

**SUMMARY**

**ANTIBACTERIAL ACTIVITIES AND CELL WALLS CHANGES  
FROM *Propionibacterium acnes* AFTER GIVING  
*Curcuma xanthorrhiza* Roxb EXTRACT.**

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*Propionibacterium acnes* and *staphylococcus epidermis* are pus-forming microbes responsible for the development of various forms, *Akne vulgaris*. Although *Akne vulgaris* is not life threatening, it can cause serious problems in the patient's social and psychological conditions. *Acne vulgaris* (acne) in Southeast Asia reaches 40-80%, cases of the entire population (Afriyanti, 2015). Based on the 2015 Indonesian Acne Expert Meeting, *Acne vulgaris* ranks the third most disease out of the total number of Poly and Skin Health visitors in hospitals and skin clinics. The highest prevalence is at the age of 14-17 years, where in women ranges from 83-85% and in men at the age of 16-19 years around 95-100% (Wasitaatmadja, 2015). The main management of *Akne vulgaris* is the use of both topical and oral antibiotics. However, the use of antibiotics is considered to have led to allegations of resistance to *P. acnes* as a causative agent of acne so that it encourages various parties to develop anti-inflammatory preparations that can be given topical or systemic.

*Curcuma xanthorrhiza* Roxb. has the main compound xanthorrhizol which is considered potential to be developed as an antibacterial. The potential content as an antibacterial is owned by *Curcuma xanthorrhiza* Roxb. are flavonoids. Flavonoids are derivatives of phenol compounds that can cause disruption of the integrity of the walls and membrane of bacterial cells which can be seen from changes in the size and morphology of bacterial cells (Jail, 2008). The results of Zaghi (2011) study of cell wall structure when bacterial cells exposed to phenol compounds using Microscope Electron Scanning (MES) showed changes or damage to the structure of bacterial cell walls due to exposure to phenolic compounds, namely changes in the size and morphology of bacterial cells.

The purpose of this study was to analyzing antibacterial activity and changes in cell wall structure of *Propionibacterium acnes* after giving *Curcuma xanthorrhiza* Roxb. Extract. The research design used was an experiment with a sample of *P. acnes* in the form of a stock culture isolate (ATCC® 11827™) which was subsequently grown on MHA media. The number of replications used was 4 replications. *Curcuma xanthorrhiza* Roxb extract concentration. each 6.25 µg / ml, 12.5 µg / ml, 25 µg / ml, 50 µg / ml and 100 µg / ml. The measurement of antibacterial activity was based on MIC, MBC and observation of the structure of bacterial cell walls through the Microscop Electron Scanning (MES) and Transmission Electron Microscope (TEM).

The results were obtained from the giving of *Curcuma xanthorrhiza* Roxb extract. has an antibacterial effect on *P. acnes* bacteria in vitro. The

*concentration of extract of 50 µg/mL was the Minimum Inhibitory Concentration and Minimum Bacterisid Concentration against P. acnes through liquid dilution. P. acnes bacteria exposed to ethanol extract of Curcuma xanthorrhiza Roxb. experienced morphological changes in the form of rough coarse cell walls due to shrinkage and the destruction of the cell wall so that the cytoplasm comes out and looks like it melts. Response to inhibition of the growth of bacteria produced by Curcuma xanthorrhiza Roxb. influenced by the active compounds contained therein such as essential oils, alkaloids, flavonoids, tannins, curcuminoids and terpenoids. In addition, the content of flavonoids can damage cell walls, causing cell death. Flavonoids can also inhibit the formation of proteins which inhibit bacterial growth.*

*Although it has been proven the effectiveness of Curcuma xanthorrhiza Roxb extract. against P. acnes, but further toxicity testing and clinical trials are needed to determine the safety and real efficacy of Curcuma xanthorrhiza Roxb extract. on bacterial growth, before it was applied to fitopharmaca preparations especially to problems caused by P. acnes.*