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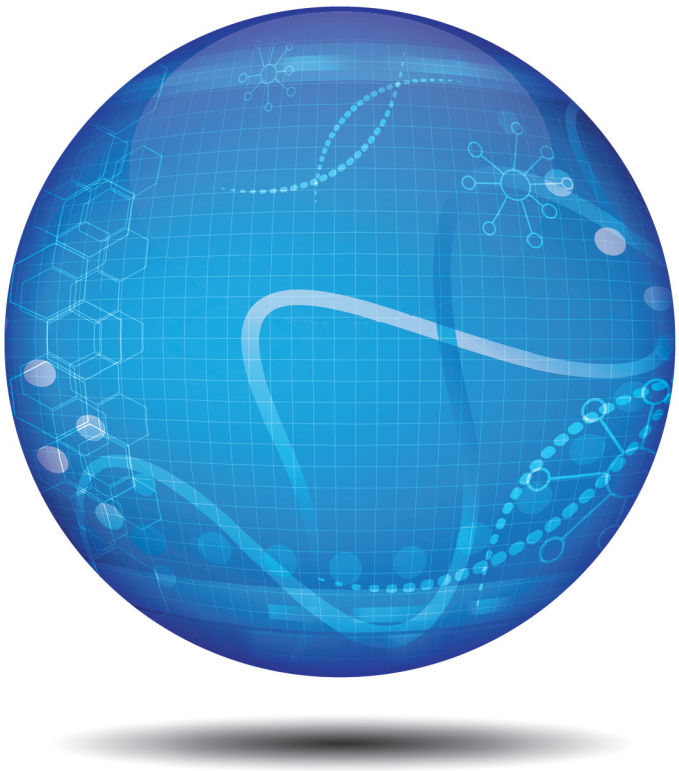

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Flowering Phenology of *Rhizophora apiculata* in the Former Ponds Sembilang National Park South Sumatra

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Abstract – Direct planting propagules of *Rhizophora apiculata* (bakau) has been carried out in December 2010 in the former ponds Barong Kecil, Banyuasin Peninsula, region of Sembilang National Park (SNP), South Sumatra. The purpose of observation is to know when *R. apiculata* first flowering. The observation were made periodically. In June 2014, observation appear that *R. apiculata* has started flowering. Based on observation, then in case, it can take as long as 43 months from direct planting propagules for the first flowering. The average of plant high is 277 cm and stem diameter is 4.23 cm.

1. INTRODUCTION

Phenology describes the occuring biological events that is, budding, flowering and fruiting of plant in relation to seasonal climatic change [1] [2]. Mangrove phenology is important in understanding the past, present and future response of mangrove species to impacts of climatic change [3]. The flowering season of *R. apiculata* was from July until August [4]. Mangrove ecosystem is the largest habitat Sembilang National Park (SNP) Banyuasin Peninsula, South Sumatra and is the largest mangrove area in Western Indonesia. Mangrove conditions in this region under pressure and degradation from year to year. The main cause of mangrove destruction in the SNP is the cultivation of ponds, especially in Banyuasin Peninsula [5]. No information about phenology of flowering of *Rhizophora apiculata* in SNP. Research on phenology study Mangrove Restoration Area SNP in particular is to know when flowering *R. apiculata*.

Basic data on phenology is very important to help when to collection of fruit/seed/mangrove propagules. During this time, the benchmark used is the data that is valid in Bali and Lombok, while the hydrological characteristics and different regions [6]. Mangrove phenology data for mangrove areas SNP, Banyuasin, South Sumatra yet available. Provision of seeds in large quantities and highly qualified help or planting rehabilitation of degraded mangrove areas. Thus will greatly assist the smooth and successful restoration projects. The benefits of this research is the availability of basic data about when *R. apiculata* at SNP started flowering since planting propagules.

According to [7], flowering and fruiting occur throughout the year, the peak fruiting season for *R. apiculata* from September to December, *R. mucronata* is from the month of July to November, and *R. stylosa* from October to December. Environmental factors such as rainfall, air temperature and humidity affect flowering and fruiting on mangrove forests. Starting time span of interest is growing to mature propagules is to the third species of *R. mucronata, R. apiculata* and *R. stylosa* respectively are 18.85 months, 22.06 months and 21.70 months.

2. METHODS

2.1 Site study

Rainfall data obtained from the climatological station near the location of the observation. Total rainfall annual average over a period 0f 10 years is more than 2,500 mm per year. Very high rainfall reached more than 3,000 mm occurred in 2001, 2005 and 2010. The cycle of monthly rainfall shows the dry months from May to September, and the wet months on the next period. Overall, the air temperature did not show extreme fluctuations. During the period 2001-2010, the average monthly minimum air temperature was 25.9^{o}C, and its maximum temperature was 28.4^{o}C. Average monthly air temperature does not show an extreme increase during the dry season. To find out more details of the air temperature, the daily temperature will be slightly higher in the dry season (October) compared with the rainy season (January). In general, soil and water quality is quite good and support the needs of mangrove plants. Soil and water pH is at neutral conditions, thus supporting the chemical processes that occur in the soil [8].

2.2 Procedures

Observation survey conducted in June 2011-June 2014 at a pilot project in the Barong Kecil (02°09' 659" S; 104°53' 608" E) Banyuasin Peninsula, SNP, South Sumatra. Phenological survey of *R. apiculata* conducted in mangrove plots on former farm land SNP. Observations in the field include whether already started flowering, measured diameter and height of the tree trunk. Documentation of *R. apiculata* used for descriptive discussion.

3. RESULTS AND DISCUSSION

Phenological survey of *R. apiculata* (bakau) conducted in mangrove plots on former pond, the mengrove demplot at the first year of JICA-RECA restoration project in SNP [9]. That activity to find out the area can support growth of mangroves related to restoration plan in the greenbelt area of Banyuasin Peninsula, SNP.

Propagules planting of *R. apiculata* implemented in December 2010 in the former pond in Barong Kecil, Banyuasin Peninsula, SNP, South Sumatra. After about a month already seen one pair of leaves fully extended (Figure 1). In June 2014 observations appear that *R. apiculata* has started flowering. Based on observations, then in this case, it can take as long as 43 months for the first time flowering (Figure 2). Starting time span of interest is growing to mature propagules of 22.06 months *R. apiculata* [7].

One pair of leaves swelled after one month till planting propagules and seedlings ready for planting accretion phase one pair every month [10]. After branching began to appear it will be followed by the emergence of stilt roots. Those roots as one of adaptation for *R. apiculata* in their natural habitat [1].

Figure 1 (*R. apiculata* propagules planting (left) and one month later of the seedling (right)

Figure 2 (*R. apiculata* plant at July 2011 (left) and June 2014, first time flowering (centre and right)

4. CONCLUSIONS

The observation appear that *R. apiculata* has started flowering. Based on observation in SNP South Sumatra, it can take as long as 43 months from direct planting propagules for the first flowering. The average plant high is 277 cm and stem diameter is 4.23 cm.

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