LANTANA CAMERA (LINN): GREENINFORMATICS APPROACH

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ABSTRACT: *Lantana camera* extract exhibits diverse types of activity.Seggregation of alliochemicals are reported by different methodology. Present paper focused on activity of *Lantana camera* and its recent chemistry which will beneficial to scientific community for the advancement.

Key words- *Lantana camera* L; alliochemical ,Bioactivity

INTRODUCTION:

Lantana camera L. (family Verbenaceae) is among top ten invasive, toxic weeds on earth (Sharma S.et al; 2011). These weeds grow well on nutrient thickets and also on nutrient deficient barren soils and light availability. It contains about 150 species of perennial flowering plants.(Ganjewala D. et al;2009) Among them *Lantana camera* Linn contains much harmful alliochemical (Choyal R..et al; 2011) and is an aggressive invader of ecosystem (Sathish R et al; 2011). Allopathic effect against crops and commonly known as wilder red sage. It's growing luxuriantly at elevations up to 2000 m in tropical Sub- tropical regions and remains to small thickets up to 1m diameter (Sharma S. et al; 2011). It is large scrambling evergreen, strong smelling shrub. It naturalized in many parts in India as a troublesome prickly weeds. *Lantana camera* Linn contain wide array of compounds exhibiting diverse range of bioactivity. Chemical constitution of it is carryophyllene, 1α-phellandrene, lantadene A. lantadene B, lancamarone quinine, lantanine were isolated in using different extraction medium. (Sharma O. et al; 1992;Sharma O. et al; 1997).Lantadene (Lantadene A, B, C with MW.552.791; General formula $C_{35}H_{52}O_5$(Nethaji M. et al; 1993) is acts as promoting agent (Eralanio et al; 2012) polymorphism and have own polymorphic forms, differed in melting behavior (Sharma O. et al; 1992). The precise mechanism and nature of Polymorphic forms of it have not yet been clear. These constituents are reported to be influence by genetic, geographical and seasonal factors as well as the developmental stages of the Concerned Plants (Ganjewala D.et al; 2009). Hence intensified research work needs to understand the chemical variation of lantadene in different solvent conditions. Potential of Lantadene and its isomers play role in brain activity of animal cell. Still need to attain Lantadene molecule may emerge as a birth control drug.

BACKGROUND :

Different parts of *Lantana camera* Linn. are used for the treatment of various human ailments. It is one of the most prevalent and weeds causing hepatoxicity. (Sharma et al 2011) Literature emphasized on extraction of *Lantana Camera* Linn for bioactive molecules and their therapeutic uses.

I] Wound healing activity: Wound healing is the body's natural process of regenerating dermal and epidermal tissue. Collagen accounts for 30% of the total protein in the human body which provides strength, integrity and structure. When tissues are disrupted following injury, collagen is required to repair and restore normal structure and function (Prockop D. et al; 1995) However thermal burns to the skins produce a remarkably different healing response due to their effects on the cells and tissue. Beyond the area of total destruction induces nutrient starvation of involved tissue. Apart from thermal injury wound may arise due to physical injury and chemical injury or microbial infections.

Lantana camera used as herbal medicine for the treatment of antiseptic for wounds (Saxena V. et at; 1999). The Ethanol extract of it, increased the rate of wound contraction by 87% in burn wound when compared to control 82%. The slight reduction in wound area might due to antimicrobial effect of the leaf extract. Thus extracts has potential for biocides (Dharmgadda V.et al; 2005). Lantane oil is used for the treatment of skin itches as an antiseptic for wounds (Saxena V. et al; 1999) and externally for leprosy and scabies (Nayak B.et al; 2008). Data demonstrates that the *Lantana Camera* Linn has antimicrobial activity but not wound healing activity on burn wound in rats. (Nayak B.et al;2008)while it reverse in number of plants that find use as wound healing during the course of the survey. The information has been counterchecked with that available in other places (Patil S.et al; 2009)

II] Anti Motility Activity: Antimotility compounds such as dipheoxylate, loperamide, opium alkaloids, anticholinergics etc have been tried against diarrheal disorders (Hoison D. et al ;2001). The anti diarrheal and anti motility effect of lantana leaf extract was studied against castor oil induced diarrhea model in mice.*Lantana camera* leaf powder. It contains neostigmine used as a promotility agent. Intestinal motility was assessed by charcoal meal test. The percent intestinal transits was increased significantly with neostigmine while decreased significantly in *Lantana camera* methanolic extract and Lantadene A. *Lantana Camera* methanolic extract (LCME) dose of 1000 mg / kg intestinal transits was nearly abolished. (Sagar L.et al; 2005)

III] Anti Ulcerogenic Activity(Sathish R. et al; 2011) :Methanolic extract of *Lantana camera* L. has been reported anti ulcerogenic activity. Oral administrations of methanol extract of it exhibited dose dependent inhibition. Methanolic extract of leaves was evaluate gastric ulcerogene is in Pyloric legated rats, ethanol induced gastric ulcers and duodenal ulcer model. It also has healing of gastric ulcer and also prevents the development of duodenal ulcer in rates.

IV] Anti Micro -Bacterial Activity:*Pseudomonas aeruginosa* usually occur infections of the airways in patients are cystic Fibrosis and bronchiectasis (Miszkie K. et al; 1997). In view of high antibiotic resistance the infections associated to *Pseudomonas. aeruginosa* are considered to have difficult management. The results of antibacterial tests by gaseous contract showed that; antibiotic activity of amikacin and gentamicin against *Staphylococcus aureus* was enhanced in the presence of the essential oil by gaseous contact. Many

plants have shown not only antibacterial properties but also the ability to interfere with the antibiotic resistance. (Pour et al 2011; Ogenda et al 2003; Sousa E.et al; 2010) The study can justify the popular use of L. camera to treat respiratory infection. (Sousa E.et al; 2012) *lantana camera'*s volatile constituents suppress the growth of pathogenic bacteria of respiratory tract. Therefore, the *lantana* essential oils were effective against all the bacterial strains when grown in nutrient agar. (Dharmagadda V. et al; 2005)

According to literature, gram positive bacteria are more sensitive to antibiotics than gram negative. They display inhibition of censibiotic penetration but it depends on seasonal influence and associated with the presence of chemical compounds. The inhibitory zone size of gram positive bacteria indicates less sensitive to the root extract of *Lantana camera* L. The maximum inhibitory zone was reported against *Escherichia coli* in methanol stem extract as compared to the other extract. Flavonoids , alkaloids saponin and tannins are reported antibacterial properties.(Kensa M.2011) Variety of chloroform extract of the leaf, stem and root has highest inhibition effect against *Eischerichia coli* (Viji M. et al ;2011.) possessing immunosuppressive and antitumor activities(Pattnaik S.et al; 2010). which helps in strengthening the immune system. The general photochemical groups of compounds in the aqueous extract were identified by preliminary photochemical screening. Catchin is reported in petroleum ether and methanol extracts. (Ganjewala D.et al; 2009)

V] Allelopathic Activity: Alleochemicals interferes with germination of many species. The inhibition of regeneration process in different plant of *Pogonatum aloides* was in the decreasing order of apical, basal and middle explants. Basal part show higher regeneration as compared to control and middle explants. (Choyal R. et al ;2011).

VI] Anthelmentic Activity: Helminthes infections are among the most common infections in man, affecting proportion of population all over the world. Helminthes still cause considerable problem for human beings and animals. Successive leaf extracts of *lantana camera* showed significant anthelminic activity on selected worms. Anthelmintic activity was assessed using healthy adult Indian earthworms *Pheratima Postuma* due to its anatomical and Physiological resemblance with the intestinal round worm parasites used in assessment of Anthelmintic activity. Ethanolic extract found to more active compared to other solvent extracts. Methanol extracts from the leaves, stems and roots of lantana camera were investigated for their anthelmintic activity against Pheritima Posthuma. (Patel J.et. al; 2011)

VII] Anti Cancer Activity:*Lantana camera* L. triterpenoids naphthaquinones, flavonoids alkaloids and glycoside are known to exert diverse biological activities including anticancer properties. Investigation on the in vitro cytotoxic properties of crude extract of different parts of *Lantana camera* was studied against four cancerous cell lines and normal cell line. The leaf extract exhibited comparatively more cytotoxic activity against all the cell lines tested. (Raghu C.et al; 2009) Flavonoids and flavonolignans may offer a great scope for the drug development in future such as breast cancer. (Sharma D. et al; 2006)

VIII] Anti Fungal Actvity: Since fungicide are very expensive and causes serious environmental pollution; control strategies are today directed towards replacing the use of hazardous fungicides by environmentally friendly natural products. Antifungal activity of the extracted essential oil derived from the flowers towards the three pathogenic fungi was studied in vitro. It also has the potential of becoming powerful and safe alternative means of disease control instead of the harmful pesticides. (Eweis M.et al; 2011; Goswami-Giri et al; 2011) antifungal compounds present in the plants are active at different stages of germination growth. High Molecular weight proteins showed the novel antifungal properties which can be used in crop improvement program of sugarcane. (Hiremath L.et al; 2011)

IX] Cytotoxicity: Recently, for the production of secondary metabolites of L. Camera cells cultures was used which possessed cytotoxic activity. Researchers reported that the aqueous extracts (0.23%)of it (50 gm dry mass) also it had an apparent cytotoxic effect of He La Cells with LC_{50} value of 1500 µg / ml in 36 h. Cytotoxicity test on Vero cell line showed that leap extract concentration up to 500 µg / ml inhibit the growth of cell cytotoxicity started to decline at elevated concentration. Pour B et al 2011; suggested that acute oral toxicity of the leaf extract should be very useful for clinical study.

Brine Shrimp Artemia Salina/sea monkey methanolic extract produced cytotoxicity is a marine invertebrate are used for determination of bioactivity of the L. camera extract. Brine shrimp lethality tests evaluates pharmacological activities of natural remedies and useful to detect antitumoral compound in terrestrial plant extract (Pour B. et al; 2011).In the history, clinical signs, diagnostic findings, necropsy findings and exposure to the toxic plant *Lantana camera* support the diagnosis of secondary photo-sensitilization and hepatotoxicity in a Red kangaroo (Harvey J.et al;1998).

X] Nematicidal Activity: Root knot nematode is one of the most harmful nematode pests in both tropical and subtropical crop production regions and cause extensive economic damage (Sikora R. et al; 2005). The nematicidal and nematostatic activities of L. camera against root nematodes have been is vitro and in soil. It was investigated that L. camera acquires leaf extract did not act as strong nematicide on the juveniles were not killed but only paralyses and consider as nematostatic effect. (Ahmad F.et al; 2010)

XI] Insecticidal Activity: *Lantana camera* L. have shown to have toxic and repellent effect against certain insect pests of stored grains. Some synthetic insecticides penetrate into stored grains and may be toxic (Lalah J. et al; 1996). In comparison, percent insect damage during 150 days of storage of untreated grains and treated exhibited that the untreated grains suffered significant percent damage on stored maize grains. Pesticides in make storage significantly reduce grain damage with no adverse effects on send germination (Ogendo J. et al; 2003). Similar observation also noted by Ogendo J. O. et al; 2003 for Maize. The insect mortality and repellency study suggested that good potential of local plant species and can be effectively used as grain proficient in the traditional resource- poor farming. Experimental study showed that, spraying 10% *lantana camera* leaf water extract once a week in the field did not control *Oulema pectoralis* pest infestation but enhanced the number of leaf, flower, stalk, bud and bloom in Mokara charak pink orchid. Orchid plant growth was not affected by

the frequency of extract spraying even though vegetative leaf number or production was enhanced (Binti N.et al; 2010)

Xii] Analgesic, Anti- Inflammatory and Anti Hemorrhoidial Activity: First time demonstration of the analgesics, anti- inflammatory and anti- hemorrhoid activity of *Lantana camera* exhibited the anti- inflammatory activity on rats, indicating that the acquires extract of *lantana camera* 300 mg / kg exhibited mild decrease in paw volume but when treated with 500 mg / kg showed significant decrease. Antihemorrhoid activity showed significant reduction in signs and symptom of acute hemorrhoidal attack at last week. No significant adverse effects were reported (Gidwani B.et al; 2009). Oleanolic acid and urosolic acid possess inhibitory effects on inflammation and on various stages of tumor development.Thrombin inhibitory activity was found to be associated with the euphone lactone triterpere which inhibit the blood- clotting.

XIII] Antipyratic Actvity: The antipyretic activity of *Lantana camera* could be at least in part due to enzyme inhibition and free radical scavenging activities which may be attributed the presence of flavonoids and other polyphenols in the extract (Bharagava S.et al ;2008). This study was provided a scientific support for the use of *Lantana camera* for the treatment of pyrexia. (Jain S. et al; 2010)

XIV] Larvicidal Activity: (Due K.el al; 2010):Mosquito borne diseases are one of the world's most health hazardous problems. Therefore, need to prevent mosquito borne disease by killing mosquito at larval stage. Synthetic insecticide resistance, pollution, toxic side effects on human beings (Zang L.et al; 2005) Extracts and oils were showed mosquito larvicidal activity (Sathish M.et al; 2000) and adulticidal activity against different mosquitoes. Adulticidal activity of the oil was highest against *Anophillus Fluviatilis* followed by *An. Culicifacies*. Due to low volatile nature of oil impregnated paper revealed that it possessed more adulticidal activity for longer period some of the major components of essential of L. camera identified insecticidal properties.

Bio Chemical Composition: The Phytochemical studies on the stem from the red, pink and yellow flowering taxa of *lantana camera* reported 13 compounds from the leaves of yellow flowering taxa of this plant. They were isolated from the ethyl acatate and identified by Spectroscopic method and GC analysis (Sharma O. et al ;2000).Eight triterpenoids, betulonic acid, Betulinic acid, O leanolic acid, Lantadene A, Lantadene B, Icterogenin, lantanilic acid, ursolic acid, three flavonoids, hispidulin, Pectolinarigenin, Pectolinarin as well as β- sistosteryl 3 0- β D glucoside and a mixture of campestral, Stigmasteool and β Sitesterol were isolated from the leave of the yellow flowering taxa of *lantana camera* (Juang F.et al; 2005). Extraction followed by gel chromatography, elutant procured 3 fractions using Chloroform- Methanol solvent. Fraction I affords phytosterols, 3-β-hydroxystigmaol-5-en-7 one oleanolic acid, betulonic acid, betulinic acid and oleanolic acid. Fraction II yields lantadene A, lantadene B, 22-B-angeloyloxylantanolic acid and lantanilic acid and Fraction III contains pomolic acid and β- sitosterd- 3-0- β-D glucoside (Huan K et.al; 2004)

Nogueiras C et al; 2010 identified more than 30 Novel compounds with therapeutic medicinal properties. Some are highly toxic showed least morbidity (Sharma et al 2011) Extraction of *lantana camera* in various polar and non polar solvents resulted in high amount of extractives in hot water than those obtained in organic solvent. There are more extractives in aerial parts than those found in root extract (Chandra A. et al; 2010).Bioactive substances activity concentration is depends on season (Barreto F.et al; 2010).During investigation, determined Chemical Components from *Lantana Camera* Leaves by GC- MS method,18 compound were identified . For performing qualitative phytochemical analysis the fruit of *Lantana camera* Linn were studied and analysized by TLC and HPTLC which shows a set of diagnostic characters .

CONCLUSION-

Literature review is intensely fruitful for the aspire researchers to present investigation. It may furnishes guidelines for collecting data, selecting proper methodology, appropriate statistical analysis, selecting parameters and new working methodology and direction to molecular recognition.

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