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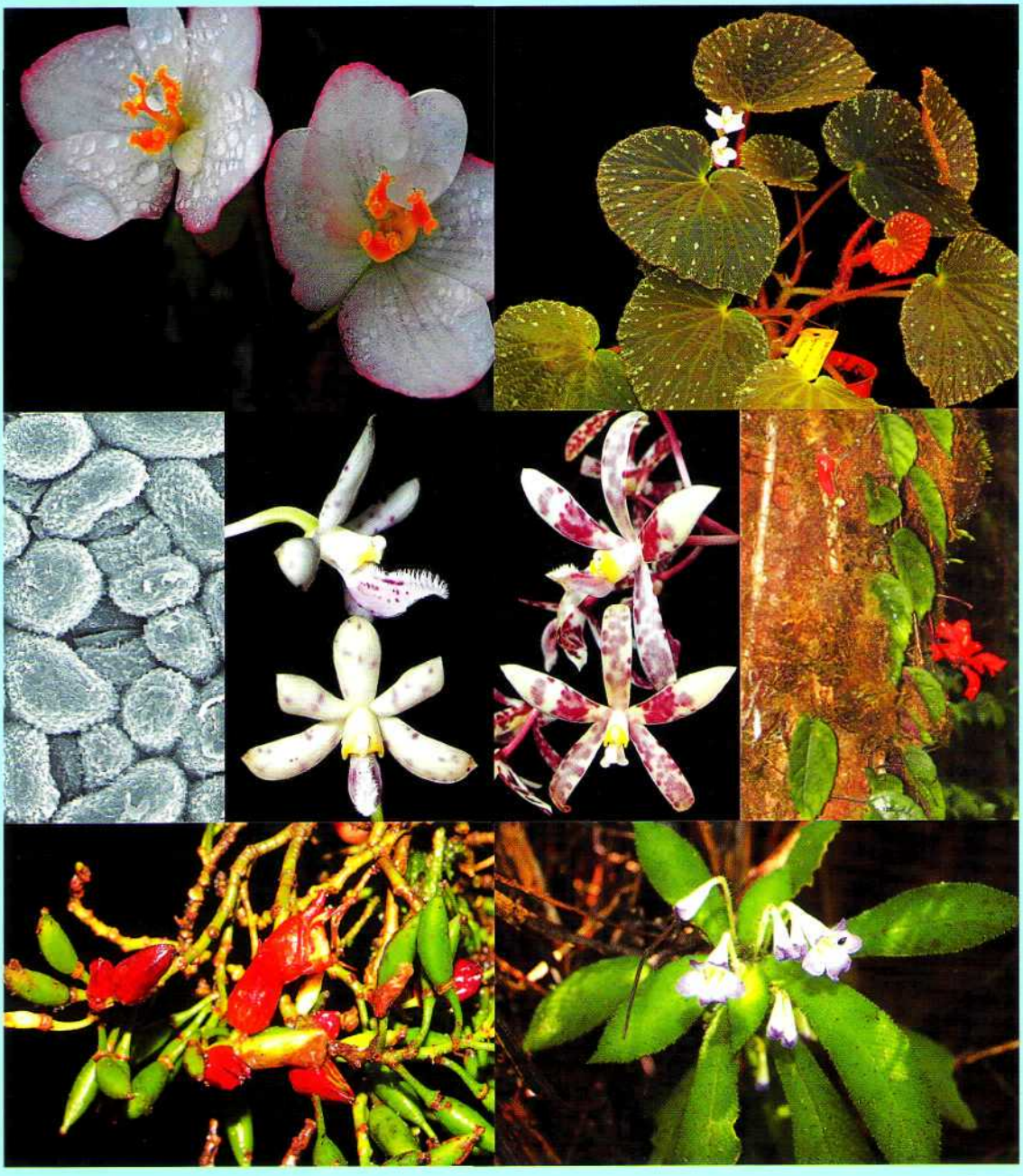

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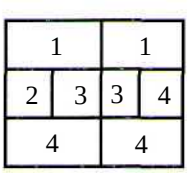

Cover images: 1. *Begonia holosericeoides* (female flower and habit) (Begoniaceae; Ardi *et al.); 2.* Abaxial cuticles of *Alseodaphne rhododendropsis* (Lauraceae; Nishida & van der Werff); *3. Dipodium puspitae, Dipodium purpureum* (Orchidaceae; O'Byrne); 4. *Agalmyla exannulata, Cyrtandra coccinea* var. *celebica, Codonoboea kjellbergii* (Gesneriaceae; Kartonegoro & Potter).

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FLORA OF BALI: A PROVISIONAL CHECKLIST

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ABSTRACT
VAN BALGOOY, M. & WIDJAJA, E. A. 2014. Flora of Bali: a provisional checklist. *Reinwardtia* 14(1): 219 – 221. — Compared to Java the flora of Bali is poorly known. A checklist has been prepared based on literature and collections. The focus is on indigenous species, but the distinction between indigenous and naturalized species is not always clear. This checklist is therefore very provisional. The flora of the much smaller island state Singapore is much richer, probably mainly due to undercollecting of Bali.

Key words: Bali, checklist, flora, indigenous species.

ABSTRAK
VAN BALGOOY, M. & WIDJAJA, E. A. 2014. Flora Bali: daftar jenis sementara. *Reinwardtia* 14(1): 219 – 221. — Dibandingkan dengan flora Jawa, informasi mengenai flora Bali masih sangat sedikit diketahui. Daftar jenis telah dipersiapkan berdasarkan pustaka dan koleksi herbarium. Daftar jenis ini difokuskan pada jenis-jenis yang asli, tetapi perbedaan antara jenis yang asli dengan jenis yang telah ternaturalisasi tidak selalu jelas. Daftar jenis ini masih bersifat sementara. Flora pulau yang lebih kecil seperti Singapura lebih banyak, hal ini kemungkinan besar karena masih sedikitnya flora Bali yang sudah dikoleksi .

Kata kunci: Bali, daftar jenis, flora, jenis asli.

INTRODUCTION

Despite it's fame as a tourist destination, botanically Bali is less known and explored than its neighbouring larger island, Java. There are very few notable comprehensive reports on the botany of the island such as by Rensch (1930), de Voogd (1937a, 1937b & 1940), and Kalkman (1955). More recent literature deals with birds and cultivated plants.

After years of neglect the importance of properly documenting the flora of Bali gained a new momentum early 2012 following the National Priority Programs in Saving and Protecting Small and Outer islands set up by the Indonesian Government and the outcome of 9th Symposium of Flora Malesiana held in Bogor in 2013, in which BO has set up the Lesser Sunda Islands –including Bali– as priority areas understudy.

The present checklist is the outcome of a joint effort of the staff of Herbarium Bogoriense, Eka Karya Botanical Garden and Rijksherbarium (now Naturalis) Leiden. It is based on literature, mainly Flora Malesiana and revisions in various journals, and herbarium collections housed in these institutes.

Short history of botanical collecting in Bali

Information on botanical collecting in Malesia is found in van Steenis (1950, 1974). The first exploration was made and reported by Horsfield in 1806 (see Horsfield, 1852), but no specimens were made. It was subsequently followed by Teysmann in 1854 (see Teysmann, 1856) and two visits made by Zollinger in 1846 (see Zollinger, 1854) & 1857; both with specimens made. A period of inactivity lasting more than half a century ensued.

In the next century the explorations were continued by van der Paardt (1915 to 1918). Unfortunately his specimens were lost during shipment to Java. Maier collected in Bali in 1918 accompanied by Sarip, a technician ("mantri") from BO. In 1920 Becking conducted an exploration to the island and brought more specimens to BO. Van der Paardt returned to the island in 1926 and this time his collections safely arrived in Bogor. Demandt and van Dillewijn made collections in 1929.

One of the most prolific collectors of Bali plants is de Voogd who lived on the island for three years (1933-1935) and published reports in de Tropische Natuur (de Voogd 1937a and b, 1940).Van Steenis laid the significant foundation to the comprehen-

sive study on the flora of the island following his extensive collecting activities throughout 1936 (see van Steenis, 1950). The ferns of Bali were collected noticeably by Posthumus during his two visits to the island in 1933 and 1937.

Some collections, mainly of trees were made by the Boschbouw Proefstation (Forestry Institute).

After World War II and subsequently followed by the independence of Indonesia the explorations were continued mostly by Indonesian botanists such as Kostermans in 1958 accompanied by his students: Kartawinata, Reksodihardjo, and Soepadmo. Only few foreign botanists had the opportunity to carry out botanical explorations in Bali such as Meyer – accompanied by two technicians from BO: Noerta and Mochtar – in 1974 and 1975. The other was Mc Donald –also accompanied by a technician from BO, Ismail– in 1994. Important collectiosn were also made by staff of Herbarium Bogoriense and of Eka Karya Botanic Garden, established in 1959.

Important collections are also made by staffs from the Eka Karya Botanical Garden since its establishment in 1959. Unfortunately their specimens have not been widely distributed yet. Some have been sent to BO though.

According to the Cyclopedia, by 1950, 3350 herbarium numbers had been collected in Bali against 7400 in Singapore.

RESULT & DISCUSSION

The list contains indigenous (naturally occurring), naturalized (introduced intentionally or unintentionally maintaining themselves without the help of man) and cultivated (introduced and only maintaining themselves with the help of man) species. They are arranged alphabetically according to families and each species is accompanied by literature and herbarium specimen cited (when available).

In this list such information is regarded unnecessary for abundant and well known species like *Cocos nucifera* (Arecaceae), *Morinda citrifolia* (Rubiaceae), and *Terminalia catappa* (Combretaceae).

Naturalized species are indicated by (nat.) behind their scientific name. Examples of this are *Azadirachta indica* (Meliaceae) (nat.), *Leucaena leucocephala* (Fabaceae) (nat.), and *Muntingia calabura* (Tiliaceae) (nat.).

Cultivated plants as defined above, are indicated by (cult.). Examples of this are *Carica papaya* (Caricaceae), *Nerium oleander* (Apocynaceae), and *Plumeria rubra* (Apocynaceae).

Some truly indigenous species are also cultivated such as *Arenga pinnata* (Arecaceae), *Ficus benjamina* (Moraceae), and *Terminalia catappa* (Combretaceae). Some alien species are so much part of the Bali scenery and have been cultivated for so long that the Balinese find it hard to believe that these are actually introduced species. Examples are *Artocarpus heterophyllus* (Moraceae), *Durio zibethinus* (Bombacaceae) and *Tectona grandis* (Verbenaceae). No attempt has been made to completely record all naturalized and cultivated species. They are not included in the following statistics (Table 1).

It is interesting to compare the figures for Bali with that of another island in Malesia, Singapore. For Bali 1338 Spermatophyte species are recorded against 2007 for Singapore Chong *et al.* (2009), Low Yee Wen (pers. com.). Bali is richer in Poaceae and Singapore richer in Orchidaceae. Eu-

Table 1. Number of family, genera and species of Bali

	Number of family	Number of genera	Number of species
Spermatophytes	152	748	1338
5 largest families:			
Poaceae		71	162
Orchidaceae		45	113
Fabaceae		43	80
Rubiaceae		22	30
Euphorbiaceae		21	38
Pteridophyte		82	165
Bryophyte and Hepatics		54	71
Fungi		38	75

phorbiaceae are better represented in Bali and Apocynaceae better in Singapore (Table 2).

Bali (5770 sq km) is ten times the size of Singapore (570 sq km) and is much more elevated. One would expect it to be richer than Singapore. One of the reasons could be that Singapore is adjacent to a very rich source area, the Malay Peninsula, whereas Bali is near a much poorer one, Java. The most plausible explanation, however is that the Singapore flora is much better documented.

Many species known from Java and the Lesser Sunda islands (Lombok eastwards) are not recorded for Bali. This suggests that Bali is undercollected. More exploration of Bali may yield many new records and perhaps even new species.

CONCLUSION

The current checklist of Bali is provisional. For a comprehensive flora of Bali it is essential to start with more exploration and study of specimens still hidden in various herbaria. The island may prove much richer than the present checklist suggests.

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Table 2. Number of family, genera and species of Singapore

	Number of family	Number of genera	Number of species
Spermatophytes	154	742	2007
5 largest families:			
Orchidaceae		78	-
Rubiaceae		45	-
Poaceae		36	-
Apocynaceae		31	-
Fabaceae		30	-

INSTRUCTION TO AUTHORS

Scope. *Reinwardtia* is a scientific irregular journal on plant taxonomy, plant ecology and ethnobotany published in December. Manuscript intended for a publication should be written in English.

Titles. Titles should be brief, informative and followed by author's name and mailing address in one-paragraphed.

Abstract. English abstract followed by Indonesian abstract of not more than 250 words. Keywords should be given below each abstract.

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Nomenclature. Strict adherence to the International Code of Botanical Nomenclature is observed, so that taxonomic and nomenclatural novelties should be clearly shown. English description for new taxon proposed should be provided and the herbaria where the type specimens area deposited should be presented. Name of taxon in taxonomic treatment should be presented in the long form that is name of taxon, author's name, year of publication, abbreviated journal or book title, volume, number and page.

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