Three Species Zonation of *Sonneratia*; Based on Salinity, in River Calik, South Sumatera

Hanifa Marisa, and Sarno

***Abstract*---**Investigation about zonation of three species of *Sonneratia* (S *alba*, S *ovata* and S *caseolaris*) based on their salinity tolerance had been done at May 2014 at River Calik, Musi Banyuasin, South Sumatera Province, Indonesia. The aim of study is to find out their distribution along River Calik bank based on the salinity level. Ten sampling points put systematically begin at estuarine area. Salinity was maesured by hand-refractometer at every sampling point and *Sonneratia* species were noted at every point. Three species were found; *Sonneratia alba, Sonneratia ovata* and *Sonneratia caseolaris*. Every spcies has its own salinity zonation ; S *caseolaris* be found at 0 – 15 %0 , S *ovata* 6 – 15 %0 and S *alba* at 11 – 20 %0 . These data should be useful for mangrove reboitation, eartquake mitigation and ecology science development.

***Keywords*---**zonation, salinity, *Sonneratia*.

I. Introduction

SOIL condition of mangrove forest in Japan were found to correlate largely with zonaldistributions of the species. Kandelia candel grew in soils with low salinity and low pH, *Avicennia marina, Rhizopora stylosa* and *Sonneratia alba* in soil with a wide range of pH but limited range of salinity. *Lumnitzera racemosa* colonised soil with a wide range of pH and medium salinity. Seedlings of *Kandelia candel, Bruguiera rhymnorrhiza* and *Rhizophora stylosa* were planted in soil with differing salinity and pH. It is suggesting that growth of mangrove species and their zonal distributions were regulated by salinity and soil pH [6]. Several factors heva been thought to restrict the growth and distribution of mangroves in tropical and subtropical zones such as salinity [6].

It is reported the realtionship between salinity and spatial patterns of mangrove species distribution. Of the three major species *Avicennia marina, Ceriops tagal*, and *Rhizophora mucronata* present along the transect only the distribution of the latter correlated with the measured soil variables, R *mucronata* being absent from the less-reduced zone with high salinity. *Bruguiera gymnorrhiza* and *Heritiera littoralis* occur in minor populations, they are restricted to the saline, sulphide-poor and less-reduced substrates [3].

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Field survey in western coast in Thailand, it is found that S alba, and S griffithii coexisted in Ranong Mangrove Forest Center, Ranong. In *Sonneratia*, S *alba* is the most widespread species occuring in almost the whole range of *Sonneratia* whereas S *griffithii* is restricted to the coast of Andaman sea, from the upper Malay peninsula to Bengal [4]. Both species grow in low intertidal zones of downstream estuaries [4]. However, S *griffithii*, was slightly upward in the habitat relative to S *alba* in survey [4]. The species distribution along soil salinity gradient in mangrove swamps of Sunderbans, Lethian Island. They investigated five sampling points about 50, 500, 550, 750, 850, 1644, and 2378 m distance from coast. Salinity decrease gradually from 20.9, 31.25, 29.01, 17.92, 17.66, 18.45 and 13.01 ppt. Ecological group of classification indicates that *Avicennia marina* and A *officinalis* can tolerate wide range of salinity while *Aegiceras corniculatum, Ceriops decandra, Dalbergia spinosa, Derris trifolia* and *Exoecaria agallocha* are restricted to low salinity areas [1].

The existency of a species in a habitat, depend on the dispersal, behavior, other species, and physical chemical factors. Salinity is categorized into chemical factor [2].

II. Material And Methods

Ten sampling points put systematically begin at estuarine area. Salinity was maesured by hand-refractometer at every sampling point and *Sonneratia* species were noted at every point. Map of sampling points should be read at below table.

Fig. 1. Map of sampling points along River Calik, South Sumatera.

III. Result and Discussion

Measuring of salinity and notation of *Sonneratia* sp at every sampling point found the result as could be seen at figure 2.

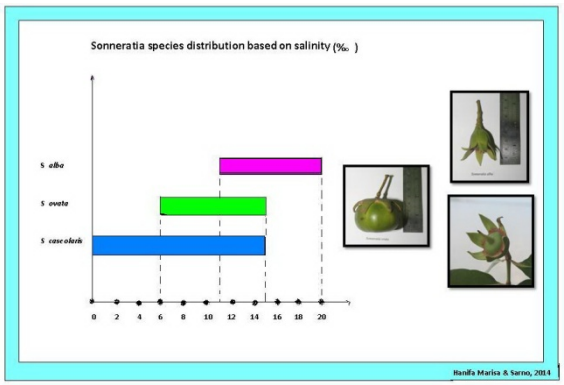

Fig. 2 Species zonation of three kind *Sonneratia* based on salinity

It is seem, that S *alba* exist high salinity condition, 11-20 ppt while S *ovata* adapted to medium range (6-15 ppt) and widest tolerance but can not growth at high salinity coast, S *caseolaris* (0-15 ppt). Existency species is depend on the dispersal, behavior, other species, and physical chemical factors [2]. Salinity is categorized into chemical factor. Water of river body must influence the medium of growth of *Sonneratia*. But these research prove that S alba is occupied at coast side(11-20 ppt), and S ovata growth at medium zone (6-15), where both species have tha same wide range salinity ; 9 ppt. Even the other species, S *caseolaris* is distributed in the widest range, but small salinity concentration ow water medium, 0-15 ppt.

The result is different with mangrove swamps of Sunderbans, where researcher, found *Avicennia marina* and A *officinalis* were the two species adapted to high salinity coast, about 20.9 to 31.25 ppt [1]. In other hand, in *Sonneratia*, S *alba* is the most widespread species occuring in almost the whole range of *Sonneratia* whereas S *griffithii* is restricted to the coast of Andaman sea, from the upper Malay peninsula to Bengal [4].

Furthermore, salinity should effected the uptake of lead and cadmium of mangrove species; *Rhizophora apiculata* and *Avicennia alba* [6].

IV. Summary

Three species were found; *Sonneratia alba, Sonneratia ovata* and *Sonneratia caseolaris.* Every spcies has its own salinity zonation ; S *caseolaris* be found at 0 – 15 %0 , S *ovata* 6 – 15 %0 and S *alba* at 11 – 20 %0 .

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