FREYCINETIA GAUDICH
(Pandanaceae : Freycinetoideae)
IN SULAWESI

BY:
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THE GRADUATE SCHOOL
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LETTER OF STATEMENT

I express that thesis entitling:

FREYCINETIA GAUDICH (PANDANACEAE : FREYCINETOIDEAE)
IN SULAWESI

Is 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, August 2009

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ABSTRACT

ENDANG WAHJUNINGSIH. Freycinetia Gaudich (Pandanaceae: Freycinetioideae) in Sulawesi. Supervised by SRI SUDARMIYATI TJIITROSOEDIRDJO and ARY PRIHARDHYANTO KEIM.

Studies on the genus Freycinetia Gaudich (Pandanaceae: Freycinetioideae) in Sulawesi Island were conducted based on morphological characters. Thirteen species are recognized: Freycinetia amboinensis Martelli, Freycinetia beccarii Hemsl, Freycinetia celebica Solms, Freycinetia devriesei Solms, Freycinetia funicularis Merr, Freycinetia inermis Ridl, Freycinetia kostermansii B.C Stone, Freycinetia koordersiana Martelli, Freycinetia minahassae Koord, Freycinetia ob lanceolata Martelli, Freycinetia polystachya Martelli, Freycinetia rigidifolia Hemsl and Freycinetia sarasinorum Warb respectively. A determination key to species is presented including their description. A phylogenetic analysis was undertaken using Paup vers. 4. Ob. Swofford Programs was performed with Pandanus nitidus Kurz and Sararanga sinuosa Hemsl appointed as outgroups. The result of the analysis suggest that Freycinetia in Sulawesi is a monophyletic genus and divided into two clade and supported by the high bootstrap value of 70 % and belong to six section there are Auriculifoliae, Lateriflorae, Polystachyae, Devriesella, Oligostigma, Hemsleyella. One interesting discovery is that despite the fact that F. oblanceolata is placed in the same section as F. beccarii which is Oligostigma but the tree does not suggest a close relationship. In the first clade showing that F. devriesei Solms is sister species to F. funicularis Merr and F. koster mansii B.C Stone are suggested to have a close relationship and supported by the bootstrap value of 52 %. F. funicularis Merr to have a close relationship with F. kostermansii B.C Stone to have a close relationship and supported by the high bootstrap value of 79 %. In the second clade F. inermis Ridl and F. koordersiana Martelli are suggested to have a close relationship and supported by the high bootstrap value of 82 %. This current study also suggests that species of Freycinetia in Sulawesi has stronger affinity with the eastern part of Malesia rather than with the western part.

Key word: Freycinetia, Pandanaceae, Sulawesi, Taxonomy
ABSTRAK

ENDANG WAJUNINGSIH. Freycinetia Gaudich (Pandanaceae : Freycinetoideae) di Sulawesi. Dibimbing oleh SRI SUDARMIYATI TJITROSOEDIRDJO dan ARY PRIHARDHYANTO KEIM.


Kata kunci : Freycinetia, Pandanaceae, Sulawesi, Taxonomy
ENDANG WAHJUNINGSIH. *Freycinetia* Gaudich (Pandanaceae: Freycinetoideae) in Sulawesi. Supervised by SRI SUDARMIYATI TJITROSOEDIRDJO and ARY PRIHARDHYANTO KEIM.

*Freycinetia* is the only liana or climber in Pandanaceae and all of the member have auricle on the leaf, the have numerous seeds in one locul (multiovulate). Although there is a species from the genus Pandanus which known to possess auricle, such as *Pandanus pectinatus*, however auricle is still a good field identification for the genus. Stone (1972) suggested *Freycinetia* as the most advance genus within Pandanaceae. His statement is supported by its habit (liana/climber) and infructescence structure.

*Freycinetia* consist of approximate 200 species which spreads from Srilangka, Indochina, a whole Malesia until Australia (North Queensland) and Pasific (New Zealand). Although they are close to each other, *Freycinetia* is never found on India.

Sulawesi is an island that has never joined Sunda to either or Sahul shelves (Metcalf, 1996; Hall, 1998; Halloway & Hall, 1998). In other words, Sulawesi is composed of many parts that have always been independent as Oceanic islands. This study is based on herbarium spesimens collected from Sulawesi and adjacent Islands. The total number of 62 specimens deposited in the Herbarium Bogoriense (BO) were examined. See materials were studied and their morphological characters were examined with 10 x 40 binocular microscope. A phyllogenetic analysis was conducted to clarify the relationships between *Freycinetia* species in Sulawesi using PAUP vers. 4.0b (Swoffort, 2000)

The recent study indicated that there were thirteen species of *Freycinetia* in Sulawesi. From thirteen species have been identified, *Freycinetia devriesei* Solms, *Freycinetia minahassae* Koord and *Freycinetia koordersiana* Martelli are wideles spread in Sulawesi, from North side to South Sulawesi. *Freycinetia oblaceolata* Martelli, *Freycinetia beccarrii* Hemsl and *Freycinetia rigidifolia* Hemsl are species which have limited distribution. Thus arrange of its habitat are secondary forest and slope mountain. Species of *Freycinetia* have bracts of varied coloration, *Freycinetia amboinensis* Martelli having yellow colour bracts, *Freycinetia minahassae* Koord having white with red to purple colour bracts, *Freycinetia sarasinorum* Warb having white to pale yellow bracts.

The same for the species *Freycinetia* on Sulawesi with Moluccas, Philippines and New Guinea is the shown there is close relation of floristic like what have been Postulated by Lam (1945a; 1945b). *Freycinetia* are rarely used by public. Seeing
from the interest colour of bract, even it has to be used as decorative plants and spathes catching red colour used material colour alcoholic drink in China (Heyne, 1987). Roots to be used to make rope, stem from *Freycinetia celebica* Solms to be used to make for rope of a bird and other animal trap. The leaves of *F. koordersiana* Martelli are used as medicinal for after birth treatment in which the leaves are boiled than given to the mother after labour (childbirth) to clear the womb.

The phyllogenetic analysis was result one parsimonious trees with 87 tree length, Consistency index (CI) of 0.6897, Homoplasy index (HI) of 0.3103, Retency index (RI) of 0.5909 and Rescaled Consistency index (RC) of 0.4075. The result of this current study suggest that the *F. funicularis* Merr and *F. kostermansii* B.C Stone united only by one very informative morphological character there is both species have lateral infructescence.

In accordance with Stone (1968) in placing the two species into the same section, Lateriflorae. *F. devriesei* Solms is suggested to be the closest sister species to the clade that unites *F. funicularis* Merr and *F. kostermansii* B.C Stone. The section Lateriflorae is suggested to have a nearness relationship with the section Devriesella. However this result is still preliminary, thus further study with more taxa involved is needed. *F. beccarii* Hemsl is regarded as the sister species to the clade that unites *F. funicularis* Merr, *F. kostermansii* B.C Stone, *F. devriesei* Solms.

This can also be interpreted that Stone’s section of Oligostigma is regarded to have a close relationship with both section Lateriflorae and Devriesella. This is also a preliminary result, further study is essensial. One interesting discovery is that despite the fact that *F. oblanceolata* Martelli is placed in the same section as *F. beccarii* Hemsl in Stone’s infrageneric classification, which is Oligostigma but the tree does not suggest a close relationship.

This current study also suggests that species of *Freycinetia* in Sulawesi has stronger affinity with the eastern part of Malesia rather than with the western part. In other words, the biogeographical pattern of *Freycinetia* in Malesia is confined to Huxley’s line rather than Wallace’s line. Thus, the biogeographic patterns in *Freycinetia* in Sulawesi are explained better with Huxley’s line.

Key word: *Freycinetia*, Pandanaceae, Sulawesi, Taxonomy
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