

## ABSTRACT

Syphilis is one of the deadly diseases that infects through the reproductive organs. Syphilis has continuous and comprehensive characteristics that can attack all organs of the body. Starfruit positively contains secondary metabolite compounds in the form of flavonoids, alkaloids, phenols, and saponins. Secondary metabolite compounds function as a defense which can be used as antibacterials. The use of compounds for antibacterials from natural ingredients will be more environmentally friendly, safe, and easy to obtain. The in silico method can be used to analyze a chemical compound and the resulting interactions. In silico can provide predictions of the activity and properties of candidate drug molecules before further testing is carried out in the laboratory. This study used microneedle patches as antibacterial products. Microneedles have more advantages than other transdermal patches, such as minimal pain, faster onset of action, higher permeability, and more effective. This study aims to determine the effectiveness of starfruit extract in inhibiting *Treponema pallidum* (T. pallidum) bacteria in silico, to determine the phytochemical content of starfruit extract, and to determine the characteristics of microneedles produced from starfruit extract. This study used an in silico approach in testing antibacterial activity and in vitro in the manufacture and testing of microneedle patches. The results showed that one of the test compounds in starfruit tested in silico was close to being effective in inhibiting *Treponema pallidum* bacteria. In addition, starfruit positively contained secondary metabolite compounds alkaloids, flavonoids, saponins, and tannins.

**Keywords:** *Treponema pallidum*, Syphilis, Insilico, Microneedle