Perspective

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Photochemistry and Biological Activities of Aglaia Species

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Perspective

Aglaia is the largest genus in the *Meliaceae* family (also known as Mahagoni in Indonesia), consisting of over 150 species, of which 65 are indigenous to Indonesia. These species spread through the tropical regions, especially Southeast Asia as well as the Northern part of Australia, and have been used in traditional medicine for the treatment of several diseases. However, preliminary chemical researches commenced in 1965, where dammarane-type triter penoids, agnail was isolated, and the structure was determined by chemical reaction and spectroscopic methods. Several studies have been carried out on the stem bark, bark, leaves, seeds and leaves in the last fifty five years, and about 291 metabolites have been isolated from the sesquiter penoid, diterpenoid, triterpenoid, limonoid, steroid, lignan, and alkaloid groups, as well as flavagline, which known to be the largest. This specifically amounts to 34% of Aglaia species, reported to show cytotoxic and insecticidal potentials, and also the tendency for use as chemical markers for this species.

The extracts and compounds obtained from Aglaia species are evaluated for potential biological activities, including cytotoxicity, insecticidal, anti-inflammatory, antifungal, moll suicidal, anti-tuberculosis and antiviral effects. In addition, flavagline (rocaglamide) derivatives have been confirmed to exhibit exceptional cytotoxicity, and are, thus, considered lead compounds for further development. Therefore, the results support the concept of utilizing Algeria species as a potential source for the production of biologically active compounds. Camellia seeds have been traditionally used as oil raw materials in Asia, and are known for a wide spectrum of applications.

Oleanane-type triterpene saponins are the major specialised metabolites in Camellia seeds, and more than seventy saponins have been isolated and characterized. These natural compounds have caught much attention due to their various biological and pharmacological activities, including modulation of gastrointestinal system, anti-cancer, anti-inflammation, anti-microorganism, ant oxidation, neuroprotection, hypolipidemic effects, foaming and detergence, as well as helping the accumulation of pollutants by plants. These compounds have a promising application in medicine, agriculture, industry and environmental protection. The present paper summarized the information from current publications on Camellia seed saponins with a focus on the advances made in chemical structures, determination methods, bioactivities and toxicity.

We hope this article will stimulate further investigations on these compounds. The phytochemical content of the Mediterranean species of the *Sideritis* genus has been reviewed. The components included in this review are monoterpenes, sesquiterpenes, diterpenes, triterpenes, sterols, flavones, coumarins and phenylpropanoids. From the chemotaxonomic point of view, we have divided the species from this region into four groups. The first of this is formed by taxa containing triterpenes, but not diterpenes. A second group is constituted by species having bicyclic diterpenes of the labdane type and not diterpenes. The third group is characterized by its content in tetracyclic diterpenes of the ent-kaurene type. A fourth group is composed of plants with tetracyclic diterpenes of the ent-beyer-15-ene and/or ent-atis-13-ene class.

In addition, the relations of these Mediterranean species with those of the Macaronesian region have been examined. The present state of knowledge of the phytochemistry of small molecules isolated from the roots and leaves of cassava, *Manihot esculenta* Crantz (Euphorbiaceae), is reviewed. Cassava roots are an important source of dietary and industrial carbohydrates, mainly eaten as a source of starch, forming the staple food to over 500 million; additionally, the roots have value as a raw material for industrial starch production and for animal feed giving the crop high economic value, but it suffers markedly from Post-Harvest Physiological Deterioration (PPD). The hydroxycoumarins scopoletin and its glucoside scopolin as well as trace quantities of esculetin and its glucoside esculin are identified from cassava roots during PPD. The biotechnological prospects for cassava are also reviewed including a critical appraisal of transgenic approaches for crop improvement, together with its use for bioethanol production, due to cassava's efficient ability to fix carbon dioxide into carbohydrate.