

# The role of *Mondia whitei* in reproduction: a review of current evidence

F Lampiao

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## Abstract

*Mondia whitei* has been used as a traditional cure for male infertility problems for a very long time. Unlike other medicinal plants used for treatment of male infertility, *Mondia whitei* effects on the male reproductive system have been thoroughly researched. This review sums-up the scientific evidence supporting *Mondia whitei* as an aphrodisiac.

## INTRODUCTION

Various plants have been used in folk medicines of different cultures to treat male infertility problems. Some have been identified pharmacologically, allowing for understanding of their mechanisms of action but most of these plants have not been scientifically investigated in order to test and substantiate their claimed properties<sup>1, 2</sup>. One such plant is *Mondia whitei*, an aromatic plant of the Periplocaceae family. It is a woody climber with large tuberous root stock which is widely distributed in Tropical Africa<sup>3</sup>. In Malawi, *Mondia whitei* is commonly known as Gondolosi. The roots are traditionally used as either aphrodisiacs or for treatment of urinary tract infection, jaundice and headaches, while the whole plant is used to treat diarrhea<sup>4, 5</sup>. As an aphrodisiac for the treatment of impotence and infertility, men eat the barks of the root or drink the aqueous extract of *Mondia whitei*.

Aphrodisiacs can be classified by their mode of action into three types: those that increase (1) libido (i.e., sexual desire), (2) potency (i.e., effectiveness of erection), or (3) sexual pleasure. This review seeks to shade more light on the functions of *Mondia whitei* as an aphrodisiac based on the scientific evidence available.

## MONDIA WHITEI AND LIBIDO

Libido increasing aphrodisiacs act at the level of the central nervous system by altering specific neurotransmitter or specific sex hormone concentrations. They can be effective in both sexes, although most act through an increase in testosterone concentration and are therefore male-specific<sup>6</sup>.

Studies have reported that chronic treatment of rats with *Mondia whitei* induced a significant increase in serum and testicular testosterone levels, the testicular protein content as well as sperm density. The observed increase in testicular protein content and weight may be the result of testosterone action. This increased sperm density observed in the cauda epididymis of the treated rats confirmed the androgenic effect of *Mondia whitei*. The findings of this study suggested that *Mondia whitei* possesses sex-stimulant property thus supporting its traditional use as an aphrodisiac.

## AND INCREASE IN POTENCY

The mode of action of aphrodisiacs in this class is generally through induction of vasodilatation, to allow for erection to occur. A good example of a synthetic drug in this category is Sildenafil (Viagra) manufactured by Pfizer. It is an oral drug for men with erectile dysfunction which produces satisfactory erections and improves sexual satisfaction<sup>7</sup>. Sildenafil appears to be effective for various conditions that cause impotence, such as diabetes, spinal cord injuries and drug effect<sup>8</sup>. It works by competitively inhibiting type-V cyclic guanosine monophosphate (cGMP)-specific phosphodiesterase enzyme (PDE) <sup>9</sup>. Inhibition of this iso-enzyme increases stores of cGMP, the second messenger of nitric oxide and a mediator of vasodilatation to the penis, which relaxes corpus cavernosal smooth muscle cells and increases blood flow into cavernosal spaces. This leads to increased intracavernosal pressure, which is a necessity in producing erection. However, Sildenafil may produce potentially hazardous cardiovascular effects for certain patients, such as those with coronary ischemia or congestive

heart failure, or patients taking multidrug antihypertensive regimens or drugs that might prolong the half-life of Sildenafil<sup>10</sup>.

*Mondia whitei* has been reported to have the ability to reduce  $\beta$ -adrenergically stimulated contraction of the guinea pig corpus cavernosum tissue thus relaxing the muscle<sup>11</sup>. Relaxation of cavernous smooth muscle is critical for inducing and maintaining penile erection<sup>12, 13</sup>. The ability of *Mondia whitei* to reduce  $\beta$ -adrenergically stimulated contraction of the corpus cavernosum suggests that this plant might possess a therapeutic potential in the treatment of erectile dysfunction. The corpus cavernosum relaxation induced by *Mondia whitei* was not via NO as evidenced by the inability of NG-nitro-L-arginine methyl ester (L-NAME), a non-specific NO synthase inhibitor to abolish it<sup>11</sup>.

### **AND SPERM FUNCTION**

The potency of *Mondia whitei* as an aphrodisiac has not only been demonstrated through its ability to increase testosterone production or relax corpus cavernosum tissue, but by also enhancing human sperm function. We have shown in our laboratory that an aqueous extract of *Mondia whitei* is beneficial to human sperm function as demonstrated by enhanced total motility and progressive motility in a time-dependent manner in vitro<sup>14</sup>. The mechanism through which this action occurs is still unclear and needs further investigation

### **CONCLUSION**

There is enough scientific evidence supporting the use of *Mondia whitei* as an aphrodisiac. The evidence indicates that it is able to increase libido by stimulating testosterone production, increase potency by being able to relax the corpus cavernosum muscle thus aiding erection and by improving sperm total motility and progressive motility. *Mondia whitei* can be used as an alternative medicine in vivo

in the treatment of men affected with asthenozoospermia (less than the reference value for motility) as well as erectile dysfunction.

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**Author Information**

**Faniel Lampiao, MSc**

Department of Physiology, College of Medicine