A New Generic Status to Section *Plectoglossa* (Orchidaceae: *Habenaria*)

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Abstract

Four ‘abnormal’ monotypic sections were published by Hooker in *Habenaria*. Three of them, namely, *Diphylax*, *Dipyla* and *Dithrix* were upgraded subsequently as three independent genera, viz., *Diphylax*, *Ponerorchis* and *Dithrix* respectively. The fourth section, *Plectoglossa*, represented by endemic (Western Ghats) *Habenaria perrottetiana*, is collected and studied in detail and presented it now under a new genus, *Plectoglossa*. Its diagnostics, distribution and conservation status are presented. A key to all 4 related genera and a review on their current status is given.

Keywords: Monotypic sections, Hooker, *Plectoglossa*, Peninsular India, Western Ghats

Introduction

*Habenaria* Willd. is one among the 3 large genera in the family Orchidaceae with c. 876 species (Batista *et al.*, 2013; Govaerts *et al.*, 2011). It is distributed in the tropical and subtropical regions of the Old and New World (Batista *et al.*, 2013; Pridgeon *et al.*, 2001) with centres of diversity in Brazil, southern and Central Africa and East Asia (Batista *et al.*, 2013). India is well represented with 72 species, 30 of them are endemic (Misra, 2007; Sathish Kumar & Manilal, 1994). The higher percentage of endemism, with 24 species, is found in the Shola forests of Western Ghats.

Hooker (1890) enumerated 106 species in *Habenaria* in two groups and under 10 different sections. Group 1 consists of 6 sections (*Ate*, *Platyglossa*, *Trimeroglossa*, *Hologlossa*, *Peristylus* and *Phyllostachya*) while the Group 2 consists of four monotypic aberrant sections (*Plectoglossa*, *Diphylax*, *Dipyla* and *Dithrix*). The latter four monotypic sections founded by him differ greatly, called them abnormal, and he expected them to be eventually regarded as monotypic genera. But due to ‘insufficient knowledge’ available to him and also due to views of Bentham (1881) on structure of the stigma and its modifications as qualifying features in founding new genera and difficulties in ascertaining these features in dried specimens, he preferred keeping them as sections, awaiting their confirmation as genera. The present status of these four monotypic sections is discussed below.

The Section *Diphylax* was represented by *Habenaria urceolata* C.B.Clarke. Clarke (1889) had reservations to include it under *Habenaria* as he felt that this plant strongly differs from other known *Habenaria* spp. Later, Hooker who happened to study Clarke’s collections observed two linear processes pointing obliquely forward in the mouth of the corolla. Since the genus *Habenaria* exhibit no such processes near labellum, Hooker (1889) finally described it as a new genus *Diphylax* under the combination *Diphylax urceolata* (C.B.Clarke) Hook. f. But he (1890) reverted it to *Habenaria urceolata* under the influence of Bentham though *Diphylax urceolata* is currently the accepted name. Though *Diphylax* is synonymised under the genus *Platanthera* with a proposed new combination, *Platanthera urceolata* (Hook.f. R.M.Bateman (Bateman *et al.*, 2009), recent molecular studies on Asian Orchidineae (Jin *et al.*, 2014) negated this proposed synonymy and concluded that *Diphylax* as an independent genus.


Type: *Diphylax urceolata* (C.B. Clarke) Hook. f.

The Section, *Dipyla*, described by Hooker included a new species, *Habenaria secundiflora*, described from Sub-Alpine Himalaya based on specimens collected by him (Sikkim) and of Duthie (Kumoan) and King (Chumbi). Later Kraenzlin (1901) proposed new combinations based on Hooker’s name, *Peristylus secundiflorus* and *Gymnadenia secundiflora*. Thereafter, Schlechter (1919) based on “Hooker’s Icons (Plate 2321) described a new genus, *Neottianthe* and the combination, *N. secundiflora* (Hook. f.) Schltr. Jin et al. (2014) had taken it to *Ponerorchis* and proposed a new combination, *Ponerorchis secundiflora* (Hook. f.) X.H. Jin, Schuit. et W.T. Jin. This is current accepted name.

**Type:** *Ponerorchis graminifolia* Rchb.f., Linnaea 25: 228. 1852.


**Type:** *Ponerorchis graminifolia* Rchb.f., Linnaea 25: 228. 1852.

Type: *Dithrix griffithii* (Hook.f.) Ormerod & Gandhi


The Section *Plectoglossa* has a single species, *Habenaria perrottetiana* A. Rich. Hooker well defined *H. perrottetiana* from other Indian *Habenaria* and diagnosed it by citing features such as very visible stigmatic processes and the formation of broad triangular acute plate by rostellum which extends across the column. Kraenzlin (1892) also followed Hooker’s treatment as a separate section. Prior to Hooker, Wight (1844) described it as a new species under *Platanthera*, as *P. lutea* from Pulney mountains. Richard while describing species contended that this belonging to *Habenaria* since it has two fleshy appendages born of stigma. Since this species has fleshy appendages, its inclusion in *Platanthera* by Wight is not tenable. Bentham (1881) stated, *Habenaria lutea* (Wight) (=*Platanthera lutea* Wight), is very different in the whole *Habenaria* genus with the sepals and petals connive into a globular perianth and placed it under his proposed section *Phyllostachya*, characterised by leaves passing into large foliaceous bracts in the inflorescence. Many other South Indian botanists believed in the distinctive diagnostics of *Habenaria perrottetiana* that include Fyson (1920), Henry et al. (1989), Joseph (1987) and Sathish Kumar & Manilal (2004). Seidenfaden(1999) is of the opinion that fresh material should be studied prior to considering it as a new genus. Unfortunately, the monotypic section *Plectoglossa* remained included under *Habenaria* for want of fresh collections to clarify and ascertain features that deserve it to be treated as a new genus. In spite of its distribution restrictive to Shola forests in Western Ghats, a few fresh collections were made in recent years by general taxonomists and placed them in *H. perrottetiana* without attempting any in-depth analysis on the identity. Even revisionary study undertaken on the genus *Habenaria* (Choudhury et al., 2011), failed to give any additional diagnostic inputs on the referred species.

Under a SERB-DST sponsored programme on South Indian genus *Habenaria*, one of the authors (KP) had collected fresh material of this species from Anamudi Shola forest. A detailed study points to the fact that *H. perrottetiana* varies in...
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multiple features, apart from stigma and its modifications pointed out by Hooker that qualifies it in describing it under a new genus, Plectoglossa. Unfortunately molecular phylogenetic data on Habenaria spp. was limited. Only 152 species from North America (Batista et al., 2013) were taken up for such study.

Key to the Genera

1. Sepals, petals and lip coherent at the base; lip saccate; staminodes filiform, capitate, at the back of the anther .................................. Dithrix
2. Lip unlobed, spur fusiform; staminodes linear, as long as anther .................................. Diphylax
3. Lip base papillose, spur conical; stigma lobes not stalked; rostellum 2-lobed; caudicles less than 1 mm long .................................. Ponerorchis
4. Lip coriaceous, thickened in margins, mid and side lobes folded longitudinally down the middle, with the side lobes appressed to midlobe; claw long, geniculate; column as long as anther; stigmas large, rhomboid reflex and adpress to the base of the lip; rostellum forms a broad triangular plate, middle lobe reaching to the base of the anthers.

Plectoglossa perrottetiana (A. Rich.) K. Prasad &Venu, comb. nov.


Taxonomic treatment

Plectoglossa (Hook.f.) K. Prasad &Venu, gen. nov. & stat.nov.


Type species: Plectoglossa perrottetiana (A.Rich.) K. Prasad & Venu

Etymology: The generic name refers to twisted tongue shape of lip in flower bud (Greek:Plecto, twisted; glossa, tongue).

New genus is allied to Habenaria, but differs in following features: leaves passing into the large sheathing amplexicaul foliaceous bracts; inflorescences secund; flowers globose; pedicel with ovary erect and close to rachis; lip coriaceous, not widely spreading, thickened in margins, 3-fid, triplicate and tongue shape in bud; mid and side lobes folded longitudinally down the middle, with the side lobes appressed to midlobe; claw long, geniculate; column as long as anther; stigmas large, rhomboid reflex and adpress to the base of the lip; rostellum forms a broad triangular plate, middle lobe reaching to the base of the anthers.
Fig. 1: *Plectoglossa perrottetiana* (A. Rich.) Prasad & Venu: 

- **a.** Distribution map; 
- **b.** Habitat; 
- **c.** Habit; 
- **d.** Upper portion of stem; 
- **e.** Flower buds; 
- **f-g.** Inflorescence: front & side views.
Fig. 2: *Plectoglossa perrottetiana* (A. Rich.) K. Prasad & Venu: **a-a1.** Bracts; **b.** Dorsal sepal; **c.** Lateral sepals; **d.** Petals; **e.** Flower; **f-f3.** Lip in different views; **g.** Lip dorsal and ventral view; **h.** Mouth of spur; **i.** Pedicel with ovary; **j-j3.** Column front, side and rear views; **k.** Pollinia (AT. Anther; AL. anther locules; AP. Antherophores; RS. Rostellum; RL. Rostellummidlobe; ST. Stigmas; SP. Stigmatophore; A. Auricles; CL. Column).
whitish-yellow, as long as the anther. Anther confluents with the column, yellow, erect, c. 4 × 3 mm, broad; anther locules discrete, parallel, truncate at apex, bases often produced into short tubes (antherophores); antherophores upcurved, c. 1.6 mm long; auricles prominent, pale yellow, fleshy, entire below, verrucose above. Sigmus 2, distinct, yellow, reflex and adpressed to the base of the lip, rhomboid, c. 2 × 3 mm, translucent and crenulate at margin. Rostellum light yellow, forms the lip, rhomboid, distinct, yellow, reflex and adpressed to the base of the column, 1.6 mm long; auricles prominent, pale yellow, tuberous, 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, broad; anther locules discrete, parallel, confluent with the column, yellow, erect, 2 × 3 mm, b
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