ISSN 1346-7565 Acta Phytotax. Geobot. 61 (2): 93–108 (2010)

Plant Diversity on Lombok Island, Indonesia: An Approach at Identification Using DNA Barcodes

HIROSHI TOBE[1,*], WATARU SHINOHARA[1], NANDA UTAMI[2], HARRY WIRIADINATA[2], DEDEN GIRMANSYAH[2], KAZUO OGINUMA[3], HIROSHI AZUMA[1], TORU TOKUOKA[4], ERI KAWAGUCHI[1], MASUMI KONO[5] AND MOTOMI ITO[6]

[1]*Department of Botany, Graduate School of Science, Kyoto University, Kyoto 606-8502, Japan.* **tobe@sys.bot.kyoto-u.ac.jp (author for correspondence);* [2]*Herbarium Bogoriense, Research Centre for Biology, LIPI, Chibinong 16911, Indonesia;* [3]*Department of Environmental Sciences, Faculty of Human Life and Environmental Science, Kochi Women's University, Kochi 780-8515, Japan;* [4]*Department of Biology, Faculty of Science, Shizuoka University, Shizuoka 422-8529, Japan;* [5]*Center for Ecological Research, Kyoto University, Otsu 520-2113, Japan;* [6]*Graduate School of Arts and Science, The University of Tokyo, Tokyo 153-8902, Japan*

Plant diversity is poorly known on most tropical Asian islands, where many native species are under threat due to the rapid increase in non-indigenous plants. We conducted fieldwork to survey plant diversity on Lombok Island, Indonesia, an island where floral diversity has been poorly documented. Among the more than 800 angiosperm collections, 492 leaf fragments preserved for molecular analyses were identified using *rbcL* sequences as barcodes. Using *Basic Local Alignment Search Tool* (BLAST) searches against the entire DNA Data Bank of Japan (DDBJ) data sets yielded 314 haplotypes and 289 species in 265 genera and 87 families, determined by 96–100% sequence identity. While only 27 (8.6%) of the collections showed 100% sequence identity, the remainder (91.4%) exhibited less than 99% sequence identity. Those collections likely represent described or undescribed species, whose *rbcL* sequences have not yet been investigated. Since at least one species in every collection had a high similarity in the *rbcL* sequence, this method of species identification is of great use as a fast approach for surveying and analyzing largely unexplored tropical island floras.

Key words: Lombok, *rbcL*, DNA barcode, plant diversity, tropical islands

As seen from Charles Darwin's experiences in the 18th century, islands are an important source of evidence for evolution due to their distinct faunas and floras (Losos & Ricklefs 2009). Currently, however, rapid loss of biodiversity is occurring on tropical islands worldwide. According to the International Union for the Conservation of Nature (IUCN) (http://www.iucn.org/about/work/programmes/), the updated assessment in 2009 indicates that 70% of the plants evaluated are now under threat. In particular, native island plants are declining rapidly due to invasive species introduced by human activities and deforestation. For example, in the Independent State of Samoa (Samoa), a country of small islands in the Pacific Ocean, half of the approximately 1,000 known plant species (angiosperms) are non-native species (Whistler, unpublished data). Even in the Mt. Vaea Nature Reserve on the main island of Opolu, naturalized species already comprise more than 60% of all plant species. This is likely the case on many other islands, including the Galápagos (van Leeuwen 2008) and the tropical islands of Asia, but no exact information ex-

ists for those islands. Thus, at the 2010 Convention on Biological Diversity (CBD) (COP 10) held in Nagoya, Japan, "invasive alien species" is one of the significant subjects related to "island biodiversity." We are now encouraged to explore the flora of individual islands to analyze how the native flora is being impacted by the introduction of alien plants.

Since 2003, we have undertaken an inventory of plants on Lombok Island, Indonesia, under the Global Taxonomy Initiatives (GTI) work program. From fieldwork conducted on three separate occasions, we made over 800 angiosperm collections, all of which include either flowers, fruits, or both. We also preserved leaf fragments of some 500 collections for molecular analysis. While trying to identify the specimens using morphological characters, we often encountered difficulties. Many collections thus remain unidentified. Subsequently, we analyzed cpDNA (*rbcL* region) sequences using the *Basic Local Alignment Search Tool* (BLAST) (Altschul *et al.* 1997) for molecular identification. According to Chase *et al.* (2005), *rbcL* sequences exhibit several autapomorphies that distinguish more than 99% of the 170 species of *Moraea* (Iridaceae), suggesting that BLAST may be useful for distinguishing plant species in regional floras, such as on Lombok Island. In November 2009, *rbcL* was adopted as one of the DNA barcodes for identifying species of plant (CBOL Plant Working Group 2009).

We here present results of the molecular identification of plant specimens collected on Lombok Island, Indonesia. We discuss how such analyses are likely to be of use in identifying the flora of tropical islands.

Geography and general information

Lombok Island lies at 8°S and 35 km east of Bali, Indonesia (Fig. 1), between Southeast Asia and Australia. The island is roughly circular, with a tail to the southwest. It is about 70 km across, and encompasses a total area of about 4,729 km^2 (Fig. 1). The whole island is tropical, with two dry and rainy seasons. The northern part of Lombok Island is mountainous and lush with tall trees and shrubs. The volcano, Mt. Rinjani, at 3,726 m and the third largest mountain in Indonesia, dominates the central part of the island (Fig. 2A). The southern part of the island, which is arid and covered by savanna, is a fertile plain on which corn, rice, coffee, tobacco, and cotton are cultivated. Large mammals have been replaced by large numbers of marsupials, lizards, cockatoos, and parrots.

Lombok Island is similar in many ways to Bali, but less well-known and less often visited, and is thus called an unspoiled Bali. Because of a rapid increase in population (2,403,025 in 1990), the entire island is being destroyed and losing its natural forests (Fig. 2B, C).

Previous accounts of the flora of Lombok Island

Between Lombok Island and Bali is the well-known Wallace's Line, named after 19th century naturalist Alfred Russell Wallace, separating the floras and faunas of Southeast Asia and Australasia. Compared with animals, the plants of Lombok Island are poorly known, and only a few publications have been published on them. Van Slooten (1936) published a list of temperate mountain plants of the Lesser Soenda Islands, including 50 species from Lombok Island. Kalkman (1955) also listed the plants collected in the Lesser Soenda Islands, including 123 species from Lombok Island. His analysis suggested that Lombok Island (and Timor) has a high percentage (10.4%) of endemic species. Soewanda Among Prawira and Tantra (1972) listed 189 species of trees from Lombok. Additionally, Mansur (1998) and Rahayu *et al.* (2002) reported on the plants of Mt. Rinjani as well as on the medicinal plants of Lombok Island. The number of species in those accounts is far from the number of species that might be expected on Lombok Island.

Materials and Methods

Specimens of flowering plants were collected during three field trips in 2003, 2004 and 2005. The 2003 trip was short, mostly to obtain general information about the island. The second trip of about three weeks, from July 14 to August 5,

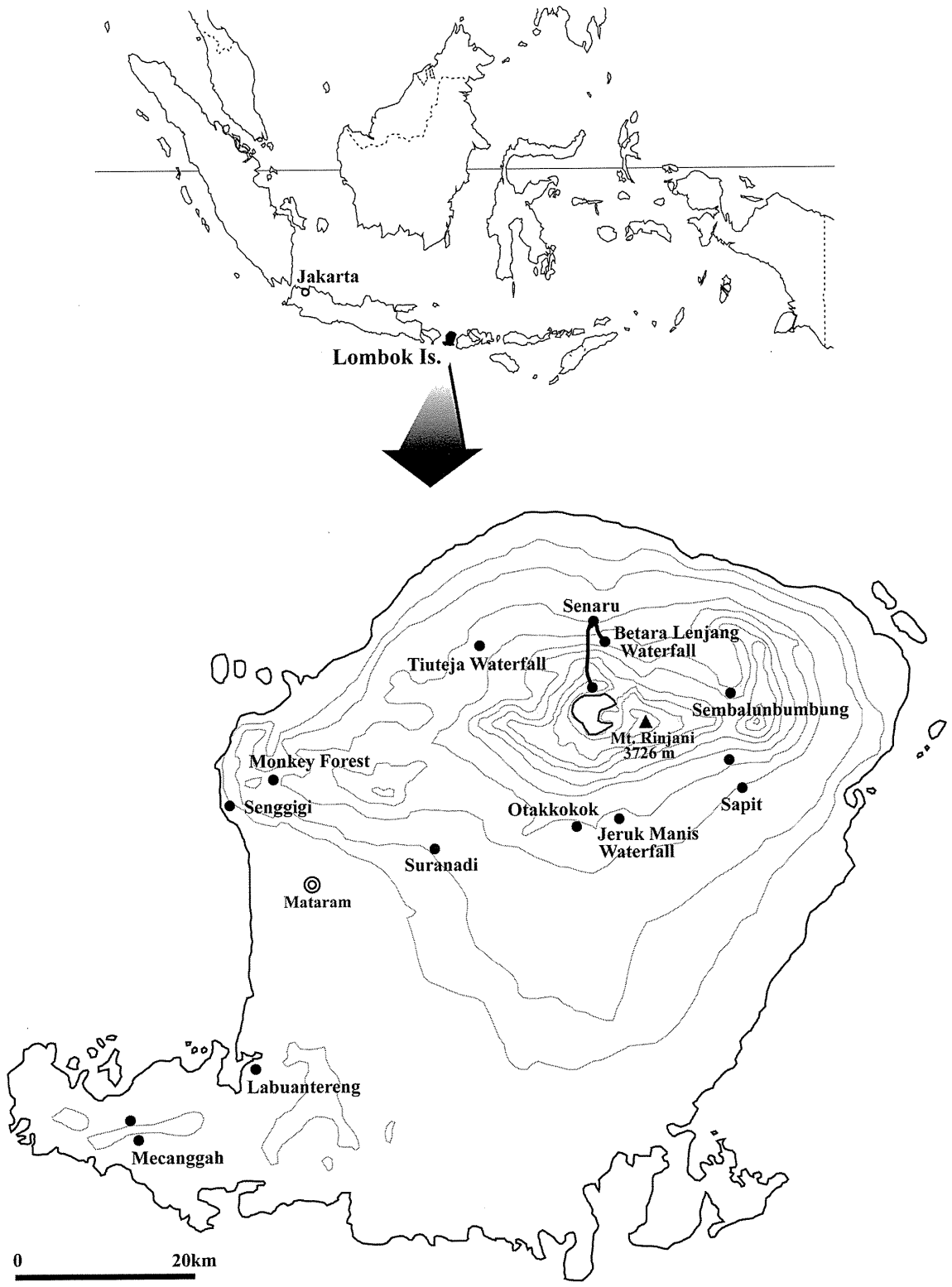

FIG. 1. Map showing location of Lombok Island (above) and 15 sites where specimens were collected (below).

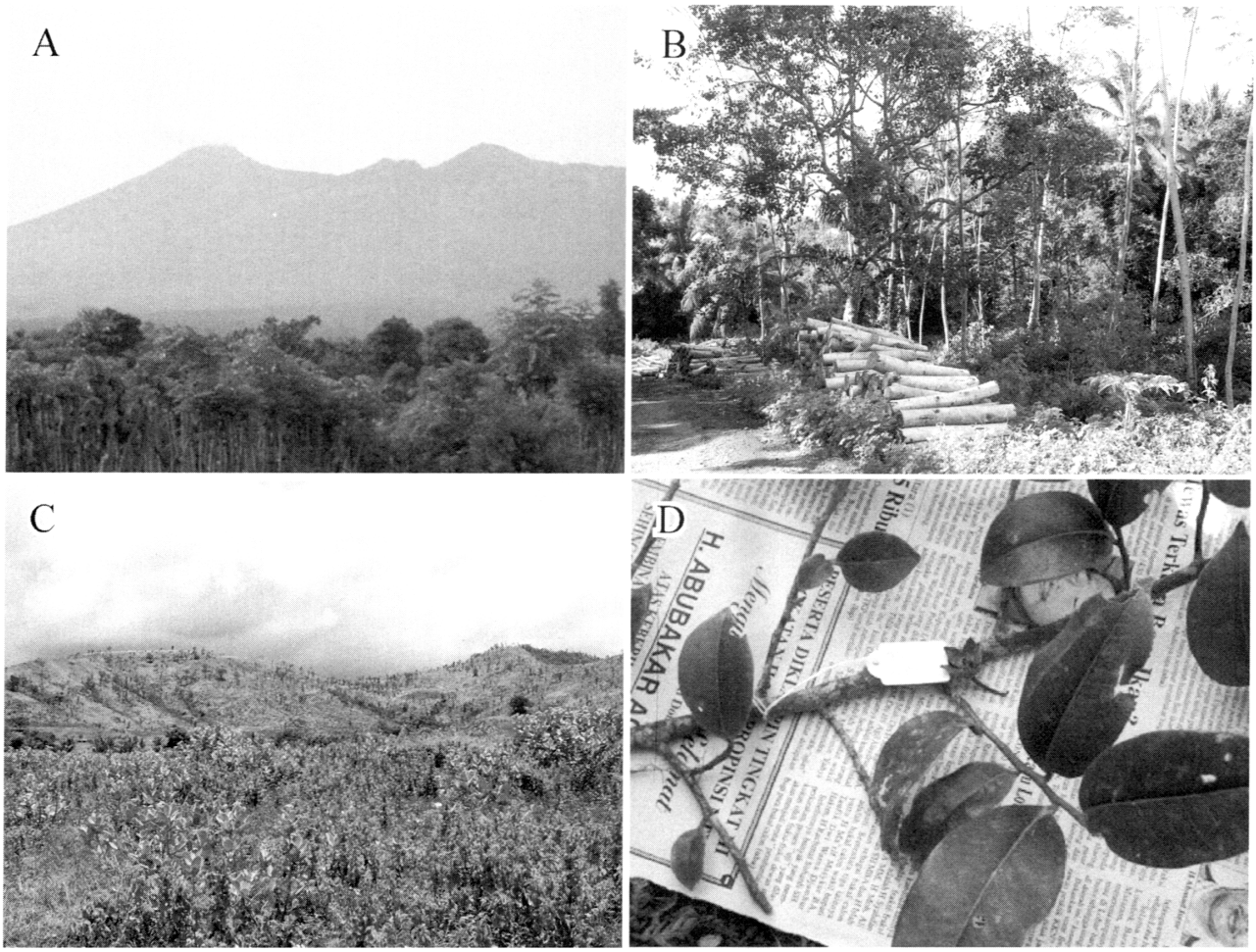

FIG. 2. Lombok Island. A: View from east side showing Mt. Rinjani. B: Timber trees piled up on wayside. C: Meadow after timber harvesting in southwestern Lombok. D: Herbarium specimen in preparation.

2004, included a few days for obtaining permission for fieldwork on visits to government offices in Jakarta and on Lombok Island. The third trip lasted for two weeks, from February 13 to February 21, 2005. We conducted fieldwork at more than 15 sites, including several sites in and around Mt. Rinjani, and from Senaru to a lake (with a depth of about 230 m) within the caldera (Fig. 1). Our fieldwork focused on the northern side of Rinjani Mountain National Park, because the conserved area supports a variety of vegetation types, such as tropical evergreen forests, semideciduous forests, and savannas.

While collecting dried herbarium specimens, we photographed as many plants as possible (Fig. 2D). In addition to flowering and/or fruiting specimens we also collected leaf fragments from as many specimens as possible. The herbarium specimens were preserved in FAA (five parts formalin, five parts acetic acid, and 90 parts 50% ethanol) for morphological and anatomical studies; the fragments were collected in plastic bags with silica gel for molecular analysis. Specimens have been deposited in both Herbarium Bogoriense, LIPI, Indonesia (BO), and Kyoto University (KYO).

DNA extraction, PCR amplification, and nucleotide sequencing

Total DNA was extracted from the leaf fragments of 492 specimens as follows. Leaf tissue (10×5 mm^2) was crushed in 2.0-mL microtubes using TissueLyser II (Qiagen KK, Tokyo, Japan). Five hundred microliters of CTAB buffer (100

mM Tris; 1.4 M NaCl; 20 mM EDTA; 2% cetyl trimethyl ammonium bromide) was added to the crushed tissue and the mixture was incubated for 30 min at 55°C. After incubation, the cloudy suspension was extracted using an equal volume of chloroform, then centrifuged for 5 min at 16,000 × *g*. The clear supernatant was then transferred to a new microtube. An equal volume of isopropanol was added to the supernatant and the mixture was centrifuged for 15 min at 16,000 × *g*. After washing with 70% ethanol, the precipitated DNA was dissolved in 200 μL of TE buffer (10 mM Tris; 1 mM EDTA, pH 8.0).

Rubisco large subunit (*rbcL*) regions were amplified from chloroplast DNA using the aF and cR primers as described by Hasebe *et al.* (1994). PCR amplification was carried out using up to 150 ng of total DNA in a 10-μL reaction mixture of 1× Ampdirect Plus buffer with dNTPs, 5 pmol of both forward and reverse primers, and 0.25 units Nova Taq polymerase (Shimadzu, Kyoto, Japan). Cycling parameters for PCR were as follows: heat shock at 95°C for 10 min, followed by 40 cycles at 94°C for 30 s, 50°C for 30, and 72°C for 30 s, followed by a final extension at 72°C for 7 min. We added 5 μL of 0.05× ExoSAP-IT (GE Healthcare, Ltd., Little Chalfont, Buckinghamshire, UK) to the PCR products to remove extra oligonucleotides and dNTPs. This was followed by incubation at 37°C for 30 min and finally, the enzymes were deactivated at 80°C for 20 min.

The purified PCR products were sequenced using the same primers used for amplification. Direct sequencing of nucleotides was performed using an ABI 3130 automated sequencer (Applied Biosystems, Foster City, CA, USA) with BigDye Terminator ver. 3.1 (Applied Biosystems) following the manufacturer's protocols.

The cost (of, e.g., chemicals) for this study totaled approximately 700 yen per specimen.

Molecular determination by comparing with nucleotide sequences in DDBJ

The obtained sequences, ranging from 1000 to 1300 bp, were used to query sequences in the database of the DNA Data Bank of Japan (DDBJ) using the blastn algorithm (Altschul *et al.* 1997). Collections were considered to be identified to the genus level when they shared >95% of the *rbcL* region with the reference sequence in the DDBJ or in public databases or unpublished sequences. All the sequence data are registered in DDBJ.

Results and Discussion

BLAST searches for the 492 collections yielded 314 haplotypes comprising 289 species (including undetermined species) of 265 genera in 87 families (Appendix). Some of the 289 species had two haplotypes. Compared to earlier records of plants from Lombok Island (van Slooten 1936, Kalkman 1955, Soewanda Among Prawira & Tantra 1972, Mansur 1998, Rahayu *et al.* 2002), the number of species, genera, and families we collected is higher. Only 27 (8.6%) of the 314 haplotypes, however, were determined at 100% sequence identity, Of the remainder, the figures were 170 at 99% sequence identity, 94 at 98% sequence identity, 20 at 97% sequence identity, and 3 at 96% sequence identity.

The 27 collections with 100% sequence identity were *Alstonia scholaris**, *Calotropis procera*, *Micholitzia obcordata*, *Thevetia peruviana* (Apocynaceae); *Youngia japonica* (Asteraceae); *Capsella bursa-pastoris* (Brassicaceae); *Porana volubilis*, *Merremia vitifolia** (Convolvulaceae); *Trichosanthes bracteata*, *Luffa aegyptiaca*, *Coccinia grandis* (Cucurbitaceae); *Pycreus nuerensis* (Cyperaceae); *Chamaesyce atoto* (Euphorbiaceae); *Cassia fistula**, *Centrosema virginianum*, *Cajanus cajan** (Fabaceae); *Torenia fournieri* (Linderniaceae); *Michelia champaca* (Magnoliaceae); *Dysoxylum gaudichaudianum* (Meliaceae); *Pericampylus glaucus** (Menispermaceae); *Knema latericia* (Myristicaceae); *Amaracarpus* sp., *Gardenia hansemannii*, *Ochreinauclea maingayi* (Rubiaceae); *Buddleja asiatica** (Scrophulariaceae); *Physalis peruviana* (Solanaceae); *Symplocos zizyphoides* (Symplocaceae). Six of the species (with asterisk) agreed in both morphological and DNA identification, but the 21 remaining collections (without asterisk) were identified solely based on morphology due to a lack of sequence

data in the DDBJ database.

With regard to the 287 remaining haplotypes (91.4%), no species showed 100% sequence identity. A few collections assignable to Gesneriaceae, Xanthorhoeaceae (Hemerocallidoideae), and Icacinaceae were identified with low sequence identity (97%). In addition, three species (*Bacopa repens* [Plantaginaceae], *Cecropia palmata* [Urticaceae], *Forestiera angustifolia* [Oleaceae]) were identified at 96% sequence identity, mainly because sequence data are not sufficient for these families and genera, thus requiring information on *rbcL* from more species.

We can, however, use these results as an initial step toward obtaining more exact identifications, since collections with such haplotypes may be related to the species or genera that were suggested at 96–99% sequence identity. In addition, some of the 23 haplotypes that were identified at lower (97% or 96%) sequence identity are likely to be more distantly related to the suspected species or genus. Because many specimens could not be identified from morphology, our findings represent a great advance in methods of identification. Once we are able to determine probable species identifications for individual collections, we can consult herbarium specimens and/or published descriptions for comparison and confirmation.

Perspectives

Throughout our short periods of fieldwork we collected representatives of more species than were previously recorded from Lombok Island. Many additional species can be added to the list of flowering plants through further fieldwork throughout the season and covering the whole island. The flowering season (April to June) begins at the end of the rainy season. Our collections were not made during the flowering seasons and were restricted to 15, mostly mountainous sites (Fig. 1). Furthermore, they represent mainly tree species. Herbaceous species are not adequately represented in our collections. The number of species of Cyperaceae (four) and Poaceae (four) that we have collected are obviously too few. Kalkman (1955) recorded 30 species of Poaceae and 9 species of Cyperaceae from Lombok. More species from these families, as well as from other monocot families, should be collected in the future.

This study showed that analysis of *rbcL* sequences coupled with fieldwork to collect specimens is useful for surveying the flora of tropical islands. Such studies would allow us to analyze native versus invasive plants on islands. The sequence data of plants, particularly tropical species, are currently insufficient. The DDBJ database (accessed on January 18, 2010), contains some 35,000 *rbcL* sequences (including 15,980 from Magnoliophyta) from far fewer species. The known sequences are obviously too few for comparing the estimated 300,000 plant species. For example, the *rbcL* sequence data composed of about 1,400 bp for *Ficus* (Moraceae) is restricted to five (seven accessions) of about 850 species in the DDBJ. Our analyses further showed that most (91.4%) of the 314 haplotypes were determined at less than 99% sequence identity and that some species had two haplotypes. Some of them may represent undescribed taxa. This will be clarified by ongoing herbarium work. Myers *et al.* (2000) estimated the frequency of endemic species in Wallacea (including Lombok) to be 0.5%. We are encouraged to investigate DNA (*rbcL*) sequences of more species in more genera in more families for GenBank and for the Barcode of Life Data Systems (BOLD). Identification using DNA barcoding can then be used as an effective, time-saving, and even economical approach to identifying tropical plants from islands whose flora is poorly known.

The study was supported by the Global Environment Research Fund (Junko Shimura, principal investigator) from the Ministry of the Environment of Japan; molecular analyses were funded by the Global Center for Excellence Program A06.

References

Altschul, S. F., T. L. Madden, A. A. Schaffer, J. Zhang, Z. Zhang, W. Miller & D. J. Lipman. 1997. Gapped BLAST and PSI-BLAST: A new generation of protein database search programs. Nucleic Acids Res. 25:

3389–3402.
CBOL Plant Working Group. 2009. A DNA barcode for land plants. Proc. Natl. Acad. Sci. U.S.A. 106: 12794–12797.
Chase, M. W., N. Salamin, M. Wilkinson, J. M. Dunwell, R. P. Kesanakurthi, N. Haidar & V. Savolainen. 2005. Land plants and DNA barcodes: Short-term and long-term goals. Philos. Trans. B 360: 1889–1895.
Hasebe, M., T. Omori, M. Nakazawa, T. Sano & M. Kato. 1994. *rbcL* gene sequences provide new evidence for the evolutionary lineages of leptosporangiate ferns. Proc. Natl. Acad. Sci. U.S.A. 91: 5730–5734.
Kalkman, C. 1955. A plant-geographical analysis of the Lesser Sunda Islands. Acta Bot. Neerl. 4: 200–225.
Losos, J. B. & R. E. Ricklefs. 2009. Adaptation and diversification on islands. Nature 457: 830–836.
Mansur, M. 1998. Kajian pemanfaatan tumbuhan oleh suku sasak disekitar kawasan taman Nasional Gunung Rinjani, Lombok. Prosiding Seminar Nasional Etnobotani III, 5–6 May 1998.
Myers, N., R. A. Mittermeier, C. G. Mittermeier, G. A. B. da Fonseca & J. Kent. 2000. Biodiversity hotspots for conservation priorities. Nature 403: 853–858.
Rahayu, M., Rugayah, Praptiwi & dan Hamzah. 2002. Keanekaragaman pemanfaatan tumbuhan obat oleh masyrakat suku Sasak di Taman Nasional Gunung Rinjani, Lombok-Nusa Tenggara Barat. Proceeding Simposium Nasional II Tumbuhan obat dan aromatik, 2002.
Soewanda Among Prawira, R. & I. G. M. Tantra. (comp.). 1972. List of tree species from Bali and Lombok. Bogor.
van Leeuwen, J. F. N. 2008. Fossil pollen as a guide to conservation in the Galápagos. Science 322: 1206.
van Slooten, D. F. 1936. List of temperate mountain plants known from the Lesser Soenda Islands. Bull. Jard. Bot. Buitenz. Ser. III. 14: 58–72.

Received September 29, 2010; accepted October 20, 2010

Appendix. Taxa suggested by *rbcL* sequences at 96–100% identities, collections, and accession numbers in DDBJ.

Family	Genus/species	Identities	Collections	Accession No.
Acanthaceae	*Barleria prionitis* L.	99%	T058	AB586149
Acanthaceae	*Barleria prionitis* L.	97%	T111	AB586150
Acanthaceae	*Barleria prionitis* L.	97%	T951	AB586151
Acanthaceae	*Hypoestes forsskaolii* R. Br.	99%	T056	AB586152
Acanthaceae	*Hypoestes forsskaolii* R. Br.	99%	T262	AB586153
Acanthaceae	*Monechma spartioides* C.B.Clarke	99%	T266	AB586154
Acanthaceae	*Ruellia graezicans* Backer	99%	T046	AB586155
Acanthaceae	*Ruellia graezicans* Backer	99%	T069	AB586156
Acanthaceae	*Ruttya fruticosa* Lindau	98%	T001	AB586157
Acanthaceae	*Ruttya fruticosa* Lindau	98%	T055	AB586158
Acanthaceae	*Ruttya fruticosa* Lindau	99%	T062	AB586159
Acanthaceae	*Ruttya fruticosa* Lindau	99%	T287	AB586160
Acanthaceae	*Ruttya fruticosa* Lindau	98%	T295	AB586161
Acanthaceae	*Sanchezia nobilis* Hook.f.	97%	T243	AB586162
Actinidiaceae	*Saurauia napaulensis* DC.	99%	A115	AB586163
Actinidiaceae	*Saurauia oldhamii* Hemsl.	99%	A220	AB586164
Actinidiaceae	*Saurauia tristyla* DC. var. *oldhamii* (Hemsl.) Finet & Gagnep.	99%	A259	AB586165
Actinidiaceae	*Saurauia oldhamii* Hemsl.	98%	T102	AB586166
Actinidiaceae	*Saurauia oldhamii* Hemsl.	99%	T205	AB586167
Actinidiaceae	*Saurauia oldhamii* Hemsl.	99%	T804	AB586168
Adoxaceae	*Sambucus caerulea* Raf.	99%	T284	AB586169
Adoxaceae	*Viburnum rhytidophyllum* Hemsl.	99%	A094	AB586170
Adoxaceae	*Viburnum rhytidophyllum* Hemsl.	99%	A257	AB586171

Family	Genus/species	Identities	Collections	Accession No.
Adoxaceae	*Viburnum acerifolium* L.	98%	T873	AB586172
Amaranthaceae	*Nototrichium humile* Hillebr.	99%	T121	AB586173
Amaranthaceae	*Nototrichium humile* Hillebr.	99%	T905	AB586174
Amaranthaceae	*Pandiaka angustifolia* (Vahl) Hepper	99%	T017	AB586175
Annonaceae	*Cyathostemma hookeri* King	99%	A313	AB586176
Annonaceae	*Dasymaschalon sootepense* Craib	99%	A315	AB586177
Annonaceae	*Sphaerocoryne gracilis* (Engl. & Diels) Verdc.	99%	T355	AB586178
Apiaceae	*Eryngium giganteum* M.Bieb.	98%	T318	AB586179
Apiaceae	*Eryngium giganteum* M.Bieb.	98%	T851	AB586180
Apiaceae	*Pimpinella saxifraga* L.	99%	T137	AB586181
Apocynaceae	*Alstonia scholaris* (L.) R.Br.	100%	T247	AB586182
Apocynaceae	*Calotropis procera* (Aiton) W.T.Aiton	100%	T044	AB586183
Apocynaceae	*Kopsia fruticosa* (Roxb.) A.DC.	99%	A127	AB586184
Apocynaceae	*Kopsia fruticosa* (Roxb.) A.DC.	99%	T354	AB586185
Apocynaceae	*Melodinus monogynus* Roxb.	99%	A207	AB586186
Apocynaceae	*Micholitzia obcordata* N.E.Br.	100%	A116	AB586187
Apocynaceae	*Micholitzia obcordata* N.E.Br.	99%	T312	AB586188
Apocynaceae	*Ochrosia coccinea* Miq.	98%	A248	AB586189
Apocynaceae	*Rauvolfia mannii* Stapf	98%	A087	AB586190
Apocynaceae	*Rauvolfia mannii* Stapf	98%	A122	AB586191
Apocynaceae	*Rauvolfia mannii* Stapf	98%	T101	AB586192
Apocynaceae	*Rauvolfia mannii* Stapf	99%	T179	AB586193
Apocynaceae	*Rauvolfia mannii* Stapf	98%	T329	AB586194
Apocynaceae	*Rauvolfia mannii* Stapf	99%	T856	AB586195
Apocynaceae	*Rauvolfia mannii* Stapf	99%	T929	AB586196
Apocynaceae	*Strophanthus eminii* Asch. & Pax	98%	A226	AB586197
Apocynaceae	*Tabernaemontana divaricata* R.Br.	99%	A125	AB586198
Apocynaceae	*Tabernaemontana divaricata* R.Br.	99%	T002	AB586199
Apocynaceae	*Thevetia peruviana* K.Schum.	100%	T043	AB586200
Apocynaceae	*Trachelospermum jasminoides* Lem.	98%	T971	AB586201
Apocynaceae	*Tylophora sylvatica* Decne.	99%	A240	AB586202
Aquifoliaceae	*Ilex brasiliensis* Loes.	99%	A096	AB586203
Aquifoliaceae	*Ilex brasiliensis* Loes.	99%	T891	AB586204
Araceae	*Alocasia odora* K.Koch	99%	T958	AB586205
Araceae	*Remusatia vivipara* (Roxb.) Schott	99%	T967	AB586206
Araceae	*Steudnera colocasiifolia* K.Koch	99%	T975	AB586207
Aristolochiaceae	*Aristolochia zollingeriana* Miq.	99%	T948	AB586208
Asteraceae	*Aster bakeranus* Burtt Davy	99%	T906	AB586209
Asteraceae	*Aster bakeranus* Burtt Davy	99%	T908	AB586210
Asteraceae	*Chromolaena* sp. (*Dillon 4105*)	99%	T024	AB586211
Asteraceae	*Conyza scabrida* DC.	99%	A098	AB586212
Asteraceae	*Conyza scabrida* DC.	99%	T916	AB586213
Asteraceae	*Conyza scabrida* DC.	99%	T918	AB586214
Asteraceae	*Coreopsis grandiflora* Hogg	98%	T122	AB586215
Asteraceae	*Coreopsis grandiflora* Hogg	98%	T857	AB586216
Asteraceae	*Coreopsis grandiflora* Hogg	98%	T921	AB586217
Asteraceae	*Erigeron tenuis* Torr. & A.Gray	99%	T145	AB586218
Asteraceae	*Erigeron tenuis* Torr. & A.Gray	99%	T888	AB586219
Asteraceae	*Eupatorium atrorubens* Nicholson	98%	T310	AB586220
Asteraceae	*Eupatorium atrorubens* Nicholson	98%	T949	AB586221
Asteraceae	*Gamochaeta pensylvanica* (Willd.) Cabrera	99%	T889	AB586222
Asteraceae	*Gnaphalium* sp. *Goldblatt 12556*	99%	T884	AB586223
Asteraceae	*Guizotia abyssinica* Cass.	98%	T898	AB586224
Asteraceae	*Iva frutescens* L.	98%	T084	AB586225
Asteraceae	*Liatris cylindracea* Michx.	98%	T014	AB586226

Family	Genus/species	Identities	Collections	Accession No.
Asteraceae	*Piptocarpha axillaris* (Less.) Baker	98%	T006	AB586227
Asteraceae	*Piptocarpha axillaris* (Less.) Baker	98%	T194	AB586228
Asteraceae	*Piptocarpha axillaris* (Less.) Baker	98%	T895	AB586229
Asteraceae	*Senecio mikanioides* Otto	99%	T280	AB586230
Asteraceae	*Senecio mikanioides* Otto	99%	T877	AB586231
Asteraceae	*Senecio burchellii* DC.	99%	T910	AB586232
Asteraceae	*Sonchus oleraceus* L.	99%	T909	AB586233
Asteraceae	*Stilpnogyne* sp. *Manning 2982*	98%	T915	AB586234
Asteraceae	*Youngia japonica* (L.) DC.	100%	T881	AB586235
Balsaminaceae	*Impatiens hawkeri* W.Bull	99%	A201	AB586236
Begoniaceae	*Begonia grandis* Otto subsp. *grandis*	99%	A276	AB586237
Begoniaceae	*Begonia isoptera* Dryand.	99%	T335b	AB586238
Brassicaceae	*Capsella bursa-pastoris* (L.) Medik.	100%	T912	AB586239
Brassicaceae	*Cardamine pensylvanica* Muhl.	99%	T162	AB586240
Brassicaceae	*Cardamine pensylvanica* Muhl.	99%	T858	AB586241
Brassicaceae	*Rorippa sylvestris* (L.) Besser	99%	T892	AB586243
Boraginaceae	*Cordia myxa* L.	99%	A306	AB586242
Cannabaceae	*Trema orientalis* Blume	98%	A212	AB586610
Capparidaceae	*Capparis spinosa* L.	98%	T054	AB586244
Celastraceae	*Euonymus americanus* L.	98%	A249	AB586245
Celastraceae	*Euonymus americanus* L.	98%	T103	AB586246
Celastraceae	*Euonymus americanus* L.	98%	T938	AB586247
Celastraceae	*Maurocenia frangula* Mill.	99%	A237b	AB586248
Celastraceae	*Maurocenia frangula* Mill.	99%	A242	AB586249
Celastraceae	*Salacia undulata* Cambess.	99%	T819	AB586250
Chloranthaceae	*Chloranthus spicatus* Makino	99%	T007	AB586251
Chloranthaceae	*Chloranthus spicatus* Makino	98%	T112	AB586252
Chloranthaceae	*Chloranthus spicatus* Makino	99%	T803	AB586253
Chloranthaceae	*Chloranthus spicatus* Makino	99%	T817	AB586254
Chloranthaceae	*Chloranthus spicatus* Makino	99%	T848	AB586255
Clethraceae	*Clethra barbinervis* Siebold & Zucc.	99%	A084	AB586256
Clethraceae	*Clethra barbinervis* Siebold & Zucc.	99%	T119	AB586257
Clethraceae	*Clethra barbinervis* Siebold & Zucc.	99%	T865	AB586258
Commelinaceae	*Amischotolype monosperma* (C.B.Clarke) I.M.Turner	98%	T947	AB586259
Commelinaceae	*Cyanotis* sp. (*Goldblatt 12489*)	98%	T962	AB586260
Commelinaceae	*Pollia hasskarlii* R.S.Rao	98%	T979	AB586261
Convolvulaceae	*Ipomoea obscura* (L.) Ker Gawl.	99%	T064	AB586262
Convolvulaceae	*Ipomoea obscura* (L.) Ker Gawl.	99%	T072	AB586263
Convolvulaceae	*Ipomoea batatas* (L.) Lam.	99%	T245	AB586264
Convolvulaceae	*Merremia vitifolia* Hallier f.	100%	T090	AB586265
Convolvulaceae	*Porana volubilis* Burm.f.	100%	T041	AB586266
Cornaceae	*Alangium kurzii* Craib	98%	A126	AB586267
Cornaceae	*Alangium kurzii* Craib	98%	A227a	AB586268
Cornaceae	*Alangium kurzii* Craib	99%	A256	AB586269
Cornaceae	*Alangium kurzii* Craib	98%	T861	AB586270
Cornaceae	*Mastixia pentandra* Blume subsp. *chinensis* (Merrill) K. M. Matthew	99%	A076	AB586271
Cornaceae	*Mastixia pentandra* Blume subsp. *chinensis* (Merrill) K. M. Matthew	99%	A297	AB586272
Cucurbitaceae	*Coccinia grandis* (L.) Voigt	100%	T059	AB586273
Cucurbitaceae	*Luffa aegyptiaca* Mill.	100%	T045	AB586274
Cucurbitaceae	*Trichosanthes bracteata* Voigt	100%	A332	AB586275
Cunoniaceae	*Weinmannia madagascariensis* DC.	99%	A311	AB586276
Cyperaceae	*Bulbostylis atrosanguinea* C.B.Clarke	99%	T899	AB586277
Cyperaceae	*Carex echinochloe* Kunze	99%	T852	AB586278

Family	Genus/species	Identities	Collections	Accession No.
Cyperaceae	*Carex nigra* (L.) Reichard	98%	T874	AB586279
Cyperaceae	*Cyperus cyperoides* (L.) Kuntze	99%	T239	AB586280
Cyperaceae	*Cyperus cyperoides* (L.) Kuntze	99%	T808	AB586281
Cyperaceae	*Cyperus cyperoides* (L.) Kuntze	99%	T897	AB586282
Cyperaceae	*Pycreus nuerensis* (Boeckeler) S.S.Hooper	99%	T880	AB586283
Cyperaceae	*Pycreus nuerensis* (Boeckeler) S.S.Hooper	100%	T972	AB586284
Daphniphyllaceae	*Daphniphyllum macropodum* Miq.	99%	T876	AB586285
Dilleniaceae	*Curatella americana* L.	98%	A308	AB586286
Dioscoreaceae	*Dioscorea bulbifera* L.	98%	A334	AB586287
Droseraceae	*Drosera gigantea* Lindl.	98%	T917	AB586288
Ebenaceae	*Diospyros kaki* L.	99%	A309	AB586289
Elaeagnaceae	*Elaeagnus angustifolia* L.	99%	A231	AB586290
Elaeocarpaceae	*Elaeocarpus reticulatus* Sm.	99%	A293	AB586291
Euphorbiaceae	*Aleurites moluccana* (L.) Willd.	99%	T020	AB586292
Euphorbiaceae	*Chamaesyce atoto* (G.Forst.) Croizat	100%	T981	AB586293
Euphorbiaceae	*Claoxylon australe* Baill.	98%	A213	AB586294
Euphorbiaceae	*Cleidion castaneifolium* Müll.Arg.	98%	T260	AB586295
Euphorbiaceae	*Cleidion castaneifolium* Müll.Arg.	98%	T261	AB586296
Euphorbiaceae	*Euphorbia pulcherrima* Willd.	98%	T304	AB586297
Euphorbiaceae	*Macaranga grandifolia* Merr.	99%	T202	AB586298
Euphorbiaceae	*Mallotus japonicus* Müll.Arg.	98%	A252	AB586299
Euphorbiaceae	*Mallotus japonicus* Müll.Arg.	99%	T208	AB586300
Euphorbiaceae	*Mallotus japonicus* Müll.Arg.	99%	T209	AB586301
Euphorbiaceae	*Mallotus japonicus* Müll.Arg.	99%	T351	AB586302
Euphorbiaceae	*Mallotus japonicus* Müll.Arg.	99%	T364	AB586303
Euphorbiaceae	*Mallotus japonicus* Müll.Arg.	98%	T825	AB586304
Euphorbiaceae	*Pedilanthus tithymaloides* (L.) Poit.	99%	T301	AB586305
Fabaceae	*Caesalpinia pulcherrima* (L.) Sw.	99%	T323	AB586306
Fabaceae	*Cajanus cajan* (L.) Huth	100%	T051	AB586307
Fabaceae	*Cajanus cajan* (L.) Huth	99%	T096	AB586308
Fabaceae	*Calliandra pittieri* Standl.	98%	T099	AB586309
Fabaceae	*Cassia fistula* L.	100%	A123	AB586310
Fabaceae	*Centrosema virginianum* (L.) Benth.	100%	T042	AB586311
Fabaceae	*Crotalaria pallida* Klotzsch	99%	A216	AB586312
Fabaceae	*Crotalaria* sp. (*Van Wyk 3367*)	99%	T902	AB586313
Fabaceae	*Dalbergia hupeana* Hance	99%	T327	AB586314
Fabaceae	*Derris laxiflora* Benth.	99%	A217	AB586315
Fabaceae	*Derris laxiflora* Benth.	99%	A305	AB586316
Fabaceae	*Desmodium barbatum* Benth. & Oerst.	98%	A283	AB586317
Fabaceae	*Desmodium barbatum* Benth. & Oerst.	98%	T066	AB586318
Fabaceae	*Desmodium barbatum* Benth. & Oerst.	98%	T074	AB586319
Fabaceae	*Desmodium podocarpum* DC. subsp. *oxyphyllum* (DC.) H.Ohashi	99%	T934	AB586320
Fabaceae	*Dumasia villosa* DC.	99%	T213	AB586321
Fabaceae	*Dumasia villosa* DC.	99%	T890	AB586322
Fabaceae	*Erythrina sousae* Krukoff & Barneby	99%	T022	AB586323
Fabaceae	*Mucuna* sp. (*Doyle & al. s.n.*)	99%	T957	AB586324
Fabaceae	*Parkia multijuga* Benth.	98%	T098	AB586325
Fabaceae	*Phaseolus vulgaris* L.	99%	T095	AB586326
Fabaceae	*Rhynchosia capensis* Schinz	98%	T004	AB586327
Fabaceae	*Robinia pseudoacacia* L.	97%	T050	AB586328
Flagellariaceae	*Flagellaria indica* L.	99%	A254	AB586329
Gesneriaceae	*Agalmyla parasitica* Kuntze	97%	A224	AB586330
Gesneriaceae	*Agalmyla parasitica* Kuntze	97%	A271	AB586331
Gesneriaceae	*Agalmyla parasitica* Kuntze	97%	T340	AB586332

Family	Genus/species	Identities	Collections	Accession No.
Gesneriaceae	*Agalmyla parasitica* Kuntze	97%	T976	AB586333
Gesneriaceae	*Streptocarpus rexii* Lindl.	97%	A270	AB586334
Gesneriaceae	*Streptocarpus rexii* Lindl.	97%	T019	AB586335
Gesneriaceae	*Streptocarpus rexii* Lindl.	97%	T335a	AB586336
Gesneriaceae	*Streptocarpus rexii* Lindl.	97%	T339	AB586337
Hemerocallidaceae	*Dianella ensifolia* (L.) DC.	97%	A236	AB586338
Hemerocallidaceae	*Phormium tenax* J.R.Forst. & G.Forst.	97%	T935	AB586339
Icacinaceae	*Icacina senegalensis* Juss.	98%	A113	AB586340
Icacinaceae	*Icacina senegalensis* Juss.	97%	A251	AB586345
Icacinaceae	*Cassinopsis ilicifolia* (Hochst.) Sleumer	97%	A299	AB586341
Icacinaceae	*Cassinopsis ilicifolia* (Hochst.) Sleumer	97%	T931	AB586342
Icacinaceae	*Gomphandra javanica* Valeton	97%	A230	AB586343
Icacinaceae	*Gomphandra javanica* Valeton	97%	A247	AB586344
Icacinaceae	*Irvingbaileya* sp. (*Plunkett 1510*)	99%	T166	AB586346
Icacinaceae	*Irvingbaileya* sp. (*Plunkett 1510*)	99%	T823	AB586347
Icacinaceae	*Irvingbaileya* sp. (*Plunkett 1510*)	99%	T828	AB586348
Icacinaceae	*Irvingbaileya* sp. (*Plunkett 1510*)	99%	T829	AB586349
Iteaceae	*Itea japonica* Oliv.	99%	T830	AB586350
Juglandaceae	*Carya illinoinensis* (Wangenh.) K.Koch	99%	T801	AB586351
Lamiaceae	*Clerodendrum fragrans* Willd.	98%	T954	AB586352
Lamiaceae	*Collinsonia canadensis* L.	98%	T140	AB586353
Lamiaceae	*Cyclonema myricoides* Hochst.	99%	A317	AB586354
Lamiaceae	*Leucas capensis* Engl.	98%	T154	AB586359
Lamiaceae	*Otostegia tomentosa* A.Rich.	99%	T222	AB586362
Lamiaceae	*Otostegia tomentosa* A.Rich.	99%	T896	AB586363
Lamiaceae	*Plectranthus barbatus* Andrews	98%	T016	AB586364
Lamiaceae	*Plectranthus barbatus* Andrews	98%	T285	AB586365
Lamiaceae	*Salvia subincisa* Benth.	98%	T013	AB586366
Lamiaceae	*Scutellaria galericulata* L.	99%	T159	AB586367
Lamiaceae	*Scutellaria galericulata* L.	99%	T841	AB586368
Lamiaceae	*Sideritis hyssopifolia* L.	98%	T311	AB586369
Lamiaceae	*Tetraclea coulteri* A.Gray	98%	A301	AB586370
Lamiaceae	*Tetraclea coulteri* A.Gray	98%	T104	AB586371
Lamiaceae	*Tetraclea coulteri* A.Gray	98%	T244	AB586372
Lamiaceae	*Tetraclea coulteri* A.Gray	98%	T855	AB586373
Lamiaceae	*Thymus vulgaris* L.	99%	T885	AB586374
Lauraceae	*Laurus nobilis* L.	99%	A121	AB586355
Lauraceae	*Laurus nobilis* L.	99%	A229	AB586356
Lauraceae	*Laurus nobilis* L.	99%	A264	AB586357
Lauraceae	*Laurus nobilis* L.	99%	A328	AB586358
Lauraceae	*Lindera benzoin* Meisn.	98%	A278	AB586360
Lauraceae	*Lindera benzoin* Meisn.	99%	A292	AB586361
Linderniaceae	*Torenia fournieri* Linden	100%	T963	AB586375
Loganiaceae	*Logania vaginalis* (Labill.) F.Muell.	99%	T862	AB586376
Loranthaceae	*Benthamina alyxifolia* (Benth.) Tiegh.	98%	A250	AB586377
Loranthaceae	*Benthamina alyxifolia* (Benth.) Tiegh.	97%	A269	AB586378
Loranthaceae	*Benthamina alyxifolia* (Benth.) Tiegh.	97%	A286	AB586379
Loranthaceae	*Benthamina alyxifolia* (Benth.) Tiegh.	98%	T281	AB586380
Maesaceae	*Maesa ternata* Nakai	99%	A244	AB586381
Maesaceae	*Maesa ternata* Nakai	99%	T088	AB586382
Maesaceae	*Maesa ternata* Nakai	99%	T241	AB586383
Magnoliaceae	*Michelia champaca* L.	100%	A261	AB586384
Malvaceae	*Anisodontea triloba* (Thunb.) D.M.Bates	98%	T076	AB586385
Malvaceae	*Byttneria pilosa* Roxb.	99%	T357	AB586386
Malvaceae	*Heliocarpus americanus* L.	97%	T097	AB586387

Family	Genus/species	Identities	Collections	Accession No.
Malvaceae	*Heliocarpus americanus* L.	97%	T251	AB586388
Malvaceae	*Heliocarpus americanus* L.	97%	T290	AB586389
Malvaceae	*Microcos latistipulata* Burret	99%	A318a	AB586390
Malvaceae	*Pachira aquatica* Aubl.	99%	T248	AB586391
Malvaceae	*Pavonia multiflora* A.St.-Hil.	98%	T010	AB586392
Malvaceae	*Pavonia multiflora* A.St.-Hil.	98%	T063	AB586393
Malvaceae	*Pavonia multiflora* A.St.-Hil.	98%	T071	AB586394
Malvaceae	*Pterospermum menglunense* H.H.Hsue	99%	T330	AB586395
Malvaceae	*Sida* sp. (*Balele 43*)	98%	T047	AB586396
Malvaceae	*Sida* sp. (*Balele 43*)	99%	T080	AB586397
Malvaceae	*Sida* sp. (*Balele 43*)	99%	T082	AB586398
Malvaceae	*Sida* sp. (*Balele 43*)	99%	T083	AB586399
Malvaceae	*Theobroma cacao* L.	98%	A211	AB586400
Melastomataceae	*Diplectria divaricata* Kuntze	99%	A258	AB586401
Melastomataceae	*Medinilla humbertiana* H.Perrier	98%	A263	AB586402
Meliaceae	*Aglaia elliptica* Blume	99%	A273	AB586403
Meliaceae	*Aglaia elliptica* Blume	99%	T338	AB586406
Meliaceae	*Aglaia* sp. (*Samuel 2*)	99%	A302	AB586404
Meliaceae	*Aglaia* sp. (*Samuel 2*)	99%	T242	AB586405
Meliaceae	*Aphanamixis polystachya* (Wall.) R.Parker	99%	A323	AB586407
Meliaceae	*Dysoxylum gaudichaudianum* Miq.	100%	T265	AB586408
Meliaceae	*Melia azedarach* L.	99%	A333	AB586409
Menispermaceae	*Anamirta cocculus* Wight & Arn.	98%	A331	AB586410
Menispermaceae	*Pericampylus glaucus* Merr.	100%	T091	AB586411
Menispermaceae	*Pericampylus glaucus* Merr.	100%	T969	AB586412
Menispermaceae	*Stephania longa* Lour.	99%	T177	AB586413
Moraceae	*Broussonetia papyrifera* Vent.	98%	A214	AB586414
Moraceae	*Ficus benjamina* L.	99%	T199	AB586418
Moraceae	*Ficus cordata* Thunb.	99%	T255	AB586421
Moraceae	*Ficus cordata* Thunb.	99%	T352	AB586424
Moraceae	*Ficus pumila* L.	99%	A288	AB586415
Moraceae	*Ficus pumila* L.	99%	T092	AB586416
Moraceae	*Ficus pumila* L.	99%	T169	AB586417
Moraceae	*Ficus pumila* L.	99%	T224	AB586419
Moraceae	*Ficus pumila* L.	99%	T353	AB586425
Moraceae	*Ficus pumila* L.	99%	T837	AB586426
Moraceae	*Ficus pumila* L.	99%	T926	AB586427
Moraceae	*Ficus pumila* L.	99%	T927	AB586428
Moraceae	*Ficus pumila* L.	99%	T980	AB586430
Moraceae	*Ficus* sp. (*Moore 315*)	99%	T232	AB586420
Moraceae	*Ficus* sp. (*Moore 315*)	99%	T299	AB586422
Moraceae	*Ficus* sp. (*Moore 315*)	99%	T313	AB586423
Moraceae	*Ficus* sp. (*Moore 315*)	99%	T965	AB586429
Myristicaceae	*Knema latericia* Elmer	100%	A327	AB586431
Myristicaceae	*Knema latericia* Elmer	100%	T362	AB586432
Myrsinaceae	*Ardisia crenata* Roxb.	98%	T176	AB586433
Myrsinaceae	*Ardisia crenata* Roxb.	98%	T216	AB586434
Myrsinaceae	*Ardisia crenata* Roxb.	98%	T270	AB586435
Myrsinaceae	*Ardisia crenata* Roxb.	98%	T827	AB586436
Myrsinaceae	*Ardisia crenata* Roxb.	98%	T831	AB586437
Myrsinaceae	*Elingamita johnsonii* G.T.S.Baylis	98%	T805	AB586438
Myrsinaceae	*Lysimachia nummularia* L.	98%	A099	AB586439
Myrsinaceae	*Lysimachia nummularia* L.	98%	T181	AB586440
Myrsinaceae	*Lysimachia nummularia* L.	98%	T883	AB586441
Myrsinaceae	*Rapanea ferruginea* Mez	98%	A078	AB586442

Family	Genus/species	Identities	Collections	Accession No.
Myrsinaceae	*Rapanea ferruginea* Mez	98%	A215	AB586443
Myrsinaceae	*Rapanea ferruginea* Mez	98%	T832	AB586444
Myrsinaceae	*Rapanea ferruginea* Mez	99%	T839	AB586445
Myrtaceae	*Eugenia uniflora* L.	99%	A237a	AB586446
Myrtaceae	*Myrcianthes fragrans* (Sw.) McVaugh	98%	A295	AB586447
Myrtaceae	*Myrcianthes fragrans* (Sw.) McVaugh	98%	T094	AB586448
Myrtaceae	*Myrcianthes fragrans* (Sw.) McVaugh	98%	T864	AB586449
Nyctaginaceae	*Bougainvillea glabra* Choisy	99%	T286	AB586451
Nyctaginaceae	*Mirabilis jalapa* L.	98%	T075	AB586450
Oleaceae	*Forestiera angustifolia* Torr.	96%	T282	AB586452
Oleaceae	*Jasminum abyssinicum* R.Br.	99%	A091	AB586453
Oleaceae	*Jasminum abyssinicum* R.Br.	99%	A234	AB586454
Oleaceae	*Jasminum abyssinicum* R.Br.	99%	T118	AB586455
Oleaceae	*Jasminum abyssinicum* R.Br.	99%	T184	AB586456
Oleaceae	*Jasminum abyssinicum* R.Br.	99%	T188	AB586457
Oleaceae	*Jasminum abyssinicum* R.Br.	99%	T847	AB586458
Oleaceae	*Jasminum abyssinicum* R.Br.	99%	A101	AB586459
Orchidaceae	*Ancistrochilus rothschildianus* O'Brien	98%	T930	AB586460
Orchidaceae	*Bulbophyllum lobbii* Lindl.	98%	A092	AB586461
Orchidaceae	*Bulbophyllum lobbii* Lindl.	98%	T849	AB586462
Orchidaceae	*Calanthe calanthoides* (A.Rich. & Galeotti) Hamer & Garay	98%	A093	AB586463
Orchidaceae	*Cyrtopodium punctatum* Lindl.	99%	T968	AB586464
Orchidaceae	*Eulophia streptopetala* Lindl.	98%	T974	AB586465
Orchidaceae	*Galearis spectabilis* (L.) Raf.	98%	A203	AB586466
Orchidaceae	*Glomera pulchra* J.J.Sm.	99%	A108	AB586467
Orchidaceae	*Holothrix aspera* Rchb.f.	98%	T900	AB586468
Orchidaceae	*Isochilus amparoanus* Schltr.	98%	T924	AB586469
Orchidaceae	*Malaxis spicata* Sw.	98%	A221	AB586470
Orchidaceae	*Octomeria gracilis* Barb.Rodr.	98%	A222	AB586471
Orchidaceae	*Octomeria gracilis* Barb.Rodr.	97%	T879	AB586472
Orchidaceae	*Oreorchis patens* Lindl.	98%	T944	AB586473
Orchidaceae	*Phalaenopsis aphrodite* Rchb.f. subsp. *formosana* Christenson	98%	A107	AB586474
Orchidaceae	*Pristiglottis montana* (Schltr.) Cretz. & J.J.Sm.	99%	T928a	AB586477
Orchidaceae	*Spathoglottis plicata* Blume	98%	T933	AB586478
Oxalidaceae	*Dapania racemosa* Korth.	97%	T065	AB586479
Oxalidaceae	*Dapania racemosa* Korth.	97%	T073	AB586480
Pandanaceae	*Freycinetia scandens* Gaudich.	98%	T196	AB586481
Passifloraceae	*Passiflora quadrangularis* L.	99%	A090	AB586482
Phyllanthaceae	*Breynia cernua* Müll.Arg.	99%	T186	AB586483
Phyllanthaceae	*Breynia cernua* Müll.Arg.	99%	T866	AB586484
Phyllanthaceae	*Bridelia tomentosa* Blume	99%	A118	AB586485
Phyllanthaceae	*Glochidion puberum* Hutch.	99%	A235	AB586486
Phyllanthaceae	*Phyllanthus flexuosus* Müll.Arg.	99%	T356	AB586487
Phyllanthaceae	*Sauropus racemosus* Beille	99%	A294	AB586488
Piperaceae	*Peperomia* sp. (*MAJ-2004*)	99%	T200	AB586490
Piperaceae	*Peperomia* sp. (*Qiu 91047*)	99%	A109	AB586489
Piperaceae	*Peperomia* sp. (*Qiu 91047*)	99%	T229	AB586491
Piperaceae	*Piper hispidum* Sw.	98%	T223	AB586495
Piperaceae	*Piper nigrum* L.	99%	A253	AB586492
Piperaceae	*Piper nigrum* L.	99%	T085	AB586493
Piperaceae	*Piper nigrum* L.	99%	T219	AB586494
Piperaceae	*Piper nigrum* L.	99%	T806	AB586496
Piperaceae	*Piper nigrum* L.	99%	T818	AB586497

Family	Genus/species	Identities	Collections	Accession No.
Piperaceae	*Piper nigrum* L.	99%	T960	AB586499
Piperaceae	*Piper sarmentosum* Roxb.	99%	T959	AB586498
Pittosporaceae	*Pittosporum japonicum* Hort.	98%	A082	AB586500
Pittosporaceae	*Pittosporum tobira* (Thunb.) Aiton	99%	A209	AB586501
Plantaginaceae	*Bacopa repens* Wettst.	96%	T292	AB586502
Plantaginaceae	*Plantago australis* Lam.	99%	T922	AB586503
Plumbaginaceae	*Plumbago auriculata* Lam.	99%	T049	AB586504
Poaceae	*Eragrostis minor* Host	99%	T901	AB586505
Poaceae	*Festuca rubra* L.	99%	T904	AB586506
Poaceae	*Gynerium sagittatum* P.Beauv.	98%	T903	AB586507
Poaceae	*Imperata cheesemanii* Hack.	98%	T878	AB586508
Polygonaceae	*Polygonum undulatum* P.J.Bergius	99%	T913	AB586509
Portulacaceae	*Portulacaria afra* Jacq.	98%	T081	AB586510
Ranunculaceae	*Clematis hexapetala* L.f.	99%	T867	AB586512
Ranunculaceae	*Clematis* sp.	99%	A233	AB586511
Ranunculaceae	*Ranunculus hispidus* Michx.	99%	T850	AB586513
Rhamnaceae	*Paliurus spina-christi* Mill.	99%	A319	AB586514
Rhamnaceae	*Ventilago viminalis* Hook.	98%	T264	AB586515
Rhamnaceae	*Ventilago viminalis* Hook.	98%	T269	AB586516
Rosaceae	*Photinia fraseri* Dress	99%	A210	AB586517
Rosaceae	*Photinia fraseri* Dress	99%	T886	AB586518
Rosaceae	*Rubus idaeus* L.	98%	T011	AB586519
Rosaceae	*Rubus idaeus* L.	98%	T012	AB586520
Rosaceae	*Rubus idaeus* L.	98%	T870	AB586521
Rubiaceae	*Aidia micrantha* (K.Schum.) Bullock	99%	T204	AB586522
Rubiaceae	*Alberta sambiranensis* Homolle ex Cavaco	99%	T868	AB586523
Rubiaceae	*Amaracarpus* sp. (*Parvis 680*)	100%	T210	AB586524
Rubiaceae	*Amaracarpus* sp. (*Parvis 680*)	100%	T824	AB586525
Rubiaceae	*Augusta austrocaledonica* (Brongn.) J.H.Kirkbr.	99%	A298	AB586526
Rubiaceae	*Gardenia hansemannii* K.Schum.	100%	A120	AB586527
Rubiaceae	*Geophila repens* (L.) I.M.Johnst.	99%	T298	AB586528
Rubiaceae	*Hedythyrsus thamnoideus* (K.Schum.) Bremek.	97%	T809	AB586529
Rubiaceae	*Hypobathrum racemosum* Kurz	99%	A272	AB586530
Rubiaceae	*Hypobathrum racemosum* Kurz	99%	T207	AB586531
Rubiaceae	*Hypobathrum racemosum* Kurz	99%	T820	AB586532
Rubiaceae	*Hypobathrum racemosum* Kurz	99%	T940	AB586533
Rubiaceae	*Hypobathrum racemosum* Kurz	99%	T332	AB586534
Rubiaceae	*Ixora coccinea* L.	99%	A316	AB586535
Rubiaceae	*Ixora coccinea* L.	99%	T005	AB586536
Rubiaceae	*Lasianthus strigosus* Wight	99%	A081	AB586537
Rubiaceae	*Margaritopsis acuifolia* C. Wright	98%	A110	AB586538
Rubiaceae	*Margaritopsis acuifolia* C. Wright	98%	T060	AB586539
Rubiaceae	*Morinda citrifolia* L.	97%	A088	AB586540
Rubiaceae	*Morinda citrifolia* L.	98%	A089	AB586541
Rubiaceae	*Morinda citrifolia* L.	99%	A314	AB586542
Rubiaceae	*Morinda citrifolia* L.	98%	T846	AB586543
Rubiaceae	*Nertera granadensis* Druce	99%	T158	AB586544
Rubiaceae	*Ochreinauclea maingayi* (Hook.f.) Ridsdale	99%	A304	AB586545
Rubiaceae	*Ochreinauclea maingayi* (Hook.f.) Ridsdale	99%	T943	AB586546
Rubiaceae	*Ochreinauclea maingayi* (Hook.f.) Ridsdale	100%	T363	AB586547
Rubiaceae	*Ophiorrhiza mungos* L.	99%	T215	AB586548
Rubiaceae	*Ophiorrhiza mungos* L.	99%	T842	AB586549
Rubiaceae	*Ophiorrhiza mungos* L.	99%	T946	AB586550
Rubiaceae	*Paederia scandens* (Lour.) Merr.	99%	A285	AB586551
Rubiaceae	*Paederia scandens* (Lour.) Merr.	99%	T268	AB586552

Family	Genus/species	Identities	Collections	Accession No.
Rubiaceae	*Psychotria capensis* Vatke	99%	T211	AB586554
Rubiaceae	*Psychotria capensis* Vatke	99%	T331	AB586555
Rubiaceae	*Psychotria micrococca* Valeton	99%	T120	AB586553
Rubiaceae	*Psychotria micrococca* Valeton	99%	T835	AB586557
Rubiaceae	*Psychotria nervosa* Sw.	99%	T815	AB586556
Rubiaceae	*Pyrostria hystrix* (Bremek.) Bridson	99%	A228	AB586558
Rutaceae	*Melicope ternata* J.R.Forst. & G.Forst	99%	A300	AB586559
Rutaceae	*Ruta graveolens* L.	97%	T156	AB586560
Rutaceae	*Sarcomelicope simplicifolia* (Endl.) T.G.Hartley	98%	A239	AB586561
Rutaceae	*Zanthoxylum monophyllum* (Lam.) P.Wilson	98%	A241	AB586562
Rutaceae	*Zanthoxylum* sp. (*Chase 1348*)	99%	A325	AB586563
Rutaceae	*Zanthoxylum* sp. (*Chase 1348*)	99%	A326	AB586564
Salicaceae	*Capsicum baccatum* L.	98%	T822	AB586565
Salicaceae	*Casearia sylvestris* Sw.	99%	A245	AB586566
Salicaceae	*Flacourtia jangomas* Raeusch.	99%	A219	AB586567
Salicaceae	*Flacourtia jangomas* Raeusch.	99%	A274	AB586568
Salicaceae	*Flacourtia jangomas* Raeusch.	99%	T337	AB586569
Salicaceae	*Flacourtia jangomas* Raeusch.	99%	T811	AB586570
Salicaceae	*Flacourtia jangomas* Raeusch.	99%	T821	AB586571
Salicaceae	*Flacourtia jangomas* Raeusch.	99%	T941	AB586572
Salicaceae	*Homalium racemosa* Jacq.	99%	A321	AB586573
Sapindaceae	*Diploglottis campbelli* Cheel	99%	A238	AB586574
Sapindaceae	*Dodonaea viscosa* Jacq. subsp. *angustifolia* (L.f.) J.G. West	99%	A206	AB586575
Sapindaceae	*Guioa semiglauca* Radlk.	99%	A232	AB586576
Sapindaceae	*Guioa semiglauca* Radlk.	99%	T932	AB586577
Sapindaceae	*Mischocarpus pyriformis* Radlk.	99%	A246	AB586578
Sapindaceae	*Mischocarpus pyriformis* Radlk.	99%	A289	AB586579
Scrophulariaceae	*Buddleja asiatica* Lour.	100%	T278	AB586580
Simaroubaceae	*Brucea javanica* Merr.	99%	T970	AB586581
Simaroubaceae	*Picrasma javanica* Blume	99%	A280	AB586582
Simaroubaceae	*Picrasma javanica* Blume	99%	A329	AB586583
Smilacaceae	*Smilax rotundifolia* L.	98%	A281	AB586584
Solanaceae	*Capsicum baccatum* L.	98%	T197	AB586585
Solanaceae	*Nicotiana tabacum* L.	98%	T077	AB586586
Solanaceae	*Physalis peruviana* L.	100%	T964	AB586587
Solanaceae	*Solanum bulbocastanum* Dunal	99%	A104	AB586588
Solanaceae	*Solanum bulbocastanum* Dunal	99%	A105	AB586589
Solanaceae	*Solanum bulbocastanum* Dunal	99%	A106	AB586590
Solanaceae	*Solanum bulbocastanum* Dunal	99%	T100	AB586592
Solanaceae	*Solanum bulbocastanum* Dunal	99%	T267	AB586593
Solanaceae	*Solanum bulbocastanum* Dunal	99%	T275	AB586594
Solanaceae	*Solanum bulbocastanum* Dunal	99%	T919	AB586596
Solanaceae	*Solanum* sp. (*Goldblatt 12426*)	99%	T086	AB586591
Solanaceae	*Solanum* sp. (*Goldblatt 12426*)	99%	T860	AB586595
Symplocaceae	*Symplocos zizyphoides* Stapf	99%	A290	AB586597
Symplocaceae	*Symplocos zizyphoides* Stapf	99%	A296	AB586598
Symplocaceae	*Symplocos zizyphoides* Stapf	100%	T871	AB586599
Ternstroemiaceae	*Cleyera japonica* Thunb.	99%	A291	AB586600
Ternstroemiaceae	*Eurya chinensis* R. Br.	99%	A279	AB586601
Thymelaeaceae	*Phaleria capitata* Jack	99%	A303	AB586602
Thymelaeaceae	*Phaleria capitata* Jack	99%	T003	AB586603
Thymelaeaceae	*Phaleria capitata* Jack	99%	T057	AB586604
Thymelaeaceae	*Phaleria capitata* Jack	99%	T271	AB586605
Thymelaeaceae	*Phaleria capitata* Jack	99%	T361	AB586606

Family	Genus/species	Identities	Collections	Accession No.
Thymelaeaceae	*Wikstroemia canescens* Maxim.	98%	A086	AB586607
Thymelaeaceae	*Wikstroemia canescens* Maxim.	99%	T168	AB586608
Thymelaeaceae	*Wikstroemia canescens* Maxim.	99%	T836	AB586609
Urticaceae	*Boehmeria biloba* Wedd.	98%	A266	AB586611
Urticaceae	*Boehmeria biloba* Wedd.	98%	T023	AB586612
Urticaceae	*Boehmeria biloba* Wedd.	98%	T026	AB586613
Urticaceae	*Boehmeria biloba* Wedd.	99%	T273	AB586617
Urticaceae	*Boehmeria biloba* Wedd.	98%	T277	AB586618
Urticaceae	*Boehmeria biloba* Wedd.	98%	T321	AB586619
Urticaceae	*Boehmeria biloba* Wedd.	98%	T816	AB586620
Urticaceae	*Boehmeria biloba* Wedd.	98%	T961	AB586622
Urticaceae	*Boehmeria grandis* A.Heller	99%	T105	AB586614
Urticaceae	*Boehmeria grandis* A.Heller	99%	T160	AB586615
Urticaceae	*Boehmeria grandis* A.Heller	99%	T254	AB586616
Urticaceae	*Boehmeria grandis* A.Heller	99%	T894	AB586621
Urticaceae	*Cecropia palmata* Willd.	96%	A080	AB586623
Urticaceae	*Cecropia palmata* Willd.	96%	T845	AB586624
Urticaceae	*Laportea canadensis* Gaudich.	98%	T109	AB586625
Urticaceae	*Pellionia daveauana* N.E.Br.	97%	A083	AB586626
Urticaceae	*Pellionia daveauana* N.E.Br.	98%	T854	AB586627
Urticaceae	*Pellionia daveauana* N.E.Br.	98%	T977	AB586628
Urticaceae	*Pellionia daveauana* N.E.Br.	98%	T978	AB586629
Urticaceae	*Poikilospermum* sp. (*Wooliams 547*)	98%	A114	AB586630
Urticaceae	*Poikilospermum* sp. (*Wooliams 547*)	99%	T950	AB586631
Urticaceae	*Poikilospermum* sp. (*Wooliams 547*)	99%	T953	AB586632
Urticaceae	*Urera glabra* Wedd.	99%	T296	AB586633
Verbenaceae	*Lantana camara* L.	98%	A284	AB586634
Verbenaceae	*Lantana camara* L.	97%	T914	AB586635
Verbenaceae	*Stachytarpheta dichotoma* Vahl	99%	T025	AB586636
Vitaceae	*Cayratia mollissima* Gagnep.	99%	T300	AB586637
Vitaceae	*Cissus discolor* Blume	97%	A267	AB586638
Vitaceae	*Leea guineensis* G.Don	99%	T256	AB586639
Vitaceae	*Leea guineensis* G.Don	98%	T812a	AB586640