymnadenia* R. Br., *Netotianthe* (Rchb.) Schltr., *Peristylus* Blume and *Platanthera* Rich., or even less related groups such as the spiranthoid genus *Mesadenella* Pabst & Garay.

The taxonomy of *Habenaria* and its relatives has been discussed for years. Various classification systems have been proposed based on results of morphological studies (e.g., Pfitzer 1887; Dressler & Dodson 1960; Dressler 1993; Szlachetko 1995). Genetic research has not resolved doubts about the separateness of Orchidinae and Habenariinae; moreover, generic delimita-

tion within *Habenaria* and its closest relatives is still not determined (Inda *et al.* 2010; 2012; Batista *et al.* 2013; Jin *et al.* 2014). In its currently accepted concept, *Habenaria* is clearly polyphyletic and some smaller, morphologically clearly defined genera should be delimited within this taxon. Some taxa were established based on gynostemium morphology (e.g., Szlachetko 2001, 2003a, b, c; Szlachetko & Kras 2003, 2006; Szlachetko *et al.* 2003, 2005) but the establishment of several of them has been questioned as they were not determined as monophyletic (cf. Batista *et al.* 2013).

So far only one comprehensive morphological study on *Habenaria* has been published. Kraenzlin (1892) divided the genus into 34 sections. The main characters he used in his classification system were lip and petal form. Species with an undivided lip were placed within five sections: *Anomalae*, *Platycoryne*, *Seticaudae*, *Stenochilae* and *Odontopetalae*. Some years later, Small (1903) proposed to segregate from *Habenaria* a new genus, *Habenella* Small. The author recognized the undivided lip and the ‘dropping’ stigmas of this species as sufficient to treat it as separate taxon. A second orchid, *H. odontopetala*, was transferred to *Habenella* by the same author 30 years later

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(Small 1933). Small's concept was ignored by subsequent researchers, who preferred to maintain the broad concept of *Habenaria*. Restitution of *Habenella* was recommended by Szlachetko and Kras (2006), who transferred over 30 species to this genus, but the diversity of this taxon requires further studies.

Our studies on Asian Habenariinae revealed the existence of a distinct, spurless species of *Habenella* which is described here as new. The novelty is included in the key to *Habenaria* s.l. of Nepal, where so far 17 representatives of this taxon have been found (Press *et al.* 2000).

#### TAXONOMIC TREATMENT

***Habenella wallichii*** Kolan., Kras & Szlach., *sp. nov.* Figs 1 & 2

Species similar to *Habenaria anomaliflora* Kurzweil & Chantanaorr., distinguished by the presence of a single leaf, oblong-lanceolate lip, ovate lateral sepals with a somewhat oblique base, and oblong-lanceolate petals.

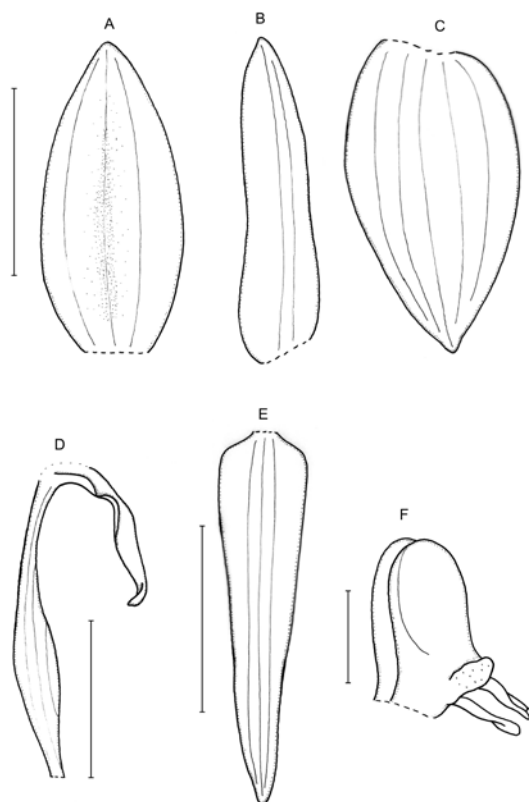
**HOLOTYPE:** NEPAL. Sahid Smarak, Hetauda. 31 June 2004. *B. R. Sharma s.n.* (K).

Plant *ca* 20 cm tall. Tubers ovoid. Leaf single, basal, *ca* 3.5 cm long and wide, soborbicular, apiculate, cordate at base. Sheaths of peduncle 4, 0.7–1.1 cm long. Raceme *ca* 6 cm long, loosely several-flowered. Floral bract ovate-lanceolate, acuminate, up to 6 mm long. Pedicel and ovary 9.5 mm long. Dorsal sepal 5 mm long, 3.1 mm wide, cucullate, ovate when spread, obtuse, 3-veined. Petals 5.3 mm long, 1.5 mm wide, oblong-lanceolate, obtuse, 2-veined. Lateral sepals 5 mm long, 2.5 mm wide, ovate, obtuse, 5-veined, base somewhat oblique. Lip 6 mm long, 1.3 mm wide, unlobed, oblong-lanceolate, apex rounded, 3-veined. Spur absent. Gynostemium 2 mm long, massive. Anther erect, 2-chambered, the chambers parallel, elongated at the base into antherophores. Auriculae small. Stigma bilobed, forming stigmaphores.

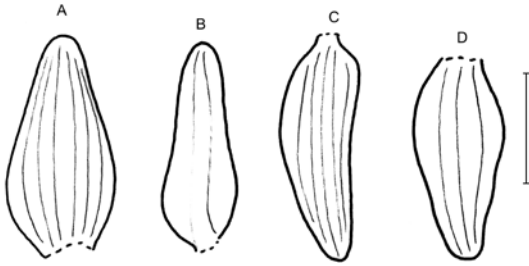
**ETYMOLOGY.** To honor Dr. Nathaniel Wallich (1786–1854), eminent plant collector in the Indo-

Malesian region and author of *Tentamen Flora Nepalensis Illustratae* (1824–1826).

**TAXONOMIC AFFINITY.** This species somewhat resembles *Habenaria anomaliflora* Kurzweil & Chantanaorr., from which it differs by the presence of a single leaf (vs two leaves), oblong-lanceolate lip which is almost five times longer than wide (vs lip  $4.5\text{--}6.6 \times 2.0\text{--}3.5$  mm, twice longer than wide, ovate-elliptic), almost symmetric ovate lateral sepals (vs obliquely broadly lanceolate) and oblong-lanceolate petals (vs narrowly ovate). *Habenaria anomaliflora* was described in 2009 (Kurzweil *et al.* 2009) based on material collected in Thailand (Fig. 2). Currently it is known also from Laos (Keer 1969) and the Chinese province of Hainan (Wang & Wang 2010; Fig. 3).



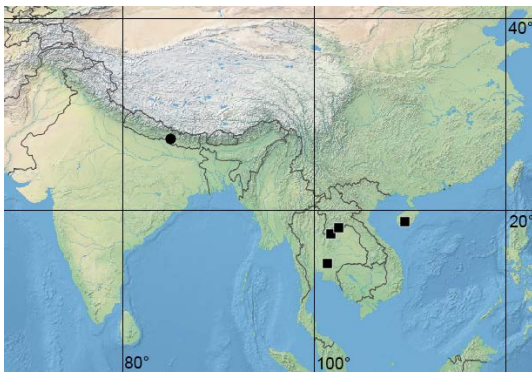
**Fig. 1.** *Habenella wallichii* Kolan., Kras & Szlach., *sp. nov.* A – dorsal sepal, B – petal, C – lateral sepal, D – ovary and lip, E – lip, F – gynostemium (drawn from the holotype). Scale bars: A–C & E = 3 mm, D = 5 mm, F = 1 mm.



**Fig. 2.** *Habenaria anomaliflora* Kurzweil & Chantanaorr., dissected perianth. A – dorsal sepal, B – petal, C – lateral sepal, D – lip. Redrawn from illustration presented by Kurzweil et al. (2009). Scale bar = 3 mm.

In lip form *Habenella wallichii* resembles *Habenaria reniformis* (D. Don) J. D. Hooker, which is a very variable species, widespread in Southeast Asia. The spur of this orchid may be absent in some specimens. Its lip may be deeply 3-lobed, or entire with small, horn-like appendages at the base. Unlike the new species, its petals are falcate, narrowly lanceolate, 3.5–4.5 mm long and 0.8–1.6 mm wide.

Spurless taxa are rare within Habenariinae and sometimes the spur is lacking only in some populations of species which normally produce a spur. Among Asian representatives of *Habenella* we did not find any species that could fit this case. The most similar species is *Habenella cumminsiana* (King & Pantl.) Szlach. & Kras-Lap., which, however, produces 2–4 broadly elliptic to lanceolate leaves and has ovate-triangular petals.



**Fig. 3.** Distribution of *Habenaria anomaliflora* Kurzweil & Chantanaorr. (■) and *Habenella wallichii* Kolan., Kras & Szlach., sp. nov. (●).

KEY TO *HABENARIA* S.L. OF NEPAL

1. Inflorescence with 1 or 2 flowers .....  
***Bhutanthera albomarginata*** (King & Pantl.) Renz  
 (= *Habenaria albomarginata*)
- 1\* Inflorescence with several to many flowers .... 2
2. Lip simple ..... 3
- 2\* Lip deeply 3-lobed ..... 4
3. Petals 3.5–4.5 × 0.8–1.6 mm, narrowly lanceolate, falcate, lip with minute horn-like appendages at base .....  
***Habenaria reniformis*** (D. Don) Hook. f.
- 3\* Petals 5.3 × 1.5 mm, oblong-lanceolate, not falcate, lip without any appendages .....  
***Habenella wallichii*** Kolan., Kras & Szlach.
4. Petals deeply bilobed ..... 5
- 4\* Petals entire or with an indistinct tooth ..... 6
5. Lower lobe linear, longer and narrower than upper lobe ..... ***Habenaria digitata*** Lindl.
- 5\* Lower lobe narrowly falcate, much smaller than upper lobe ..... ***Habenaria stenopetala*** Lindl.
6. Lip lateral lobes laciniate along external margins ..... 7
- 6\* Lip lateral lobes not laciniate ..... 9
7. Spur much longer than ovary .....  
***Ochyrorchis intermedia*** (D. Don) Szlach.  
 (= *Habenaria intermedia*)
- 7\* Spur shorter or subequal in length to ovary .... 8
8. Spur up to 20 mm long .....  
***Ochyrorchis pectinata*** (D. Don) Szlach.  
 (= *Habenaria pectinata*)
- 8\* Spur 30–40 mm long .....  
***Ochyrorchis arietina*** (Hook. f.) Szlach.  
 (= *Habenaria arietina*)
9. Lip lobes dissimilar in shape, lateral lobes ovate 10
- 9\* Lip lobes similar in shape, lateral lobes more or less linear-lanceolate ..... 13
10. Lip lateral lobes larger than middle lobe .. 11
- 10\* Lip lateral lobes much smaller than middle lobe ..... ***Habenaria platyphylla*** Spreng.
11. Leaves distributed along stem ..... 12
- 11\* Leaves gathered in basal part of stem .....  
***Plantaginorchis plantaginea*** (Lindl.) Szlach. (= *Habenaria plantaginea*)
12. Leaves lanceolate, lip middle lobe obscure, much shorter than lateral lobes .....  
***Plantaginorchis longifolia*** (Lindl.) Szlach.  
 (= *Habenaria longifolia*)
- 12\* Leaves oblong to narrowly elliptic, lip middle lobe as long as lateral lobes .....  
***Plantaginorchis dentata*** (Sw.) Szlach.  
 (= *Habenaria dentata*)

13. Leaves basal, cordate to ovate . . . . . 14  
 13\* Leaves cauline, lanceolate to elliptic . . . . . 15  
 14. Inflorescence densely many-flowered . . . . .  
 . . . . . *Habenaria diceras* Schltr.  
 14\* Inflorescence laxly 3–7-flowered . . . . .  
 . . . . . *Habenaria reniformis* (D. Don) Hook. f.  
 15. Lip lateral lobes shorter than middle lobe . . . . .  
 . . . . . *Habenaria marginata* Colebr.  
 15\* Lip lateral lobes longer than middle lobe . . . . . 16  
 16. Spur shorter than lip . . . . .  
 . . . . . *Habenaria malleifera* Hook. f.  
 16\* Spur longer than lip . . . . . 17  
 17. Lateral sepals strongly oblique so that their front  
 margin forms a downward-pointing false apex while  
 the true sepal apex is close behind their base . . . . .  
 . . . . . *Habenaria commelinifolia* (Roxb.) Lindl.  
 17\* Lateral sepals ovate . . . . . 18  
 18. Raceme glabrous . . . . .  
 . . . . . *Habenaria furcifera* Lindl.  
 18\* Raceme pubescent . . . . .  
 . . . . . *Habenaria pubescens* Lindl.

ACKNOWLEDGEMENTS. We are grateful to André Schuiteman for his kind hospitality and assistance during visits in the Royal Botanic Gardens, Kew, the anonymous reviewer for valuable comments on the manuscript, and Sahut Chantanaorrapint and David Middleton for permission to redraw the illustration of *Habenaria anomaliflora* published in *Gardens' Bulletin, Singapore*. The research described here was funded by the Faculty of Biology, University of Gdańsk (grant no. 538-L150-B583-14).

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Received 28 November 2014