

Microcidin® AF

Low FODMAP Anti-Microbial Formula

Key Features:

- Allium-free formula (**low-FODMAP compatible**) for **individuals intolerant to garlic**.
- **Berberine** has been shown to **improve IBS symptoms** (abdominal pain, stool frequency & urgency), as well as **anxiety and depression** in patients with IBS-D.
- **Cinnamon** - “warming” antimicrobial to **prevent loose stool** from the “cooling” property of berberine.
- Synergized with concentrated **Thyme** and **Oregano** extracts for **spasmolytic, carminative, and broad spectrum antimicrobial** effect in the GI tract.
- **Neem** and **Uva Ursi** extract are **potent antimicrobials, anti-biofilm**, and provide additional **gastroprotective** and **antiulcer** effects.

Indication:

- Small intestine bacterial or fungal overgrowth (SIBO or SIFO), Dysbiosis, Candidiasis
- H. pylori-induced gastritis, peptic ulcer disease (PUD)
- Gastroenteritis, food poisoning (prevention and treatment)
- Irritable Bowel Syndrome (IBS)
- Upper Respiratory Tract Infections (URTI), Cold/Flu

Description:

Microcidin® AF is a **low-FODMAP “Allium-Free”** broad spectrum antimicrobial formula that targets multiple mechanisms to inhibit and eradicate pathogenic bacteria, fungi and parasites in the gut.

Berberine has been used clinically to **relieve diarrhea caused by gastrointestinal infections**, as well as **diarrhea-type irritable bowel syndrome (IBS-D)**. It is well-known to have antimicrobial, antioxidants, anti-acetylcholinesterase, anti-diabetic and anticancer effects.^[1]

In an RCT involving patients with acute diarrhea caused by enterotoxigenic *Escherichia coli* (ETEC), a single dose of 400 mg of berberine sulfate* significantly reduced the stool volume in 8 hours, and stopped the diarrhea within 24 hours compared to controls.^[2]

In another RCT on patients with diarrhea-dominant IBS (n=196), 400 mg of berberine hydrochloride* was given twice daily for 8 weeks. Significant improvements in diarrhea frequency (p=0.032), abdominal pain frequency (p<0.01) and urgent need for defecation frequency (p<0.01) were observed in the berberine group compared to placebo.^[3]

Quantity: 112 Vegetarian Capsules

Ingredients (per capsules):

Berberine Hydrochloride.....	250 mg
Thyme Extract (20:1) (<i>Thymus vulgaris</i>).....	35 mg (leaf) (equivalent to 700 mg dried herb)
Cinnamon Extract (10:1) (<i>Cinnamomum aromaticum</i>).....	40 mg (bark) (equivalent to 400 mg dried herb)
Neem Extract (20:1) (<i>Azadirachta indica</i>).....	35 mg (leaf) (equivalent to 700 mg dried herb)
Uva Ursi Extract (10:1) (<i>Arctostaphylos uva-ursi</i>).....	35 mg (leaf) (equivalent to 350 mg dried herb)
Oregano Extract (5:1) (<i>Origanum vulgare</i>).....	50 mg (leaf) (30% carvacrol) (equivalent to 375 mg dried herb)

Non-medicinal Ingredients:

L-leucine, silicon dioxide, pullulan/ hypromellose (capsule)

Suggested Use:

Adults - Take 2 capsules with food, 2 times per day, or as directed by a health care practitioner. May increase the dosing to **3 times per day with food for SIBO Eradication**.

Berberine is well tolerated in clinical trials, with minor and transient gastrointestinal adverse events (mostly nausea) in the first 4 weeks with 1500 mg of berberine hydrochloride.^[4]

**Berberine sulfate contains 87.5% berberine; berberine hydrochloride contains 90.5% berberine.*

Thyme is a culinary herb traditionally used to help relieve **upper respiratory tract illness** (anti-catarrh, spasmolytic), and **flatulent dyspepsia and colic** (carminative).^[5] The active constituents are phenol and flavonoids compounds, such as **thymol**, geraniol, thujanol and linalool.^[6] Thyme possesses remarkable anti-biofilm, anti-adhesive and bactericidal properties^[7,8], as well as strong antimicrobial activity against clinical multidrug-resistant strains of *Staphylococcus*, *Enterococcus*, *Escherichia*, *Pseudomonas* genus^[9], antifungal, and antiherpetic properties.^[10]

Cinnamon is known to have multiple therapeutic actions involving **astringent, antimicrobial, carminative**, lipid-lowering, antioxidant/anti-inflammatory, insulin-sensitizing, astringent and anti-clotting properties.^[11]

In Traditional Chinese Medicine, cinnamon is considered “warming” and could protect the Spleen and reduced incidence of loose stool from the “cooling” property of berberine.^[15]



Study found two constituents of cinnamon, **eugenol and cinnamic acid**, have potent antioxidant activity and anti-inflammatory effect on *H. pylori*-induced gastritis in vitro and are **protective against gastric damage in vivo through stimulation of mucus secretion**.^[12] Recent studies have also demonstrated the anti-*Candida* and anti-biofilm efficacy of cinnamon^[13], as well as its antiviral activity against influenza A virus.^[14]

Oregano has been shown to exert cytotoxic, antioxidant, and antibacterial activities, which mostly attributed to **carvacrol and thymol**.^[16] It has been shown bacteriocidal and bacteriostatic to some clinically significant pathogens such as *Pseudomonas aeruginosa*, *E. coli*, *Acinetobacter baumannii*, *Candida albicans* and *S. aureus* (including MRSA).

Uva Ursi is traditionally used as antimicrobial/mild diuretic in UTI. It has also been demonstrated in vitro to have *anti-S. aureus* activity^[17], as well as **strongest direct growth-inhibitory and anti-quorum sensing (bacterial cell-to-cell communication systems)** against *Chromobacterium violaceum* and *Pseudomonas aeruginosa*, among seven selected medicinal plants.^[18] **Arbutin** is thought to be the main constituents for antimicrobial effect. Moreover, arbutin has been demonstrated to have **anti-ulcer/gastro-protective activity**, making it a potential application in gastrointestinal conditions.^[19]

Neem (*Azadirachta indica*) has been traditionally used in Chinese, Ayurvedic and Unani medicines worldwide for various diseases.^[20] Constituents such as **polyphenols, quercetin and beta-sitosterol** were identified to have antifungal and antibacterial activities through growth inhibition and cell wall breakdown. Studies also found neem has properties **against biofilm formation of MRSA and *P. aeruginosa***^[21, 22], as well as **potent gastroprotective and antiulcer effects**.

Reference:

1. Abd El-Wahab, A. E., Ghareeb, D. A., Sarhan, E. E., Abu-Serie, M. M., & El Demellawy, M. A. (2013). In vitro biological assessment of berberis vulgaris and its active constituent, berberine: antioxidants, anti-acetylcholinesterase, anti-diabetic and anticancer effects. BMC Complementary and Alternative Medicine, 13, 218.
2. Rabbani GH, Butler T, Knight J, Sanyal SC, Alam K. (1987). Randomized controlled trial of berberine sulfate therapy for diarrhea due to enterotoxigenic Escherichia coli and Vibrio cholerae. The Journal of Infectious Diseases, 155(5):979-84.
3. Chen C, Tao C, Liu Z, Lu M, Pan Q, Zheng L, Li Q, Song Z, Fichna J. (2015). A Randomized Clinical Trial of Berberine Hydrochloride in Patients with Diarrhea-Predominant Irritable Bowel Syndrome. Phytotherapy Research, 29(11):1822-7.

4. An Y, Sun Z, Zhang Y, Liu B, Guan Y, Lu M. (2014). The use of berberine for women with polycystic ovary syndrome undergoing IVF treatment. Clinical Endocrinology, 80(3):425-31.
5. Bradley PR, editor. British Herbal Compendium: A Handbook of Scientific Information on Widely Used Plant Drugs, Volume 2. Bournemouth (UK): British Herbal Medicine Association; 2006.
6. Abdul Qadir, M., Shahzadi, S. K., Bashir, A., Munir, A., & Shahzad, S. (2017). Evaluation of Phenolic Compounds and Antioxidant and Antimicrobial Activities of Some Common Herbs. International Journal of Analytical Chemistry, 2017, 3475738.
7. Mohsenipour, Z., & Hassanshahian, M. (2015). The inhibitory effect of Thymus vulgaris extracts on the planktonic form and biofilm structures of six human pathogenic bacteria. Avicenna Journal of Phytomedicine, 5(4), 309–318.
8. Miladi H, Mili D, Ben Slama R, Zouari S, Ammar E, Bakhrouf A. (2016). Antibiofilm formation and anti-adhesive property of three mediterranean essential oils against a foodborne pathogen Salmonella strain. Microbial Pathogenesis, 93:22-31.
9. Sienkiewicz M, Łysakowska M, Denys P, Kowalczyk E. (2012). The antimicrobial activity of thyme essential oil against multidrug resistant clinical bacterial strains. Microbial Drug Resistance, 18(2):137-48.
10. Swamy, M. K., Akhtar, M. S., & Sinniah, U. R. (2016). Antimicrobial Properties of Plant Essential Oils against Human Pathogens and Their Mode of Action: An Updated Review. Evidence-Based Complementary and Alternative Medicine : eCAM, 2016, 3012462.
11. Hariir M, Ghiasvand R. (2016). Cinnamon and Chronic Diseases. Advances in Experimental Medicine and Biology, 929:1-24.
12. Jung J, Lee JH, Bae KH, Jeong CS. (2011). Anti-gastric actions of eugenol and cinnamic acid isolated from Cinnamomi Ramulus. Yakugaku Zasshi, 131(7):1103-10.
13. Almeida Lde F, Paula JF, Almeida RV, Williams DW, Hebling J, Cavalcanti YW. (2016). Efficacy of citronella and cinnamon essential oils on Candida albicans biofilms. Acta Odontologica Scandinavica, 74(5):393-8.
14. Fatima M, Zaidi NU, Amraiz D, Afzal F. (2016). In Vitro Antiviral Activity of Cinnamomum cassia and Its Nanoparticles Against H7N3 Influenza A Virus. Journal of Microbiology and Biotechnology, 26(1):151-9.
15. Chinese Herbal Medicine: Materia Medica; Dan Bensky and Andrew Gamble, ed.; Eastland Press, Seattle, 1986.
16. Coccimiglio, J., Alipour, M., Jiang, Z.-H., Gottardo, C., & Sutures, Z. (2016). Antioxidant, Antibacterial, and Cytotoxic Activities of the Ethanollic Origanum vulgare Extract and Its Major Constituents. Oxidative Medicine and Cellular Longevity, 2016, 1404505.
17. Snowden R, Harrington H, Morrill K, Jeane L, Garrity J, Orian M, ... Langland J. (2014). A comparison of the anti-Staphylococcus aureus activity of extracts from commonly used medicinal plants. Journal of Alternative and Complementary Medicine, 20(5):375-82.
18. Tolmacheva AA, Rogozhin EA, Deryabin DG. (2014). Antibacterial and quorum sensing regulatory activities of some traditional Eastern-European medicinal plants. Acta pharmaceutica (Zagreb, Croatia), 64(2):173-86.
19. Taha MM, Salga MS, Ali HM, Abdulla MA, Abdelwahab SI, Hadi AH. (2012). Gastroprotective activities of Turnera diffusa Willd. ex Schult. revisited: Role of arbutin. Journal of Ethnopharmacology, 7;141(1):273-81.
20. Alzohairy, M. A. (2016). Therapeutics Role of Azadirachta indica (Neem) and Their Active Constituents in Diseases Prevention and Treatment. Evidence-Based Complementary and Alternative Medicine : eCAM, 2016, 7382506.
21. Harjai K, Bala A, Gupta RK, Sharma R. (2013). Leaf extract of Azadirachta indica (neem): a potential antibiofilm agent for Pseudomonas aeruginosa. Pathogens and diseases, 69(1):62-65.
22. Sarkar P, Acharyya S, Banerjee A, Patra A, Thankamani K, Koley H, Bag PK. (2016). Intracellular, biofilm-inhibitory and membrane-damaging activities of nimbolide isolated from Azadirachta indica A. Juss (Meliaceae) against methicillin-resistant Staphylococcus aureus. Journal of medical microbiology, 65(10):1205-1214.

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