

Two new combinations in *Corybas* and *Genoplesium* (Orchidaceae) for New South Wales.

Matt A.M. Renner

*National Herbarium of New South Wales, Royal Botanic Garden and Domain Trust,
Mrs Macquaries Road, Sydney NSW 2000, Australia.*

Abstract

The new combinations, *Corybas longitubus* (D.L.Jones & L.M.Copel.) M.A.M.Renner and *Genoplesium trifidum* (Rupp) M.A.M.Renner, are provided for a species described in a genus not currently accepted (*Corysanthes*), and for another species described in a genus since split (*Prasophyllum*) for which no valid combination in *Genoplesium* exists. The circumscription, recognition, and distribution of *Genoplesium trifidum* are all reconsidered.

Introduction

Preparation of the Australian Plant Census (APC 2019) treatment for Orchidaceae identified two orphaned species from New South Wales. These are taxa that are accepted, but for which no combinations in accepted genera are currently available.

Salisbury proposed the genus *Corybas* Salisb. based on *Corybas aconitiflorus* Salisb., in Hooker (1807). Brown (1810) was unimpressed by Salisbury's illustration and description, and published his own genus, *Corysanthes* R.Br., and species, *Corysanthes bicalcarata* R.Br. (= *Corybas aconitiflorus*); the lectotype of Brown's *Corysanthes* is *Corysanthes fimbriata* R.Br. (= *Corybas fimbriatus* (R.Br.) Rchb.f.), designated by Endlicher (1837). Salisbury's *Corybas* was not accepted by Bentham (1873), and for many years thereafter *Corysanthes* was used in preference (eg., Rupp 1942). A third genus, *Nematoceras* Hook.f. was proposed for five species from New Zealand with filiform tepals (Hooker 1853). *Nematoceros* remained in occasional use in New Zealand, until the *Flora of New Zealand* treatment (Moore and Edgar 1970) placed all species under *Corybas*. During the latter half of the 20th Century all species previously assigned to *Corysanthes* and *Nematoceros* were placed in *Corybas*.

Both *Corysanthes* and *Nematoceros* were reinstated, and three new genera segregated from Australian and New Zealand *Corybas* by Jones *et al.* (2002): *Anzybas* D.L.Jones & M.A.Clem., *Molloybas* D.L.Jones & M.A.Clem., and *Singularibas* D.L.Jones & M.A.Clem., the latter two were monotypic. Evidence supporting the recognition of these new and reinstated genera was published subsequently by Clements *et al.* (2002), which included recovery of monophyla in the nrITS gene tree corresponding with the proposed genera. The generic classification proposed by Jones *et al.* (2002) has not been widely adopted, and *Corybas* remains circumscribed in the broad sense in both Australia and New Zealand (Lehnebach *et al.* 2016).

Corysanthes longituba D.L.Jones & L.M.Copel. was newly described by Jones and Copeland (2018) for a taxon that had been informally recognized for more than two decades, as *Corybas* sp. A in the *Flora of New South Wales* (Jones 1993) and as *Corybas* sp. aff. *dilitatus* (Barrington Tops) in Bishop (1996). A combination for Jones and Copeland's (2018) species under *Corybas* is proposed below.

Genoplesium R.Br. was reinstated by Jones and Clements (1989) for a distinctive group of species then placed in *Prasopphyllum* R.Br. sect. *Genoplesium* (R.Br.) Hook.f., and this reinstatement has been widely adopted. However, Jones *et al.* (2002), in the absence of published supporting data and contrary to their own earlier interpretations of morphological evidence, proposed Fitzgerald's genus *Corunastylis* also be reinstated, leaving *Genoplesium* monotypic. That latter proposal has not been universally adopted, and further generic splitting within the *Prasopphyllum* complex based on nrITS sequence data alone (Clements and Jones 2019), make a broadly circumscribed *Prasopphyllum* more appealing, given the disruption to morphological circumscription of *Corunastylis* introduced by *Mecodium*; and likely more stable. There are inherent limitations to nrITS (Alvarez and Wenzel 2003), and broad inference of relationships from single gene trees (Degnan and Rosenberg 2009), the latter of which has already had a destabilizing influence on orchid taxonomy in Australia (Jones *et al.* 2002; Hopper 2009; Clements *et al.* 2015). Until the veracity of relationships presented by Clements and Jones (2019) has been corroborated by additional data, including *both* chloroplast and low-copy nuclear genes, the National Herbarium of New South Wales will continue to recognize two genera, *Prasopphyllum* and *Genoplesium*, *sensu* Clements and Jones (1989).

Prasopphyllum trifidum Rupp was described from Castlecrag, a suburb on Sydney's north shore (Rupp 1941). In the *Flora of Queensland* (Jones 1989, p. 384), *P. trifidum* was treated as *Genoplesium trifidum* (Rupp) D.L.Jones & M.A.Clem. but this name was invalid as full and direct reference to the place of publication of *P. trifidum* was not provided (see Articles 38.12 and 45.1 of *International Code of Nomenclature*, Turland *et al.* 2018). *Prasopphyllum trifidum* was treated as a synonym of *G. rufum* (R.Br.) D.L.Jones & M.A.Clem. by Jones and Clements (1989), then reinstated in the genus *Corunastylis* by Jones and Clements (2004). *Corunastylis* is not accepted as distinct from *Genoplesium*, and a new combination for Rupp's species is proposed below. Currently it is generally accepted that *P. trifidum* Rupp occurs only on the Northern and Central Coast of New South Wales, and Queensland records are referable to other species. Here the distribution and circumscription of *G. trifidum* are reconsidered with reference to the type material, with the result that many specimens attributed to this taxon are excluded, which has implications for the known distribution and abundance of *G. trifidum*.

Taxonomic Treatment

Corybas longitubus (D.L.Jones & L.M.Copel.) M.A.M.Renner *comb. nov.*

Basionym: *Corysanthes longituba* D.L.Jones & L.M.Copel., *Australian Orchid Review* 83(6): 56 (2018).

Type: New South Wales; Barrington Tops, 50 m downstream of Manning River Camping area, 8 Sept. 2004, W.M. Dowling 412 (holotype: CANB 652827; isotypes: MEL, NSW 935081!)

= *Corybas* sp. A. *sensu* D.L. Jones, *Flora of New South Wales Volume 4*: 215 (1993)

= *Corybas* sp. aff. *dilitatus* (Barrington Tops)

For description, images, and recognition of this species see Jones and Copeland (2018).

Genoplesium trifidum (Rupp) M.A.M.Renner *comb. nov.*

Basionym: *Prasopphyllum trifidum* Rupp, *The Victorian Naturalist* 58(2): 21 (1941).

Type citation: Castlecrag, Middle Harbour, Port Jackson; May 1940. (H.M.R.R.)

Type: Castlecrag, May 1940, H.M.R.Rupp (NSW 87486!)

≡ *Genoplesium trifidum* (Rupp) D.L.Jones, & M.A.Clem., *Flora of south-eastern Queensland* 3: 384 (1989) *nom. inval.*

≡ *Corunastylis trifida* (Rupp) D.L.Jones & M.A.Clem., *The Orchadian*, Scientific Supplement 14(8): xiii (2004)

Description: *Leaf* terete, 110–330 mm long, 1–2 mm wide, lamina sheathing the scape, linear, free lamina 15–30 mm long and 2–3 mm wide, ending below or level with the first flower. *Inflorescence* 160–380 mm long, bearing 10–42 flowers on a spike 12–43 mm long; flowers opening in sequence from the base; pedicel and ovary straight, 1–4 mm long, lengthening with age such that young spikes with newly opened flowers are densely crowded while older spikes with all flowers open and presenting may be openly spaced. *Flowers* porrect to deflexed, *dorsal sepal* 3 mm long, 1.5 mm wide, triangular-ovate, concave and inflated at medial base, apex shortly attenuate, not bearing a gland; *lateral sepals* 4 mm long, 1 mm wide, linear-lanceolate,

widest just above base, concave toward apex sometimes margins overlapping and so tubular, acute, bearing a small dark orange to fuscous unstalked ovoid gland around 0.1 mm diameter; *petals* 2.5 mm long, 1 mm wide, triangular-falcate, outer surface papillate in distal third, dorsal margin straight in lower half above weakly ampliate base, then curved through 45° to the apex, margin crenulate to shortly ciliolate in distal half, ventral margin straight at middle then arched through 15–30°, margin shortly ciliolate in outer half, apex acute, sharply inwardly curved and with a pale opaque circinate-falcate gland attached and presented on the inner side of the petal, gland 0.5–0.6 mm long; *labellum* 2.5 mm long, 1.2 mm wide, elliptic, widest at midpoint, apex acute, margins ciliolate in distal half, entire in proximal half, with callus linear in distal two thirds of the labellum and extending almost to the labellum apex, flaring toward labellum base in the basal third where it becomes ridged marginally, ridges extending to and incorporated into the labellum margin, callus surface papillate medially, papillae formed by prorate surface cells, and ciliolate marginally; attachment narrow, articulated, at apex of column foot. *Column* 1.5–2.0 mm long not including column foot, 1 mm wide; column foot present, 0.5 mm long, curved; wings subequally bilobed, around 1 mm long and 0.625 mm wide, divided to 0.4 their length, dorsal lobe slightly ligulate, apex obtuse or rounded, margins entire, slightly broader than ventral lobe; ventral lobe narrow triangular, apex acuminate, margin and surfaces shortly and closely ciliolate; anther versatile, 0.75 mm long, ovate, with a filiform rostrum whose apex is emarginate or weakly and shortly bifurcate; *stigma* ampulliform but with truncate apex and base, the base faintly emarginate, surface concave along lateral and basal margins. *Pollinarium* not seen sufficiently intact for description. Fig. 1.

Recognition: *Genoplesium trifidum* can be recognized by the combination of 1) closely ciliolate labellum margins, wherein the marginal cells are elongate, and their ends are free from neighbouring cells; 2) the papillose callus surface; 3) the elliptic-obovate labellum whose apex is acute; 4) the pale, circinate to hook-shaped gland attached to the apex of each petal and typically presenting on the inner surface of the petal; 5) the absence of glands on the apex of the dorsal and lateral sepals, or presence of a minute usually *fuscous* gland-like protruberance; 6) the broad upper column arm that narrows to an obtuse to rounded apex, the lower column arm being narrow acuminate, and papillose to ciliolate at the apex. The pale circinate to hook-shaped gland attached to the apex of each petal will immediately distinguish *G. trifidum* from all other similar species including *G. rufum*.

Notes: The specific epithet chosen by Rupp referred to the presence of three column arms, while this is a feature of flowers in some specimens, in which it presents as subdivision of the upper column arm, it is not consistently expressed. Subdivision of the upper column arm occurs sporadically in other species (M.A.M. Renner *pers. obs.*). Rupp (1941) stated in the protologue ‘no segments gland-tipped’ but this statement is in conflict with his own type, in which the petals each bear a gland at the petal apex. Presumably Rupp did not recognize these structures as glands, but exactly what he made of them is unclear as he omitted a description of the petals from his protologue. These glands were described and figured by Jones (1989).

The series of specimens collected during the 1940’s from Castlecrag, Castlecove, and Roseville by Rupp, Dockrill, Bowden and Schmidt are morphologically homogeneous, sharing all of the characters presented in the recognition section above. Most specimens in the National Herbarium of New South Wales identified as *G. trifidum* do not possess this combination of distinctive characters. The distribution and shape of glands, the size and shape of column arms, petals, and sepals, are all significant characters with regards species circumscription (e.g. Jones 2001), implying specimens lacking the characters possessed by the type have been misidentified.

The *Genoplesium trifidum* (as *Corunastylis trifida* (Rupp) D.L.Jones & M.A.Clem.) image in Jones (2006) may not be this species, given the presence of conspicuous pale glands on the lateral sepal apex, and the absence of glands on the petals of the photographed plant.

Distribution and ecology: *Genoplesium trifidum* is endemic to New South Wales and is known with certainty only from the north shore of Sydney, in the vicinity of Castlecrag, Castlecove and Roselle, and from Oxford Falls. All reports from the North Coast of New South Wales and Queensland are referable to other species. All herbarium specimens are flowering, with most being collected in April or May, suggesting this is primarily an autumn-flowering species, though flowering at other times of the year is possible, as demonstrated by a collection made in January at Oxford Falls. No information on habitat or microsite is recorded in association with the specimens. The most recent genuine and correctly identified specimen held by the National Herbarium of New South Wales was collected in 1949.

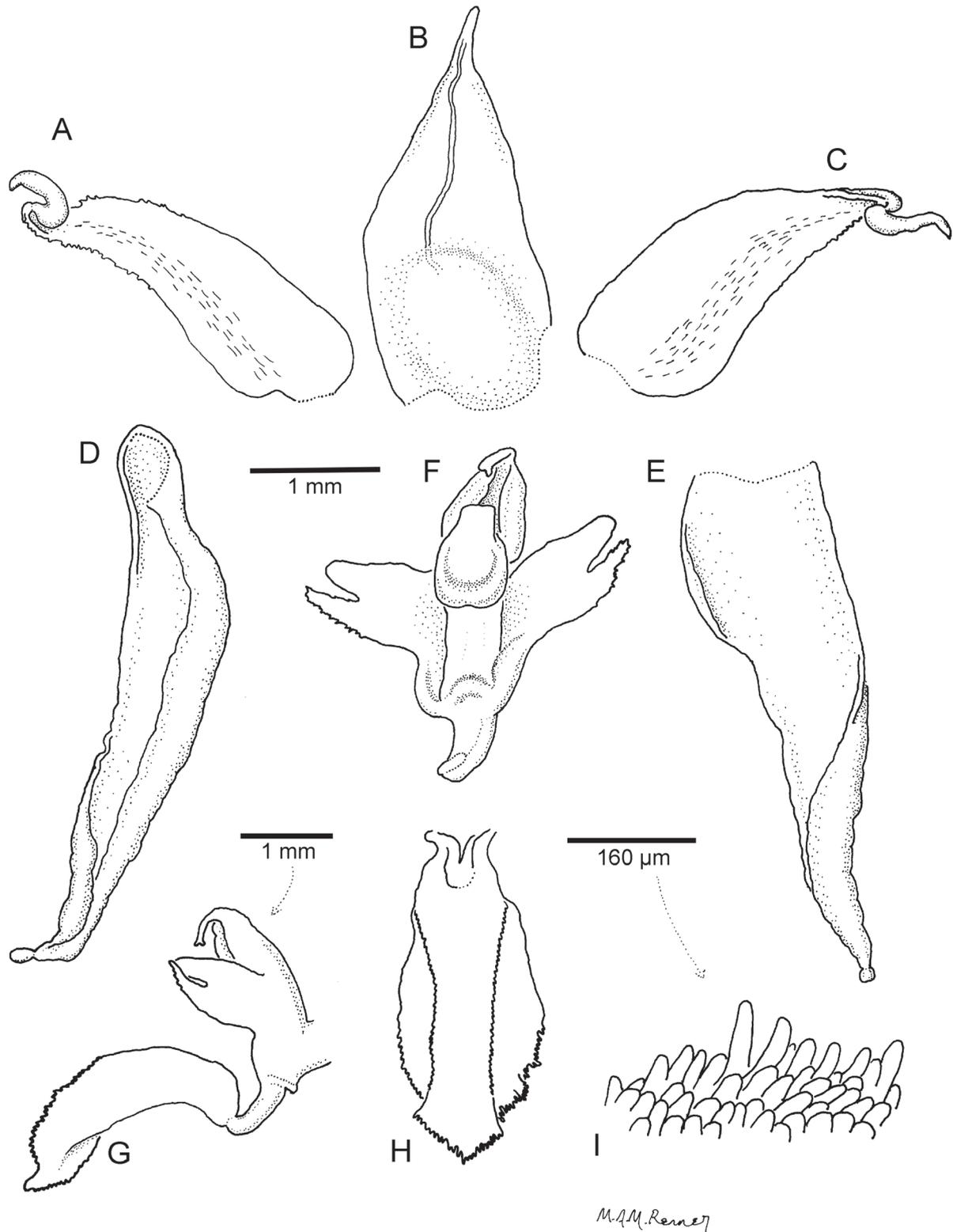


Fig. 1. *Genoplesium trifidum* (Rupp) M.A.M.Renner. A, C: Petals; B: Dorsal sepal; D,E: Lateral sepals; F: Column; G: Column with labellum in lateral-oblique view showing labellum articulated on curved column-foot; H: Labellum; I: Cells of labellum margin. Scale bars A-F, H: 1 mm; G: 1 mm as indicated; I 160 μ m as indicated. All from A.R. Rupp & H.M.R. Rupp (NSW 209997).

Conservation status: Data deficient. Historical confusion regarding the circumscription of *Genoplesium trifidum* and lack of recent collections to the immediate north of Sydney preclude an informed assessment. Although no recent collections are known within the National Herbarium of New South Wales, recent collections may exist under other names. Searchers in both herbarium and field are required. Habitat that

may be suitable for *G. rufum* occurs to the north of Castlecrag and Castlecove within Garigal National Park, around Manly Reservoir, and Narrabeen Lagoon. Searches here, and further afield including Ku-ring-gai Chase National Park and Berowra Valley National Park should be completed.

Specimens examined: New South Wales: Central Coast: Moore's Creek Roseville, 9 Apr 1949, *W. Schmidt* (NSW 210019); Oxford Falls, Jan 1940, *H.M.R. Rupp & C.A. Messmer* (NSW 210015); *ibid*, Jun 1940, *C.A. Messmer & H.M.R. Rupp* (NSW 210017); near Castlecove Golf Links, Middle Harbour, Port Jackson, Apr 1942, *H.M.R. Rupp ex herb. Rupp 444b* (NSW 210016); Castlecove, May 1945, *A.R. Rupp & H.M.R. Rupp* (NSW 210018); Roseville Golf Links, Apr 1949, *F.W. Schmidt* (NSW 9282); Castlecove, Apr 1948, *I. Bowden* (NSW 210002); Castlecove, East Roseville, 8 May 1945, *A.R. Rupp & H.M.R. Rupp* (NSW 209997); Castlecove, Middle Harbour, Port Jackson, 16 Apr 1949, *A.W. Dockrill* (NSW 209996); Middlecove, Apr 1949, *I. Bowden* (NSW 209995).

Acknowledgements

I thank Norm Graham (Tweed-Byron NPWS) for sending specimens for identification which initiated this enquiry into what exactly was *G. trifidum*; Gavin Phillips for his thoughts on *G. rufum*, *G. trifidum*, and *F.W. Schmidt*; Anna Monro on advice on the status of names, and drawing my attention to these orphaned taxa in the first instance.

References

- Alvarez I, Wendel JF (2003) Ribosomal ITS sequences and plant phylogenetic inference. *Molecular Phylogenetics and Evolution* 29: 417–434.
- Australian Plant Census (APC) (2019) Council of Heads of Australasian Herbaria (CHAH). <https://biodiversity.org.au/nsl/services/APC>
- Bentham G (1873) *Flora Australiensis. Volume 6. Thymeleae to Dioscorideae*. Lovell Reeve: London.
- Bishop T (1996) *Field guide to the orchids of New South Wales and Victoria*. UNSW Press: Sydney.
- Brown R (1810) *Prodromus Florae Novae Hollandiae*. London: Richard Taylor and Company.
- Clements MA, Jones DL (2019) Notes on Australasian Orchids 5: *Paraprasophyllum*, a new genus in Prasopphyllinae (Diurideae). *Australian Orchid Review* 84: 24–38.
- Clements MA, Jones DL, Sharma IK, Mackenzie AM (2002) Phylogenetics of Diurideae (Orchidaceae) based on the internal transcribed spacer (ITS) regions of nuclear ribosomal DNA. *Lindleyana* 17: 135–171.
- Clements MA, Howard CG, Miller JT (2015) *Caladenia* revisited: Results of molecular phylogenetics analyses of Caladeniinae plastid and nuclear loci. *American Journal of Botany* 102: 581–597.
- Degnan JH, Rosenberg NA (2009) Gene tree discordance, phylogenetic inference and the multispecies coalescent. *Trends in Ecology and Evolution* 24: 332–340.
- Endlicher SFL (1837) *Genera Plantarum Secundum Ordines Naturales Disposita* 3: 218
- Hooker W (1807) *The Paradisus Londinensis: or coloured figures of plants cultivated in the vicinity of the metropolis. 2*. London: William Hooker.
- Hooker JD (1853) *The Botany of the Antarctic Voyage II. Flora Novae-Zelandiae. Part I. Flowering Plants*. London: Lovell Reeve.
- Hopper SD (2009) Taxonomic turmoil down-under: recent developments in Australian orchid systematics. *Annals of Botany* 104: 447–455.
- Jones DL (1989) *Genoplesium*. In: Stanley TD, Ross EM, *Flora of south-eastern Queensland. Volume III*. Brisbane: Queensland Department of Primary Industries.
- Jones DL (1993) Orchidaceae. In: Hardin GJ, *Flora of New South Wales. Volume 4*. Sydney: New South Wales University Press, 133–247.
- Jones DL (2001) Six new species and a new combination in *Genoplesium* R.Br. (Orchidaceae) from eastern Australia. *The Orchadian* 13: 293–307.
- Jones DL, Clements MA (1989) Reinterpretation of the genus *Genoplesium* R.Br. (Orchidaceae: Prasopphyllinae). *Lindleyana* 4: 139–145
- Jones DL, Clements MA (2004) Miscellaneous new species, new genera, reinstated genera and new combinations in Australian Orchidaceae. *The Orchadian Scientific Supplement* 14(8): xiii
- Jones DL, Clements MA, Sharma IK, Mackenzie AM, Molloy BPJ (2002) Nomenclatural notes arising from studies into the tribe Diuridae (Orchidaceae). *The Orchadian* 13: 437–468.
- Jones DL, Copeland LM (2018) *Corysanthes longituba* (Orchidaceae: Acianthiinae), a new species from northern New South Wales. *Australian Orchid Review* 83: 56–57.

- Lehnebach CA, Zeller AJ, Frericks J, Ritchie P (2016) Five new species of *Corybas* (Diurideae, Orchidaceae) endemic to New Zealand and phylogeny of the *Nematoceras* clade. *Phytotaxa* 270: 1–24.
- Moore LB, Edgar E (1970) *Flora of New Zealand. Volume II*. A.R. Shearer, Government Printer: Wellington.
- Rupp HMR (1941) Two new species of *Prasophyllum*. *The Victorian Naturalist* 58: 21–22.
- Rupp HMR (1942) *Corybas* or *Corysanthes*? *The Victorian Naturalist* 59: 60–61.
- Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kusber W-H, Li D-Z, Marhold K, May TW, McNeill J, Monro AM, Prado J, Price MJ, Smith GF (2018) *International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017*. Regnum Vegetabile 159. Glashütten: Koeltz Botanical Books.

Manuscript received 27 July 2019, accepted 6 November 2019