

Nicholas Dalzell's orchids in western India

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Abstract: The Scottish botanist and forester N.A. Dalzell (1817–1878) described nearly 300 taxa in western India, including nineteen orchid taxa. Nevertheless, most of the orchid names (except eight) were synonymized under earlier available names. The purpose of this paper is to review the orchid names described by Dalzell. All of his collections went to K in parts (some duplicates were later distributed to CAL, DD, and GH), and some of the drawings have been distributed to E and BM. The orchid collections from western India by Dalzell, J.S. Law (1810–1885), and D. Ritchie (1809–1866) housed at K were arranged and labelled by J.E. Stocks (1820–1854) and are briefly discussed here along with the associated drawings. Confusion in the application of two names, *Dendrobium filiforme* Wight and *D. dalzellii* Hook. is discussed, and a new combination *Porpax dalzellii* (Hook.) Nandikar & Bramhad. *comb. nov.* is proposed. The earliest names, *Habenaria laciniata* Dalzell and *Habenaria modesta* Dalzell, are resurrected against *Habenaria gibsonii* Hook.f. and *Habenaria ovalifolia* Wight respectively. A note on their taxonomic flux with congeneric taxa is also provided with photographs. The protologues and remnants of Dalzell's collection do not indicate the precise original material, and some material is likely to have been lost. Except for *Micropera* Lindl., Dalzell's remaining orchid names included here are typified.

Keywords: Endemic, *Habenaria*, John Ellerton Stocks, New combination, Orchidaceae, *Porpax dalzellii*.

Introduction

The botanical exploration of Bombay and its vicinity started with Graham's Catalogue, subsequently completed by Nimmo (Graham, 1839), which listed more than 35 orchids. Until this time, the Bombay Presidency was less explored in comparison with the rest of the Indian subcontinent. Exceptions

include, for instance, Lindley's (1839) description of *Cirrhopetalum fimbriatum* Lindl., which was procured from Bombay through 'Messrs. Loddiges and Co.'. More comprehensive plant exploration in western India, particularly the Bombay Presidency, was undertaken by A. Gibson (1800–1867), N.A. Dalzell (1817–1877), J.E. Stocks (1820–1854), J.S. Law (1810–1885), and D. Ritchie (1809–1866). They were cooperatively linked and exchanged botanical correspondence with William Jackson and Joseph Dalton Hooker at K.

Nicholas Alexander Dalzell (1817–1878), an early member of the Botanical Society of Edinburgh, joined the Custom Department of the East India Company in 1841 and later succeeded as Superintendent and Conservator in 1860. Dalzell described approximately 14 genera and about 300 species from western India in a series of publications (Dalzell, 1850, 1851, 1852; Dalzell & Gibson, 1861), including 19 new orchids: *Coeloglossum luteum* Dalzell (= *Habenaria viridiflora* (Rottler ex Sw.) R.Br. ex Spreng.), *Dendrobium crispum* Dalzell, *D. fimbriatum* Dalzell *pro syn.* (*non* Hooker 1823, *nec* Lindley 1830) (= *Porpax dalzellii* (Hook.) Nandikar & Bramhad. *comb. nov.*), *D. microchilos* Dalzell (= *Porpax microchilos* (Dalzell) Schuit., Y.P.Ng & H.A.Pedersen), *D. nodosum* Dalzell, *Dendrochilum roseum* Dalzell (= *Dendrobium lawanum* Lindl.), *Eria uniflora* Dalzell (= *Porpax reticosa* (Wight) Schuit.), *Eulophia bicolor* Dalzell (= *Eulophia nuda* Lindl.), *Habenaria candida* Dalzell (= *Habenaria heyneana* Lindl.), *H. caranjensis* (= *Peristylus caranjensis* (Dalzell) Ormerod & C.S.Kumar), *H. diphylla* Dalzell, *H. laciniata* Dalzell, *H. modesta* Dalzell, *H. suaveolens* Dalzell, *H. uniflora* Dalzell (= *Habenaria rariflora* A.Rich.), *Micropera maculata* Dalzell (= *Smithsonia maculata* (Dalzell) C.J.Saldanha), *M. viridiflora* Dalzell (= *Smithsonia viridiflora* (Dalzell)

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C.J.Saldanha), *Peristylus elatus* Dalzell (= *Peristylus plantagineus* (Lindl.) Lindl.) and *Sarcanthus peninsularis* Dalzell (= *Cleisostoma tenuifolium* (L.) Garay). Even though later taxonomic adjustments were carried out by a number of authors (Lindley, 1857–1858; Kuntze, 1891; Cooke, 1908; Santapau, 1948; Holttum, 1960; Santapau & Kapadia, 1966; Garay, 1972; Saldanha, 1974; Noltie, 2005; Jalal & Jayanthi, 2013; Ormerod & Kumar, 2018), six species have been recognised as distinct and are endemic to peninsular India (Singh *et al.*, 2015; Jalal, 2018).

The Dalzell's collections kept at K have been arranged and numbered by his contemporary, J.E. Stocks. The material was received in parts from the Bombay Presidency. Some of these collections were later used by Lindley (1858) and Hooker (1890) to describe novelties in the Indian Orchidaceae. Multiple specimens are associated with the protologue, which often complicates the precise application of a name. Accordingly, the typification of all orchid names by Dalzell are evaluated. In this article, all of Dalzell's orchids are reviewed for their nomenclature, available original material, drawings, diagnostic characters, distribution, including important orchid collections from western India referred to J.E. Stocks.

Materials and Methods

Dalzell's orchid specimens including original material at K, and duplicates at CAL and DD were examined. Other collections referred to by Dalzell, such as those of Stocks, Law, and Ritchie's available at C, GH, GOET, L, and P, were accessed through their webpages and the JSTOR Global Plant database (<https://plants.jstor.org/>). The drawings associated with Dalzell's orchids available at K and BM were studied and accessed later through their data portal. The relevant correspondences between Dalzell and Hooker were procured from K libraries and archives, specimen labels, and information accessed through JSTOR. For plant names and authors, the International Plant Name Index (IPNI: <https://www.ipni.org/>), for distribution, and bibliographic records Plants of the World Online (POWO: <http://powo.science.kew.org/>) have been followed. Nomenclatural decisions and typifications were done in accordance with the Shenzhen Code (Turland *et al.*, 2018). Synonymy, previous typifications, and nomenclatural updates

on Dalzell's orchids in the literature were accessed and compiled to provide comprehensive records. Taxonomic decisions taken for some orchids listed here are based on live collections, protologue studies, and consultation of herbarium specimens at BSI, CAL, BSID (see Appendix 1).

Dalzell's orchid collection at K

Through the Director's correspondence available at K, it is clear that all the orchid collections from western India were sent to K in parts. The first few sets were sent between 1848 and 1850 by Dalzell to W.J. Hooker, particularly for the species published in *Hooker's Journal of Botany*. Another set of collections from western India by Dalzell was sent to K through the hands of Stocks in 1853. This collection was the result of 12 years of Dalzell's botanical exploration in western India (Dalzell, *in lit.* 1855) and perhaps also included Law's and Ritchie's collections from the Bombay Presidency. It is difficult to precisely decipher when and why this orchid collection from Bombay Presidency was arranged, labelled, and numbered by Stocks. Nevertheless, it could have been done, possibly in 1852 or 1853, when Alexander Gibson was on furlough and Stocks was appointed as Conservator of Forests and Superintendent of the Botanic Gardens in Bombay. After spending much of his life in the provinces of Scinde and Bellochistan, Stocks travelled to Khandala, Pune, on February 13, 1853 (Stocks, *in lit.* 1853). The appointment at the Botanic Gardens in Bombay might have triggered his ambition to succeed as Superintendent and to work on tropical vegetation, in particular Orchidaceae and Zingiberaceae, from the Concan and Ghats (Stocks, *in lit.* 1847). This also extended an opportunity to commence his botanical research in western India, both personally and by means of collectors like Law, Ritchie, and Dalzell. There are also chances that the orchid collections were sorted and labelled by Stocks during his stay at K (late 1853 to mid-1854). However, it was a comparatively short span of time to do this, as he died very young with an apoplexy in August 1854 (Hooker, 1854). The last set of Dalzell's collection was presented to K by Mrs. Dalzell in 1878, from where some of the duplicates and additional collections were distributed to DD and CAL (King, *in lit.* 1878); another set of duplicates must have reached GH through William Hooker to build Asa Gray's Botanical museum (Gray, *in lit.* 1858).

As an example, Dalzell's collection of *Coeloglossum luteum* Dalzell [= *Habenaria viridiflora* (Rottler ex Sw.) R.Br. ex Spreng.], an Asian terrestrial orchid from western India (Malwan), could be located at K, CAL, DD, and GH. The available material likely arrived at K at different times. The specimen marked with "x" had perhaps been sent by Dalzell separately and reached K before 1850 (now pasted along with a Griffith collection from Serampore); another sheet (4 specimens from extreme left, just above the Stocks label, K001097955) was brought to K by Stocks (perhaps in late 1853) (now grouped with Law's collection from Mysore); and the remaining gathering (K001097954) is part of the last set of Dalzell's collection presented by Mrs. Dalzell (duplicates at CAL [CAL0000094780], DD [Acc. no. 17259], and GH [GH00217952]).

J.E. Stocks labels on orchids of western India

The Stocks' orchid labels were attached to two different sets of herbarium sheets (Appendix 1). One set was presented as a part of the original collection, and the second set may consist of duplicates. In the first set, all Stocks' labels are pencil annotations, on blue or occasionally white paper and are pasted vertically. Each label has three parts, divided by horizontal lines (lower left edge): 1. Stocks' own herbarium number, 2. binomial and publication details (often including synonyms) 3. the collector and provenance of the specimen (Fig. 1a). All of these collections have a 'Herb. Hookerianum, 1867' circular stamp, and the engraved labels 'Herb. Hook fil. & Thomson' were added from c. 1855 onwards when Joseph Hooker and Thomson were preparing the *Flora Indica*. The original collector labels and annotations were also associated with these collections.

Another set of specimens, which appears to have been incorporated later, lacks the 'Herb.

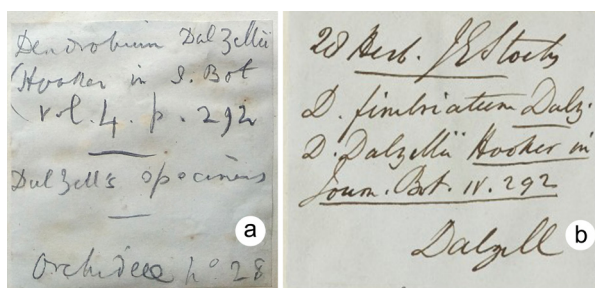


Fig. 1. J.E. Stocks and J.D. Hooker labels and numbers on Dalzell's collection. **a.** A pencil label by J.E. Stocks which presented at Kew perhaps in 1853; **b.** An ink label duplicate of 'a' by J.D. Hooker.

Hookerianum' stamp. Those were perhaps made during Joseph Hooker's time, arranged, and pasted freshly on thinner and brighter papers. The labels are uniformly annotated in black ink by J.D. Hooker on pale blue, squarish paper, and have a number that is identical to the preceding set (Fig. 1b). None have the original collector's annotations, suggesting that the specimens were pasted separately. Each specimen has Joseph Dalton Hooker's ink annotation with the collection details and most specimens include a small pencil drawing of floral parts with 'JDH' pencil annotation. It cannot be ruled out that this set was part of the 'Lindley Herbarium' made with the purpose of organising and identifying the orchids in western India more precisely.

Orchid drawings from western India

Three sets of drawings mainly associated with the Dapuri Garden (which was situated in Pune then part of the Bombay Presidency) can be traced at the library and archives of K, BM, and E. Important orchid drawings are discussed here. K houses a few of Dalzell's coloured drawings, including *Micropera viridiflora* and *Sarcanthus peninsularis*. Similarly, 'Icones Stocks' at K has uncoloured drawings from 'Stocks collections' associated with Dalzell's names, which include six orchids. Another set of 42 drawings attributed to Dalzell is available at BM, including three orchids. Similarly, E holds an important set of Indian botanical drawings (170 taxa), which were organized and discussed by Noltie (2002). These colour drawings were made by the Dapuri artists with considerable botanical interest and document their association with Gibson, Dalzell, Law, and Stocks. A total of four orchid species from the Dapuri Botanic Garden (*Dendrobium ovatum*, *H. gibsonii*, *H. heyneana*, and *Eulophia pratensis*) are depicted in the E set.

Of the three orchid drawings from Dalzell's collection housed at BM, one is labelled as *Habenaria longicalcarata* A.Rich. (= *H. longicorniculata* J. Graham) a terrestrial, Indo-Sri Lankan orchid best known for its long spur. This was one of the first orchids described from the Bombay Presidency (Graham, 1839). The second with a distinct, globose tuber is here identified as *Habenaria laciniata* Dalzell, the earliest name of *Habenaria gibsonii* Hook.f., whereas the flowers with an ovate and incurved mid-lobe are recognised as *Habenaria modesta* Dalzell, another earliest overlooked name against *Habenaria ovalifolia* Wight. The latter is often confused and synonymised

(Pearce & Cribb, 2002; Noltie, 2005; WCSP, 2021) with *H. furcifera* Lindl. Nevertheless, *Habenaria modesta* is clearly distinct from *H. furcifera* in having an ovate, inflexed lip mid-lobe often adherent to the galea formed by the dorsal sepal and petals, whereas *H. frucifera* has a linear, oblong, reflexed lip mid-lobe free from the galea. These water-coloured drawings are more refined, larger than the 'Icones Stocks', with smaller but more complete floral dissections than the Dapuri drawings at E.

The orchid collection from 'Icones Stocks' at K was either brought by Stocks in 1853 or purchased later by Sir William Hooker (Noltie, 2002). These are uncoloured, in pencil, ink, and fine brush. This set is unique as it depicts six Dalzell orchids from western India: *Coeloglossum luteum* (= *Habenaria viridiflora*), *Eria uniflora* (= *Porpax reticosa*), *Habenaria candida* (= *Habenaria heyneana*), *H. diphylla*, *Micropera maculata* (= *Smithsonia maculata*), and *Sarcanthus peninsularis* (= *Cleisostoma tenuifolium*). These were clearly made with botanical interest (perhaps by Dalzell), possibly to be published along with the protologues in *Hooker's Journal of Botany*. Floral dissections are illustrated larger in size than on the BM drawings. None of them were annotated by Dalzell but have the species name in black ink, which perhaps was done by the artist under Dalzell's supervision. The right bottom of each drawing is signed by J.E. Stocks and engraved with the Kew emblem.

The coloured drawings at K with Dalzell's annotations as *Micropera viridiflora* and *Sarcanthus peninsularis* are made on pale blue paper of different sizes together (now separated and pasted on two different sheets), with some floral parts filled with colour and the remaining left blank. The drawing of *Sarcanthus peninsularis* is the same drawing available in the 'Icones Stocks', but in colour and with annotation by Dalzell. It is also possible that these two sets were prepared together by Dalzell, of which the coloured one was sent along with the correspondence to William Hooker prior to 1848, whereas the remaining one was brought to K by J.E. Stocks in 1853. These eight coloured drawings are the original material for Dalzell's species.

Orchids described by N.A. Dalzell: taxonomy, nomenclature, and distribution

*The orchids names of Dalzell discussed in this article are arranged alphabetically, accepted names in boldface, synonyms in italics.

1. *Coeloglossum luteum* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 263. 1850. *Habenaria viridiflora* var. *dalzellii* Hook.f., Fl. Brit. India 6: 150. 1890. *Lectotype* (designated here): INDIA, *s.loc., s.d.*, Dalzell *s.n.* (K!). *Residual syntypes*: (K [K001097954–55], except lectotype]; DD, Acc. no. 17259!).

Habenaria viridiflora (Rottler ex Sw.) R.Br. ex Spreng., Syst. Veg. 3: 691. 1826. *Orchis viridiflora* Rottler ex Sw., Kongl. Vetensk. Acad. Nya Handl., Ser. 2, t. 21: 206. 1800. *Lectotype* (designated here): India Orientalis, ex *Herb. Rottler s.n.* (S07-289.2; iso S 07-288.1!). **Fig. 2**

The sheet at S (S07-289.2) is chosen here as the lectotype for *Orchis viridiflora*, as it is from O. Swartz's Herbarium, who described the species, and it has an annotation by Rottler, who collected the species. Rottler's collection of *O. viridiflora* at L (L1381.15) and C (C10016243), the former is



Fig. 2. Lectotype of *Coeloglossum luteum* Dalzell (K, specimen marked 'x'). © The Board of Trustees of the Royal Botanic Gardens, Kew, reproduced with permission.

from Tranquebar, collected in 1796 but without Swartz's annotation. The latter has a small manuscript description by Rottler on the back of the specimen; however, it is also without Swartz's writing. Averyanov (1994) cited a collection at C as a type, possibly he was not aware of Rottler's collection of *O. viridiflora* at Swartz's herbarium.

Habenaria viridiflora is a widespread orchid in continental Southeast Asia. It was rarely collected from Maharashtra and Concan (Jalal, 2018) from where Dalzell described it under *Coeloglossum*. It can be recognized in the field with its thin, deeply penetrating narrow tubers, elliptic-oblong often glaucous leaves in a rosette, with almost equal sepals and petals.

Hooker (1890) reduced *Coeloglossum luteum* to *Habenaria viridiflora* var. *dalzellii*. It was solely based on collections by Dalzell from Malwan. It is characterised by rosette-like linear leaves, a very slender, wire-like scape, smaller flowers, and a slender and incurved spur longer than the ovary. A comparison of the protologues and the original material of *C. luteum* and *O. viridiflora* show them to be conspecific. The type specimens for *C. luteum* are available at K and DD. There are three sheets at K: K001097955 (Orchideae no. 36) brought by Stocks, which is missing Dalzell's annotation. K001097954 is a part of Dalzell's personal collection presented in 1878 by Mrs. Dalzell, the same collection is also distributed at DD (Acc. no. 17259); although it is labelled by Dalzell, it is difficult to determine that it has been labelled prior to the publication of the species. The remaining two sheets at K are yet to be digitized, and one has Dalzell's annotation, '*Coeloglossum luteum*'. It perhaps arrived at K before 1848 and is now pasted with Griffith's collection. It is chosen here as lectotype giving preference over the remaining specimens at K. Another specimen at K has a similar label as on the lectotype, but the collection belongs to *Peristylus densus* (Lindl.) Santapau & Kapadia. The other collection by Dalzell, with publication details on it has been excluded from the original material. It is not clear whether the GH00217952 from Vengurla (now part of Malwan) was used by Dalzell when he was preparing the MS.

2. *Dendrobium crispum* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 4: 111. 1852 (excl. descr.). *Dendrobium humile* Wight, Icon. Pl. Ind. Orient. 5, 5: t. 1643. 1851, *nom. illeg., non* Smith (1808). *Type:*

INDIA, **Tamil Nadu**, Iyamally, *s.d.*, R. Wight *s.n.* (K [K000943912!]).

An epiphytic orchid that occurs in peninsular India, Nepal, Bhutan, Myanmar, and Thailand. It was previously known as *D. peguanum* Lindl. *Dendrobium crispum* can be recognised in the field by ellipsoid pseudobulbs, a short (up to 7 mm long) pedunculate inflorescence, and *c.* 15 mm long flowering rachis with patent floral bracts, and a medial lip callus that ends with two prostrate horns (Ormerod & Kumar, 2018).

Dalzell (1852) described *Dendrobium crispum* citing *D. humile* Wight (1851), which is a later homonym of *D. humile* Smith (1808). However, *D. crispum* has been retained by replacing *D. humile* Wight with its type, excluding the description. Ormerod and Kumar (2018) described *Dendrobium turbinatum* based on the accompanying description of *D. crispum* (Fig. 3a).

Lindley's (1858) perception of *Dendrobium crispum* auct. Dalzell (1852) and *D. humile* Wight (1851) were altogether different, he considered both conspecific with *D. microbulbon* A.Rich. (Richard, 1841), which has been followed for many years (Dalzell & Gibson, 1861; Hooker, 1890; Nairne, 1894; Cooke, 1908; Almeida, 1990; Jalal, 2018; POWO, 2023). However, *D. microbulbon* differs from *D. turbinatum* by having a synanthous habit, a conical, obtuse, incurved mentum, and a sub-orbicular lip mid-lobe (Ormerod & Kumar, 2018).

3. *Dendrobium dalzellii* Hook., Hooker's J. Bot. Kew Gard. Misc. 4: 292. 1852 (*Dendrobium fimbriatum* Dalzell in MSS *non* Hooker, 1823, *nec* Lindley, 1830). *Neotype* (designated here): INDIA, Bombay, *s.d.*, N. A. Dalzell *s.n.* (K [K000881643]).

Porpax dalzellii (Hook.) Nandikar & Bramhad., **comb. nov.** Fig. 3b

An Indian endemic and epiphytic orchid, *Porpax dalzellii*, can be recognized by its reticulately veined pseudobulbs, secund flowers, sepals, and petals with glandular margins (sparse at apex, dense at base) and an erose lip. The species appears to have a wider distribution (Maharashtra, Karnataka, Kerala, and Tamil Nadu) compared to other *Porpax* species in peninsular India. *Porpax dalzellii* was based on *Dendrobium dalzellii*, which was described by Dalzell on the basis of an orchid he had collected in the woods at Ram Ghat [Maharashtra]. He had

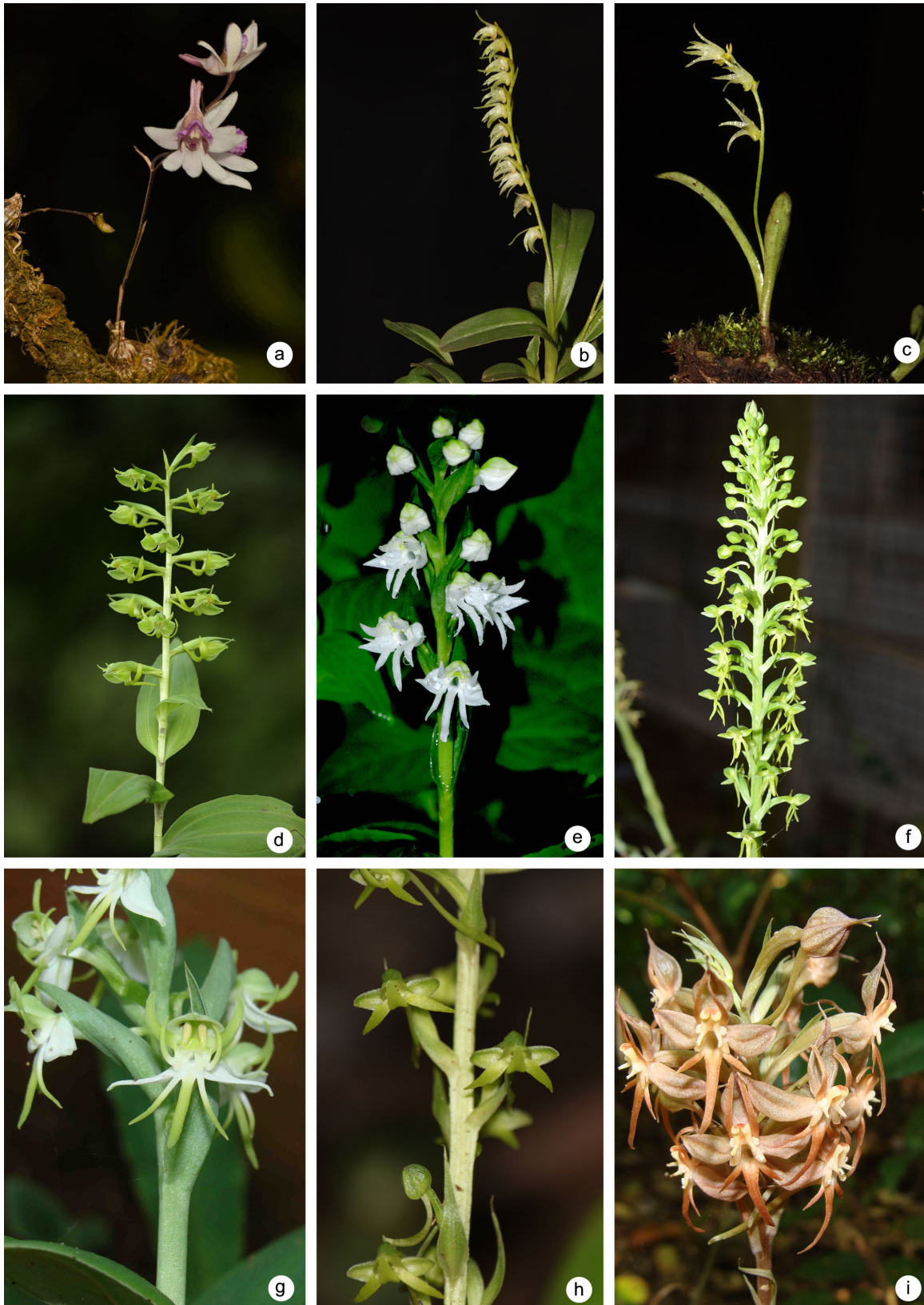


Fig. 3. a. *Dendrobium turbinatum* Ormerod & C.S.Kumar, b. *Porpax dalzellii* (Hook.) Nandikar & Bramhad., c. *Porpax microchilos* (Dalzell) Schuit., Y.P.Ng & H.A.Pedersen, d. *Habenaria digitata* Lindl., e. *Habenaria foliosa* A.Rich. f. *Habenaria furcifera* Lindl., g. *Habenaria laciniata* Dalzell, h. *Habenaria modesta* Dalzell, i. *Habenaria stenopetala* Lindl. (photos a, b, c, d by Mayur Nandikar; e, h by Mayuresh Kulkarni; f, g, i by B.T. Dangat).

proposed the name “*Dendrobium fimbriatum*” for it but, presumably in editing Dalzell’s MS, Hooker drew his attention to the existing *D. fimbriatum* (Hooker, 1823) and proposed instead the name *D. dalzellii*. As only the name (not the description) was ascribed by Hooker, the name must be attributed to “Dalzell ex Hook.” or just to “Dalzell” according to Art. 46.5 of the ICN (Turland *et al.*, 2018).

Lindley (1858) transferred *Dendrobium dalzellii* to *Eria*, citing *Dendrobium filiforme* Wight (Icon. Pl. Ind. Orient. 5(1): 5, t. 1642. 1851) in the synonymy. This makes the name *E. dalzellii* superfluous; however, it has been widely adopted for over a century (Hooker, 1890; Gammie, 1906; Cooke, 1908; Blatter & McCann, 1931; Saldanha, 1976; Joseph & Ansari, 1989; Lakshminarsimhan, 1996; Santapau & Kapadia, 1966; Pradhan, 1979; Abraham & Vatsala, 1981; Kumar & Manilal, 1994; Noltie, 2005; Mulgaonkar & Dabhade, 2005).

Dendrobium filiforme Wight (1851) was found to be based on collections of Wight (Nilgiris and Iyamally Hills) and Law (Bombay? Belgaum?), which included two different species, *viz.* *Eria nana* A.Rich. and *Dendrobium microchilos* Dalzell (Hooker, 1890; Noltie, 2005). In fact, Wight (*l.c.*) in the protologue of *D. filiforme* also noted variation within the species commenting that “the plate exhibits three forms, all more or less differing but still evidently the same species”. We found that the description of *D. filiforme* and the original material contain a mixture of three different taxa: 1. *Eria nana* (‘Icones.’ No. 1642: the right bottom figure is based on his own collection from ‘172 Nilgiris’, a left bottom specimen at K [K000883999]) with a solitary scape and sub-sessile few large flowers, and a distinctly clawed lip; 2. *Dendrobium microchilos* (‘Icones.’ No. 1642: top bottom figure appears to be identical with Law’s collection from Bombay? or Belgaum at K [K000827404]) and can be characterized by filiform scapes, alternate, whorled to semi-secund flowers, and a lip with hyaline margins; 3. *Dendrobium dalzellii* (‘Icones.’ No. 1642: middle figure apparently matches with his own collection from Pulney Hills? at K [K000357712]), and is unique by its much smaller habit, distinctly secund flowers, and a serrulate lip.

In the last few decades, *Dendrobium filiforme* has been presented as *Eria filiformis* (Wight) Rchb.f., *Conchidium filiforme* (Wight) Rauschert, *Porpax*

filiformis (Wight) Schuit., Y.P.Ng & H.A.Pedersen, and also appeared in regional literature (Agrawala, 2009; Nayar *et al.*, 2014; Singh *et al.*, 2015; Jalal, 2018). Nevertheless, the authors believe that *Dendrobium filiforme* long remained a nomenclatural problem as it was based on discordant elements – a reason for rejection (Staffeu *et al.*, 1972), and this is a possible reason for the name being abandoned by several workers.

The epithet ‘*filiforme*’, perhaps denoting ‘filiform flowering scape’ (Wight Icones no. 1642, top bottom figure) is again more referable to *D. microchilos* Dalzell, but applying *D. filiforme* to either *D. microchilos*, or *E. nana* will cause several nomenclatural changes. Hence to avoid future uncertainty, the popular use of *D. dalzellii* over *D. filiforme* (*nom. confus.*) is accepted here and following an updated circumscription of *Porpax* by Ng *et al.* (2018), the new combination *Porpax dalzellii* is proposed.

In our search for original material of *Dendrobium dalzellii*, the authors failed to locate Dalzell’s collection referred to in the protologue ‘from Ram Ghât’ as well as other material that Dalzell had utilized prior to describing the species; consequently, it was necessary to look for a suitable neotype. We could locate several Dalzell, Stocks & Law specimens of *D. dalzellii*, perhaps examined by Dalzell, Hooker, and Lindley and housed at K, CAL, and GOET. The sheets at K (K000260025, K000883997, K000883993, K000883994, K000883995) appear to be mixed collections of *D. dalzellii* and *D. microchilos* from the different localities of Bombay and Concan, thus not suitable as a neotype. The sheet at CAL (CAL0000081379) has a ticket as ‘Herb. N. Dalzell, Bombay’ and has a total of 14 plants of *D. dalzellii* pasted on it, but it doesn’t seem to have been Dalzell’s own collection and is excluded. Similarly, two sheets at GOET (GOET013849, GOET013850), collected by Stocks & Law from Malabar and Concan, lack Dalzell’s annotation and are not considered part of the original material. One more sheet at K (K000881643) presented by Mrs. Dalzell in 1878 has a label ‘*Eria*’ in Dalzell’s handwriting, which perhaps appears to have been labelled after Lindley’s publication in 1858. This specimen comprising 22–23 plants mounted on a single sheet, is selected as the neotype.

4. *Dendrobium microchilos* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 3: 345. 1851. *Neotype* (designated here): INDIA, Bombay, *s.d.*, Dalzell 167 (K [K000883993!]).

Porpax microchilos (Dalzell) Schuit., Y.P.Ng & H.A.Pedersen, Bot. J. Linn. Soc. 186: 200. 2018. **Fig. 3c**

An epiphytic orchid endemic to peninsular India. Remarkably similar to the preceding species by having a synanthous habit, but *Porpax microchilos* differs mainly in having filiform, few-flowered scapes, alternate, whorled to semi-secund flowers, eglandular sepals and petals, and lip with entire, hyaline margin. As discussed in *Dendrobium dalzellii*, this species has also gone through the circumscriptions of *Eria* and *Conchidium* and is often recognized as *Eria microchilos* in most of the Indian literature, we followed the recent circumscription of *Porpax* by Ng *et al.* (2018).

A specimen at K (K000260025) with Dalzell's annotation as *D. microchilos* is mixed with *Porpax dalzellii*, hence, we have not chosen it as a lectotype. The specimens at GH (GH00090173) and CAL (CAL0000081376) are also missing Dalzell's annotation and are a mixture of two different species. In the absence of any original material, another specimen at K (K000883993) with four plants mounted on the top left corner, labelled by J.D. Hooker as '167. *D. microchilos* Bombay presidency, Dalzell', is selected here as the neotype. It is one of the collections perhaps sorted and numbered by J.E. Stocks (see the discussion under J.E. Stocks labels on orchids in Western India).

5. *Dendrobium nodosum* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 4: 292. 1852. *Neotype* (designated here): INDIA, *s.loc.*, *s.d.*, Dalzell (ex Herb. Stocks 30) (K [K001085563!]).

An epiphytic orchid, endemic to southern India and Sri Lanka (*vide* Seidenfaden 1980), often confused with *Dendrobium macraei* Lindl., but can be recognized by its oblong pseudobulbs and axillary, solitary flowers with linear sepals and petals. The original material precisely from 'Ram Ghaut' with Dalzell's annotation as '*Dendrobium nodosum*' is not traceable. Two sheets of Dalzell's collection are housed at K, labelled by J.E. Stocks (Orchidae no. 30), and one of them has been annotated or labelled by Dalzell. The sheet K000960025 has a small packet wherein a dissected flower has been kept, the same

has probably been illustrated by Lindley. The other sheet K001085563 has four specimens pasted on it and has different labels: 'Herb. Stocks' (possibly purchased by Sir William Hooker), an engraved label 'Herb. Hook fil. & Thomson' (perhaps after 1855 when Joseph Hooker & Thomson were writing *Flora Indica*), and Stocks pencil label as 'Orchideae no. 30, specimen from Dalzell'. It also has a packet marked with the pencil pointing to the extreme right specimen and contains a fragmented flower, it has been designated here as the neotype.

6. *Dendrochilum roseum* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 4: 291. 1852, *non* (Swartz, 1805). *Neotype* (designated here): INDIA, *s. loc.*, *s.d.*, Dalzell *s.n.* (K!)

Dendrobium lawanum Lindl., J. Proc. Linn. Soc., Bot. 3: 10. 1858. **Fig. 4**

An epiphytic orchid, endemic to peninsular India,



Fig. 4. Neotype of *Dendrochilum roseum* Dalzell (Dalzell *s.n.* [K]). © The Board of Trustees of the Royal Botanic Gardens, Kew, reproduced with permission.

can be identified by its unbranched stems, lilac or pink-tinged, white, paired flowers and lips with entire margins. Two sheets housed at K are yet to be digitized. The sheet with Dalzell's label (top right corner) and 'Herbarium Hookerianum' stamp has two specimens pasted on it. Dalzell's handwritten label has a note 'A parasite called in Concan Bendoorly - a small white flower tinged with pink. Petals 6 (violaceous), fruit long shaped green figured (?) 24'. Another sheet at K, presented by Mrs. Dalzell in 1878, has two specimens and Dalzell's annotation as '*Dendrobium lawanum*'. As none of the specimens have been annotated by Dalzell as '*Dendrochilum roseum*', the sheet with the description label in Dalzell's handwriting is designated here as a neotype. The sheet (K001368946) is probably collected by Dalzell, however, it must have travelled to K with J.E. Stocks as it is without Dalzell's annotation, and hence we are hesitant to call it part of the original material.

Schuiteman *et al.* (2022) and online databases such as POWO and Tropicos listed *D. lawanum* (incl. *D. roseum*) under the synonymy of *D. crepidatum* Lindl. & Paxton. However, *D. lawanum* is quite distinct from *D. crepidatum* by its unidirectional curving stems, white flowers faintly tinged with pink or lilac, obscure mentum, and slightly clawed lip base, without a yellow patch (Jalal, 2018).

The epithet '*lawanum*' is often used (Santapau & Kapadia, 1966; Jalal, 2018) as '*lawianum*' which is an error.

7. *Eria uniflora* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 4: 111. 1852. *Lectotype* (designated here): INDIA, Bombay, *s.d.*, Dalzell *s.n.* (K [K000260013!]); *Residual syntypes*: (K [K000827405!, K000827406!, K000827409!]).

Porpax reticosa (Wight) Schuit., Malesian Orchid J. 24: 107. 2020. *Eria reticosa* Wight, Icon. Pl. Ind. Orient. 5, 1: 4, t. 1637. 1851. *Lectotype* (designated here): INDIA, perhaps Pycarrah, *s.d.*, Herb. Griffith, Wight *s.n.* (K [K000260012!]). *Residual syntype*: INDIA, peninsular India, Herb. Wight 2960 (K [K000881644!]).

Eria rupestris Blatt & McCann, J. Bombay Nat. Hist. Soc. 35(2): 270, t. 6. 1931. *Type*: INDIA, Panchgani Tableland, above Convent, May Langham 231 (holo BLAT *n.v.*).

An epiphytic orchid endemic to India can be easily distinguished from other species by pseudobulbs close to and completely masking the rhizome, presence of a loose net-like reticulate sheath on pseudobulbs, presence of leaves during flowering, a singular flower, acute to acuminate sepals and petals, and a distinctly 3-lobed lip (Agrawala, 2009).

Three sheets and a line drawing housed at K refer to *Eria uniflora* Dalzell. The sheet (K000827409) has four specimens and two flowers with Dalzell's label as '*Dendrobium* which I propose to be called *uniflorum*'. In the absence of the name *Eria uniflora*, it is not selected as the lectotype. The sheet K000260013 has sixteen specimens and is labelled in Dalzell's hand as '*Eria uniflora*'. As it bears William Hooker's annotation as 'Bombay Dalzell' it appears to have been communicated by Dalzell himself to Hooker, and hence selected here as the lectotype. Another sheet at K, has three stamps of 'Herbarium Hookerianum' which indicates that it must be the gathering of three different collections: two of them, K000827405 and K000827406 belong to Dalzell; the latter has two labels: one label is in Dalzell's hand, '*Eria uniflora* mihi in Hook. Jour.', while the other labels are in Stocks's hand, 'Concan on trees in the rainy season on the Ghauts'. Orchidae no. 24'. Whereas collection K000827405 has a label in Dalzell's hand that says 'Orchideous parasite begins to sprout in May & flowers in June/ Mahabaleshwar'. Both collections may have reached K through Stocks. The line drawing at K from 'Icones Stocks' has been annotated in pencil by J.E. Stocks' as '*Eria reticosa* Wight' and '*Eria uniflora* Dalz.'

Lindley (1858), while transferring his *Dendrobium braccatum* into *Eria*, cited *E. reticosa* and *E. uniflora* as synonyms. The treatment was then often followed by some authors (Fischer, 1928; Nayar *et al.*, 2014 as '*Conchidium braccatum*'). However, *E. braccata* can be distinguished from *E. reticosa* by the absence of a net-like, reticulate sheath on pseudobulbs, obtuse to sub-acute sepals and petals, and an obscurely 3-lobed lip (Agrawala, 2009). Dalzell was unaware of Wight's *E. reticosa* and published *E. uniflora* barely a year later. Afterwards, he realised the priority of *E. reticosa* over the latter and published a note in the same publication reducing *E. uniflora* to *E. reticosa*. Following Agrawala (2009) and the recent circumscription of *Porpax* by Ng *et al.* (2018) and Schuiteman (2020), *E. reticosa* has been maintained here as *Porpax reticosa*.

Porpax reticosa is often considered a synonym of *Pinalia reticosa* (Wight) Kuntze, which is an error. In *Pinalia*, the pseudobulbs are embedded in the leaf sheath, and the inflorescence rachis is dense to sparsely lanate (Ng *et al.*, 2018). In our plants, the pseudobulbs are ovoid to truncate with distinct leaf scars and a glabrous pedicel. There are multiple specimens associated with *Eria reticosa* Wight available at K, one of the five flowering specimens (K000260012) pasted on the top right side unequivocally agrees with Wight Icon no. 1637, and is here selected as lectotype. Noltie (2005) referred to these collections as holotype and isotypes. We are hesitant to conclude that all these collections are part of a single gathering. Therefore, we prefer the remaining collections to be residual syntypes rather than isolectotypes. The holotype citation by Noltie (2005) cannot be corrected to lectotype following Art. 9.10 of the ICN (Turland *et al.*, 2018) because of the requirement of Art. 7.11 to include, on or after 1 January 2001, the phrase “designated here” or an equivalent.

8. *Eulophia bicolor* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 3: 343. 1851. *Lectotype* (designated here): INDIA, Bombay, *s.d.*, Dalzell *s.n.* (K [K000078323!]); *Residual syntype*: (K, without barcode!; DD, Acc. No. 172598!).

Eulophia nuda Lindl., Gen. Sp. Orchid. Pl. 180. 1833. *Syntypes*: India Orientali, in Morang hills (present day Nepal), Hamilton *s.n.* (K [K000960023!]; E [E00394250!]).

A terrestrial orchid, which widely occurs in India and Southeast Asia, can be recognized with the help of characters like spherical corms, hysteranthous habit, purple to maroon flowers, and the presence of a prominent column foot.

Three sheets are housed at K and DD. The sheet K000078323 has Dalzell's label as '*Eulophia bicolor*', the 'Herbarium Hookerianum stamp' and Hooker's annotation as 'Bombay Dalzell'. Although the name *E. bicolor* is crossed out by someone, the remarks by Robert Allen Rolfe (R. A. R) on the sheet clearly suggest the specimen is the type of *Eulophia bicolor*. We have therefore selected this sheet as the lectotype. Another collection at K presented by Mrs. Dalzell is yet to be digitized, it does not bear Dalzell's annotations. The specimen at DD (172598) is perhaps a duplicate of the latter.

9. *Habenaria candida* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 262. 1850. *Lectotype* (designated here): INDIA, Bombay, *s.d.*, Dalzell *s.n.* (K [K000247458!]); *Residual syntypes*: (K [K000061925!, K001097957!]).

Habenaria heyneana Lindl., Gen. Sp. Orchid. Pl. 320. 1835. *Type*: India Orientalis, Wall. Cat. 7044, *Herb. Heyne* (K [K000061927!]).

A terrestrial orchid, endemic to India, can be recognized in the field by scattered leaves throughout the stem, entire petals, narrowly oblong lip lobes, and lateral lobes shorter than the mid-lobe. Hitherto, the species is endemic to peninsular India, but there is a collection '*T. Lobb 10*' from Meghalaya at K (K000061924), which extends the occurrence of *Habenaria heyneana* in Northeast India, which is quite disjunct and therefore deserves more detailed study.

Three sheets and a line drawing are housed at K. The sheet K000061925 has multiple specimens pasted on it, with the top middle two specimens labelled by Stocks as '78'. Herb. J.E. Stocks S. Concan Dalzell'. Another sheet (not yet digitized) at K, also has three specimens, the right two specimens labelled by Dalzell, and a label in Stocks' hand 'Orchideae no.11'. The sheet with barcode K000247458 has seven specimens with the label '*Habenaria candida*' in Dalzell's hand and Hooker's annotation as 'Bombay Dalzell', which is chosen here as the lectotype.

10. *Habenaria caranjensis* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 262. 1850. *Neotype* (designated by Ormerod & Kumar, 2018): INDIA, Maharashtra, Dronagheree, 07.1848, Dalzell *s.n.* (K [K000387524!]).

Peristylus caranjensis (Dalzell) Ormerod & C.S.Kumar, Harvard Pap. Bot. 23(2): 283. 2018.

An endemic, terrestrial orchid occurs throughout India and can be identified in the field by its broadly obovate to elliptic leaves, broad, rounded lip lobes, and linear, sub-clavate spur.

The species was overlooked for more than a century until Hooker (1890) listed it as an imperfectly known species. It might be because of the unusual character like cuneate, truncate lateral lip lobes for the genus *Habenaria*. It became well known as *Peristylus stocksii* (Hook.f.) Kraenzl., nevertheless, recently it has been found to be conspecific with

P. caranjensis and relegated to synonymy (Ormerod & Kumar, 2018).

The sheet K000387524 has a label in Dalzell's hand as 'small yellow flowered *Habenaria* spp. undescribed, Dronagheree, July 1848, *vide* drawing'; the annotation 'Concan Stocks' seems to have been added afterwards, which was chosen as a neotype by Ormerod and Kumar (2018). However, we were not able to trace the drawing mentioned on the label.

11. *Habenaria diphylla* Dalzell in Hooker's J. Bot. Kew Gard. Misc. 2: 262. 1850. *Lectotype* (designated here): INDIA, Bombay, *s.d.*, Dalzell *s.n.* (K!); *Residual syntypes*: (K, without barcode!; GH [GH00099782 digital image!]). **Fig. 5**

This terrestrial orchid is widespread in India and Southeast Asia and can be recognized in the field by its ground appressed two leaves, entire petals,



Fig. 5. Lectotype of *Habenaria diphylla* Dalzell (Dalzell *s.n.* [K]). © The Board of Trustees of the Royal Botanic Gardens, Kew, reproduced with permission.

much longer lateral lobes, and a shorter mid-lobe.

Three sheets and a line drawing housed at K and GH can be referred to as Dalzell's *Habenaria diphylla*; the collection at K is yet to be digitized. One sheet has Stocks label 'authentic specimens from Dalzell himself, Orchidae no. 8'. The other sheet has Dalzell's label '*Habenaria diphylla*', which agrees with the protologue and is selected here as the lectotype. A sheet at GH (GH00099782), distributed from K, also has Dalzell's label as '*Habenaria diphylla* mihi in Hook. Jour.' perhaps a collection made after 1850.

Liparis diphyllus Nimmo (1839) has often been cited as the basionym for *Habenaria diphylla* Dalzell (Hooker, 1890; Duthie, 1906; Cooke, 1908; Jalal, 2018; Prasad *et al.*, 2019; POWO, 2023), even though the two are obviously heterotypic taxa. The protologue of *Liparis diphyllus* describes the lip as large and rounded (Graham, 1839), whereas in the protologue of *Habenaria diphylla*, the lip is described as trifid and filiform lobes (Dalzell, 1850). *Liparis diphyllus* is probably an earlier name for *L. prazeri* King & Pantl., but the description is too short and insufficient to determine with certainty (Santapau & Kapadia, 1966).

12. *Habenaria laciniata* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 261. 1850. *Neotype* (designated here): Drawings from Dalzell's collection (BM!).

Habenaria gibsonii Hook.f., Fl. Brit. India 5: 135. 1890, **syn. nov.** *Lectotype* (designated here): INDIA, Pune, near Khora? Kyreshwar (perhaps Khireswar), *A. Gibson s.n.* (K [K000247421!]); *Residual syntype*: INDIA, Pune, Khandala, *A. Gibson s.n.* (K [K000247473!]).

Habenaria foliosa auct. Wight in Icon. Pl. Ind. Orient 5: 12, t. 1700. 1851, *p.p.* **Figs. 6 & 3g**

Habenaria laciniata Dalzell (1850) which was overlooked and misinterpreted for long years, is resurrected here as the oldest available name for *H. gibsonii* Hook.f. (Hooker, 1890). Dalzell and Gibson (1861) erroneously synonymised *Habenaria laciniata* under *H. foliosa* A.Rich. (Richard, 1841) following Wight (1852, t. 1700), providing the description of the former species. It is evident that, Dalzell was not aware of the protologue of *H. foliosa*. As *H. foliosa* of Wight (1852, t. 1700) is contrary to *H. foliosa* A.Rich. in having filiform lip-lobes, greenish petal margins, and agrees more

with *H. gibsonii*. Hooker (1890) followed the circumscription of *H. laciniata* appearing in Dalzell and Gibson (1861), and relegated *H. foliosa* as a variety of *H. digitata* Lindl. (Lindley, 1835). He also stated that he had never seen the Salsette (part of Bombay) plant of Dalzell with spirally twisted posterior petal lobes and a broader mid-lobe. After careful study of the protologues of *H. laciniata* and *H. foliosa*, we found both to be taxonomically distinct. *Habenaria laciniata* has lanceolate acute leaves, shorter bracts, larger flowers, green petal lobes, filiform lip-lobes, a longer, broader medial-lip, and a clavate spur (Fig. 3g), whereas *H. foliosa* has elliptic acute leaves, longer bracts, smaller flowers, pale white to white petal lobes, narrow, linear, sub-equal lip-lobes, and an inflated spur (Fig. 3e).

Habenaria digitata Lindl. var. *foliosa* Hooker (1890) was placed under *Habenaria gibsonii* as a variety by Santapau and Kapadia (1966), which was an error, as *Habenaria foliosa* has priority over *H. gibsonii*. *Habenaria gibsonii* var. *foliosa* is

circumscribed by deeply divided petal lobes and sub-equal recurved linear-subulate lip-lobes. Santapau and Kapadia (1966) have not commented upon *H. laciniata*, however, the species has been overlooked for a century, and erroneously placed either partly in *H. foliosa* (Dalzell & Gibson, 1861; Hooker, 1890), or *H. digitata* (POWO, 2023). It is evident here observing the protologues, original material, herbarium specimens (Appendix 1), and live collections of *H. digitata* (Fig. 3d), *H. foliosa* (Fig. 3e) and *H. laciniata* (Fig. 3g), these species share similarities in their floral characteristics like concave spreading dorsal sepals and bipartite petals. But *H. foliosa* differs from *H. digitata* and *H. laciniata* by its white to pale white sepals and petals, sub-equal linear-subulate lip-lobes, and inflated spur. *H. digitata* differentiated from *H. laciniata* by its trinnerved leaves, pale green to yellowish green small flowers, comparatively shorter falcate included anterior petal lobes, linear-acute lip lobes with distinct mesochile, reflexed (right angle) lateral lobes, and a shorter faintly clavate spur (Fig. 3d).

Habenaria gibsonii is conspecific to *H. laciniata*, hence relegated to synonymy. The former species was described based on greenish-white flowers, ovate obtuse dorsal sepals, oblong lateral sepals, filiform lip-lobes, a broader mid-lobe, and a clavate spur. These characters unequivocally agree with the description of *H. laciniata*, except for the shorter bract, and spirally twisted posterior lobes. The bract length often varies from equal to longer than the ovary, whereas spirally twisted posterior lobes of petals seem to be an error. *Habenaria laciniata* was often misinterpreted with its conspecific taxa, perhaps due to the absence of the original material. Nevertheless, a collection housed at BM of N.A. Dalzell's drawings with the anonymous pencil annotation *Habenaria* in the bottom left corner and N.A. Dalzell in the bottom right corner, depicts the character of *H. laciniata*, is chosen here as a neotype.

13. *Habenaria modesta* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 262. 1850. *Neotype* (designated here): Drawings from Dalzell's collection (BM!).

Habenaria ovalifolia Wight, Icon. Pl. Ind. Orient. 5: 13, t. 1708. 1851, **syn. nov.** *Lectotype* (designated here): INDIA, Tamil Nadu, Annamalai (as Annamalay), July 1848, R. Wight s.n. (K [K000247463!]). *Residual syntypes*: INDIA, Kerala, Malabar, June 1836, R. Wight



Fig. 6. Neotype of *Habenaria laciniata* Dalzell (Drawings from Dalzell's collection at BM). Nicholas Alexander Dalzell (1817–1878) collection of watercolour and outline drawings of plants [Public domain. From the Library and Archives, Natural History Museum, London].

3016 (K [K000247461!]); (GH [GH00099981 digital image!]); *Ibid.*, 1836, R. Wight 1037? (K [K000247464]).

Figs. 7 & 3h

Habenaria modesta (Dalzell, 1850) is resurrected here which is the oldest available name for *H. ovalifolia* (Wight, 1851). The former name was overlooked and erroneously considered as part of *H. stenopetala* Lindl. (Cooke, 1908), also confused with *H. stenostachya* Lindl. ex Benth. and presumed doubtful (Hooker, 1890; Blatter & McCann, 1932). The POWO (2023) shows that *H. modesta* is conspecific with *H. furcifera* (Lindley, 1835). Nevertheless, Santapau and Kapadia (1966) rightly identified *H. modesta* as being conspecific to *H. ovalifolia* and recognised its nomenclatural priority. In the absence of the original material of *H. modesta* and its past taxonomic flux, perhaps they hesitated to make the nomenclatural decision.

After comparing the protologues of *H. ovalifolia* Wight and *H. modesta* Dalzell and following the observations of Santapau and Kapadia (1966) with

H. modesta, we found that both are morphologically similar. Both species have aggregated leaves near the base, bracts shorter than the ovary, dorsal sepals and petals together forming a galea and a filiform spur. Wight's (1851: t. 1708) illustration of *H. ovalifolia* shows an ascending lip mid-lobe, which is contradictory, as the original material housed at K (K000247461, 63, 64) and GH (GH00099981) shows an incurved mid-lobe, coherent with galea, which is clearly seen in *H. modesta* (Dalzell, 1850).

The illustration of *H. ovalifolia* (Wight 1851: t. 1708), portrayed equal sepals and petals, which appears to be an error by the artist. The bracts in *H. modesta* vary, either shorter or equal to the ovary, which was depicted contrastingly in the protologues of *H. modesta* (bracts half of the ovary) and *H. ovalifolia* (shorter than the ovary). In the drawing maintained at BM referring to Dalzell's collection, the enlarged flower shows the bract is equal to the ovary, which is also shown in the original material of *H. ovalifolia*. The drawing housed at BM is from Dalzell's collection and agrees with the description of *H. modesta* which is designated here as the neotype.

Hooker (1890) considered *H. modesta* similar to *H. stenostachya* (Lindl. ex Benth.) Benth. (= *Platanthera stenostachya* Lindl. ex Benth.) but placed it as an 'imperfectly known species'. *Habenaria modesta* shares similarities with *H. stenostachya* in its trilobed lip and short broad obtuse mid-lobe. However, it differs by its aggregated leaves near the base, shorter or equal bracts, and a longer spur.

Cooke (1908) erroneously reduced *H. modesta* to the synonymy of *H. stenopetala* Lindl. (Fig. 3i), however, the former can be differentiated from the latter by its entire petals, together with dorsal sepal form galea (bipartite, free from galea), green to greenish white lip (greenish to brown, or ochreous), mid-lobe of the lip shorter than lateral lobes, and incurved (longer than lateral lobes).

Habenaria ovalifolia Wight has been reduced to the synonymy of *H. furcifera* Lindl. (Fig. 3f) (POWO 2023) which is corrected here and considered conspecific to *H. modesta*. *Habenaria furcifera* has longer filiform lateral lip lobes, broader mid-lobe free from galea, and hamate spur as opposed to sub-equal lip lobes, whereas *H. modesta* has linear-lanceolate acute lateral lobes, an ovate-oblong mid-lobe coherent with galea and a filiform faintly



Fig. 7. Neotype of *Habenaria modesta* Dalzell (Drawings from Dalzell's collection at BM), 'a' flower; 'b' enlarged and edited flower to show incurved lip mid-lobe. Nicholas Alexander Dalzell (1817–1878) collection of watercolour and outline drawings of plants. [Public domain. From the Library and Archives, Natural History Museum, London].

bulged clavate spur, hence the latter is treated here as distinct.

14. *Habenaria suaveolens* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 263. 1850. *Lectotype* (designated here): INDIA, Bombay, *s.d.*, Dalzell *s.n.* (K [K000247434!]); *Residual syntypes*: K [K000247435!]; DD (Acc. no. 172597!).

Habenaria variabilis Blatt. & McCann, J. Bombay Nat. Hist. 36: 19–20. 1932. *nom. illeg., non* Ridley, 1886.

Habenaria panchganiensis Santapau & Kapadia, J. Bombay Nat. Hist. Soc. 54: 478. 1957. *Syntypes*: INDIA, Maharashtra, Panchgani and Mahabaleshwar, *Frenchman* 21; *Hallberg* 26494; *Blatter* 55, 200, 201, 202, 203, 204; *Sedgwick* 7908; *Mozelle Issacs & Blatter* 205, 206; *McCann s.n.*, all perhaps at BLAT, *n.v.*)

A terrestrial orchid, endemic to peninsular India, can be identified by its bipartite, filiform petals, mid-lobe narrower than lateral lobes of lip and longer spur than ovary. *Habenaria suaveolens* was resurrected by Jalal and Jayanthi (2013), which had previously been known as *H. panchganiensis* Santapau & Kapadia.

We could locate four sheets associated with *H. suaveolens* housed at K and DD. The sheet K000247434 has six specimens with a label by Dalzell in pencil as '*Habenaria suaveolens* mihi' and Hooker's annotation as 'Bombay Dalzell' which agrees with the protologue is designated here as the lectotype. The sheet K000247435, presented by Mrs Dalzell in 1878, has a pencil label by Dalzell. Similarly, there are other sheets (not yet digitized) at K with Hooker's annotations as '*Habenaria suaveolens* Dalzell, Bombay Dalzell' but without Dalzell's annotation. The sheet from DD (172597) is perhaps a duplicate of K000247435 and has Dalzell's annotation '3 *Habenaria suaveolens*'.

15. *Habenaria uniflora* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 3: 344. 1851. *nom. illeg., non* Don (1825). *Type*: INDIA, *jugo Syhadrensi*. *Lectotype* (designated here): INDIA, Bombay, *s.d.*, Dalzell *s.n.* (K [K000247424!], perhaps holotype).

Habenaria rariflora A.Rich., Ann. Sci. Nat., Bot., sér. 2, 15: 70. 1841. *Type*: INDIA, Tamil Nadu, Nilgiris, Mont. Herb. Coonoor, 1840, *Perrottet s.n.* (P [P00439690 digital image!], perhaps holotype).

Habenaria rariflora is said to be epiphytic, rather it

is commonly lithophytic (growing on rocks and walls), occasionally epiphytic, or rarely terrestrial, and is endemic to peninsular India. It can be recognized by rosette to basally gathered oblong-lanceolate leaves, 1–4-flowered cymes, white fragrant flowers, long filiform lateral lobes, and a longer spur. It appears that Dalzell was uncertain in describing *H. uniflora* and doubted that it was more appropriate to be a variety than a distinct species. Although it was named '*uniflora*' by Dalzell, it usually has 1–4-flowered cymes.

A single sheet at K (K000247424) is referable to *H. uniflora* and labelled by Dalzell as '*Habenaria uniflora* mihi. var. of *H. rariflora*?'. It also has a Hooker's annotation 'Bombay Dalzell', which is chosen here as the lectotype.

16. *Micropera maculata* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 3: 282. 1851. *Lectotype* (designated by Bokil *et al.*, 2019): INDIA, *s.loc., s.d.*, Dalzell *s.n.* (K!, K000891594) *Residual syntypes*: (K [K001097951!, K, without barcode!]; GH ([GH00101590 digital image!]).

Smithsonia maculata (Dalzell) C.J.Saldanha, J. Bombay Nat. Hist. Soc. 71: 74. 1974.

An epiphytic orchid, endemic to the Western Ghats of India, can be identified by longer racemes (usually exceeding the leaves) and, yellow and purple spotted flowers. Since its description, Dalzell's *Micropera maculata* went through different generic circumscriptions until Saldanha (1974) resolved it in *Smithsonia* C.J.Saldanha. Dalzell (1851) himself was not sure about the placement of this species in *Micropera*. In the protologue, therefore he added, 'in my opinion, this a typical form doubtfully belongs to this genus'. Pfitzer (1881) recognized it in *Sarcochilus* R.Br., followed by Hooker (1890), who transferred it to into *Saccolabium* Blume. Soon, it was transferred it to *Gastrochilus* D.Don by Kuntze (1891), and subsequently, Garay (1972) and Rauschert (1982) placed it in *Loxoma* Garay and *Loxomorchis* Rauschert, respectively.

17. *Micropera viridiflora* Dalzell in Hooker's J. Bot. Kew Gard. Misc. 3: 282. 1851. *Lectotype* (designated by Bokil *et al.*, 2019): INDIA, Bombay, *s.d.*, Dalzell *s.n.* (K!, K000891593). *Residual syntypes*: (K [K001222284!]; CAL [CAL0000087303!]).

Smithsonia viridiflora (Dalzell) C.J.Saldanha, J. Bombay Nat. Hist. Soc. 71: 75. 1974.

An epiphytic orchid endemic to the Western Ghats. It can be recognized by its corymbose-umbellate inflorescence (not exceeding the leaves), greenish-white flowers, and conical rounded fleshy spur. Like the preceding species, many workers treated this species under different genera. Cooke (1908) assigned the species to genus *Sarcochilus* (as *Sarcochilus viridiflorus*) which became a later homonym (*non* Hooker, 1890) and hence illegitimate. Santapau (1948) provided a replacement name, *Sarcochilus dalzellianus*, which was later transferred to *Aerides* Lour. by Garay (1972). Moreover, Pradhan (1979) transferred it to *Loxoma* but failed to cite the basionym, which made the combination invalid. Santapau and Kapadia (1966) had a similar opinion as Kuntze (1891) for treating this species in *Gastrochilus* but they erroneously cited it as *Gastrochilus dalzellianus* (Santapau) Santapau & Kapadia. However, Malaysian species of *Gastrochilus* are unique in having a wide sac, which is entirely replaced by a narrow spur in *G. dalzellianus* (Holttum, 1960).

Bokil *et al.* (2019) lectotypified *Micropera viridiflora*, but while doing so, they erroneously cited the locality as ‘Koyana valley, Mahabaleshwar, Satara District’ which appears to be copied from Cooke’s collection, possibly made in May 1892 (K001222283). Similarly, the isolectotype choice presented by Bokil *et al.* (2019) is also excluded here. The remaining collection of *M. viridiflora* by Dalzell housed at K (K001222284: with Stocks label ‘Orchideae no. 26’) may not be a single gathering.

18. *Peristylus elatus* Dalzell, Hooker’s J. Bot. Kew Gard. Misc. 3: 344. 1851. *Lectotype* (designated here): INDIA, Bombay, *s.d.*, Dalzell *s.n.* (K!, K000387510); *Residual syntypes*: K!, (K000387509); K!, (without barcode!).

Peristylus plantagineus (Lindl.) Lindl., Gen. Sp. Orchid. Pl. 300. 1835. *Herminium plantagineum* Lindl. Edwards’s Bot. Reg. 18: t. 1499. 1832. *Type*: SRI LANKA, *s.d.*, Macrae *s.n.* (K, *n.v.*).

A terrestrial orchid, endemic to the Western Ghats of India and Sri Lanka. It can be identified in the field by its plantain-like leaves, which are whorled in the middle of the stem, 10–25 cm long densely white flowered spike, trilobed lip, saccate and globose spur, usually shorter than the sepals.

The original material of *Peristylus elatus* is traced at K. The sheets with barcodes K000387509 and

K000387510 have Dalzell’s labels as ‘*Peristylus elata*’ and ‘*Peristylus elatus*’ and Hooker’s annotation as ‘Bombay Dalzell’. The latter, which is more precise and has pencil illustrations of flower parts, is selected here as the lectotype. Another sheet (yet to be digitized) has mixed collections from Dalzell and Law and has Stocks’ orchid label ‘Orchideae no. 43’.

19. *Sarcanthus peninsularis* Dalzell, Hooker’s J. Bot. Kew Gard. Misc. 3: 343. 1851. *Lectotype* (designated here): INDIA, Moolus, July, N.A. Dalzell *s.n.* (K [K000942275!]); *Residual syntypes*: (K [without barcode!], GH [GH00103899 digital image!]).

Cleisostoma tenuifolium (L.) Garay, Bot. Mus. Leaf. 23: 175. 1972. *Epidendrum tenuifolium* L., Sp. Pl. 952. 1753. *Lectotype* (designated by Majumdar & Bakshi, 1979): [icon] “Tsjerou-mau-maravara” in Rheede, Hort. Malab. 12: 11, t. 5. 1693. **Fig. 8**

An epiphytic orchid distributed in India, Sri Lanka, and Thailand. It can be identified by its simple raceme, yellow sepals, and petals with red margins, yellowish or white lip, purplish lateral lobes and dilated conical spur.

We could locate three sheets and two drawings of *Sarcanthus peninsularis* housed at K and GH. The sheet K000942275 has been labelled by Dalzell as ‘*Sarcanthus peninsularis* mihi...’ It also has pencil illustrations of flower parts. The remaining sheet at K is not digitized yet, and it has Stocks’ label ‘Orchideae no. 35’. A sheet from Harvard (GH00103899) has Dalzell’s label in the



Fig. 8. Drawing of *Sarcanthus peninsularis* Dalzell (= *Cleisostoma tenuifolium* (L.) Garay) at Kew: a. An ink drawing available through ‘Icones Stocks’; b. Water colour drawing (perhaps corresponded by Dalzell to Hooker) exactly similar to the preceding with Dalzell’s own ink label. © The Board of Trustees of the Royal Botanic Gardens, Kew, reproduced with permission.

same ink as in sheet at K (K000942275), but the only difference in the GH sheet is that Dalzell has written 'in Hook. Jour.', which perhaps was collected later, after the publication of the species. As in the protologue, Dalzell mentioned '*lc. ined.*', which is referable to colour drawing at K with an annotation as '*Sarcanthus peninsularis mihi*', the habit of drawing agreeing with the top right specimen on K000942275. After comparing drawings and, specimens of *S. peninsularis*, a sheet at K (K000942275) that is unequivocally in agreement with the description is designated here as the lectotype.

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Appendix 1

Orchidaceae specimens examined in the Herbarium Stocks at K

Cleisostoma tenuifolium (L.) Garay: INDIA, *s.loc., s.d.*, Dalzell ex Herb. Stocks 35 (K); *Dendrobium nodosum* Dalzell: INDIA, *s.loc., s.d.*, Dalzell ex Herb Stocks 30 (K); *Dendrobium turbinatum* Ormerod & C.S.Kumar: INDIA, *s.loc., s.d.*, Dalzell ex Herb Stocks 34 (K [K000943917]); *Eulophia* spp.: INDIA, Karnataka, Mysore, *s.d.*, Law ex Herb Stocks 56 (K); *Habenaria diphylla* Dalzell: INDIA, *s.loc., s.d.*, Dalzell ex Herb Stocks 08 (K); *Habenaria digitata* Lindl.: INDIA, Deccan, 8.1852, *J.E. Stocks* 62 (K); Malabar, Canara, *s.d.*, *Herb Stocks & Law* 19 (K); *Habenaria grandifloriformis* Blatt. & McCann: INDIA, Concan, Belgaum & Mahabaleshwar, *s.d.*, Dalzell ex Herb Stocks 20 (K); *Habenaria heyneana* Lindl.: INDIA, *s.loc., s.d.*, Dalzell ex Herb Stocks 11 (K); Southern Ghats, *s.d.*, Dalzell ex Herb Stocks 12 (K); South Concan, *s.d.*, Dalzell ex Herb Stocks 78 (K); Karnataka, near Dharwar, *s.d.*, Law ex Herb Stocks 79 (K); *Habenaria hollandiana* Santapau: INDIA, Karnataka, Belgaum, *s.d.*, Dr. Ritchie ex Herb Stocks 17 (K); *Habenaria stenopetala* Lindl.: INDIA, Parwar ghat, *s.d.*, Dalzell ex Herb Stocks 15 (K); *s.loc., s.d.*, *J.E. Stocks* 64 (K); *Habenaria viridiflora* (Rottler ex Sw.) R.Br. ex Spreng.: INDIA, *s.loc., s.d.*, Dalzell ex Herb Stocks 36 (K); *Peristylus* sp.: INDIA, Deccan, August 1852, *J.E. Stocks* 63 (K); *Peristylus caranjensis* (Dalzell) Ormerod & C.S.Kumar: INDIA, Karnataka, Mysore, *s.d.*, *Stocks* 65 (K); *Peristylus lawii* Wight: INDIA, Karnataka, near Dharwar, *s.d.*, Law ex Herb Stocks 73 (K); *Peristylus plantagineus* (Lindl.) Lindl.: INDIA, *s.loc., s.d.*, Dalzell ex Herb Stocks 43 (K); *Porpax braccata* (Lindl.) Schuit., Y.P.Ng. & H.A.Pederson: INDIA, Concan, *s.d.*, Dalzell ex Herb Stocks 24 (K); *Porpax filiformis* (Wight) Schuit., Y.P.Ng. & H.A.Pederson: INDIA, *s.loc., s.d.*, Dalzell ex Herb Stocks 28 (K); *Saccolabium* spp.: INDIA, South Concan, *s.d.*, Dalzell ex Herb Stocks 74 (K); *Smithsonia maculata* (Dalzell) C.J.Saldanha: INDIA, *s.loc., s.d.*, Dalzell ex Herb Stocks 25 (K); *Smithsonia viridiflora* (Dalzell) C.J.Saldanha: INDIA, *s.loc., s.d.*, Dalzell ex Herb Stocks 26 (K).

Specimens examined to resurrect *Habenaria laciniata*, *H. modesta* and congeneric taxa.

Habenaria laciniata Dalzell: INDIA, Maharashtra (as '*H. gibsonii*'), Tilari, Kolhapur, 21.08.2014, *J.S. Jalal* 197714

(BSI); Kasara, Nashik, 23.7.2014, *J.S. Jalal* 195154 (BSI); Khandala, Pune, 02.08.1966, *B.M. Wadhwa* 109972 (BSI); Mumbra, Thane, 09.09.1968, *K.V. Billore* 116608 (BSI); Matheran, Raigad, 26.07.1966, *B.M. Wadhwa* 109746 (BSI). Concan, *s.d.*, *Stocks s.n.* (K, as '*H. gibsonii*'); Khandala, *s.d.*, 1896, *Cooke s.n.* (K, as '*H. digitata*').

Habenaria modesta Dalzell (as '*H. ovalifolia*'): INDIA, Maharashtra, Kolhapur, Kalanandigad, Chandgad, 17.08.2017, *K. Prasad* 86513 (CAL). Tamil Nadu, Agamalay near Palagautcherry, August 1850, *Wight* 3017 (K [K000247462]); GH [GH00099982]; Nilgiris, G. Thomson 25 (CAL); Anamalai, June 1859, *Beddome* 47 (CAL).

Habenaria digitata Lindl.: INDIA, Chhattisgarh, Bastar, *s.d.*, Kamharras (?) 1021 (K); Maharashtra, Dronagiri, July 1847, *N.A. Dalzell s.n.* (K); Kolhapur, Chandgad, 26.08.2013, *J.S. Jalal* 194987 (BSI); Pargad road, Chandgad, 20.8.2014, *J.S. Jalal* 195198 (BSI); Pune, Rajmachi, Khandala, 26.08.2012, *Jalal & Patil* 200578 (BSI); Raigad, Matheran, 25.08.2011, *Paranjape s.n.* (BSI [BSI0000145851]); Saltar dam, Ambey valley, Lonavala, 26.08.2012, *Jalal & Patil* 200568 (BSI); Sindhudurg, Amboli-Belgaum rd., 26.08.2013, *J.S. Jalal* 194961 (BSI); Hiranyakeshi-Amboli, 26.08.2013, *J.S. Jalal* 194949 (BSI); Thane, Malshej Ghat, 16.08.2013, *Jalal & Patil* 200847 (BSI); Tamil Nadu, Chaklianparai-Anamalai, 20.08.1920, *C.E.C. Fischer* 4474 (K); Nilgiri & Coorg, *s.d.*, G. Thomson ex Herb Madras 48 (K); Concan, *s.d.*, Law *s.n.* (K). Malabar & Conara, *s.d.*, *Stocks & Law s.n.* (K); Bababoodan hills, *s.d.*, Law *s.n.* (K);

Habenaria foliosa A.Rich.: INDIA, Karnataka, Biligirirangana Hills, June 1938, *E. Barnes* 1878 (K). Maharashtra, Khandala, Pune, 13.08.2016, *K. Prasad* 8408 (BSID, as '*H. gibsonii*'). Tamil Nadu, Ooty, Avalanche, 1840, *Perrottet* 858 (P [P00426396]); Nilgiri hills, September 1937, *R.S. Vine* 249 (K); *Ibid., s.d.*, *Wight* 2004 (K); Maharashtra, Pune, Khadakvasla, 10.07.1890, *Raojee s.n.* (K); Odisha, Koraput, Pottangi, 15.07.1950, *H.F. Mooney* 3943 (K).

Habenaria furcifera Lindl.: INDIA, Jharkhand, Ranchi, Ichadagh, 01.09.1918, *Haines* 4433 (K). Maharashtra, Ahmednagar, Waranghushi forest, 10.10.1970, *B.M. Wadhwa* 128357 (BSI); Amravati, Semadoh-Makhla rd, Melghat, 26.07.1978, *M.Y. Ansari* 149399 (BSI); Nashik, Katipada, 25.09.1984, *PL. Narasimhan* 167623A (BSI).