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Molecular and morphological evidence for a remarkable new species of *Leptopus* (Phyllanthaceae) from Southeast Yunnan, China

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Leptopus malipoensis, a remarkable new species of Phyllanthaceae form Southeast Yunnan Province, China, is described. The phylogenetic position of the new species within the genus *Leptopus* was analyzed based on the nuclear ribosomal internal transcribed spacer (nrITS) and the plastid DNA region *matK*. The results show that *L. malipoensis* is highly supported to be the sister of *L. fangdingianus* (P. T. Li) Voronts. & Petra Hoff., a species endemic to Western Guangxi Province, China. Morphologically, the new species can be distinguished from all known congeneric taxa by its long and slim branches usually pendulous or procumbent, large leaves up to 15 cm long and 7 cm wide, and further differs from its sister species by its hirsute stems, leaves and pedicel of female flowers, longer pedicel of male flowers, 3-locular ovary and 3 styles. A key to all the *Leptopus* species is provided.

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Abstract

Leptopus malipoensis, a remarkable new species of Phyllanthaceae form Southeast Yunnan Province, China, is described. The phylogenetic position of the new species within the genus *Leptopus* was analyzed based on the nuclear ribosomal internal transcribed spacer (nrITS) and the plastid DNA region *matK*. The results show that *L. malipoensis* is highly supported to be the sister of *L. fangdingianus* (P. T. Li) Voronts. & Petra Hoff., a species endemic to Western Guangxi Province, China. Morphologically, the new species can be distinguished from all known congeneric taxa by its long and slim branches usually pendulous or procumbent, large leaves up to 15 cm long and 7 cm wide, and further differs from its sister species by its hirsute stems, leaves and pedicel of female flowers, longer pedicel of male flowers, 3-locular ovary and 3 styles. A key to all the *Leptopus* species is provided.

Subjects Biodiversity, Molecular Biology, Plant Science, Taxonomy
Keywords: *Leptopus*, Phyllanthaceae, Poranthereae, taxonomy, Yunnan, China

Introduction

Leptopus Decne. is a small genus in the tribe Poranthereae, subfamily Phyllanthoideae of Phyllanthaceae and distributed mainly from the Caucasus to Malesia (Vorontsova & Hoffmann, 2009; Webster, 2014). In the latest taxonomic revision of *Leptopus*, nine species were accepted and six among them were recorded in China (Vorontsova & Hoffmann, 2009). Results from molecular phylogenetic analyses showed that *Leptopus* was sister to *Actephila* Blume with high support (Vorontsova et al., 2007; Vorontsova & Hoffmann, 2008). Morphologically, the genus *Leptopus* can be distinguished from its sister clade by its leaves membranous to papery (vs. leathery, rarely papery), disk lobed evidently (vs. annular), fruit less than 10 mm in diameter (vs. more than 10 mm in diameter), exocarp adnate to endocarp (vs. free from endocarp) and mature seed with copious endosperm (vs. seed without endosperm) (Li et al., 2008).

During the field investigation in Malipo Hsien, Southeast Yunnan Province of China, in March 2018, two of the authors (E.D. Liu and X.X. Zhu) collected a Phyllanthaceae specimen belongs to *Leptopus*, and the same species was collected again in the same locality by another author (G. Yao) in July 2020. The species superficially differs from all the other members of *Leptopus* in morphology. After detailed morphological investigation and molecular phylogenetic analyses of *Leptopus*, it was concluded that the species is new to science, thus it is formally described here.

Materials & methods

Ethics statements

The collection location of the new species reported in this study is outside any natural conservation area and no specific permissions were required for the location. Since this species is currently undescribed, it is not currently included in the China Species Red List (Wang & Xie, 2004). Our field studies did not involve any endangered or protected species. No specific permits were required for the present study.

Nomenclature

The electronic version of this article in Portable Document Format (PDF) will represent a published work according to the International Code of Nomenclature for algae, fungi, and plants (ICN), and hence the new names contained in the electronic version are effectively published under that Code from the electronic edition alone. In addition, new names contained in this work which have been issued with identifiers by IPNI will eventually be made available to the Global Names Index. ~~The~~ IPNI can be accessed and the associated information contained in this publication viewed through any standard web browser by using the web address "*http://ipni.org/*". The online version of this work is archived and available from the following digital repositories: PeerJ, PubMed Central, and CLOCKSS.

Material collection

Flowering and fruiting specimens of the new species were collected in the mountain area, in Nandong to Bajiaoping, Laoshan, Malipo Hsien of Yunnan Province, China, for morphological

study. Leaf materials for DNA extraction were collected and dried using silica gel in the field.

Morphological study

Specimens of *Leptopus* deposited in the herbaria GXMG, IBK, IBSC, KUN and PE were studies carefully in the present study. Field investigation of Chinese *Leptopus* species were also conducted in recent years. Morphological characters of stems, leaves, flowers and fruits of relevant species were photographed and measured. Additionally, morphological comparisons between the new species and all the nine *Leptopus* species accepted by Vorontsova & Hoffmann (2009) were also conducted.

Phylogenetic study

Phylogenetic relationships among members of *Leptopus* were investigated by Vorontsova et al. (2007) based on analysis of two DNA fragments, viz. the nuclear ribosomal internal transcribed spacer (nrITS) and the plastid DNA region *matK*. To study the phylogenetic position of the new species within the genus *Leptopus*, the two above mentioned DNA regions of the new species were sequenced. Relevant DNA sequences of *Leptopus* species included in Vorontsova et al. (2007) were obtained from the website NCBI (*https://www.ncbi.nlm.nih.gov/*) and used in the present phylogenetic analyses. Additionally, outgroups were selected from the other seven genera of the tribe Poranthereae [*Actephila* Blume, *Andrachne* L., *Meineckia* Baill., *Notoleptopus* Voronts. & Petra Hoffm., *Phyllanthopsis* (Scheele) Voronts. & Petra Hoffm., *Pseudophyllanthus* (Müll. Arg.) Voronts. & Petra Hoffm. and *Poranthera* Rudge] and the genus *Heywoodia* Sim of the tribe Wielandieae, based on previously published phylogenetic frameworks (Kathriarachchi et al., 2005; Vorontsova et al., 2007). DNA sequences of outgroups were also downloaded from the website NCBI. Detailed information about the species sampled and DNA sequences are provided in Table 1.

Total DNA of the new species was extracted and then sequenced by genome skimming following the protocol of Zeng et al. (2018). Plastid and the nrITS sequence reads were assembled using the software GetOrganelle (Jin et al., 2020), with the reference plastid genome of *Glochidion chodoense* C.S. Lee & Im (GenBank accession number: NC_042906) and nrITS sequence of *Leptopus chinensis* (Bunge) Pojark. (MH710764), respectively. Genes in the plastid genome obtained were annotated in the software PGA (Qu et al., 2019). Then the sequence *matK* was extracted from the assembled whole plastid genome.

Sequences were aligned using MAFFT 7.221 (Katoh & Standley, 2013) and then three data sets were constructed: the *matK* dataset, the nrITS dataset and the combined dataset (including *matK* and nrITS). All the three datasets were analyzed using two approaches: Bayesian Inference (BI) and Maximum Likelihood (ML). Detailed information about the parameter setting in BI and ML analyses referred the phylogenetic analyses conducted in Yao et al. (2020). The models of nucleotide substitution of the two DNA fragments used were selected under the Akaike Information Criterion (AIC) using jModeTest v. 3.7 (Posada, 2008): TVM+G for *matK* and GTR+I+G for nrITS.

Results & discussion

Phylogenetic analysis

The *matK* dataset, nrITS dataset and combined dataset contained 2000 bp, 812 bp and 2812 bp, respectively. Conflicted topologies were found between the *matK* and nrITS frameworks (Fig. 1), but relevant conflicted phylogenetic nodes were all lowly supported in analyses of the nrITS dataset (Fig. 1B). Phylogenetic relationships derived from the combined dataset were much better resolved compared with those obtained from analyses based on the other two datasets, and phylogenetic relationships among *Leptopus* species sampled here were all resolved with high supports (Fig. 2). Thus we focus on describing phylogenetic relationships based on the result derived from the combined dataset.

Phylogenetic results showed that the genus *Leptopus* was sister to *Actephila* with high support values (MLBS = 100%, PP = 1.00), and the monophyly of *Leptopus* was strongly supported (MLBS = 100%, PP = 1.00). Within *Leptopus*, three major clades were recovered. *Leptopus australis* (Zoll. & Moritzi) Pojark. represents the earliest divergent clade within this genus. The new species is strongly supported to be the sister of *L. fangdingianus* (P.T. Li) Voronts. & Petra Hoffm. (MLBS = 100%, PP = 1.00) and then sister to *L. clarkei* (Hook. f.) Pojark. (MLBS = 100%, PP = 1.00). *Leptopus chinensis* (Bunge) Pojark. and *L. cordifolius* Decne. formed the third clade and sister to the (new species-*L. fangdingianus*)-*L. clarkei* clade with strong support (MLBS = 100%, PP = 1.00). Furthermore, the sister relationship between the new species and *L. fangdingianus* was highly supported in both of the *matK* (Fig. 1A) and nrITS (Fig. 1B) frameworks.

Morphological comparisons

Morphologically, the new species has pendulous or procumbent stems (Fig. 3A–B) and large leaves up to 15 cm long and 7 cm wide. These characters could distinguish it easily from all the other *Leptopus* members, which usually have ascendant or erect ~~stem~~ and smaller leaves less than 10 cm long and 5 cm wide. The procumbent habit is also recorded in *L. clarkei*, a species widely distributed from southern China, extending west to Assam and Burma, and south to northern Vietnam (Vorontsova & Hoffmann, 2009), and also is closely related to the pair of the new species and *L. fangdingianus* phylogenetically (Figs. 1 and 2). However, the new species differs from *L. clarkei* by having straight and not ribbed stems (Fig. 3C–F) (vs. flexuous and longitudinally strongly ribbed stems), larger leaves up to 15 cm long and 7 cm wide (vs. less than 10 cm long and 3 cm wide), leaves hirsute on both surfaces (Figs. 3C–E & 4D) (vs. glabrous adaxially and glabrous to sparsely hirsute abaxially), margin of leaves densely hirsute (Figs. 3C–E & 4D) (vs. glabrous to hirsute). While the new species differs from its sister *L. fangdingianus* by its leaves hirsute on both surfaces (Figs. 3C–E & 4D) (vs. glabrous to sparsely hirsute on both surfaces), pedicel of male flowers 10–25 mm long (vs. usually less than 10 mm long), pedicel of female flowers hirsute (Fig. 4D) (vs. glabrous), ovary 3-locular (vs. 4–5) and styles 3 (vs. 4–5).

Four species of *Leptopus* [viz. *L. micans* (Dunn) Pojark., *L. hainanensis* (Merr. & Chun) Pojark., *L. pachyphyllus* X.X. Chen and *L. robinsonii* Airy Shaw] were not sampled in the

present phylogenetic analyses. Morphologically, the new species also can be easily distinguished from these four congeneric species based on its above-mentioned pendulous or procumbent stems and large leaves. Additionally, the new species has hirsute indumentum, not ribbed branches, chartaceous leaves with 4 (or rarely 5) pairs of secondary veins. In contrast, *L. micans* has glabrous branches longitudinally ribbed and 8–10 pairs of secondary veins in leaves. *Leptopus hainanensis* also has glabrous branches and leaves, as well as 2–3 pairs of secondary veins in leaves. While the other two species *L. pachyphyllus* and *L. robinsonii* both have glabrous and bilaterally flattened branches, and the leaves of *L. pachyphyllus* are glabrous on both sides and almost succulent.

Taxonomic treatment

***Leptopus malipoensis* W.H. Zhang & Gang Yao, sp. nov.** (Figs. 3–4)

IPNI:

Type. CHINA. Yunnan Province, Wenshan State, Malipo Hsien, Laoshan, Nandong to Bajiaoping, on stone slopes near the roadsides of the semi-shady forests, at the elevation of ca. 1200 m, 15 July 2020, *G. Yao YGYN2020071501* (holotype: IBSC; isotypes: KUN, CANT).

Diagnosis. The species is similar to *L. fangdingianus* (P.T. Li) Voronts & Petra Hoffm. in morphology, but differs from the latter by its procumbent habit with long and slim branches usually pendulous, larger leaves up to 15 cm long and 7 cm wide, hirsute stems, leaves and pedicel of female flowers, longer pedicel of male flowers, 3-locular ovary and 3 styles.

Description. Shrub, monoecious. Stems straight, terete, hirsute; branchlets long and slim, sometimes up to 1.5 m long, usually pendulous or procumbent, hirsute. Leaves alternate, chartaceous, elliptic to ovate, 2–15 cm long and 1.2–7 cm wide, both surfaces hirsute, densely hirsute when young, margin densely hirsute, base cuneate to round, apex acuminate; midvein adaxially impressed, abaxially raised; secondary veins usually 4 pairs, rarely 3 or 5 pairs, adaxially slightly impressed, abaxially raised, obliquely ascending, sometimes arcuately anastomosing near margins. Petiole 4–12 mm long, hirsute. Stipules narrowly triangular, apically acuminate. Inflorescences unisexual or bisexual. Male flowers 1–3 per fascicle, ca. 3 mm in diameter, light yellow to slightly green; pedicel 10–25 mm long, glabrous; sepals 5, oblong, apically round, adaxially glabrous, abaxially sparsely hirsute, 0–3-veined; petals 5, clavate to slightly linear, alternating with sepals; disk with 5 contiguous regular segments deeply biobed, ~~apical~~ of lobes truncate to round; stamens 5, opposite sepals; filaments 5 free; anthers 5 longitudinally dehiscent. Female flowers usually 1 per fascicle, 3.5–4 mm in diameter; pedicels usually 15–25 mm long, sparsely hirsute, apically dilated evidently; sepals 5, oblong to ovate-triangular, apically acute to round, adaxially glabrous, abaxially glabrous or sparsely hirsute, usually 0–5-veined; petals 5, slightly linear, alternating with sepals; disk with 5 contiguous regular segments deeply biobed, apical of lobes truncate to round; ovary 3-locular, globose, glabrous; styles 3 free, deeply bifid, lobes usually recurved. Fruiting pedicel 2–3 cm long, hirsute; capsules depressed globose, smooth, glabrous or sparsely hirsute when young, 4–6 mm in diameter, 2.5–3 mm high, persistent sepals oblong; seeds 6, brown to dark-brown, hemispheric or laterally compressed, ca. 2.5 mm long and 2 mm wide.

Etymology. *Leptopus malipoensis* is named after its type locality, Malipo Hsien. Malipo Hsien is a hotspot for biodiversity research in Yunnan Province, China, and many new species were described recently from there, such as *Bredia malipoensis* D. H. Peng, S. Jin Zeng & Z.Y. Wen (Wen et al., 2019), *Habenaria malipoensis* Q. Liu & W.L. Zhang (Zhang et al., 2017), *Primulina malipoensis* L.H. Yang & M. Kang (Yang et al., 2018), *Salacia malipoensis* X.D. Ma & J.Y. Shen (Ma et al., 2020).

Phenology: Flowering in April to August, fruiting in May to October.

Paratype: CHINA. Yunnan Province, Wenshan State, Malipo Hsien, Laoshan, Nandong to Bajiaoping, under the semi-shady forests, at the elevation of 1171 m, 5 March 2018, *Z.D. Wei, F.Z. Shangguan, X.X. Zhu, et al. LiuED8755* (KUN).

Distribution and habitat: The species is known only from its type locality, Malipo Hsien in Southeast Yunnan Province, China (Fig. 5).

Habitat. The species grows on stone slopes near the roadsides of the semi-shady forests or under the semi-shady forests, in limestone environments, at the elevation of 1171–1200 m.

Chinese name. Ma Li Po Que She Mu (麻栗坡雀舌木)

Key to species of *Leptopus*, modified from Vorontsova & Hoffmann (2009)

1a. Leaf blades coriaceous, almost succulent; endemic to Guangxi Province, China ……..…….. ***L. pachyphyllus***

1b. Leaf blades membranaceous to thick chartaceous, never succulent ……..……..…….…….. 2

2a. Leaf blades with 8–10 visible pairs of secondary veins; fruit strongly reticulate; seed with orange micropylar appendage …….. ***L. emicans***

2b. Leaf blades with 0–6 (7) visible pairs of secondary veins; fruit smooth to faintly reticulate; seed without appendage …….…… 3

3a. Ascendant herb to subshrub up to 0.5 m high; female pedicels 2–5 mm in flower, 5–9 mm in mature fruit ……..…..…… ***L. australis***

3b. Erect to procumbent herb or shrub 0.5–4 m; female pedicels 5–30 mm in flower, 7–36 mm in mature fruit ……. 4

4a. Male pedicels less than 3 mm in length ……...……... 5

4b. Male pedicels no less than 3 in length, and usually up to 10 mm or longer 6

5a. Branches white to light brown; male petals, filaments and styles mostly glabrous; seeds smooth; endemic to Hainan Province, China ……..……..……..…… ***L. hainanensis***

5b. Branches reddish; male petals, filaments and styles hirsute; seeds transversely to irregularly ridged, sometimes pitted; endemic to Khanh Hoa Province, Vietnam ……..…… ***L. robinsonii***

6a. Stem flexuous; branches strongly ribbed ……..……..…….. ***L. clarkei***

6b. Stem straight; branches terete to moderately ribbed …….. 7

7a. Leaves usually less than 3 cm in length, and never longer than 5 cm ……..…… ***L. chinensis***

7b. Leaves usually longer than 5 cm in length, sometimes even longer than 10 cm in length ……..…….…. 8

8a. Leaves less than 10 cm in length and less than 3.5 cm in width; leaf blades with 4–7 pairs of secondary veins; leaf apex rounded ……..…… ***L. cordifolius***

8b. Leaves sometimes longer than 10 cm and wider than 3.5 cm; leaf blades 4 or 5 pairs of secoandary veins; leaf apex acute or acuminate …….……...…….. 9

9a. Stems and branchlets usually pendulous or procumbent; ovary 3-locular; styles 3 ……..…… ***L. malipoensis***

9b. Stems and branchlets ascendant or erect; ovary 4–5-locular; styles 4–5 ……..…… ***L. fangdingianus***

Adhikari et al. (2010) described the new species *Leptopus nepalensis* B. Adhikari, R.P. Chaudhary & S.K. Ghimire from Nepal, the holotype (*B. Adhikari 224*, TUCH) of which had been identified as *Phyllanthus griffithii* Müll.Arg.. On the basis of the morphological description provided by Adhikari et al. (2010), the new species is characterized by its 6 petals in two whorls, 6 stamens (or 3 as observed from the linear picture drawn based on the holotype), 3 styles connated into a column up to about halfway, however all of these characters are much different from those of the genus *Leptopus* as currently circumscribed (Vorontsova & Hoffmann, 2009; Webster, 2014). Thus the species *L. nepalensis* is not included in the above key and the taxonomic status of the species needs to be clarified in further study, especially in molecular phylogenetic analysis.

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Figure 1

Maximum likelihood (ML) trees of *Leptopus* and its relatives inferred from the *matK* dataset (A) and nrITS dataset (B).

Fig. 1. Maximum likelihood (ML) trees of *Leptopus* and its relatives inferred from the *matK* dataset (A) and nrITS dataset (B). Bootstrap (BS) value ≥ 50% in ML analysis and posterior probability (PP) ≥ 0.50 in Bayesian inference (BI) is indicated on the left and right of slanting bar associated with phylogenetic node, respectively. Dashes denote that the phylogenetic node associated was not supported or the BS value is < 50% in ML analysis or PP > 0.50 in BI. The crown node of *Leptopus* is shown by the arrowhead.

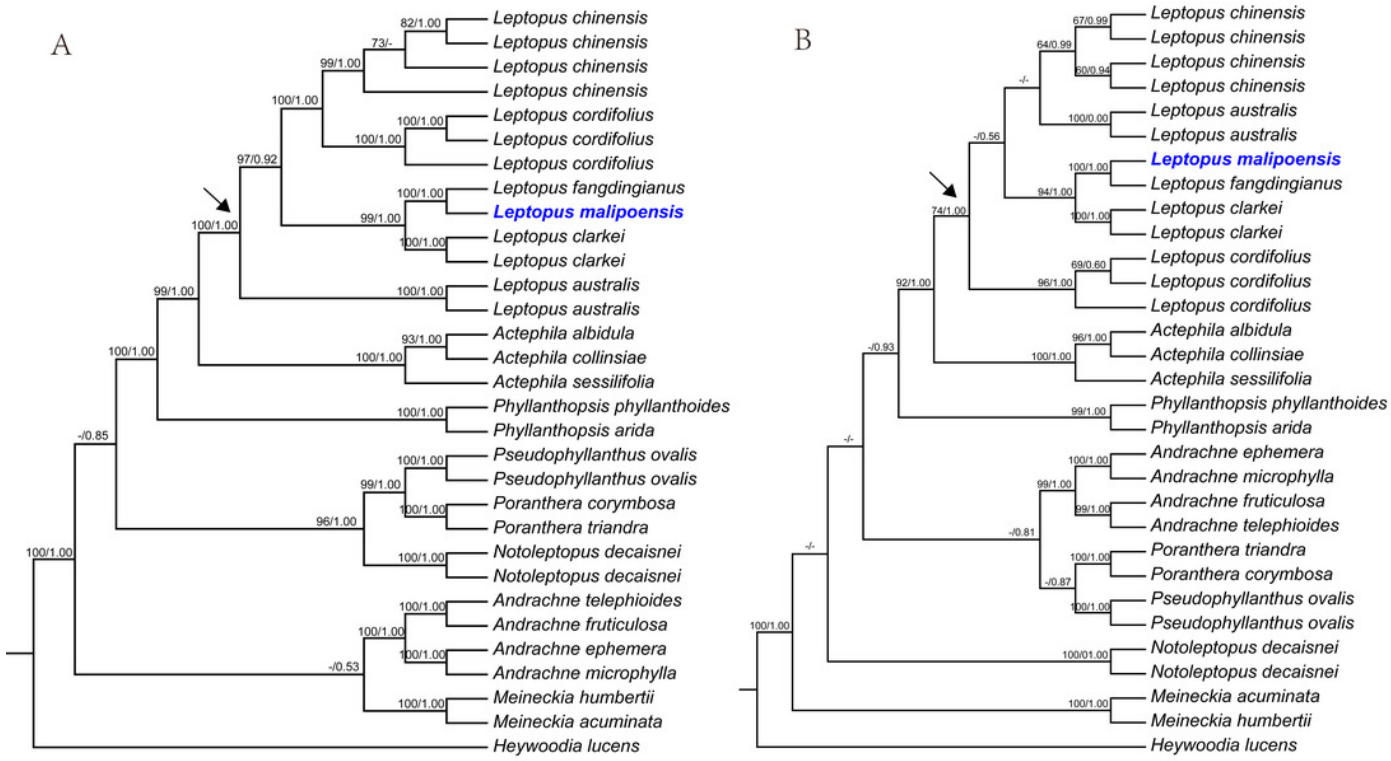

Figure 2

Maximum likelihood (ML) trees of *Leptopus* and its relatives inferred from the combined data set (including nrITS and *matK*).

Fig. 2. Maximum likelihood (ML) trees of *Leptopus* and its relatives inferred from the combined data set (including nrITS and *matK*). Bootstrap (BS) value in ML analysis and posterior probability (PP) in Bayesian inference (BI) is indicated on the left and right of slanting bar associated with phylogenetic node, respectively. The crown node of *Leptopus* is shown by the arrowhead.

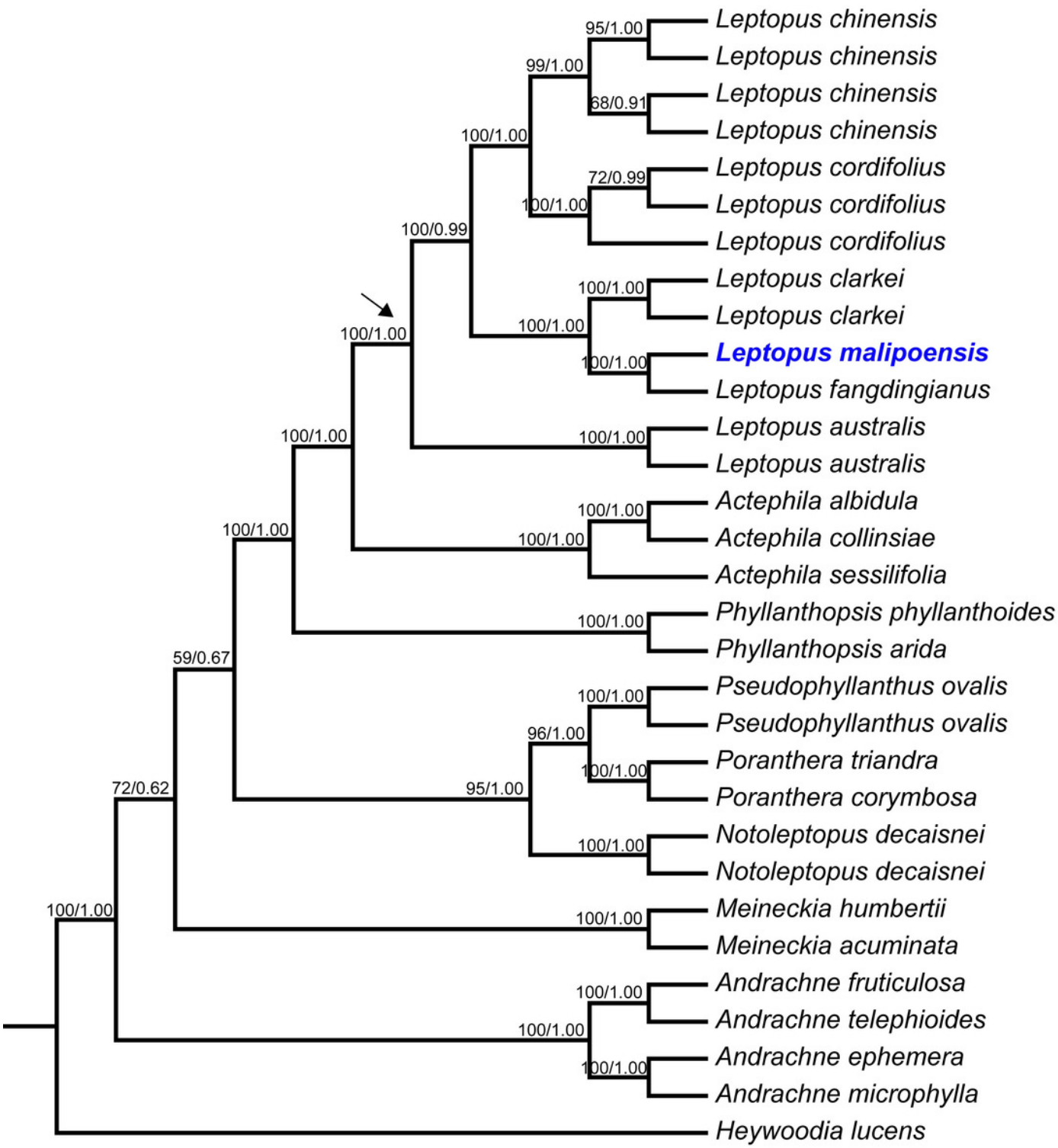
Leptopus chinensis
Leptopus chinensis
Leptopus chinensis
Leptopus chinensis
Leptopus cordifolius
Leptopus cordifolius
Leptopus cordifolius
Leptopus clarkei
Leptopus clarkei
Leptopus malipoensis
Leptopus fangdingianus
Leptopus australis
Leptopus australis
Actephila albidula
Actephila collinsiae
Actephila sessilifolia
Phyllanthopsis phyllanthoides
Phyllanthopsis arida
Pseudophyllanthus ovalis
Pseudophyllanthus ovalis
Poranthera triandra
Poranthera corymbosa
Notoleptopus decaisnei
Notoleptopus decaisnei
Meineckia humbertii
Meineckia acuminata
Andrachne fruticulosa
Andrachne telephioides
Andrachne ephemera
Andrachne microphylla
Heywoodia lucens
95/1.00
99/1.00
68/0.91
100/1.00
72/0.99
100/1.00
100/0.99
100/1.00
100/1.00
100/1.00
100/1.00
100/1.00
100/1.00
100/1.00
100/1.00
100/1.00
59/0.67
100/1.00
96/1.00
100/1.00
72/0.62
95/1.00
100/1.00
100/1.00
100/1.00
100/1.00
100/1.00
100/1.00

Figure 3

Leptopus malipoensis (from the type locality).

Fig. 3. *Leptopus malipoensis* (from the type locality). (A–B & E–F) habit; (C) adaxial side of leaves; (D) abaxial side of leaves. (Photo credit: Gang Yao).

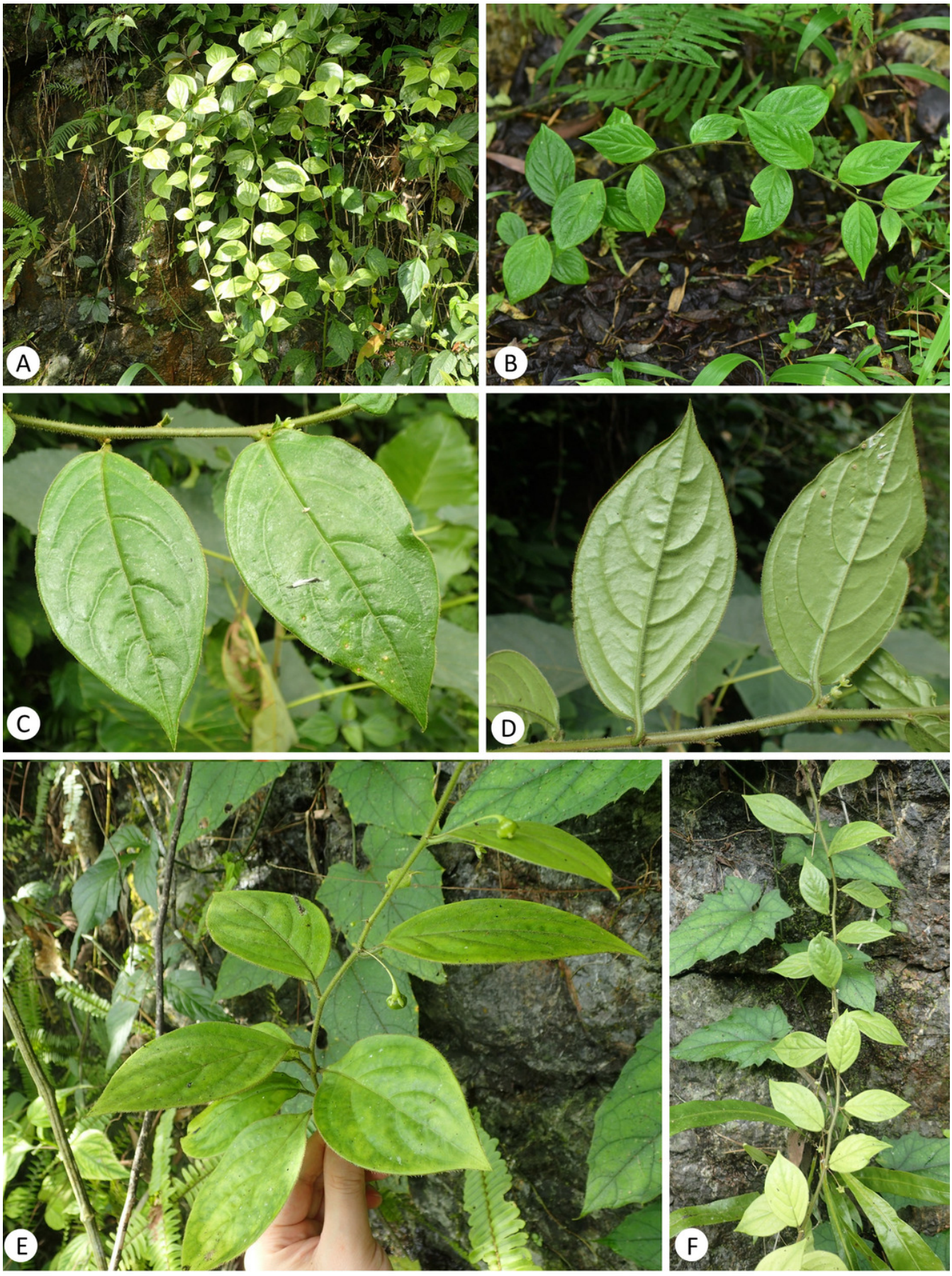
A
B
C
D
E
F

Figure 4

Leptopus malipoensis (from the type locality).

Fig. 4. *Leptopus malipoensis* (from the type locality). (A) female flower; (B) male flower; (C) young fruit; (D) young leaf, stem and female flower with pedicel; (E) stem and male flower with pedicel; (F) stem and young fruits with fruiting pedicels; (G) fruit and fruiting pedicel; (H) fruit; (I) fruit transection; (J) capsule with fungus on its surface; (K) seeds. (Photo credit: Gang Yao and Xin-Xin Zhu).

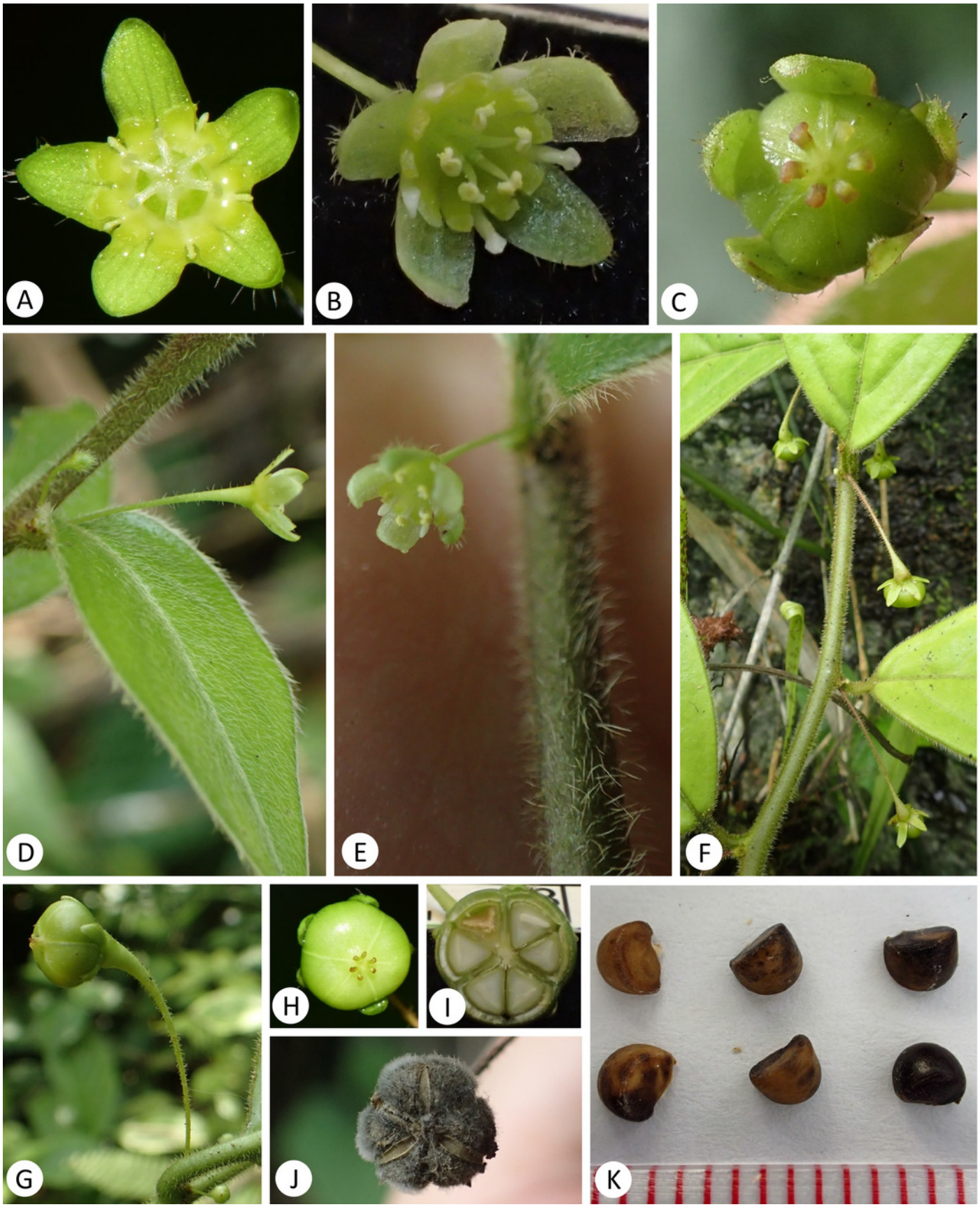
A
B
C
D
E
F
G
H
I
J
K

Figure 5

Distribution of *Leptopus malipoensis* (blue square) and *L. fangdingianus* (red circular).

Fig. 5. Distribution of *Leptopus malipoensis* (blue square) and *L. fangdingianus* (red circular).

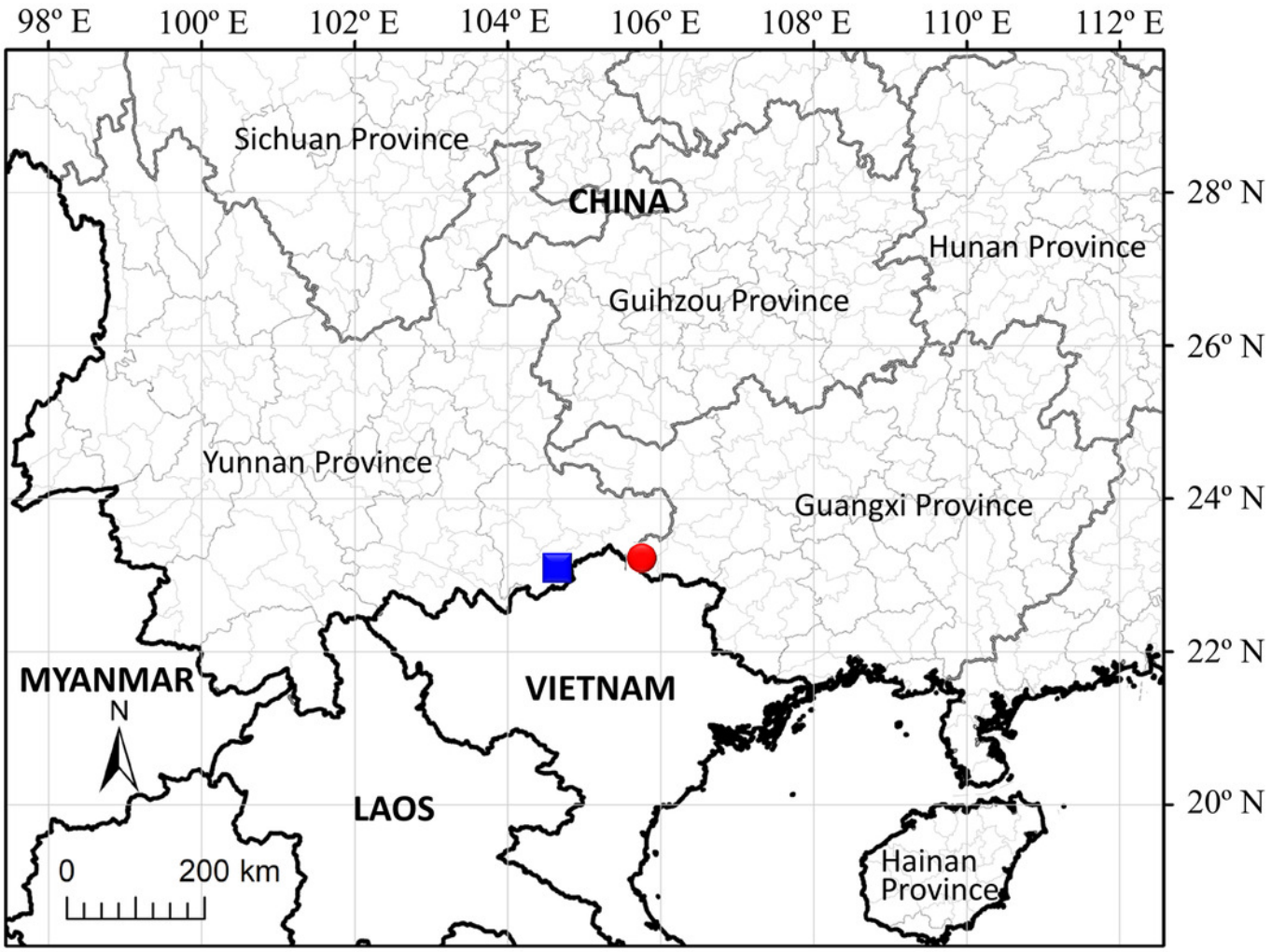

Table 1(on next page)

Sequences information for all samples used in the present study.

Table 1. Sequences information for all samples used in the present study. Sequences newly generated in this study are marked in bold.

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Taxon	nrITS	*matK*
Leptopus australis (Zoll. & Moritzi) Pojark.	AM745811	AM745812
Leptopus australis (Zoll. & Moritzi) Pojark.	AM745813	AM745814
Leptopus chinensis (Bunge) Pojark.	MN722097	MN722149
Leptopus chinensis (Bunge) Pojark.	MH710764	MH659095
Leptopus chinensis (Bunge) Pojark.	AM745819	AM745820
Leptopus chinensis (Bunge) Pojark.	AM745821	AM745822
Leptopus clarkei (Hook. f.) Pojark.	AM745938	AM745939
Leptopus clarkei (Hook. f.) Pojark.	AM745940	AM745941
Leptopus cordifolius Decne.	AM745826	AY552433
Leptopus cordifolius Decne.	AM745827	AM745828
Leptopus cordifolius Decne.	AM745829	AY552433
Leptopus fangdingianus (P.T. Li) Voronts. & Petra Hoffm.	AM745809	AM745810
Leptopus malipoensis W.H. Zhang & Gang Yao	**MW962203**	**MZ062211**
Actephila albidula Gagnep.	AM745910	AM745911
Actephila collinsiae W. Hunter ex Craib	AM745912	AM745913
Actephila sessilifolia Benth.	AM745931	AM745932
Andrachne ephemera M.G. Gilbert	AM745767	AM745768
Andrachne fruticulosa Boiss.	AM745773	AM745774
Andrachne microphylla (Lam.) Baill.	AM745787	AM745788
Andrachne telephioides L.	AM745802	AM745803
Heywoodia lucens Sim	AM745935	AM745937
Meineckia acuminate (Verdc.) J.F. Brunel	AM745894	AM745895
Meineckia humbertii G.L. Webster	AM745846	AM745847
Notoleptopus decaisnei (Benth.) Voronts. & Petra Hoffm.	AM745830	AM745831
Notoleptopus decaisnei (Benth.) Voronts. & Petra Hoffm.	AM745832	AM745833
Phyllanthopsis arida (Warnock & M.C. Johnst.) Voronts. & Petra Hoffm.	AM745762	AM745763
Phyllanthopsis phyllanthoides (Nutt.) Voronts. & Petra Hoffm.	AM745836	AM745837
Poranthera corymbosa Brongn.	AM745872	AM745873
Pseudophyllanthus ovalis (E. Mey. ex Sond.) Voronts. & Petra Hoffm.	AM745789	AY830260
Pseudophyllanthus ovalis (E. Mey. ex Sond.) Voronts. & Petra Hoffm.	AM745790	AM745791
Poranthera triandra J.M. Black	AM745892	AM745893

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