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A Review of Some Ornamental Plants Used in the Treatment of Reproductive Disorders



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ABSTRACT

Plants have been used for treatment of several disorders since long before history. Ornamental plants are plants which are mainly grown for their aesthetic value, however, there are many ornamental plants that are being used as folk medicine in the treatment of various diseases. This review highlights some ornamental plants on KNUST campus, Kumasi, with medicinal properties used in treating some reproductive disorders. Present paper aims to provide basis for further drug discovery of active phytochemicals for managing reproductive disorders.



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INTRODUCTION

The continuous existence of species is maintained through reproduction, with genetic code passed from one generation to the next. Reproductive dysfunction, a disorder resulting from the inability to achieving a normal sexual intercourse and these include premature ejaculation, retrograded or retarded ejaculation, erectile dysfunction, and arousal difficulties (reduced libido) (Patel *et al.*, 2011). Reproductive disorders are steadily increasing worldwide due to etiological factors and aging (Figura *et al.*, 2012; Patel *et al.*, 2011). Although synthetic drugs are available for treatment of these reproductive disorders, they come with severe side effects and higher cost. The use of natural supplements from medicinal plants as remedy is therefore significantly increasing (Patel *et al.*, 2011).

Ornamental plants are described as plant species that are primarily cultivated for their aesthetic characteristics (Davidson and Miller, 1990). However, an important use of these plants is their use as folk medicine (Ahmed *et al.*, 2013). It is, therefore, imperative that in-depth knowledge is acquired on the medicinal properties of these ornamental plants (Larbie and Abboah-Offei, 2014). This would serve as a noble source of remedy to various diseases including reproductive disorders as well as conserving these plants from going extinct.

MATERIALS AND METHODS

Monograph of all ornamentals plants cultivated in lawns on the main Campus of Kwame Nkrumah University of Science and Technology (KNUST) were reviewed. Searches were made on Google Scholar and PubMed Central to identify those with documented use for reproductive diseases. Information on plat part used, phytochemistry and reproductive disorder treated were documented. In all, five (5) plants were identified and summarized as shown in table 1.

RESULTS

Table 1: Ornamental plants on KNUST actively used in treating reproductive disorders

Name of plant	Family	Part(s) used	Extract studied	Activity	Reference
1. <i>Allamanda cathartica</i> L.	Apocynaceae	Leave	Aqueous	Antifertility	Singh and Singh, 2008
2. <i>Caesalpinia Pulcherrima</i> L.	Fabaceae	Leaves and bark	Aqueous	Abortifacient	Chakraborty <i>et al.</i> , 2009
3. <i>Cassia fistula</i> L.	Fabaceae	Stem, bark, seeds, flower, Fruits	Aqueous, Ethanolic, petroleum Ether (seeds)	Amenorrhea, inhibition of ovarian function	Bhalerao and Kelkar (2012); Danish <i>et al.</i> , 2011
4. <i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Flowers	Ethanolic and Benzene	Fertility, female contraceptive	Prakash, 1979
5. <i>Jatropha podagrica</i>	Euphorbiaceae	Roots; water extraction of branches	Methanol	Gonorrhoea	Nowshin <i>et al.</i> , 2012

DISCUSSION

The presence of phytochemicals such as saponins, tannins, alkaloids, just to mention a few are believed to have conferred these medicinal properties in these ornamental plants (Usha and Bopaiah, 2011).



***Allamanda cathartica* L.**

The family Apocynaceae consists of several important medicinal plants with wide range of biological activities and interesting phytochemical constituents. *Allamanda cathartica* L. commonly known as the yellow bell, golden trumpet or the buttercup flower is a genus of tropical shrubs. The word ‘cathartica’ means purgative (Tiwari *et al.*, 2002).

All parts contain the toxic iridoid lactone allamandin (Abdel-Kader *et al.*, 1997). The bark, latex and the infusion of its leaves in small doses are cathartic. The decoction of its bark is a hydragogue. Its latex is employed as a purgative and for relieving colics. It has also been implicated in the treatment of malaria and jaundice (Prabhadeviet *al.*, 2012). Phytochemicals present are plumericin and isoplumericin (extracted from stem and root bark and leaves), according to Nithya and Muthumary (2011). The oral administration of aqueous leaf extract of *A. cathartica* induces infertility and changes in various male reproductive endpoints in Parkes strain mice. Histologically, tests in extract-treated mice showed non-uniform degenerative changes in the seminiferous. The treatment also had adverse effects on motility, viability, morphology and on number of spermatozoa in the cauda epididymitis. Fertility of the extract-treated males was also suppressed (Singh and Singh, 2008).

Caesalpinia pulcherrima L.



Caesalpinia pulcherrima L., known as peacock flower is widely distributed in India and its leaves, flower, bark and seeds are used in Indian medicine (Ambasta, 1998). Plant is considered as a tonic, stimulant and emmenagogue. The leaves are used as cathartic while the bark is used as abortifacient (Chakraborty *et al.*, 2009).

Phytochemicals screening showed that aqueous extracts possess tannins. Ethanolic extract showed alkaloids, steroids, flavonoids, saponins, and gums (Sharma *et al.*, 2013).

Cassia fistula L.



Cassia fistula L., (Caesalpinioideae), very common plant is known for its medicinal properties. It is a semi-wild Indian Laburnum. Known as the golden shower, it is distributed in various regions including Asia, South Africa, China, West Indies, China, West Indies and Brazil (Prashanth, 2006). It is a deciduous tree with greenish gray bark, compound leaves; leaflets are each 5-12 cm long pairs. A semi-wild tree is known for its beautiful bunches of yellow flowers (Gupta, 2010). Root is useful in fever, heart diseases, retained excretions and

biliousness. The root is also useful in treating rheumatic condition, hemorrhages, wounds, ulcers and boils and various skin diseases (Nadkarni, 2009; Erik *et al.*, 2009). The stem bark is used against amenorrhoea, chest pain and swellings (Erik *et al.*, 2009).

The extract of the flower inhibits the ovarian function and stimulate the uterine function in albino rats, while the fruits are used in the treatment of diabetes, antipyretic, abortifacient, demulcent, lessens inflammation and heat of the body (Kirtikar and Basu, 2006). The petroleum ether extract of seeds of *Cassia fistula* screened for the antifertility activity in proven fertile female albino rats resulted in a decline in the fertility index, numbers of uterine implants and live fetuses in a dose dependent manner as confirmed by laparotomy (Bhalerao and Kelkar, 2012). This indicated that the petroleum ether extract of *Cassia fistula* seeds possesses pregnancy terminating effect by anti-implantation activity (Gupta *et al.*, 2000). The phytochemicals present in aqueous extract are anthraquinone glycosides, flavonoids, phenolic compounds and carbohydrates (Sharma *et al.*, 2013).

***Hibiscus rosa-sinensis* L.**



Hibiscus rosa-sinensis L. flowers have been reported to possess significant antifertility activity in female albino rats (Prakash 1979). *Hibiscus rosa-sinensis* L.(Malvaceae) is an ornamental plant often a hedge or fence plant. It is native to China and is also seen in India and Philippines. This plant has several forms and varying colors of flowers.

This is a national flower of Malaysia (Bhaskar, 2011). The phytochemicals present in the flower extract reveals the presence of Thiamine, Riboflavin, Niacin and Ascorbic acid, Apigenidin, citric acid, fructose, glucose, oxalic acid, pelargonidin, quercetin (Ambasta, 1992). Another study reveals that the flowers contain vitamins, flavonoids, ascorbic acid, niacin, riboflavin, thiamine and cyaniding diglucoside. Quercetin-3-diglucoside, cyanidin-3-

sophoroside-5-glycosides, 3, 7-diglucoside, cyanidin-3, 5-diglucoside have been isolated from deep yellow flowers (Srivastava *et al.*, 1976). It has been reported that the plant flower possesses anti-spermatogenic and androgenic, making the plant flower ethanolic extract essential for the initiation and maintenance of spermatogenesis (Reddy *et al.*, 1997; Vijaykumar *et al.*, 2004).

Jatropha podagrica



Jatropha podagrica commonly called coral nut is from the family *Euphorbiaceae*. is a shrub native to tropical America, but it is also found in Australia, the Hawaiian Islands, Southern Africa, Mozambique, Zambia and warmer parts of Asia. *Jatropha* species are used in traditional medicine for various diseases including skin infections, sexually transmitted diseases such as gonorrhoea, jaundice and fever (Nowshin *et al.*, 2012).

Previous 143 phytochemical investigations of *J. podagrica* led to the isolation of japodic acid, erytrinasinate, n- hexacosane, β -amyrin, lupeol palmitate, quercetin, apigenin, vitexin, isovitexin, rutin, podacycline A, podacycline B and 3-acetylaleuritolic acid. The crude methanol extract of *J. podagrica* led to the isolation of six metabolites: fraxidin, fraxetin, scoparone, 3-acetylaleuritolic acid, β -sitosterol and sitosterone (Nowshin *et al.*, 2012). *Jatropha podagrica* has been reported to be active in treating gonorrhoea (Nowshin *et al.*, 2012).

CONCLUSION

Reproductive disorders are treated by surgical means and the use of synthetic drugs. However, there is an increasing demand and use of plants which are the true natural source of medicine. The accounting factors for these natural remedies is because of they have less

severe side effects, they are inexpensive compared to synthetic medicines as well as readily available for use.

These plants and other ornamental plants need to be further studied and investigated to find the active components responsible for their function in treating reproductive disorders. Further studies should be done on their potency and toxicity in acknowledging the safety for their usage since the plants listed are “folk medicine”.

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