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Abstract

Title

Chemical study on bioactive terpenoids from Okinawan marine organisms.

This thesis is written on the chemical study of bioactive terpenoids from marine organisms which were collected from different locations around the Okinawa Main Island, Japan. A total of forty-one terpenoids were identified from the selected marine organisms. The structures of all compounds were elucidated by spectroscopic analyses (1D, 2D NMR, IR, and MS), chemical conversion and comparison of their spectral data with those reported for related compounds. Eleven new bioactive alcyonolide congeners (1–12) and known alcyonolide (5), a seco-type diterpenoid of xenicin, were isolated from a *Cespitularia* sp. A *Sinularia* sp. contained three new endoperoxy and hydroperoxy cadinene-type sesquiterpenoids (13–15), six known sesquiterpenoids (16–21) and three known cembrane diterpenoids (22–24). Plausible biogenetic pathways of the new compounds (13–15) were proposed. Chemical study of a *Lobophytum* sp. led to the isolation of a novel casbene (25) and two new cembranes (26, 27), together with eleven known cembrane diterpenoids (28–35). Six known sesquiterpenoids (36–41) were identified from a sponge *Dysidea* sp.

All new compounds were evaluated for cytotoxicity against HCT116 colon cancer cells, anti-inflammatory effect in LPS/IFN- γ -stimulated RAW 264.7 macrophage cells and some of these evaluated for anti-bacterial activity against *Staphylococcus aureus*, *Salmonella enteric*, *Serratia marcescens*, and *Escherichia coli*. These compounds showed anti-bacterial activity (Inhibition zones of 9–15 mm at 25 μ g/disc), moderate to mild cytotoxicity (IC₅₀ 5.85–460 μ M) and dose dependent anti-inflammatory effect.

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