

Note on the typification and synonymy
of *Cynorkis coccinelloides* (Frapp.) Schltr.,
C. trilinguis (Frapp.) Schltr.
and *C. flexuosatis* (Thouars) Hermans
(Orchidaceae, Orchidoideae, Habenariinae)

Thierry PAILLER,
Benny BYTEBIER &
Cláudia BAIDER



DIRECTEUR DE LA PUBLICATION / PUBLICATION DIRECTOR: Bruno David
Président du Muséum national d'Histoire naturelle

RÉDACTEUR EN CHEF / EDITOR-IN-CHIEF: Thierry Deroin

RÉDACTEURS / EDITORS: Porter P. Lowry II; Zachary S. Rogers

ASSISTANT DE RÉDACTION / ASSISTANT EDITOR: Emmanuel Côté (adanson@mnhn.fr)

MISE EN PAGE / PAGE LAYOUT: Emmanuel Côté

COMITÉ SCIENTIFIQUE / SCIENTIFIC BOARD:

P. Baas (Nationaal Herbarium Nederland, Wageningen)
F. Blasco (CNRS, Toulouse)
M. W. Callmänder (Conservatoire et Jardin botaniques de la Ville de Genève)
J. A. Doyle (University of California, Davis)
P. K. Endress (Institute of Systematic Botany, Zürich)
P. Feldmann (Cirad, Montpellier)
L. Gautier (Conservatoire et Jardins botaniques de la Ville de Genève)
F. Ghahremaninejad (Kharazmi University, Téhéran)
K. Iwatsuki (Museum of Nature and Human Activities, Hyogo)
A. A. Khapugin (Tyumen State University, Russia)
K. Kubitzki (Institut für Allgemeine Botanik, Hamburg)
J.-Y. Lesouef (Conservatoire botanique de Brest)
P. Morat (Muséum national d'Histoire naturelle, Paris)
J. Munzinger (Institut de Recherche pour le Développement, Montpellier)
S. E. Rakotoarisoa (Millenium Seed Bank, Royal Botanic Gardens Kew, Madagascar Conservation Centre, Antananarivo)
É. A. Rakotobe (Centre d'Applications des Recherches pharmaceutiques, Antananarivo)
P. H. Raven (Missouri Botanical Garden, St. Louis)
G. Tohmé (Conseil national de la Recherche scientifique Liban, Beyrouth)
J. G. West (Australian National Herbarium, Canberra)
J. R. Wood (Oxford)

COUVERTURE / COVER:

Réalisée à partir des Figures de l'article/*Made from the Figures of the article.*

Adansonia est indexé dans / *Adansonia is indexed in:*

- Science Citation Index Expanded (SciSearch®)
- ISI Alerting Services®
- Current Contents® / Agriculture, Biology, and Environmental Sciences®
- Scopus®

Adansonia est distribué en version électronique par / *Adansonia is distributed electronically by:*

- BioOne® (<http://www.bioone.org>)

Adansonia est une revue en flux continu publiée par les Publications scientifiques du Muséum, Paris
Adansonia is a fast track journal published by the Museum Science Press, Paris

Les Publications scientifiques du Muséum publient aussi / *The Museum Science Press also publish: Geodiversitas, Zoosystema, Anthropozoologica, European Journal of Taxonomy, Naturae, Cryptogamie* sous-sections *Algologie, Bryologie, Mycologie, Comptes Rendus Palevol*

Diffusion – Publications scientifiques Muséum national d'Histoire naturelle
CP 41 – 57 rue Cuvier F-75231 Paris cedex 05 (France)
Tél.: 33 (0)1 40 79 48 05 / Fax: 33 (0)1 40 79 38 40
diff.pub@mnhn.fr / <http://sciencepress.mnhn.fr>

© Publications scientifiques du Muséum national d'Histoire naturelle, Paris, 2022
ISSN (imprimé / *print*): 1280-8571/ ISSN (électronique / *electronic*): 1639-4798

Note on the typification and synonymy of *Cynorkis coccinelloides* (Frapp.) Schltr., *C. trilinguis* (Frapp.) Schltr. and *C. flexuosatis* (Thouars) Hermans (Orchidaceae, Orchidoideae, Habenariinae)

Thierry PAILLER

Herbier de l'Université de La Réunion, UMR C53 Cirad-Université, Peuplements Végétaux et Bioagresseurs en Milieu Tropical, Saint-Denis Messag, Cedex 9, La Réunion (France)
thierry.pailler@univ-reunion.fr (corresponding author)

Benny BYTEBIER

Bews Herbarium, Centre for Functional Biodiversity, School of Life Sciences, University of KwaZulu-Natal, Private Bag X01, 3209 Scottsville (South Africa)
bytebier@ukzn.ac.za

Cláudia BAIDER

The Mauritius Herbarium, R. E. Vaughan Building, Agricultural Services, Ministry of Agro-Industry and Food Security, Réduit (Mauritius)
cbaider@govmu.org

Submitted on 28 June 2021 | accepted on 21 October 2021 | published on 7 March 2022

Pailler T., Bytebier B. & Baidier C. 2022. — Note on the typification and synonymy of *Cynorkis coccinelloides* (Frapp.) Schltr., *C. trilinguis* (Frapp.) Schltr. and *C. flexuosatis* (Thouars) Hermans (Orchidaceae, Orchidoideae, Habenariinae). *Adansonia*, sér. 3, 44 (8): 57-62. <https://doi.org/10.5252/adansonia2022v44a8>. <http://adansonia.com/44/8>

ABSTRACT

KEY WORDS
Orchidaceae,
La Réunion,
Madagascar,
Mascarenes,
orchids,
lectotypification,
neotypifications,
new synonyms.

Most species of the genus *Cynorkis* are found on the Western Indian Ocean Islands. The correct taxonomic status of many species in this genus is not clear or is unresolved due to poor or lost type specimens, coupled with short protologue descriptions. Here, we lectotypify *Cynorkis coccinelloides* (Frapp.) Schltr. and show that *C. brachycentra* (A.Rich.) ex. Kraenzl. is a synonym of *C. trilinguis* (Frapp.) Schltr. Moreover, *C. flexuosatis* (Thouars) Hermans, a Mauritian endemic, and *C. trilinguis*, a Réunion endemic, are different species. These clarifications are important to correct the taxonomic reference for the Mascarene flora, and to support any necessary conservation work.

RÉSUMÉ

MOTS CLÉS
Orchidaceae,
La Réunion,
Madagascar,
Mascareignes,
orchidées,
lectotypification,
néotypifications,
synonymes nouveaux.

Note sur la typification et synonymie de Cynorkis coccinelloides (Frapp.) Schltr., *C. trilinguis* (Frapp.) Schltr. et *C. flexuosatis* (Thouars) Hermans (Orchidaceae, Orchidoideae, Habenariinae).

La plupart des espèces du genre *Cynorkis* se trouvent dans les îles de l'océan Indien occidental. Le statut taxonomique correct de nombreuses espèces de ce genre n'est pas clair ou n'est pas résolu, en raison de spécimens types pauvres ou perdus, associés à de courtes descriptions de protologues. Ici, nous lectotypifions *Cynorkis coccinelloides* (Frapp.) Schltr. et montrons que *C. brachycentra* (A.Rich.) ex. Kraenzl. est un synonyme de *C. trilinguis* (Frapp.) Schltr. De plus, *C. flexuosatis* (Thouars) Hermans, endémique mauricien, et *C. trilinguis*, endémique de la Réunion, sont des espèces différentes. Ces précisions sont importantes pour corriger la référence taxonomique de la flore des Mascareignes et soutenir tout travail de conservation.

INTRODUCTION

The genus *Cynorkis* Thouars was created for a species collected in Réunion (Thouars 1809: tabl. *Satyriens*). Nowadays, nearly 190 species are recognised, most of them occurring in Madagascar and the surrounding islands (Mascarenes, Comoros and Seychelles) (Pailler *et al.* 2018; Hassler 2004–2021; Govaerts *et al.* 2021). The taxonomy of this genus is complex, because some species and their variability are not well known, particularly the 31 species from Réunion described by Frappier in Cordemoy (1895). Many of the protologue descriptions were based on living plants seen in the field or on a few herbarium specimens, some of which were already in poor state at the time of their description. Moreover, the herbarium of Frappier (Bossier 2011), as well as some specimens from the herbarium of Cordemoy are considered lost. Studies undertaken as part of the preparation for the ‘Flore des Mascareignes’ have revealed two new species (Bossier 2007; Pailler 2020), and taxonomic, as well as nomenclatural, issues for certain taxa have been clarified (e.g. Bytebier 2019 and Bytebier & Pailler 2019 dealt with the identity of *C. citrina* (Thouars) Bytebier, whereas Ngugi *et al.* 2020 showed that *Arnottia* A.Rich. and *Physoceras* Schltr. should undoubtedly be considered as *Cynorkis*). Hermans & Cribb (2021) typified 16 species of *Cynorkis* described by Thouars (1822) and Frappier in Cordemoy (1895), and also proposed 27 new synonyms for taxa of the Mascarenes. Here, we discuss the typification of *Cynorkis coccinelloides*, as well as one of its recently proposed new synonyms, to clarify the correct taxonomic reference for the Mascarene flora.

Cynorkis coccinelloides (Frapp.) Schltr., a species endemic to Madagascar and Réunion, was first described as *Camilleugenia coccinelloides* Frapp. Recently, Hermans & Cribb (2021) neotypified *C. coccinelloides* with *Cordemoy 3* deposited at K, a specimen without indication of its collection locality and gathered two years after publication of the name (Frappier in Cordemoy 1895: 234). Three herbarium specimens from Réunion are cited in the protologue of *Camilleugenia coccinelloides*: 1) Saint Denis, Ravine à Verdure from the J.M.C. Richard Herbarium; 2) Côteau Maigre du Piton des Neiges from the Potier Herbarium; and 3) Plaine des Cafres from the Frappier Herbarium. In 1998, during the preparatory study of orchids for the ‘Flore des Mascareignes’, Jean Bossier found and identified the specimen of J.M.C. Richard (Fig. 1). Unfortunately, he did not publish it at that time. This specimen is one of the syntypes and is here formally lectotypified. According to article 9.19a of the International Code of Nomenclature for algae, fungi and plants (Turland *et al.* 2018), the lectotypification supersedes the neotypification in Hermans & Cribb (2021).

In addition, Hermans & Cribb (2021) considered *Cynorkis brachycentra* A.Rich. ex Kraenzl. as a synonym of *Cynorkis coccinelloides*. The authors stated that “Kraenzlin [Kraenzlin 1901: 484] described a species with 3-lobed lip but the Boivin type specimen [Boivin 1072, P00693006] has five lobes, two being tiny basal ones. The size and shape of the rachis, flowers, the puberulous lip and spur correspond well with *Cynorkis*

coccinelloides that Frappier [in Cordemoy 1895] described three years earlier.” However, due to the fact that Boivin 1072 has resupinate flowers whereas *C. coccinelloides* has non-resupinate flowers, *Cynorkis brachycentra* A.Rich. ex Kraenzl. cannot be considered as a synonym of *C. coccinelloides*. Furthermore, when comparing the types of *Cynorkis brachycentra* A.Rich. ex Kraenzl. (Boivin 1072, P00693006) and *Cynorkis trilinguis* (Frapp.) Schltr. (Cordemoy *s.n.*, P00541671), no clear morphological differences can be found. Hence *C. brachycentra* A.Rich. ex Kraenzl. should be considered as a synonym of *C. trilinguis*.

Finally, Hermans & Cribb (2021) also considered *Cynorkis flexuosatis* (Thouars) Hermans as a synonym of *C. trilinguis*. Hermans & Cribb (2021) have rightly chosen the Thouars’ painting (1822: t. 7) as the lectotype of *C. flexuosatis*, since no original material could be located. However, there are clear differences between the above two species. Firstly, *C. flexuosatis* is a species from Mauritius (the most recent specimen was collected in 1997 [Florens *et al. s.n.*, MAU22810, Fig. 2]), whereas *C. trilinguis* is endemic to Réunion. Secondly, these species differ by the size and shape of the spur. The cylindrical spur of *C. flexuosatis* is as long as one of the lateral lobes of the labellum, features clearly visible on Thouars’ plate. On the other hand, *C. trilinguis* has a very short spur (< 1 mm), which is saccate and obconical. Thus, these two names are not synonymous.

TAXONOMY

Family ORCHIDACEAE Juss.
Genus *Cynorkis* Thouars

Cynorkis coccinelloides (Frapp.) Schltr.
(Figs 1; 3B)

In *Beihefte zum Botanischen Centralblatt* 33 (2): 399 (Schlechter 1915). — *Camilleugenia coccinelloides* Frapp., *Orchidées de l’Île de La Réunion*: 10 (Frappier 1880), *nomen nudum*; Frapp. in Cordem., *Flore de l’Île de la Réunion*: 234 (Cordemoy 1895). — *Bicornella coccinelloides* (Frapp.) Szlach. & Kras, *Richardiana* 6: 141 (Szlachetko & Kras 2006). — Type: France. La Réunion, St-Denis, ravine à Verdure, s.d., J.M.C. Richard *s.n.* (lecto-, here designated: REU) (Fig. 1).

Cynorkis trilinguis (Frapp.) Schltr.
(Fig. 3A)

In *Beihefte zum Botanischen Centralblatt* 33 (2): 403 (Schlechter 1915). — *Hemiperis trilinguis* Frapp. *Orchidées de l’Île de La Réunion*: 11 (Frappier 1880), *nomen nudum*; Frapp. in Cordem., *Flore de l’Île de La Réunion*: 242 (Cordemoy 1895). — Type: France. La Réunion, Îlet de Patience, 1900 m, *Cordemoy s.n.* (P[P00541671]).

Hemiperis nervilabris Frapp., *Orchidées de l’Île de La Réunion*: 11 (Frappier 1880), *nomen nudum*; Frapp. in Cordem., *Flore de l’Île de La Réunion*: 250 (Cordemoy 1895). — *Cynorkis nervilabris* (Frapp.) Schltr., *Beihefte zum Botanischen Centralblatt* 33 (2): 401 (Schlechter 1915), *syn. nov.* — Type: France. La Réunion, Bélouve, Côteau Monique, 19.II.1875, *de l’Isle 71* (neo-, here designated: P[P00693011]).

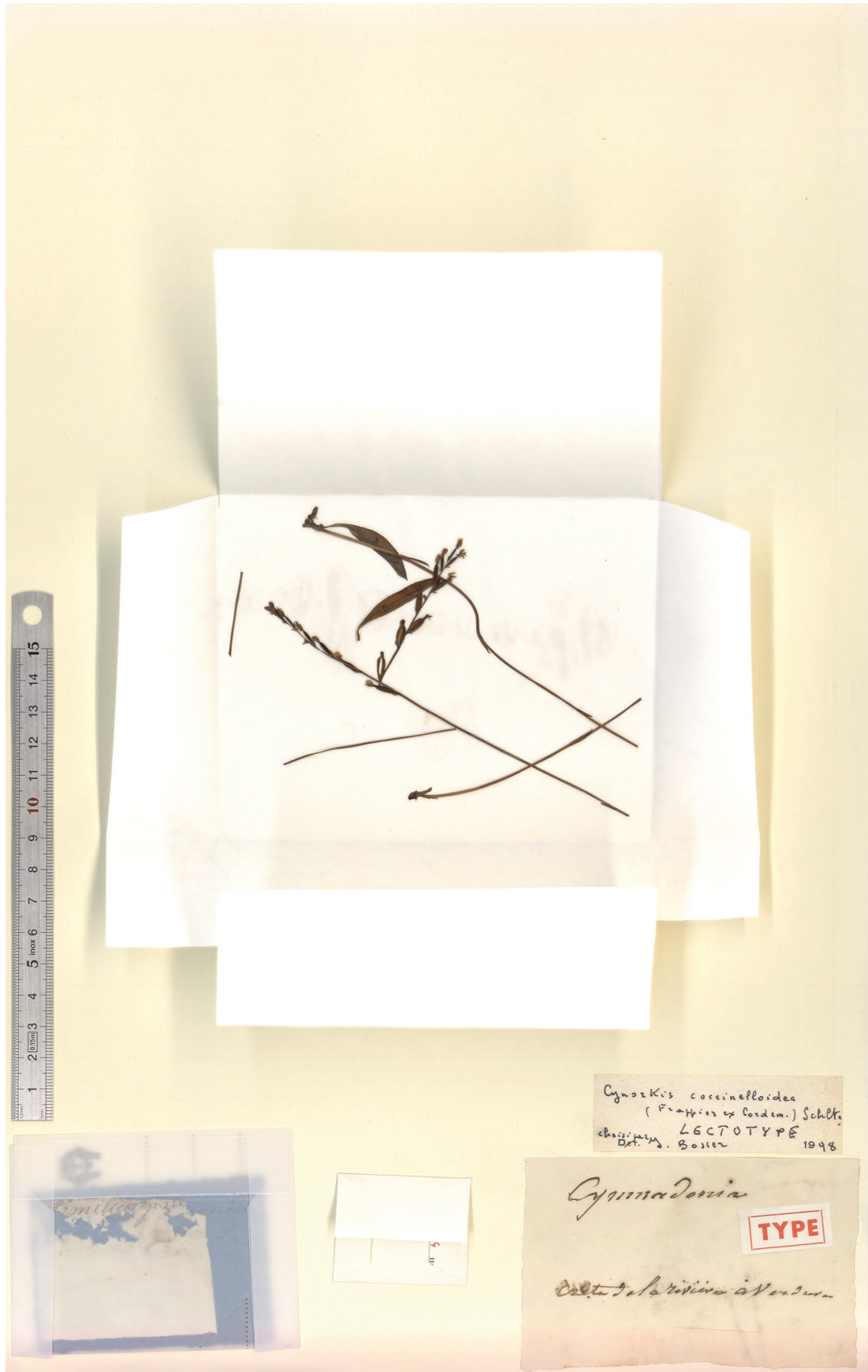


FIG. 1. — *Cynorkis coccinelloides* (Frapp.) Schltr.: lectotype identified by Jean Bosser, housed at REU.



FIG. 2. — *Cynorkis flexuosatis* (Thouars) Hermans: only known specimen (MAU22810).



FIG. 3. — **A**, *Cynorkis trilinguis* (Frapp.) Schltr.; **B**, *Cynorkis coccinelloides* (Frapp.) Schltr. Arrows indicate the labellum. Photos: Frédéric Henze.

Hemipervis exilis Frapp., *Orchidées de l'Île de La Réunion*: 11 (Frappier 1880), *nomen nudum*; Frapp. in Cordem., *Flore de l'Île de La Réunion*: 238 (Cordemoy 1895), **syn. nov.** — *Cynorkis exilis* (Frapp.) Schltr., *Beihfte zum Botanischen Centralblatt* 33 (2): 400 (Schlechter 1915), **syn. nov.** — Type: France. La Réunion, Tampon, Pitons Mare à Boue, 1650 m, 1.III.2002, Pailler 36 (neo-, here designated: REU[REU017516]).

Hemipervis affinis Frapp., *Orchidées de l'Île de La Réunion*: 11 (Frappier 1880), *nomen nudum*, **syn. nov.**

Cynorkis brachycentra A.Rich. ex Kraenzl. [as *Cynosorchis brachycentra*], *Orchidacearum genera et species* 1: 484 (Kraenzlin 1901), **syn. nov.**

Cynorkis flexuosatis (Thouars) Hermans
(Fig. 2)

In *Lankesteriana* 21 (2): 105 (Hermans & Cribb 2021). — *Satorkis flexuosatis* Thouars, *Histoire particulière des plantes orchidées recueillies sur les trois Îles Australes d'Afrique*: t. 7 (Thouars 1822). — *Satyrium flexuosum* Thouars, *Histoire particulière des plantes orchidées recueillies sur les trois Îles Australes d'Afrique*: t. 7 (Thouars 1822), *nomen illegitimum*. — *Gymnadenia flexuosa* (Thouars) A.Rich., *Mémoires de la Société d'Histoire naturelle de Paris* 4: 25 (Richard 1828). — *Peristylus flexuosus* (Thouars) S.Moore, *Journal of Botany* 5: 293 (Moore 1876). — Type: Mauritius. *Histoire particulière des plantes orchidées recueillies sur les trois Îles Australes d'Afrique*: t. 7 (Thouars 1822).

Acknowledgements

We thank Tariq Stévant and Emmanuel Côté for improving the manuscript. This work would not have been possible without access to the Biodiversity Heritage Library.

REFERENCES

- BOSSER J. 2007. — Contribution à l'étude des Orchidaceae de Madagascar, des Comores et des Mascareignes. XXXVI. Description d'un *Cynorkis* nouveau de La Réunion et d'un *Angraecum* nouveau de Madagascar. *Adansonia* 29 (1): 13-17.
- BOSSER J. 2011. — À propos de la citation du nom d'auteur de certaines orchidées établies dans la "Flore de l'île de la Réunion" de E. Jacob de Cordemoy (1895). *L'Orchidophile* 189: 117-119.
- BYTEBIER B. 2019. — *Cynorkis citrata* is the correct name for *Cynorkis citrina* (Orchidaceae, Orchidoideae). *Phytotaxa* 409 (1):46-48. <https://doi.org/10.11646/phytotaxa.409.1.6>
- BYTEBIER B. & PAILLER T. 2019. — A new combination in *Cynorkis* (Orchidaceae, Orchidoideae) for the Mascarenes. *Phytotaxa* 394 (4):299-300. <https://doi.org/10.11646/phytotaxa.394.4.7>
- CORDEMOY J. E. 1895. — *Flore de l'Île de la Réunion. Phanérogames, cryptogames, vasculaires, muscinées avec l'indication des propriétés économiques et industrielles des plantes*. P. Klincksieck, Paris, 574 p. <https://www.biodiversitylibrary.org/page/21709618>
- FRAPPIER C. DE M. 1880. — *Orchidées de l'Île de La Réunion. Catalogue des espèces indigènes découvertes jusqu'à ce jour extrait d'une monographie inédite des mêmes plantes*. Gabriel et Gaston Lahuppe, Saint-Denis, Réunion, 16 p.
- GOVAERTS R., BERNET P., KRATOVCHIL K., GERLACH G., CARR G., ALRICH P., PRIDGEON A. M., PFAHL J., CAMPACCI M. A., HOLLAND BAPTISTA D., TIGGES H., SHAW J., CRIBB P. J., GEORGE A., KREUZ, K. & WOOD J. J. 2021. — *World Checklist of Orchidaceae*. Available from: <https://wccsp.science.kew.org/qsearch.do> [accessed 7 June 2021].
- HASSLER M. 2004-2021. — *World Orchids. Synonymic Checklist and Distribution of the Orchids of the World*. Version 12.3; last update May 28 2021. <https://www.worldplants.de/orchids/> [accessed 7 June 2021].
- HERMANS J. & CRIBB P. 2021. — New combinations and other taxonomic changes for the forthcoming 'Flore des Mascareignes' Orchidaceae accounts. *Lankesteriana* 21 (2): 61-137. <https://doi.org/10.15517/lank.v21i2.47156>

- KRAENZLIN F. 1901. — *Orchidacearum genera et species*. Vol. 1. Mayer & Mueller, Berlin, 986 p. <https://www.biodiversitylibrary.org/page/15443727>
- MOORE S. LE M. 1876. — On the orchids collected at the island of Bourbon, during the transit of Venus expedition, by Dr. I. B. Balfour. *Journal of Botany* 5: 292-294. <https://www.biodiversitylibrary.org/page/9103487>
- NGUGI G., LE PÉCHON T., MARTOS F., PAILLER T., BELLSTEDT D. & BYTEBIER B. 2020. — Phylogenetic relationships amongst the African genera of subtribe Orchidinae *s.l.* (Orchidaceae; Orchideae): implications for subtribal and generic delimitations. *Molecular Phylogenetics and Evolution* 153: 106946. <https://doi.org/10.1016/j.ympev.2020.106946>
- PAILLER T. 2020. — Un nouveau *Cynorkis* (Orchidaceae) pour la flore des Mascareignes. *Plant Ecology and Evolution* 153 (3): 492-497. <https://doi.org/10.5091/plecevo.2020.1671>
- PAILLER T., ANDILYAT M., ANDRIANARIVO M., BAIDER C., BYTEBIER B., FILER D., HENZE F., MOREL C., RAPANARIVO S., RAKOTOARINIVO M. & RAZAFIMANDIMBY H. 2018. — *Guide des orchidées des îles de l'Océan Indien : Espèces indigènes et endémiques*. Université de La Réunion : Commission de l'Océan Indien, Mauritius, 174 p. https://www.commissionoceanindien.org/wp-content/uploads/2020/01/Guide_Des_Orchidees_LOWRES_BD.pdf
- RICHARD A. 1828. — Monographie des orchidées des Îles de France et Bourbon. *Mémoires de la Société d'Histoire naturelle de Paris, sér. 2, 4*: 1-83 + 11 pl. <https://gallica.bnf.fr/ark:/12148/bpt6k985693.texteImage>
- SCHLECHTER R. 1915. — Kritische Aufzählung der bisher von Madagaskar, den Maskarenen, Komoren und Seychellen bekanntgewordenen Orchidaceen. *Beihfte zum Botanischen Centralblatt* 33: 390-440. <https://www.biodiversitylibrary.org/page/33651984>
- SZLACHETKO D. L. & KRAS M. 2006. — Matériaux pour la révision des Habenariinae (Orchidaceae, Orchidoideae) – 6. *Richardiana* 6: 139-146. <https://www.biodiversitylibrary.org/page/56992138>
- THOUARS A. A. DU PETIT 1809. — Extrait de trois mémoires lus à la première classe de l'institut, sur l'histoire des plantes orchidées des îles australes d'Afrique. *Nouveau Bulletin des Sciences de la Société Philomatique de Paris* 1: 314-319. <https://www.biodiversitylibrary.org/page/4123300>
- THOUARS A. A. DU PETIT 1822. — *Histoire particulière des plantes orchidées recueillies sur les trois Îles Australes d'Afrique*. L'auteur, Paris, 32 pp., 109 plates. <https://www.biodiversitylibrary.org/page/516130>
- TURLAND N. J., WIERSEMA J. H., BARRIE F. R., GREUTER W., HAWKSWORTH D. L., HERENDEEN P. S., KNAPP S., KUSBER W.-H., LI D.-Z., MARHOLD K., MAY T. W., MCNEILL J., MONRO A. M., PRADO J., PRICE M. J. & SMITH G. F. 2018. — *International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code)*. Regnum Vegetabile 159. Koeltz Botanical Books, Glashütten., <https://doi.org/10.12705/Code.2018>

*Submitted on 28 June 2021;
accepted on 21 October 2021;
published on 7 March 2022.*