

FC-Cidal™

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⁾

FC-Cidal™ contains the herbal preparations French tarragon (*Artemisia dracunculus*), Stinging Nettle extract (*Urtica dioica*), Indian tinospora (*Tinospora cordifolia*), Horsetail (*Equisetum arvense*), Olive (*Olea europaea*), Thyme (*Thymus vulgaris*) and Pau D' Arco (*Tabebuia impetiginosa*).

Artemisia dracunculus (Tarragon). A culinary herb yielding a characteristic aromatic oil, *Artemisia* yields a complex mixture of almost 50 different components. Its most potent constituents include anisaldehyde, paracymene, eugenol, liminene, linalool, menthol, cisocimene, alpha phellandrene, alpha pinene and beta pinene.⁽¹⁾ The essential oil of *Artemisia* showed antagonistic activity toward the 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⁾

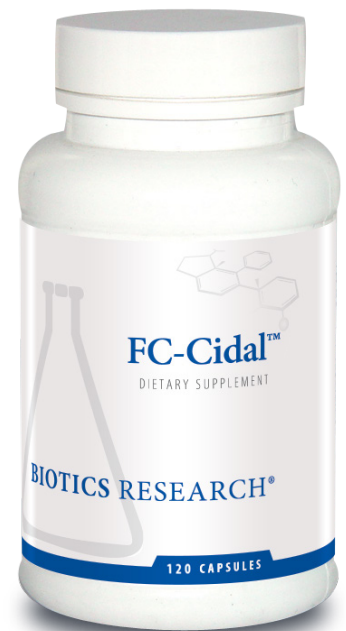
Urtica dioica (Stinging Nettle Extract). *Urtica dioica*, often called common nettle, stinging nettle or nettle leaf, is native to Europe, Asia, northern Africa, and western North America. *Urtica dioica* was studied on 16 skin and wound infections and was found to possess qualities to promote healing and bacterial homeostasis.⁽³⁾ In another interesting study, the extract from *Urtica dioica* demonstrated antagonistic activity toward specific biofilm production (SBF) in *Escherichia coli* BW25113.⁽⁴⁾

Tinospora cordifolia (Guduchi). This herb has also been used traditionally in India. It contains bitter substances, giloin (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⁾ It also induces production of interleukin (IL)-1, IL-6, IL-12, IL-18, interferon-gamma, tumor necrosis factor (TNF)-alpha and nonocyte chemoattractant protein (MCP)-1.⁽⁸⁾

Equisetum arvense (Horsetail). In addition to a high percentage of silicates, horsetail contains a variety of polyphenols, such as agigenin and luteolin glycosides. These flavones are typical of American and Asian species, but not the European *Equisetum* species.⁽⁹⁾ This herb also contains quercetin, and more unusual polyphenolics, such as genkwanin and progenkwanin glycosides. Horsetail also contains sterols, such as beta sitosterol and campesterol, as primary sterol constituents.⁽¹⁰⁾ The antimicrobial activity of horsetail extracts has been reported⁽¹¹⁾ to stimulate flow through the ureters⁽⁹⁾ 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 apigenin, luteolin, rutin and quercetin.⁽¹²⁾ 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 possesses antiviral properties.⁽¹³⁾ Furthermore, olive phenolic compounds inhibited the growth of spore-forming bacteria⁽¹⁴⁾ and *Staphylococcus aureus*.⁽¹⁵⁾ 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.⁽¹⁶⁾



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In a laboratory test, olive leaf water (0.66% w/v) extract killed almost all bacteria tested within three hours, and scanning electron microscopic observations of *Escherichia coli* cells exposed to only 0.6% (w/v) olive leaf extract showed complete destruction.⁽¹⁷⁾

Thymus vulgaris (Thyme). An aromatic culinary herb, thyme has long been used as a seasoning and food preservative.⁽¹⁸⁾ 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 supports healthy microbial diversity. Volatile constituents of the aromatic oil of thyme influenced the growth of seven different Gram-positive and Gram-negative bacteria.⁽¹⁹⁾ Thyme also contains several polyphenolic compounds, such as eriodictyol and polyphenolic biphenyls, that exhibit potent antioxidant activity.⁽²⁰⁾ Additional studies of lipid peroxidation in egg yolk, chicken liver, and muscle from mature chickens highlighted that the essential oil of thyme acted as a strong antioxidant in all of these systems.⁽²¹⁾

Tabebuia avellanae (Pau D'Arco, LaPacho). This tropical tree is native to Brazil, where its inner bark has a long history of use among the indigenous peoples 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 β -lapachone functions as an activator of the DNA unwinding enzyme, topoisomerase I, which is required for DNA repair. Among the naphthoquinones, β -lapachone was found to be the most effective in fostering the growth of healthy bacteria.⁽²²⁾ β -lapachone also inhibited the expression of iNOS, proinflammatory cytokines, and MMPs (MMP-3, MMP-8, MMP-9) at mRNA and protein levels in LPS-stimulated microglia, which suggests its support of inflammation pathways. The antioxidant effects of β -LAP appear to be related with the increase of HO-1 and NQO1 via the Nrf2/antioxidant response element (ARE) pathway and/or the PKA pathway.⁽²³⁾

Product Adjuncts: **A.D.P.[®], Lactozyme[®], BioDophilus-FOS[™]**

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Supplement Facts

Serving Size: 1 Capsule

	Amount Per Serving
Proprietary Blend	500 mg
French Tarragon (<i>Artemisia dracunculus</i>) (leaf) *	
Indian <i>Tinospora</i> (<i>Tinospora cordifolia</i>) (stem & root) *	
Horsetail (<i>Equisetum arvense</i>) (whole herb) *	
Thyme (<i>Thymus vulgaris</i>) (leaf) *	
Pau D' Arco (<i>Tabebuia impetiginosa</i>) (inner bark) *	
Stinging Nettle Extract (<i>Urtica dioica</i>) (root) *	
Olive (<i>Olea europaea</i>) (leaf) *	
* Daily Value not established	

Other ingredients: Capsule shell (gelatin and water), cellulose and magnesium stearate (vegetable source).

This product is gluten, dairy and GMO free.

RECOMMENDATION: One (1) capsule two (2) times each day as a dietary supplement or as otherwise directed by a healthcare professional.

CAUTION: Not recommended for pregnant or lactating women.

KEEP OUT OF REACH OF CHILDREN

Store in a cool, dry area.
Sealed with an imprinted safety seal for your protection.

Product # 6310 Rev. 09/18

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