

Search for Biologically Active Compounds from Korean Seaweeds

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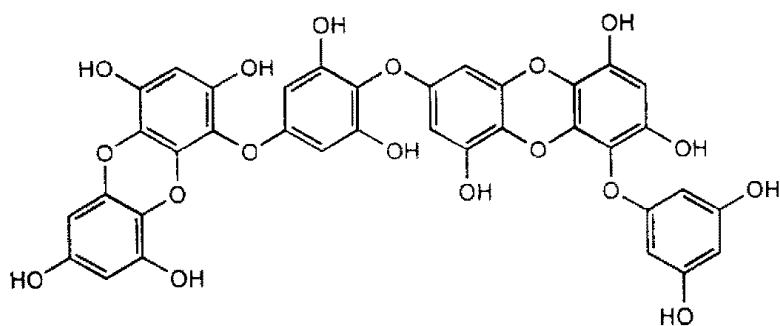
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Marine organisms have been very attractive during the last thirty years for natural product chemists. They have produced various types of interesting secondary metabolites not only in their structural features but also in their biological activities. Some of the compounds discovered from marine organisms exhibit quite different structural characteristics from those of terrestrial organisms. For these reasons, various marine organisms have been investigated extensively for the potential uses as drugs, food additives and cosmetics.

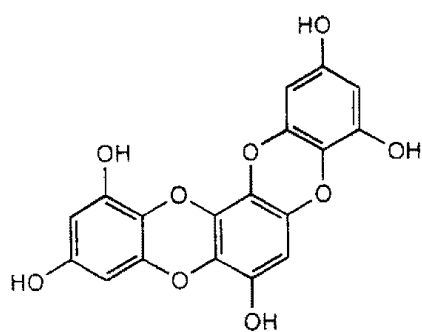
In our laboratory, during the last five years, we have searched for the biologically active compounds from Korean seaweeds such as antioxidants, various serine protease inhibitors and tyrosinase inhibitors. We have collected more than 80 species of seaweeds at the several sites of Cheju Island and Southwest coast of Korea. Biological activities were tested on the methanol extracts of the dried samples and the promising extracts were further purified by activity guided fractionation. Some of our recent results are presented in this symposium.

The methanol extracts of several *Sargassum* sp. were turned out to be antioxidative. Further purification suggested that the active components are water soluble. Due to the water solubility, so far, it has been unsuccessful to purify any single compound yet. However, for example, the partially purified water-soluble fraction of *Sargassum hemiphyllum* showed better superoxide radical scavenging activity than Vitamin E. We also found that the radical scavenging activity was not decreased after one hour heating of the water solution at the concentration of 50 µg/mL at 80 °C. The strong radical scavenging activity, water solubility and thermostability could be advantageous for the development of this fraction as an antioxidant.

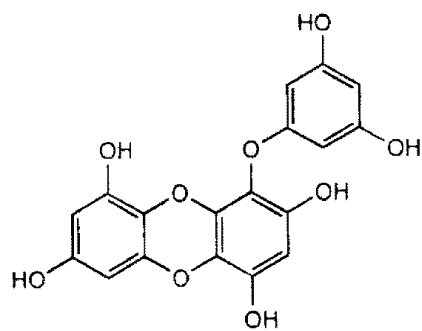
The methanol extract of *Ecklonia cava* has been extensively studied because it showed not only radical scavenging activity but also potent enzyme inhibitory activities against tyrosinase and some of serine proteases such as leukocyte elastase and trypsin. The solvent partition and chromatographic experiments brought several compounds related with the biological activities mentioned above. The structures of these compounds have been investigated mainly by extensive ¹H, ¹³C and 2D NMR experiments. Three of the compounds were elucidated to be phlorotannin type compounds, one new metabolite named dicarval A(1) and two known metabolites, phlorotannin A(2) and eckol(3). All these compounds were antioxidants and potent inhibitors against tyrosinase and leukocyte elastase (IC₅₀ of dicarval A; 9 µg/mL against tyrosinase, 16 µg/mL against leukocyte elastase). The structures of the other compounds isolated are under investigation.



dicarval A (1)



Phlorotannin A (2)



Eckol (3)