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**File: ■ *Mondia (Mondia whitei)*
■ African Ethnobotany**

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RE: Review of *Mondia's* Aphrodisiac and Antidepressant Properties

Oketch-Rabah HA. *Mondia whitei*, a medicinal plant from Africa with aphrodisiac and antidepressant properties: a review. *J Diet Suppl.* December 2012;9(4):272-284.

Mondia (Mondia whitei), widely distributed in sub-Saharan Africa, is used throughout the region as food and medicine. Aerial and underground parts are used, with the root more common in medicine. The most cited use for *mondia* is as an aphrodisiac. Among East Africa's Luo people, it is called *ogombo*, or "desire." It is said to enhance desire for life, including food, sex, and happiness, stimulating libido and appetite. Other uses include uterine stimulant in childbirth, tonic, appetite enhancer, for indigestion, sexually transmitted diseases, constipation, bilharziasis, and stress and tension. *Mondia* may be an adaptogen, in that it seems to have many uses related to restoring wellbeing.

In Kenya, *mondia* is used to boost fertility and vitality, and to treat stomachache and rheumatism. Fresh or dried roots are steeped in water and filtered; the filtrate is taken with food or water. Roots are cooked in stews for flavor and to aid preservation. Found in Kenyan markets, *mondia* root is chewed by men and women. Bittersweet at first, roots become sweet while chewed, and modify taste buds to perceive plain water as sweet or sugary. This is thought to be due to 2-hydroxy-4-methoxybenzaldehyde, a tyrosinase inhibitor. The compound was reported in the earliest of only 10 publications on *mondia* found in PubMed on May 1, 2012; its taste-modifying effect was shown by later researchers.

Among its uses in Africa, *mondia* is added to soft drinks for flavor by South Africa's Zulu people and is also a flavoring agent in Uganda. Besides its taste-modifying compound, isovanillin and other benzaldehyde compounds give it a spicy, vanilla (*Vanilla planifolia*)-like taste.

Researchers have studied various fractions of root extracts, finding them rich in sterols, alkaloids, benzaldehyde metabolites, and glycosides. A chlorinated coumarinolignan has been reported. In vivo and in vitro studies found that hexane fractions had stronger effects than other fractions whenever they were used. Steroids, triterpenes, and aromatic benzaldehyde derivatives are a major portion of this fraction.

While modes of action remain unclear, *mondia's* aphrodisiac effect may be mediated through more than one pathway. Aphrodisiacs must either increase libido, potency (maintain erection), and/or sexual pleasure; *mondia* appears to do all three. It seems to

have reversible androgenic qualities (e.g., increased weight of reproductive organs) and may potentiate norepinephrine (NE) action on the vas deferens. It affects physiological actions involved in penile erection and thus may offer benefits in erectile dysfunction (ED). ED results from decreased nitric oxide (NO) generation, low cyclic guanosine monophosphate (cGMP) levels, and high phosphodiesterase (PDE) activity. In rabbits given ethanolic *mondia* extracts for six weeks, those receiving 200 mg/kg, but not those receiving either 100 or 400 mg/kg, had increased cavernosal tissue NO and cGMP. Rabbits given sildenafil as a positive control had slight decreases in NO and cGMP.

Various organic fractions of *mondia* were also examined in this study. A chloroform fraction showed the most activity; again, increases in NO and cGMP were seen at 0.01 mg/g but not at 0.10 mg/g. The authors suggested that in rabbits, an optimum dose might be 200 mg/kg, with higher or lower doses likely to have a negative effect on erectile function. Reduced α -adrenergic-stimulated contraction of guinea pig cavernosal tissue and consequent muscle relaxation, necessary for maintaining erections, has been reported. Inexperienced male rats given *mondia* extracts and placed with proestrus females had significantly shorter mount latency. Findings suggest that aqueous and hexane extracts of *mondia* may induce changes in levels of neurotransmitters, modulate their action on target cells, and/or increase androgen levels (as seen in earlier research).

In a study using human spermatozoa, *mondia* enhanced total motility in a time-dependent manner, with a significant effect at 120 minutes. Researchers said the effect was probably due to increased intracellular calcium and cyclic nucleotides through signaling pathways. *Mondia* may offer a treatment for asthenozoospermia.

ED is associated with depression, although the association is not well understood. *Mondia*'s effects on serotonin, noradrenaline, and dopamine uptake support its use as an antidepressant. Of 75 plants used in South Africa for depression investigated for the ability to inhibit serotonin reuptake, an ethanolic extract of *mondia* had a high affinity for the transporter. In a forced swim test in rats, the *mondia* extract had a significant effect, showing its antidepressant activity. A monoterpene lactone in *mondia* leaves, (-)-loliolide, has been identified through the serotonin transporter binding assay. It has apparently not been found in *mondia* root, but the plant is incompletely characterized.

While no clinical studies have assessed its safety, no ill effects were found in research animals given large quantities of *mondia* extracts. Much lower amounts used traditionally in Africa suggest that *mondia* is quite safe. In theory, it could interfere with selective serotonin reuptake inhibitors (SSRIs). More study is needed.

—*Mariann Garner-Wizard*

The American Botanical Council has chosen not to reprint the original article.

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