

Current Scenario of *Bauhinia racemosa* and *Drimia indica* as Medicinal Plants and their Future Prospects

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Abstract:- Medicinal plants are the important bio-resources for their pharmaceutical values. In present investigation the medicinal properties of *Bauhinia racemosa* and *Drimia indica* are studied. In Ayurveda both these plants are used in different formulations. Medicinal properties are herewith discussed in following investigation. The use of nanotechnology and biotechnology with special reference to highlight their use in medicine has been discussed.

Keywords:- *Bauhinia racemosa*, *Drimia indica*, Medicinal plants, Nanotechnology, Ayurveda.

I. INTRODUCTION

The medicinal plants have prime importance in human life. These medicinal plants are used traditionally to cure diseases all over the world. Worldwide demand of medicines is increasing day by day. World Health Organization (WHO) says that, 80% population of the world is dependent on traditional medicines for their foremost healthcare needs. Active chemical constituents which are present in the plant parts are having curing properties during the treatments of human and animal diseases is termed as medicinal plant. (Humayun *et al.*, 2006). Many developing countries and their rural areas are well known for the use of medicinal plants to fulfil their primary medicinal needs (Sandhu and Heinrich, 2005; Gupta *et al.*, 2005). Plants contains many important bioactive compounds like alkaloids, tannins, flavonoids and phenolics which are having definite physiological actions on the human body (Edeoga *et al.*, 2005). These bioactive compounds which are presented in medicinal plants provides ample resources in important fields like Pharmaceuticals, cosmetics, food industry and agriculture for the pest management. (Rice, 1995).

Globally, people from different cultures have developed the knowledge of local medicinal plants for their medicinal use (Silvério and Lopes, 2012). From ancient time Ayurvedic medicines, Unan and tribal medicines were the rich sources of medicines (Joy *et al.*, 1998). In the company of all these traditional systems, Ayurveda is most practiced and used system in India. It having tremendous knowledge of how to use the medicinal plants to treat the numerous diseases (Diallo *et al.*, 1999). Medicines which are derived from plants are having enormous contribution to human well-being. Medicinal plants are having prime importance because majority of medicinally active properties are not been investigated yet from numerous plant species. Those major properties will be useful in present as well as future

research activities of medicinally useful plants (Hassan, 2012).

Medicinal plants *Bauhinia racemosa* and *Drimia indica* are precious resources of the Western Ghats. They are having remarkable role in human culture and their advancement since prehistoric time.

II. *Bauhinia racemosa* Lam. (Apta)

Bauhinia racemosa is commonly known as Apta plant in Maharashtra. It belongs to family Fabaceae which is a medicinal flowering shrub native to tropical Southeast Asia. Found in India, China, Ceylon and Timor. *Bauhinia racemosa* is highly medicinal and having faithful importance in the tradition of India. Genus *Bauhinia* covers 300 tree as well as shrub species which grow in warm climate in tropical region. In ayurvedic treatments *Bauhinia racemosa* having prime importance because of it's highly medicinal properties. *Bauhinia racemosa* is self grown tree but also found to be cultivated in parks and near road sides due to its ornamental value.



Fig. 1: *Bauhinia racemosa* Lam.

➤ **Plant Morphology**

Bauhinia racemosa Lam. is a small bushy deciduous tree with drooping branches. The bark is Bluish black in colour with pinkish colour inside. Leaves are compound, ovate with leaflets. White to pale yellow coloured flowers, arranged in raceme. On loose racemes Small flowers are born. Greenish white flowers about 1 cm in length with 5 petals and 10 stamens. 13 to 25 cm by 1.8 to 2.5 sized pods with 12 to 20 seeds, reddish brown to black in colour and 8 mm in size. (Anonymous, 1996).

➤ **Medicinal uses of *Bauhinia racemosa* Lam.**

Bauhinia racemosa plant has numerous benefits. Stem bark is an astringent and used in the treatment of various diseases like fever, skin diseases, tumor and headache. (Gupta *et al.*, 2004; Kirtikar and Basu, 1975). Stem bark is used in the ayurvedic treatment of dysentery, malaria and diarrhoea. The fruit is acrid and sweet; refrigerant, astringent to the dimethyl chroman have been isolated from the roots of *Bauhinia racemosa*. (Jain *et al.*, 2002; Prabhaker *et al.*, 1994). The leaves of *Bauhinia racemosa* are useful in the treatment of asthma. It is anti-dermatoses and also cures lymphatic inflammation. Treats oral disorders, helps to cure toothache, aids in wounds, helps in bleeding piles, cures burning sensation and cures the Swelling of Liver (Jaiswal, 2015). *Bauhinia racemosa* has antihistaminic effect (Nirmal, 2011). It is anti-dermatoses and also cures lymphatic inflammation. The plant pacifies vitiated kapha, diarrhoea, skin diseases, rectal prolapse, diabetes, inflammations, worms, tumours, haemorrhoids, menorrhagia hemolysis and cervical lymphadenopathy (Jaiswal, 2015).

III. *Drimia indica* (Roxb.) Jessop. (Rankanda)

Drimia indica (Roxb.) Jessop. belongs to family Asparagaceae. Globally *Drimia* is distributed from Tropical Africa to Myanmar. In India, *Drimia* is distributed throughout the plains and in lower Himalayas. This plant is also called as Indian Squill, Vana palandu and Rankanda. It is a small, glabrous herb with a pale, ovoid or pear-shaped bulb.

Recently, it is proposed that European squill could be substituted by Indian squill to overcome shortage of European squill. If its cultivation and methods of harvesting are improved, it will compete with European squill. During last few years there is steady increase in export trade and nearly 21805 kg of *Drimia indica*. Plants were exported during the year 1967-68 (Wealth of India, Raw materials XI, 256, 1972). No pharmaceutical company of Indian origin is engaged in medical preparation of this drug. At present pharmaceutical company from Mumbai (Boehlinger Knoll Pvt. Ltd.) is collecting these plants and exporting the crude extract to West Germany. Only m/s Sandoz Ltd. of Switzerland, prepares injections, tablets of squill glycosides. One 'cc' injection of 'Scillaren' containing 0.5 mg glycosides priced at one Rupee at this rate 1g of it would make Rs.2000.



Fig. 2: *Drimia indica* (Roxb.) Jessop.

➤ **Plant Morphology**

It is bulbous, scapiogerous, hysternanthus herb (Fig. 2). Bulb 4-6 cm in diameter, 5.7 cm in height with neck 1.0 cm in length, globose, conical ovoid, tunicated, scales white, basal rooting disc 2.4 cm in diameter with strong ability to produce roots. The leaves are radical, erect or ascending, green linear lanceolate or lorate, uniform narrowed towards base, glabrous, acute (Fig. 2). The flowers are small, loosely arranged, long pediceled, white to pale green in colour, slender arranged on racemes. Fruit is rounded in shape, 0.5 to 0.8 inch in diameter having 6-8 seeds inside it. The rhizome is round, fleshy, about 1-2 inch in diameter and brown in colour.

➤ **Medicinal uses of *Drimia indica* (Roxb.) Jessop.**

The rhizome of *Drimia* is made into paste and applied over the area effected with skin disease and localized swelling as part of treatment. Fresh juice of the rhizome is given in a dose of 15-20 ml as part of treatment in condition of ascites. The rhizome of *Drimia indica* is heated and the juice is extracted which is given in a dose of 15-20 ml in conditions of rhinitis and cough. In condition of difficulty in micturition, the cold infusion of Vana palandu is given in a dose of 40-50 ml. The decoction of the rhizome of the plant is given in a dose of 30-40 ml to treat dysmenorrhoea. The herb acts similar to digitalis leaf; hence the rhizome of the plant is given in conditions of irregular heart beat and weakened cardiac muscles. The decoction of Vana palandu is given in a dose of 25-30 ml to treat intestinal worms. *Drimia indica* is an ayurvedic herb used for the treatment of skin diseases, respiratory diseases, dysmenorrhoea, intestinal worms and ascites.

The Indian squill also called as Rankanda or Jangli piyaz also contains cardiac glycosides similar to those of *U. maritima* and possesses antiprotozoal, hypoglycemic and anticancer properties. Mucilaginous bulb powder is used in the skin diseases and it has good adhesive properties and 3% solution of it is used as a paper paste. (Desai, 1999).

IV. FURTHER STUDIES IN BIOTECHNOLOGY AND NANOTECHNOLOGY

By using Biotechnology and Nanotechnology we can obtain different medicinal and industrially important compounds and products in the form of nanoparticles. Manipulation of matters at atomic, molecular or supra molecular level is known as nanotechnology. The study and application of extremely smaller things nothing but nanoparticles can be used across all the other science fields, such as chemistry, biology, physics, materials science, and engineering. *Bauhinia racemosa* and *Drimia indica* has antioxidant and antibacterial properties and many more. We can obtain nanoparticles by using the plant parts of *Bauhinia* and *Drimia* and analyze the potential of biologically synthesized nanoparticles.

Research on nanomaterials having advantages in the field of science and technology with two motivating factors. They having different interesting properties over bulk materials and applications of these innovative properties can be used for the welfare of humanity. The Greek word nano identifies a material whose size has been reduced, which is 1000 times smaller than one micron. The presence and uses of nanomaterials having historic background since ancient time. In ayurveda, the first relationship between mankind and nano materials was developed, which is the oldest Indian system of medicines. Ayurveda had some proofs that, nano medicines were used before the term nanotechnology was coined (Banerjee *et al.*, 2009). The nanoparticles can be prepared by biological methods. In current days of research on nanoparticles biological methods of nanoparticle preparations are developing and those methods are chief and time consuming.

Biosynthesis of nanoparticles has far been investigated using various bacteria. (Anima Nanda and Carvanan, 2006), different fungi (Bhainsa and Souza 2006) and also plants (Chandran *et al.*, 2006). The green synthesis using plant material is having advantages over chemical synthesis considering its simplicity, cost effectiveness and stability in results. More over it assures non-generation of high waste products and contaminants. They also add up to be non-hazardous to the Ecosystem. Their use in Biomedical imaging, therapeutic drug delivery system, treatment of burnt injured Victims, targeted and conclusive drug delivery, endocytic capture, treatment of dreadful illnesses, targeting superficial as well as acute skin problems and many more. These two plants may be used for such an assay of work system using nanotechnology hand in hand. This may bypass all the non-desirable outcome of chemical synthesis of nanoparticles in which ample amount of and different types of metals including electrochemical, sonochemicals and microwaves are used. A perfect, cost effective delivery system may be designed using these two plants effectively which may in turn lesser the amount of drug normally used for drug delivery. The country's economy may be increased in such a way and apart from this; the drug will be delivered without any wastage.

V. CONCLUSION

Bauhinia racemosa and *Drimia indica* are highly medicinal plants and having antimicrobial properties. We can manipulate the metallic nanoparticles by using various metal salts and plant extracts of these selected plants by biological synthesis. The prepared nanoparticles will be used against pathogenic bacterial and fungal colonies for laboratory experiments and antimicrobial properties will be analyzed.

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