Potent antibacterial activity of halogenated metabolites from Malaysian red algae, Laurencia majuscula (Rhodomelaceae, Ceramiales)

Abstract

Red algae genus Laurencia (Rhodomelaceae, Ceramiales) are known to produce a wide range of chemically interesting secondary halogenated metabolites. This investigation delves upon extraction, isolation, structural elucidation and antibacterial activity of inherently available secondary metabolites of Laurencia majuscula Harvey collected from two locations in waters of Sabah, Malaysia. Two major halogenated compounds, identified as elatol (1) and iso-obtusol (2) were isolated. Structures of these compounds were determined from their spectroscopic data such as IR, 1H-NMR, 13C-NMR and optical rotation. Antibacterial bioassay against human pathogenic bacteria was conducted using disc diffusion (Kirby–Bauer) method. Elatol (1) inhibited six species of bacteria, with significant antibacterial activities against Staphylococcus epidermis, Klebsiella pneumonia and Salmonella sp. while iso-obtusol (2) exhibited antibacterial activity against four bacterial species with significant activity against K. pneumonia and Salmonella sp. Elatol (1) showed equal and better antibacterial activity compared with tested commercial antibiotics while iso-obtusol (2) only equaled the potency of commercial antibiotics against K. pneumonia and Salmonella sp. Further tests conducted using dilution method showed both compounds as having bacteriostatic mode of action against the tested bacteria.