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Formulation & Evaluation of Tinospra cordifolia Tablet: A Herbal Antialzymer Medicine

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Abstract: *In Ayurvedic medicine Guduchi is considered to be one of the three Amrit plants. Amrit means nectar of gods; such are the qualities of this climber plant that in Sanskrit it is named as "Amritavalli". Botanical name of Guduchi is Tinospora cordifolia. Guduchi is a welldocumented in Ayurveda literature. It is used in multiple drug formulations. Ayurvedic practice without this herb may not be possible. It is useful in the promotion and restoration of health and in the treatment and curing of many diseases and known as Panacea (remedy) for all the diseases and disorders. Scientific studies also evaluate and confirm the insight beneficial properties of this medicinal herb like cardio protective, hepatoprotective, antiinflammatory, analgesic effect, confirms the Ayurvedic views of Guduchi as Rasayana and immunity booster. The present review involves the medicinal properties of Guduchi and its uses in Ayurveda.*

Keywords: Guduchi; Tinospora cordifolia; Ayurveda; Rasayana

I. INTRODUCTION

Tinospora Cordifolia is a climbing shrub belongs to family Menispermaceae. It is commonly known as Guduchi, Amrita, Gurach, Tinospora. It isa large, glabrous deciduous climbing shrub. The stems are rather succulent with long filiform fleshy aerial roots form the branches. The bark is gray brown and watery. The leaves are membranous and cordate.

Fig.no.1 Pharmacognosy of Tinospora Cordifolia

1. Stems - Fleshy
2. Roots - long thread like, aerial, arise from branches.
3. Bark - Thin, greyish or creamy white in colour, when peeled fleshy stem is exposed. Leaves - Cordate (heart shaped), membranous, juicy.

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4. Flowers - Bloom during summer a. Male flower - Small, yellow or green coloured occur in clusters, b. Female flower - Occur singly.
5. Fruits - Pea shaped, fleshy, shiny turn red when boiled. Occur in winter
6. Seeds - curved, pea sized.
7. Parts Used: Stems, Roots
8. Distribution The plant occurs throughout tropical regions of India extending from Kumaon to Assam and Myanmar, Bihar, Konkan to Sri Lanka. It is a large climber which Kishori college of pharmacy grows over the highest trees in the forests and throws out aerial roots which reach the length of 10 metres, though not thicker than. 9. Cultivation: Soil And Climate: It grows well in almost any type of soils and under varying climate condition
9. Nursery raising and planting: The plant is cultivated by stem cuting in the month of MayJune. It requires some support preferably Neem and Mango trees, such plants are supposed to possess better medicinal values.
10. Weeding and Hoeing: Periodical hoeing is done, both in the nursery and field as per requirement.
11. Manures, Fertilisers and Pesticides: The medicinal plants have to be grown without chemical fertilizers and use of pesticides. Organic manures like, Farm Yard Manure (FYM), Vermi-Compost, Green Manure etc. may be used asas per requirement of the species. To prevent diseases, bio-pesticides could be prepared (either single or mixture) from Neem (kernel, seeds & leaves), Chitrakmool, Dhatura, Cow's urine etc.
12. Irrigation: The field after plantation should be irrigated periodically as and when required Weekly or fortnightly.
13. Harvesting/Post Harvesting Operation: Mature plants are collected, cut into small pieces and dried in shad.
14. Yield: Approximately 8-10 q./ha. Economics: The rate for a kg. of dried stem ranges from Rs. 15-20. (YEAR-2001) Chemical Constituents: The plant mainly contains alkaloids, and polysaccharides. The alkaloids include berberine, bitter gilonin, non- glycoside gilonin gilosterol. The major phytoconstituent in Tinospora cordifolia include tinosporine,

AIM & OBJECTIVE :

Aim :

Formulation and Evaluation of tinospora cordifolia tablet a herbal antialzymer medicine.

Objective :

- To select the herb for effective against alzymer disease.
- To formulate the herbal tablet
- To reduce theside effects of chemical formulation
- To treatdibeties allergy
- Jmprore the quality of antipsychotic drug
- To improve memory functions
- To boosttheimmunitysystem
- Lower risk of side effect cost compared to pharmacelitical drug

LITERATURE VIEW

Hook F.& Thomson

They promising plant species of tinospora known as giloy or guduchi that is used in the serveral traditional medicine in treating disease.

Bhoopendra mani et al 2015 :

Apart from these other benitical effects have also been reporte that might help to treat neurodegenerative disease.

Ahmad et al 2010 :

The plant extrat chiefty contains glycosides steroids sequiterpenoids alkaloids aliphatic compound fatty acids essentical oil

Mutalik 2011 :

Tinospora cordifolia one of most important herbs in Ayurveda has remarkable affect in memory impairment & learning enharcement it stimulate the immure system by synthesizing acelylcholine which has signiticant role in the enchancement of cognitive function.

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Burtron 2009 :
Tinospora cordifolia is also used in the form of a tablet of poly hrbal formulation for treatment of dieficit hyperactivity disorder

PLAN OF WORK
• Literature view
• Aim and objective
• Selection of plant material (tinospra cordifolia)
• Botanical description
• Medical use of guduchi
• Extraction of tinospra cordifolia
• Formulation of herbal tablet
• Result
• Conclusion
• Reference

Plant Chemical constituents present in Tinospora cordifolia:
A variety of constituents have been isolated from different parts of Tinosporacordifolia. They belong to different classes such as alkaloids, diterpenoid lactones, steroids, glycosides aliphatic compounds, polysaccharides Some constituents have been isolated from plant mainly they are_tinosporone, tinosporic acid, cordifolisides A to E, syringen, berberine, giloin, gilenin, crude giloininand, arabinogalactan polysaccharide, picrotene, bergenin, gilosterol, tinosporol, tinosporidine, sitosterol, cordifol, heptacosanol, octacosonal, tinosporide, columbin, chasmanthin, palmarin, palmatosides C and F, amritosides, cordioside, tinosponone, ecdysterone, makisterone A, hydroxyecdysone, magnoflorine, tembetarine, syringine, glucan polysaccharide, syringineapiosylglycoside, isocolumbin, palmatine, tetrahydropalmaitine, jatrorrhizine_respectively.

BOTANICAL DESCRIPTION:
Botanical name of Guduchi is Tinospora cordifoliajt is a large deciduous climbing shrub belonging to Menispermaceae family, and this family is a rich source of alkaloids and terpenes. This plant contains 70 genera and 450 species . This herb is commonly known as Heart leaf moonseed because the leaves of Guduchi are heart shaped, individualized, slimy, simple, alternate, membranous and cordate . Wood is porous soft and white in colour. Flowers are greenish which are unisexual and bloom in summer. Female flowers occur singly and male flowers are small yellow or green coloured occur in clusters, sepals and petals are six in number . Fruits are orangish colouring found in aggregate of 1-3 drupes with scarlet. Roots are seen in both underground and aerial form . Stem is rather succulent with long; fleshy in nature, bark is creamy white to grey . Guduchi belongs to different classes of constituents such as alkaloids, glycosides, protein, steroids, polysaccharides, aliphatic compound, essential oil, phosphorous , sesquiterpenoid, tannin, saponin,terpenoids, amino acid . The major phytoconstituent in Guduchi include are such as berberine, tembatarine,choline,aporphine alkaloid, tinosporine, jatrorrhizine, furanolactone, tinosporon, tinosporides, columbin, tinocordiside, tinocordifolioside, cordifoliosideA, B, C, D and E, cordifolioside syringin, syringin apiosylglycoside, jateorine, palmatosides, G-sitosterol, delta sitosterol,furanoid diterpene glucoside, makisterone A, giloinsterol,tinocordifolin, pregnane.

NUTRITIONAL COMPOSITION:
Medicinal properties of Guduchi are mainly due to the presence of micro nutrients, macro nutrients and phytochemicals. Every parts of the plant like leaves, stem, fruits and roots are being used since ancient times and are rich in nutraceuticals. One of the studies concluded that Guduchi stems are a potential source of nutrition and minerals for human as well as animals . Bitter starch of the plant known as Guduchi satva obtained from stem is highly nutritive and digestive and it is used to treat number of diseases and it also reported to possess rich nutrients like fat, protein,

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dietary fibres, calcium etc. . By analysing Tables 1 and 2 it can be concluded that Guduchi is a rich source of nutrition for body building and boosting the immune response. Calcium and phosphorous are good for the formation of bones and teeth. Iron plays pivotal role in erythropoietin and oxygen transport. By analysing Tables 1 and 2 it can be concluded that Guduchi is a rich source of nutrition for body building and boosting the immune response. Calcium and phosphorous are good for the formation of bones and teeth. Iron plays pivotal role in erythropoietin and oxygen transport By analysing Tables 1 and 2 it can be concluded that Guduchi is a rich source of nutrition for body building and boosting the immune response. Calcium and phosphorous are good for the formation.

Medicinal uses of Guduchi:

According to Ayurveda Guduchi increases the diminished Dosha or Dhatu and reduces the increased Dosha, so it brings balance of

Table I: Taxonomical classification

Subkingdom	Tracheobionta
Super division	Spermatophyte
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Rasidae
Order	Sapindales
Fimaly	Rutaceae
Genus	aegle

Table 2: Nutrients in Guduchi leaves

Nutrients	Concentration %
Moisture	7.78
Protein	8.74
Fat	2.80
Fiber	8.25
Ash	7.12
Iron	1.53
Calcium	0.11
Vitamin C	1.24

Tridosha (Vata, Pitta, Kapha) in the body and helps in preventing all types of diseases Alzheimer's disease Alzheimer's disease is an irreversible, progressive brain disorder that slowly destroys memory and thinking skills and eventually the ability to carry out the simplest tasks. Ayurvedic drugs can help in the management ofAlzheimer's by providing Medhya (Intellect promoting) effect to improve the memory of the patients. Drugs mentioned as Medhya will improve cognitive function and can be used successfully in cases of Alzheimer's disease. The four Medhya rasayana are

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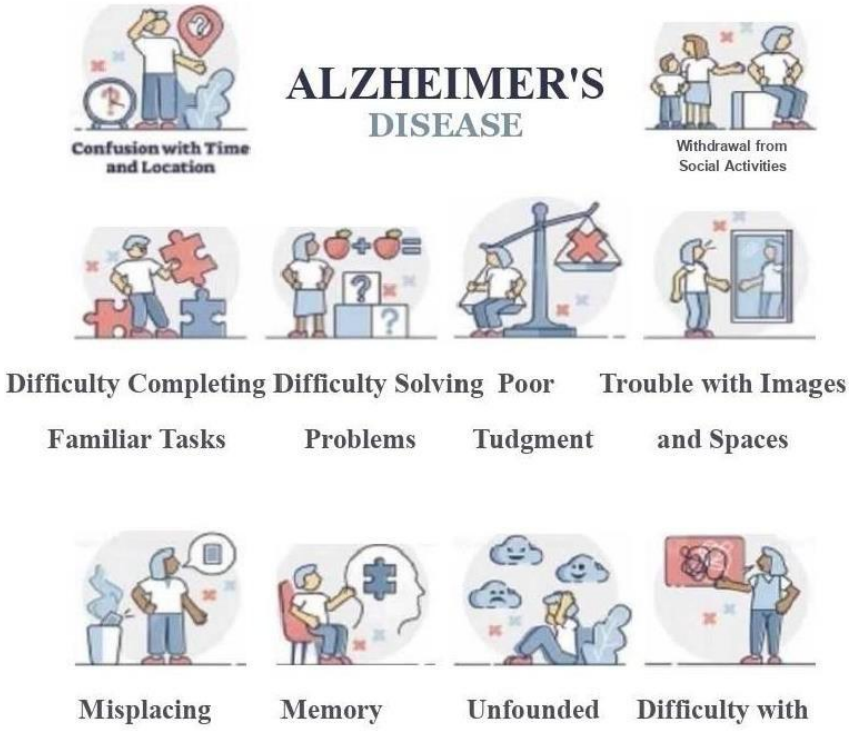
Guduchi(Tinospora cordifolia), Mandukaparni (Centellaasiatica), Shankapushpi (Convolvulus plur icaulis), Madhuyashti (Glycyrrhiza glabra). One of the experimental studies undertaken with the objective of studying the effect of Guduchi on learning and memory in normal rats and on cyclosporine- induced memory deficits, Guduchi extr acts enhanced cognition in normal rats as were seen in behavioural tests-Hebb William maze and the passive avoidance tasks. Hence Guduchi have the potential to provide a significant improvement in memory and learning capacity of the patients suffering from Alzheimer's disease.

SYMPTOMS OF ALZHEIMER'S DISEASE :



RECEPTORS

ronal plasticity, neural transmission, memory processes, and learning.50) The pathogenesis of AD is strongly associated with alterations in glutamate signaling and the tissues affected by AD contain high densities of glumatergic neurons.9,51-56) Early degeneration occurs to the neoeortex pyramidal neurons of layers V and 11157,58) and to the glutamate-innervated cortical and hippocampal neurons.59) 'Exeitotoxicity' occurs as a result of the chronic, moderate activation of NMDA receptors, leading to neurodege-neration.9,60-63) The exeitotoxicity hypothesis is supported by clinical evidence indicating that the NMDA receptor antagonist memantine slows AD progression.64) Prolonged Ca2 + elevation suppresses synaptic function, leading to subsequent synaptotoxicity and eventually atrophy; these events correlate with the loss of learning and memory functions in AD.56,64,65) Multiple neurotrophic factors have.

MECHANISMS ACTION OF ALZHEIMER'S

Cholinesterase inhibitors are prescribed to treat symptoms related to memory, thinking, language, judgment and other thought processes. These medications prevent the breakdown of acetylcholine. A chemical messenger important for memory and learning Fiagure l:Results of Qualitative test for various functional Groups of Tinospora Cordifolia.

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Sr.no	Functional gp	Test/reagent	Observation	Male	Female
1	Cardiac glycosides	Legal test	No colour change	-ve	-ve
2	Alkaloids	Dragendroffs	Orange brown ppt	+ve	+ve
		Wagners	Reddish brown ppt		
3	Tamins and phenols	5% feel 3 sol.	Deep blue black colour	+ve	+ve
4	Protiens	Biuret reagent	No colour change	-ve	-ve
5	Carbohydrates	molish test	Violet ring is formed at the junction	+ve	+ve
6	Steroids	Liebermannbuchard	First red then blue and finally green colour appears	-ve	-ve
7	Flavonoids	Shinoda test	Yellow ppt	-ve	-ve
8	Siphoning	Shaking in test	Frothing with honeycomb appearance	+ve	+ve
9	Amino acids	Ninhydrin test	Purple or bluish colour observed	-ve	-ve
10	Starch resent – ve=abse	Iodine test	Bluish colour appeared	+ve	+ve

DOSAGE

500mg to 1g once of twice a day or before or after food. Or directed by ayurvedic doctor

How long to use?

• It can be used for a long period of time Toxicology: In an acute toxicity study leaves and stem of Guduchi did not show any side effects and mortality of Swiss mice even at the highest dose level.

• It has not been mentioned to be a highly toxic substance. Guduchi is considered being safe in dosage mentioned.

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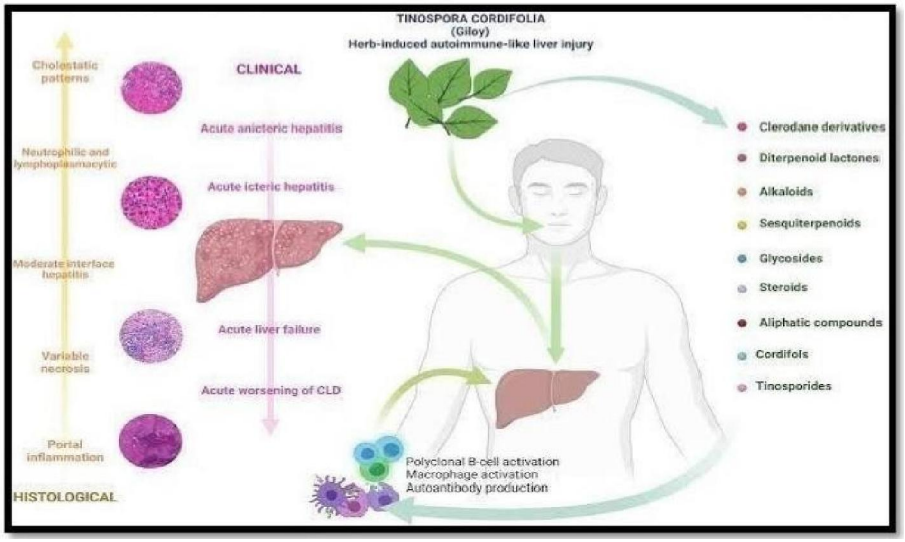
• No conspicuous information on toxicity is available so far It has no side effects and toxicity and no adverse reaction has been noted.



MATERIALS AND METHODS:

Procurement and identification of Guduchi stem Fresh male and female varieties of Guduch, spreading over Nimba(Azadirachta indical) tree were collected from the nonpolluted, wild areas.Identification was carried out on the basis of morphological data provided by earlier study. The plants were authenticated in the Pharmacognosylaboratory of the institute. For identification and authentication help was taken from various available official databases and floras.

Figure1:Male and female Guduchi collected fromtheir natural habitat with neem tree

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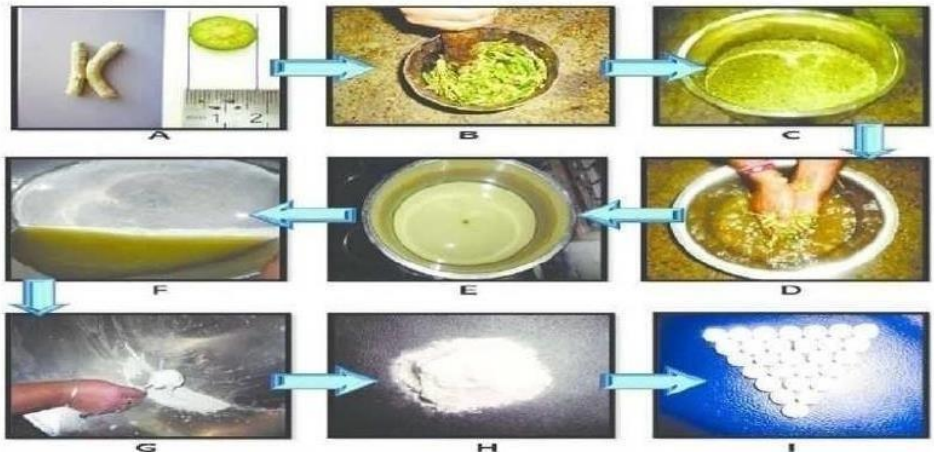
Method of preparation

kg fresh Guduchi stems were collected and washed thoroughly with potable water. Stems were chopped into pieces of 1.5-2 inches, pounded thoroughly into coarse slimy mass and and soaked in 6 times water for overnight. The material was macerated thoroughly on next day for about 1 hour and strained through four folded cotton cloth. The filtered liquid was kept undisturbed for 4 hrs for sedimentation, the supernatant liquid was decanted carefully and the starchy sediment settled at the bottom was scrapped into a tray. Later, it was air dried under running fan which took 2 hours and stored as Guduchi Satva in airtight glass jars. Satva was Shankhabha (clear white) in colour. The pharmaceutical process is illustrated in figure 3. Similar



Process of extraction and prepration of powder

chopped Guduchi Stem, B- pounding, C- overnight soaking, D- maceration, E- allowed for sedimentation, E- Decanting of supernatant liquid, G- scrapping ofwhite sediment, HDried Satva, I- prepared table

Tinospora Cordifolia tablet preparation:

Take 10 gram of giloy powder and weight it Then add chemical ingredients in itAnd weight it with the help of weighting machineMix it well 3]and drawn wet granulation from itPass the granulation between the 80 number sieve and dry it with the help of hot air oven 10 number sieve we get dry granulation Then tablets are produced by the use of punching machine

Tablet prepration method

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INSTRUMENT LIST:

Sr.no	Excipients	Chemicals	Quantity
1	Lubricant	Magnesium stearate	2mg
2	Binder	Methyl cellulose	2mg
3	Disintegrated agent	SLS	2mg
4	Sweeting agent	Sucrose	4mg
5	Coating agent	Gum acacia	3mg
6	Glidant	Starch	3mg
7	Powder	Tinospora cordifolia	10mg

Tablet are sustained release they show prolong during action, administration orally TYPES OF QUALITY CONTROL TEST:

Sr.no	OFFICIAL TEST		UNOFFICAL TEST
1	Weight variation	1	Organoleptic test
2	Drug content	2	Thickness
3	Content uniformily	3	Friability test
1	Disintegration test and dissolution test	4	hardness

organoleptic test: Smell: better Taste: sweet, non irritant Appearance size: 2-5cm UNOFFICIAL TEST 1) organoleptic test

thickness friability test hardness thickness: thickness should be controlled within+- 5%variation of the value.controlled lead to better customer acceptance and facilitating packaging.

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friability test:

friability is the tendency of particle to break apart.the process of agitation and seiving may change the particle size distribution for friable sample Process:

1] initial weight of 20 tablet

2] 25rpm for 4min = 100 rotation

3] firstly check the calibration status and clean the friability test apparatus (friabilitor) before starting

4] before testing tablets must be cautiously dedust

5] for ⩽650 mg weight of tablets take 6.5 g tablet or as near as possible to 6.5g for tablet with more than 650 mg weight,take 20 tablet put the required quantity of tablets (it is initial weight) into the drum

6] start the test after setting all parameters (revolution time)

Fig. friabilitor

Friability test formula:

Friability (%)=initial weight (w1)-final weight (w2)-initial weight (w1)×100 Calculation=i- f+i×100

=6.536-6.443-6.536×100

=0.093-6.536×100

=0.014×100 =1.42%

Hardness teaster Monsanto :

Tablet hardness testing is a laboratory technique used by the pharmaceutical industry to determine the breaking point and structural integrity of a tablet and find out how it changes under conditions of storage, transportation, packaging and handling before usage.

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Hardness tester Monsanto

Calculation= =
Total hardness/no.of tablet
=10+10.11+10.5/3
=30.61/3 =10.20m
Drug content

Weight variation test:
(U.S.P) .take 20 tablet and weighed individually.calculate average weight and compare the individual tablet weight to the average
1) according to usp.20 tablets are weighted individually and their average is calculated
2) Each weight is compair with Average weight and %weight variation is calculated
A) Average weight of tablet= total weight of 20 tablet/20 = 11713.8/20=585.7 mg B) deviation %=weight of each tablet -average weight of tablet +average weight of tablet ×100
=90-585.7-585.7×100=10mg Uniformity of Weight in tablet formulation

Average weight of tablet (IP)	USP	Maximum of difference allowed
80mg or less than	130mg or less	+10%
80mg – 250mg	130-324 mg	+75%
More than 250 mg	More than 324mg	+5%

Dissolution test :
1) Single Tablet placed in wire mesh basket connected to shaft with the speed motor
2) Basket immersed in disc medium in 100ml flask
3) Flask is maintained at 37+0.5c

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4) Motor is at specificied speed is an monograph
5) Sample are withdrawn at interval to determine the amount of drug solution

Fig: Tablet dissolution test apparatus

RESULT &DISCUSSION:

Tinospora cordifolia has an importance in traditional ayurvedic medicine used Recent reports have shown the compounds and their biological roles in Tinospora cordifolia extract. Such properties may be exploited for production of new formulations, which may be better and promising over conventional one. Although genetically diverse and reports of application of tissue culture based propagation of Tinospora exist, effective conservation strategies of the germplasm for such an economically important medicinal plant with many biological role remains yet to be accomplished. Reports on studies of morphological and physiological characters of the plant, including plant length, stem diameter,growth habit, floral morphology, flower color, stomatal density, trichomal density, lenticels density, petiole length, plant biomass, and other characteristics of the plant and diversity in the genetic components identified by markers have indicated the diversity in the medicinal plant which has profound importance for efficient and effective management of plant genetic resources.

II. CONCLUSION

Guduchi is one of the most valued herbs in Ayurvedic collection. Every part of the plant is used for healing. Guduchi is renowned as a powerful healing herb, also aptly named the Divine nectar. It makes for an essential ingredient in many kind of refreshing tonic, it has a long list of medicinal uses mainly supports the immune system, skin, liver, spleen, stomach, blood, intestine and also used to treat chemotherapeutic side effects. The importance of this wonderful herb is gaining importance day by day as more and more people start knowing the uses of Guduchi. There is no wonder that this Ayurvedic herb is also known as "Queen of all herbs.

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