

ANTIOXIDANT ACTIVITY OF METHANOL EXTRACTS FROM THE STEM BARK OF MANGROVE PLANT *Rhizophora mucronata*

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INTRODUCTION

Numbers of diseases such as stroke, diabetes, gout, and even cancer are caused by the reaction of free radicals (oxidants) found in the body. Those diseases currently have not yet controlled. Deleterious lifestyle, lack of exercise, or genetics can be the trigger to this oxidant. Based on Chemotaxonomic, drugs that have been used to inhibit the oxidation process or termination stage of free radicals contain the active ingredient in the form of secondary metabolites of alkaloids, phenolics, terpenoids and steroids. For example, phenolic compounds such as flavonoids, xanthenes, antioxidants and polyphenols is a good agent because it has a structure with a high degree of oxidation (Suarez, et al, 2010).

Researches related to the exploration of antioxidant active ingredient has been more focused on secondary metabolites found in terrestrial plants. The development of natural compounds potential of marine plant material such as mangrove are still not received much attention. Spalding *et al.* in 2001 explained that mangroves plant in Indonesia is the highest in the world, both in terms of quantity area ($\pm 42\,550\text{ km}^2$) as well as the number of species (± 45 species). This basic natural resource of Indonesia mangrove is certainly valuable promising opportunities to be expanded as a biological drug.

Mangroves plant that commonly used as medicine discovered from various species i.e: *Acanthus ilicifolius*, *Avicennia alba*, *Avicennia marina*, *Avicennia officinalis*, *Bruguiera cylindrical*, *Bruguiera exaristata*, *Bruguiera gymnorrhiza*, *Ceriops tagal*, *Hibiscus tiliaceus*, *Ipomoea pes-capre*, *Lumnitzera racemosa*, *Nypa fructicans*, *Pluchea indica*, *Rhizophora apiculata*, *Rhizophora mucronata* and *Sonneratia alba*. Those plants are usually utilized as antiasma, antidiuretic, antidiabetic, reliever itching, and others. (Purnobasuki, 2004).

The potential of mangroves as a drug is very important to be developed considering the need for drugs is increasing deals with the growing of population and many kinds of diseases such as cancer, hypertension, tumor diseases and diseases caused by chemical or biological waste pollution from viruses and bacteria. People are more likely to

choose drugs that are natural because relatively take few side effects or even none at all.

Several studies of mangrove plants from genus *Rhizophora* that have antioxidant bioactivity are shown in the crude butanol extract of mangrove *R. apiculata* with IC_{50} 33.34 $\mu\text{g} / \text{mL}$ (Gao, 2012). The methanol extract of *R. mangle's* stem were also documented to have antioxidant activity (Palacio, et al, 2014).

One of mangroves found in Surabaya East Coastal (Pamurbaya), East Java, Indonesia is the mangrove *Rhizophora mucronata*. This mangrove species is indigenous mangroves that ethno-botanically popular used as a pain reliever and dyes natural wood. Secondary metabolites contained in the leaves, bark, stems, roots, and fruit are different in quantity. The content of secondary metabolites in plant commonly used as a medicine is from general part of the bark. Therefore, on the basis of chemotaxonomic and ethno-botany of mangroves *R. mucronata*, this study aims to explore the bioactivity of antioxidant from the stem bark of *R. mucronata*.



Figure 1. Mangrove *Rhizophora mucronata*