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REVIEW ON NATURAL APHRODISIAC POTENTIALS TO TREAT SEXUAL DYSFUNCTION

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ABSTRACT

Erectile dysfunction (ED) or male impotence is defined as the inability of a man to achieve and maintain an erection sufficient for mutually satisfactory intercourse with his partner. Sexual health and function are important determinants of quality of life. To overcome the problem of sexual (or) erectile dysfunction various natural Aphrodisiac potentials are preferred. This review will discuss the current research done on the most popular natural aphrodisiacs and examine the weight of evidence to support the use of any of these substances to enhance sexual desire and function. A variety of natural aphrodisiac potentials are known to have a potential effect on the sexual functions, supporting older claims and offering new hopes. The available synthetic drugs and treatments have limited efficacy, unpleasant side effects and contraindications in certain disease conditions. The present review, describes the detail information about the major constituents and their medicinal importance found in naturally occurring plants, which are helpful to further development of pharmaceutical formulations.

Key Words: Erectile dysfunction, Male impotence, Aphrodisiac potentials, Herbal drugs.

INTRODUCTION

Sexual relationships are some of the most important social and biological relationship in human life. Male impotence also called Erectile dysfunction (ED) is a common medical condition that affects the sexual life of millions of men worldwide (Montorsi *et al*., 2003; Shab Singh *et al*., 2003). Erectile dysfunction is defined as the inability of a man to achieve and maintain an erection sufficient for naturally satisfactory intercourse. Sexual dysfunction is a serious medial and social symptom that occurs in 10-52% of men and 25-63% of women (Porst-2004). It is the repeated inability to achieve normal sexual intercourse male impotence (or) erectile dysfunction is a significant problem that may contribute to infertility (Yakubo *et al.,* 2003) function decreases spontaneously with advanced aging. It occurs commonly in middle aged and older men. Erectile dysfunction is adversely affected by diabetes mellitus, antihypertensive, antipsychotic, antidepressant therapeutic drugs. Organic causes of erectile dysfunction like Hypogonadism, hyperprolactinaemia, and neurological disorders. (Mendoza-Lujambio *et al*., 2008). Treatment of ED involves several natural aphrodisiac potentials. Aphrodisiac is described as any substance that enhances sexual pleasure (Guay *et al*., 2003; Rosen *et al.,* 1993). Sexual dysfunction caused by various factors such as psychological disorders like Anxiety, depression, stress, fear of sex, neurological disorders, stroke, cerebral

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trauma, alzhemiers, Parkinson's disease and chronic disorders–diabetes, hypertension, vascular insufficiency, Atherosclerosis, penile disease–phinosis, peyronies, life style–chronic alcohol abuse, cigarette smoking, aging-decrease in hormone level with age. Systemic diseases – cardiac, hepatic, renal, pulmonary, cancer. (Guay *et al*., 2003; Feldman *et al.,* 1994; Kandeel *et al*., 2004). Among natural treatment various treatments like psychotherapeutic approach. Pharmacotherapy involves locally acting vasoactive drugs such as papaverine and alprostadin (Bostandjier and Mitra, 2004) and first line oral therapy for ED includes phosphodiesterase type-5 (PDE-5) inhibitors such as sildenafil, verdenafil and tadalafil which inhibit hydrolysis of second messenger cyclic guanosine mono phosphate (GMP) release with in penile smooth cells (Montorsi *et al*., 2006; Wespes *et al*., 2006).

The available drugs and treatments have limited efficacy, unpleasant side effects and contraindications in certain disease conditions. Sildenafil Citrate (Viagra) is a successful drug that modifies the heamodynamics in the penis (Segraves *et al.,* 2003). But side effects with this drug are headache, flushing, dyspepsia and nasal congestion are reported with this treatment (Lue, *et al* 2003).

The importance of sexuality in human life is well recognized in the ancient Indian medicine ayurveda as an entire specialty is devoted to it under the name 'Vijakarna' or virilification therapy. Vajakarna therapy includes aphrodisiacs for erectile dysfunction, causes of infertility, spermatogenesis, semenogenesis reproduction, methods of correcting defective semen and sexual satisfaction (Sharma *et al*., 1990).

Mechanism involved in Aphrodisiac potentials

On sexual stimulation (visual (or) otherwise the famines of the axons of parasympathetic nerves release nitric oxide (NO) gas. The gas diffuses into smooth muscle cells that line those arteries of the corpus carvenosum (spongy erectile tissue) and activates the enzyme guanylate cyclase (GC). The later converts the nucleotide guanosine triphosphate (GTP) into cyclic guanosine monophosphate (C.GMP). The C.GMP in turn causes the smooth muscle cells around the penis to relax, leading to dilation and increased flux of blood into the penile tissue. This blood is essentially trapped in the penis and results in an erection (Palmer – 1999). The erection ceases after a while because C.GMP is hydrolyzed by phosphodiesterase type-5 enzyme (PDE-5) into inactive GMP. (The PDE-5 enzyme resides in the penile tissues). Aphrodisiac potentials inhibit the hydrolyzing action of PDE-5 with the result that active C.GMP can accumulate. 'Undisturbed' and prolong the erection through increased blood flow (Chew *et al.,* 2000).

Since many people are now relying on herbal medicines for health care (Griffin *et al*., 1998). In ayurveda, the following plants that have on aphrodisiac effect. These include *Myristica fragrans Houtt (Myristicaceae), Fadogia agrestis (Rubiaceae), Allium tuberosum (Zingiberaceae crocus sativus L. (Iridaceae). Palisota Hirsuta (Commelinaceae) Mondiawhiteion, (Periplocaceae), passiflora incarnatal (Passifloracae), Boesen bergia rotunda L. (Zingiberaceae), Eurycoma longifolia (Simarubaceae), Lepidium myenii (Brassicaceae), Montanoa tomentosa: Securidaca longepedunculata (Polygalaceae), Duriozibentihs L (Bombacaceae) Dactylorhiza hatagirea (Orchiadaceae), securidaca longepedunculata (Polyganaceae), suzygium aromaticum L (Myrtaceae), Vanda tessellata, Butea frondosa (Papillionaceae), Fodgia agrestis (Rubiaceae).*

1. *Crocus Sativus*

Crocus sativus L., commonly known as saffron, is a Perennial stemless herb of iridaceae family that is widely cultivated in Iran and other countries, including India and Greece (Rios *et al.,* 1996). In traditional medicine, saffron is recommended an aphrodisiac agent (Madan *et al*., 1966). Thus in this study the effects of saffron stigma extract and two active constituents, crocin and safranal, on sexual behaviors were evaluated in male rats. The aqueous extract of C. Sativus and crocin can be considered to have aphrodisiac properties (Hosseinzadeh *et al.,* 2008).

2. *Allium tuberosum*

Allium tuberosum since Ancient times have been used as food, spices and herbal remedies. It is rich source of steroidal saponins, alkaloids, as well as sulfur containing compounds (Hostettmann, *et al.,* 1995). In China it seeds have been reputedly used as a traditional Chinese medicine. For treating both impotence and nocturnal emissions. This plant provide experimental evidence that the n-butanol extract preparation of *Allium tubersum* seeds, used as a traditional remedy, possesses aphrodisiac property (Hu Guohua *et al*., 2009).

3. *Eurycoma Longifolia*

Eurycoma longifolia jack (Simarubacae) is a small tree that has been used as a medicinal herb for countries in south East Asia. In Malaysia, the plant is traditionally used as an aphrodisiac. Recent studies conducted in rats confirmed the sexual enhancing proportion of this plant (Ang *et al*., 2000). Over the years, this plant has been shown to exhibit antimalarial (Hooi Hoon Ang *et al.,* 1998) antiulcer and antipyretic activities. (Ang *et al*., 2000). The test extract was prepared from the roots of the plant. This plant suggests that it may be effective in human HSDD (Hypo active sexual desire disorder) finally , *Eurycoma longifolia* found to be an

aphrodisiac effect as evidence by the enhanced sexual orientation (Ang & Lee *et al.*, 2002).

4. *Mondia whitei*

Mondia whitei belongs to periplocaceae family. Barks of the roots of *Mondia whitei*, have been used since a pretty long time as an aphrodisiac agent alone or in combination with ingredients such as roots of *Albizia antunesiana* Harms (Mimosaceae) and Stem-bark of *Ozoroa insigni* del (Anarcadiaceae) (Noumi *et al.*, 1998: Carpentier *et al.*, 2004). The aqueous and hexane extracts from the dried roots of *Mondia whitei* shows sexual enhancement, in experienced male rats (Watcho *et al.*, 2004).

5. *Boesenbergia Rotunda*

Boesenbergia rotunda (L) in Tailand, they are also used as a folk medicine for health promotion antiflatulence, stomach discomfort, diuresis, Leucorrhea treatment of oral diseases and anti dysentery (Hemhongsa *et al.*, 1998). It long been used among Thai men for sexual enhancement by using it as an ingredient of traditional remedies for impotency sexual enhancing herb (Theingburanathum *et al.*, 1995, Wutythamawech *et al.*, 2000, Deewiset, 1999). The chemical constituents present in it are 1, 5-cineole, Boesenbergin A, dl-Pinostrobin corphor, flavonoid, Chromene (Hemhonga, 1998), Pandurtin C, Panduratin A hydroxyl Panduratin A, helichrystein, 2^1, 4^1, 6^1 – trihydroxyhydrochalcone and Uvangoletin (Cheen pracha *et al.*, 2006). In addition to the purposes of primary health care, the rhizomes have been reported as having aphrodisiac properties (Theingburanathum *et al.*, 1995, Wutythamawech *et al.*, 2000, Deewiset, 1999). It has long been used among Thai men for sexual enhancement by using it as an ingredient of traditional remedies for impotency. (Paiwan Sudwan *et al.*, 2007).

6. *Myristica fragans: (Myristcacecae)*

Myristica fragrans Houtt (nutmeg) has been mentioned in Unani medicine to be of value in the management of, male sexual disorder due to the presence of sterols, phenols, alkaloids and amino acids. The suspension of the extract shows resultant significant and sustained increase in the sexual without any adverse effects. (Tajuddin *et al.*, 2005). The 50% ethanolic extract of nutmeg possess aphrodisiac activity. Thus it provides a scientific rationale for the traditional use of nutmeg in the management of male sexual disorders.

7. *Lepidium Mayenii*

Lepidium meyenii (Maca) is Peruvian hypocotyls which belongs to, Brassicaceae family and is traditionally employed in the Andean region for its supposed aphrodisiac and fertility enhancing properties. Multiple regression analysis showed that serum testosterone levels were not affected by treatment with Maca (Gonzales *et al.*, 2001). The aphrodisiac properties of the root of *Lepidium meyenni* (Maca) have recently been described (Zheng *et al.*, 2003). Additionally, a favorable effect on spermatogenesis has been observed in for both, adult male rats and adult men (Gonzales *et al.*, 2001).

8. *Passiflora incarnata*

Linneous (Passiflaraceae) is a fast growing perennial vine and has been used mainly as an anxiolytic, sedative, anticonvulsant and analgesic in traditional system of therapeutics in many countries. The methanolic extract *Passiflora incarnate* leaves shows aphrodisiac effect (Dhawan *et al.*, 2003).

9. *Securidaca Longepedunculata*

It (Fresen) beolngs to Polygalaceae. Found in venda are used to treat erectile dysfunction. *Securidaca longepedunculata* s used as a general remedy for several other ailments such as cough,cold,fever,body ache,tooth ache,veneral disorders,malaria,tb,inflammation,ulcers and pneumonia(Galeffi *el al.*,1990).The plant is having profound knowledge of traditional medicine,which can possibly be harvested for the treatment of sexual impotency.The chloroform and ethonolic extract of root bark of *Securidaca longepedunculata* can deal successfully with erectile dysfunction (Rakuambo *et al.*, 2006).

10. *Montanoa tomentosa*

Montanoa tomentosa have an extensive ethnomedical history of use as a traditional remedy for reproductive impairments. M. to aqueous crude extract has been used for the last 5 centuries for the induction of labor, regulation of fertility, treatment of postpartum bleeding problems and to induce menses (Gallegos *et al.*, 1983 , southam *et al.*, 1983).This plant has been described to possess anti pregnancy activity in women. The aqueous extract of the leaves is administered orally during early stage of pregnancy (Hahn *et al.*, 1981). The aqueous *Montanoa tomentosa* used are traditional remedy posses aphrodisiac properties.

11. *Dactylorhiza hatagirea*

Dactylorhiza hatagirea (D. don) belongs to Orchidacea family. Which are synonymous to the tubers of orchis macula (orchidaceae) and serve as source of salep, are used traditionally in Indian subcontinent especially in northern region and Nepal are aphrodisiac and sexual stimulant. It is also considered as an alternative source of salep used very commonly in Europe (Bhattarain *et al.*, 1996), lyophilized aqueous extract of roots was studied for effect on sexual behavior and spermatogenesis in male albino rats It is considered as an important aphrodisiac plant in Ayurvedic, unani literature and is employed to enhance performance as well as to increase vigor and uitality (Bhattarain *et al.*, 1996).

12. *Durio, Zibenthinus*

Durio, Zibenthinus Linn belongs to the Bombacaceae family. The family Bombacaceae is best known for stowy flowers and woody or thin-shelled pods filled with small seeds and silky or cotton like fiber. The durian, *Durio zibenthinus L*., is one member that differs radically in having large seeds. Surrounded by fleshy arils. β-galactosidase was isolated from (Tanboly, 2001), forty-three sulphur containing constituents were found. It contains esters, sulphur containing compound, ketones, alcohols (Wong & Tie., 2006) and ethyl-2methyl butanoate was found to have highest odour impact among the non-sulfurus odourants in durain (Weenen *et al*., 1996). Traditionally the fruits of *Durio zibenthinus* are being used by people all over the world for their fertility enhancing activity. The pet ether extract of *Durio zibenthinus* shows significant aphrodisiac activity (Venkatesh *et al*., 2009).

13. *Fadogia agrestis (Rubiaceae)*

This plant is used to modify sexual functions, in animals, especially those arising from hypotesteronemia. Phytochemical screening of the aqueous extract of Fadogia agrestis stem showed the presence of alkaloids and saponins, while anthraquinones and flavonoids are present in small amount. Saponins have been implicated as possible bioactive agent responsible for the Aphrodisiac effect in Tribulus terrestris extract (Gauthaman *et al*., 2002). The prolonged ejaculatory latency indicates enhancement of sexual function and suggests an aphrodisiac action male rats were orally dosed with 18mg/kg, 50mg/kg and 100mg/kg body weight, respectively, of the extract at 24hr intervals and their sexual behavior parameters and serum testosterone concentrations were evaluated at days 1, 3 and 5 (Yakubo *et al*., 2005. There was also a significant increase in serum testosterone concentration in all groups of tested animals (Yakubo *et al*., 2005). So, it may be used to modify impaired sexual functions in animals especially those arising from hypotesteronemia.

14. *Butea frondosa (Papilionaceae)*

It is reported to possess antistress, hepatoprotective, antiestrogenic, ocular inflammatory and antihelminthic activities. *Butea frondosa* is also claimed to possess aphrodisiac, expectorant, emmenagogue, diuretic and astringent properties. These claims are based largely on subjective opinion rather than scientific observation (Ramachandran *et al*., 2004).

15. *Vanda tessellata*

Although orchids are being cultivated and valued, mainly for ornamental purposes, some of them are used from time immemorial in traditional practices to treat various medical conditions. One among them is V. tessellate (Roxb) Hook exbon. This is an epiphytic orchid which is found in many part of India (including Western Ghats), Sri Lanka and Burma. This plant has been used in the indigenous medicine such as Ayurvedic local traditional medical practices (Chopra *et al*., 1965). The leaf juice is used for treatment of certain inflammatory conditions. The leaves in the form of a paste are applied to the body to bring down fever (Basu *et al*., 1971). The roots are used in rheumatism, nervous problems, bronchitis, dyspepsia and fever (Kirtikar, 1978). This plant root is reported to contain an alkyl perulate and β-sistosterol-D-glucoside. The dried whole herb also contains long chain alkanes and alkanol sistosterol, resin, saponins, tannins, fatty acids, colouring agents (Das *et al*., 1967, Prasad *et al*., 1968). The aqueous or alcoholic extract of V-tessellata shows aphrodisiac activity (Suresh Kumar *et al*., 2000).

16. *Palisota Hirsuta (Commelinacea)*

It is a traditional herbal medicine in cote 'd' Ivoire. Total flavanoids are extracted from leaves of *palisota Hirsuta Thunb.K Schum.* These plants contain secondary metabolites of which the flavonoids, occupy a place of choice in modern medicine (Drewes *et al*., 2002). The plant possesses aphrodisiac activity by the assessment of sexual stimulant properties among the male rats. The total flavonoids extracted from *Palisota hirusta* leaves possess the aphrodisiac property (Boua Boua Benson *et al*., 2008).

17. *Syzygium aromaticum*

Clove is the dried flower bud of *syzyyium aromaticum (L) Merr* and Perry belongs to the family (Myrtaceae). It is an evergreen three 10-20m in height indigenous to India, Indinesia, Zanzibar, Mauritus and Sri Lanka (Trease & Evans, 1972). It is one of the most important drugs used in indigenous medicine in India, especially in Unani medicine. Clove is reported to have as aphrodisiac (Treas and Evans, 1972). Phytochemical studies indicate that the clove contiaines free eugenol, eugenol acetate, caryophyllene, sesquenterpene ester, phenyl prop anoid, β-caryophyllene, Eugenol and acetyle eugenol (Rastogi *et al*., 1984, Miyazawa *et al*., 2003, Ghelardini *et al*., 2001, Srivastava *et al*., 1993). The results indicated that the 50% ethanolic extract of clove produced a significant and sustained increase in sexual activity of male rats, Thus, the resultant aphrodisiac activity of the extract lends support to the claim for its traditional usage in sexual disorders (Tajuddin *et al*., 2004).

List of plants having aphrodisiac potentials

	Plant	Part used	Extract	Chemical constituents	Traditional uses
1.	*Crocussativus (iridaceae)*	Stigma	Aqueous extract	Safranal and crocin	Aphrodisiac agent
2.	*Alliumtuberosum (Zingiberaceae)*	Seeds	n. butonol extract	Steroidal saponins and alkaloids	Aphrodisiac agent
3.	*Palisota hirusta (Commelinaceae)*	Leaves	Aqueous extract	Flavanoids	Aphrodisiac property
4.	*Eurycoma longifolia (Simarubaceae)*	Whole plant	Chloroform and aqueous extract	Quassinoids, squalene derivatives, biphenylneolignans, triterpenes, conthine-6-one and 1-carboline alkaloids.	Aphrodisiac agent Also effective in human HSDD, (Hypoactive sexual desire disorder) antimalarial antiulcer, antipyretic.
5.	*Mondia whiteion (Periplocaceae)*	Roots	Aqueous and Hexane extracts	Steroids triterpenes, aldehydes.	Aphrodisiac agent
6.	*Boesenbergia rotunda (L) (Zingeberaceae)*	Rhizomes	Ethanolic extract	Flavonoids Boesenbergin A, Chromene, Panduratin C& A, Chalcones.	Aphrodisiac agent. Also used as antiflatulence, stomach discomfort, antidysentry, diuresis, treatment of oraldisease etc.,
7.	*Myristica fragrans (myristicaceae)*	Seeds	50% Ethanolic extract	Sterols, phenols, alkaloids, aminoacids.	Aphrodisiac agent. Also used as analgesic, anti inflammatory and anti diarrheal.
8.	*Lepidium meyenii (Brassicaceae)*	Root	Alcoholic extract	Macaene and Macamide, multi saturated fattyacids, and amides.	Fertility enhancer and aphrodisiac agent.
9.	*Passiflora incarnata (Passifloraceae)*	Leaves	Methanolic extract	Bioactive benzoflavone compound (BZF)	Aphrodisiac effects anxiolytic sedative, anti convulsant.
10.	*Securidaca longepedunculata (Polygalaceae)*	Root bark	Chloroform	1, 7-dimethery 2- Hydroxy Xanthone	Treats erectile dysfunction. Also used to treat cough, cold, fever, bodyache, toothache, malaria, veneval disease, tB, inflammation, Ulcer and pneumonia.

11.	*Montanoa tomentosa*	Whole plant	Aqueous extract	Diterpenes such as, montanol, and zoapatanol.	Aphrodisiac property.
12.	*Dactylorhiza hatagirea (Orchidaceae)*	Roots	Aqueous	Steroids	Aphrodisiac activity, Nutritive and restorative tonic.
13.	*Durio Zibenthinus (Bombacaceae)*	Fresh fruits	Petroleum ether	β-galactosidae, ketones, alcohols, sulphur containing compounds, esters.	Aphrodisiac activity.
14.	*Fadogia agrestis (Rubiaceae)*	Stem	Aqueous extract	Alkaloids and saponins, anthrquinones and flavonoids.	Aphrodisiac activity used in hypotestoste onemia.
15.	*Butea frondosa (papilionaceae)*	Whole plant	Aqueous extract	----	Aphrodisiac activity. Also used as antistress activity, hepato protective, anti estrogenic, anti-inflammatory, and anti helminthic activities.
16.	*Vanda tessellata*	Root, flower	Alcohol (or) aqueous extract	Alkyl perulate and β-sitosterol D glucoside, alkanes, alkanol, sitosterol, resins, fattyacids, colouring agents.	Aphrodisiac activity. Also used in rheumatism, nervous problems, bronchitis, dyspepsia, fever.
17.	*Syzygium aromaticum (Myrtaceae)*	Dried flower buds	50% ethanolic extract	Eugenol, eugenolacetate, caryophellene, acetyle eugenol, sesquiterpene ester, phenyl propanoid.	Aphrodisiac agent. Also used as stomachic, carminative, antispasmodic, cataract, anti carcinogenic property, inhibits platelet aggregation, posses antiviral activity.

CONCLUSION

This review focuses on several natural Aphrodisiac potentials. Erectile dysfunction is defined as the inability of a man to achieve and maintain on erection. Aphrodisiac can therefore be described as any substance that enhances sex drive and (or) sexual pleasure. Aphrodisiac are used to improve the sexual behavior and performance. This study validates the effectiveness of herb in improving as well as preventing the functionality of sexual organ, several natural aphrodisiacs like *Allium tuberosum*, crocus *sativus, mondia whiteion, Boesenbergio* rotunda, *Myristicafragrans, Palisota hirusta etc.*, are being nominated as herbal cure for sexual dysfunction. Several medicinal plants are used in ayurvedic formulations as aphrodisiac potentials to enhance performance as well as to increase vigor and vitality under several researcher studies in current trend.

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