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## Metabolomic profiling of Jeruju (*Acanthus ilicifolius*) leaf extract with antioxidant and antibacterial activity on *Aeromonas hydrophila* growth

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### Abstract

Jeruju (*Acanthus ilicifolius*) is a Kalimantan tidal swamp plant that is potent to treat *Aeromonas hydrophila* infection. This study aimed to determine the potential of Jeruju leaf extract as antioxidant and antibacterial agents to inhibit *A. hydrophila* growth. The research method included the sampling of Jeruju leaves in South Kalimantan, Indonesia. Then, the extracted sample was macerated with ethanol. The sample extracts were screened for phytochemical (Harborne) and metabolomic profiles (liquid chromatography and high-resolution mass spectrometry). The profile of compounds in the extract predicted biological activity using PASS server. Furthermore, the extracts were assayed for antibacterial activity (well diffusion and broth dilution), antioxidant activity 2,2-diphenyl-1-picrylhydrazyl (DPPH), and total phenol content (Folin-Ciocalteu). The phytochemical screening showed that the Jeruju leaves' ethanol extract contained alkaloids, flavonoids, tannins, phenolics, terpenoids, and steroids. The metabolomic profiling was dominated by betaine (41.61%) and choline (40.27%). The prediction of biological activity showed that the Jeruju leaf extract acted as a peptidoglycan glycosyltransferase enzyme inhibitor, DNA synthesis inhibitor, and free radical scavenger. The Jeruju leaf extract can inhibit *A. hydrophila* growth on glutamate starch phenol agar (9.09%). The ethanol extract of Jeruju leaves showed very strong antioxidant potential ( $IC_{50} = 49.73 \pm 1.14 \mu\text{g/ml}$  and 70.31% DPPH scavenging effect at  $96 \mu\text{g/ml}$ ), with a total phenol content of  $32,667 \pm 1,778.58 \text{ mg Gallic acid equivalent (GAE)/100 g dry extract}$ . These research findings provide potential antioxidant and antibacterial activities for Jeruju (*A. ilicifolius*) leaves' ethanol extract for inhibiting *A. hydrophila* growth.

Keyword:

[Acanthus ilicifolius](#)[Banjar](#)[Jeruju](#)[Mangrove](#)[South Kalimantan](#)