BALI AND LOMBOK SPECIES OF *BEGONIA*  
(BEGONIACEAE)

BY:  
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THE GRADUATE SCHOOL  
BOGOR UNIVERSITY OF AGRICULTURE  
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ABSTRACT

A taxonomic study of the genus *Begonia* Blume (Begoniaceae) in Bali and Lombok Islands were conducted based on morphological characters. Three previously known species (*Begonia coriaceae* Hassk., *B. longifolia* Blume and *B. tenuifolia* Dryander) five new species (*B. baliensis* Girmansyah sp. nov., *B. lempuyangensis* Girmansyah sp. nov., *B. lombokensis* Girmansyah sp. nov., *B. multibractea* Girmansyah sp. nov., *B. pseudomuricata* Girmansyah sp. nov.) are proposed. A key to species is included.

A phylogenetic analysis was undertaken using PAUP vers. 4. Ob4. Programs Swofford (2000) with Hillebrandia *sandwicensis* as out group. This analysis be resulted a parsimonious cladogram, which shows that the *Begonia* divided into three subclade and belong to four section (*Sphenanthera*, *Reichenheimia*, *Petermannia* and *Parvibegonia*).
ABSTRAK


LETTER OF STATEMENT

I express that thesis entitling:

BALI AND LOMBOK SPECIES OF *BEGONIA* (BEGONIACEAE)

are true represent result of my research and have never been published. All information and data that used have been expressed clearly and can be checked its truth.

Bogor, June 2008

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BALI AND LOMBOK SPECIES OF BEGONIA
(BEGONIACEAE)

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SUMMARY

Girmansyah. 2008. Bali and Lombok species of Begonia (Begoniaceae). Supervised by Dr. Sri Sudarmiyati Tjitrosoedirdjo and Dr. Harry Wiriadinata

Begonia is the biggest genus in the family Begoniaceae. This genus is easily recognized by asymmetric leaf, unisexual flowers and winged fruits characters. That very asymmetric leaf is one of the special characteristic. Begonia is found wild throughout tropical and subtropical Asia, Africa and America. More than 1500 species have been named with many species waiting to be discovered.

This study was based on herbarium specimens of Begonia collected from Bali and Lombok Islands. The total number of 60 sheets specimens deposited in the Herbarium Bogoriense (BO) were examined. In addition some pictures of Begonia specimens from Leiden (L), Kew (K), Edinburgh (E) and Aurus (AAU) were consulted. The living plants in Bali Botanic Gardens and surrounded areas and some area of Lombok Island were also studied in-situ. Exploration was conducted at Bali and Lombok Islands as an addition of Bogor Herbarium collections. Exploration and specimen collection were based on the methods of Rugayah et al (2004).

All materials were studied and their morphological characters were examined with a 10 x 40 binocular microscope. The methods used were based on Leenhouts (1968), Rifai (1976), Vogel (1987) and Maxed (1992). For the morphological terminology the author follows Harris (1954), Lawrence (1955), Doorenbos (1998) and Kiew (2005) and a phylogenetic analysis was conducted to clarify the relationships between species Begonia in Bali and Lombok using PAUP vers. 4.0. (Swofford 2000).

Taxonomic study on Bali and Lombok Begonias were conducted. The recent study indicated that there were 8 species Begonia found in Bali and Lombok. Three species have been known previously (Begonia coriacea, B. longifolia and B. tenuifolia) and five new species were discovered (Begonia baliensis, B. lempuyangensis, B. pseudomuricata, B. lombokensis and B. multibracteata).
Some of the Bali and Lombok Begonias are endemic. *Begonia lombokensis* and *Begonia multibractea* are only found in Lombok, while *Begonia baliensis*, *B. lempuyangensis* and *B. pseudomuricata* are only collected from Bali. Meanwhile the distribution of the *Begonia longifolia* extends from the Himalayas (India) to south China, Vietnam and through Thailand, Peninsular Malaysia, and Indonesia (Sumatra, Java, Bali and Lombok). Until now, there is no *B. longifolia* recorded from Borneo and eastern part of Indonesia like Sulawesi, Maluku and Papua. *Begonia coriacea* is a new record from Bali, it is one of the Begonia which grows on the lime stones. In Bali, this species was found only in Pura Lempuyang, Karang Asem Distric, east of Bali. One of the exiting Begonias we call as the spotted Begonia. The species name is *Begonia tenuifolia* found in Java, Bali, Lombok and Sumbawa. This species has wide variation in size of habit and leaf colour. It leaf colour is also variable ranging from bright green, dark brown green with spotted on upper side leaves. Fruits with unequal wings, the larger one have variation in size and tip of wing. The longest wings about 1 cm long with the tip rounded. While another wing with narrowly elongated and tip pointed. The extended small tuber is a specific character for this species.

Begonia is a very appreciated genus of ornamental plants, of economic relevancy, having species of flowers and foliage. These species can be used as foliage or flowers of varied coloration, usually commercialized in pots or to constitute gardens, very appreciated among the ornamentals. Some of Bali and Lombok Begonias have a nice morphological character. *Begonia tenuifolia* Dryander has a nice spot on the leaves. It is very nice plant if planted on the small pot and put as indoor plant. *Begonia coriacea* and *B. pseudomuricata* have flowers with pinkish rosy colour. The colour is very attractive and good for ornamental. The genus Begonia has flower with an acceptable taste. The rose petals contain relatively high levels of antioxidants. Meanwhile *B. baliensis*, *B. lempuyangensis* and *B. multibracteata* are Begonia with strong habit and big stem. All of them can be eaten as salad or cooked with fish. Especially for *B. lempuyangensis*, can be used as a palliative cough. Cane-like Begonia as *B. lombokensis* and *B. longifolia* are also can be eaten and used also for medical plant.
The phylogenetic analysis was result two parsimonious trees with 26 steps length, Consistency index (CI) of 0.72 and retention index (RI) of 0.81. To see relationship between Begonia in Bali and Lombok, hence the Javanese species also using in this analysis like B. robusta, B. multangula, B. isoptera and B. muricata.

There is a good relationship between Java, Bali and Lombok Begonia species. This analysis supported by Kalman (1955), there is no difference between the West and East element of plant and the Wallace line was meaningless for Bali and Lombok plants. However, it is too early to make a decision about the phylogenetic analysis of the Bali and Lombok Begonia, because of there is not enough species for this analysis especially from other location in Lesser Sunda Island. I have to improve by sampling more species. I hope this preliminary analysis can make ideas for further research.