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''Study of pharmacological properties of lantana camara plant''.

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ABSTRACT:
Present study revealed that antioxidant, antibacterial, cytotoxic, AgNPs were synthesized using terpenes rich extract (TRE) Of Environmentally notorious lantana camara L. leaves. The essential activity of was tested for antibacterial activity. Here we report the biochemical composition and antibacterial activity of the leaves of lantana camara (Verbenaceae). The Chemical Constituent of essential oil from the fresh leaves of lantana camera leaves. The main oil constituents were α-pinene (17.53%), α-terpineol (16.67 %) and alloocimene (13.55 %). India is having the highest number Diabetics in the world and by the year 2025 it is expected to swell up to 57.2 millions. Ayurveda and other literature have mentioned the use of plant in treatment of various human ailments. Although the effects of invasive alien plants on natural ecosystems are widely acknowl- edged, the effects of specific plant species can be context dependent. The study examined changes in native vegetation diversity and composition following Lantana camara invasion at different cover conditions in the Vhembe Biosphere Reserve, Limpopo Province of South Africa. Using a comparative approach, native vegetation diversity, cover, and composition were compared in L. camara high and low cover and un invaded conditions, on three replicated sites, each with five 10 ×10 m plots. Medicinal plants play an important role in the management of diabetes mellitus especially in developing countries where resources are meager. Diabetes is a growing health concern worldwide and is now emerging as an epidemic. The management of diabetes is still a major challenge. According to the World Health Organization (WHO), up to 90% of the population in developing countries uses plants and their products as traditional medicine for primary health care. There are about 800 plants that have been reported to show anti-diabetic potential. Thus there is great opportunity for research on natural products with anti-diabetic properties.

KEYWORDS: Lantana camara, Nag-don, Hemorrhoid & Pharmacological Activities,(Anti-bacterial, Anti-diabetic, Wound healing, Anti-hypertensive, Anti-obesity, Hepatoprotective).

I. INTRODUCTION:

Lantana camara L. is a noxious weed belongs to family verbeneaceae. They are mostly cultivated for their ornamental purpose because of their flowers which can be pink, orange, yellow, white, and lilac depending on the variety [1]. Plant have been used in traditional medicine for several thousand years, During the last few decades there has been an increasing interest in the study of the medicinal plant and their traditional use in different part of the world [2]. They are commonly known as wild or red sage is the most widespread species of this genus and regarded both as a notorious weed and a popular ornamental garden plant, lantana camara linn. whole plant and plant parts viz, leaves flowers and essential oils have been thoroughly studied for their chemical composition, previously and currently [3]. The chemical composition of essential oil obtained from air-dried leaves of lantana camara L. by Hydro-distillation was analysed by GC and GC-MS, A total of thirty-two compounds representing 74.8% of the oil were identified, the main constituents were 1,8-cineol (15.8) , sabinene (14.7%) and beta caryophylene (8.9%). These medicines refers to the use of natural products from natural origin for medicinal purposes, lantana camara has been reported to be used in traditional medicine system for the treatment of itches, cuts, ulcers, swellings [4]. Although the impacts of invasive alien plants, on natural ecosystems are site and species specific, the general observation is that many invasive alien plants trigger changes in ecosystem structure, function- ing, and composition.[18,19] . Diabetes meliitus is a heterogeneous metabolic disorder

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characterized by altered carbohydrate, lipid and protein metabolism. Streptozotocin (STZ) causes selective degeneration of pancreatic p-cells thereby inhibiting insulin secretionL Only a few investigations have been made on the biochemical effects of low dose STZ diabetes with histomorphologic and ultrastructural evidences in the tissues like pancreas, liver and kidney [20]. Inflammatory diseases are a longstanding medical problem and a major cause of morbidity worldwide. To get symptomatic relief in inflammatory conditions such as arthritis and rheumatism, treatment mostly involves the application of steroidal and non-steroidal antiinflammatory drugs (NSAIDs), which are in great demand these days. However, prolonged use of NSAIDs often leads to renal problems, gastrointestinal irritation and other side effects, while some of these specific COX-2 inhibitors, such as rofecoxib and celecoxib, have recently been implicated in a high possibility of myocardial infarction/strokes, and have been marketed with a 'black-box' warning. In the present study therefore, three plant samples were chosen, namely Ventilago madraspatana Gaertn. (Rhamnaceae; Red Creeper) stem-bark, Rubia cordifolia Linn. (Rubiaceae; Indian Madder) root and Lantana camara Linn. (Verbenaceae; Wild Sage) root bark. This selection was based on the plants' traditional usage in Ayurveda and other indigenous systems of medicine, where they are used in the treatment of rheumatism, asthma and other inflammatory conditions [21]. L. camara is a well known medicinal plant in traditional medicinal system and recent scientific studies have emphasized the possible use of L. camara in modern medicine L. camara is an important medicinal plant andin recent history this plant is reported for various medicinal properties [22]. Different varieties of L. camara plant parts were reported for anticancer and antiproliferative activity. Leaves of L. camara were reported for antiproliferative activity against HEp-2 (laryngeal cancer) and NCIH292 (lung cancer) cell lines. In vitro antiproliferative test was performed by MTT assay. Methanol extract of L. camara leaves exhibited antiproliferative activity against NCI-H292 cells (% living cells= 25.8±0.19). Leaves of L. camara were reported to exhibit cytotoxicity effect on Vero cell line. In vitro cytotoxicity test was performed by MTT assay. The methanol extract (500 µg/ml) concentration inhibited the growth of cells 2.5 times less than did Triton 100 × 1% [23,24]. Oleanonic acid isolated from L. camara was screened for anticancer activity against a murine tumour (Ehrlich ascites carcinoma), and three human cancer cell lines, namely A375 (malignant skin melanoma), Hep2 (epidermoid laryngeal carcinoma) and U937 (lymphoma). Oleanonic acid exhibited promising cytotoxicity against A375 cells [25].

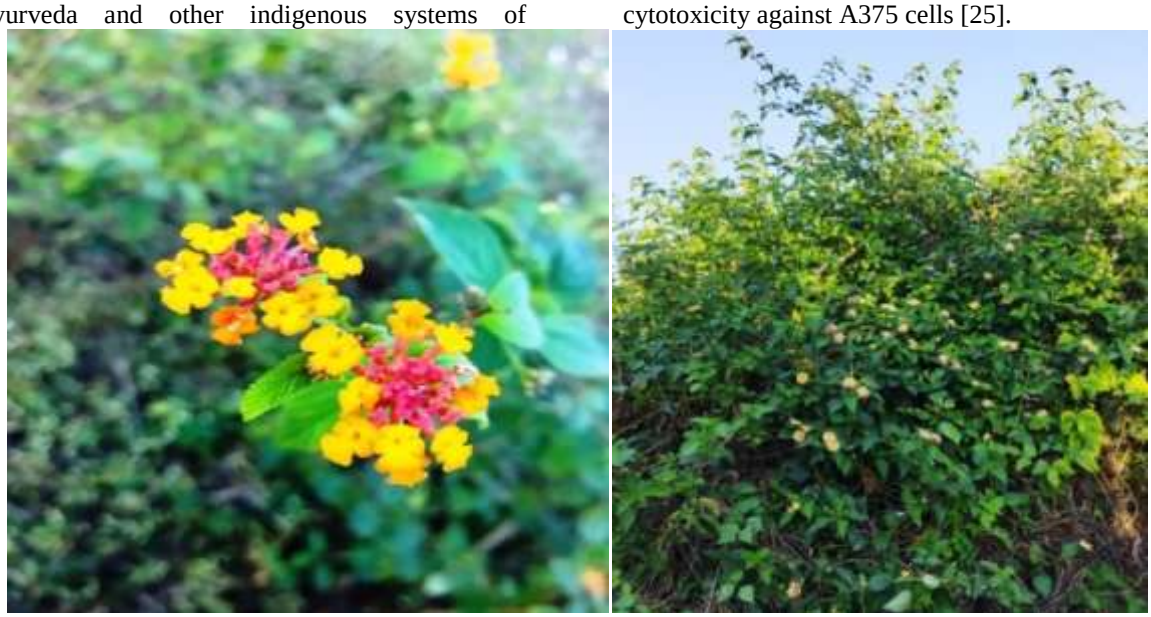

Fig. No.02: Camara Lantana Flowers& Leaves Used in anti-hemorrhoidal activity.

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Table 3: Effect of treatment on itching:

Follow up weeks	Group	
	Mean (X)	Standard Deviation (SD)
1st week	2.13	0.757
2nd week	1.26	0.643
3rd week	0.43	0.507
4th week	0.11	0.300

Table 4: Effect of treatment on constipation:

Follow up weeks	Group	
	Mean (X)	Standard Deviation (SD)
1st week	2.435	0.507
2nd week	1.522	0.511
3rd week	0.609	0.409
4th week	0.09	0.02

Table 5: Effect of treatment on bleeding:

Follow up weeks	Group	
	Mean (X)	Standard Deviation (SD)
1st week	2.140	0.541
2nd week	1.123	0.338
3rd week	0.483	0.317
4th week	0.04	0.01

II. TAXONOMICAL CLASSIFICATION:

Sr. no.	Kingdom	Plantae
1.	Subkingdom	Tracheobionta
2.	Super division	Spermatophyta
3.	Division	Magnoliopesida
4.	Subclass	Asteridae
5.	Order	Lamiales
6.	Family	Verbeneceae
7.	Genus	Lantana
8.	Species	Lantana camara

Part Used: Apart from the whole plant, seeds, stem, roots, leaves and flowers are also used.
Synonyms: Lantana aculeate, Camara vulgaris, Lanatana indica Roxb., Lantana salvifolia Jacq.

Ayurvedic Description:
Sanskrit Name: Chaturangi, Vanacchedi.
Properties: Rasa: Kashya, Tikta; Guna; Guru; Virya: Sita

Therapeutic Uses: Plant specific vitiated condition of vata and kapha, pita.

III. PHARMACOLOGICAL STUDIES:

1. ANTI-BACTERIAL: L. Camara leaf and flower extracts reported here might be due to the presence of some of these chemical constituents particularly lantadenes and theveside in the

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extracts. The mechanism of the action of these chemical constituents is not yet fully known it is clear that the effectiveness of the extracts largely depends on the type of solvent used. [6]

Fig. No. 01: L camara leaf and flower extracts Used in anti- bacterial Activity

The antibacterial activities of L. camara leaf and flower extract are presented in Table 1 a and b

Table 1 a. The antibacterial activities of the leaf extract of L.camara with yellow, lavender, red, and white flowers.

L.Camara	Extract Bacteria	Zone of Growth inhibition (MM)			
		E.Coli	P.aeruginosa	B.subtilis	S.aureus
Yellow	Ethyl acetate	17	16	21	R
	Chloroform	12	15	11	R
	Acetone	14	12	12	R
	Streptomycin	12-22	R	R	14-22
Lavender	Ethyl acetate	18	15	15	R
	Chloroform	11	14	10	R
	Acetone	17	14	12	R
	Streptomycin	12-22	R	R	14-22
Red	Ethyl acetate	17	16	15	R
	Chloroform	12	15	16	R
	Acetone	11	13	13	R
	Streptomycin	12-22	R	R	14-22
White	Ethyl acetate	18	15	20	R
	Chloroform	13	15	10	R
	Acetone	14	13	12	R
	Streptomycin	12-22	R	R	14-22

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Table 1 b. The antibacterial activities of the leaf extracts of L. camara with yellow, lavender, red, and white flowers.

L. Camara	Extract Bacteria	Zone of Growth Inhibition (MM)			
		E. Coli	P.aeruginosa	B.subtilis	S. aureus
Yellow	Ethyl acetate	13	11	14	R
	Chloroform	10	14	09	R
	Acetone	15	11	09	R
	Streptomycin	12-22	R	R	14-22
Lavender	Ethyl acetate	14	12	14	R
	Chloroform	09	09	10	R
	Acetone	09	10	11	R
	Streptomycin	12-22	R	R	14-22
Red	Ethyl acetate	09	13	10	R
	Chloroform	10	09	09	R
	Acetone	09	10	10	R
	Streptomycin	12-22	R	R	14-22
White	Ethyl acetate	14	10	14	R
	Chloroform	10	14	09	R
	Acetone	14	12	10	R
	Streptomycin	12-22	R	R	14-22

R=Resistant [7].

Therefore in the continuation of our search for bioactive quinonoids, three indigenous plants of enthno pharmacological importance, which are known to contain various quinonoid compounds, were chosen for investigation of their antibacterial property [8].

2. ANTI-DIABETIC: Lantana camera L. is a perennial aromatic shrub that grows up to 2 to 3 meter and can spread about 2.5 meter in wide lantana camera has been reported to be used in traditional medicine system for the treatment of itches, cuts , ulcers, swellings, bilious fever, cataract, eczema and rheumatism[9].according WHO, the terms diabetes mellitus is defined as a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbances or carbohydrate ,fat and protein metabolism resulting from defects in insulin secretion , insulin action or both .the effects of diabetes mellitus included long term damage , dysfunction and failure of various organs. Diabetes mellitus may present with characteristic symptoms such as thirst, polyuria, blurring of vision of weight loss. (2.1) insulin dependent diabetes mellitus (IDDM, type 1): it is probably an autoimmune disorder. Antibodies that destroy β cell of islets of langarhans in the pancreas and are often detectable in blood. (2.2)Non-insulin dependent diabetes mellitus (NIDDM, type 2): there is no loss in β cell mass insulin in circulation is low normal or even high degree of genetic predisposition generally has a lat onset past middle age often found after the age or 40.(2.3) Gestational diabetes (Type 3):it refers to initial recognition of glucose tolerance during pregnancy ,usually in the second or third trimester. It occurs in about 4% of all pregnancies. Patients with GD have a 30% to 50% chance of developing DM, usually type 2 [10].

3. WOUND HEALING: wound healing is the body's natural process of regenerating dermal and epidermal tissue .the healing cascade is activated when platelets come into contact with exposed collagen leading to platelet aggregation and the release of clotting factors resulting in the deposition of a fibrin clot at the site of injury [11].

TYPES OF WOUND HEALING:

(3.1.) Primary healing (healing by first intention) occurs when a wound is closed within 12-24 hours of its creation (clean surgical incision, clean laceration).the wound edges are approximated directly using sutures, tissue glue, tapes or a mechanical device. (3.1.1)delayed primary healing

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: occurs in a contaminated or poorly delineated wound that is closed after a few days having been left open to prevent infection (e.g. bites, abdominal wound after peritoneal soiling.)

(**3.2) Secondary healing** (healing by second intention) occurs in a wound with extensive loss of soft tissue, as seen in major trauma, severe burns and after some surgical procedures (e. g laparoscopy).

(3.3) Homeostasis (immediate): tissue injury is characterized by Micro-vascular injury and extravasations of blood into the wound.

(3.4) Inflammation: inflammation can be divided into early and late phases depending on the time and duration of response and the type of inflammatory cell involved.

(3.4.1.) Early inflammatory phase (days 1-2): inflammation begins with the activation of the classical and alternative pathways of the complement cascade.

(3.4.2.) Proliferation (days 3 to week 2): the proliferative phase starts at about day 3 and lasts for 2-4 weeks after wounding and is characterized by fibroblast migration, deposition of the extracellular matrix and formation of granulation tissue.

(3.5) Fibroblast migration: Fibroblasts appear in the wound 2-4 days after wounding and endothelial cells follow about one day later. Following injury, fibroblasts are attracted to the wound by a number of factors, including platelet-derived growth factor and transforming growth factor-β [12].

4. ANTI-HYPERTENSIVE: hypertensive is most common cardio vascular disease and is a major public health issue. Recent study have reported and increasing trend in the prevalence of hypertension in India subcontinent. This increase was found to be about 30% in urban population and 10% in rural habitants in last three decades [13]. Lantana camara also referred to as "Spanish flag or West Indian Lantana"; and sometimes known as "Red Sage." L. camara is an "ornamental weed" with aromatic leaves, prange, blue, red, yellow, and bright red flowers, and dark blue and black fruits (drupes) Add more information of hypertensive [26]. L. camara especially the leaves has been used as an anti-tumor, antibacterial, anti-hypertensive agent, tonic, and expectorant whereas the roots are known for the treatment of rheumatism, skin rashes, and malaria[26,27].

5. ANTI-OBESITY: Obesity is a chronic metabolic disorder cause by an imbalance between energy intake and expenditure. Over weight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. Obesity is one of the greatest health threats of this century. In the literature survey, it was found that falconoid, sterols, tannins and alkaloids have shown promising effects to tackle obesity by various mechanisms, Lantana camera whole plant has shown the presence of sterols, triterpenoids, flavonoids alkaloids and saponins, and other in the extracts. Moreover, traditional Indian medicines also claims for its anti obesity activity [14]. Obesity is known to be a social problem and has become the focus of much attention by public and especially health-related institutions, whose aim is to provide as much information as possible to reduce its prevalence. Both statistics and the observation of people that we commonly meet are evidence to the fact that many of these attempts fail. Taking advantage of the strong impact it has on the audience, the mass media have taken hold of this topic, but do not necessarily deal with it with due seriousness; at the same time, food and drug industries continue to propose and advertise new weight-lowering products[28]. Obesity is one of the greatest health threats of this century, which has an important impact on life style-related diseases such as coronary heart disease, dyslipidemia, glucose intolerance, diabetics, hypertension and some cancers (Hu et al., 2008). Several factors, including lack of exercise, sedentary lifestyles and the consumption of energy rich diets are contributory to the etiology of obesity (Ekanem et al., 2007). Despite the urgent need for safe [29]. The aim of the present study was to investigate the anti-obesity effect of a mixture composed of Garcinia cambogia extract, soypeptide, and L-carnitine (1.2:0.3:0.02, w/w/w) in rats rendered obese by a high-fat diet (HFD). Sprague-Dawley rats were fed either the high-fat control diet (CD) or the 0.38% mixture-supplemented HFD (CD + M) for 9 weeks. The mixture significantly reduced body weight gain and the accumulation of visceral fat mass in a rat model of HFD-induced obesity. Moreover, the mixture effectively lowered blood and hepatic lipid concentrations and serum glucose, insulin, c-peptide, and leptin levels in rats with HFD-induced obesity. Results from real-time reverse transcription-polymerase chain reaction analyses indicated that the expression levels of leptin, tumor necrosis factor-alpha (TNF-α), and sterol regulatory element binding protein Ic (SREBP1c) genes in the epididymal fat tissue of rats fed the CD + M diet were 0.4-, 0.6-, and 0.48-fold,

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respectively, of those found in the CD rats ($P < 0.05$), while expression of the uncoupling protein 2 (UCP2) gene in epididymal adipose tissue was 1.25-fold ($P < 0.05$) of that found in CD rats. In conclusion, a mixture composed of G. cambogia extract, soy peptide, and L-carnitine attenuated visceral fat accumulation and improved dyslipidemia in a rat model with HFD-induced obesity[30].

6. HEPATOPROTACTIVE: Liver is the biggest reticulum-endothelial organ in the body as such has important immune function in maintaining body integrity. The liver plays an astonishing array of vital function in the continuation, performance and adaptable homeostasis of body. It is concerned with approximately all the biochemical pathway to enlargement, fight in opposite to disease, nutrient contribute, energy stipulation and reproduction. The liver is the largest gland of the body enclosed within the right lower rib cage beneath the diaphragm it is almost completely covered by visceral peritoneum and a dense irregular connective tissue layer that lies deep to the peritoneum. Liver is divided in two principle lobes, a large right lobe and a smaller left lobe separated by falciform ligament. The right lob is considered by many anatomists to include an inferior quadrate lobe and posterior caudate lobe. Liver has five surfaces as anterior, posterior, superior, inferior, and right [15]. The extract was evaluated for hepato-protective and curative activity against acetaminophen-induced liver injury in mice. Histological examination was also performed and correlated to the biochemical parameters [16].

7. ANTI-HEMORHOIDAL ACTIVITY: Anti-hemorrhoid activity was carried out on patients using capsules prepared from dry aqueous extract of lantana camera 500 mg/kg. Hemorrhoids / Pills can be describe as masses or clumps (cushions) of tissue within the anal canal that contain blood vessels and their surrounding, supporting tissue made up of muscles and elastic fibers. Selection of patients was done according to their age, sex and dietary habits. Capsules were prescribed for one month, once in a day assessment of subjective and objective parameter were done. Results of anti – hemorrhoidal activity revealed significant reduction in signs and symptoms of acute hemorrhoidal attack (viz. Bleeding, Anal discomfort, anal discharge, swelling and pain at prolapse and proctitis) at last week i.e. on 28^{th} day was found treated in patients. No significant adverse effects were reported. All these parameters are shown in fig 3,4 ,and 5 .[17].

IV. CONCLUSION:

The anti-diabetic effect might be antioxidant property of the plant or by the stimulation of the beta-cell resulting in elevated insulin secretion. Yet the precise mechanism was very extant to be identified and explained also in view of the varied phyto-constituent classes. Ethanolic extract of lantern camera increased the volume contraction activity as well as epithelialization period only during the letter phase of previous pharmacological studies reveal that lantana camera possessed Anti-bacterial, Anti-diabetic, Wound healing, Anti-hypertensive, Anti-obesity, Hepatoprotective, Anti-hemorhoidal activity.

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