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Molecular phylogeny and taxonomic synopsis of the angraecoid genus *Ypsilopus* (Orchidaceae, Vandeae)

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Abstract Previous phylogenetic analyses focused on angraecoid orchids suggested that the genus *Ypsilopus* was paraphyletic and that some species of *Tridactyle* and *Rangaeris* belong to a clade that included *Ypsilopus*. These studies, based on three to four genes, sampled few taxa in each genus, and did not include the type of *Rangaeris*, nor did they take morphological variation into account. To delineate *Ypsilopus* more precisely, we reconstructed phylogenetic relationships of the genus and seven other closely related genera by analysing sequence variation at the nuclear ribosomal internal transcribed spacer (ITS-1) and at five plastid markers (*matK*, *rps16*, *trnC-petN* intergenic spacer, *trnL-trnF* intergenic spacer, *ycf1*), from 42 specimens representing 36 taxa. Trees based on maximum likelihood and Bayesian inference confirm that two species of *Tridactyle* are nested with three *Ypsilopus* species, including the type of the latter, and two species of *Rangaeris* are grouped with this clade. Moreover, we examined morphological variation among all species belonging to these three genera, highlighting morphological features that characterize *Ypsilopus*, and we used these data to assign the two species of *Tridactyle* included in the molecular analyses, three other species of *Tridactyle* not included in the molecular analyses and two species of *Rangaeris* to *Ypsilopus*. New combinations for *Tridactyle citrina*, *T. furcistipes*, *T. sarcodantha*, *T. tanneri*, *T. tricuspis*, *Rangaeris amaniensis* and *R. schliebenii* in *Ypsilopus* are thus proposed, and one new section (i.e., *Ypsilopus* sect. *Barombiella*) is described. Keys to the species of *Ypsilopus* and closely related genera are provided, along with a table of characters that can be used to differentiate these species.

Keywords East Africa; Epidendroideae; generic recombination; molecular phylogeny; morphology; Orchidaceae

Supporting information may be found online in the Supporting Information section at the end of the article.

INTRODUCTION

The genus *Ypsilopus* Summerh. is a member of tribe Vandeae and subtribe Angraecinae (ca. 760 spp.), one of the most taxonomically problematic groups within the large subfamily Epidendroideae of Orchidaceae (Chase & al., 2015). The genus was named after the Greek letter *Y*, *upsilon*, because of the characteristic shape of the stipes, which is single but apically bifurcated, each part presenting one pollinium (Summerhayes, 1949). The current circumscription of *Ypsilopus* encompasses five species (Govaerts & al., 2018), all native to tropical East Africa to South Africa (Kenya, Rwanda, South Africa and United Republic of Tanzania), with *Y. longifolius* (Kraenzl.) Summerh. as its type. These species occur mostly in montane rainforests or woodlands, located between 1500 and 2500 m of elevation.

Summerhayes (1949) and Rice (2005) pointed out the similarity between *Ypsilopus* and *Aerangis* Rchb.f. and *Rangaeris* (Schltr.) Summerh. but differentiated *Ypsilopus* by its extremely narrow, grass-like leaves, the truncate rostellum that is dilated at the apex, and the rather broadly deflexed, large and reniform viscidium.

In the large phylogenetic study of angraecoid orchids by Simo-Droissart & al. (2018), many taxonomic problems were uncovered among the genera of this group, including the paraphyly of *Ypsilopus*, *Tridactyle* Schltr. and *Rangaeris*. More specifically, the study indicated that *Tridactyle tanneri* P.J.Cribb, *Rangaeris schliebenii* (Mansf.) P.J.Cribb and *R. amaniensis* (Kraenzl.) Summerh. are grouped within a clade that also includes *Ypsilopus viridiflorus* P.J.Cribb & J.Stewart, confirming earlier results of Carlsward & al. (2006). The position of *Y. longifolius*, the type, was not clear, as it was grouped with *Tridactyle furcistipes* Summerh. in the study of Carlsward & al. (2006) and in an unresolved clade in Simo-Droissart & al. (2018). The morphological affinity of *Tridactyle* to *Ypsilopus* was noted by Cribb & al. (1989) and Rice (2005), but taxon sampling in the studies of Carlsward & al. (2006) and Simo-Droissart & al. (2018) was insufficient to allow taxonomic changes, nor did they assess morphological variation.

The study of Freudenstein & Chase (2015) mixed ITS, *matK* and *trnL-trnF* from *Rangaeris amaniensis* and *ycf1* from *R. muscicola* (Rchb.f.) Summerh. as representatives of the genus *Rangaeris*, and similarly grouped *Rangaeris* with *Ypsilopus* but was not focused on the infrageneric level.

Within the framework of a current taxonomic revision of *Tridactyle* conducted by the first author, we investigated the morphology of the *Tridactyle* species and, after the results obtained by Simo-Droissart & al. (2018), we decided to also investigate the morphology of *Rangaeris amaniensis*, *R. schliebenii* and the five species recognized in *Ypsilopus*, to examine in further detail the phylogenetic position of these genera.

The purpose of this study, therefore, is to investigate the phylogenetic relationships of *Ypsilopus*, *Rangaeris* and *Tridactyle*. Herein, we present a phylogenetic analysis based on nrITS-1 and five plastid markers. We compare the tree based on our maximum likelihood and Bayesian analyses to those of other studies (Carlsward & al., 2006; Simo-Droissart & al., 2018) and provide a taxonomic treatment with identifications keys to the recircumscribed genus *Ypsilopus* and to related genera.

MATERIALS AND METHODS

Taxon sampling. — Forty-two samples representing 36 taxa in the following eight genera were sampled: *Cyrtorchis* Schltr. (outgroup), *Listrostachys* Rchb.f., *Nephrangis* (Schltr.) Summerh., *Plectrelminthus* (Lindl.) Summerh., *Rangaeris*, *Solenangis* Schltr., *Tridactyle* and *Ypsilopus* (Appendix 1). We selected *Cyrtorchis* as the outgroup based on the phylogenetic studies of Angraecoids (Carlsward & al., 2006; Simo-Droissart & al., 2018). Samples were obtained from São Tomé and Príncipe, Guinea-Bissau, Guinea Conakry, Liberia, Ivory Coast, Cameroon, Rio Muni (Equatorial Guinea), Gabon, Democratic Republic of the Congo, Rwanda, Kenya, Tanzania and South Africa. Plants from Cameroon and Gabon

were grown in shadehouses monitored by our teams in Yaoundé (for those collected in Cameroon) and in Libreville, Tchimbélé and Sibang (for those collected in Gabon). This procedure allows both the harvesting of leaves for DNA extraction and the cultivation of the plants until they produce flowers, ensuring accuracy in species identification (Stévart, 2003).

DNA amplification and sequencing. — Genomic DNA was extracted from silica-gel dried leaf material, using a modified version of the Doyle & Doyle (1987) protocol (using 0.3 g of dried material) or the NucleoSpin plant kit protocol from Macherey-Nagel (Düren, Germany), following the manufacturer's instructions. The following primers were used for PCR amplification and DNA sequencing: (i) for nrITS-1, primers ITS-A and ITS-C were used (Blattner, 1999); (ii) for *matK*, primers 19F (Molvray & al., 2000), 1326R (Cuénoud & al., 2002), 390F (Cuénoud & al., 2002) and trnK-2R (Johnson & Soltis, 1994); (iii) for the *rps16* intron, primers rps16-1F and rps16-2R (Oxelman & al., 1997); (iv) for the *trnC-petN* intergenic spacer, primers trnC and petN-1R (Lee & Wen, 2004); (v) for the *trnL-trnF* intergenic spacer, primers trnL(UAA) 3′ exon and trnF(GAA) gene (Taberlet & al., 1991); and (vi) for *ycf1*, primers 3720F, IntR, IntF and 5500R (Neubig & al., 2009). PCR amplifications were carried out in one of three thermocyclers (Biometra TProfessional thermocycler, PTC-100 or PTC-200, Bio-Rad Laboratories), all of which contained 0.125 µl (5 U/µl) of Taq polymerase (Qiagen, Valencia, California, U.S.A.), 0.25 µl of each primer (10 µM), 1–2 µl of template genomic DNA extract (of unquantified concentration), 2.5 µl PCR buffer, 1 µl $MgCl_2$ (25 mM), 0.5 µl dNTPs (10 µM) and ultrapure H_2O to a final volume of 25 µl. The amplification program included an initial denaturation at 94°C (3 min), 30 cycles of denaturation at 94°C (30 s), annealing at 50°C (*ycf1*) or 52°C (all others) (30 s), and elongation at 72°C (1 min 30 s for *matK* and *ycf1*, 1 min for all others), and a final elongation step at 72°C for 10 min.

Purification of amplified products was conducted by enzymatic digestion using Exosap (Qiagen). Cycle sequencing was carried out, in both directions, using the Big Dye Terminator v.3.1 Cycle Sequencing Kit (Applied Biosystems, ABI, Lennik, the Netherlands). Sequencing was performed with the same primers used for PCR amplifications, and the reaction mixture included 1.5 µl of sequencing buffer, 1 µl of BigDye terminator, 0.2 µl of 10 µM primer, 1–3 µl of unquantified amplified product and 4.3–6.3 µl of H_2O, for a total reaction volume of 10 µl. More detailed information on cycle sequencing conditions is provided in Simo-Droissart & al. (2013). These sequences were combined with 113 previously published sequences (Carlsward & al., 2006; Simo-Droissart & al., 2018), obtained from GenBank (http://www.ncbi.nlm.nih.gov/genbank/). Voucher specimens and respective metadata are provided in Appendix 1.

Alignment and phylogenetic analyses. — Automatic base calling was verified manually by examining electropherograms in Geneious v.9.0.5 (Drummond & al., 2012). Sequences were automatically aligned in ClustalW v.2.0, using default settings (Cost Matrix: IUB, Gap open cost: 15, Gap extent cost: 6.66) (Thompson & al., 1994), and then manually adjusted in Geneious. We conducted separate phylogenetic analyses on a nuclear dataset based on nrITS-1 (suppl. Appendix S1), a plastid dataset based on the combination of the five plastid markers (*matK*, *rps16*, *trnC-petN* intergenic spacer, *trnL-trnF* intergenic spacer, *ycf1*) (suppl. Appendix S2) and a combined nuclear and plastid dataset (suppl. Appendix S3). Gaps were also coded and added to matrices for analyses as detailed hereafter. We used maximum likelihood (ML) and Bayesian inference (BI) to analyse the phylogenetic relationships among the different genera. Substitution models were selected for each dataset using the four criteria implemented in jModelTest v.2.1.10 (Darriba & al., 2012). Site heterogeneity was modelled using a gamma distribution. The ML analyses were run with RAxML-HPC BlackBox v.8.2.10 (Stamatakis, 2014) through the CIPRES Science Gateway (Miller & al., 2010). We analysed support through a bootstrap analysis by letting RAxML halt the bootstrapping automatically when the required criteria were met, instead of specifying the number of bootstraps for the analysis. We considered bootstrap support (BS) values as poor (<50%), weak (50%–70%), moderate (>70%–85%), or strong (>85%) (Kress & al., 2002). PartitionFinder v.2.1.1 (Lanfear & al., 2016) was used to select the best-fitting model for each marker, using the second-order information criterion (corrected Akaike information criterion) for model selection. The model available in CIPRES that was closest to those suggested by jModelTest 2 and PartitionFinder 2 was GTR+Γ for the three matrices (combined, plastid, nrITS-1). The exact criteria were specified/configured using subsequent entry fields on CIPRES. BI analyses were carried out using MrBayes v.3.2.6 x86 (Huelsenbeck & Ronquist, 2001; Ronquist & al., 2012). We considered posterior probabilities (PP) as poor (<0.90), weak (0.90 to <0.95), moderate (0.95 to <0.98), and strong (≥0.98) (Erixon & al., 2003). The models available in MrBayes that were closest to those suggested by jModelTest 2 were HYK+Γ for nrITS-1, and suggested by PartitionFinder 2 were GTR+Γ, GTR+I+Γ, HKY+I+Γ and F81+I+Γ for both the plastid loci dataset and the combined nuclear plus plastid matrix. We performed two runs in parallel of four MCMC for 20×10^6 (30×10^6 for the combined matrix) generations, with trees sampled every 1000

generations (Huelsenbeck & Ronquist, 2001). To estimate clade posterior probabilities, a 50% majority-rule consensus was built from the remaining sampled trees. Convergence between both runs and stationarity were checked onto the stationary distribution by examining whether the potential scale-reduction factor was close to 1 in the pstat file, standard deviation of split frequencies fell below 0.01 in the log file, and examining the p file using the program Tracer v.1.7.1 (Rambaut & al., 2018).

Indel coding and analysis. — Gaps were treated as missing data, but insertion/deletions (indels) were coded as single characters irrespective of their length, and inserted at the end of the sequence alignment (Swofford, 1993; Simmons & Ochoterena, 2000; Freudenstein & Chase, 2001; Ogden & Rosenberg, 2007; Peraza-Flores & al., 2016). We used the multistate gap region method (Young & Healy, 2003). In this method, when indels of different lengths overlapped, each length was considered a different character state for the corresponding multistate gap region. All subsequent phylogenetic analyses were conducted both excluding and including additional indel characters. When indel characters were included, we applied to them the same substitution models that were applied to regular nucleotide characters, as other studies using the multistate gap region method (Baum & al., 1994; Freudenstein & Chase, 2001; Young & Healy, 2003).

Morphological study. — A total of 1099 specimens of *Ypsilopus*, *Rangaeris* and *Tridactyle* were examined from ten herbaria (BM, BR, BRLU, COI, K, LISC, LISU, P, UPS, WAG) using standard herbarium practices (de Vogel, 1987) (suppl. Appendix S4). Type specimens not available in these herbaria were consulted through the Global Plants facility (https://plants.jstor.org/). Additionally, photographs of living plants were retrieved from the World Orchid Iconography of the Swiss Orchid Foundation at the Herbarium Jany Renz and the Botanical Institute of the University of Basel (WOI, 2018). The terminology used to describe the material followed the Systematics Association Committee for Descriptive Biological Terminology (1962a,b), Stearn (2004) and, for shapes and colour, *The Kew plant glossary* (Beentje, 2010).

The table of diagnostic characters (Table 1) is based largely on first-hand observations, but the original descriptions and protologues were also used to complete it. Additional photographs were taken with a camera Canon Eos 700D, measurements and morphological study of spirit material were carried out using an optical stereomicroscope (Zeiss STEMI SV11).

RESULTS

Phylogenetic analyses. — We generated a total of 110 new sequences: 5 of ITS-1, 5 of *matK*, 7 of *trnL-trnF* intergenic spacer, 29 of *trnC-petN* intergenic spacer, 32 of *rps16* and 32 of *ycf1*. All sequences were deposited in GenBank (Appendix 1). The number and percentage of identical sites for each marker are: 191 (58.8%; ITS-1), 1669 (91.1%; *matK*), 673 (74%; *rps16*), 251 (65.5%; *trnC-petN* intergenic spacer), 251 (65.5%; *trnL-trnF* intergenic spacer) and 1343 (78.2%; *ycf1).* We combined them with sequences available from GenBank and generated three datasets: the nrITS-1 dataset comprised 32 sequences (representing 31 taxa) with an aligned length of 319 characters; the plastid dataset included 42 sequences (36 taxa) with 5254 characters (*matK*: 1465, *rps16*: 909, *trnC-petN* intergenic spacer: 774, *trnL-trnF* intergenic spacer: 383, *ycf1*: 1723 characters), and the combined dataset contained 42 sequences (36 taxa) with 5513 characters. Trees inferred from the plastid and from the combined datasets were better resolved than the tree inferred from the nrITS-1 dataset alone.

Phylogenetic reconstructions produced with BI and ML methods resulted in congruent topologies and differed only in unsupported nodes. Congruence between nuclear and plastid trees was assessed by comparing individual trees and indicating disagreements. The outgroup *Cyrtorchis* is recovered in all trees in both analyses. Another clade is recovered at the base of every tree, which corresponds to *Rangaeris muscicola*. Three clades A, B and C (Figs. 1–3) were recovered in both analyses and in all trees: Clade A, containing *Nephrangis* (one species) and *Solenangis* (three species in the nrITS-1 analysis and four in the others), with support values of 1.0 (PP) and 100 (BS) in the combined analyses (Fig. 1); of 1.0 (PP) and 99 (BS) in the plastid analyses (Fig. 2) and of 0.56 (PP) and 25 (BS) in the nrITS-1 analyses (Fig. 3). This clade is the sister clade of all others, outgroups excluded. Clade B, containing *Tridactyle tanneri* and *Ypsilopus viridiflorus*, with support values of 1.0 (PP) and 100 (BS) in the combined (Fig. 1) and plastid analyses (Fig. 2), and of 1.0 (PP) and 97 (BS) in the nrITS-1 analyses (Fig. 3). Clade B is the sister clade of Clade C, containing *Tridactyle furcistipes*, *Ypsilopus erectus* and *Y. longifolius*, with support values of 1.0 (PP) and 100 (BS) in the combined (Fig. 1) and plastid analyses (Fig. 2), and of 0.93 (PP) and 60 (BS) in the nrITS-1 analyses (Fig. 3).

Three other clades, D, E and F, are recovered in both analyses only in the combined and in the plastid trees (Figs. 1, 2). Clade D, containing *Rangaeris amaniensis* (2 specimens) and *R. schliebenii*, with support values of 1.0 (PP) and 94 (BS) in the combined (Fig. 1) and of 1.0 (PP) and 96 (BS) in the plastid analyses (Fig. 2), is grouped as the sister clade of Clade B and C. It is not recovered in the nrITS-1 tree as we had only succeeded to sequence one specimen of *R. amaniensis* for this marker. In the nrITS-1 tree, this species is in a polytomy with seven other clades (Fig. 3). Clade E contains *Plectrelminthus caudatus* (2 specimens) and *Listrostachys pertusa* (3 specimens), with support values of 1.0 (PP) and 100 (BS) in the combined (Fig. 1) and plastid analyses (Fig. 2). In the nrITS-1 tree, these two species (1 specimen each) are placed in the polytomy with seven other clades (Fig. 3). Clade F contains all the *Tridactyle* species included in our analyses, except for *T. tanneri* and *T. furcistipes* (20 taxa, 22 specimens). This clade is the sister clade of Clade E, with support values of 1.0 (PP) and 97 (BS) in the combined (Fig. 1) and plastid analyses (Fig. 2). In Clade F, the only phylogenetic position of a species that differed in the nrITS-1 tree (Fig. 3) compared to the combined and plastid trees (Figs. 1, 2) is the position of *T. exellii*. Indeed, in the nrITS-1 analyses, *T. exellii* is placed in the polytomy with seven other clades, but in the plastid and combined analyses, this species is placed in Clade F, with *T. latifolia*, *T. tridactylites*, *T. lisowskii* and *T. nalaensis* with support values of 0.57 (PP) and 57 (BS) in the combined (Fig. 1) and of 0.77 (PP) and 73 (BS) in the plastid analyses (Fig. 2).

Analyses with indels. — The coding of indel characters with the simple coding scheme yielded 112 variable characters for the plastid regions and 6 variable characters for the ITS regions. The results of the ML and BI analyses of the plastid data without coded indels (suppl. Fig. S1) were similar to the analyses including indels but some clades had higher BS and PP support values or were better resolved in the indel-coded analyses (Fig. 2). The analysis of the nrITS-1 data with indels coded (Fig. 3) produced a much more resolved topology than the analysis without indels coded (suppl. Fig. S2). The clades recovered with good support in the nrITS-1 analysis without indels coded are the same in the analysis with indel coded.

Morphological survey. — *Nephrangis* and *Solenangis* are sister groups in clade A, but present very different vegetative and floral characteristics (*Nephrangis* has needle-shaped leaves; a kidney-shaped labellum; an elongate rostellum, shortly recurved at the apex; and two spathulate-liguliform stipites; *Solenangis* has oval leaves; a small labellum, embracing the base of the column; a rostellum entire, extrorse, more or less bifid or notched apically; and a single stipes).

Species in Clades B and C are characterized by a combination of three characters: short stems (less than 30 cm); flattened, conduplicate leaves; and terete inflorescences arising from the axils of leaves (Figs. 1, 4A,D,E,G).

The type of the genus, *Ypsilopus longifolius*, is grouped in Clade B, along with *Y. erectus* and *Tridactyle furcistipes*, sharing leaves that are arranged in a fan. Three other species of *Tridactyle* share this same feature: *T. citrina* P.J.Cribb, *T. sarcodantha* Mansf. and *T. tricuspis* (Bolus) Schltr. (Fig. 4C). They correspond to the informal "section H" according to Summerhayes (1948), which he characterized as follows: "Inflorescence long; lip with relatively long narrow undivided portion, middle lobe acuminate, much longer than laterals; basical auricles rounded, not very distinct; stipes of pollinia usually bifid in upper portion."

Species in Clade D (*Rangaeris amaniensis*, *R. schliebenii*) have leaves not arranged in a fan, but slightly spaced out along the stem. These species also share unique floral characteristics, such as long column (>5 mm) and spur (>7.5 cm), compared to those of Clade B, where the column is similar in shape but smaller (<2 mm), and the spur does not exceed 5 cm (Fig. 4B,F). Besides these distinctive characteristics, Clade D shares with Clades B and C the Y-shaped stipes, the characteristic Summerhayes (1949) used to describe the genus *Ypsilopus*.

Unfortunately, we could not include *Rangaeris trilobata* Summerh. and *R. longicaudata* (Rolfe) Summerh. in our molecular analysis, but the specimens preserved in BR, BRLU, K, and P did permit us to examine the stipites, which are clearly two in number.

Clade E contains *Plectrelminthus* and *Listrostachys*, two monospecific genera that present very different vegetative and floral characteristics: *Plectrelminthus* presents long inflorescences (up to 80 cm), large flowers (10 cm) hyper-resupinate (360°), with a very long looped spur (15–25 cm), while *Listrostachys* presents much shorter inflorescences (15–20 cm), small flowers (1 cm) not hyper-resupinate, the lip having a claw at its base that separates the spur entrance from the base of the column, and a claviform spur slightly curved (4–6 mm).

Species in Clade F are different from those in Clades B, C and D by long stems (usually more than 50 cm), leaves that are spread along the stem, distichous, usually twisted at the base, lips that are auriculate at the base, and a single entire stipes bearing two pollinia. This clade contains only *Tridactyle*, including the type, *T. bicaudata*. We included representatives from all sections of the genus (see Summerhayes, 1948) in our study, and we examined the morphology of all species of

Tridactyle (type specimens included). Besides of the species corresponding to the informal "section H" of Summerhayes (1948), they all share the same morphological features.

Clades E and F are sisters, and the characteristic they share is, once again, the stipes, which is entire for the three genera (*Listrostachys*, *Plectrelminthus*, *Tridactyle*). Their viscidia, however, are quite different (*Listrostachys* has a reniform viscidium, *Tridactyle* a circular or elliptic one and *Plectrelminthus* an elliptic one).

DISCUSSION

Our results are consistent with previous molecular analyses (Carlsward & al., 2006; Freudenstein & Chase, 2015; Simo-Droissart & al., 2018). We were able to further resolve the relationships among seven genera of angraecoid orchids (Fig. 1): *Listrostachys*, *Nephrangis*, *Plectrelminthus*, *Rangaeris*, *Solenangis*, *Tridactyle* and *Ypsilopus.* As *Listrostachys*, *Nephrangis*, *Plectrelminthus* and *Solenangis* present very different vegetative and floral characteristics, we recommend to maintain them as distinct genera. By transferring some species of *Rangaeris* and *Tridactyle* to *Ypsilopus*, these genera become all monophyletic and easily identifiable by morphological characteristics as well (see the Key to the genera below). The most informative characters to distinguish the genera are the shape of the labellum and spur, and the resupination and shape of the stipes. Thanks to the great number of species included in our study, we were able to improve the reconstruction of relationships among the species of *Rangaeris*, *Tridactyle* and *Ypsilopus.* As *Rangaeris muscicola*, the type of the genus, was not placed in the same clade as *R. amaniensis* and *R. schliebenii*, and these two species share morphological characteristics with *Ypsilopus*, they were transferred to *Ypsilopus* to restore the monophyly of *Rangaeris*, which includes therefore three species. We were not able to include *R. longicaudata* and *R. trilobata* in our molecular analyses, but the morphological characteristics of these species, particularly their double stipes, allows us to conclude that they do not belong to *Ypsilopus*. Furthermore, contrary to *Ypsilopus*, which is confined to East Africa and the Zambesian Region, *R. longicaudata* and *R. trilobata* are endemic to the Guineo-Congolian Region.

Morphologically, we emphasize the importance of the stipes and the rostellum as two discriminant characters among these three genera. The stipes of *Tridactyle* is single, and the rostellum is elongate and tapering to the apex; *Rangaeris* has two stipites, and the rostellum is bifid, while the stipes of *Ypsilopus* is Y-shaped, and the rostellum is geniculate and 2-lobed. The rostellum plays a role in pollination, acting as a mechanical barrier between the stigma and pollinia (Dressler, 1993) and, after pollinia excision, as a transducer activating flower senescence (Yam & al., 2009).

Geographically, among the eight genera present in our study, *Ypsilopus* is the only one occurring solely in East and South Africa. *Listrostachys* and *Plectrelminthus* are restricted to Central and West Africa, while the others are broadly distributed (Fig. 5).

In this paper, molecular and morphological evidence was used to identify the paraphyly in *Tridactyle* and *Rangaeris*, and to reassess the position of seven species that are now treated in *Ypsilopus*: *Y. amaniensis* comb. nov., *Y. citrinus* comb. nov., *Y. furcistipes* comb. nov., *Y. sarcodanthus* comb. nov., *Y. schliebenii* comb. nov., *Y. tanneri* comb. nov. and *Y. tricuspis* comb. nov. Indeed, these species share most of the characters of the genus, particularly the most important feature, the Y-shaped stipes, a character that has been missed by previous researchers as crucial for the taxonomy of the angraecoid genera. For example, the specific epithet of *Y. furcistipes* refers specifically to its forked stipes. Besides, former authors did not have access to molecular data, which have allowed us to identify the Y-shaped stipes as a synapomorphy of this genus. In addition, stipites are very tiny structures that were not taken into account as much as others and are also difficult to observe in herbarium specimens. Access to spirit-preserved specimens is, in this case, more useful.

Rostellum structure and stipes also seem to be informative characters in reconstructing phylogenetic relationships among Angraecoids. The structure of the rostellum and associated floral parts has often been used to differentiate taxa (e.g., Lindley, 1840; Dressler, 1993). Among the taxa of tribe Vandeae, several genera have been created based largely on the diversity in rostellum morphology (Dressler, 1993). For example, the structure of the rostellum has been considered a key feature differentiating *Margelliantha* from *Rhipidoglossum* (Cribb, 1979). More recently, Zhang & al. (2016) found that the column had similar value in resolving infrageneric relationships in *Paphiopedilum*. Future studies of the relationship between rostellum morphological diversity and reproductive biology will greatly improve our knowledge of the evolution of the diverse angraecoid lineage.

Finally, the nothogeneric ×*Ypsilactyle* J.M.H.Shaw, reported as a possible natural hybrid between *Ypsilopus erectus* and

Tridactyle tricuspis (*Y. tricuspis*) in Malawi by la Croix & Cribb (1998), is no longer intergeneric but interspecific. After careful observation of the only specimen available, this hybrid was found to be similar to *T. furcistipes* (*Y. furcistipes*). Up to this sample, *T. furcistipes* (*Y. furcistipes*) was only found between 2500 and 2850 m altitude. In light of the above findings, our understanding of this case is that *T. furcistipes* (*Y. furcistipes*) is the hybrid between *Y. erectus* and *T. tricuspis* (*Y. tricuspis*), found at lower altitude (1600 m alt.) only in presence of the parent species, and at higher altitude alone because of heterosis effect. The name ×*Ypsilactyle* remains, however, available for use if known or postulated hybrids between *Ypsilopus* and *Tridactyle* should appear.

TAXONOMIC TREATMENT

Ypsilopus Summerh. in Kew Bull. 4(3): 439. 1949 – Type: *Y. longifolius* (Kraenzl.) Summerh.
= *Barombiella* Szlach. in Ann. Bot. Fenn. 40: 69. 2003 – Type: *Y. schliebenii* (Mansf.) D'haijère & Stévart (≡ *Leptocentrum schliebenii* Mansf.).

Diagnosis. – Most similar to *Aerangis*, *Rangaeris* and *Tridactyle* in the general appearance of the flowers but differing in the structure of the stipes; the stipes is here single in the lower two-thirds, then forked, each part bearing a single pollinium.

Description. – Epiphytic monopodial herbs with generally short stems, less than 15 cm long; the roots arise from the basal part of the stem. The leaves are dorso-ventrally flattened, arranged in a terminal fan or spread along the stem, linear, conduplicate or twisted at the base to lie in one plane. The leaf-bases are distichously overlapping, leaving acute or acuminate points at each side when the leaves drop. The inflorescences are solitary, racemose, terete, spreading to suberect, arising from the axils of leaves, laxly few- to many-flowered; the peduncle and rachis are slender and terete; the bracts are amplexicaul and small. The flowers are pale green to white, with free and subsimilar sepals and petals. The lip is entire, obscurely 3-lobed, ecallose, and spurred at the base. The column is short, terete, and lacking a foot; the rostellum is truncate and dilated at the apex; the pollinia are 2 and ellipsoid; the stipes is solitary, slender, and Y-shaped; the viscidium is single, reniform, and elliptic or oblong. (Fig. 4A)

Distribution. – East to South Africa, 500–3000 m.

Habitat and ecology. – Epiphytes in submontane or montane forest, or in shrubby vegetation.

Etymology. – *Ypsilopus* comes from the ancient Greek *upsilon*, the letter *Y*, allusion to the shape of the stipes.

A new infrageneric classification of *Ypsilopus*

To achieve a classification resulting in monophyletic, morphologically coherent and easily diagnosable taxa, we treated species of Clades B and C (Fig. 1) as belonging to one genus on the basis of our morphological and molecular analyses. These species share the remarkable characteristics of *Ypsilopus*: leaves flattened and conduplicate; inflorescences terete and arising from the axils of leaves; Y-shaped stipes. However, to highlight the genetic division and the morphological differences (including the arrangement of the leaves and the size of the column and spur), we treated them as two sections (sect. *Ypsilopus* and sect. *Barombiella*). The name of the new section *Barombiella*, containing *Rangaeris amaniensis* and *R. schliebenii*, is retrieved from the genus *Barombiella* Szlach., which is the earliest available name for a supraspecific taxon typified by either *R. amaniensis* or *R. schliebenii*.

Key to *Ypsilopus* and allied genera

1. Flowers star-shaped, labellum similar to the other petals but with a rather broader base and markedly recurved …… ***Cyrtorchis***
1. Flowers generally not star-shaped, labellum not similar to the petals …… 2
2. Labellum deflexed and abruptly dilated into a reniform lamina …… ***Nephrangis***
2. Labellum not deflexed nor dilated into a reniform lamina …… 3
3. Lip having a claw at its base that separates the spur entrance from the base of the column …… ***Listrostachys***

3. Lip not clawed at its base …… 4
4. Spur ampullaceous at the apex …… ***Solenangis***
4. Spur not ampullaceous at the apex …… 5
5. Flowers hyper-resupinate (360°), with a very long looped spur …… ***Plectrelminthus***
5. Flowers resupinate, spur not looped …… 6
6. Rostellum entire …… ***Tridactyle***
6. Rostellum bifid …… 7
7. Pollinia pyriform; stipites 2, linear or oblanceolate …… ***Rangaeris***
7. Pollinia subglobose; stipes 1, Y-shaped …… ***Ypsilopus***

Key to sections and species of *Ypsilopus*

1. Leaves spread along the stem, flower spur at least 7.5 cm long, column at least 5 mm long ..... sect. ***Barombiella***: 2
1. Leaves arranged in a fan, flower spur less than 5 cm long, column less than 2 mm ..... sect. ***Ypsilopus***: 3
2. Column longer than 2 cm ..... ***Y. schliebenii***
2. Column less than 2 cm long ..... ***Y. amaniensis***
3. Inflorescence 1–2-flowered ..... ***Y. viridiflorus***
3. Inflorescence 3- to many-flowered 4
4. Plant pendent ..... ***Y. longifolius***
4. Plant erect 5
5. Leaves shorter than 7 cm, flowers subcampanulate ..... ***Y. leedalii***
5. Leaves longer than 10 cm, flowers not subcampanulate 6
6. Lip obscurely 3-lobed, sub-rhombic to ovate, acute ..... ***Y. erectus***
6. Lip clearly 3-lobed with spreading side lobes and an acute, triangular median lobe 7
7. Spur more than 3 cm long, flowers bright yellow ..... ***Y. citrinus***
7. Spur less than 3 cm long, often much shorter, flowers white fading to orange-yellow 8
8. Leaves spotted dark green on a paler background in both fresh and dried material ..... ***Y. tanneri***
8. Leaves unspotted 9
9. Spur inflated toward the apex ..... ***Y. sarcodanthus***
9. Spur slender, not inflated 10
10. Flowers with tepals 5–7.5 mm long, side lobes erose or bifid ..... ***Y. tricuspis***
10. Flowers with tepals 8–12 mm long, side lobes slender and acute ..... ***Y. furcistipes***

1. ***Ypsilopus*** sect. ***Ypsilopus***

Ypsilopus citrinus (P.J.Cribb) D'haijère & Stévart, **comb. nov.** ≡ *Tridactyle citrina* P.J.Cribb in Kew Bull. 32(1): 183. 1977 – Holotype: Malawi. Nyika, on *Protea* trees and rocks, Dec 1966, *Williamson 230* (K barcodes K000049440! & 27461.023 [in spirit]!).

Ypsilopus erectus (P.J.Cribb) P.J.Cribb & J.Stewart in Kew Bull. 40(2): 417. 1985 ≡ *Ypsilopus longifolius* subsp. *erectus* P.J.Cribb in Kew Bull. 32(1): 177. 1977 – Holotype: Zambia. Kundalila Falls, Mar 1969, *Williamson 1545* (K barcode K000306409!; isotypes: K barcode K000306410! SRGH barcode [handwritten] SRGH0106338-0 [photo!]).

Ypsilopus furcistipes (Summerh.) D'haijère & Stévart, **comb. nov.** ≡ *Tridactyle furcistipes* Summerh. in Kew Bull. 3: 300. 1948 – Holotype: Kenya. Aberdare Mountains, Kinangop, 8800–8900′ alt., Apr 1938, *Chandler 2401* (K barcode K000306511!).

Note. – The specimen determined as a possible hybrid between *Yspilopus erectus* and *Y. tricupis* (*la Croix 133*, K barcode 45139.000 [in spirit]!) by la Croix & Cribb (1998) actually corresponds to *Y. furcistipes*.

Ypsilopus leedalii P.J.Cribb in Kew Bull. 40(2): 417. 1985 – Holotype: Tanzania. Ibala, Umalila, T9, 7000′, 19 Mar 1978, *Leedal 5135* (K barcode K000306408! & 49237.000 [in spirit]!).

Ypsilopus longifolius (Kraenzl.) Summerh. in Kew Bull. 4(3): 440. 1949 ≡ *Mystacidium longifolium* Kraenzl. in Bot. Jahrb. Syst. 17(1–2): 57. 1893 – Holotype: Kenya. Mt. Kenya, Ndoro, *von Hoehnel 31* (B†). **Neotype (designated here):** Kenya. Rift Valley, Laikipia, 1920 m, 28 Mar 1935, *Leakey 8540* (K barcode K000390316!).

= *Listrostachys graminifolia* Kraenzl. in Engler, Pflanzenw. Ost-Afrikas C: 158. 1895 ≡ *Angraecum graminifolium* (Kraenzl.) Engl. in Engler & Drude, Veg. Erde 9(2): 420. 1908 ≡ *Aerangis graminifolia* (Kraenzl.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 122. 1918 ≡ *Ypsilopus graminifolius* (Kraenzl.) Summerh. in Kew Bull. 4(3): 440. 1949 – Holotype: Tanzania. Usambara Mts., Mbalu, *Holst 2607* (B†). **Neotype (designated here):** Tanzania. Western Usambaras, Sunga-Manolo road, 1950 m, 26 May 1955, *Drummond & Hemsley 2780* (K barcode K000390302! & 10486.000 [in spirit]!).

Note. – The holotypes of *Ypsilopus longifolius* and *Y. graminifolius* were certainly lost during the bombing raid of the Berlin herbarium on the night of 1–2 March 1943. No plant material nor original illustration remains from the original gathering. The neotype of *Y. graminifolius* was chosen considering that it comes from the type locality, consists of an herbarium specimen and a spirit collection specimen and possesses the diagnostic characters of the species. The neotype of *Y. longifolius* was chosen considering that it is the specimen available the closest geographically from the type locality, and it possesses the diagnostic characters of the species.

Ypsilopus sarcodanthus (Mansf.) D'haijère & Stévart, **comb. nov.** ≡ *Tridactyle sarcodantha* Mansf. in Notizbl. Bot. Gart. Berlin-Dahlem 11: 1063. 1934 – Holotype (B†) and **Lectotype (designated here):** Tanzania. Uluguru Gebirge, Nordwestseite, 1800 m alt., 31 Mar 1933, *Schlieben 3705* (BR barcode 000008815538!).

Note. – One of the duplicates of *Schlieben 3705* of *Ypsilopus sarcodanthus* that was probably in Berlin was certainly lost during the bombing raid of the Berlin herbarium on the night of 1–2 March 1943. However, a duplicate was sent to the Botanical Garden of Belgium, and, therefore, we choose this sample as the lectotype.

Ypsilopus tanneri (P.J.Cribb) D'haijère & Stévart, **comb. nov.** ≡ *Tridactyle tanneri* P.J.Cribb in Kew Bull. 34(2): 338. 1979 – Holotype: Tanzania. Lushoto District: West Usambara Mts, Mazumbai Forest Reserve, 5800′, 7 Jan 1976, *Cribb & Grey-Wilson 10038* (K barcode K000306506!).

Ypsilopus tricuspis (Bolus) D'haijère & Stévart, **comb. nov.** ≡ *Angraecum tricuspe* Bolus in J. Linn. Soc., Bot. 25: 163. 1889 ≡ *Tridactyle tricuspis* (Bolus) Schltr. in Bot. Jahrb. Syst. 53(3–5): 601. 1915 – **Lectotype (designated here):** South Africa. In Natal, *Mc Ken 14* (K barcode K000306501!, isolectotype: BOL barcode BOL149994 [photo!]). Other Syntypes: *Cooper 1398* (BOL), *Sanderson s.n.* (BOL).

= *Angraecum rhodesianum* Rendle in J. Linn. Soc., Bot. 40: 208. 1911 ≡ *Tridactyle rhodesiana* (Rendle) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 147. 1918 – Holotype: Zimbabwe. Chimanimani, Melsetter, 6000 feet, in fruit in September, 23 Sep 1906, *Swynnerton 755* (BM barcode BM000540376 [photo!]).

= *Angraecum frommianum* Kraenzl. in Bot. Jahrb. Syst. 51(3–4): 398. 1914 ≡ *Tridactyle frommiana* (Kraenzl.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 147. 1918 – Holotype: Zimbabwe. Tanganyika, Nyassa See, Mfimbwaberg, 2300 m, *Fromm 226* (B†).

= *Tridactyle nyassana* Schltr. in Bot. Jahrb. Syst. 53(3–5): 601. 1915 – **Lectotype (designated here):** Malawi. Nördliches Deutsch-Nyassaland: auf Bäumen bei Kyimbila, ca. 1350 m, *Stolz 658* (M barcode M-0103362 [photo!]; isolectotypes: C barcode C10001113 [photo!], G barcode G00022228 [photo!], U barcode U 0005426 [photo!], WAG barcode WAG0002580 [photo!]).

= *Tridactyle fragrans* G.Will. in Pl. Syst. Evol. 134(1–2): 75. 1980 – Holotype: Malawi. Nyika, in deep forest, s.d., *Williamson 227* (K barcode K000306512!; isotype: SRGH).

Note. – The lectotype of *Ypsilopus tricuspis* was chosen because it possesses the diagnostic characters of the species, and is deposited in one of the most accessible botanical institutions (K). The lectotype of *Tridactyle nyassana* designated here was chosen from all the isosyntypes as it is the most complete specimen, showing all the characters of the species, and it is located in Munich (M), so probably the sample Schlechter used for its description.

Ypsilopus viridiflorus P.J.Cribb & J.Stewart in Kew Bull. 40(2): 417. 1985 ≡ *Rangaeris viridiflora* (P.J.Cribb & J.Stewart) Szlach. in Ann. Bot. Fenn. 40(1): 69. 2003 – Holotype: Tanzania. *Greenway & Kanuri 13493* (K barcode K000306407!; isotype: EAH).

Ypsilopus sect. ***Barombiella*** (Szlach.) D'haijère & Stévart **comb. & stat. nov.** ≡ *Barombiella* Szlach. in Ann. Bot. Fenn. 40(1): 69. 2003 – Type: *Y. schliebenii* (Mansf.) D'haijère & Stévart (≡ *Leptocentrum schliebenii* Mansf.).

Ypsilopus amaniensis (Kraenzl.) D'haijère & Stévart, **comb. nov.** ≡ *Listrostachys amaniensis* Kraenzl. in Bot. Jahrb. Syst. 43(5): 397. 1909 ≡ *Leptocentrum amaniense* (Kraenzl.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 112. 1918 ≡ *Rangaeris amaniensis* (Kraenzl.) Summerh. in Kew Bull. 4(3): 438. 1949 – Holotype (B†) and **Lectotype (designated here):** Tanzania. West-Usambara: Amani; s.d., *Braun 1551* (K barcode K000306413!).
= *Cyrtorchis cufodontii* Chiov., Miss. Biol. Borana, Racc. Bot., Angiosp.-Gymnosp.: 335. 1939 ≡ *Angraecum cufodontii* (Chiov.) Chiov. ex Chiarugi in Webbia 8: 2. 1951 – Holotype: Ethiopia. Nel Territorio dei borana, A.O.I., 10 Apr 1917, *Cufodontis 317* (FT barcode FT000895 [photo!]; isotypes: FT barcodes FT000896 [photo!] & FT000897 [photo!]).
Note. – One of the duplicates of *Braun 1551* of *Ypsilopus amaniensis* was certainly lost during the bombing raid of the Berlin herbarium on the night of 1–2 March 1943. However, a duplicate was sent to the Royal Botanic Gardens of Kew, and, therefore, we choose this sample as the lectotype.

Ypsilopus schliebenii (Mansf.) D'haijère & Stévart, **comb. nov.** ≡ *Leptocentrum schliebenii* Mansf. in Notizbl. Bot. Gart. Berlin-Dahlem 12: 704. 1935 ≡ *Barombia schliebenii* (Mansf.) P.J.Cribb in S. African Orchid J. 11(4): 110. 1980 ≡ *Rangaeris schliebenii* (Mansf.) P.J.Cribb, Fl. Trop. E. Africa 3: 570. 1989 ≡ *Barombiella schliebenii* (Mansf.) Szlach. in Ann. Bot. Fenn. 40(1): 69. 2003 – Holotype (B†) and **Lectotype (designated here):** Tanzania. Masagati, Mahenge, 12 Jun 1931, *Schlieben 1159* (BR barcode 000008814746!).
Note. – One of the duplicates of *Schlieben 1159* of *Ypsilopus schliebenii* was certainly lost during the bombing raid of the Berlin herbarium on the night of 1–2 March 1943. However, a duplicate was sent at the Botanical Garden of Belgium, and, therefore, we choose this sample as the lectotype.

Deleted:

Excluded species

Ypsilopus liae Delep. & J.-P.Lebel, as it lacks the characteristic Y-shaped stipes of *Ypsilopus*, and had been described before as *Diaphananthe arbonnieri* Geerinck, is actually a species of *Rhipidoglossum* as firstly pointed out by Fischer & al. (2011).

AUTHOR CONTRIBUTIONS

TD and TS designed the research; TD performed data curation and formal analysis; LD and MS-D performed all the lab work; TD and PM performed all analyses; TS, GMP and PM provided the resources; TS and PM are the supervisors of the present work; TD, TS, PM, GP, LD, MS-D and VD wrote the manuscript under the lead of TD, TS and PM.

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Appendix 1. Taxon list for 42 individuals sampled in the current study including outgroup species.
Species are listed in alphabetical order. The herbarium cited in brackets indicates where the silica gel sample is currently housed. GenBank accession numbers are included for each of the six genic regions used in the current study (ITS, *trnL-trnF* intergenic spacer, *matK*, *rps16*, *trnC-petN* intergenic spacer and *ycf1*). An asterisk (*) indicates squences newly generated in this study; an en-dash (–)indicates unsequenced regions.

Cyrtorchis chailluana (Hook.f.) Schltr., Cameroon, Cult. at Botanical Garden Meise BR 19750114 (BRLU), MH236968.1, MH237337.1, MK685441, MK721986*, MK697535*, MK722018*; ***Listrostachys pertusa*** (Lindl.) Rchb.f., *Carlsward 399* (FLAS), –, DQ091509, DQ091384, –, –, –; ***Listrostachys pertusa*** (Lindl.) Rchb.f., Cameroon, *Simo & al. (Yaoundé shadehouse) 2522* (BRLU), MH237083.1, MH237463.1, MK685556, MK722001*, MK697536*, MK722033*; ***Listrostachys pertusa*** (Lindl.) Rchb.f., Cameroon, *Simo & al. (Yaoundé shade house) 2447* (BRLU), MH237084.1, MH237464.1, MK685557, MK721979*, –, MK722011*; ***Nephrangis bertauxiana*** Szlach. & Olszewski, Cameroon, *Simo & al. (Yaoundé shadehouse) 2521* (BRLU), MK714123*, MK722045*, MK722039*, MK721973*, MK697511*, MK722005*; ***Plectrelminthus caudatus*** (Lindl.) Summerh. var. ***caudatus***, Cameroon, *Simo & al. (Yaoundé shade house) 2386* (BRLU), MH237091.1, MH237471.1, MK685564, –, –, –; ***Plectrelminthus caudatus*** (Lindl.) Summerh. var. ***caudatus***, Cameroon, *Simo & al. (Yaoundé shade house) 2803* (BRLU), MH237090.1, MH237470.1, MK685563, MK721992*, –, MK722023*; ***Rangaeris muscicola*** (Rchb.f.) Summerh., purchased plant, origin unknown, *Carlsward 400* (FLAS), DQ091631, DQ091513, DQ091387, MK722002*, MK697537*, MK722034*; ***Solenangis clavata*** (Rolfe) Schltr., ex hort. Orchids, *Carlsward 397* (FLAS), DQ091666, DQ091534, DQ091409, –, –, –; ***Solenangis scandens*** (Schltr.) Schltr., Cameroon, Cult. in Yaoundé shadehouse Y3308 YK, –, MK722044*, MK722038*, MK722019*, MK721987*, MK697510*; ***Solenangis saotomensis*** (Stévart & P.J.Cribb) R.Rice, São Tomé, *Stévart 274* (BRLU), MK714125*, –, –, MK721980*, –, MK722012*; ***Solenangis wakefieldii*** (Rolfe) P.J.Cribb & J.Stewart, Kenya, *Bytebier 627* (EA), DQ091667, DQ091535, DQ091410, –, –, –; ***Tridactyle anthomaniaca*** (Rchb.f.) Summerh., Cameroon, Cult. at Yaoundé shade house Y3679 RH (BRLU), MH236990.1, MH237359.1, MK685461, MK721977*, MK697519*, MK722009*; ***Tridactyle anthomaniaca*** subsp. ***nana*** P.J.Cribb & Stévart Equatorial Guinea, *Ndong Bokung & Stévart 1* (BRLU), MH237031.1, MK722041*, MK685499, –, MK697531*, MK722031*; ***Tridactyle aurantiopunctata*** P.J.Cribb & Stévart, Príncipe, *Stévart 656* (BRLU), KF672201, KF662356, KF672287, KF672236, KF672287, KF672319; ***Tridactyle bicaudata*** (Lindl.) Schltr., Gabon, no voucher (BRLU), MH236983.1, MH237352.1, MK685454, MK721995*, MK697522*, MK722026*; ***Tridactyle brevicalcarata*** Summerh., Gabon, Cult. at Botanical Garden Meise BR 20090424-75 (BRLU), MH236967.1, MH237336.1, MK685440, MK721997*, MK697526*, MK722028*; ***Tridactyle brevicalcarata*** Summerh., Cameroon, *Droissart & al. (Yaoundé shadehouse) 1838* (BRLU), MK714121*, MK722040*, MK722037*, –, –, –; ***Tridactyle crassifolia*** Summerh., origin unknown, *Nkongmeneck 2076* (SEL), MH237176.1, MH237394.1, MK685642, MK721976*, MK697517*, MK722008*; ***Tridactyle*** cf. ***eggelingii*** Summerh., Cameroon, *Droissart & al. (Yaoundé shade house) 3832* (BRLU), MH236992.1, MH237361.1, MK685463, MK721978*, MK697521*, MK722010*; ***Tridactyle exellii*** P.J.Cribb & Stévart, São Tomé, *Stévart 297* (BRLU), MH237026.1, MH237400.1, MK685493, MK721985*, MK697533*, MK722017*; ***Tridactyle filifolia*** (Schltr.) Schltr., Kenya, *Bytebier 707* (EA), MH237196.1, MH237584.1, MK685654, MK721989*, MK697513*, MK722021*; ***Tridactyle gentilii*** (De Wild.) Schltr., Cameroon, *Stévart & Pial 280* (BRLU), MH237022.1, MH237101.1, MK685489, MK721990*, –, MK722004*; ***Tridactyle gentilii*** (De Wild.) Schltr., Cameroon, *Stévart & Pial 297* (BRLU), –, MK721972*, –, MK722043*, MK697514*, –; ***Tridactyle latifolia*** Summerh., Príncipe, *Primo & Stévart 94* (BRLU), MH237024.1, MH237398.1, MK685491, MK721988*, MK697509*, MK722020*; ***Tridactyle laurentii*** (De Wild.) Schltr., Gabon, *T. Stévart* (BRLU), MH236982.1, MH237351.1, MK685453, MK721996*, MK697523*, MK722027*; ***Tridactyle lisowskii*** (Szlach.) Szlach. & Olszewski, Cameroon, *Droissart & al. (Yaoundé shade house) 874* (BRLU), MH237098.1, MH237479.1, MK685572, MK721999*, MK697528*, MK722030*; ***Tridactyle minutifolia*** Stévart & D'haijère, Gabon, *Stévart 3609* (BRLU), MH237012.1, MH237384.1, MK685480, MK721982*, MK697527*, MK722014*; ***Tridactyle muriculata*** (Rendle) Schltr., Cameroon, *Simo & al. (Yaoundé shade house) 2189* (BRLU), MH236996.1, MH237366.1, MK685468, MK721974*, MK697512*, MK722006*; ***Tridactyle nalaensis*** (De Wild.) Schltr., Gabon, Cult. at Jardi-Gab BTO91 (BRLU), MH236971.1, MH237553.1, MK685634, –, MK697534*, –; ***Tridactyle scottellii*** (Rendle) Schltr., Cameroon, Cult. at Yaoundé shade house DJ736 (BRLU), MH236993.1, MH237362.1, MK685464, MK721984*, MK697530*, MK722016*; ***Tridactyle thomensis*** P.J.Cribb & Stévart, São Tomé, Cult. in Bom Sucesso 2040.1, MK714124*, MK722046*, MK722035*, MK721983*, MK697529*, MK722015*; ***Tridactyle tridactylites*** (Rolfe) Schltr., Cameroon, *Simo & al. (Yaoundé shade house) 1993* (BRLU), MH236989.1, MH237358.1, MK685460, MK721975*, MK697516*, MK722007*; ***Tridactyle truncatiloba*** Summerh., Gabon, *Stévart, Mounoumoulossi E. & Kombila T. 1624* (BRLU), MH237035.1, MH237410.1, MK685504, MK721998*, MK697525*, MK722029*; ***Ypsilopus amaniensis*** (Kraenzl.) Summerh., origin unknown, *Bytebier & Kirika 26* (EA), DQ091634, DQ091512, DQ091386, MK721981*, MK697524*, MK722013*; ***Ypsilopus amaniensis*** (Kraenzl.) Summerh., Tanzania, Cult. at Botanical Garden Meise BR 20090422-73 (BRLU), MH236964.1, MH237333.1, MK685437, –, –, –; ***Ypsilopus erectus*** (P.J.Cribb) P.J.Cribb

& J.Stewart, origin unknown, *Grieve 1244* (EA), MK714122*, MK722042*, MK722036*, MK721991*, MK697515*, MK722022*; ***Ypsilopus furcistipes*** Summerh., Kenya, *Bytebier 1731* (EA), DQ091635, DQ091518, DQ091392, MK721994*, MK697520*, MK722025*; ***Ypsilopus longifolius*** (Kraenzl.) Summerh., origin unknonw, *MO4274452* (NY), MH237190.1, MH237578.1, –, MK722000*, MK697532*, MK722032*; ***Ypsilopus schliebenii*** (Mansf.) P.J.Cribb, Cult. At Botanical Garden Meise BR 20090389-40 (BRLU), MH236965.1, MH237334.1, MK685438, –, –, –; ***Ypsilopus tanneri*** P.J.Cribb, Kenya, *PCP 198* (EA), DQ091632, DQ091520, DQ091394, MK721993*, MK697518*, MK722024*; ***Ypsilopus viridiflorus*** P.J.Cribb & J.Stewart, Tanzania, *Bytebier 402* (EA), DQ091633, –, DQ091395, MK721971*, –, MK722003*.

Figures Captions

Fig. 1. Tree of *Ypsilopus* and allied genera, summarized from Bayesian (BI) and maximum likelihood (ML) analyses of the combined dataset, based on six markers (nrITS, *matK*, *rps16*, *trnC-petN*, *trnL-trnF, ycf1*) (5631 characters, 42 sequences, 36 taxa) with indels coded; BI using MrBayes under the substitution model GTR+Γ; posterior probabilities are shown above branches; ML using RAxML under the substitution model GTR+Γ; bootstrap values are shown below branches. The clades discussed in the Results section are indicated on the right. The circumscription adopted here is indicated with the colour bars. The long branch was trimmed (a double slash on the branch). Drawings of the types of *Rangaeris*, *Tridactyle* and *Ypsilopus* by TD.

Fig. 2. Tree of *Ypsilopus* and allied genera, summarized from Bayesian (BI) and maximum likelihood (ML) analyses of the plastid dataset, based on five plastid markers (*matK*, *rps16*, *trnC-petN*, *trnL-trnF*, *ycf1*) (5306 characters, 42 sequences, 36 taxa) with indels coded; BI using MrBayes under the substitution model GTR+Γ; posterior probabilities are shown above branches; ML using RAxML under the substitution model GTR+Γ; bootstrap values are shown below branches. The clades discussed in the Results section are indicated on the right.

Fig. 3. Tree of *Ypsilopus* and allied genera, summarized from Bayesian (BI) and maximum likelihood (ML) analyses of the nrITS dataset (325 character, 32 sequences, 31 taxa) with indels coded; BI using MrBayes under the substitution model HKY+Γ; posterior probabilities are shown above branches; ML using RAxML under the substitution model GTR+Γ; bootstrap values are shown below branches. The clades discussed in the Results section are indicated on the right.

Fig. 4. Some species we propose to transfer to *Ypsilopus* Summerh., as they are grouped in the molecular analysis and share similar morphological characters with the type. **A,** *Y. longifolius* (Kraenzl.) Summerh. (Bachmann, 1981); **B,** *Rangaeris amaniensis* (Kraenzl.) Schltr. (Jenny, 1982); **C,** *Tridactyle triscuspis* (Bolus) Schltr. (photo by J. Farminhão, taken 2018); **D & E,** *T. tanneri* P.J.Cribb. (Bachmann, 1976, 1986); **F,** *R. schliebenii* (Mansf.) P.J.Cribb. (Grey-Wilson, s.d.); **G,** *T. furcistipes* Summerh. (Bachmann, 1983). — The use of photographs A, B, D, E & G is facilitated by the World Orchid Iconography of the Swiss Orchid Foundation at the Herbarium Jany Renz (Botanical Institute, University of Basel, Switzerland).

Fig. 5. Distribution of the genera included in this study: **A,** *Cyrtorchis* (grey) and *Listrostachys* (grid); **B,** *Nephrangis* (grey) and *Plectrelminthus* (grid); **C,** *Rangaeris* (grey) and *Solenangis* (grid); **D,** *Tridactyle* (grey) and *Ypsilopus* (grid).

Fig. S1. Tree of *Ypsilopus* and allied genera, summarized from Bayesian (BI) and maximum likelihood (ML) analyses of the plastid dataset (5254 characters, 42 sequences, 36 taxa) without indels coded; BI using MrBayes under the substitution model GTR+Γ; posterior probabilities are shown above branches; ML using RAxML under the substitution model GTR+Γ; bootstrap values are shown below branches.

Fig. S2. Tree of *Ypsilopus* and allied genera, summarized from Bayesian (BI) and maximum likelihood (ML) analyses of

the nrITS dataset (319 characters, 32 sequences, 31 taxa) without indels coded; BI using MrBayes under the substitution model HKY+Γ; posterior probabilities are shown above branches; ML using RAxML under the substitution model GTR+Γ; bootstrap values are shown below branches.

Table 1. Morphological comparison of characters for the eleven species of *Ypsilopus*.

Taxa	Distribution	Stem	Leaf blade	Inflorescence	Flower colour	Pedicel and ovary	Sepal (mm)	Petal (mm)	Lip	Spur	Column
Ypsilopus amaniensis (Kraenzl.) D'haijère & Stévart	Ethiopia, Kenya, Tanzania, Uganda, Zimbabwe	5–12(45) cm	3.5–11.5 × 1–2.3 cm, coriaceous, conduplicate linear	6–9 cm, 5–13-flowered	greenish white fading to yellow	**25–55 mm long**	10–25 × 2.7–5.6 mm, lanceolate, acuminate	9–21 × 2.2–5 mm, lanceolate, acuminate	**10–24 × 5–11 mm; obscurely 3-lobed;** side lobes rounded; mid-lobe lanceolate	filiform, pendent, **75–160 mm**	4.5–5 mm, stipes Y-shaped
Ypsilopus citrinus (P.J.Cribb) D'haijère & Stévart	Malawi, Tanzania, Zambia	1–9 cm	8–13 × 0.7–0.8 cm, spreading-falcate, conduplicate linear	7.5–11 cm, 9–11-flowered	pale green to creamy yellow	4 mm long	8–11 × 3.5–4 mm, lanceolate, acuminate	7–8 × 2.5–3 mm, lanceolate, acuminate	10–16 × 3–5 mm; **3-lobed**, auriculate at the base; side lobes spreading, acute, half the length of the mid-lobe; mid-lobe narrowly triangular	filiform, decurved-pendent, **36–43 mm**	4 mm, stipes Y-shaped
Ypsilopus erectus (P.J.Cribb) P.J.Cribb & J.Stewart	Malawi, Swaziland, Tanzania, Zambia, Zimbabwe	Up to 6 cm	3–15 × 0.35–0.6 cm, conduplicate linear	5–20 cm, 4–12-flowered, spreading to suberect	white	9–12 mm long	5–7 × 2.3–3 mm, ovate to oblong lanceolate, acute or acuminate	5–6.5 × 1.5–2 mm, oblong lanceolate, acuminate	**5–6.5 × 2.3–3 mm, obscurely 3-lobed, sub-rhombic to lanceolate, acute**	slender, cylindrical, 35–53 mm	±2 mm, stipes Y-shaped
Ypsilopus furcistipes (Summerh.) D'haijère & Stévart	Kenya, Tanzania, Uganda	7–10 cm	11–18 × 0.7–1.3 cm, spreading-falcate, conduplicate linear	4.5–11 cm, 9–11-flowered	greenish white or cream fading to orange	3 mm long	9.5–12 × 2–3.5 mm, lanceolate, acuminate	8.5–10 × 2–3 mm, lanceolate, acuminate	9–12.5 × 3.5–6.5 mm; 3-lobed, **auriculate at the base; side lobes shorter than mid-lobe**; mid-lobe ligulate, acuminate	**filiform, straight, 14–27 mm**	2–3 mm, stipes Y-shaped
Ypsilopus leedalii P.J.Cribb	Tanzania	±4 cm	5–7 × 0.8–0.9 cm, ligulate, twisted at the base	4–5.5 cm, 6–10-flowered	white, subcampanulate	3–4 mm long	5.5–6 × 2.5–3 mm, oblong to oblong-elliptic, rounded or obtuse	5.5–6 × 3 mm, elliptic, obtuse	8.5–9 × 5–6 mm, concave, **oblong flabellate, with erose apical margin**	cylindrical, tapering to the apex from a broader mouth, 13–14 mm	2–2.4 mm
Ypsilopus longifolius (Kraenzl.) Summerh.	Kenya, Tanzania	up to 4 cm	**5–25(50) × 0.15–0.3** cm, conduplicate linear, acute or subacute	3–8 cm, 2–9-flowered	white, with greenish tips to the segments	9–12 mm long	6–9.2 × 2.1–3.8 mm, ovate to ovate-lanceolate, or oblong-lanceolate, acute or acuminate	5.5–6.7 × 1.9–2.8 mm, lanceolate, acuminate	6.5–7.5 × 2–3.7 mm, obscurely 3-lobed; slightly recurved, ovate to sub-rhombic, acute and fleshy at the apex	slender, cylindrical, pendent-decurved, 35–42 mm	1.7–2.3 mm, Y-shaped
Ypsilopus sarcodanthus (Mansf.)	Tanzania	5 cm	9–16.5 × 1.2–1.3 cm, linear, twisted at the	up to 9 cm	yellow	5 mm long	9–10 × 3.5 mm, apex reflexed	8 × 2.5 mm, triangular lanceolate	11 × 3.5 mm; 3-lobed, auriculate at	filiform, **upcurved, slightly**	4 mm

D'haijère & Stévart			base						the base; **side lobes shorter than mid-lobe**; mid-lobe triangular, acuminate	**dilated at apical part; 22 mm**	
Ypsilopus schliebenii (Mansf.) D'haijère & Stévart	Tanzania	7–11 cm	15–20 × 1.7–2.5 cm, coriaceous, conduplicate linear	18–27 cm, 4–8-flowered	white with a greenish orange spur	60–90 mm long	34–40 × 3.5–4.5 mm, recurved, linear, acuminate	34–38 × 4 mm, reflexed, linear, acuminate	30–42 × 7–11 mm, distal margin erose-denticulate	filiform, pendent, wide mouthed, **160–190 mm**	**20–27 mm, puberulent in basal half, stipes Y-shaped**
Ypsilopus tanneri (P.J.Cribb) D'haijère & Stévart	Kenya, Malawi, Tanzania, Zambia	1–3.5 cm	6–11 × 0.6–1.1 cm, linear, twisted at the base, **spotted with dark green on a pale green background**	2–5 cm, 2–8-flowered	green or dull green	6–8 mm long	7–9.5 × 2.5–3 mm, oblong-lanceolate, acuminate	7–7.5 × 2 mm, lanceolate, acuminate	8–9.5 × 3–3.5 mm; 3-lobed, auriculate at the base; side lobes tooth-like, blunt; mid-lobe narrowly triangular	pendent, slightly upcurved, slightly dilated at apical part; 18.5–19.5 mm	3 mm, stipes Y-shaped, rugulose
Ypsilopus tricuspis (Bolus) D'haijère & Stévart	D.R. Congo, Malawi, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe	1–10 cm	4–15 × 0.6–1.2 cm, spreading or arcuate, conduplicate linear	4–15 cm, 7–30-flowered, suberect	pale green to pale butterscotch, scented of mignonette	2–3 mm long	6–7.5 × 2–2.4 mm, lanceolate, acuminate	5–6.5 × 1.2–2 mm, lanceolate, acuminate	5.7–8 × 3.5–5 mm; 3-lobed, **cuneate-auriculate at the base; side lobes short, erose at the apex**. Mid-lobe triangular, acuminate	**filiform, 12–14 mm**	2–2.3 mm, stipes Y-shaped
Ypsilopus viridiflorus P.J.Cribb & J.Stewart	Tanzania	6–27 cm	4–25 × 0.2–0.5 cm, bilaterally compressed, iridiform, linear taping	2–6 cm, **1(–2)-flowered**	pale yellow green or whitish green	5–7 mm long	7–9 × 1.5–2 mm, lanceolate, acuminate	6–8 × 1.5–1.8 mm, linear-lanceolate, acuminate	7–8 × 2 mm, entire, lanceolate, acuminate, deflexed	decurved, pendent, slenderly cylindrical, 15–18 mm	1 mm, stipes Y-shaped

Diagnostic characters are indicated in bold.

Appendix S1. Alignements files for the nr-ITS analyses.

Appendix S2. Alignements files for the plastid analyses.

Appendix S3. Alignements files for the combined analyses.

Appendix S4 List of the additional specimens examined for the morphological analysis. Information is mentioned as on the label of the specimens.

Rangaeris Summerh. in Bull. Misc. Inform. Kew 1936: 227. 1936 – Type: *Rangaeris muscicola* (Rchb.f.) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 450. 1936.

Rangaeris muscicola (Rchb.f.) Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 450. 1936 ≡ *Aeranthes muscicola* Rchb.f. in Flora 48: 190. 1865 ≡ *Epidorkis muscicola* (Rchb.f.) Kuntze, Revis. Gen. Pl. 2: 660. 1891 ≡ *Mystacidium muscicolum* (Rchb.f.) T.Durand & Schinz, Consp. Fl. Afric. 5: 54. 1895 ≡ *Listrostachys muscicola* (Rchb.f.) Rolfe in Oliver, Fl. Trop. Afr. 7: 158. 1897 ≡ *Aerangis muscicola* (Rchb.f.) Schltr. in Bot. Jahrb. Syst. 53: 599. 1915 – Holotype: Angola. *Welwitsch 699* (K barcode K000306341!).

= *Angraecum englerianum* Kraenzl. in Bot. Jahrb. Syst. 7: 333. 1886 ≡ *Listrostachys engleriana* (Kraenzl.) Kraenzl. in Bot. Jahrb. Syst. 19: 254. 1894 ≡ *Aerangis engleriana* (Kraenzl.) Schltr., Bot. Jahrb. Syst. 53: 599. 1915 – Holotype: Cameroon. Mungo, *Buchholz 9.74* (B†)

= *Mystacidium batesii* Rolfe in Oliver, Fl. Trop. Afr. 7: 172. 1898 ≡ *Angraecum batesii* (Rolfe) Schltr., Westafr. Kautschuk-Exped.: 283. 1900 ≡ nom.illeg. *Aerangis batesii* (Rolfe) Schltr. in Bot. Jahrb. Syst. 53: 599. 1915 – Holotype: Cameroon. Batanga, *Bates, G.L. 382* (BM barcode BM000540209!)

= *Aerangis mixta* Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 122. 1918 – Holotype: Cameroon. 20 Sep 1895, *Bates 382* (K barcode K000306340!)

= *Aerangis falcifolia* Schltr. in Bot. Jahrb. Syst. 53: 598. 1915 – Type: Tanzania. 1912, *Stolz 1960* (BR barcode 0000025286090!, K barcode K000306346!, LD barcode 1220164 [photo!]).

= *Listrostachys floribunda* Rolfe in Bull. Misc. Inform. Kew 1918: 236. 1918 ≡ *Aerangis floribunda* (Rolfe) Summerh. in Bull. Misc. Inform. Kew 1932: 509. 1932 – Holotype: Hort. Kew, 23 Sep 1918, *s.n.* (K barcode K000306344!).

Additional specimens examined. – Burundi. Gasurubwe, 1 Mar 1984, *Arbonnier 88* (BR), Rohoro, 5 Apr 1992, *Arbonnier 328* (BR), Kininya; Mosso, 30 Jan 1952, *Michel & Reed 1045* (BR). Cameroon. Central, 1370 m, 05°05′51″N, 11°19′46″E, 22 Mar 2012, *Droissart, Descourvières & Verlynde 1319* (BRLU), East, 499 m, 02°38′19″N, 14°07′56″E, 1 Aug 2010, *Droissart & Simo 734* (BRLU), South, 590 m, 02°40′55″N, 10°46′32″E, 15 Aug 2006, *Droissart & Simo 268* (BRLU), 765 m, 02°44′57″N, 10°32′19″E, 25 Apr 2007, *Droissart & Simo 474* (BRLU), 605 m, 02°41′42″N, 10°46′37″E, 8 Jul 2007, *Droissart & Simo 612*, (BRLU), 567 m, 02°24′02″N, 10°48′03″E, 2 Jul 2013, *Droissart, D'haijère, Kamdem, Mayogo & Chimi 1500* (BRLU), Kodmin, 13 Nov 1998, *Pollard 189* (K), Mont Kupe Nyasoso, 3 Jun 1996, *Zapfack 649* (K), 15 Jul 1996, *Zapfack 946* (K). Guinea. Nzérékoré,Lola, 1419 m, 07°39′18″N, 08°22′28″W, 5 Jul 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 145* (BRLU), 1000 m, 07°40′35″N, 08°23′18″W, 26 Jul 2012, Nimba Spirit Collection*, Traoré, Stévart, Bidault & Serein 156* (BRLU), 1511 m, 07°39′52″N, 08°22′21″W, 27 Jul 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 164,* (BRLU), 1000 m, 07°40′44″N, 08°23′08″W, 27 Jul 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 168* (BRLU), 535 m, 07°42′58″N, 08°26′13″W, 27 Jul 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 170* (BRLU), 07°39′52″N, 08°22′23″W, 28 Jul 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 181* (BRLU), 945 m, 07°40′29″N, 08°23′42″W, 3 Aug 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 207* (BRLU), 1000 m, 07°40′44″N, 08°23′08″W, 6 Aug 2012, Nimba Spirit Collection*, Traoré, Stévart, Bidault & Serein 215* (BRLU), 1230 m, 07°40′28″N, 08°22′22″W, 10 Aug 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 236* (BRLU), 1000 m, 07°40′35″N, 08°23′18″W, 14 Aug 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 242* (BRLU), 860 m, 07°41′29″N, 08°23′18″W, 14 Aug 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 246* (BRLU), 775 m, 07°41′50″N, 08°23′43″W, 14 Aug 2012, Nimba Spirit Collection*, Traoré, Stévart, Bidault & Serein 252* (BRLU), 1255 m, 07°40′24″N, 08°22′22″W, 25 Aug 2012, Nimba Spirit Collection,

Traoré, Stévart, Bidault & Serein 262 (BRLU), 521 m, 07°42′34″N, 08°24′20″W, 25 Aug 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 269* (BRLU), 623 m, 07°38′32″N, 08°20′36″W, 5 Sep 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 278* (BRLU) 623 m, 07°38′32″N, 08°20′36″W, 10 Oct 2012, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 333* (BRLU), 730 m, 07°41′51″N, 08°24′04″W, 13 Jul 2013, Nimba Spirit Collection, *Traoré, Stévart, Bidault & Serein 661* (BRLU). Rwanda. *Defleur s.n.* (BR), route Goma, *Delepierre 183* (BR), Nyungwe-Gisakura, 1975, *Troupin 15777* (BR). Uganda. *Sine loc.* Sep 1918, *Departement of Agriculture,Uganda 225-16* (K).

Rangaeris trilobata Summerh. in Hutchinson & Dalziel, Fl. W. Trop. Afr. 2: 449. 1936 – Holotype: Nigeria. Southern Nigeria, Eket District, 1912, *Mr & Mrs. Talbot 3299* (K barcode K000306411!).

Additional specimens examined. – Equatorial Guinea. Rio Muni. Mirador, dalle rocheuse, 3 km à l'O de la station Ecofac Inselberg: Frange forestière, 1200 m, 1 Jul 1999, *Stévart 589* (BRLU), Mirador, dalle rocheuse de Monte Alén, 3 km à l'O de la station Ecofac (Parc Nat. de Monte Alén), Inselberg: Lisière forestière de 5 m de haut, 1100 m, 5 Feb 2001 *Stévart 755* (BRLU), inselberg, 21 Jun 1905, *Parmentier & Nguema, 1128* (BRLU), parc national de Monte Alén, dalle rocheuse d'Engong, 5 km à l'ouest du Village d'Engong, 01°37′N, 10°18′E, 1100 m, 11 May 2002 *Parmentier & Esono 2794* (BRLU), inselberg de Akoa Ebanga, à 1h de Marche du village de Ngong Mocomo, à 10 km de Nsork, 01°04′N, 11°12′E, 570 m, 31 May 2002, *Parmentier & Esono 3521* (BRLU) Mungum (inselberg de), à 45 minutes de Marche du village de Kukumancoc Inselberg: lisière forestière supérieure (3 à 6 m de hauteur), 24 May 2002, *Stévart, Ndong Bokung & Ndong Maye 1537* (BRLU). Gabon. Tchimbélé, forêt aux environs du barrage Forêt dense, bors de ruisseau, 00°36′53″N, 10°24′10″ E, 460 m, 25 Sep 2001, *Stévart, L. Ngok Banak & Mendu 1098* (BRLU), Tchimbélé, ancien lit de la rivière qui descend du barrage, Fourré à *Rangaeris trilobata* et *Polystachya rhodoptera* et manteau arbustif très riche en orchidées, 00°36′50″N, 10°23′60″E, 440 m, 8 Sep 2001, *Stévart, Ngok Banak & Mendu 1121* (BRLU), inselberg de Ntan (Bikougou), à 1h30 de Marche du village de La Hollande (à 2 km de Sam) Frange forestière supérieure, 01°00′06″N, 11°12′36″E, 790 m, 22 Jan 2000, *Parmentier & Nguema 816* (BRLU), Tchimbélé, forêt aux environs du barrage, Forêt dense, bors de ruisseau, 00°36′53″N, 10°24′10″ E, 460 m, 23 Sep 2002, *Stévart 1747* (BRLU), Mont Sémé (Ekoko), 2 Oct 2002, *Stévart 1781* (BRLU), Tchimbélé (carrière de) près du bras mort du lac, 00°37′54″N, 10°24′25″E, 570 m, 7 Sep, 2002, *Stévart 1808* (BRLU), Mbigou, chutte de la keboumis à keligou, 01°33′00″N, 11°33′00″E, 30 Apr 1925, *Le Testu 5405* (K). Nigeria. Calabar Prov., Eket Distr., Big town. On path from village to Western boundary of Stubb's Creek Forest Reserve, Roadside climber and tangle vegetation in swamp, strangling scrub rathe epiphytic, 13 May 1953, *Onochie & Latilo 32937* (K). São Tomé and Príncipe. Pico Maria Fernandes Forêt secondaire sur ancienne plantation, 150 m, 26 Aug 1997, *Stévart 91* (BRLU), Rio Xufexuf, Forêt secondaire sur ancienne plantation, 230 m, 1 Oct 1997, *Stévart 203* (BRLU), Pico Maria Fernandes, Forêt secondaire sur ancienne plantation, 150 m, 11 Oct 1997, *Stévart 261* (BRLU), Morro Chamiço, Forêt claire de crête très humide, à nombreuses épiphytes, 1100 m, 1 Sep 1999, *Stévart 662* (BRLU) Pico Maria Fernandes Forêt secondaire dense et haute sur ancienne plantation, 150 m, 1 Sep 1999, *Stévart 677* (BRLU), Rio Io Grande, 200 m, *Stévart 703* (BRLU), Morro Chamiço, Forêt dense et humide, 1100 m, 12 Aug 2002, *Primo & Stévart 71* (BRLU), Rio Io Grande, Forêt dense et humide, 200 m, 20 Aug 2002, *Primo & Stévart 80* (BRLU).

Tridactyle Schltr., Orchideen: 601. 1914 – Type: *Tridactyle bicaudata* (Lindl.) Schltr., Orchideen: 602. 1914.

Tridactyle anthomaniaca (Rchb.f.) Summerh. in Kew Bull. 3: 284. 1948 ≡ *Listrostachys anthomaniaca* Rchb.f. in Linnaea 41: 75. 1877 – Holotype: Nigeria. Bonny, growing on a tree, Jun 1873, *J. Monteiro* (K barcode K000306469!).

= *Angraecum lepidotum* Rchb.f. ex Rolfe in Oliver, Fl. Trop. Afr. 7: 146. 1897 ≡ *Tridactyle lepidota* (Rchb.f. ex Rolfe) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 146. 1918 – Holotype: Liberia. From Mr. Christy, Chelmsford, Nov 1878, *Christy*, *s.n.* (K barcode K000306468!).

= *Angraecum wittmackii* Kraenzl. in Mitt. Deutsch. Schutzgeb. 2: 158. 1889 ≡ *Listrostachys wittmackii* (Kraenzl.) Rolfe in Oliver, Fl. Trop. Afr. 7: 158. 1897 – Holotype: Cameroon. *Braun 2* (?B†).

= *Angraecum trachyrrhizum* Schltr. in Bot. Jahrb. Syst. 26: 343. 1899 ≡ *Tridactyle trachyrrhiza* (Schltr.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 147. 1918 – Holotype: Mozambique. 25 Miles Station, Regio orientalis et Mosambicensis, 11 Apr 1898, *Schlechter 12256* (G barcode G00022232 [photo!]; isotype: K barcode K000306491!).

Additional specimens examined. – Burundi. Forêt de Rumonge, dessin de *G. Delepierre 74* (BR). Cameroon, Mbam-Minkom (region de, au NO de Yaoundé), Village de Nye-Meyong, sommet d'une colline au NO du campement.

03°55′33″N, 11° 22′13″E, RVIN 32, 1115 m, 13 May 2006, *Droissart 65* (BRLU), Mbam-Minkom (region de, au NO de Yaoundé), Village de Nye-Meyong. Le long de la route entre Nye-Meyong et Ekekam 03°54′29″N, 11°22′17″ E, 815 m, 30 Oct 2007, *Droissart, Stévart & Simo 791* (BRLU), Mefou Proposed National Park, Ndanan 1, 03°36′53″N, 11°34′20″E, Oct 2010, *Cheek 11755* (K), Southwest, Montane scrub near Mbu-bakundu village, 900 m, 05°01′N, 09°18′E, 12 Nov 1986, *Mambo & Thomas 253* (K, BR, P), Massif Manengouba, 4500–5000 feet, 16 Nov 1968, *Sanford 5491* (P), *ibid.*, *Sandford 5468* (P), Mount Cameroon, Mapanja to Mann's Spring 1400–1600 m, 3 Oct 1992, *Thomas 9244* (K), South West, Fako, Buea, TB1 Mapanja, 2000 m, 26 Sep 1992, *Tekwe 261* (K), Mount Cameroon, Mapanja, 23 Sep 1992, *Tekwe 208* (K) South West, Fako, Buea, Etinde, 1680m, 10 Nov 1992, *Mbatchou 403* (K), Kodmin, 13 Nov 1998, *Pollard 182* (K), Kodmin, 18 Nov 1998, *Pollard 221* (K), Fosimondi, 17 Apr 2004, *Simo 209* (K), Mount Cameroon Mount Etinde, 25 Oct 1992, *Wheatley 618* (K), Fako South Bakundu, 2 Jun 1960, *Adebusuyu 44047* (K), Nkoum, 19 Feb 1960, *Letouzey 3064* (P), 9 km.Inselberg d'Akookas, près du village d'Akookas, à 38 km au sud est d'Ebolowa, 02°42′59″N, 11°16′20″E, 710 m, 15 Mar 2001, *Parmentier & Kouuob 1874* (BRLU), Bidou III, Nkolembonda (route Kribi–Ebolowa), campement au pied du Mont des Elephants à moins d'un km de la route qui va de Bidou III à HEVECAM, versant SSE, 02°47′60″N, 10°01′21″E, RVIN 54, 220 m, 5 Jul 2006, *Droissart 185* (BRLU), Province du Sud, village de Ma'an, UFA 09-022 (Wijma), 02°24′02″N, 10°48′03″E, 567 m, 2 Jul 2013, *Droissart, D'haijère, Kamdem, Mayogo & Chimi 1499* (BRLU). North of Kribi, old mangrove swamp, estuary of small stream, 03°00′N, 09°56′E, 11 Sep 1969, *Bos 5336* (P), GR. Baanga road, 2 km S. of Kribi, river-north, on a tree branche above beach, above high water mark, 02°55′N, 09°54′E, 11 Oct 1968, *Bos 3049* (BR, P), 7 km south of Kribi, forested islet directly above Lobé Rainfalls, 02°53′N, 09°54′E., 20 Feb 1969, *Bos 3951* (K, BR, P), 17 km of Kribi, mangrove swamp, on tree shading sandy beach, 03°02′N, 09°58′E, 19 Feb 1969, *Bos 3923* (BR, P, UPS), Eboundja I (route Kribi–Campo, au bord de la rivière qui passe entre Eboundja I et II, 02°47′48″N, 09°53′42″E, 40 m, 1 Feb 2008, *Droissart, Stévart & Simo 929* (BRLU), Réserve Eala-Douala, lac Tissongo, 03°34′17″N, 09°53′14″E, 16 Nov 2009, *Simo, Stévart, Sonké, Guiakam & Droissart 1955* (BRLU), Bipindi 1908, Urwaldgebiet *Zenker 3453* (BM, BR), *ibid*., 1913, *Zenker 4718* (BM), Village Nkolbisson, 7 km West of Yaoundé. Edge of forest, 700 m, 26 Oct 1961, *Breteler 1987* (P), Mindourou, site d'exploitation de la Palisco près de Lomie (AC5), 03°23′04″N, 13°54′12″E, 770 m, 13 Oct 2001, *Stévart et Pial 253* (BRLU), *ibid.*, 21 Oct 2001, *Stévart & Pial 279* (BRLU), *ibid.*, 2 Nov 2001, *Stévart & Pial 295* (BRLU), sine loc, coll. J.P. Vautherin (ancient chef de composante ECOFAC Cameroun à Yaoundé), *Stévart & Pial 460* (BRLU). Central African Republic. Bambari, 8 km SE of Bambari, East side of Ouaka river, 500 m, 3 Nov 1981, *Fay 1870* (K), Territoire de l'Oubangui Krehedjé (Fot. Sibut) Bangui and la Kémo, 18 Dec 1903, *Chevalier 11031* (P), ibid, *Chevalier 11012* (P), *ibid.*, 1–9 Dec 1903, *Chevalier 10781* (P), ibid, 15 Oct 1902, *Chevalier 6038* (P), Pl. de l'Oubangui, région de la Ouaka, Rivière Mburu, 10 km East Bambari,rivière large, tjs au dessus de l'eau, 10 Nov 1925, *Tisserant 1333 bis* (P, BM), Pl. de l'Oubangui, region de Bambari, rivière Djimbiya, 18 Nov 1923, *Tisserant 1333* (P) Rivière Mbunu, Station Boukoko, Nov 1925, *Tisserant 1500-1333* (P), Région de Mbaïki et Boukoko, Station Boukoko, Nov 1947, *Tisserant 423* (BM, P). Democratic Republic of the Congo. Menkao, Kinshasa Centr., Congo, 14 Feb 1971, forêt inondée, depression, *Bouharmont 6878* (BR), Mofinu, Maluku, depression marécageuse, 14 Feb 1971, *Breyne 2096* (BR), 1903, *Laurent 35* (K), *Thielens 21989* (BR), Entre Ruki Ikelemba (environs de Coquilhatville), Jul 1930, *Lebrun 819* (K), Katanga, Mitwaba, Bruyé Bala affluent muyé, Parc National Upemba, 26 Mar 1948, *de Witte 3564* (K), Kasafa (Katanga), 2 May 1972, *Darcis 14* (BR), Eala, 1905, *Laurent 1741* (K), Eala, 10 Oct 1906, *Pynaert 542* (BR), Eala, 1917, *Seret* (BR), Dikila, 1 Dec 1906, *Bruneel* (BR), Irangi, Forêt primaire, Dec 1987, 800 m, *Babilou 131* (BR), Kivu, Kalehe, km 70 route Kavumu Walikale, Mayiwano, 1200 m, 21 Jun 1956, *Christiaensen 939* (BR), Nala, 9 May 1903, *Rysselherghe* (BR), Station II/fd/17, 6 Nov 1951, galerie forêt claire, *De Saeger 1451*(BR), Panga, forêt, 20 Dec 1913, *Bequaert 1569* (BR), 8 Sep 1919, *Corbisier Baland 501* (BM, BR, P), Yambata, Oct 1913, *S. De Giorgi 1426* (BR), Env. Amadi, 25 Nov 1905, *Seret 275* (BR), rivière Bwere, route Dungu–Bafuka, 17 Nov 1906, *Seret 697* (BR),Uluwari, près du lac Kalwe, 18 Apr 1947, *Van Meele 1778* (BR), Haut Zaïre, Kisangani, près de la poste, 10 Feb 1978, *Lisowski 47773* (BR), Dundusana, Sep 1913, *Mortehan 469* (BR), Mondjo, 1 Aug 1906, *Pynaert 349* (BR), Menda (près de Jadotville), cultivéau Jardin Botanique de Liège « orchidée no. 3 », 11 Jan 1960 (fleurit le 6), ramenée Jun 1957, *Damblon s.n.* (BR), galerie forestière de la rivière Lulua à 33 km au WWS de Kolwezi sur la route de Musohantanka, 15 Nov 1981, 1408 m, *Schaijes 1131* (BR), République du Zaïre, région de Shaba, rivière Lulua, région de Kolwezi, 4 Sep 1988, *Schaijes 4064 B* (BR),District de la Tshuapa, Bonndu u/ Maringa, Macrololim Aug 1938, *Dubois* 944 (BR),Kiri, 6 Nov 1903, *Mission Emile Laurent* (BR), Kapinga, 23 Nov 1903, *Mission Emile Laurent* (BR), Yangambi, km 11 route de Ngazi, plateau de l'Itasukulu, env. 470 m, 22 Jul 1937, forêt primitive ombrophile, *Louis 5622* (BR)Yangambi, plateau de la Luweo, environ 470 m, forêt primitive, 13 Sep 1937, *Louis 6026*

(BR), Yangambi, Réserve-Flore-Isalowe, env. 470 m, forêt primitive ombrophile, 27 Sep 1937, *Louis 6171* (BR), *ibid.*, 12 Oct 1937, *Louis 6343* (BR), *ibid.*, 29 Nov 1935, *Louis 735* (BR), *ibid.*, *Louis 9262* (BR), *ibid.*, 11 Jun 1938, *Louis 9762* (BR), ibid, 17 Aug 1938, *Louis 10887* (BR), Nov 1938, pied du plateau, *Louis 12596* (BR), Sources de la Ngula (env. Yangambi), env. 470 m, 8 Jul 1939, *Louis 15510* (BR), Bombura (route Gemena Bosebole), forêt inondée de la Lua-Vindu, 24 Oct 1955, *Evrard 1945* (BR), Region de Kiantu, 1938, *Gillet 13* (BR), Mare Mufufu, 1900 m,14 Jun 1969, *Lisowski, Malaisse, Symoens 6595* (BR), Rivière Salonga, entre Bofoku et Botoka Ndjoku, forêt inondable à Guibourtia, 6 Aug 1958, *Evrard 4518* (BR), Ruti, Jul 1899, *Schlechter 12617* (BR), in arboribus juxta flumen Ruki pone Coquilhatville, Jul 1899, *Schlechter 12619* (BM, BR, P), Buyi-Bala, affluent Nuyé, 26 Mar 1948, Kiluba, Kipaniëpanië, *P.C. 3564* (BR), entre Ruti-Kelemba (environs de Coquilhatville), forêt inondée périodiquement, Jul 1930, *Lebrun* 819 (BR), près de Inkanda sur Ikelemba, 5 Sep 1946, *Leonard* 490 (BR), Ikelemba, entre Embouchure & la Wandoka, lisière forestière, 18 Sep 1929, *Robyns 657* (BR) Zone de Mambasa (Ituri), Epulu, 01°25′N, 28°35′E, 750 m, forêt mixte, *Hart 636* (BR), Boende (district de la Tshuapa), Aug 1938, *Dubois 944* (BR, P), Mission Laurent, Sep 1903 (BR), *Mission Laurent 35* (BR), *Mission Laurent 1190* (BR), *Mission Laurent 1733* (BR), *Mission Laurent 2045* (BR), Nyolo, Oct 1903, *Mission Laurent 2046* (BR), Jul 1954, *Ghroufin* (BR). Equatorial Guinea. Rio Muni, Nifang to Reata, 1300 feet, 13 Feb 1969, *Sanford 5746* (P), Pita, cult. Saordeauw (M. Beille), 23 Jul 1910, *Pobéguin 26* (P), route Ymbo-Orobé, bords Kunkuwé, 4eme mission Aug. Chevalier, 19 Nov 1905, *Caille 14668* (P), Route Engong à Monte Allen, milieu du trajet, 1 Aug 1999, *Ndong Bokung & Stévart 9* (BRLU), mongola, près Anisok, 17 Aug 2000, *Ndong Bokung & Stévart 221* (BRLU), Pierda Nzas, Inselberg, 01°27′N, 11°20′E, 27 Jun 2001, *Ndong Bokung & Stévart 275* (BRLU). Gabon. Milobo (inselberg de), 16 Dec 2001, *Stévart, Mounoumoulossi, Kombila 1697* (BRLU), Parc National de la Pongara, Pointe Ouingombé à 6 km de la pointe Denis. Camp de Gabon Environnement. 00°19′47.3”N, 09°19′17″E, 4 m, 6 Dec 2006, *Dauby, Nguema, Stévart & Bissiemou 34* (BRLU). Nyanga, Doudou Mountains, Chantier SNF Bakker, High forest, 02°51′06″S, 10°31′36″E, 150 m, Mar 2004, *Jongkind 5853* (BR), Lambaréné, 20 km au sud de la ville, à la pointe Nord du lac Evaro, Fourrés humides en bord de lac, 00°52′26″S, 10°08′04″E, 34 m, *Bidault, Serein & Ikabanga 1470* (BR, P), 15 km de Libreville, 1 Nov 1997, *Biteau & Stévart 21* (BRLU), 8 km Libreville, 27 Jan 1961, *Hallé 926* (P), *Duparquet s.n.* (P), vallée de la N’Gounié, region de N’Dendé, plaine de la Dolla, route de Lebamba, 7 Dec 1960, *Descoings 6444* (P). Ghana, Nzima District. Beyin Lake, 10 Nov 1982, *Hepper 7457* (K). Ivory Coast. Abidjan, Anguededou forest, near Agneby river. Primary forest, ferralitic clayish-sandy soil. 23 Nov 1975, 05°23′N, 04°08′W, *de Koning 6208* (BR), Abidjan, Banco Forest Reserve, on left hand side of Route Reste, near entry, 11 Feb 1974, 05°22′N, 04°03′W, *de Koning* 4731 (BR), Procédent Forêt de Buyo, en cult. à Daloa, 6 Dec 1973, *Perez Vera 263* (P), Route Daloa Mau, près de la rivière Lobo, 8 May 1974, *Perez Vera 630* (P), Bassin du Haut Sassandra et bassin du Cavally, sommet du Mont Dou, 22 Jan 1931, 1340 m, *Portères 552* (P). Kenya. Mala River area of Kakamega Forest, 10 Dec 1956, *Verdcourt 1704* (K), Kakamega District, Kakamega Forest, Iveko, Buyangu area on the trail to Buyangu hill from the camping site after the river, 00° 20′97″N, 34°52′01″E, 1584 m, 30 Mar 2009, *Miyawa 1224* (EA, K), Burnt forest, flowers blue, 25 Jul 1938, *Evans & Erens 1473* (P). Liberia. Grand bassa, Cestos- Saguin area, Logging concession of the Cooper’s, Sudan section. Recently logged forest. 6 Dec 2002, 05° 29′24″ N, 09°23′00″E, 60 m, *Jongkind 5655* (BR). Liberia, Roberts from Chimiaty, 1878, *s.n.* (BM), Nimba, Sanniquelle Distr., Nimba Mount, Mount Ganta, 400 m, 10 Oct 1969, *Johansson 635* (UPS), Nimba, Sanniquelle Distr., Nimba Mountains, 600 m, 5 Nov 1969, *Johansson 676* (UPS). Malawi. Nyassaland, Northern Province, 5000 feet on the Viphya near Mzuzu, 1954, *Chapman 286* (BM, P). Nigeria. Onitsha Aba road. At Idemili Bridge, *Flip FHI 35807* (K), Sapoba, Jameson River, 21 Nov 1934, *Ross 228* (K), Moba, near Pico ca. 6000 ft, 1 Jan 1967, *Sanford 4399* (K), Oban District, Southern Nigeria, 15 Jan 1912, *Talbot* (K), Calabar, Eket, Ibeno, on the path from Ibeno to the Western Boundary of Stubb’s Creek, 12 May 1953, *Onochie 32090* (K), Calabar, opposite to Calabar prison club, 13 Nov 1964, *Daramola 55330* (K). Rwanda. Cyangugu, Forêt de Nyungwe, route Pindura-Nyungwe près de Pindura, 2350 m, 22 Jan 1971, *Bouxin, 112* (BR), Cyangugu, Forêt de Nyungwe marais Kamiranzovu, 1950 m, épiphyte sur arbre mort dans le marais, 14 Feb 1971, *Bouxin 260* (BR), Forêt du Nyungwe, environs de Mayebe, 19 Feb 1971, *Bouxin 359* (BR), Cyangugu, Gisakura, 1800–2000 m, *Troupin 15948* (BR). Sierra Leone. *Sine loc.,* 27 Nov 1932, *Deighton 2566* (K), Kpakpeibu, Kailahun District, 19 Nov 1981, (K), Yagoi, month of Jong River, 1 Nov 1946, *Adams 107* (BR), Mont Loma, 1100 feet, 1 Oct 1964, *Jaeger 7785* (BR), Yagoi, month of Jong River, 1 Nov 1946, *Adams 102* (K, P), Mont Iowa, 1100 feet, 14 Oct 1964, *Jaeger 7785* (P, K).Tanzania. Flora of Amani, 3000 feet, 20 Jan 1950, *Verdcourt 50* (K, P), Flora of East Usambaras, Kwamtoro Kihuhwi, 16 Dec 1937, *Greenway 4796* (P), East Usambara, Kwamkoro-Kiganga Forest Reserve adjoining Mnyusi Scarp Forest at the SW escarpments of the East Usambara. 930–970 m, 9 May 1987, *Borhidi, Iversen, Mziray, Persson, Pettersson & Pocs 87385* (UPS), Kwamkoro

Reserve bordering Kwamsambia, 960–1000 m, 5 May 1987, *Borhidi, Iversen, Mziray, Persson, Pettersson & Pocs 87250* (UPS). Uganda. Bukoto Country, Bale, Lake Nabugabo, 00°22′00″S, long. 31°52′60″E, 5 May 1969, *Lye, Manum & Morrison 2781* (UPS), Entebbe, 3900 feet, Jun 1905, *Brown 252* (K), *ibid.*, May 1936, *Chandler 1617* (BR), Masaka District, N.W. side of Lake Nabugabo, 9 Oct 1953, 1140 m Lakeside forest fringe, *Drummond, Hemsley 4720* (BR, P, K). Zambia. Nyika Plateau, Chisai hill, Mar 1966, *Williamson 123* (K). *Sine loc.*, Ngoko, Sep 1899, *Schlechter 12743* (BM, BR, K, P), Incertae sedis: Ghana. Anyinam, Cocoa farm, 29 May 1967, *Bowling 36595* (K) Fankyeneko nr. Bunso, 19 Nov 1967, *Bowling 36620* (K). *Sine Loc.*, *Thielens 21988* (BR).

Tridactyle anthomaniaca subsp. ***nana*** P.J.Cribb & Stévart in Kew Bull. 59: 205. 2004 – Holotype: Equatorial Guinea (Rio Muni), N part of National Parc of Monte Alén, 2 km NW from the Monte Chocolate Ecofac transect, about 5 km from the beginning of the transect, 1000 m, 20 Dec 2002, *Senterre & Obiang 3796* (BR!; isotype: K!).

Additional specimens examined. – Cameroon. East Cameroon, at the sea shore, at mouth Lobé River, just south of Kribi, 10 Feb 1969, *Sanford 5704* (K, P), 30 km à l'Est de Kribi au Nord de la Kienké, feuille IGN 1/200000 Nyabessan, 19 Apr 1968, *Letouzey 9405* (P). Equatorial Guinea. Engong, National Parc of Monte Alén, 5 km NW from Engong village, inselberg, 01°37′N, 01°18′E, 1 Aug 1999, *Ndong Bokung & Stévart 1* (BRLU); *ibid.*, 12 Sep 2001, *Ndong Bokung & Stévart 422* (BRLU).

Tridactyle armeniaca (Lindl.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 143. 1918 ≡ *Angraecum armeniacum* Lindl. in Edwards's Bot. Reg. 25: Misc. 67. 1839 ≡ *Angorchis armeniaca* (Lindl.) Kuntze, Revis. Gen. Pl. 2: 651. 1891 – Holotype: Sierra Leone. sin. loc., *Loddiges s.n.*, Lindley Collection (K barcode K000975005!).

= *Angraecum whitfieldii* Rendle in J. Bot. 33: 250. 1895 ≡ *Tridactyle whitfieldii* (Rendle) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 148. 1918 – Holotype: Sierra Leone, 1844, *Whitfield s.n.* (BM barcode BM000540348 [photo]!).

Additional specimens examined. – Equatorial Guinea. Cercle de Aranah, Socourala, 23–24 Jan 1909, *Chavalier 20512* (P), Pays des Guerzés, dans le ravin au pied de la montagne de N'Zo, 26 Mar 1909, *Chevalier 21011* (P), *ibid.*, Mar 1909, *Fleury 21033* (P, 3 sheets). Ghana. Atewa Range F.R., 2600 feet, 14 Dec 1967, *Bowling 36627* (P, K). Ivory Coast. Route Douané Guinée, en cult. à Daloa, 16 Feb 1974, *Perez Vera 576* (P), Summit Mount Tonkoui, near Man, 110 m, 24 Jan 1984, *Hepper & Maley 7743* (K), Mountains Momy, Monts des Dans, 40 km North of Danané, 30 Jan 1984, *Hepper & Maley 7914* (K). Liberia. Nimba Mountains, 600 m, 10 Feb 1969, *Johansson 452* (K, UPS), Sanniquelle Distr., 1200 m, 8 Mar 1969, *Johansson 465* (UPS), *ibid.*, 8 Mar 1970, *Johansson 746* (UPS), 500 m, 1 Mar 1965, *Adam 21046* (K), Mount Nimba, 1200 m, 16 Mar 1965, *Adam 21166* (UPS, 2 sheets). Sierra Leone. Boma, Pukuru Krim, 9 Jan 1954, *Jackson 17* (K), Loma Mountains, galerie forestière, 1800 m, 5 Feb 1952, *Jaeger 4283* (K, 2 sheets). *Sine Loc.*. From Colman's Collection, gatton Park, Surrey, 9 Jun 1943, *s.n.* (K).

Tridactyle aurantiopunctata P.J.Cribb & Stévart in Kew Bull. 59: 201. 2004 – Holotype: Príncipe, Pico Papagaio, 01°36′N, 07°23′E, 680 m, 1 Oct 1998, *Stévart 395* (BR!; isotype: K barcode K000306510!).

Additional specimens examined. – Príncipe, Pico Papagaio, 01°36′N, 70°23′E, 680 m, *de Oliveira 1999/36* (BRLU); *ibid.*, 6 Oct 1997, *Stévart 226* (BRLU, K); *ibid.*, 3 Jan 1998, *Stévart 290* (BRLU), *ibid.*, 1 Sep 1999, *Stévart 656* (BRLU), *ibid.*, Feb 2002, *Stévart 224* (BRLU), Estacao Souza, 00°15′30″N , 06°33′30″E Parc National Obo, 1600 m, 11 Oct 1997, *Stévart & Oliviera 278* Infente Do Henrique, 01°34′N, 07°24′E, 100 m, *de Oliveira 1999/94* (BRLU), Juan Dias Pays, 01°36′N, 07°22′E, 250 m, 12 Aug 2002, *Primo & Stévart 70* (BRLU); *ibid.*, 1 Feb 2000, *Stévart 689* (BRLU); way of Pico of Príncipe (first ridge), 01°35′N, 07°22′E, 300 m, 1 Sep 1999, *Stévart 628* (BRLU); *ibid.*, 1 Feb 2000, *Stévart 690* (BRLU); Morro De Leste, 01°37′N, 07°24′E, 650 m, 1 Sep 1999, *Stévart 643* (BRLU).

Tridactyle bicaudata (Lindl.) Schltr. in Orchideen: 602. 1914 ≡ *Angraecum bicaudatum* Lindl. in Compan. Bot. Mag. 2: 205. 1837 ≡ *Listrostachys bicaudata* (Lindl.) Finet in Bull. Soc. Bot. France 54(9): 51. 1907 ≡ *Angorchis bicaudata* (Lindl.) Kuntze in Revis. Gen. Pl. 2: 651. 1891 – Type: South Africa. In coll. calc. Kopje, prope Zwartkopsrivier, *Drège s.n.* (possibly 2215, see dupl. at P) (isosyntypes: BM barcode BM001050390 [photo]!, P barcode P00388520!).

= *Angraecum fimbriatum* Rendle in J. Linn. Soc., Bot. 30: 387. 1895 ≡ *Listrostachys fimbriata* (Rendle) Kraenzl. in Bot. Jahrb. Syst. 33: 74. 1902 ≡ *Rhaphidorhynchus fimbriatus* (Rendle) Finet in Bull. Soc. Bot. France 54(9): 42. 1907 ≡ *Tridactyle fimbriata* (Rendle) Schltr. in Bot. Jahrb. Syst. 33: 602. 1915 – Type: Giryama and Tsimba Mountains, 1887,

Taylor s.n. (BM barcode BM000540358!).

= *Listrostachys cirrhosa* Kraenzl. in Bot. Jahrb. Syst. 33: 73. 1902 – Type: Tanzania. Usambara, Derema, 800–1300 m, *Scheffler 125* (B†).

= *Tridactyle pulchella* Schltr. in Bot. Jahrb. Syst. 53: 602. 1915 – Isosyntypes: Malawi. North German-Nyassaland, Nyassa Hochland, flowered near Kyimbila, 1350 m, 10 May 1911, *Stolz 716* (B barcode B 10 0167145 [photo!]; C barcode C10001114 [photo!], G barcode G00022230 [photo!], K barcode K000306518!, L barcode L 0062641 [photo!], M barcode M-0103361 [photo!], S No. S-G-7339 [photo!], U barcode U 0005425 [photo!], WAG barcode WAG0002579 [photo!]).

= *Angraecum laciniatum* Kraenzl. in Vierteljahrsschr. Naturf. Ges. Zürich 74: 101. 1929 – Type: Uganda. Ripayo, forest edge, 1330 m, *Dümmer s.n.* (B†).

– "*Tridactyle polychista*" Schltr. ex Mansf. in Repert. Spec. Nov. Regni Veg. Beih. 68(11): 104. 1932, not validly published.

Additional specimens examined. – Angola. Distr. Pungo Andongo, Mar 1857, *Walwirsch 700* (BM, LISU). Burundi. Prov. Muramvya mont Ngoma, forêt de montagne, 03°13′S, 29°33′E, Jan 1980, 2200 m, *Reekmans 8503* (BR), Giharo, 19 Mar 1991, 03°51′S, 30°13′E, savane boisée, *Arbonnier 220* (BR), Prov. Bururi, Arr. Bururi, Km 9 route Rumonge–Bururi, 04°01′S, 29°28′E, 1000 m, 13 Apr 1969, *Delarge 131* (BR), Prov. Muramvya plantation de thé de Tesa, 20 Apr 1969, forêt de montagne dense, 2200 m, 03°13′S, 29°34′E, *Delarge 137* (BR), Muramvya Nyabiondo, plantation de thé, 2000 m, 1 Nov 1967, forêt dense, *Lewalle 2186* (BR). Cameroon. Kodmin, 20 Jan 1998. *Etuge 4022* (K), *ibid.* 16 Nov 1998, *Pollard 2006* (K), Mount Kupe, 1 Nov 1995, *Sebsebe Demissew 5074* (K), Entre Ngaoundéré et Meiganga, bord de route, Lat.: 07°06′59″N, Long.: 13°44′30″E, 1239 m, 5 Oct 2011, *Droissart, Kamdem, Kamden & Ploton 1116* (BRLU), *ibid.*, *Droissart, Simo, Stévart, Sonké, Kamdem & Guiakam 3719* (BRLU), Mont Kupe, chemin ("Mountain trail"),Village de Nyasoso, *Simo, Stévart, Sonké & Droissart 2009* (BRLU), *ibid.*, *Simo, Stévart, Sonké & Droissart 2023* (BRLU), entre Kupe et Muanangouba, Ebamut, 05°08′65″N et 09°41′66″E, 2 Oct 2002, *Simo 112* (BRLU). Central African Republic. Station de Boukoko, Wamiri Zubingi, 4–14 Sep 1925, *Tisserant 2124-2021* (P), Plante de l'Oubangui, region de la Ouaka 12 Feb 1926, *Tisserant 2021* (P, 4 sheets, BM, 2 sheets, LISC), Plante de l'Oubangui, forêt de plateau, Kaga Latimui 20 Jul 1927, *Tisserant 2021bis* (BM, 2 sheets). Democratic Republic of the Congo. *Lebrun 3747* (BR), Entre Makagi et Thibali, 2200 m, savane. *Lebrun 3847* (BR). Congo Ougi, plaine de lave, 30 Sep 1914, *Bequaert 5961* (BR), Mayambe bayaka, Zeluibanga, 15 Feb 1915, *le Testu 2021* (BR), Parc de la Garamba, 11/fd/17, 13 Sep 1951, *De Saeger 1369* (BR), Parc de la Garamba, 11/fd/17, 800 m, 13 Sep 1951, *De Saeger 354* (pictures) (BR), Bagbuyo, 26 Aug 1957, ±800 m, galerie d'un affluent de l'Alea, *Troupin 2009* (BR), Kalehe, Kivu, Mont Kahuzi, parc à Hagenia, 2700 m, 26 Nov 1953, *Christiaensen 246* (BR), *ibid.*, 27 Nov 1955, *Deuse 55/4* (BR), *ibid.*, 1 Oct 1971, *Ntakiyimana* 180 (BR), entre Makagi et Kibali, 2200 m, savane, *Lebrun 3847*(2 pages) (BR), Forêt CTC Suraiga, 30 Sep 1906, *Seret 667* (BR), Au sud de Rumangabo, 1600 m, maquis sclérophylle, 22 Jan 1945, *Germain 3450* (BR), Parc national Albert, Plaine de lave, versants du Nyanloqua, Oct 1935, *Smets 94* (BR, BRLU), *ibid.*, *Smets 95* (BRLU), Parc national Albert, Nyamulagira, 2000 m, 8 Jun 1945, *Germain 3912* (BR),Parc National Albert, Versant est du Nyiragongo, 2000–2400 m, Nov 1937, forêt de montagne, *Lebrun 8709* (2 pages) (BR), *ibid.*, *Lebrun 8723* (BR), Plaine de lave entre les Lacs Kivu et Edouard, du Mikeno au Nyiragongo 1460–2000 m, Apr/May 1929, *Humbert 8173* (BR P), Fond d'une large vallée au confluent de plusieurs vallées latérales, au Nord de Ngussa, M.G.L. Sud, division cassitérite, 2300 m, 20 Dec 1947, forêt humide d'altitude, *Michelson 763* (BR), Lulanga Congo, 13 Apr 1927, *Van den Moudt 5890-31* (BR), Parc National de Upemba, Versant Nord Mount Kia, rive droite Koulule, 1050 m, 2 Mar 1979, *Mission de Witte 05738* (BR), Luishia, 3 Apr 1990, *Malaisse & Bodenghien 14213* (BR), région de Shaba, Poste Kolwezi/ Mamfuse, 19 Mar 1989, *Schaijes 4326 B* (BR). Equatorial Guinea. Bikurga (inselberg de), près du village de Bicurga (face Est de l'inselberg), 01°34′56″N, 10°28′14″E, 665 m, 22 May 2002, *Stévart 1525* (BRLU), Fernando Poo, Pico Sta. Isabel from 7600 feet to 3000 feet., at about 6000 feet., 21 Feb 1969, *Sanford 5994* (K), Misergue, 23 Sep 1999, *Ngok Bokung 80* (BRLU), Engong (Parc. National de Monté Alén), chemin de la dale rocheuse (inselberg) d'Engong, 5 km North West du village d'Engong, 467 m de l'inselberg au 100°, 01°37′18″N, 10°18′04″E, 1090 m, 13 May 2002, *Stévart 1446* (BRLU). Ethiopia. Ye Debub Biheroch Bihereseboch na Hizboch, Kefa A., 37 km north of Mezan Tefari, on the road to Tepi, 5 km south of the boundary river between Kefa and Illubabor A. Regions, 1200 m, 07°04′60″N, 35°25′60″E, 7 Dec 1984, *Friis, Gilbert & Vollesen 4050* (UPS). Gabon. Estuaire, Libreville, Cap Esterias, near Moka. Mangrove, 00°35′42″N, 09°25′36″E, 1 m, Nov 1987, *Louis, Sterck & N'Goyé 2623* (BR), Delta de l'Ougoué, Cape Lopez, Dec 1899, *Schlechter 12818* (BM, BR) Pointe Denis, épiphyte lisière de savane, 25 Feb 1968, *Hallé & Villiers 5549* (P),

Pointe Denis, Nov 1997, *Biteau & Stévart 22* (BRLU), Achanka, *Thollon 94* (P), Schwouam (rocher de), à 1h e Marche du village de Schwouam, axe Somalomo-Ekom, face NE 55°, 03°19′20″N, 12°47′27″E, 605 m Num cult. 973, 18 Oct 2003, *Stévart & Pial 930* (BRLU), *sine loc., Dauby, Nguema, Bissiemou & Stévart 34* (BRLU). Ivory Coast. "Nahoua" sacred waterfalls in Sassandra River, 2 km West-North West of Soubré, 27 Nov 1961, *De Wilde 3323* (K), Segela à Makono, en culture à Daloa, 11 Nov 1974, *Perez-Vera 715* (K). Kenya. Nasailand, Marok District, Oriroi (Masai), Nara river, Ngebai Langata endul., 5200 feet, 3 Apr 1961, *Clover, Gnynne & Samuel 358* (BR), Nairobi Municipality, Ngong Road Forest near race course, 1700 m, 5 May 1981, *Gilbert 6130* (UPS). Liberia. Nimba, Sanniquelle Distr., Nimba Mount, Mount Ganta, 700 m, 6 Nov 1969, *Johansson 684* (UPS), Nimba, Sanniquelle Distr., Nimba Mount, 500 m, 28 Jun 1970, *Johansson 854* (UPS). Malawi. North Province, Mzimba District, Mzuzu, Marymount, 4500 feet, 19 Apr 1977, *Pawek 12596* (BR), *ibid.*, 13 Mar 1973, *Pawek 6500* (P), Flora of Nyassaland, Northern Province, Viphya near Mzaza, 5000 feet, 1954, *Chapman 288* (BM). Mozambique. 7 May 2009, *Matimele 88b.* (K), Niassa, Vila Cabral, serra de Massangulo, (Fe), 1450 m, saxideserta a granito, 25 Feb 1964, *Torre & Paiva 10794* (LISC). Nigeria. North Nigeria, Jos Plateau, Rafin Bauna (N), F.R. 23 Jul 1962, *Lawlor & Hall* 45581 (BR, P). Plateau, New Farim Rua between William Conny and Markai, 24 Aug 1968, *Hall 643* (BR). Rwanda. Préfecture de Kibuye, Commune de Mabanza, Cellule de Mukura, UTM 9778812 N, 0780460 O, 2485 m, 11 May 2000, *Ewango, Nzakizwanayo & Mulindahabi 2263* (BR, MO, WAG), Cyangugu, Gisakura, Forêt de Nyungwe-Rugege, Oct 1974, 1900 m, 0/74/16, *Troupin 15483* (BR). Guinea. Env. Konakry, Jan–May 1893, *Paroisse 7* (P), Nzérékoré, Nimba Mountains, Gbaa River, 07°40′30″N, 08°23′59″E, 937 m, 22 Mar 2009, *Haba, Bilivogui & Traoré 118* (BR). Sierra Leone. Near Alikalia, 1918, *Bunting 30* (BM). South Africa. Grahamstown, in silvis prope, 2200 feet, novi florif., 1887, *Hance 16299* (BM), Natal, Port Shepstone, near Paddock, 31 Nov 1965, *Strey 6261* (BR), Natal-Colony, District Alexandra, Station Dumisa, Bahrander, Ungayo Alsona, 600 m Seehöhe, 2 Mar 1910, *Rudatis 863* (BM, P),Uitenhage, in valle Olifantshoek, inter ostia fluviorum Zondagiuvier & Boshmanorium, *Zeyher & Ecklon (comm.Drège)* (P, UPS, 2 sheets), Cap de Bonne Espérance, 1847, *Zeyher 3888* (P), Cap, étudié par *Duihenbroek 279* (P), Angraecum à deux éperon, Cap de Bonne Espérance, 11836, *Eklon s.n.* (P), Plantes du Cap, Koratra, 29 Sep 1831, *Drège 8269* (P), Plante du Cap, Kopje, 14 Dec 1829, *Drège 2215* (P), Cap de Bonne Espérance, 10 Nov coll. Drège, *Rgt 2004* (P), *ibid.*, *Drège s.n.* (P), District Uitenhage, on the trees and rocks of Krakakamma, hills by the Coega River, Nov, *s.n.* (P), Komgha C.P., 2000 feet, Jan 1891, *Hanagan 636* (BM, P, UPS), Tanzania. 10 May 1911. *Stolz 716* (K), Morogoro, Uluguru, 500 m, 26 May 1933, *Schlieben 3988* (BR, K), *ibid.*, *Schlieben 3986* (P, K, BM, LISC), Arusha district, Momela Lake, 4575 feet, Ngurdoto National Park, Nov 1965, *Greenway & Kanuri 12277* (BR), Mbeya, crater lake near Masoko. 900 m 09°19′60″S, 33°45′00″E Mar 1985, *Pettersson, Hedrén & Kibuwa 426 D* (UPS), Mbeya, Chivanjee Tea Estate, 1000 m Lat. 09°19′60″S, 33°40′00″E, 27 Mar 1985, *Pettersson, Hedrén & Kibuwa 461* (UPS). Uganda. Forest Kipago, flowers seems white, 4000 feet, Oct 1915, *Dümmer 1089* (BM, P), Kwigluwa, 4000 feet, Flowers orange yellow, 1913, *Dümmer 489* (BM) Mount Elgon, 5–6000 feet, 19 Oct 1924, *Snowden 941* (BM), near Namatala & Mount Elgon, 6000 feet, 23 Oct 1917, *Snowden 526* (BM), Toro, 5000 feet, 26 Nov 1921, *Snowden 740* (BM). Zambia. North Rhodesia, Broke Hill District, Muyama, 8 Feb 1961, *Morze 59* (BR), Southern, Choma District, ca. 45 km N along Namwala-Choma Road from intersection Choma Namwala and Choma-Lusaka Roads Intersection, then W (ca. 1.2 km N of Ngonga stream), then 12.4 km W-NW on road to Macha Mission (Sikweshina) in Mulundeka hills; disturbed miombo, 16°26′10″S, 26°49′28″E, 1260 m, 9 Mar 19997, *Harder, Schmidt, Zimba &Luwiika 4015* (P, K). Zimbabwe. Ref. 801-1H, 26 Feb 1971, *Schaijes s.n.* (pictures) (BR), Melsetter, Chimanimani Mountains, 5500 feet, 7 Apr 1967, *Grosvenor 345* (P, K). *Sine Loc.*. Plant Afrique Australe, *Ecklon & Zeyher 4091* (BR), 81/23, 11a10, 6 Dec 1981, *Schaijes 1211* (pictures) (BR), 801-3V, 4 Mar 1971, *Schaijes 1211* (pictures) (BR), 801-1H, 26 Feb 1971, dia 19, *Schaijes 1211* (pictures) (BR), 89-/9, 18–20, *Schaijes 4326* (BR), Dec 1988, *Gillet 2* (BR), Southern Rhodesia, Umtali, Uyachowa Falls, 4000 feet, G.H. 28115 = G.H. 22740, *Centlivres Chase 2170* (BM), *ibid.*, 7 Mar 1949, G.H. 24027 = G.H. 22740, *Centlivres Chase 993* (BM). *Sine Loc*. Herbier de Claude et Richard, *s.n.* (P).

Tridactyle brevicalcarata Summerh. in Kew Bull. 3: 295. 1948 – Type: Gabon. Upper Ngounyé River, between Kembélé and Ayoumba, by R. Micounzou, Oct 1925, *Le Testu 5564* (BM barcode BM000540404!, K barcode K000306471!).

Additional specimens examined. – Cameroon. Douala/Edea Forest, sandy soil, 1978, *Thomas 153* (K), Akom II (route de Kribi-Ebolowa), Campement à 3h de Marche au S du village. Sommet de la colline située à 2h de Marche au N du campement. 02°44′19″N, 10°31′52″E, no. cult. 2112, 1065 m, 1 Oct 2009, *Simo, Stévart, Sonké & Droissart 1838* (BRLU), *ibid.*, *Simo, Stévart & Droissart 1643* (BRLU). Gabon. Tchimbélé, ancient lit de rivière qui descend du barrage,

00°36′50″N, 10°23′60″E, no. cult. 189, 440 m, 19 Oct 2001, *Stévart, Ngok & Nguema A. 1123* (BRLU), plus haut que Kinguele, Dec 1997, *Biteau & Stévart 23* (BRLU), Ngounié, Waka forest exploitation (near what is called The Falaise), small creek, 01°18′S, 10°57′E, 370 m, living plant associated, 9 Mar 1988, *Arends 849* (WAG, 2 sheets+1 spirit), *sine loc. Arends 850* (WAG, spirit), Estuaire, Forest exploitation Leroy, 20 km North West of Assok, 00°53′N, 10°12′E, 600 m, 27 Dec 1983, *van der Laan 728* (WAG Sheet+spirit), Nyanga, Doussala, 02°36′S, 10°35′E, 25 May 2011, Leg. To Wageningen by Reitsma et al. s.n., *van der Laan 1318* (WAG), Woleu–Ntem, Crystal Mountains, 10 km on road from Tchimbélé to Assok, 00°40′12″N, 10°24′12″E., 630 m, 15 Apr 2004, *Wieringa 5299* (WAG), Moyen Ougoué, 18 km NW of Ndjolé, 00°04′S, 10°38′E, coll. by Wieringa on same loc. as 1596, 15 Apr 2004, *Wieringa 5298* (WAG). Ghana. Ashanti, Kumasi, Aug 1938, Cox 98 (K), *Sine Loc. Damen 269* (WAG), *van der Laan 775* (WAG).

Tridactyle brevifolia Mansf. In Notizbl. Bot. Gart. Berlin-Dahlem 11: 1063. 1934 – Type: Tanzania. Uluguru-Gebirge: Nordwestseite, ca. 2100 m u. M., Lupanga, Nebelwald, epiphytisch, häufig, 12 Nov 1932, *Schlieben 2982* (AMES barcode 00090835 [photo!], BM barcode BM000540405!, BR barcode 0000008815576!, G barcode G00022229 [photo!], MA barcode MA 386582 [photo!], P barcode P00388502!).

Additional specimens examined. – Tanzania. Morogoro North Uluguru, 13 Dec 1993, *Kisena 914* (K), Morogoro Mhonda Mission, 5 Feb 1989, *Pocs 89056* (K), Morogoro Bondwa, 23 Jan 1976, *Cribb & Grey Wilson 10381* (K) Morogoro Bondwa, 3 Jan 1975, *Mwasumbi., Kinunda 11312* (K), Morogoro District, Nguru Mountains, Elfin forest above "Spirit Lake" at the N. source of CHASI river, above the fall, 2100 m, Chazi, 4 Feb 1989, *Pocs 89053* (K), Morogoro Bondwa, 22 Jan 1976, *Cribb & Grey Wilson 10311* (K), Eastern Province, Morogoro District, Uluguru Mountains, Lukwangule Plateau, Mar 1955, *Semsei 2014* (K), Morogoro, Divue headwaters, 6 km SSE Maskati Mission, Upper montane forest on upper side of very mossy horizontal branches, 1950–2050 m, 11 Feb 1991, *Manktelow & Swenson 91301* (UPS), *ibid.*, 12 Feb 1991, *Manktelow & Swenson 91345* (UPS).

Tridactyle crassifolia Summerh. in Kew Bull. 3(2): 285. 1948 – Holotype: Gabon. Plantes recueillies dans la Haute-Ngounyé, Mouyamba, 2 Jan 1925, *Le Testu 5173* (P barcode P00388501!; isotypes: BM barcode BM000540406!, BR barcode 0000006422400!, K barcode K000306489!, LISC barcode LISC 003344!).

Additional specimens examined. – Cameroon. Haut Nyong, Dimako, 26 Oct 1968, *Sanford 5245* (P, K), South Province, Ocean Division, Mvie. About 8 km (along a straight line) ENE of village Mvie. Mvie 12 km N of Akom II by the road. Road to plot of logging study., 02°55′N, 10°37′E, 400 m, 26 Sep 1997, *van der Burg & Laan 182* (K). Bindem (route allant vers Messama, perpendiculaire à la route Kribi Ebolowa). Campement 2h de Marche au SO du village. Le long du sentier à 1h30 de Marche au SO du campement, 02°40′55″N, 10°46′32″E, RVIN 70, 590 m, 15 Aug 2006, *Droissart & Simo 266* (BRLU), Mindourou, site d'exploitation de la Palisco près de Lomie (AC5), 03°23′04″N, 13°54′12″E, 770 m, no. cult. 269, 22 Nov 2004, *Droissart, Simo, Nguembou, Djuikouo (ombrière de Yaoundé) 199* (BRLU). Central African Republic. Oubangui, Boukoko, 12 Aug 1948, *Tisserant 1081* (BM, P, K). Democratic Republic of the Congo. Cultivé au Jardin Gillet, Kisantu, *Callens 805* (K). Equatorial Guinea. Avelemang, 570 m, 30 Jan 2003, no. culture 1619, *Deman 295* (BRLU). Ivory Coast. Bassin du moyen Cavally, Mont Niénokué 500 m 20 km Nord East Fort Binger (granit), 18–19 Jul 1907, *Chevalier 19464* (P). Kenya. Taita Taveta, Mbololo Forest, Southern end of the forest, near the forest edge., 03°19′S, 28°27′E, 1550 m, 27 Nov 1998, *Bytebier 1198* (BR). Nigeria. 7 Jun 1976, *Segerback 1214* (K).

Tridactyle cruciformis Summerh., Kew Bull. 3: 293. 1948 – Holotype: Tanzania. East Usambara Mountains, Amani, 900 m (3000 feet), rain forest, especially in canopy, common, 20 Apr 1941, *Moreau 17* (K barcodes K000306473!, K000382771! & 10683.000 [spirit]!).

Additional specimens examined. – Kenya. Masai District: Chyulu Hills, *Bally 7856* (K), Kajiado Chyulu Hills, edge of main forest north, 02°40′S, 37°52′E, 1980 m, 11 Dec 1993, *Luke & Luke 3865* (K), Taita Taveta, Mbololo Forest, Southern end of the forest, near the forest edge, 03°19′S, 28°27′E, 1550 m, 27 Nov 1998, *Bytebier 1198* (BR), Taita Hill, Mbololo Hill (Mraru Ridge). 1440–1550 m, Mist forests, 2 Jan 1971, *Faden, Evans, Msafiri & Smeenk 71/46* (BR, K, 2 sheets). Tanzania. Amani, NE Tanganyika Territories, 3000 feet, 20 Apr 1941, *Moreau* (K), Tanga, Usambara Mountains, Amani, in the surrounding of the Forestry House, 900 m, 05°07′00″S, 38°37′60″E, 9 Jan 1971, *Johansson 925* (UPS), East Usambara Mountains, 600–1500 m (2000–8500 feet), rain forest, cult. in Amani, flowered in hort. 28 Dec 1941, *Moreau 116* (K), Lushoto Mazumbai, on peak opposite Mazumbai estate, T311 Jan 1976, *Cribb & Grey-Wilson 10170* (K), N.E. of

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Mazumbai F.R., 5500 feet, West Usambaras, Lushoto Mazumbai, 16 Jan 1976, *Cribb & Grey-Wilson 10239* (K), West Usambara, Lushoto Mazumbai, coll. By L. Tanner and flowered in her garden, 7 Nov 1975, *Cribb & Grey-Wilson 10051* (K), 2 km before Amani, road from Kilosi Muheza, Amani, 3000 feet, 18 Jan 1976, *Cribb & Grey-Wilson 10277* (K), Muheza, Amani, May 1980, *Simkin 163* (K), West Usambara, Mazumbai, Shamba Migamba, Shamba ya Matingo, 1300 m, 14 Dec 1979, *Tanner 225* (K).

Tridactyle eggelingii Summerh. in Kew Bull. 3: 289. 1948 – Holotype: Uganda. Kigezi, Impenetrable forest, Nyebeya, Flower whitish, Oct 1940, *Eggeling 4186* (K barcode K000306479!).

Additional specimens examined. – Burundi. Ndoun- Gisunno, 02°53′S, 29°25′ E, 12 Dec 1990, *Arbonnier 137* (BR). Democratic Republic of the Congo. Parc National Albert, Nyamulagira, a little beyond Mushumangabo, 2000 m, in mountain forest, Dec 1944, *Germain 3121* (K, BR); Sud-Kivu, route de Kahuzi, 2100 m, 02°15′S, 28°41′E, 16 Oct 1958, *Leonard* 1292 (BR, K, MLGU [photo!], YBI [photo!]), Marais de la Musisi, Terr. Kalehe, 2100 m, 30 Apr 1959, *Leonard 4010* (BR, K, UPS). Rwanda. Cyangugu piste vers Birambo, 18 Dec 2003, *Delepierre 134* (BR), Nyungwe, route de Pindura-Bweyeye km 12, 10 Mar 1998, *Delepierre 52* (BR), Nyungwe, route de Pindura, km 10, Feb 1993, dessin d'après nature (aquarelle et crayon), *Delepierre 172* (BR), *ibid.*, photo, *Delepierre s.n.* (BR).Uganda. Near Karungu, Kigezi, 7000 feet, common in N.W. Kigezi, Mar 1962, *Leakey 17* (K).

Tridactyle exellii P.J.Cribb & Stévart in Kew Bull. 59: 195. 2004 – Holotype: São Tomé, Estacao Souza, 00°15′N, 06°33′E, 1550 m, 1 Feb 2000, *Stévart 687* (BR!; isotype: K barcode 76647.000 [in spirit]!). [*Tridactyle* sp. C. sensu Stévart & Oliveira, Guide des Orchidées de São Tomé et Príncipe: 2004, fig. 187–190. 2000; Stévart & al. in Acta Bot. Gallica 147(2): 166. 2000.]

Additional specimens examined. – São Tomé, Bom Sucesso to Lagoa Amelia (Zona ecologica), 00°17′N, 06°37′E, 1250 m, 10 Apr 1997, *de Oliveira 238* (BRLU); Estacao Souza, 00°15′N, 06°33′E, 1550 m, 1 Feb 2000, *Stévart 687* (holotype BR; isotype: K); *ibid.*, *de Oliveira 1999/28* (BRLU); *ibid.*, 12 Dec 2002, *Primo & Stévart 111* (BRLU); *ibid.*, 1 Dec 1997, *Stévart 297* (BRLU, K); *ibid.*, 1610 m, 1 Sep 1998, *Stévart 394* (BRLU); path to Cabumbé (central ridge), 00°10′N, 06°33′E, 900 m, *de Oliveira 1999/30* (BRLU); Morro Vileta, 00°17′N, 06°33′E, 1100 m, *Primo & Stévart 2* (BRLU); *ibid.*, 16 Oct 2000, *Primo & Stévart 34* (BRLU); around the Lagoa Amelia, 00°16′N, 06°35′E, 1959, *Rose 207/1959* (K); between 1400 and 1500 m, 1956, *Rose 962/1956* (K); Escadas, 00°15′N, 06°34′E, 1450 m, 15 Aug 1997, *Stévart 47* (BRLU); Morro Vileta, 00°17′N, 06°33′E, 1100 m, 1 Sep 1998, *Stévart 393* (BRLU); Pico de Ana Chavez, 00°15′N, 06°34′E, between 1400 and 1500 m, 1 Feb 2000, *Stévart 698* (BRLU); *ibid.*, *Stévart 708 (*BRLU).

Tridactyle filifolia (Schltr.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 144. 1918 ≡ *Angraecum filifolium* Schltr., Westafr. Kautschuk-Exped.: 284. 1900 – Holotype: Gabon, Sanga, Sep 1899, *Schlechter 12791* (B†; isotypes: BM barcode BM000540357!, BR barcode 0000008815569!, K barcode K000306485!, PRE barcode PRE0587580-0 [photo!]).

= *Listrostachys linearifolium* De Wild., Not. Pl. Util. Congo: 149. 1900 ≡ *Tridactyle linearifolia* (De Wild.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 146. 1918 – Type: Democratic Republic of the Congo, 18 Dec 1895, *Laurent 25* (BR barcode 0000008815583!).

Tridactyle fimbriatipetala (De Wild.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36: 144. 1918 ≡ *Angraecum fimbriatipetalum* De Wild. in Bull. Jard. Bot. État Bruxelles 5: 186. 1916 – Type: Democratic Republic of the Congo. Injolo, *Laurent 1783* (BM barcode BM000540361!, BR barcode 0000008815255!, K barcode K000306514!).

Tridactyle flabellata P.J.Cribb, Fl. Trop. E. Afr., Orchid. 3: 617. 1989 – Holotype: Tanzania. Iringa District, Mwanihana Forest Reserve, Above Sanje, 10 Oct 1984, *Thomas 3763A* (K barcodes K000306508!, isotype, K000306509!).

Additional specimens examined. – Tanzania. Udzungwa Mountains NP, T7, Ridge above camp nr 52, 07°41′S, 36°52′E, 1950 m, 5 Nov 2005, *Luke, Mwangoka & Festo 11416* (K).

Tridactyle gentilii (De Wild.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 145. 1918 ≡ *Angraecum gentilii* De Wild. in Not. Pl. Util. Congo: 594. 1903 – Type: Democratic Republic of the Congo, Kinumbi, 28 Jan 1903, *Gentil s.n.* (BR

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barcode 0000008815439!, K barcode K000306517!).

Additional specimens examined. – Cameroon. Eastern Cameroon, Yaoundé District, near Minta, Nanga-Eboko to Yaoundé., 28 Oct 1968, *Sanford 5257* (K, P), Bouamir, inselberg, no. cult. 64, 720 m, 5 Nov 2001, *Stévart & Pial 297* (BRLU), Schwouam (rocher de), Bouamir, inselberg, no. cult. 13, 770 m, 24 Oct 2001, *Stévart & Pial 280* (BRLU), à 1h de Marche du village de Schwouam, axe Somalomo-Ekom, face NE 55°, 03°19′20″N, 12°47′27″E, 605 m Num cult. 1005, 15 Oct 2002, *Stévart & Pial 662* (BRLU), Lekinga (inselberg de), quartier 2, zone de Bouamir, reserve du Dja, 03°11′28″N, 12°48′32″E, 665 m, no. cult. 1255, 15 Oct 2002, RC 341, *Stévart & Pial 672* (BRLU), Nkoubar (zone de), sur un petit rocher près du grand rocher de Nkoubar, à 15–20 km de Bouamir, reserve du Dja, no. cult. 1412, 7 Oct 2002, *Stévart & Pial 678* (BRLU), piste de Kougoulou à Nkoubar, 15–20 min à l'est de Bouamir, reserve du Dja, no. cult. 1511, 11 Oct 2004, *Droissart, Stévart, Nguembou, Djuikouo 146* (BRLU), *sine loc.*, *Bates 1073* (BM). Democratic Republic of the Congo, Bas Katanga, Kaniama, *Mullenders 2273* (BR), Forestier Central, Likimi, *Evrard 1966* (BR), *ibid.*, Bas Uele, *Dewulf 21* (BR), Yangambi, *Louis 11571* (BR), Ubangi-Uele, Momvu, zone Watsa, *Lacomblez 51* (BR), *ibid.* Gombari, Moto, *Lacomblez 58* (BR), Forêt de Maum, Sep 1916, *Lacomblez s.n.* (BM), Haut Katanga, Kolwezi, *Schaijes 3528* (BR). Ivory Coast, forêt d'Oureya, cult. In Daloa, Jul 1971, *Perez-Vera 147* (P), Nigeria, nr. Ukpaby, Nsukka, Odani road, 10 Apr 1963, *Okigbo 37* (K). Rwanda, Lac Edouard et Kivu Nyungwe-Gisakura, *Troupin 15746* (BR), *ibid.*, Uwinka, *Troupin 9743* (BR). Uganda. N. Kigezi, 6000 feet, Dec 1964, *Leakey OR50* (K). Zambia. Mwinilunga, Zambezi rapids, 6 km N of Kulene Hill Mission, 20 Feb 1975, *Williamson & Gassner 2447* (K).

Tridactyle inaequilonga (De Wild.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 145. 1918 ≡ *Angraecum inaequilongum* De Wild. in Bull. Jard. Bot. État Bruxelles 5: 187. 1916 – Type: Democratic Republic of the Congo, Injolo, *Laurent 2044* (BR barcode 0000008815422!).

= *Angraecum acutoemarginatum* De Wild. in Bull. Jard. Bot. État Bruxelles 5: 181. 1916 ≡ *Tridactyle acutoemarginata* (De Wild.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 143. 1918 – Holotype: Democratic Republic of the Congo, Eala, *Laurent 1214* (BR barcode 0000008815507!)

Additional specimens examined. – Malawi, North Region, Nyika, Chisanga Falls, 1600–1800 m in large hanging colonies, on rocks or trees near water, *Dowsett-Lemaire 281* (K), Mkunje Mont, Chambe Plateau, 5500 feet, 1965, *Morris 125* (K). Tanzania, Usambara Mts., Mazumbai rainforest just W of tea estate, 04°49′S, 38°31′E, 1900 m, 1974, *Balslev 301* (K).

Tridactyle inflata Summerh. in Kew Bull. 3: 291. 1948 – Type: Tanzania, South Nasailand, Summit of Njoro Hill, near Kibaya, 6000 feet, 5 Jul 1942, *Elliott 326* (EA barcode EA000000310 [photo!], K barcode K000306476!).

Tridactyle lagosensis (Rolfe) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 145. 1918 ≡ *Angraecum lagosense* Rolfe in Oliver, Fl. Trop. Afr. 7: 145. 1813 – Type: Nigeria. Upper Guinea. Lagos, *Moloney* (K barcode K000306482!).

Additional specimens examined. – Cameroon. Entre Tabo et rivière Akoumayip sur piste d'Agborkem (ex. Ossidinge) 20 km W. MAMFE, 2 Jun 1975, *Letouzey 13703* (K, P), Tissongo, 1977, *Thomas 96* (K). Democratic Republic of the Congo. Bishusha Terr., Ruthuru, coulée de lave ancienne, 1810 m, 28 Aug 1959, *Leonard 5268* (BR). Equatorial Guinea. Rio Muni, Mitemele (chantier Schimmer), 01°09′27″N, 10°12′07″E, RG 20, 7 Jul 2001, *Stévart & Ndong 290* (BRLU), Wele-Nzas: Eviam, Aconibe-Acurenam 01°11′N, 10°47′E, explotacion forestall 38B, 8 Mar 2000, *Perez Viso 1820* (BRLU, CSIC). Gabon. N'Djolé à Bifoun, *Biteau & Stévart 8* (BRLU), ougoué Maritime, Rab (parcelled Smithsonian), vieille forêt, 01°55′55″S, 09°52′53″E, 23 Nov 2014, *Nguema & al. 2903* (BRLU, MO). Nigeria. Southern Nigeria, Eket District, 1912–1913, *Mr. & Ms. Talbot s.n.* (BM), *ibid.*, 1912–1913, *Mr. & Ms. Talbot 3298* (BM). Rwanda. Marais du kamiranzovu, à env. 30 km à l'Est de Shangugu, 1950 m, 8 Feb 1958, *Symoens 5393d* (BR), *Sine loc.* Angraecum sp Rolfe in Flora of Tropical Africa, *s.n.* (K).

Tridactyle latifolia Summerh. in Kew Bull. 3: 298. 1948 – Type: Gabon. Upper Ngounyé River, banks of River Ighamba, near Kembélé, Nov 1925, *Le Testu 5785* (BM barcode BM000540408!, K barcode K000306515!, P barcode P04026608!).

Additional specimens examined. – São Tomé and Príncipe. Príncipe, Pico Mesa, 01°35′15″N, 07°21′00″E, 550 m, 1 Nov 1998, *Stévart 416* (BRLU), Chemin du Pico de Príncipe, 01°35′30″N, 07°22′30″E, 600 m, 1 Nov 1998, *Stévart 478*

(BRLU), *ibid.*, 19 Oct 2002, *Primo & Stévart 94* (BRLU), Chemin de Cabumbé, 900 m, 25 Mar 2002, no. cult. 1435, *Stévart 1206* (BRLU), *sine loc.*, 1999, *Olivera 61* (BRLU), *sine loc.*, 1999, *Olivera 31* (BRLU).

Tridactyle laurentii (De Wild.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 145. 1918 ≡ *Mystacidium laurentii* De Wild., Not. Pl. Util. Congo: 152. 1903 ≡ *Angraecum viridescens* De Wild., Miss Ém. Laurent: 61. 1905 – Type: Democratic Republic of the Congo, Eala, 1 Sep 1905, *Laurent 28* (BR barcode 0000008815477!, K barcode K000306488!).

Additional specimens examined. – Cameroon. Bipindi, village de Memel II au N de Bipindi, entre le campement et les premiers reliefs. RDS 21, 90 m, 1 Mar 2004, *Stévart & Droissart 2018* (BRLU), Bifa (piste sur la route Kribi-Ebolowa), à 5 km au SE de Zingui. Sur piste villageoise à environ 1h de Marche au SE du village, 02°43′41″N, 10°13′58″E, RVIN 158, 14 Jun 2007, *Droissart 584* (BRLU), Akom II (route Kribi-Ebolowa), campement à 3h de Marche au S du village, Sur une piste de chasseur entre le village et le campement, 02°46′07″N, 10°32′11″E, 485 m, no. cult. 2584, 12 Feb 2010, *Simo, Stévart, Sonké & Droissart (ombrière de Yaoundé) 2047* (BRLU).

Tridactyle lisowskii (Szlach.) Szlach. & Olszewski, Fl. Cameroun 36: 716. 2001 ≡ *Tridactyle scottellii* (Rendle) Schltr. Subsp. *lisowskii* Szlach. Fragm. Florist. Geobot. 39: 547. 1994 – Type: Cameroon. *Lisowski B-6741* (hb. Szlachetko).

Additional specimens examined. – Cameroon. Nkolbisson, colline de Minlo 03°53′N, 11°26′E, 965 m, 10 Jan 1968, *Bamps 1753* (BR) (2 sheets), Nkolbisson (8 km Yaoundé), rocher ensoleillés nus de la colline de Minlo, 900 m, 6 Feb 1963, *Raynal 9469* (P, 2 sheets), Nkolbisson (8 km Yaoundé), rocher ensoleillés nus de la colline de Minlo, N 03°53′, E 11°26′, 700–900 m, 5 Dec 1986, *Lejoly 86/495* (BRLU, 2 sheets) Hill North of village Nkolbisson, 7 km west of Yaoundé, 750–90 m, 22 Dec 1961, *Breteler, de Wilde, Leewenberg 2253* (P, BR, WAG, 2 sheets), Hill North of village Nkolbisson, 8 km west of Yaoundé, 700 m, 24 Jan 1964, *de Wilde & de Wilde-Duyfjes 1692* (WAG, 2 sheets), Mbam-Minkom (region au NO de Yaoundé), village de Nye-Meyong, exposition NE à S, 03°55′11″N, 11°22′13″E, Sommet 2, 1115 m, 13 May 2006, *Droissart 55 bis* (BRLU), *ibid.*, *Droissart 63* (BRLU) Mbam-Minkom (region au NO de Yaoundé), village de Nye-Meyong, exposition NE à S, 03°55′60″N, 11°22′26″E, no. cult. 1492, 1165 m, 21 Dec 2006, *Droissart, Stévart & Simo 433* (BRLU), Mbam-Minkom (region au NO de Yaoundé), inselberg, E to SE of Kolaki village, 03°58′10″N, 11°23′44″E, no. cult. 597, 900 m, 16 Dec 2007, *Droissart, Stévart & Simo 874* (BRLU), *ibid.*, no. cult. 597, *Droissart 10* (BRLU), 1000 m, 25 Mar 2004, *sine loc.*, *Damen 272* (WAG), *sine loc.*, *Damen 274* (WAG), *sine loc.*, *Damen 282* (WAG).

Tridactyle minuta P.J.Cribb, Fl. Trop. E. Afr., Orchid. 3: 612. 1989 – Type: Tanzania. Mwanihana Forest Reserve above Sanje Village, Kilombero District, Morogoro region, 07°50′S, 36°55′E, 1400–1700 m. Muhanga, Uzungwa, T.7, 1 Nov 1980, 5000 feet, *Leedal 6138* (K barcodes K000382741! & K000306507!).

Additional specimens examined. – Kenya. Chyulu-South, 6500 feet, 10 Jul 1938, *Bally 7856* (K). Tanzania. Iringa District, Mwanihana Forest Reserve above Sanje village, Kilombero District, Morogoro Region, 07°50′S, 36°55′E, 1400–1700 m, 10 Oct 1984, *Thomas 3764* (K, 2 sheets).

Tridactyle minutifolia Stévart & D'haijère in Phytotaxa: 212 (2): 143. 2015 – Holotype: Gabon. Monts de Cristal, SEEF logging concession, 490 m, 00°15′15″N, 10°18′08″E, 26 Oct 2011, *Stévart, Niangadouma, Akouangou & Kaparidi 3609* (BRLU!; isotypes: LBV, MO).

Additional specimens examined. – Equatorial Guinea, Rio Muni, Monte Mitra, 01°22′59″S, 09°57′58″E, *Stévart 823* (BRLU). Gabon, Ogooué-Maritime, Doudou Mountains, West of Doussala, Réserve de la Faune de Moukalaba, 350 m, 02°09′S, 10°12′E, 1988, *Arends 829* (WAG); *ibid.*, 26 May 1988, *Arends 870* (WAG); *ibid.*, 5 Dec 1984, *Arends & de Wilde 634* (WAG); *ibid.*, 1985, *Van der Laan 841* (WAG); Tchimbélé, 00°13′16″N, 10°07′25″E, *Biteau 155* (BRLU); *ibid. GB 416* (BRLU); Moyen-Ogooue, Ndjolé area. Concession Bordamur, SE of Ndjolé, between Wata NP and La Lopé NP, bottom of a very wet valley, 570 m, 00°06′15″S, 10°27′19″E, 25 Feb 2009, *Stévart, Dauby, Nguema, Mounoumoulossi & Bissiemou 3054* (BRLU).

Tridactyle muriculata (Rendle) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 146. 1918 ≡ *Angraecum muriculatum* Rendle, Cat. Pl. Oban 105. 1913 – Type: Nigeria. South Nigeria, Oban, 1911, *Talbot 904* (K barcode K000306487!).

Additional specimens examined. – Cameroon. Récolté sur la route à komba tida, 03°24′47″N, 12°42′11″ E, 700 m, 4 Jul 2005, *Droissart, Stévart, Nguembou, Djuikouo 303* (BRLU), Nguti, exploitation forestière, village de Tayov, 05°37′14″N,

09°46′40″E, no. culture 379, 9 Jul 2009, *Simo, Stévart & Droissart (ombrière de Yaoundé) 1625* (BRLU).

Tridactyle nalaensis (De Wild.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 147. 1918 ≡ *Angraecum nalaense* De Wild. in Bull. Jard. Bot. État Bruxelles 5: 189. 1916 – Holotype: Democratic Republic of the Congo. Environs de Nala, 1911, *Boone 107* (BR barcode 0000008815460!; isotype: K barcode K000306484!).

Tridactyle nanne-ritzkae Eb.Fisch., Killmann, J.-P.Lebel & Delep. in Orchidee (Hamburg) 64 (5): 350. 2013 – Holotype: Rwanda. Western Province, Nyungwe National Park, Ericaceous shrub on Mont Bigugu, 2700 m, 10 Nov 2008 *Fischer, Lebel & Delepierre s.n.* (BR; isotypes: KOBL, NHR).

Tridactyle nigrescens Summerh. in Kew Bull. 3: 288. 1948 – Holotype: Uganda. Ankole, Kyamahunga near Kalinzu Forest, Jun 1938, *Eggeling 3722* (K barcodes K000306480! & K000306481!; isotypes: BR barcode 0000008815392!, P barcode P00388475!, PRE barcode PRE0812503-0 [photo!]).

Additional specimens examined. – Democratic Republic of the Congo. Between Nyamulagira and Tschambene, 2000 m in island of sclerophyllous forest, Feb 1945, *Germain 3602* (BR). Mont Kahuzi, South West Corner of Lake Kivu, 2400–2700 m, coll. F.L. Hendrickx, Flowered at Amani, Apr 1944, *Moreau 537* (BR, K), Uganda. Kyotera county, Masaka U4, Katera, 00°55′S, 31°38′E, 1180 m, on branches of *Parinari curatellifolia,* 3 May 1972, *Lye 6808* (K), Masaka, Kyanamulnalna, 1170 m, in woodland, occasional, Nov 1942 (in fruit), *Thomas 4088* (K).

Tridactyle oblongifolia Summerh. in Kew Bull. 3: 286. 1948 – Type: Central African Republic. Haute Kotto (Oubangui-Chari), Village de Yadélé 30 km de Yalinga, route de Bangason. *Le Testu 4314* (BM barcode BM000540409!, K barcode K000306486!, P barcode P00388474!).

Additional specimens examined. – Democratic Republic of the Congo. Panga, Aruwimi River, in forest, on trees above river, Dec 1913, *Bequaert 1569* (K). Sierra Leone, Origin unknown (possibly from Roruks or Njala), cult. Njala, 11 Nov 1946, *Deighton 4393* (K).Guinea. Friguiaghé, 12 Nov 1938, *Chillou 806* (P). Uganda. Buddu, 1905, *Dawe 311* (K), Apormu, Akwe F.R., collected live by Keay in Oct 1948, 3 Nov 1951 and 28 Oct 1952, *F.H.I. staff* (K).

Tridactyle pentalobata P.J.Cribb & Stévart in Kew Bull. 59: 202. 2004 – Holotype: Gabon, Mont Mbilan (between the camp at the first river and the third river), 00°28′N, 10°16′E, 465 m, 2 Apr 2002, *Stévart 1394* (BR!).

Tridactyle phaeocephala Summerh. in Kew Bull. 3: 292. 1948 – Type: Tanzania. Uluguru Mts., Lukwangule, 2250 m in forest, Jan 1934, *Bruce 729* (BR barcode 0000008815545!, K barcodes K000306474! & K000306475!, P barcode P00388473!).

Additional specimens examined. – Tanzania. Pare Mountains., coll. P. Greenway, cult. Amani, flowered Aug 1942, *Moreau 334* (K), Lukwangule Plateau, W. side, 2370 m in dry evergreen forest on *Xymalos monospora*, Jan 1943, *Moreau 471* (K), *ibid.*, cult. Amani, Flowered Feb 1943, *Moreau 472* (K); Uluguru Mountains, T6, On Bondwa peak to side of radio station, 22 Jan 1976, 7000 feet., *Cribb & Grey-Wilson 10323* (K), Morogoro, Uluguru, 2400 m, 26 May 1933, *Schlieben 3534* (BM, K, 2 sheets, LISC).

Tridactyle scottellii (Rendle) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 147. 1918 ≡ *Angraecum scottellii* Rendle in J. Bot. 33: 249. 1895 – Type: Uganda. Ruwenzori, head of Butagu Valley, 1894, 7000 ft., *Elliott 8081* (BM barcode BM000540377!, K barcode K000306483!).

Additional specimens examined. – Burundi. Ndora-Mirudi, 02°54′S, 29°22′E, 24 Nov 1990, *Arbonnier 214* (picture) (BR), Rwegura, 12 Dec 1992, cultivé à Teza, *Arbonnier 367* (BR). Democratic Republic of the Congo. Parc National Albert, Secteur Ruwenzori (en bordure de piste d'ascension de Kalonge à Mohangu, 2300 m, 15 Aug 1953, *De Wilde* 560 (BR) (2 sheets), Vers Kabare(Mikeno), près zone Lamloen, 2300 m, 2 Jul 1934, *De Witte 1682* (BR, P) (2 sheets), Piste Kalonge-Mahungu. Forêt ombrophile mélangée à quelques bruyères arboricoles, 2400 m, 15 May 1953, *Fredericq 9024* (BR), Ituri, Massif du Ruwenzori, versant Ouest, vallée Butagu, 2500 m au dessus de Kalonge, Jul 1932, *Humbert 8858* (BR, P, 3 sheets), Mount Ruwenzori East, 6000 feet, 14 Jan 1906, *Wollaston s.n.* (BM) Lwamisole, 3 Mar 1955, *Hendrickx 6937* (BR). Kenya. Tree orchid found at Kamerin & moved to Elgon (6700 feet) were it flowered, BEA, Elgeyo

escaremeny, 8000 feet, Jul 1931, 100 Bks 8/28, H&J Ld, Gp 148 *Tweedie 20* (K), Mount Kenya, 1899, *MacKinder s.n.* (BM), Naromoru Valley, Mount Kanya (Western sector), 6500 feet, 19 Aug 1949, *Schelpe 2690* (BM), Rift Valley, 12 km N of Maralal on the road to Baragoi. Olea Africana forest, 01°07′60″N, 36°39′59″E, 2 Jan 1979, *Gilbert, Kanuri Kibui & Mungai 5437* (UPS). Republic of the Congo. Environs de Dimonika, 30 Nov 1978, *Cusset 726* (P). Rwanda. Pindura, prefect. Cyangugu, 02°29′S, 29°13′E, 2400 m, 17 Dec 1971, *Bamps 2797* (BR), Cyangugu, Forêt de Nyungwe, environs de Pindura, 240 m, 17 Dec 1971, *Bouxin 1250* (BR), Cyangugu, Nyungwe, 2000–2400 m, 1978, extrait des collections vivantes P. de Wanckel (Kigali), ref. 0/78/164, *Troupin 15953* (BR), Cyangugu, forêt de Nyungwe Rugege, 1900–2200 m, 1975 (floraison décembre), ref. 0/75/121, *Troupin 15767* (BR), Vallée de Nyamuamba, versant est, 2500 m, 31 Jul 1948, *Robyns 9294* (BR).Tanzania. Bezirk Morogoro: Uluguru Gebirge, Nordwestseite, Nebelwald 1640 m, Blume gelbgrün, 25 Dec 1932, *Schlieben 3171* (BRLU), Morogoro, Morogoro Kanga Mountains, Northern Nguru, 06°00′S 37°43′E, 400–2000 m, 1700 m, 2 Dec 1987, *Lovett & Thomas 2677* (K).Uganda. Mnt Elgon, 29 Jun 1924, 4–6000 feet, *Snowden 903* (BM, K), Western Province, Nyimabitaba ridge, Mobuku Valley, 2300 m, 17 Jul 1952, *Osmaston 1567* (BM). Zimbabwe. South Rhodesia, Vuwba Monts flower dull orange, 6000 feet, Dec 1937, no. 37080, *Obermenj 2087* (K), Chimanimani Mountains, 2nd range; 5500 feet, 1 Apr 1955, *Holmes 0155* (K).

Tridactyle stévartiana Geerinck in Taxonomania 2: 7. 2001 – Holotype: Rwanda. route Butare-Cyangugu km 70, forêt de Nyungwe, Feb 1997, *Delepierre & Lebel 47* (BR barcode 0000006410735!).

Additional specimens examined. – Rwanda. Gisenyi, route Gysenyi Kibuye, 2000 m, 1976, ref. 0/76/147, *Troupin 15880* (BR).

Tridactyle stipulata (De Wild.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 147 1918 ≡ *Angraecum stipulatum* De Wild., Miss. Ém. Laurent 1: 226. 1906 ≡ *Tridactyle scottellii* var. *stipulata* (De Wild.) Geerinck in Fl. Afr. Centr., Spermatoph. Orchid. 2: 535. 1992 – Holotype: Democratic Republic of the Congo. Congo, rivière Loléra, 1905, *Laurent* (BR barcode 0000008815521!).

Tridactyle teretifolia Schltr. in Fries, Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped. 1: 251. 1916. – Type: Zambia. Nordost-Rhodesia: epiphytisch auf Bäumen der lichten Trockenwälder bei Abercorn, blühend 20. Nov., *Fries 1273* (B†).

Additional specimens examined. – Angola. Cuchi, Uonongue Bie, 10 Nov 1905, *Gossne 2268* (COI), Floresta galleria, margeus do rio Luachimo Lunda Dundo, 19 Jul 1927, *Carrisso & Mendonça 125* (COI). Democratic Republic of the Congo. 24 km au N.N.E. de Lumumbashi, miombo de la Luiswishi, 22 Nov 1972, *Lemaire-Elias 135* (BR), Lumumbashi (Elizabethville), 7,5 km au N.E. du Poste de Katshupa, Plateau des Kundelungu, 1560 m, 5 Dec 1966, *Malaisse 4835* (BR), Kwatabala, 10°34′49″S, 26°11′04″E, 20 Jan 2008, *Malaisse, Semereab & Handjilia 174* (BR), Kafubu, Katanga, 23 Nov 1927, *Quarré 825* (BR), Katanga, 50 km de Kasaji sur la route de Sandoa, 8 Nov 1962, *Schmitz 7985* (BR), région de Shaba, Kolwezi/ Mawfwe, 12 Nov 1988, *Schaijes 4149A* (BR), bord de la rivière Luilu à 23 km au N.N.W. de Kolwezi sur la route Nzilo Kyawasumba, 25 Nov 1981, 1170 m, *Schaijes 1191* (BR). Rwanda. Parc National Akagera, Byumba, 1300–1500 m, 0/78/163, 1977, *Troupin 15903* (BR), dessin d'après nature, Rusumo, 10 Feb 1997, *Delepierre s.n.* (BR). South Africa. Natal Colony, District of Alexandra, Station Dumisa, Farm Friedenau, 19 Nov 1908, *Rudatis 491* (BM). Tanzania. Musoma Distr., between Musakime Grand Guard Prat and Seronera, 4800 feet, flower brown with a pale cream spur, *Greenway, 10244* (BR). Zambia. Mwinilunga Distr, at Matonchi Farm, 30 Oct 1947, *Milne Redhead 3038* (K), Mwinilunga Distr, at Matonchi Farm, 30 Oct 1947, *Milne Redhead 3039A* (K), Mwinilunga, 11 km East of Matonchi, flowered in cultivation in Lusaka, 24 Oct 1969, *Williamson & Drummond 1739* (K) 15 Dec 1949, *Abercorn 2105* (BR, K), North Rhodesia: Solwezi, in dug bush, Nov 1958, *Holmes 23* (BR, K), Belingwe, Mount Buhwa, north facing gully, 1350 m, 31 Oct 1973, *Bieggd, Pope & Gusden, 4340* (BR). Zimbabwe. Salisbury, Greenhouse, ex. Domboshawa, epiphyte on Msasa, 4900 feet, Jun 1947, 12 Dec 1947, *Wild 2252 (G.H. 17710)* (K).

Tridactyle thomensis P.J.Cribb & Stévart in Kew Bull. 59: 199. 2004 – Holotype: São Tomé, São Nicolau, *Stévart 488* (BR!; isotypes: K barcodes K0003065! & K000306505!). [*Tridactyle* sp. A. sensu Stévart & Oliveira, Guide des Orchidées de São Tomé et Príncipe: 2003, fig. 181–182. 2000; Stévart & al. in Acta Bot. Gallica 147(2): 166. 2000.]

Additional specimens examined. – São Tomé, on the steep path from Vanhulet to Jamaf, 3000 feet, 7 Nov 1932, *Exell 286* (BM, COI), Litoral, Burnay, 00°09′N, 06°29′E, 0 m, 15 Dec. 1997, *de Oliveira 347* (BRLU); São Nicolau, 00°17′N,

06°37′E, 830 m, 1 Dec 1998, *Stévart 488* (holotype BR; isotype: K); *ibid.*, *de Oliveira 1999/25* (BRLU); *ibid., de Oliveira 1999/26* (BRLU); *ibid.*, 1 Dec 1997*, Stévart 296* (BRLU, K); near Agua Ize, 00°14′N, 06°44′E, 100 m, 1 Nov 1998, *Stévart 412* (BRLU, K); Aguas Belas, 00°15′N, 06°37′E, 600 m, 1 Nov 1998, *Stévart 467* (BRLU), *sine loc.*, *de Oliviera 1666* (BRLU), São Tomé, Floresta sec. Ribeira Peixe Dep., Vila José Carminho de Vila Verde, 80 m, 5 Oct 1956,. *Espirito Santo 3868* (COI, 2 sheets, LISC, 2 sheets).

Tridactyle translucens Summerh. in Kew Bull. 3: 290. 1948 – Holotype: Zambia. Mwinilunga District, just E. of River Kasompa, on trees in Cryptosepalum woodland, Mar 1938, *Milne-Redhead 4438* (K barcodes K000306478! & 14646.000 [in spirit]!)

Additional specimens examined. – Zambia. Mwinilunga District, on Brachystegia woodland, 30 Mar 1960, *Holmes 245* (K!).

Tridactyle tridactylites (Rolfe) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 148. 1918 ≡ *Angraecum tridactylites* Rolfe in Gard. Chron. 2: 34. 1888 – Type: Sierra Leone. Hort. Kew 19 Jun 1888, Type sp drawing made by Smith. (K barcode K000306470!).

= *Aeranthes diesteliana* Kraenzl. in Bot. Jahrb. Syst. 33: 75. 1902 – Type: Cameroon, Buea Kamerun, b. 1600 feet, 1905, *Deistel 593* (BM barcode B000540386!, K barcode K000306519!, P barcode P00388458!, SING barcode SING 0054566 [photo!]).

= *Mystacidium ledermannianum* Kraenzl. in Bot. Jahrb. Syst. 51: 393. 1914 ≡ *Tridactyle ledermanniana* (Kraenzl.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 14. 1918. – Type: Cameroon, Mfongu, Muti-Abhänge, lichter Gebirgswald, teilweise buschähnlich, alles mit Roccella und Epiphyten behangen, in 1700–1900 m, blühend im November, *Ledermann 5950* (B†).

= *Tridactyle kindtiana* (De Wild.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 145. 1918 ≡ *Listrostachys kindtiana* De Wild., Not. Pl. Util. Congo: 148. 1903 ≡ *Angraecum kindtianum* (De Wild.) De Wild., Miss. Ém. Laurent 1: 225. 1906 – Type: Cult. from Democratic Republic of the Congo, Hort. Laeken s.n. (BR barcode 0000008815415!).

Additional specimens examined. – Angola. D. Pungo Andongo, 2400–3800 feet, Mar 1857, *Welwitsch 685* (BM, LISU). Cameroon. East, Dzanga-Sangha reserve, west bank of Sangha River near confluence of Lobeke river, 1400 m, 02°23′N, 16°07′E, 18 Sep 1988, *Harris & Fay 1149* (K). Banyang-Mbo, 6 Feb 2002, *Simo 74* (BR), South-West Province, Buea, west of Bokwango, 04°07′42″N, 09°12′30″E, 990 m Living plants sent to WAG, 28 Jan 1994, *Wieringa 2042* (BR), Buea, 800–900 m, *Schlechter 12840* (BM, BR), VHF hid, Yaoundé, Nov 1968, *Sanford 5293* (P), H. Vokke, 15 km S Poli, forêt galerie, 1600 m, IGN Poli, 13 Apr 1977, *Fotius 2630* (P), Mbam-Minkom (region de, au NO de Yaoundé), Village de Nye-Meyong, sommet d'une colline au NO du campement. 03°55′33″N, 11°22′13″E, RVIN 32, 1115 m, 13 May 2006, *Droissart 282* (BRLU), Mbam-Minkom (region de, au NO de Yaoundé), Village de Nye-Meyong, sommet de la colline à l'Ouest du village, 03°55′25″N, 11° 22'5"E, 1160 m, 12 Feb 2010, *Simo, Stévart, Sonké & Droissart 2045* (BRLU), Parc National du Mbam et Djérem, 8.95 km de Myéré, 06°10′04″N, 12°49′27″E, 824 m, no. cult. 3827, 28 Mar 2011, *Simo, Stévart, Sonké & Droissart 2700* (BRLU) Akom II (route Kribi-Ebolowa), campement à 3h de Marche au S du village. Montée vers le sommet de la colline située à l'O du campement, 02°44′53″N, 10°32′23″E, RVIN124, 700 m, 25 Apr 2007, *Droissart & Simo 444* (BRLU), Mont Kupe, Chemin "Montane Trail", from Nyassono to the summit, 1600 m, 04°49′05″N, 09°42′29″E, no. cult 3459, 9 Nov 2009, *Simo, Stévart, Sonké & Droissart 1928* (BRLU), Mont Kupe, Chemin "Montane Trail", from Nyassono to the summit, 1762 m, 04°48′35″N, 09°42′22″E., no. cult 3346, 15 Jun 2011, *Simo, Stévart, Sonké & Droissart 1966* (BRLU), Mont Kupe, chemin ("Mountain trail"),Village de Nyasoso, 04°49′58″N, 09°41′05″E, no. cult. 3569, 869 m, 16 Jan 2010, *Simo, Stévart, Sonké & Droissart 2008* (BRLU), Rhumpi Hills, Small Massaka, le long d'une piste, 04°48′50″N, 09°15′25″E, 1009 m, no. cult. 3649, 12 Feb 2010, *Simo, Stévart, Sonké & Droissart 2048* (BRLU), Mount Cameroon, Likombe-Mann's Spring, 190–2000 m, 10 Nov 1992, *Thomas 9440* (K), Mont Cameroun, Chemin de Mann Spring, 1000 m, *Stévart 826* (BR), Montagne de Ngang-Ha (village de Ndigou), 50 km à l'est de Ngaoundéré, à coté du campement, 07°21′35″N, 13°57′47″E, RVIN 326, 1507 m, 2 Oct 2011, *Droissart, Kamdem, Kamden & Ploton 1057* (BRLU), Mont Oku, village d'Oku, 06°15′47″N, 10°31′19″E, RVIN 317, 1695 m, 6 Sep 2011, *Droissart, Kamdem & Ploton 969* (BRLU). Democratic Republic of the Congo. Yongo, piste vers la Yenge, forêt de la Salonga, 14 Aug 1958, *Evrard 4698* (BR),Yangambi, reserve Flore Isalowe, 470 m, 27 Aug 1938, *Louis 11022* (BR), *ibid*., *Louis 15645* (BR), Kivu, Kalehe, route Kavumu Walikale, vers km 110, colline Karambi, 860 m, 12 Mar 1959, *Troupin 10111* (BR), Paku,

Bord du Sumokandi, 30 Aug 1906, *Seret 660* (BR), Paku, 22 Aug 1908, *Seret 992* (BR), Bambili droite de l'Uélé, près du passage en Pirogue, 31 Aug 1905, *Seret 207* (BR), Kafungwila, 1100 m, 28 Mar 1953, *Desenfant 2997* (BR), Eala, 10 Aug 1903, *Laurent 1753* (BR), ibid, 13 Aug 1903, *Laurent 1754* (BR), Eala, Jul 1907, *Pynaert 1533* (BR), Eala, 29 Oct 1907, *Pynaert 563* (BR), Parc National Albert, Plaine *Mission Emile Laurent s.n.* (BR), Zydo act. of, *Laurent 2038* (BR), Eala, Aug 1903, *Laurent s.n.* (BR). Kivu, Rutshuru, laves de Singiro (North of Rumangabo), 1650 m, 20 Feb 1945, *Germain 3556* (BR, 2 sheets), Kivu, Kalehe, Vers km 110 route Kavumu Walikale, Irangi, réserve IRSAC, Catena II, 2100 m, 900 m, 7 Feb 1957, *Christiaensen 2016* (BR, UPS), Entre Kasinga et Kalule Sud, km 576 du chemin de fer, 16 Aug 1977, *Wechuysen 726* (BR) Kamasha, Kahuzi, Nov 1946, *Hendrickx* (BR), Parc National Albert, *Donis 4072* (BR), Parc national Albert, Jan 1955, *de Wilde 585* (BRLU), rivière Mulamba, plateau de Biavo, à environ 27 km entre NE et NNE de Tenke, 1530 m, 4 Sep 1983, *Schaijes 1990* (BR), crête Congo-Aruwimi, km 39 à partir de Bengamisa de la route vers Yangambi, 500 m, 27 Feb 1938, *Louis 8276* (BR, 2 sheets). Kilelema, Territoire Masisi, 1300 m, 28 Aug 1957, *Gutzwiller 1528 bis* (BRLU, 2 sheets) Equatorial Guinea. Bioko, Moka-Balacha 03°21′45″N, 08°40′48″E, 1300 m, 6 Feb 2009, *Luke, Lingon & Obono 13373* (K, EA). *Gabon*. Bélinga, 2 Jan 1965, *Hallé 3641* (WAG), Tchimbélé, sentier botanique de Tchimbélé, 00°37′18″N, 10°24′24″E, 470 m, no. cult. 120, 23 Oct 2001, *Stévart, Ngok & Nguema 1113* (BRLU), Woleu-Ntem, 9 km ESE Medouneu, Efot, Inselberg Fene, 01°00′17″N, 10°54′06″E, 461 m, 27 Dec 2002, *Ngok Banak, Moungazi & Lekanga 1287* (BR, WAG), Woleu-Ntem, 9 km ESE Medouneu, Efot, Inselberg Bangoui, 00°58′46″N, 10°53′57″E, 500 m, 22 Dec 2002, *Ngok Banak, Moungazi & Lekanga 1116* (BR), Woleu-Ntem, 9 km ESE Medouneu, Efot, Inselberg Voma, 01°00′55″N, E 10°54′18″E, 500 m, 24 Dec 2002, *Ngok Banak, Moungazi & Lekanga 1193* (BR), Bélinga, 28 Oct 1964, *Hallé 2846* (P, 2 sheets), Estuaire, Libreville-Cap Esterias, à l'est du Moka. Forêt de Mangrove, 00°35′42″N, 09°25′36″E, 1 m, Dec 1987, *Louis, Sterck & Elias 2656* (WAG). Forêt sublittorale, 8 km de Libreville, 30 Jan 1961, *Hallé 971* (P), *ibid*., 2 Jan 1965, *Hallé 3641* (P), Touffe sur paroie rocheuse éclairée, tige env. 50 cm, Rocher Fané, 5 Feb 1968, *Hallé & Villiers 4937* (P), cap Esterias, 23 Feb 1968, *Hallé & Villiers 5499* (P), Nyanga, Doudou Mount near Doussala, 20 Jul 1987, *van der Laan 1369* (WAG), Foulaya (I.F.A.C no. 4 f. 109), 1952 (P), Au pied du Kimba, en forêt, Mar 1942, *Schnell 697* (P, 2 sheets), Mission 1913, Cap Lopez, *Pobéguin s.n.* (P). Guinea. Pays des Guerzés, forêt au pied de la montagne de N'Zo, 28 Mar 1909, *Fleury 21033* (BR), Pita, Feb 1910, Serres des Museum, *Pobéguin 2269* (P, 2 sheets), Mont Nimba, Feb 1942, *Schnell 462* (P, 3 sheets), *ibid.*, *Schnell 220* (P, 2 sheets), Fouta-Djallon, 1500 m, Sep 1954, *Schnell 7329* (P), *ibid.*, *Schnell 7222* (P), massif du Benna, May 1950, *Schnell 5592* (P, 3 sheets), mont Nimba, Apr 1942, *Schnell 1093* (P, 3 sheets) mont Loma, épiphyte galerie forestière 1800 m, 5 Feb 1952, *Jaeger 4283* (P), 1937, *Mission pédo-écologique Scaëtta s.n.* (P, 3 sheets), Bitinn, Apr 1905, *Chevalier 12986* (P), Diagissa, 1300–1400 m, *Chevalier 13470* (P), *ibid*., 18 Apr 1905, *Chevalier 12918* (P). Ivory Coast. Mont Toukoui, Jan 1950, *Schnell 4081* (P, 4 sheets), *ibid.,* Jan 1950, *Schnell 4154* (P), Mont Momy, Monts des Dans, 40 km N of Danané, 30 Jan 1984, *Hepper & Maley 7914* (K). Kenya, k5, Kakamega forest, 5500 feet, 27 Aug 1975, *Kokwaro 3771* (BR), route Kahuzi, Marais de Musisi, Jun 1949, *Hendrickx 5961* (BR), Mulungu, INEAC, Forêt de la Musisi, Terr. Kabare, Réserve du Kahuzi-Biega, 02°17′S, 28°40′E., 2300 m 25 Feb 1957, basaltes, *Pierlot 1489* (BR), Zambèze, Marumbala, Horti Thenesis Herbarium, 290 Ser III, Nov & Dec 1900, *Liya 390* (BR), Mulungu, INEAC, Terr. Masisi, km 44 route Bitso-Kikoma, 01°35′S, 28°38′E, cendres volcaniques, 1680 m, 28 Apr 1958, *Pierlot 1928* (BR). Liberia. Liberia. Nimba, Sanniquelle Distr., Nimba Mountains, 1200 m, 20 Jan 1970, *Johansson 726* (UPS), *ibid.*, 11 Mar 1970, *Johansson 752* (UPS). Malawi. Nyassaland, 1891, *Buchanan 154* (BM), Chenga Hills, ona dry rock, 1600 m, 9 Sep 1946, *Brass 17603* (BM, BR), Midima Mont, Blantyre, *Westwood 582* (K), Mainly in gallery forest, 18 1964, *Brian Morris 926577* (K), Luchilemu River, Viphya, 1200 m, 15 Dec 1981, *la Croix 238* (K), South Viphya, Luchilemu Valley, 1250 m, 23 Oct 1987, *la Croix 1058* (K, 2 sheets), Southern Province, Zomba District, Zomba Plateau, 1500 m, 1 Dec 1984, *Pettersson 326* (K, UPS), Zomba District, NHGB Orchid Shed, on Charcoal, 29 Nov 1991, *Thera & Banda 674* (K), Mount Mulanje, Low down in Likabula Valley, 692365, 1000 m, 23 Nov 1987, *Chapman 8967* (K). Mozambique. Manica e Sofala, Makurupini Falls, southern foothills of Chimanimani Mountains, 1500 feet, 25 Nov 1967, *Simon & Ngoni 1291* (LISC), Mossurize, prox. de Espunzahera, 11 Nov 1943, *Torre 6150* (LISU). Nigeria. Zaria Province, 12 miles from Zonkwa on Zonkwa- Kaciya Road. Southern Zaria, 2300 feet, 12 Apr 1957, *Summerhayes 86* (K, 2 sheets), Gongola State, near Dundere, a few miles from Mayo Ndaga, Mambilla Plateau, Sardauna Div., 5000 feet, 8 Feb 1977, *Chapman 4623* (K), Plateau, Jos, Assob Falls, Fringing forest on rocks by water fall, 12 Apr 1958, *Keay & Jones 37618* (K), Akure, Carter's Peak, Idanre, 1 Jan 1948, *Brenan, Jones, Richards & Keay 8644* (BM, P, BR), R. Katsina (= Kimbi), Bridge, 1070 m, 11 Feb 1958, *Hepper & Charter 1928* (P, K), Interior, Western lagos, *s.n.* (K), Ago-Owu F.R. 07°15′N, 04°10′E, No FHI 64999, 11 Mar 1972, *Wit & Geerling 1255* (WAG). Rwanda. (origine incertaine), *Delepierre 184* (BR) São Tomé and

Príncipe. São Tomé, Espérança, sp. no. 116, 1956, *Rose 207* (P), Estacao Souza, 00°15′30″N, 06°33′30″E, 1600 m, 1 Sep 1998, *Stévart 392* (BRLU), Estacao Souza, 1550 m, no. cult. 95, 8 Apr 2003, *Primo & Stévart 131* (BRLU), Calvario, 1600 m, no. cult. 178, 8 Apr 2003, *Primo & Stévart 128* (BRLU) São Tomé, Bom Sucesso, chemin SO, 1200 m, 1 Nov 1998, *Stévart 507* (BRLU), Cultivate in Wageningen Greenhouse, *de Wilde & al. (1980)*, bot. Gard. Number 1980 PT ST 054, *Arends 879* (WAG), Príncipe, sp. no. 141, F257-1956, *Rose 1008* (P), Culta. Greenhouse WAG. Nr. 80 PTST 054 (coll. By De Wilde, c.s. (Walg), s.n.), 18 Jun 1981, *van der Laan 369* (BRLU), Príncipe, chemin du Pico de Príncipe, première crête, 400 m, no. cult. 1409, 8 Apr 2003, *Primo & Stévart 127* (BRLU), *ibid.*, 500 m, Feb 2002, *Stévart 1219* (BRLU), Príncipe, Infente d' Henrique, 01°34′15″N, 07°E, *Primo & Stévart 7* (BRLU), Príncipe, Praia da Lapa, 10 m, no. cult. 951, Feb 2002, *Stévart 1229* (BRLU) Praia Lapa, Orch. 951.1, Erva, *De Oliviera 102/99* (BRLU). Sierra Leone. Mont Loma, 1400 feet, 1 Jan 1966, *Jaeger 7766* (P), *ibid*., 1600 m, 17 Aug 1964, *Jaeger 7191* (P), *ibid.* 24 Feb 1966, *Jaeger 9396* (P). Tanzania, Uluguru Gebirge, Nordwestseite, Nebelwald, 1910 m, 18 Oct 1932, *Schlieben 2832* (BM, P, K, BR, 2 sheets). Uganda. Kibale Forest Toro, flowered at Botanic Gardens, Entebbe, 8 feet, Sep 1938, *Thomas 2526* (BR), Rukungiri district, Kayonza, Bwindi forest, Ishasha gorge, 00°53′–1°08′S, 30°25′–30°35′E, 1350 m, Apr 1998, *Hafshimana 0541* (K, BR), by Lake Victoria, Apr 1964, *Leakey s.n.* (K), near Namatala Mount Elgon, 6000 feet, 23 Oct 1917, *Snowden 525* (BM). Zambia. North Rhodesia, Abercorn, 15 Sep 1962, *Lawton 994* (K), Abercorn, Rock at Lake Chila outflow, 29 Sep 1949, *Bullock 1097* (K, BR), Abercorn, 1 Oct 1943, *Bredo 5770* (BR), Abercorn, on tree, 5500 feet, 16 Sep 1951, *Nash 11* (BM), Inyanga, 3200 feet, 6 Dec 1969, *Ball 849* (K), Lusaka, approx. 18 miles on Great East Road, 30 Jul 1962, *Maze 89A* (K). Zimbabwe. Chirinda forest, 3700–4000 feet, 8 Dec 1909, *Swynnerton s.n.* (BM), Haroni/ Makurupini Forest, between the Haroni Road & de Makurini stream, almost entirely in Rhodesia but the Makurupini rises in Mozambique, 1000–1300 feet, 4 Dec 1964, *Wild, Goldsmith, Ti Muller 6640* (BR, K, LISC). *Sine Loc.*. Botanical Gardens, Glasnevin, Dublin, 13 Jul 1892, *s.n.* (BM).

Tridactyle tridentata (Harv.) Schltr. in Bot. Jahrb. Syst. 53: 603. 1915 ≡ *Angraecum tridentatum* Harv., Thes. Cap. 2: 6. 1863 – Type: South Africa. Eastern Region: Natal; jutting rocks at Holderness, Krans Kloof, 1000 ft., *Sanderson 562* (K barcode K000306502!).

= *Angraecum goetzeanum* Kraenzl. in Bot. Jahrb. Syst. 30: 289. 1901 ≡ *Tridactyle goetzeana* (Kraenzl.) Schltr. in Bot. Jahrb. Syst. 53: 602. 1915 – Type: Tanzania. Oberes Kondeland: im Kivirathal, Kasimulohügel, etwa 600 m, 1899, *Goetze 1491* (BR barcode 0000008815552!, G barcode G00022227 [photo!], P barcode P00388392!).

= *Angraecum bolusii* Rolfe in Harvey, Fl. Cap. 5(3): 73. 1912 ≡ *Tridactyle bolusii* (Rolfe) Schltr. in Bot. Jahrb. Syst. 53: 603. 1915 – Type: South Africa. Eastern Region, Zululand, near Eshowe, Maxwell in Herb., *Bolus 6319* (BOL barcode BOL149995!, K barcode K000306503!).

= *Angraecum hislopii* Rolfe in Bull. Misc. Inform. Kew 1920: 130. 1920 – Type: Zimbabwe, South Rhodesia, *Hislop 67* (K barcode 000306472!).

Additional specimens examined. – Tanzania. Bukoba, Rumanyika Game Reserve, 01°13′S, 30°45′E, 1829 m, 22 Oct 2000, *Bytebier (coll. Butynski) 1881* (BR).

Tridactyle tridentata (Harv.) Schltr. var. *subulifolia* Summerh. in Kew Bull. 3: 287. 1948 – Type: Uganda. Bunyoro, Budongo Forest, Dec 1942 (sterile), flowered Busingiro Apr 1943 and Apr 1944, *Eggeling 5277* (EA barcode EA000000314 [photo!], K barcode 3153.000 [in spirit]!).

Additional specimens examined. – Burundi. Route Rumonge-Tora, forêt claire, 03°55′S, 29°30′E, 950 m, 16 Mar 1969, *Delarge 108* (BR), Prov. Bururi Gitwe, forêt claire à Brachystegia, 04°00′S, 29°30′E, 20 Mar 1981, *Reckmans 9873* (BR, K, UPS). Cameroon. Province South West: Degraded forest remnant at Barombi Kang research station, Kumba, 04°35′N, 09°27′E, 1987, *Thomas, Memba, Mambo & Etuge 7079* (K, BR), 20 km NNE of Moloundou, 3 Mar 1973, *Mbenkun 306* (BR), Près Kinshasa 65 km NNE de moloundou sur route de Yokadwma, 3 Mar 1971, *Letouzey & Villiers 10481* (BR), Near village Oboat, Yaoundé Mbalmayo road, 13 Oct 1968, *Sanford 5190* (P), Bambui,1971, *Botté 553* (P), Secondary forest near Ngombombeng, north of Nyassosso, 04°54′N, 09°42′E, 31 Apr 1986, *Etuge & Thomas 26* (P), Bindem (route allant vers Messama, perpendiculaire à la route Kribi-Ebolowa), campement à 2h de Marche au SO du village, le long du sentier à 1h de Marche au SO du campement, 02°41′08″N, 10°47′04″E, RVIN 69, 60 m, 15 Aug 2006, *Droissart & Simo 261* (BRLU). Central African Republic. Mbaïki, Station centrale de Boukoko (Oubangui-Chari A.E.F.), 3 Mar 1952, reprise no. 2076, *Tisserant & Le Testu 2410* (BR, K, LISC), *ibid.*, 13 Apr 1951, *Tisserant & Le Testu 2076* (BR, P, 3 sheets, LISC),

ibid., 1 Oct 1948, fruit du no. 1124, *Tisserant 1158* (BM, P, 2 sheets), *ibid.*, 30 Aug 1948, *Tisserant 1124* (BM, P), La Maboki, *Rose s.n.* (P). Democratic Republic of the Congo. Village de Kingani, forêt après les plantations, 22 Oct 1965, *Bouquet 1856* (P, 2 sheets), Dungu, Parc National de la Garamba, piste centrale vers km 32, le long de la rivière Garamba, 700–800 m, 8 Sep 1951, *de Saeger 1345* (P). Rwanda. Biumba, Kakitumba, 1400 m, 20 May 1955, *Christiaensen 881* (BR), Biumba, Kakitumba, 1400 m, 29 Jun 1954, *Christiaensen 521* (BR), P.N.A., Environs de Mutsora, 1000 m, 30 Aug 1953, *Robyns 4036* (BM), Forêt primitive ombrophile, épiphyte xérophylle, 31 Dec 1939, *Louis 7300* (BR), colline Maganga, km 136, route de Kisangani vers Ituri, 00°45′N, 26°16′E, 500–700 m, 17 Jun 1978, *Lejoly 3633* (BR), Jangambi, plateau de l'Isalowe, 470 m, reçu du jardin de Bruxelles en 1991, 26 Aug 1938, *Louis 11014* (P, BR, 2 sheets), ibid, 13 Jun 1937, *Louis 4139* (P), Jangambi, 8 km N du fleuve, plateau de la Luweo, 13 Sep 1937, *Louis 6029* (P), Duwresama, 1913, *Mortehan 382* (BM, P) Cuvete, P.N. D'Odrala, 7 km de Uboko sur la lékénié, Apr 1995, *Dowsett-Lemaire 1952* (BR), Bugsera, 30 Dec 1953, *Liber 1670* (BR), Lokoro, 17 Jul 2005, *Belesi 1474 (005)* (BRLU), Maganga, km 136, route de Kisangani vers Ituri, 500–700 m, 17 Jun 1978, *Lejoly 3633* (BRLU). Gabon. Bakota, Kobo Melé, Bélinga, 27 Oct, *Hallé 2820* (P). Ghana. Mlabo, in saddle towards Toga, Togo Plateau above Wurupong, Kpandu, 17 May 1960, *Morton 3938* (P, K). Guinea. Macenta Guéckédou, 6 Jul 1949, *Adam 5543*(P, 2 sheets), Foulaya Prov. Kimiti (IFAC F. 109), 1952, no. 3, *s.n.* (P), Guéckédou, Jul 1936, *Félix 1038* (P), Pita et environs, 1909, *Pobéguin 2272* (P), *ibid*., *Pobéguin s.n.* (P), Koumi, Mar 1907, *Pobéguin 1503* (P), Nimba, Oct 1947, *Schnell 3800* (P), Konroissa, Dec 1902, *Pobéguin 939* (P). Ivory Coast. Forêt de la Kediouni, 16 Jun 1974, *Perez Vera 648* (P). Liberia. Nimba, Sanniquelle Distr., Nimba Mountains, 600 m, 24 Jan 1969, *Johansson 591* (UPS). Mozambique. Niassa, Lizombe, 110 km NE of Lichinga, Mountain Miombo, 17 Feb 1982, *Pettersson 216* (UPS). Nigeria. Uzuakoli Metu College forest reserve, 18 Feb 1966, *Aruwaodo 1107* (P). Tanzania. Tanganyika, Near Foresters House (Kakamega Keimosi road), Kakamega Forest, 1600 m, 15 Oct 1953, *Drummond & Hemsley 4794* (BR, K, LISC), Mbeya, Chivanjee Tea Estate, 1000 m 09°19′60″S, 33°40′00″E, 27 Mar 1985, *Pettersson, Hedrén & Kibuwa 426 A* (UPS). Uganda. Budongo Forest, Oct 1935, *Eggeling 2235* (BR), *ibid.*, Jun 1935, *Eggeling 2087* (BR). Uganda. Forêt Kipayo, Jun 1914, *Dümmer 848* (BM, P). Zambia. Mwinilunga, 60 miles South of Mwinilunga, on the Kabompo road, 3 Jun 1963, *Loverdrige 748* (K, LISC), Mwinilunga, in evergreen forest, flowers greenish cream, turning orange), 30 Mar 1960, *Holmes 0243* (BR).

Tridactyle trimikeorum Dare in Excelsa 19: 84. 1999 – Holotype: Zimbabwe Zvishavane District, *Kimberley & Dare 247* (SRGH).

Tridactyle truncatiloba Summerh., Kew Bull. 3: 297. 1948 – Holotype: Gabon. Upper Ngounyé River, Kembélé, 24 Nov 1925, *Le Testu 5784* (BM barcode BM000540414!; isotypes: K barcode K000306516!, P barcodes P04026603! & P00388393!).

Additional specimens examined. – Democratic Republic of the Congo. Mayombe, Niari region, near Foungouti, 450–500 m, 11 Dec 1990, *la Croix 1138* (BR, K). Gabon. Fleurs non épanouies verdâtres, Noumbo, 22 Nov 1925, *Le Testu 5778* (BM, P), Borde del Rio en el Bosque primario, 15 Dec 2000, *Nguema 1574* (BRLU), Tchimbélé, deversoir du Barrage, no. cult. 83, 460 m, 5 Jan 2002, *Stévart, Mounoumoulossi & Kombila 1624* (BRLU), *ibid.*, 16 Dec 2001, *Stévart, Mounoumoulossi & Kombila 1679* (BRLU), Tchimbélé (carrière de), près du bras mort du lac, 00°37′54″N, 10°24′25″E, 570 m, 10 Jun 2001, *Stévart 876* (BRLU), *sine loc,* "species: Pakhouba", *Biteau 414* (BRLU).

Tridactyle unguiculata Mansf. in Notizbl. Bot. Gart. Berlin-Dahlem 9: 1064. 1934 – Type: Tanzania. Bez. Iringa: Landschaft Lupembe im Süden, Urwald Ditima, auf Bäumen am Waldrand, 1800 m, Blüten weiss, angenehm duftend, 15 Oct 1931, *Schlieben n. 1352* (BM barcode BM000540416!, BR barcode 0000008815408!, K barcode K000382754!).

Tridactyle vanderlaaniana Geerinck in Bull. Jard. Bot. Natl. Belg. 60(1–2): 190. 1990 – Holotype: Democratic Republic of the Congo. District du forestier central: Irangi Kavumu, Walikale km 110 route Kavumu, reserve IRSAC, Catena II, 7 Feb 1957, forêt, 900 m, *Christiaensen 2015* (BR barcode 0000008815385!; isotypes: LWI barcode LWI376865605 [photo!], YBI barcode YBI178665692 [photo!]).

Tridactyle verrucosa P.J.Cribb in Kew Bull. 40: 415. 1985 – Holotype: Tanzania. Luwiri Kitema on lichen covered rocks in upland grassland: 1890 m, 5 Mar 1956. *Milne-Redhead & Taylor 8984* (K barcode K000048940!).

Additional specimens examined. – Tanzania. Iringa, Iringa District, Mt. Selegu, Miombo, large rocks covered with lithophytes. 07°30′S, 36°10′E, 1800–1900 m, already collected from flower in cult. As 1057., 28 Dec 1986, *Lovett & Congdon 1221* (K), Iringa District. Imagi Mount about 30 miles east of Iringa and south of the Gt. N. Rd., 1950 m, 15 Dec 1961, on Brachystegia, *Richards 15658* (K).

Tridactyle virginea P.J.Cribb & la Croix in Fl. Trop. E. Afr. 3: 614. 1989 – Type: Malawi. N. Vipluga, Usambara forest (= Leedal 7258): 19 Oct 1956, 1900 m, *Mr. & Ms. la Croix 862* (K barcodes K000048943! & 50955.000 [in spirit]!).

Additional specimens examined. – Tanzania. Kikongwa, Mipande forest, Lukomero, 1600 m, 29 Oct 1982, *Leedal 7258* (K), N. Viphya, Usambara Forest, 1900 m, 12 Nov 1982, *Dowsett-Lemaire 499* (K).

Tridactyle virgula (Kraenzl.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 148. 1918 ≡ *Angraecum virgula* Kraenzl. in Engler, Pflanzenw. Ost-Afrikas C: 157. 1895 ≡ *Listrostachys virgula* (Kraenzl.) Rolfe in Oliver, Fl. Trop. Afr. 7: 165. 1897 – Holotype: Uganda. Runssoro, 2500 m, *Stuhlmann 2336* (B†).

Additional specimens examined. – Burundi. Cascade Nyabuhondo (mont Ngome), 220 m, 16 Nov 1990, cultivé à Teza *Arbonnier 212* (BR), Democratic Republic of the Congo. Parc National Albert, Volcan Nyamulagira, 220 m, 4 Jun 1945, *Germain 3896* (BR, K), *ibid.* 9 Sep 1937, *Ghesquière 5183* (BR) (2 sheets), Kivu Nord, Virunga Kette, Lavaebene zwischen Nyamuragira und Mikeno, Kikomero, 1770 m, 17 Sep 1954, *Stauffer 381* (BR), Flora of Virunga Mountains, *Burtt 3191* (K), Kamiranzovu Terr. Shangugu, Marais à Erica, 2000 m, 19 Mar 1956, Orchidée epiphyte U84, *Christiaensen 1440* (BR). Rwanda. Gisenyi, Gikungu, vallée de Sebaya, 2300 m, 4 Nov 1974, *Troupin 15551* (BR), Kibungo, galerie forestière de l'Akagera, Rusumo, 1300 m, Oct 1974, *Troupin 15477* (BR), Piste Rangiro, 1750 m, 25 Nov 1993 (Floraison mars 1994), *Delepierre 234* (dessin aquarelle crayon d'après nature) (BR). Uganda. Ruwenzori, Bwamba Pass, 8000 feet, Jul 1940, *Eggeling 3991* (BR, K), Ruwenzori (Butagu), 2300 m, 14 Apr 1914, *Bequaert 3670* (BR), Ruwenzori, La Nyambamba, 2100 m, Nov 1981, *Lebrun 4482* (BR) (2 sheets), 5 Feb 1916, *Fyffe 37* (K).

Ypsilopus sect. ***Ypsilopus*** (Summerh.) D'haijère & Stévart – Type: *Y. longifolius* Summerh.

Ypsilopus citrinus (P.J.Cribb) D'haijère & Stévart ≡ *Tridactyle citrina* P.J.Cribb, Kew Bull. 32: 183. 1977 – Holotype: Malawi, Nyika, on Protea trees and rocks, Flower yellow, Dec 1966, *Williamson 230* (K barcodes K000049440! & 27461.023 [in spirit]!).

Additional specimens examined. – Malawi. base of Nyika Plateau, 3 miles after Chalinda turn-off, 27 Jul 1981, *la Croix 245* (K), 9 Dec 1986, la Croix South Viphya, Mshangatanga Forest Reserve, 9 Dec 1986*, la Croix 902bis* (K), Rumphi District, approach to Nyika National Park, 16 Dec 1986*, Mr. & Ms. la Croix 903* (K), Northern Province, Mzimba Distr., Mzuzu, Marymount 4500 feet, 28 Jul 1969, *Pawek 2570* (K), Tanzania. T4, Ufipa District.: Malonje Farm, 2100 m, 14 Dec 1956, *Richards 7272* (K); Namwele Escarpment, 1800 m, 28 Dec 1961, *Richards 15780* (K), Ufipa District, Kito Mountains, 1800 m, 3 Dec 1959, *Richards 11857* (K). Zambia. Northern Province: Abercorn [Mbala], 15 Dec 1949, *Bullock 2103* (K), Chize River, Nyika, Dec 1966, *Williamson 210A* (K).

Ypsilopus erectus (P.J.Cribb) P.J.Cribb & J.Stewart, Kew Bull. 40: 417. 1985 ≡ *Ypsilopus longifolius subsp. erectus* P.J.Cribb, Kew Bull. 32: 177. 1977 – Holotype: Zambia, Kundalila Falls, *Williamson 1545* (K barcode K000306409!; isotypes: K barcode K000306410! SRGH barcode [handwritten] SRGH0106338-0 [photo!]).

Additional specimens examined. – Malawi, Chambe Plateau, 28 Mar 1965, *Morris 122* (K), Sombani Plateau, *Morris 50* (K), Mzuzu, 23 May 1970, *Brummitt & Pawek 11098* (K), *ibid., Pawek 966* (K), Litchenya Plateau, 10 Apr 1965, *Morris s.n.* (K), Perezeki, 7 Nov 1986, *Dowsett-Lemaire 1194* (K). Tanzania, 20 May 1976, *Leedal 3564* (K). Zambia, Mar 1969, *Williamson 1545* (K).

Ypsilopus furcistipes (Summerh.) D'haijère & Stévart ≡ *Tridactyle furcistipes* Summerhayes, Kew Bull. 3: 300. 1948 – Holotype: Kenya, Aberdare Mountains, Kinangop, 8800' 8900' alt., Apr 1938, *Chandler 2401* (K barcode K000306511!).

Additional specimens examined. – Kenya, Kaisanga, Cherangani Hills, 10–100 feet, Jul 1961, *Tweedie 2173* (K), Kenangop, 8450 feet, May 1932, *Harvey 183* (BR, K), Elgeyo, Theunisscho Farm, 8000 feet, 23 Apr 1943, *Bally 2538* (K, 2

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sheets), Elegeyo Escarpment, 12 Dec 1947, Jun 1943, *Copley 116* (K), Molo, 8000 feet, 30 Jan 1943, *Harris 380* (K), Distr. Kilifi, Arabuko Sokoke Forest, 6 km from Kararacha gate, road to the view point. 03°23′41″S, 39°52′42″E, 53 m, 8 Dec 2008, *Miyawa, Muthoka, Kimeu & Gaya NMK1156* (EA, K), OL. Kalou, above 8200, Kinangop, Cedar Forêt, *Piero 54* (K). Tanzania. Lolkisale, 6800–7000 feet, Mar 1967, *Beesley 261* (K).Uganda, Mount Debasien, Karamoja, 8800 feet, May 1948, *Eggeling 5813* (K), Mount Debasien, Karamoja, 30 May 1939, 8500 feet, *Thomas 2953* (K).

Ypsilopus leedalii P.J.Cribb, Kew Bull. 40: 417. 1985 – Holotype: Tanzania, Ibala, Umalila, T9, 7000 feet, 19 Mar 1978, *Leedal 5135* (K barcode K000306408 & 49237.000 [in spirit]!).
Additional specimens examined. – Tanzania, Mbeya Umalila, 31 Mar 1975, *Leedal 2625* (K).

Ypsilopus longifolius (Kraenzl.) Summerh. in Kew Bull. 4(3): 440. 1949 ≡ *Mystacidium longifolium* Kraenzl. in Bot. Jahrb. Syst. 17(1–2): 57. 1893 – Holotype: Kenya. Mt. Kenya, Ndoro, *von Hoehnel 31* (B†). Neotype: Kenya. Rift Valley, Laikipia, 1920 m, 28 Mar 1935, *Leakey 8540* (K barcode K000390316!).
= *Listrostachys graminifolia* Kraenzl. in Engler, Pflanzenw. Ost-Afrikas C: 158. 1895 ≡ *Angraecum graminifolium* (Kraenzl.) Engl. in Engler & Drude, Veg. Erde 9(2): 420. 1908 ≡ *Aerangis graminifolia* (Kraenzl.) Schltr. in Beih. Bot. Centralbl., Abt. 2, 36(2): 122. 1918 ≡ *Ypsilopus graminifolius* (Kraenzl.) Summerh. in Kew Bull. 4(3): 440. 1949 – Holotype: Tanzania. Usambara Mts., Mbalu, *Holst 2607* (B†). Neotype: Tanzania. Western Usambaras, Sunga-Manolo road, 1950 m, 26 May 1955, *Drummond & Hemsley 2780* (K barcode K000390302! & 10486.000 [in spirit]!).
Additional specimens examined. – Kenya. Nairobi, Apr 1946, *Tweedie 685* (K), Kajiado Ngong Hills, 20 Mar 1942, *Moreau 158* (K), Laikipia Rumuruti, Mar 1943, *Copley 115* (K), Nairobi, 26 Apr 1942, *Moreau 158* (K), Apr 1946, *Tweedie 685* (K). Tanzania. Dodoma, Dodoma, Aug 1991, *Spurrier 126* (K), Korogwe Bungu, 30 Mar 1942, *Moreau 175* (K), Lushoto Mazumbai, Jun 1975, *Tanner 34* (K), Mufindi Lulando Forest, 28 Feb 1989, *Leyser 246* (K), Muheza Kiwanda, 22 Sep 1976, *Archbold 2044* (K), Rungwe, 7 May 1944, *Moreau 831* (K), Same Shengena, 28 Feb 1989, *Kisena 827* (K), Songea Matagoro, *Mcloughlin 83* (K).

Ypsilopus sarcodanthus (Mansf.) D'haijère & Stévart ≡ *Tridactyle sarcodantha* Mansf. in Notizbl. Bot. Gart. Berlin-Dahlem 11: 1063. 1934 – Holotype (B†). Lectotype: Tanzania. Uluguru Gebirge, Nordwestseite, 1800 m alt., 31 Mar 1933, *Schlieben 3705* (BR barcode 000008815538!).

Ypsilopus tanneri (P.J.Cribb) D'haijère & Stévart ≡ *Tridactyle tanneri* P.J.Cribb, Kew Bull. 34: 338. 1979 – Holotype: Tanzania. Lushoto District: West Usambara Mts, Mazumbai Forest Reserve, 5800 feet, 7 Jan 1976, *Cribb & Grey-Wilson 10038* (K! barcode K000306506!).
Additional specimens examined. – Kenya. Taita Hills, Mbololo Hill, c. 03°20′S, 38°27′E, 1450–1600 m, 29 Dec 1971, *Faden, Smeenk & McNee 71/971* (K, UPS). Tanzania. South Pare Mountains, Chome Forest Reserve (Shengena Forest), Along Manje–Chome path, 04°16′45″S, 37°58′14″E, 1600 m, 28 Nov 1999, *Massawe, Hamisi & Elia 539* (K), Mazumbai Forest Reserve, 5500 feet, *Tanner 252* (K).

Ypsilopus tricuspis (Bolus) D'haijère & Stévart ≡ *Angraecum tricuspe* Bolus, J. Linn. Soc., Bot. 25: 163. 1889 ≡ *Tridactyle tricuspis* (Bolus) Schltr., Bot. Jahrb. Syst. 53: 601. 1915 – Lectotype: South Africa. In Natal, *Mc Ken 14* (K barcode K000306501!; isolectotype: BOL barcode BOL149994 [photo!]). Other Syntypes: *Cooper 1398* (BOL), *Sanderson s.n.* (BOL).
= *Angraecum rhodesianum* Rendle, J. Linn. Soc., Bot. 40: 208. 1911 ≡ *Tridactyle rhodesiana* (Rendle) Schltr., Beih. Bot. Centralbl., Abt. 2, 36(2): 147. 1918 – Holotype: Zimbabwe. Chimanimani, Melsetter, 6000 feet, in fruit in Sep, 23 Sep 1906, *Swynnerton 755* (BM barcode BM000540376 [photo!]).
= *Angraecum frommianum* Kraenzl., Bot. Jahrb. Syst. 51: 398. 1914 ≡ *Tridactyle frommiana* (Kraenzl.) Schltr., Beih. Bot. Centralbl., Abt. 2, 36(2): 147. 1918 – Holotype: Zimbabwe. Tanganyika. Nyassa See. Mfimbwaberg, 2300 m, *Fromm 226* (B†).
= *Tridactyle nyassana* Schltr., Bot. Jahrb. Syst. 53: 601. 1915 – Type: Malawi. Nördliches Deutsch-Nyassaland: auf bäumen bei Kyimbila, ca. 1350 m, *Stolz 658* (G barcode G00022228 [photo!]; isolectotypes: C barcode C10001113 [photo!], M barcode M-0103362 [photo!], U barcode U 0005426 [photo!], WAG barcode WAG0002580 [photo!]).

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= *Tridactyle fragrans* G.Will., Pl. Syst. Evol. 134 (1–2): 75. 1980 – Holotype: Malawi. Nyika, in deep forest, flowers yellow, heavily scented, *Williamson 227* (K barcode K000306512!; isotype: SRGH).

Additional specimens examined. – Burundi. Kayongozi-Ruyigi, 03°16′S, 30°26′E, 13 Mar 1984, *Arbonnier 91* (BR), Ruyigi- Mageyo, 29 Mar 1992, Teza cult. Orig. Sangu, *Arbonnier 322* (BR). Democratic Republic of the Congo. Parc National de l'Upemba, 1700 m, 16 Apr 1949, *de Witte 6144* (BR), Parc National de l'Upemba, 1700 m, *de Witte 6035* (BR) (2 sheets), Parc National de l'Upemba, Mukama, 1810 m, 14 Apr 1947, *de Witte 2499* (BR, K, 2 sheets), *Vanden Brande M212* (BRLU), Mission Duvigneau 1959–1960, *Duvigneau 5080* (BR). Malawi. North Province, Mzimba Distr. Viphya Plateau, 37 miles BW of Mzuzu, top Varnal Pool dome, 5800 feet, 15 Mar 1975, *Pawek 9164* (BR), South Viphya Plateau, Feb 1968, G. Williamson 855 (K), North Province, Mzimba Distr., Viphya Plateau, Ntangatanga Forest Reserve 2 ml. W on Mzimba cut-off, 1700 m, 9 Mar 1978, *Pawek 13933* (K), North Province, Mzimba, Viphya Plateau, 59 miles SE of Mzuzu on road to Mzimba, 1600–1700 m, 18 Mar 1977, *Grosvenor & Renz 1283* (K), North Province, Mzimba Distr., Mzuzu, Marymount, 4300 feet, 29 May 1975, *Pawek 9664* (K), North Province, Rumphi District, Nyika, Chowo rock, 7100 feet, 30 Mar 1970, *Pawek 3428* (K), Nyika Plateau, Mar 1966, *Williamson 284* (K), Serenje Distr., Kundalila Falls, Jan 1969, *Williamson 1609* (K), Kundalila Falls, Jan 1969, *Williamson 1725* (K), Danger Hill, 18 miles from Nyika, Feb 1969, *Williamson 1610* (K), North Province, Mzimba Distr., Mzuzu, Marymount 450 feet, 2564, 8 Jul 1969, *Pawek 2571 A* (K), Rumphi gorge, Apr 1908, *Williamson 964* (K), Rumphi, Nyika Plateau, 2100 m, 13 Mar 1977, *Grosvenor-Renz 1204* (K), Northern Province, Nyika Plateau, Vitumbi 6 ml. Kassaramba junction, open scrub, 6700 feet, 24 Dec 1973, *Phillips 707* (K), North Province, Mzimba Distr., Champira, Katete Mission, 4800 feet, 24 Apr 1974, *Pawek 8502 A* (K), Mzimba District, Mtangatanga, Brachystegia Woodland, 5350 feet, 28 Mar 1978, *Phillips 3336* (K), Malowe, Austro africanae, flora of east griqualand, ex. Herbarium Tyson, 4000 feet, Mar 1886, *Tyson 3081* (K), Nyassaland, Southern Province, Zomba Mountains, Forest Nursery, 1830 m, 9 Mar 1955, *Exell, Mendzinga & Wild 732* (BM, LISC), Zomba Plateau, near Changwe's Hole, 6000 feet, 27 Feb 1979, *Blackmore & Taylor 600* (BM), Zomba Plateau, near Chingue's Hill, 1900 m, 27 Feb 1977, *Grosvenor-Renz 986* (K), Karonga Distr., Misuku Hills, 4500 feet, 10 May 1947, *Benson 51251, 51252* (K), Karonga Distr., Misuku Hills, 4500 feet, 12 May 1947, *Benson 512571 &51258* (K) *ibid.*, 11 May 1947, *Benson 1244* (K), Bombam Plateau, 4000–6500 feet, *Morris 36* (K), Mwanje, Tuchila Plateau, 6500 feet, 24 Feb 1980, *Morris 724* (K), Zomba Plateau, 6000 feet, on Brachystegia, *Morris 37a* (K), Zomba Plateau, 5500 feet, Apr 1965, *Morris 146* (K), Zomba Plateau, 550 feet, *Morris 37* (K), Zomba, Urkies grassland, 15 Mar, *Welsh 684* (K, 2 sheets), *ibid.*, 2 Mar, *Welsh 680* (K), Katamane, Soche, 4000–5000 feet, 2 Jun 1965, *Morris 128* (K, 2 sheets), Blantyre District, Top of Soche Sut., 4000 feet, 31 Mar 1938, *Curson 2* (K), Chombe Plateau, Kademere on Vellozia shrub 6500 feet, Mc Longhlin 88, *Morris 203* (K), Central Region, Ntchisi District, Ntchisi Forest Reserve, above rest house, 1400–1590 m, 25 Mar 1970, *Brummitt 9378* (K), Southern region, Mlanje District, Mlanje Mountain, path from Tuchila Hut to head of Ruo Basin, 1980–2130 m, grid ref. 780: 8241, 6 Apr 1970, *Brummitt 9637* (K), Southern region, Mlanje District, Sombaim, 2140 m, 17 Feb 1985, *Johnston-Stewart 387* (K), Nkhata Bay, Varnal Pool, Pipya 37 ml. Of Mzuzu, 5500 feet, 21 Mar 1971, *Pawek 4498* (K), N'lheere Mountains, *Davy 21107* (K), Dedza, 21 Nov 1966, *Salubeni 460* (K). Mozambique. Tete, na serra do Furanoungo, 15 Jan 1961, *de Carvalho 503* (K, 2 sheets). Rwanda. Lubirizi (Kigali), 01°16′S, 30°14′E, 1250 m, 3 Mar 1992, *Delepierre 2* (BR). South Africa. Natal, 1862, *Cooper 186 (no. 1398)* (BM, K), Natal, Com.M. Wood, From Mr. Sanderson's Herbarium, *Sanderson s.n.* (K), Transvaal, "Look out", Hanglip district, Zoutpansberg, 4400 feet, 23 Apr 1954, *Balfour-Browne 52* (BM), Limpopo, Lekgalameetse Nature Reserve, Malta Bay. Yellowwood forest, 1500 m, SE, 8 Apr 1986, *Stalmans 1222* (UPS). Swaziland. Mbabane, Mbabane-Manzini road, turn off to Mdimba Mountains, 8 km, 10 Apr 1976, 2631 AA, *van Jaarsveld 1184* (K), Mankaiana, near Jicanusa, vertical rocks, 4000 feet, 27 Mar 1958, *Compton 27711* (K). Tanzania. Idunda, Mbozi, 3 May 1975, *Leedal 2650* (K), Mbeya, 5 km before Uyole on Iringa-Mbeya road. Heavily grazed Brachystegia-Uapaca woodland, 18000 m, 08°55′00″S, 33°34′60″E, 18 Mar 1985, *Pettersson, Hedrén & Kibuwa 160* (UPS) Iringa, 6600 feet, 12 Feb 1932, *Rear-Admiral Lymes 1h75* (K, 2 sheets), South West Tanganyika Territories, Makalala, Sao Hill, Iringa, 6000 feet, 3 Jul 1942, *Jackson 320* (K, 2 sheets), Stromgebiet des oberen Ruhudre, nördlich des Flusses, Apr 1931, *Schlieben 565* (BM, BR, P, K), Tanganyika Territories, District Moshi, Kilimandjaro, 2300 m, Rongai, Gürtelwad (obere Grenze), 18 Apr 1934, *Schlieben 5086* (BM, BR, K, LISC), Dabaga Highlands, Mgama, 10 ml. E of Iheme, Iringa Distr., 5800 feet, 12 Feb 1962, *Polhill & Paulo 1448* (BR, P, K, LISC), Mount Hanang, above Katesh, Mbulu Distr., Tanganyika, 5700 feet, 3 May 1962, *Polhill & Paulo 2310* (K), Mont Iringa, 50 ml N.E. of Iringa, a little N. of the Morogoro Road, Iringa Distr., Tanganyika, 6700 feet, 3 Mar 1962, *Polhill & Paulo 1662* (BR, K), Iringa Region, Iringa Distr., Mount Selegu, Miombo Woodland, 07°30′S, 36°15′E, 1500 m, 20 May 1987, *Lovett 2189* (K), Ufipa District,

Nsanga Mountains, Malonje Plateau, 2100 m, 13 Mar 1959, *Richards 12123* (K), Amani, East Usambara Mountains, 3000 feet, 11 Aug 1941, *Moreau 24* (K, 2 sheets), Top edge of Ndombi forest at foot of Mtorwi Mountains, 8400 feet, 18 Feb 1976, *Cribb & Grey-Wilson 10779* (K, 2 sheets), Makumbako, 1800 m, 27 May 1971, *Johansson 1028* (K), *ibid., Cuthbert 50* (K), 24 Mar 1998, *la Croix, CPM 311* (K). Zimbabwe. Southern Rhodesia, Odzani Falls, Sol. G.H. 28113, 30 Apr 1950, *Chase 2187* (BM), Umtali Distr., Odzani R., 1 ml. From Odzani Falls, on trees, 4800 feet, 1 May 1950, *Chase 27818* (K), Umtali Distr., Engwa, Himalaya range, 6000 feet, 5 Mar 1954, *Wild 4539/ 46223* (= 27427 sent to Kew 1950)(K), Umtali, Himalaya range, Engwa, 6000 feet, 5 Mar 1954, no. 46223, *Wild 4539* (K) District Marandellas, 27427, Delta, on granite rocks, 6 Apr 1950, *Wild 3324* (P, K), South Ufipa, plateau Southwest Tanganyika Territories, ca 6000 feet, 13 Mar 1944, *Bell 790* (K), *ibid.*, *D.H.A. 573 A* (K), Mbisi Forest, 7000 feet, Ufipa plateau, 14 Aug 1943, *Bell 653* (K), melsetter Distr., Chimanimani Mountains, East of National Park Office, 1650 m, 20 Mar 1981, *Philcox, Leppard, Duri & Urayai 9030* (K), Chimanimani Mounts, 1 Apr 1959, *Holmes 0154* (K), Roadside 300 m, from Melsetter Police Station, 1500 m, 13 Mar 1981, *Philcox, Leppard, Duri & Urayai 8979* (K), Melsetter Distr., Chimanimani Mountains, Below the Mountain Hut, on Brachystegia, ca. 5500 feet, 7 Apr 1967, *Grosvenor 345* (K), Melsetter, Melsetter townlands' Park, Pie Hill, 28 Mar 1951, 32610, *Crook 391* (K, LISC), Melsetter, Rhodesia, 6000 feet, 23 Sep 1906, *Swynnerton 755* (K, 2 sheets), Melsetter, Cashel, 1 Apr 1959, *Holmes 0144* (K), Melsetter, Pork Pie Hill, 28 Mar 1951, 32610, *Crook 391* (K), Vumba, Norseland, 5000 feet, Mar 1949, *Wild 2819 (22705)* (K, LISC), Mouradona Mountains, Mount Darwin, 16 Apr 1964, *Wild 6529* (K, LISC), South Rhodesia, District Salisbury, Cleveland Dam., epiphyte on granite, 4500 feet, 15 May 1948, *Wild 2548 (G.H. 20361)* (K, 2 sheets), Belingwe, Mount Buhwa, summit, 29 Apr 1973, 1750 m, *Pope 1017* (K, LISC).

Ypsilopus viridiflorus P.J.Cribb & J.Stewart, Kew Bull.40: 417. 1985 ≡ *Rangaeris viridiflora* (P.J.Cribb & J.Stewart) Szlach., Ann. Bot. Fenn. 40: 69. 2003 – Holotype: Tanzania. *Greenway & Kanuri 13493* (K barcode K000306407!; isotype: UBT barcode UBT0004753[photo!]

Additional specimens examined. – Tanzania. Arumeru Mont Meru, 27 Apr 1969, *Greenway, Kanuri & Fitzgerald 13621* (K), 16 Jan 1970, *Bjornstad 232* (K), 3 Mar 1976, *Cribb & Grey-Wilson 10839* (K), Usambara Mountains, 15 May 1953, *Drummond & Hemsley 2555* (K).

Ypsilopus sect. ***Barombiella*** (Szlach.) D'haijère & Stévart ≡ *Barombiella* Szlach. Ann. Bot. Fenn. 40: 69. 2003 – Type: *Ypsilopus schliebenii* (Mansf.) D'haijère & Stévart (≡ *Leptocentrum schliebenii* Mansf.).

Ypsilopus amaniensis (Kraenzl.) D'haijère & Stévart ≡ *Listrostachys amaniensis* Kraenzl., Bot. Jahrb. Syst. 43: 397. 1909 ≡ *Leptocentrum amaniense* (Kraenzl.) Schltr., Beih. Bot. Centralbl., Abt. 2, 36(2): 112. 1918 ≡ *Rangaeris amaniensis* (Kraenzl.) Summerh. Kew Bull. 4: 438. 1949 – Holotype (B†). Lectotype: Tanzania, West-Usambara: Amani; *Braun 1551* (K barcode K000306413!).

= *Cyrtorchis cufodontii* Chiov., Miss. Biol. Borana, Racc. Bot., Angiosp.-Gymnosp.: 335. 1939 ≡ *Angraecum cufodontii* (Chiov.) Chiov. ex Chiarugi, Webbia 8: 2. 1951 – Holotype: Ethiopia. Nel Territorio dei borana, A.O.I., 10 Apr 1917, *Cufodontis 317* (FT barcode FT000895 [photo!]; isotypes: FT barcodes FT000896 [photo!] & FT000897 [photo!]).

Ypsilopus schliebenii (Mansf.) D'haijère & Stévart ≡ *Leptocentrum schliebenii* Mansf. in Notizbl. Bot. Gart. Berlin-Dahlem 12: 704. 1935 ≡ *Barombia schliebenii* (Mansf.) P.J.Cribb in S. African Orchid J. 11(4): 110. 1980 ≡ *Rangaeris schliebenii* (Mansf.) P.J.Cribb, Fl. Trop. E. Africa 3: 570. 1989 ≡ *Barombiella schliebenii* (Mansf.) Szlach. in Ann. Bot. Fenn. 40(1): 69. 2003 – Holotype (B†). Lectotype: Tanzania. Masagati, Mahenge, 12 Jun 1931, *Schlieben 1159* (BR barcode 000008814746!).

Additional specimens examined. – Tanzania. Songea, Madaba waterfall, 20 May 1989, *Spurrier 89* (K), Ulanga Mahenge, 20 Jan 1979, *Cribb, Grey-Wilson & Mwasumbi 11087* (K).

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