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Ethno botanical importance of *Citrullus colocynthis* L

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Abstract

Citrullus colocynthis (L.) Schrad, commonly known as Colocynth, a member of Cucurbitaceae is native to Mediterranean region and Asia. It is a wild, perennial, herbaceous, non-tough, harsh, angular vine with lobular tendrils, alternate leaves and small yellow monoecism flowers. Recently, various researches have been done to assess restorative capability of the plant. During present investigation its ethno botanical importance has been carried out.

Keywords: *Citrullus colocynthis*, Cucurbitacins

Introduction

Citrullus colocynthis (L.) Schrad, a valuable plant commonly known as Colocynth is member from Cucurbitaceae, reported among all parched, arid zones of world (Gurudeeban *et al.* 2010) [1] however it is native to Mediterranean region and Asia (Pravin *et al.* 2013) [2]. Geographically it is distributed in deserts of North Africa, South Europe and whole of Asia (Duke, 1983, Zamir *et al.* 1984, Burkill, 1994 and Jarret *et al.* 1997) [3-6], extended up to Egypt (Duke, 1983) [3]. In India, this drought tolerant plant species is usually dispersed among all hot arid areas (Gurudeeban *et al.* 2010) [1]. It is the most commonly utilized plant in Indian traditional medicinal framework and easily propagated by vegetative and generative modes of reproduction in summers (Rani *et al.* 2017) [7]. Local people use it to fix disorders like Boils, Pimples, Constipation, Inflammation of joints (Joshi, 2008) [8]. To reduce the glucose level (Trivedi, 2006) [9], joints aggravations, rheumatism, abdomen enlargement (Nadkarni, 1998 and Kirtikar *et al.* 2001) [10, 11] *Citrullus* is being used. Plant species is additionally used to cure Urticaria, constipation, snake poison, stomach ache, Hepatitis (Dafni and Lev, 2002 and Tiwari *et al.* 2003) [12, 13], Malaria, Epilepsy and Bowel grievances (Dey, 1980) [14]. Since all plant parts puts practically equivalent endeavors to the traditional medicinal system here is a survey of review giving updated information about phytochemical and therapeutic properties of plant.

History

A colossal role of plant in man's life have been reported from ancient to present world (Merillon *et al.* 1999) [15]. Nearly 80% of word population rely on natural medicinal system for basic medical issues (WHO, 2003) [16]. Diverse environmental conditions, physical factors and interesting geographic regions construct incredibly remarkable eco-systems, giving appropriate habitats to a large number of species driving vegetation richness. That is the only reason, India is additionally called as the hub of wild medicinal plants. In Indian traditional medicinal framework namely; Ayurvedic, Siddha and Unani maximum number of medications are retrieved from plant species to cure ailments from ancestral period of time to nowadays and have been exploited expeditiously in the market as well (Kumar *et al.* 2008) [17]. Ethnic groups of specific terrains, have their very own cultures, food habits, customs, sacraments and so on where plants play considerable role. Such inhabitants have rich knowledge on customary remedial plants which can be used to fix different infirmities (Mahishi *et al.* 2005) [18]. India ranks second after China in providing 80% of crude materials of restorative plant (Velavan *et al.* 2007) [19]. The worldwide production of medicinal plants, which amount to 1150 million USD in the year 2000 is foreseen to be of 5 trillion USD mark before 2050. The trade of medicinal plants in India has been evaluated to be US\$ 1 billion every year.

It is assessed that the Indian export of the medicinal plants has doubled from 2010 to 2014 (Kala *et al.* 2006) ^[20]. Several evidences showed that in Indian subcontinent medical intercessions are being practiced since the time of 7000 BC. Archaeo botanical excavations directed the proof regarding the use of medicinal plants in the Middle Gangetic region of India and are still found in Ayurveda folk medicine. In the Indian medicinal systems namely; Ayurveda, Siddha, Unani, the herbal medicines have their eminent place. Ayurveda, is considered as the most established medicinal system mentioned in the four Vedas written in 500-1000 BC old Indian literature (Chaudhary A, Singh, 2011) ^[21]. The Domestic trade of Ayurveda, Unani and Siddha industry is near 80-90 billion rupees with the estimated export value of 110 billion rupees from medicinal plants and their related items from India (Shankar, 1997, Sen and Chakraborty, 2015, Debnath *et al.* 2015) ^[22-24]. Early literature shows that South African watermelon (*Citrullus lanatus*) and Linnaeus' watermelon (*Citrullus vulgaris* L.) was the nearest relative or better by *C. colocynthis* (Assis *et al.* 2000) ^[25] yet herbarium test investigations led by (Chomicki and Renner, 2015) ^[26] along molecular phylogenetic analyses revealed that in actual this was not possible. Besides, what was referred to as "Egusi" melon by (Ntui *et al.* 2009, 2010) ^[27-29] as *Colocynthis citrullus* L., was wrong inversion of the Latin name. Later on (Renner *et al.* 2014) ^[30] proved that "Egusi" melon is *Citrullus mucosospermus* a species in the past known as *C. lanatus* subsp. *Mucosospermus* (Levi and Thomas, 2005) ^[31] supported by morphological, phonetic analyses (Achigan-Dako *et al.* 2015) ^[32] and genetic studies (Paris, 2016) ^[33]. Jarret and Newman additionally indicated that *C. colocynthis* and *C. mucosospermus* grouped independently using internal transcribed spacer (ITS) sequences (Jarret RL, Newman, 2000) ^[34].

Methodology

During present investigation the plant has been collected from Botanical Garden of Govt. Girls P.G. College, Satna (M.P.). The herbarium has been prepared as suggested by (Kirtikar and Basu, 2001) ^[11]. The systematics has been described as suggested by (Kirtikar & Basu, 2001) ^[11]. The ethnobotanical importance are described as per method, suggested by (Mudgal *et al.* 1997) ^[53].

Result and Discussion

Taxonomic classification

Kingdom	-	Plantae
Sub kingdom	-	Tracheobionta
Super division	-	Spermatophyta
Division	-	Magnoliophyta

Class	-	Magnoliopsida
Sub-class	-	Dilleniidae
Order	-	Cucurbitales
Family	-	Cucurbitaceae
Genus	-	<i>Citrullus</i>
Species epithet	-	<i>Colocynthis</i> (L.) Schrad

Vernacular Names of the plant in various languages and countries have been listed in Table 1.

Morphological Characteristics

The family comprises of around 118 genera and 825 species, including both cultivated and wild members (Jeffrey, 1990) ^[36] divided into two subfamilies; Zanonioideae (19 genera and 60 species) and Cucurbitoidae (111 genera and 740 species) (Jeffrey, 2005) ^[37]. They are the excellent sources of secondary metabolites like Cucurbitacins, triterpenoids, imparting bitter flavor to the family and furthermore act as an attractant of pollinators like *Diabrotica* (Paryzek, 1979) ^[38]. *C. colocynthis* is wild, perennial, herbaceous, non-tough, harsh, angular vine with lobular tendrils and is well adapted to the arid climatic conditions. Leaves are alternate, rough, hirsute with upper green and lower pale coloured surface with long petioles, 5-10 cm in length and 3-7 profound lobes. Flowers are monoecious (having subcomplanated five lobed, corolla and five parted calyx) solitary, yellow. Calyx of female flower is larger than that of male flower. Each plant contains 15 to 30 globoid fruits with smooth surface, indehiscent, diameter ranging from 5 to 7.5 cm, assorted with green and yellow strips turns yellow with maturity and ripening (Schafferman *et al.* 1998) ^[39]. Seeds are small about 6 mm in size, brownish, smooth, and caramel when ripened. The plant has very delicate, fleshy and long tap roots (Dhakad, *et al.* 2017) ^[40]. About 75% bulk of the *Citrullus colocynthis* fruit is found to be of seeds (Hussain *et al.* 2017) ^[41].

Ethno botanical importance

Most of the tribal areas and rural communities use entire plant but seeds are used to cure Bowel complaints (Nadkarni, 1954) ^[42] Blackness of grey hair (Mohammed *et al.* 2004) ^[43] and (Joshi, 2000) ^[8] Malaria (Ali *et al.* 2004) ^[44]. Fruits are used to reduce stomach ache (Singh and Pandey, 1983) ^[45], Dropsy, ^[10] timely and easy delivery (Sharma, 2002) ^[46] Hepatitis (Dafni and Lev, 2002) ^[12] Snake poison (Tiwari *et al.* 2003) ^[13]. Roots are applied in the form of paste to enlarge the abdomen and to cure Rheumatism (Kirtikar, KR, Basu, 2001 and Tiwari *et al.* 2003) ^[11, 13]. More knowledge about ethnobotanical importance of the various plant parts has been enlisted in Table 2.

Table 1: Vernacular Names of *Citrullus colocynthis* in different languages

Language/Country	Common Name
English	Colocynth or Vine-of-Sodom (Pravin <i>et al.</i> 2013) ^[2]
Sanskrit	Indravaruni or Brihadvani (Pravin <i>et al.</i> 2013 and Rani <i>et al.</i> 2017) ^[2, 7]
Hindi	Indrayan or Ghorumba (Pravin <i>et al.</i> 2013 and Rani <i>et al.</i> 2017) ^[2, 7]
Bengali	Makhal, Indrayan, Panjot, Indrabaruni (Pravin <i>et al.</i> 2013 and Rani <i>et al.</i> 2017) ^[2, 7]
Telugu	Eti-puchcha (Pravin <i>et al.</i> 2013) ^[2]
Gujarati	Indrayan (Pravin <i>et al.</i> 2013) ^[2]
Malayalam	Paikummatti (Pravin <i>et al.</i> 2013) ^[2]
Marathi	Kadu-indravani (Pravin <i>et al.</i> 2013) ^[2]
Tamil	Paedikari Attutumatti (Pravin <i>et al.</i> 2013) ^[2]
Punjabi	Kaudtumba
Kannada	Hamekkae, Hamekkikayi (Rani <i>et al.</i> 2017) ^[7]
Urdu	Hanzal, Indyaran, Shahmehinzal (Rani <i>et al.</i> 2017) ^[7]

Arabic	Handhal (Kapoor <i>et al.</i> 2020) ^[35]
French	Coloquinte (Kapoor <i>et al.</i> 2020) ^[35]
German	Bitter-melone or Koloquinte (Kapoor <i>et al.</i> 2020) ^[35]
Portuguese	Colocintida (Kapoor <i>et al.</i> 2020) ^[35]
Spanish	Alhandal or coloquintida (Kapoor <i>et al.</i> 2020) ^[35]
Swedish	Kolokvint (Kapoor <i>et al.</i> 2020) ^[35]

Table 2: Ethnobotanical importance of *Citrullus colocynthis*

Uses	Plant part used
To reduce acute stomachache (Singh and Pandey, 1983) ^[45]	Seed and Fruit
Antibacterial activity (Meena <i>et al.</i> 2014) ^[47]	Fruit
Abortifacient (Meena <i>et al.</i> 2014) ^[47]	Fruit
Ascites (Tiwari <i>et al.</i> 2003) ^[13]	Roots
Abdominal pain (Meena <i>et al.</i> 2014) ^[47]	Roots
Amenorrhoea (Meena <i>et al.</i> 2014) ^[47]	Roots
Boils and carbuncles (Meena <i>et al.</i> 2014) ^[47]	Roots and raw fruit
Chronic open wounds (Meena <i>et al.</i> 2014) ^[47]	Roots
To cure biliousness in animals (Shah and Amin, 2005) ^[48]	Seeds
To treat bowel Complaints (Singh and Pandey, 1983) ^[45]	Seeds
Bacterial Infection (Al-Snafi, 2016) ^[51]	Roots
Boils and pimple (Kirtikar <i>et al.</i> 2001) ^[11]	Fruit and root
Cooking purpose (Badifu and Ogunsua, 1991) ^[49]	Seeds
Cancer (Al-Snafi, 2016) ^[51]	Fruit
Constipation (Meena <i>et al.</i> 2014) ^[47]	Fruit
Cure Bilious (Mitaliya and Bhatt, 2003) ^[50]	Fruit
Constipation and Toxemia (Mitaliya and Bhatt, 2003) ^[50]	Fruit
To cure epilepsy (Dey, 1980) ^[14]	Seeds
Deafness (Meena <i>et al.</i> 2014) ^[47]	Fruit
Dental caries (Meena <i>et al.</i> 2014) ^[47]	Fruit
Dropsy (Nadkarni, 1998) ^[10]	Fruit
Diabetes (Al-Snafi, 2016) ^[51]	Fruit
Dyspepsia (Meena <i>et al.</i> 2014) ^[47]	Fruit
Enlarged Abdomen (Kirtikar <i>et al.</i> 2001) ^[11]	Roots
Easy delivery (Yadav <i>et al.</i> 2006) ^[52]	Roots
Flatulence (Meena <i>et al.</i> 2014) ^[47]	Fruits
Fever (Al-Snafi, 2016) ^[51]	Fruit
Hair growth and blackness of grey hairs ^[43]	Seeds
Hydrocele (Meena <i>et al.</i> 2014) ^[47]	Roots
Indurations of liver (Meena <i>et al.</i> 2014) ^[47]	Whole plant
Infertility (Meena <i>et al.</i> 2014) ^[47]	Roots and ripe fruit pulp
Inflammation of breast (Joshi, 2000) ^[8]	Roots
Inflammation of joints (Joshi, 2000) ^[8]	Roots
Jaundice (Meena <i>et al.</i> 2014) ^[47]	Roots
Leucoderma (Meena <i>et al.</i> 2014) ^[47]	Leaf
Malaria (Meena <i>et al.</i> 2014) ^[47]	Seeds
Oedema (Al-Snafi, 2016) ^[51]	Fruit
Ophthalmia (Al-Snafi, 2016) ^[51]	Roots
Poisonous bites (Al-Snafi, 2016) ^[51]	Seeds
Piles (Meena <i>et al.</i> 2014) ^[47]	Fruit pulp
Rheumatism (Meena <i>et al.</i> 2014) ^[47]	Roots
Scarcity (Meena <i>et al.</i> 2014) ^[47]	Seeds
Soup thickening and Flavorings agent (Al-Snafi, 2016) ^[51]	Seeds
Syphilis (Meena <i>et al.</i> 2014) ^[47]	Seeds
Timely and easy delivery (Sharma, 2002) ^[46]	Fruit
Urinary Disease (Al-Snafi, 2016) ^[51]	Roots
Worms (Al-Snafi, 2016) ^[51]	Roots

Conclusion

This review supports the remedial capability of the plant. However, these outcomes must be additionally assessed and revalidated by clinical preliminaries experiments. It provides novel ideas to explore all those major principle components responsible for the various significant activities along restorative properties.

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