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A Comprehensive Review on Five Medicinal Plants of Bangladesh

Chemical Constituents and Uses

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Abstract:

Since primordial period, plants are being utilized as a potent source of medicine to treat many life-threatening diseases. One of the potential way to evaluate the importance of the medicinal plant is to identify its active chemical constituents and pharmacological activities. Thus, the present study involves a thorough discussion about the general description, phytochemistry and medicinal properties of five different plants. *Gymnema sylvestre*, *Momordica charantia*, *Coccinia cordifolia*, *Trigonella foenum-graecum*, and *Lagerstroemia speciosa* are the selected plants which are the main focus of the study. All the selected plants are belong to different families but possess similar pharmacological activities such as anti-diabetic, anti-cancer, antioxidant, antimicrobial, analgesic, anti-inflammatory, anti-nociceptive, hypolipidemic and so on. Here, we have reviewed all the reported chemical constituents as well as the pharmacological activities of the plants.

Keywords: *Gymnema sylvestre*, *Momordica charantia*, *Coccinia cordifolia*, *Trigonella foenum-graecum*, *Lagerstroemia speciosa,* Phytoconstituents, Pharmacological activities, Toxicity

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Chapter 1

Introduction:

Plant derived substances are nowadays one of the potent sources of medicine to cure several complicated diseases because of their versatile applications. It is now believed that nature has given the cure of every disease exactly as the way it should be treated. Both in developed and developing countries progressive demand of traditional medicines are explored by scientific research. As a consequence, the researcher nowadays are more emphasizing on evaluation and characterization of numerous medicinal plants and plant constituents against variety of diseases based on their traditional claims. It is worth mentioning that the present study thus expressing phytochemical constituents and pharmacological activities of five different medicinal plants having potential medicinal properties. In this regards, *Gymnema sylvestre*, *Momordica charantia*, *Coccidian cordifolia*, *Trigonella foenum-graecum*, and *Lagerstroemia speciosa* are such plants. *Gymnema sylvestre*, basically an anti-diabetic plant belonging to the family of Asclepiadaceae; commonly distributed throughout the world, predominantly in tropical regions. Because of upholding diversified medicinal properties, its plant parts can be used in the treatment of diabetes, helminthiasis, dyspepsia, constipation, jaundice, hemorrhoids, cardiopathy, asthma, bronchitis, leucoderma and several inflammatory diseases. In addition, some of the potential pharmacological activities such as antimicrobial, anti-hyphal, anti-hypercholesterolemic, and hepatoprotective activities (Fabio et al., 2013) of the plant was also reported. Recent investigation on this plant is also included the hypoglycemic and chemo-preventive activities of the plant extract (Kumar, 2016). Another medicinal plant of great importance *Momordica charantia,* belonging to the family of *Cucurbitaceae*, also named as bitter melon, balsam pear and bitter gourd. The fruit of this plant is basically used as vegetable and also has the ability to treat small pox infection. Aqueous extract of *Momordica charantia* is a potent anti-diabetic, anti-hyperlipidemic and anti-caricinogenic. It also possesses anti-HIV, anti-helminthic, anti-tumor and wound healing properties (Ahmad et al., 2014). *Coccinia cordifolia*, also belonging to the family of *Cucurbitaceae* was found to be a potent source in order to treat many diseases. The whole plant of *C. cordifolia* possesses diversified pharmacological activities like analgesic, antipyretic, anti-inflammatory, antimicrobial, antiulcer, antidiabetic, antioxidant, hypoglycemic, hepatoprotective, antimalarial, antidyslipidemic, anticancer, antitussive, mutagenic activities. It is also evident that the ethanolic leaf extract of *Coccinia cordifolia* has strong effect against bacterial strains compare to its root (Gautam et al., 2014).

Trigonella foenum -graecum (Linn.) belonging to the family Papilionaceae commonly known as Fenugreek. Its seeds and leaves are used not only as food but also serve several medical benefits like hypocholesterolemic, lactation aid, antibacterial, antifungal, gastric stimulant, for anorexia, antidiabetic agent, galactogogue, hepatoprotective effect and anticancer. Apart from its medicinal benefits, it can also be utilized as a part of several food product developments as food stabilizer, adhesive, and emulsifying agent. More importantly it is used for the development of healthy and nutritious extruded and bakery product (Wani et al., 2016). Lastly, one more important medicinal plant named *Lagerstroemia speciosa,* which is belongs to Lythraceae family and in India commonly known as queen's flower, queen of flowers, crepe myrtle and pride of India whereas in Philippine referred to as "banaba". As remedy the leaves, roots and bark of *L. speciosa* have been used in folk medicine traditionally for several disorders and ailments. The leaves of this plant can be utilized as a diuretic and decongestant, and have been used to treat diabetes mellitus. Not only its leaves serve medicinal benefits but also its roots have been used to treat mouth ulcers. Even its bark is used as a stimulant, febrifuge, and for relief of abdominal pains. This plant serves different purposes in different places such as in Philippines, *L. speciosa* leaves are consumed as herbal tea for lowering blood sugar level, reducing body weight as well while in India, it is used to treat diabetes. Moreover, for garnishing dishes or as an ingredient in salad, soups, desserts and drinks the flowers of this plant is greatly used. Recently, due to having anti-diabetic property, herbal products like Banabamin and Glucosol TM have been developed from *L. speciosa* after conducting preliminary clinical trials (Chan et al., 2014) The following is a compilation and up-to-date review containing the generalized description, phytochemical constituents and pharmacological properties of the selected plants with an urge of future advancement of the medicinal plants to mitigate human diseases.

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Scientific Names:

Name of Different Medicinal Plants				
Gymnema sylvestre	***Momordica charantia***	***Coccinia cordifolia***	***Trigonella foenum-graecum***	***Lagerstroemia speciosa***
Asclepias geminate, Asclepias geminata, Periploca sylvestris, Gymnema melicida	*Momordica charantia*	*Coccinia indica, Coccinia cordifolia*	*Trigonella foenum-graecum*	*Lagerstroemia speciosa*

Common Names:

***Gymnema sylvestre*:** Gurmar, Merasingi, Meshashringi, Gurmarbooti, Peiploca of the Woods, Rams' horn, Small Indian ipecac, Sugar destroyer, Meshashringi, Madhunashini, Ajaballi, Ajagandini, Bahalchakshu, Karnika, Chakshurabahala, Kshinavartta, Kavali, Kalikardori, Vakundi, Gurmar, Merasingi, Kavali, Kalikardori, Vakundi, Dhuleti, Mardashingi, Podapatri, Adigam, Cherukurinja, Sarkarikolli, Sannager-asehambu, Chakkarakolli, Madhunashini, Mera-Singi.

Momordica charantia: Bitter melon, Balsam pear, Bitter cucumber, Bitter pear, Karalla, Balsam apple, Cerasee, Carilla cundeamor, Papailla, Melao de sao ceatano, Bitter gourd, Sorosi, Karela, Kurela, Kor-kuey, Pava-aki, Salsamino, Sorossies, Pare, Peria, Karla, Margose, Goo-fah, Mara chean.

***Coccinia cordifolia*:** Telakucha, Kuchla (Beng.) ; Ivy gourd (Eng).

***Trigonella foenum-graecum*:** Methi, Fenugreek, Alhova, Bird's Foot, Greek Clover, Greek Hay.

***Lagerstroemia speciosa*:** Queen's flower, Pride of India, Queen's crape myrtle, Banaba, Jarul.