SUMMARY

SRI ENDARTI RAHAYU. Biosystematics of Pandanaceae in Java. Supervised by ALEX HARTANA, TATIK CHIKMAWATI, KUSWATA KARTAWINATA, and MIEN A. RIFAI.

Pandan family (Pandanaceae) is represented in Java by two genera, Freycinetia Gaud. and Pandanus Parkins. Since the studies by Backer and Bakhuizen van den Brink in 1968 and Stone in 1972, there were no further exploration on the pandan flora of the island have been made, thus the pandan flora remains largely unknown. Taxonomical problem as far as the Java pandans concerned, are centered not only on the species status of Pandanus odoratissimus L.f and P. tectorius var. littoralis which are considered as synonym, but also the species status which are given as synonym of Pandanus furcatus Roxb. by Backer and Bakhuizen van den Brink. Under the latter they included of P. bantamensis Koord., P. oviger Martelli, P. pseudolais Warb., and P. scabrifolius Martelli into one species of P. furcatus Roxb. This classification is in contrast with Stone who stated that these species were regarded as four different species. Therefore an effort has been made to redescribe these species in detail, using morphological, anatomical and molecular data such as sequence data of atpB-rbcL IGS to provide better understanding of morphological, anatomical and molecular characters in supporting taxa delimitation and its distribution in Java.

This study was based mainly on available specimens at the Herbarium Bogoriemse (BO), National Herbarium Netherlands, Leiden (L) and Herbarium of the Royal Botanical Gardens Kew (K) and new collection specimens obtained from field work in different location in Java. In addition, living plants grown in botanical garden were also studied. Five species that was planted in Bogor Botanical Garde, viz. Pandanus kurzii, P. labyrinthicus, P. multifurcatus, P. polycephalus and P. spinistigmaticus were also examined.

Characters of leaf shape, leaf apex, the morphology of leaf auricles and type of pistillate inflorescence were found useful in delimitation and identification of Javanese Freycinetia, while character of habit, the surface of stem, present or absent of prop root, the surface of prop root, the leaf shape, leaf apex, the armature of leaf margins and midrib, the colour of leaf margin and midrib teeth, the distinctness or indistinctness of tertiary cross vein, present or absent of apical ventral pleats, the texture of leaves in dry state, phalange shapes, the position of infructescence, position of seed chamber and stigma shape are proved useful for distinguishing species of Javanese Pandanus.

Besides gross morphological characters, anatomical characters of leaf are used as well. They have proved useful especially for distinguishing between closely related species, because anatomical characters can provide information and strengthening conclusion based on morphological characters. Stomata in Javanese Freycinetia is relatively uniform, the degree might be in the qualitative manner, except in Freycinetia sumatrana stomata are arranged in neat longitudinal rows which are alternating with each row of stomata is one row of cubical crystals, while stomata in Pandanus were variable, and the variation largely involved papillae developed on subsidiary and neighbouring cells. The range of variation in
the epidermal tissue including the stomata proves to be a great value in identification of Pandanus species in Java.

Morphological, anatomical and comparative sequence data of *atpB-rbcL* IGS were able to solve the taxonomical problem of *Pandanus furcatus* complex and *P. tectorius* complex and as a result *P. bantamensis* Koord, *P. pseudolais* Warb. and *P. scabrifolius* Martelli treated as three different species, and *P. odoratissimus* L.f and *P. tectorius* var. *littoralis* treated as two different species.

ISSR (Inter Simple Sequence Repeat) study showed that six species of Freycinetia and thirteen species of Pandanus from Java have high genetic diversity, although Freycinetia has a bit lower of genetic diversity than Pandanus, while Principal component analysis (PCA) for Javanese thirteen Pandanus and six Javanese Freycinetia showed a bit different in clustering pattern and species relationships compared to the cluster analysis.


Keyword: anatomy, Freycinetia, Java, molecular, morphology, Pandanus