Biotics Research Corporation

Technical Support

Product #6310
FC-Cidal™
Special Dietary Supplement

Herbs, spices and botanical preparations often exhibit antimicrobial properties due to a wide array of terpenoid and polyphenolic compounds. Indeed, culinary herbs have long been used to control pests and food-borne yeasts and molds in the context of food safety.1

Artemisia dracunculus (Tarragon). A culinary herb yielding a characteristic aromatic oil. The essential oil of tarragon yields a complex mixture of almost 50 different components. The most potent antibacterial constituents include anisaldehyde, paracymene, eugenol, liminene, linalool, menthol, cisocimene, alpha phellandrene, alpha pinene and beta pinene.1 The essential oil of tarragon inhibited growth of E. coli, Pseudomonas aeruginosa, Staphylococcus aureus, Streptococcus faecalis and Yersinia in vitro. In addition, extracts of tarragon inhibited iron ascorbate-induced lipid peroxidation of microsomes prepared from human lymphoblastic cells indicating its antioxidant potential.2

Sida cordifolia (Country mallow). Sida cordifolia has been used in India since ancient times. It contains triglycerides, phytosterols, oleoresin and alkaloids, such as quinazoline alkaloids, asparagusine, but no tannins.3 A low level of ephedrine was reported (0.085%). However, at this level, one capsule of FC-Cidal™ would contain negligible amounts of ephedrine (approximately 4 mcg). Phenylamine, tryptamine derivatives, vasicinone, vasicine and vasicinol have also been reported.4 In addition, the leaves contain soluble gums (mucilages) that can act as demulcetns. Sida cordifolia was shown to possess antibacterial and antifungal properties in experiments performed with rats.3

Tinaspora cordifolia (Guduchi). This herb has also been used traditionally in India. It contains bitter substances, giloine (a glycoside), gilenin, gilosterol and tinosporine.5 Ethanol extracts of T. cordifolia, in combination with several other herbs, had a minimal inhibitory concentration (MIC) of 1 mg/ml when tested in vitro against Entamoeba histolytica.6 Using an in vitro assay system with Candida albicans as the test organism, the activity of rat macrophages was increased by the administration of T. cordifolia at a level of 100 mg/kg.7

Equisetum arvense (Horsetail). In addition to a high percentage of silicates, horsetail contains a variety of polyphenols, such as agigenin and luteolin glycosides. These flavonoids are typical of American and Asian species, but not the European Equisetum species.8 This herb also contains quercetin, and more unusual polyphenolics, such as genkwanin and progenkwanin glycosides. Horsetail also contains sterols, such as beta sitosterol and campestrol as primary sterol constituents.9 The antimicrobial activity of horsetail extracts has been reported.10 Extracts are reported to stimulate flow through the ureters, and they have been used as a component of herbal teas and herbal mixtures.

Olea europaea (Olive leaf). Various flavonoids and their glycosides have been isolated from olives and olive leaves, such as apigenen, luteolin, rutin and quercetin.11 Oleuropein, a bitter principle of olives, is a glucoside and phenolic ester of elenolate, which is a multifunctional monoterpene. In vitro studies demonstrated that elenolate can inhibit several viruses.12 Furthermore, olive phenolic compounds inhibited the growth of spore-forming bacteria13 and Staphylococcus aureus.14 Isolated flavonoids from olives, as well as olive extracts, inhibited the classical complement pathway assayed by the hemolysis of erythrocytes. Therefore olive polyphenols may help balance inflammatory mechanisms.15

Thymus vulgaris (Thyme). An aromatic culinary herb, thyme has long been used as a seasoning and food preservative.16 Thyme contains 1-2.5% as an aromatic oil enriched in monoterpenes. Thymol content of thyme oil can be 30 to 70% and carvacrol content ranges between 3 and 15%. P-cymene, limonene and other terpenes are minor constituents. Thymol is an antimicrobial agent. Volatile constituents of the aromatic oil of thyme inhibited the growth of seven different gram positive and gram negative bacteria.17 Thyme also contains several polyphenolic compounds, such as eriodictyol and polyphenolic biphenyls, that inhibited superoxide anions and microsomal membrane lipid peroxidation induced by iron oxidation.18 In studies of lipid peroxidation in egg yolk, chicken liver, and muscle from mature chickens, the essential oil of thyme was found to be inhibitory in all of these systems.19 Thymol is contraindicated in enterocolitis, cardiac insufficiency and pregnancy.

Tabeuia avellandae (Pau D'Arco, LaPacho). This tropical tree is native to Brazil, where its inner bark has a long history of use among indigenous people there. One of the active substances is lapachol, a naphthoquinone that typically accounts for 2-7% of the content. The tricyclic derivative of lapachol and beta lapachone, functions as an activator of the DNA unwinding enzyme, of topoisomerase I, which is required for DNA repair. However, lapachol does not itself exhibit this activity.20 Lapachol exhibited very low activity in vitro with blood forms of the malarial parasite, Plasmodium falciparum.21 The antibacterial and antifungal activities of lapachol and lapachone have been compared.22 An early clinical study of lapachol failed to produce a beneficial effect, because of the inability to obtain sufficiently high blood levels (more than 30 mcg/ml) and mild side effects that included antivitamin K activity and anticoagulant effects.23

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