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Review Article

Review on Nectar plant and its phyto-actives - An immunomodulatory and adaptogenic

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ABSTRACT

In our day to day we expose with various microbes and many antigens. Our body is also equally equipped with a strong immune system to fight against various pathogens. However, we need an external support for our immune system to make it more strong and ready to fight various complex pathogens and various diseases. Medicinal plants play a major role in boosting immunity and that is the treasure from ancient science and holistic approach towards healthy lifestyle. One such treasure gifted by Ayurveda/Siddha is *Tinospora cordifolia*, a plant which belongs to family Menispermaceae is known as an indispensable herb now a-days. It has various vernacular names such as Guduchi, Amrithavalli, Moonseed plant etc.,. As it has wide array of bioactive principles it is considered as an important herbal drug if Indian System of Medicine (IMS). Other than immune boosting properties, this herb is widely used in traditional medical practices for the benefits such as anti-cancer, anti-ulcer, anti-arrhythmic, anti-depressant, anti-inflammatory, anti-diabetic, anti-oxidant activity, immunomodulatory activities etc.,. The crude extracts of each and every part of the plant has their own ability to cure numerous diseases. This plant has many beneficial therapeutic uses and is very economical and hence used in folk medicines. It is also known as moonseed plant based on the shape of its leaf. It is widely known for its immunomodulatory properties. Present article gives a brief description about botanical description, chemical constituents and therapeutic activities of Guduchi.

Keywords: *Tinospora cordifolia*, botanical description, therapeutic activities, bioactive principles.

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1. Introduction

Traditional medicine involves in herbal or folk medicine in which the extractions of different parts of the plants are used as the main treatment. It is also noted that the therapeutic use of the herbal medicines are as old as 4000–5000BC[20]. In our country since ages traditional medicine plays a major role in the maintenance of our health and in the development of our immunity. Traditional medical practices are considered as a supportive medication to the synthetic medicines as they contain the active components that can act as immune modulatory, Many of the isolated phyto-actives such as alkaloids, glycosides, anthraquinones, quinones, flavanoids, coumarins, etc. are developed as synthetic drugs based on their strong pharmacological benefits[21].

Tinospora cordifolia, a boon to humans from the nature with wide pharmacological benefits and end to end solution for immunity. It has various vernacular names such as guduchi, giloy. As it is widely used in traditional medical practices it is named as nectar plant. It belongs to the family Menispermaceae. It is a shrub which is grown as an ephemeral in different tropical areas. It is grown in Indian subcontinents majorly[22]. It's common names include amrithavalli, guduchi, giloy, teppatige, heartleaf moon seed, gulanca etc., Nectar plant also has other pharmacological activities such as anti-oxidant activity, anti-cancer activity, anti-ulcer, anti-depressant, anti-inflammatory, anti-diabetic, immunomodulatory, antitoxic, anti-HIV, anti-microbial, etc.,

2. Plant Profile

The heart-shaped moon seed plant is grown in tropical regions. it is shrubaceous belonging to the family menispermaceae. It grows about 3 to 4 feet in height and about 1 feet in width[23]. LEAVES: Leaves are observed in bulk. They are green in colour. It has heart shaped leaves with simple, alternate and exstipulate in arrangement. Petioles are up to 15 cm in length with roundish and pulvinate leaves at apex. It consists of partially twisted basal region with half way around which is longer too. These leaves turn to yellow which indicates that they are turned old[23]. The leaves have distinct odour and tastes bitter. Leaves are abundant in protein, calcium and phosphorous. They have petiole which is 15cm in length approximately. FLOWERS: Flowers are unisexual.

They are small and greenish – yellow in colour. They are small and can be easily differentiated as male and female flowers due to their positioning. These male and female flowers lie on different plants[23]. No leaves are observed during the flowering season. Petals and sepals are 6 in number. They are either free or grouped in 2 or 3 numbers. Petals are smaller than sepals. FRUITS: Fruits are red in colour. They are ovulate and single seeded. They are pea sized. They are arranged in 1 – 3 drupes. They are seen in winter[23]



Figure 1 : *Tinospora cordifolia* (leaf)



Figure 2 : Fruit



Figure 3 : flower



Figure 4 : stem

STEM:

Stem is long, filiform, fleshy and climbing in nature. Stem is cylindrical in shape when it is dried. The transverse section of the stem shows ring like structures. The outer part of the stem is thin with slightly brownish to grayish in colour. Branches contains the aerial roots. Powder of the stem has characteristic order with bitter taste. Powder is cream to brownish in colour. Stem gives a starch like substance which is known as Guduchi-Satva which helps to cure many diseases and also highly nutritive.

ROOTS:

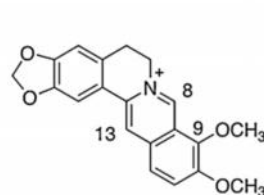
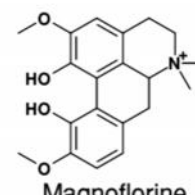
Roots are presented both aerial and underground. Aerial roots are thin, thread like long filiform in nature. Few of the roots grow downwards to the ground. Root cortex is divided in to 2 parts namely outer thick walled and inner parenchymatous[23]. Roots also consists of starch. Dried aerial roots are grey – brownish in colour with bitter in taste. Taxonomical Classification : [23] Binomial name : *Tinospora cordifolia* Kingdom : Plantae Sub kingdom : Tracheophyta Class : magnoliopsia - Dicotyledons Sub-class : Polypetalae Order : Ranunculales Family : Menispermaceae Genus : *Tinospora* Species : *cordifolia*

CHEMICAL CONSTITUENTS / ACTIVITIES :

PLANT PART/EXTRACT	CHEMICAL CONSTITUENTS	USES	ACTIVITY
WHOLE PLANT	Cordifolioside A, Tinocordiside, Syrigin, Glycosides	Immuno suppressant	Immunomodulatory activity [3]
Aqueous extract			
Ethanol extract	(-) Epicatechin, Tinosporin, Isocolumbin, Palmatine alkaloid, Diterpenoid lactones	Liver cancer in male wistar Albino rats	Antioxidant activity[4]
-	Epoxyclerodane – Terpenoids	Induced gastric ulcers in rats	Gastroprotective activity [6]
Chloroform extract	Tinocordin, Tinosporide, columbin, 8-hydroxy Terpenoids-columbin	-	Antifeedant activity[8]
Alcohol extract	Tinosporin, Tinosporide, Tatoerine, Columbin Furanolactone, Clerodane extract – Alkaloids, Terpenoids	To produce arrhythmia in rats	Cardio protective effect[16]
Aqueous extract	Magnoflorin, Tinosporin, Isocolumbin, Palmatine, Tetrahydro palmatine- alkaloids, Terpenoids	Induced jaundice in rats	Hepato protective activity[10]
Stem	Berberin - alkaloid	Alloxan induced diabetic - male albino mice	Antidyslipidemic activity [14]
Aqueous extract	Tinosporin, tinosporide, Furanolactone, tatoerine - diterpenoid lactones	Induced paw edema in rats	Anti inflammatory activity [5]
Ethanol extract	Cardifolioside. A- Terpenoid	Induced genotoxicity	Radiprotective and cytoprotective activity [7]
Aerial parts			

**Figure 5 : Root**

Root			
Ethanol extract	Berberine, choline, Palmatine, Tinosporin, Tembetarine, isocolumbin- alkaloids	Parkinson disease- lesion rat models	Neuro protective effect [1]
Ethanol extract	Tinosporin, Columbin, Palmatine, Magnoflorin, Tetrahydro Palmatine-alkaloids, Terpenoids		Ameliorative effect [9]
Others			
Ethanol extract	Magnoflorin, Palmatine, Cardifolioside. A, Tinocordiside, Terpenoids, Alkaloids	Human neuroblastoma [13]	Anti cancer activity
Aqueous extract			
Pet ether extract	Tinosporin, Berberine, jatrorrhizine – alkaloids		Anti depressant activity [12]
Aqueous & ethanol extract	Berberine, Choline, Palmatine, Isocolumbin, Tatroerhizine, Tembetarine, Magnoflorin, Tinosporin, Aporphine alkaloids- Alkaloids		Anti psychotic activity [11]
Aqueous & Hydroalcoholic extract	Berberine, Palmatine, Tinosporin, Magnoflorin, Isocolumbin- alkaloids		Aphrodisiac property [2]
Leaf	Berberine, Choline, Tembetarine, Palmatine- alkaloids	Diabetes	Antidiabetic activity[2]
Bark	B- sitosterol, Makisterone- A, steroids	Arthritis	Anti arthritic activity [15]

**Berberine****Figure 6 : Berberine****Magnoflorine****Figure 7 : Magnoflorine**

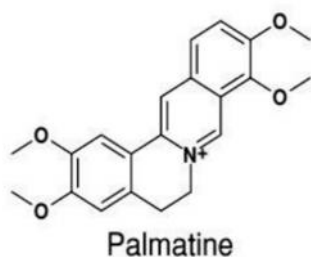


Figure 8 : Palmatine

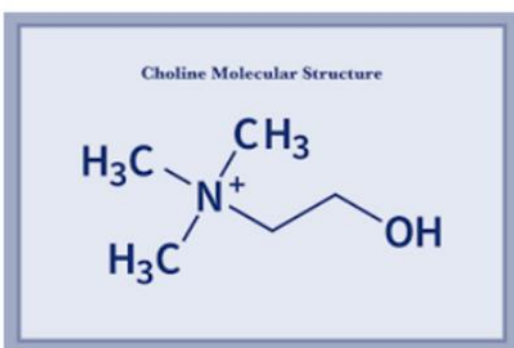


Figure 9 : Choline

4. Conclusion

This review is done on the basic plant review. Based on the references collected I hereby conclude that the nectar plant, *Tinospora cordifolia* plays an irreplaceable role in the traditional medical practices due to the presence of various chemical constituents. This plant and its extracts are highly economical with mere side effects and hence used widely since ages.

5. References

- [1] Kosaraju J., Roy PD. Neuroprotective effect of *Tinospora cordifolia* ethanol extract on 6-hydroxydopamine induced parkinson disease. *International Journal of Pharmacology* 2014; 46: 176-80.
- [2] Wani JA., Neema RK. Phytochemical screening & aphrodisiac activity of *Tinospora cordifolia*. *International Journal of Pharmaceutical & Clinical Research* 2011; 3: 21-26.
- [3] Gupta MS, Sharma GD, Chakraborty B. Effect of aqueous extract of *Tinospora cordifolia* on functions of peritoneal macrophages isolated from CCl₄ intoxicated male albino mice. *BMC Complementary & Alternate Medicine* 2011; 11:9102.
- [4] Ramesh V., Jayaprakash R., Sridhar MP. Antioxidant activity of ethanol extract of *Tinospora cordifolia* on N-nitrosodiethylamine induced liver cancer in male wistar albino rats. *Journal of Pharmaceutical & Bioallied Sciences* 2015, 1: 45-50.
- [5] Patgiri B., Umretia BL., Prajapati PK., Shukla VJ. Anti-inflammatory activity of aqueous extract of *Tinospora cordifolia*. *Ayurveda* 2014; 35: 108-10
- [6] Antonisamy P., Dhanasekaran M., Balthazar JD. Gastroprotective effect of epoxy clerodane diterpene isolated from *Tinospora cordifolia* on indomethacin induced gastric ulcers in rats. *Phytomedicine* 2014; 21: 966-9.
- [7] Patel A., Singh CS., Patel NS. Radioprotective & cytoprotective activity of *Tinospora cordifolia* stem enriched extract containing Cordifolioside. *Indian Journal of Pharmacology* 2013; 45: 237-43. Ratnasamy R., Compos AM. A new antifeedant clerodane diterpenoid from *Tinospora cordifolia*. *Natural Product Review* 2013; 27:1431-6.
- [8] Review on Nectar plant, *Tinospora cordifolia* and its phytoactives K.G. Rajyalakshmi et al. 9. Gupta R., Sharma V. Ameliorative effect of *Tinospora cordifolia* root extract on histopathological & biochemical changes induced by aflatoxin b1 in mice kidney. *Toxicol. Int.* 2011; 18: 94-8.
- [9] Stance MH., A Nagy A., Tosa M., Vlad L. Hepatoprotective effect of orally administered melatonin & *Tinospora cordifolia* in experimental jaundice. *Chirurgia (bucur)* 2011; 106(2), 205-10.
- [10] Jain BN., Jain VK., Shete A. *Journal Advanced Pharmaceutical Technology Research* 2010;1: 30-3.
- [11] Dhingra D., Goyal PK. Evidence for the involvement of monoaminergic & GABAergic systems in antidepressant like activity of *Tinospora cordifolia* in mice. *Indian journal of Pharmaceutical Sciences* 2008; 70: 761-7.
- [12] Mishra R, G Kaur. *Tinospora cordifolia* induces differentiation & senescence pathways in neuroblastoma cells. *Molecular Neurobiology* 2015; 52: 719-33
- [13] Kumar v, Mahdi F, Chander R, Hussain J. *Tinospora cordifolia* regulates lipid metabolism in alloxan induced diabetes in rats. *International journal of pharmacy and lifesciences* 2013;4 3010-17.
- [14] R.Ramya, R.Maheshwari. Anti arthritic activity of *Tinospora cordifolia* by denaturation studies 2016-02-25.
- [15] Sharma AK., K Kishore K, Sharma D., Agarwal SS., Singh SK. Cardioprotective activity of alcoholic extract of *Tinospora cordifolia* in CaCl₂ induced cardiac arrhythmia in rats. *Journal of Biomedical Research* 2011; 25: 280-6.
- [16] *Tinospora cordifolia* (giloy): a magical shrub arun kumar srivastava and vinay kumar singh Department of Zoology, Shri Guru Goraksha Nath P.G. College, Ghughli, Maharajganj-273151, U.P., India.