



Development of an Eucalyptus Leaf Extract Spray Film to Prevent Marine Barnacle Fouling

Lalitphat Srithep¹

Chareef Surinrach^{1*}

Princess Chulabhorn Science High School 138 Moo. 12 Chalung, Mueang, Satun 91140

E-mail: Lalitphat.s@pccst.ac.th

Abstract

Barnacle fouling on the surfaces of ships, piers, and underwater structures is a major problem in the marine industry because it directly affects vessel performance, increases fuel consumption, and shortens the service life of materials such as commercial ships, fishing boats, docks, and offshore structures. A common solution used by fishermen is the application of antifouling paint to the hulls of their boats. However, conventional antifouling paints contain hazardous chemicals and heavy metals that can adversely affect marine ecosystems.

Therefore, this study aimed to develop a metal coating spray film containing eucalyptus leaf extract as an environmentally friendly alternative for preventing barnacle attachment in marine environments. The eucalyptus leaf extract was obtained using the Soxhlet extraction method before being mixed with suitable solvents and film-forming agents to produce a spray capable of forming a uniform and durable thin film on metal surfaces. The resulting film was evaluated for its flexibility, adhesion, water resistance, and antifouling performance against barnacle attachment.

The developed eucalyptus leaf extract spray film successfully formed a uniform coating with good breathability and moisture permeability while maintaining durability under marine conditions. It effectively reduced barnacle attachment and demonstrated good resistance to seawater exposure. Moreover, the spray film provides an environmentally friendly and safe antifouling solution for marine organisms, making it a promising alternative for sustainable applications in coastal communities and the marine industry.

Keywords: Terpenoids, Eucalyptus, Spray Coating, Anti-Barnacle Attachment