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E: ISSN NO.: 2455-0817 *Remarking An Analisation*

A review on Phytochemistry, Antimicrobial Efficacy and Pharmacological Properties of Some Selected Medicinal Plants

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Abstract

Human from ancient times have been used plants and their products to various ailments because plant products cause minimal or no side effects.In the present paper we review five traditional Indian medicinal plants used for ethanomedicinal and pharmacological in India traditional medicinal system (Ayurveda), several researchers of have been explored different activities of these plants includes *Calotropis procera*,*Citrullus colocynthis, Delonix regia, Kiglia pinnata, Martynia annua* and *Pongamia pinnata.* These plants have been used for several medicinal and pharmacological activities like *as*anti-inflammatory, antifungal and antibacterial, antioxidant, analgesic or anti-proliferative, antifertility and abortion etc in different parts around the world.

Keywords: *Calotropis procera*, *Citrullus colocynthis, Delonix regia, Kiglia pinnata, Martynia annua* and *Pongamia pinnata.*

Introduction

It is observed that use of medicinal plants in traditional system for human health care because they cause no side effects. Over 80% of the global population relies on traditional medicine, much of which is based on plant remedies. Traditional Chinese medicine alone uses over 5,000 plant species, folkloric medicinal use in the Philippines, Bangladesh folk medicine and India.

Review of Literature

In the recent years, research on medicinal plants has attracted a lot of attentions globally. Large body of evidence has accumulated to demonstrate the promising potential of Medicinal Plants used in various traditional, complementary and alternate systems of treatment of human diseases (Chaturvedi *et al*., 1995; Manohar et *al*., 2011; Singh*et al.*, 2014; Mali *et al.*, 2015).

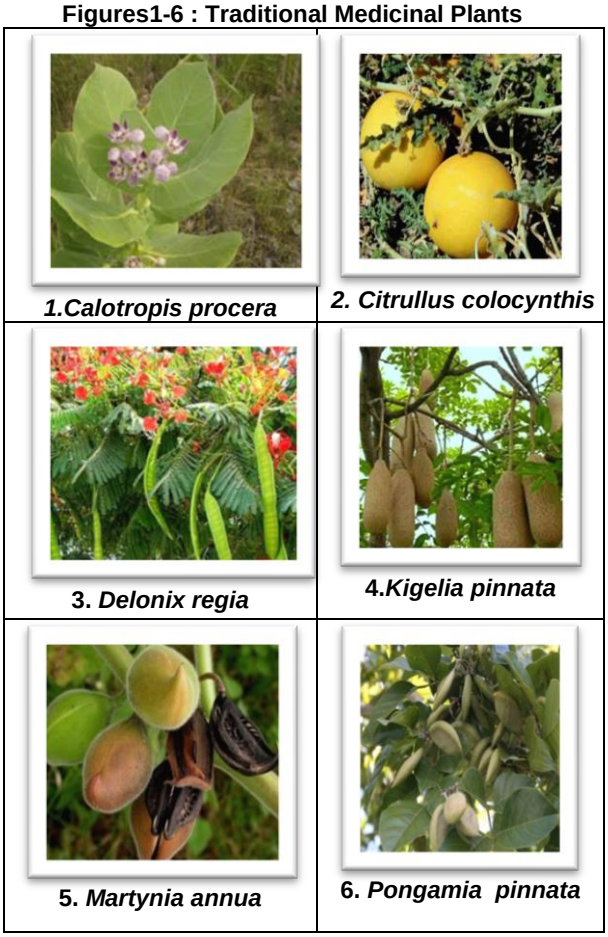
Objectives of the Study

The following review will give a brief idea about the presence of bioactive constitutes in different plant parts of selected plant species. As this review also contains information about ethaomedicinal and pharmacological properties of above said plants, it can be helpful in further pharmacological and biochemical estimation of different plant parts of selected plant species.

Methodology

Many plant species are well described in Ayurveda and Siddha for their ehtnomedicinal and pharmacological values . Their specific plant parts or decoctions prepared by mixing with other substances are generally used from ancient periods. Some of selected plant species are reviewed for their biochemical, ethanomedicinal and pharmacological properties:

Figures1-6 : Traditional Medicinal Plants



1.Calotropis procera ***2. Citrullus colocynthis***

3. *Delonix regia* **4.*Kigelia pinnata***

5. *Martynia annua* **6. *Pongamia pinnata***

Calotropis procera

The plant *Calotropis* belonging to family Ascplideaceae, is a perennial shrub. *C. procera* in India holds a pride of place largely because of its other uses and economic values. The plant is poisonous can lead to blindness if its juice is put in to the eyes. The milky exudates from the plant is a corrosive. It is said to have mercury like effects on the human body and is sometimes referred as vegetable mercury. Calotropin a compound in the latex is more toxic than strychnine which is responsible for the cytotoxicity of Apocynum cannabinum (Pathyusha 2012). The major phytoconstituents of fruits are Lupenol, n-Hexadecanoic acid, Thymol, Tetratetracontane and Linoleic acid (Chandrawat and Sharma 2015[a]). The wood is used in making charcoal. *C. procera* is an ideal plant for monitoring sulphur dioxide emissions in the air. *C. procera* is a potential plant for bioenergy and biofuel production in semi arid regions of the country (Chandrawat and Sharma, 2015[b]).

Ethanomedicinal properties of *Caotropis procera*

All the parts, viz, root, stem, leaf and flowers of *C. procera* are in common use in indigenous system of medicine (Samvatsar and Diwanji, 2000). Compounds derived from the plant have been found to have emeto-cathartic and digitalic properties. The principal active medicinals are asclepin and mudarin (Raghubir et al.1999). Other compounds have been found to have bactericidal and vermicidal properties. *C. procera* used medicinally, to treat boils, infected wounds and other skin problems in people and to treat parasitic skin infestation in animals. The whole plant when dried and consumed is a good tonic, antihelmintic and as an expectorant (Agharkar, 1991). Giant milkweed tissues, especially the root bark, are used to treat a variety of illness including leprosy, fever, menorrhagia, malaria, and snake bite (Parrotta 2001). Traditionally, the dried root is powdered and effectively used to cure bronchitis, asthma, leprosy, eczema and elephantiasis, hepatic and splenic enlargement (Vohra, 2004). The latex is used for treating ringworm, guinea worm blisters, scorpion stings, venereal sores and ophthalmic disorders; also used as a laxative (Mann And Abalaka 1997). The flowers are bitter, digestive, astringent, stomachic, anthelmintic, and tonic (Warrier et al. 1996) antiandrogenic activity of latex (Abdelgader and Elsheikh, 2018).

Pharmacological activities of *Calotropis procera*

All the parts, viz, root, stem, leaf and flowers of *C. procera* are in common use in indigenous system of medicine (Mukherjee et al, 2010). *Calotropis* is also a reputed Homoeopathic drug (Ghosh 1988).The plant shows anticancer, antifungal (Ansari and Ali 2001) and insecticidal activities. The roots are reported to have anti-fertility (Larhsini 1997) and anti-ulcer effects (Mann and Abalaka 1997). The latex of the plant is reported to possess analgesic and wound healing activity (Samvatsar and Diwanji 2000), as well as anti-inflammatory (Kumar and Basu 1994) ,antimicrobial acivity (Kishore and Chopra 1997) and also exhibited local anesthetic activity (Samar et al. 2009). The flowers of the plant exhibit hepatoprotective activity (Akhtar and Malik 1998), anti-inflammatory, antipyretic, analgesic, and antimicrobial effects and larvicidal activity (Morcelle et al. 2004). The milky juice is regarded as drastic purgative and caustic flowers were considered to improve digestion, catarrh and increases appetite (Oudhia, 2001).

Citrullus colocynthesis

The plant *Citrullus colocynthis* belongs to Family Cucurbitaceae is a perennial trailing herb, usually found wild in the sandy lands of North West, the Punjab, Sind, and Central and southern India, and coromandal coast, also known asIndrayan, Indrayan ki jad (root), Chedu Puccha, Cinna Papara, Kuturu budama, Pikkumutti. Tamate Kayi, Tamte Kai,, Rakhale Shasa, kaudatumma, paparabudam and Colocynth, bitter apple, bitter cucumber, desert gourd, vine of Sodom. In pre-modern medicine it was an ingredient in the electuary called confectio hamech, or diacatholicon, and most other laxative pills have very successful effects (Mali *et al.*,2001, Chaturvedi *et al.,*2003).

Ethanomedicinal properties of *Citrullus colocynthesis*

It is one of the most violent purgative drugs known; insomuch that it excoriates the passages to such a degree as to sometimes draw blood and induce a so-called "superpurgation". Sometimes, it was taken boiled in water, or beer, in obstruction of the menses, which was considered successful in

strong constitutions. In women in the beginning of pregnancy may cause an abortion. Its usage for this purpose is documented in ancient times used as blood purifier in skin diseases.It is used in Ayurvedic medicine with colocynth as ingredient:Maha Manjishtadi kashayam – as blood purifier in skin diseases. Abhayarishta – in haemorrhoids, constipation etc.,Maha Vishagarbha Taila – in sciatica and joint disorders with stiffness as a symptom and Mrita Sanjeevani Sura – an alcoholic Ayurvedic preparations.

Pharmacological activities of *Citrullus colocynthesis*

The main chemical contain of fruit pulp colocynthin, colocynthein, colocynthetin, pectingum. Seed contain a fixed oil and albuminiods.Flavonoid glycoside quercetin, flavone- 3- glucoside viz iso-vitexin, isoorentine and isoorentine-3-methyl ether. Cucurbitane type triterpen glycoside viz colocynthoside A & B,cucurbitane type triterpen glycoside viz cucurbitacin E 2-O-beta-D-glcoside and its aglycone cucurbitacin E, 2-O-beta-D-glucopyranosyl-16alpha-20R-dihyroxy-cucurbita-1,5,23E,25(26)-teraen-3,11,22-trione, 2-O-beta-D-glcopyranosyl-cucurbitacin B and 2, 25-di-o-beta-D-glucopyranosylcucurbitacin L.(Nayab *et al*., 2006; Yoshikawa *et al*., 2007; Gurudeeban *et al*., 2010).Different parts of the plant explored for the anti-inflammatory(Belsem *et al*., 20011), antifungal and antibacterial (Rasool and Jahanbakhsh, 2011), antioxidant, analgesic or anti-proliferative (Saba and Oridupa, 2010), hypoglycemic (Agarwal *et al*., 2012), immature fruit and seed shows anti-inflammatory and analgesic activities (Rahbar AR and Nabipour, 2010), anti –alopecia (Dhanotia *etal*., 2011), antioxidant and free radical scavenging (Kumar *et al*., 2008)**.** It also exhibitsgrowth inhibitory effects on breast cancer cells (Grossman *et al.*, 2007) and antifertility in male rats (Chaturvedi *et al.,* 2003).

Delonix regia

The plant *Delonix regia* (Bojer ex Hook.)Raf belongs to the Fabaceae family, is an ornamental plant, commonly knownas flamboyant, “flame tree”, royal *Poinciana regia* or “flamboyant”,the Royal Poinciana or Flamboyant, *Poinciana*, named after Phillippe de Longvilliers de Poincy (1583-1660), who is credited with introducing the plant to the America (Singh *et al.*, 2014.). It is used in the local medicine in several African counties, scaling-up at pilot plant level, concentrated bioproducts containing various natural phenolic compounds (Félix *et al.*, 2012).

Ethanomedicnal properties of *Delonix regia*

Delonix regia has been used in the folk medicine systems of several civilizations, anti-diarrhoeal, anti-inflammatory activity, antioxidant, hepatoprotective and antimicrobial, constipation, inflammation, arthritis, hemiplagia, leucorrhoea and rheumatism have been reported. Flowers of *Delonix regia* have been used as traditional herbal remedies for gynecological disorders and they are also used as tablet binder (Singh*et al.*, 2014), also is used by folklore for joint pains and in flatulence. The root of *D. regia* used for apotent against abdominal pain while leaves are used as anti-inflammation(Khursheed *et al.*, 2012),antibacterial activity (Khursheed *et al.*, 2012).Leaves are used by traditional practitioners in cases of inflammatory joint disorders as a folklore remedy(Samvatsar *et al*, 1999; Vidyasagar and Prashantkumar, 2007; Wijayasiriwardena*et al*, 2009. Abdullahi and Abdullahhi (2005) analysed *D. regia* seeds for organic matter, ash, crude protein crude carbohydrate, crude lipid, gross energy antinutrients. Antimicrobial and antibacterial activity of ethanol extracts of *D. regia* seed and leaves crude extracts of *D.regia,*(Aqil and Ahmed , 2003) and antifungal potential (Satish *et al.*, 2007).

Pharmacological Activities of *Delonix regia*

D. regia shows many pharmacological activities such as anti-diarrhoeal activity, gastroprotactive activity (Shiramane Rajabhau *et al*., 2011), anti-inflammatory (Vaishali *et al*., 2011), anti-diabetic(Rahman *et al.*, 2011), antioxidant (Rani *et al.*, 2011), hepatoprotactive activity (Ahmed *et al.,* 2011).Carotenoids are present in floral parts of *Delonix regia* (Jungalwala and Cama,1962) *,* cyanidin diglycoside, kaempferol and quercetin and carotenoids (Subramanian *et al.*,1966) and polyphenols (Adje *et al.,*2008),seeds contain flavonoids are used as wound healing agent in households (Vidyasagar and Prashantkumar, 2007). Stem bark contains p-methoxybenzaldehyde, isolupeol, carotene, hydrocarbons phytotoxins and phenolic acids (Sabir *et al.,* 2011).

Kigelia pinnata

K. pinnata(Family Bignoniaceae) also known as *Balam Kheera*."Hathi bailan'.In Luo "Yago".In Malayalam *Shiva Kundalam*.In Tamil 'Yaanai Pudukan'. The tree is widely grown as an ornamental tree in tropical regions for its decorative flowers and unusual fruit. Planting sites should be selected carefully, as the falling fruit can cause serious injury to people, and damage vehicles parked under the trees.

Ethanomedicnal propertiesof *Kigelia pinnata*

Several other compounds, including the naphthaquinoids kigelinone, pinnatal, and isopinnatal, and the sterols stigmasterol and beta-sitosterol have been isolated from the bark. There are many anecdotal uses of the sausage tree (Saini *et al*., 2009). An alcoholic beverage similar to beer is also made from it(Joffe, 2003; McBurney, 2004). The powdered mature fruit is applied as a dressing in the treatment of wounds, abscesses, and ulcers. *K. pinnata* extracts tested showed mild antibacterial activity, and the highest inhibition was displayed by the chloroform-soluble extract against *Shigella boydii* and *Pseudomonas aeruginosa*(Sikder, 2011).

Pharmacological activities of *Kiglia pinnata*

The roots have also yielded dihydroisocoumarins, lapachol, and sterols, and the presence of iridoid glycosides also has been reported (Lino *et al*., 2000). Heartwood of the plant shows the presence of lapachol, dehydro-alpha-lapachone, tecomaquinone-I, D-sesamin, paulownin, kigeliol, kigelinone, β-sitosterol, and stigmasterol (Singh *et al.,* 2010).It is used in a number of skin care products, cytotoxic activity (Jackson, 2000), anti-inflammatory(Carry *et al*., 2008), wound healing(Alam

and Singh, 2011), hepatoprotective activity(Olalye and Rocha, 2007).

Martynia annua

The plant Martynia annua L. belongs to Family Martyniaceae, is a native of Mexico and also found throughout India, in waster places, rubbish heaps and road sides. In tribal pockets of Chhindwara and Betul Districts, Madhya Pradesh, root decoction is administered for snakebite (Nirmal *et al*., 2007), Martynia annua seeds and fruits for the treatment of asthma, itch and aczema; causedantiandrogenic/ antifertility effects in rats (Mali*et al*., 2002).

Ethanomedicnal Poperties of *Martynia annua*

Martynia annua L. is a well-known small herbaceous annual plant commonly known as Devil's claw (Family: Martyniaceae), is native of Mexico and also found throughout India, in waster places, rubbish heaps and road sides. In Ayurveda it is used as kakanasika, which isbeing used in Indian traditional medicines for epilepsy, inflammation and tuberculosis, anthelmintic, analgesic, antipyretic, antibacterial, anticonvulsant, antifertility,antinociceptive, antioxidant, CNS depressant and wound healing activity (Mali, *et al.,*2002 ; Nagda *et al.,* 2009; Dhingra *et al.,* 2013; Singh and Mali.,2015).*M.annua* chemical constituents includes oleic acid, arachidic acid, linoleic acid, palmitic acid, gentisic acid, stearic acid,pelargonidin-3,5-diglucoside, cyanidin-3-galactoside, p-hydroxy benzoic acid, apigenin, apigenin-7-oglucuronide have been isolated from this plant and the presence of glycosides, tannins, carbohydrates, phenols, flavonoids and anthocyanins(Lodhi *et al*., 2011), oleic acid, constitutes the major part. Other major biological compounds include pelargonidin-3-5-diglucoside, cyanidin-3-galactoside, p-hydroxy benzoic acid, gentisicacid, arachidic acid, linoleic acid, palmitic acid, stearic acid, apigenin, apigenin-7-0-glucuronide (Rastogi and Melhotra, 1993).

Pharmacological activities of *Martynia annua*

Anthelmintic activity (Nirmal *et al.,* 2007), analgesic ,antipyretic activity (Kar *et al.,* 2004), anti-convulsant (Babu *et al.,* 2010), antifertility (Mali *et al.,* 2002), antinociceptive activity and CNS depressant activity (Bhalke and Jadhav, 2009), antioxidant activity (Nagda *et al.,* 2009), wound healing (Lodhi *et al.,* 2011) and antibacterial activity against *Proteus vulgaris*, *Bacillus subtilis* and *B.thuringensis*, Salmonella paratyphi A, *Salmonella paratyphi* B, *Proteus mirabilis*, *P. vulgaris* and *Klebsiella pneumonia*, *Proteus vulgaris*, *B. subtilis, S. paratyphi* B and *Pseudomonas aeruginosa* (Sermakkani and Thangapandian, 2010).

Pongamia pinnata

The plant *Pongamia pinnata* L. Syn. *Pongamia glabra* (Vent); Derris indica (Lamk.)belongs to Family Leguminosae (Merra *et al*.,2003) have one species only *Pongamia pinnata* (L.) Syn. *Pongamia glabra* (Vent). *Syn Milletia* It is also grown as a host plant for lacinsects. *Pongamia* also known as *Millettia pinnata*, formerly known as Pongamia *pinnata*, is a tree/shrub with a broadly distributed from India, through central and south-eastern Asia, Indonesia and into northern Australia. However, the Queensland Herbarium currently considers *Pongamia* native to northern

Ethanomedicinal properties of *Pongamia pinnata*

P. pinnata is well-adapted to arid zones and has many traditional uses. Seeds oil of *P. pinnata*, known as pongamia oil, is an important asset of this tree and has been used as lamp oil, in soap making, and as a lubricant for thousands of years. The oil has a high content of triglycerides, and its disagreeable taste and odor are due to bitter flavonoid constituents including karanjin, pongamol, tannin and karanjachromene. It can be grown in rain water harvesting pits /ponds / lands up to 6 meters water depth without losing the greenery and to produce bio diesel.The seeds of pongamia are rich in oil, which might be a new source of 'biofuel'.*P. pinnata* is renowned for its shade and is well known in traditional uses for its medicinal properties. It is also grown as a host plant for lacinsects.

Pharmacological Activities of *Pongamia pinnata*

It is reported to have anti-plasmodialactivity (Simonsen *et al*., 2001), anti-inflammatory activity (Srinivasan *et al*., 2001), anti-diarrhoeal activity (Brijesh *et al.,* 2006), antioxidant and anti-hyperammonemic activity (Essa and Subramanian, 2006), anti-ulcer activity (Prabha *et al.,* 2003), anti-hyperglycaemic andanti-lipidperoxidative activity (Punitha and Manoharan, 2006).

Result & Conclusion

All above said species are rich in different bioactive compounds. Such as calatropin is novel compound of *Calotropis procera;* colocynthin, colocynthein, colocynthetin, pectingum are main compounds of fruits of Citrullus colocynthesis, folwers of *Delonix regia* are rich in carotenoids, the bark of *Kigelia pinnata* is rich in naphthaquinoids kigelinone, pinnatal, and isopinnatal, and the sterols stigmasterol and beta-sitosterol , *M.annua* chemical constituents includes oleic acid, arachidic acid, linoleic acid, palmitic acid, gentisic acid, stearic acid,pelargonidin-3,5-diglucoside, cyanidin-3-galactoside, p-hydroxy benzoic acid, apigenin, apigenin-7-oglucuronide, seeds of *Pongamia pinnata* are rich in flavonids. Due to presence of different important bioactive compounds in different plant parts, above selected plants show different pharmacological activities as mentioned above. Their ethanomedicinal values are also well known from ancient era.So, it may be concluded that all selected plant species can be choose for further systematic biochemistry and pharmacological properties as well as some commercial use can be done.

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Suggestions

All the selected plant species are rich in bioactive constituents, but all plant parts have not evaluated. So, a systematic evaluation of all plant parts is needed with co-ordination with its pharmacological properties.

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