

Toxic Potential of Papaya (*Carica papaya*) Leaves as Termicidal Against *Coptotermes curvignathus* Holmgren

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Abstract—Papaya leaf (*Carica papaya*) contains secondary metabolite compounds such as terpenoids, alkaloids, saponins and flavonoids. Those compounds have been known as toxic in most insects and have potential to regulate termite *Coptotermes curvignathus*. This research aims to analyze the potential of *Carica papaya* leaf as bioinsecticides and to find Lethal Concentration LC₅₀ methanolic extract of papaya on *C. curvignathus*. The test was carried out by treating paper disc with extract at the concentration 6% 8% 10% w/v (g/ml). The effect of termites has been investigated in seven days and LC₅₀ determined by probit analyze. The bioassay showed that LC₅₀ methanolic extract of Papaya leaf (*Carica papaya*) an has an effect to *Coptotermes curvignathus* LC₅₀ 4,5%.

Keywords—*Coptotermes curvignathus*, Methanolic extract, Mortality, Papaya leaf.

I. INTRODUCTION

Termite belong to order Isoptera, which have been known for a destroyer to the building, and also attack the community plantation such oil palm, especially the young palm [1][2][3]. Termites play role in ecological of many ecosystems, particularly in nutrient-poor arid and semi-arid environments [4]. There are three major species of termites in Indonesia which become pests such as *Coptotermes curvignathus* Holmgren, *Macrotermes gilvus* Hagen, as well *Schedorhinotermes javanicus* Kemner and one type of dry wood termites, *Cryptotermes cynocephalus* light [5].

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Coptotermes is the only genus of sub Family Coptotermitinae spread in tropical regions [6]. The few tropical and subtropical locations where termites are found at high altitude (700–2500 m) [7][8]. Termites live in soil and remnant of wood, thus they difficult to be controlled. In there, termites can hide and breeding and find their food [9]. This insect can cause direct physical damage to crops and causing significant economic losses [10].

Nowday, the method which is used to reduce termite is insecticide that has chemical compound, such as organophosphate and pyrethroid. This compound could be harmful to the environment and animal especially insect [11][12]. An alternative that could be used as biotermicide is organic insecticide from plant such as papaya leaf [13].

Carica papaya (papaya) is a tree-like herbaceous plant [14]. *Carica papaya* is the member of the Family Caricaceae widely found in India, Philippines, Sri Lanka, Bangladesh, Malaysia and other countries in tropical America[15]. Recent studies said that the leaves of *Carica papaya* discovered compounds as a potential anti-sickling [16].

Papaya leaves contain active ingredients such as papain, chymopapain, cystatin, à-tocopherol, ascorbic acid, flavonoids, cyanogenic glucosides, and glucosinolates [17]. The contents which have potential as insecticide are papain enzyme, saponins, flavonoids and alkaloids karpain. These compounds cause many various reactions in the body of larvae which can inhibit the growth and development of them [18].

II. MATERIAL AND METHODS

A. Time and place of research

This research was conducted on September until February 2017. The determination of methanol extraction from papaya leaf was done in Pharmacology Laboratory, Faculty of Pharmacy. Rotatory evaporation process did in the Laboratory of Falitma, Universitas Gadjah Mada. Testing termites with

