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A REVIEW ON: SYNTHESIS OF NANOPARTICLES USING EXTRACTS OF LANTANA CAMERA TO CONTROLLEDMOSQUUITO LARVAE.

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ABSTRACT

Mosquitoes are diseases- causing vectors that are responsible for transmitting human diseases like filariasis, malaria, Dengue, Japanese encephalitis, Zika and West Nile virus and many others viral diseases. According to report of National Vector Borne Disease Control Programme, in 83 countries all over the world, almost 120 million people are infected with human filariasis and it is predicted that 1.1 billion are at risk. According to WHO report among the infected people worldwide, 70% are from India, Indonesia, Bangladesh and Nigeria. At present, many chemically synthesized insecticides such as Dichlorodiphenyltrichloro ethane, Dieldrin, Organophosphorous , Fenitrothion and synthetic pyrethoids are used for control of mosquitoes. But the residues of these insecticides have extremely harmful impact on the whole biosphere .To overcome the above problem, various biocontrol method have been adopted such as fish, application of bit granules to larval habitat, plant – based ovicides and larvicides. None of these agents provides mosquito control satisfactory level. Therefore, an alternative method is required which shoud give the desireds result and should be safer for environment. Numerous recent literature highlighted that mosquito larvae can be controlled by nanoparticles. The biologically synthesized nanoparticles have many advantages over chemical and physical method. Plant mediated nanoparticles yield dual benefits as reducing an capping agent due to presence of different biomolecules. Therefore, the synthesize of plant based nanoparticles has generated tremendous interest due to its green, rapid and non polluting nature . Various plant parts such as leaf, root, shoot, flowers and latex are being used for the synthesize of nanoparticles.

Keywords: *Lantana camera linn , larvicidal ,nanoparticles*

1. INTRODUCTION

Lantana Camera Linn is considered as a notorious weed and a popular ornamental plant. Lantana camera has been reported as one of the most important medicinal plant in the world lantana camera is used in traditional medicine system for the treatment of cuts , swelling ,ulcer ,cataract , bilious fever , itches , eczema and rheumatism . Various part of lantana camera plant are used in the treatment of cold , headache, whooping cough, asthma, chickenpox, eye injuries and arterial hypertension lantana camera has scientifically studied for various therapeutic activities like antibacterial, antioxidant, antipyretic, insecticidal, antimicrobial, wound healing etc. Now a day this plant lantana camera is worked in several recent advanced techniques like phytoextraction of heavy meals, phytoremidiation of particulate population and many others. Various literatures has reported the phytoconsitituents present in all parts of lantana camera. In last few decades, scientist and researchers throughout the globe have elaborately examined the chemical composition of the whole plant of lantana camera. The plant is spread widely over Uttarakhand , Uttar Pradesh, Himachal Pradesh and north eastern state of India. The present review is an aim to give a complete report of the literature on its photochemistry and pharmacological activity.

Lantana camera Linn, relating to the family verbenaceae, familiarized in India as a decorating plant but entirely naturalized and found throughout India. Lantana camera has been standing as one of the most fundamental medicinal weed in the world. The word lantana camera obtained from Latin “Lento” which means to bend this species was first represented and acknowledged its binomial name by Linnaeus in 1753 .The plant lantana camera commonly known as wild sage or red saga is the plant of the genus of verbenaceae family with 600 variation existing natural and it is an arborous plant with different flower colors i.e. red, white, yellow and violet

It is an evergreen potent smelling shrub and its leaves are opposite, simple with large petioles, Oval blades which are rugged and hairy and have bluntly toothed margins. Berries of lantana camera are round, fleshy, two seeded bean. In initially seeds of lantana camera are green colors & turning purple and finally to a blue – black colors. Lantana camera is indigenous plant found in tropical regions. Lantana camera is well-noted by several names in several languages in India Natasha (Kannada) , Agrippa & unnichedi (Tamil), Aripoov &poochedi (Malyalam), raimuniya(Hindi),Tnatani & ghaneri(Marathi), Lantana camera is regularly used as herbal medicine and in some area as firewood and much especially in India, there has been to a great extent work conducted on the chemical constituents of lantana camera. The leaf oil is employed as an anti-septic for scars. The roots are used for the treatment of a toothache & the flowers for chest complaints in children . lantana camera leaves extract exhibited antiproliferative , antimicrobial , fungicidal , insecticidal and nematicidal activities lantana camera shoots extract exhibits significant antioxidant activity. The berries fruits are useful in fistula, packs, tumors and rheumatism . The essential oil of lantana camera exposed a board spectrum of lantana camera exposed a board spectrum of

antibacterial , antimicrobial and antifungal activities in lantana camera, chemical constituents are present as triterpenes like lantadenes A,B,C & D, alkaloids flaonoids , saponins, tannins , germaerene A,B & D and chief compounds are valencene and y-gurjunene.

Fig (1):- Lantana Camera Plant

- **Plant Taxonomical Classification :**

Kingdom	: Planate
Sub-kingdom	: Tracheobionta
Super-division	: Spermatophyta
Division	: Magnoliopsida
Sub-class	: Asteridae
Order	: Lamiales
Family	: Verbenaceae
Genus	: Lantana
Species	: Camera

Mosquito:

Mosquitoes are disease-causing vectors that are responsible for transmitting human filariasis, malaria & many other viral disease like dengue, Japanese encephalitis, zika and west nile virus.[1,2] According to the report of national vector borne disease control programme ,in 83countries all over the world, almost 120 million people are infected with human filariasis and it is predicted that 1.1 billon are at risk.[3] According to WHO report among the infected people worldwide, 70% are from India, Indonesia, Bangladesh and Nigeria. At present many chemically synthesized insecticides such as dichloro-diphenyl ,trichloroethane, organophosphorus , fenitrothion and synthetic pyrethroids are used for control of mosquitoes but the residues of these insecticides have extremely harmful impact of the whole biosphere.[4] To overcome the above problem, various bio-control methods have been adopted such as fish , application of bit granules to larval habitat, plant-based ovicides and larvicides.[5,6,7.] None of these agents provides mosquito control a satisfactory level. Therefore an alternative method is required which should give the desired result and should be safer for environment numerous recent literature highlighted that mosquito larva can be controlled by nano-particles[8,9,10,11] The biologically synthesized nano-particles have many advantage over chemical and physical methods plant mediated nano-particles yield dual benefits as reducing has generated tremendous intrest due to its green , rapid and non polluting nature.[12] Various plant parts such as leaf , root ,shoot ,flower and latex are bring used for the synthesis of nanoparticles. [13]

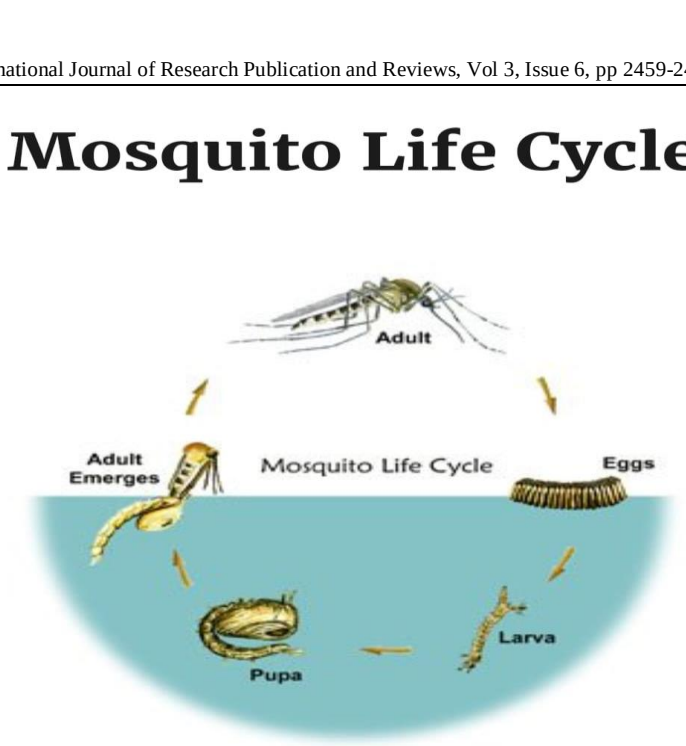


Fig (2) :- Life Cycle of Mosquito

2. AIM & OBJECTIVE

1) Preparation of plant extract
2) Screening of phytochemicals parametersof plant extract.
3) Screening of plant extract for the synthesis of silver nanoparticles.
4) Biosynthesis of silver nanoparticles from medicinal plant.
5) Screening of silver nanoparticles on larvae of mosquito

3. MATERIAL AND METHOD

Chemicals: All chemicals and reagents used in this study were of analytical grade and obtained from Merck Company, Germany.

Preparation of plant Extract:

The plant leaf and root material was dried for about 10 days in the shade at room temperature. The dried plant materials were pulverised and sieved to a particle size of 50 to 150 mm using a mechanical grinder. Before extraction, the powder was kept in polythene bags at room temperature. In a soxhlet extractor, powder (10g) was placed in the thimble and extracted for 48 hours with 70 percent methanol (methanol: water; 70: 30) and ethyl acetate: chloroform: ethyl alcohol (40: 30: 30) solvents. The crude extracts were evaluated after being condensed to dryness using a rotary evaporator.

Phytochemical Screening:

Phytochemical Screening: A standard approach and the presence of numerous phytochemicals were used to conduct phytochemical screening. The results will require some secondary metabolite testing. The following are secondary metabolite tests:

Test for secondary metabolite:-

1) **Steroids**: - 1ml extract dissolve in 10 ml chloroform and equal volume of concentrated sulphuric acid was added by sides of the test tube. The upper layer turns red and sulphuric acid layered showed yellow with green fluoresence. This indicated the presence of steriods.

2) **Tannins**: - 2 ml extract was added to few drops of 10%ferric chloride.A yellowish precipitate indicated the presence of tannins.

3) **Saponins** :-5 ml extract was mixed with 20 ml D.W. and then agitated into graduated cylinder for 15 min formation of foam indicates the presence of saponins.

4) **Alkaloid: -** Take 2 drop of extract treated with few drops of wagnersreagent.The reddish brown precipitate is observed.

5) **Phlobatanin** :- 1 ml extract was boil in 2ml 1% aq.HCl.Redcolour indicates presence of phlobatanin.

6) **Quinine: -** 1ml extract was mixed with 1ml conc. H_2SO_4.Red colour indicates presence of quinine.

7) **Glycosides: -** 2 ml extract was mixed with 3 ml of chloroform and 1ml 10%NH_3 solution was added.Pinkcolour indicates presence of glycosides.

8) **Flavonoids: -** 3ml of 1%NH_4Cl solution was added to 5ml of extract.Yellowcolour indicates the presence of flavonoids.

Synthesis of Silver Nanoparticles:

Synthesis of methanolic leaf extracts of *Lantana camara Linn* silver nanoparticles (AgNPs) (Bianca Morej´on and et.al 2028) :

5ml of the methanolic leaf extract of Lantana camara Linnwas taken in the conical flask separately and placed on a magnetic stirrer with hot plate. To this 50ml of 1mM $AgNO_3$ solution was added drop wise with constant stirring 120rpm at 50-60◦C. The colour change of the solution was checked periodically. The colour change of the medium from colourless to brown after 5h was observed which indicated the formation of silver nanoparticles. It showed that aqueous silver ions could be reduced by the methanolic extract of *Costus pictus* D. Don to generate extremely stable silver nanoparticles.

Bioassay:

We use twelve 100ml beakers in the testing setup. One beaker is for control means no chemicalis included into this only distilled water . Five for the crude extract of the plant and five for the silver nanoparticle produced from the plant for mosquito larvae control. This setup use concentrations of 1 percent, 2 percent, 3 percent, 4 percent, and 5 percent. For the manufacture of the solution, we utilize 50 mldistilled water (total volume of 50 ml) for the checking of lethal concentration. 1 percent contains 49.5 percent distilled water and 0.5 percent plant extract, 2 percent contains 49 percent distilled water and 1 percent plant extract3 percent contains 48.5 percent distilled water and 1.5 ml plant extract, 4 percent contains 48 ml distilled water and 2 ml plant extract, and 5 percent contains 48ml distilled water and 2ml plant extract.

One beaker is for control means no chemical is included in to this only distilled water which is 50 ml . Five for the crude extract of the plant and five for the silver nanoparticle produced from the plant for mosquito larvae control. This set up uses concentrations of 1 percent, 2 percent, 3 percent, 4 percent, and 5 percent. For the manufacture of the solution, we utilize 50 ml distiled water (total volume of 50 ml) for the checking of lethal concentration. 1 percent contains 49.5 percent distilled water and 0.5 percent plant extract , 2 per centcontains 49 percent distilled water and 1 percent plant extract, 3 percent contains 48.5 percent distilled water and 1.5 ml plant extract, 4 percent contains 48 ml distilled water and 2 ml plant extract , and 5 percent contains 48 ml distilled water and 2 ml plant extract. After this set up we release 10 larvae of mosquitoes into each of the beaker and observe the movement of the larvae and is solution is affect on it or not.

$$\text{Percentage Mortality} = \frac{\text{Total numbers of larvae dead}}{\text{Total number of larvae intoduced}} \times 100$$

4. RESULTS AND DISCUSSION

Table 1 showing qualitative secondary metabolism from leaf. Lantana camara Linn.

Chemicals	Present / Absent in acetone	Strong/weak (+++ ,---)
Steroid	Present	+++
Tannins	Absent	---
Saponins	Present	+++
Alkoids	Present	++
Phlobatanins	Absent	---
Quanine	Present	++
Glycosides	Absent	-
Flavonoids	Present	+++

The secondary metabolites strongly present in the steroids ,Saponin and Flavonoids.The Alkoloids and Quinines are moderately present. Glycosides , Tannin and Phlobatanins are Totally absent in Lantana camara extract.(Shows in Table no.1).

Table 2 showing Larvicidal activity soxhlet extract from leaf. Lantana camara Linn.

SR.NO.	CONCENTRAL	TOTAL NO.OF LARVAE EXPOSED	NO.OF LARVAE DEAD [TIME]					PERCENT OF MORTALITY
			5hr	10hr	15hr	20hr	25hr	
1.	Control	10	-	-	-	-	-	00%
2.	1%	10	0	0	0	1	1	20%
3.	2%	10	0	1	1	1	2	50%
4.	3%	10	1	0	2	2	1	60%
5.	4%	10	1	1	1	2	2	70%
6.	5%	10	2	2	1	2	2	90%

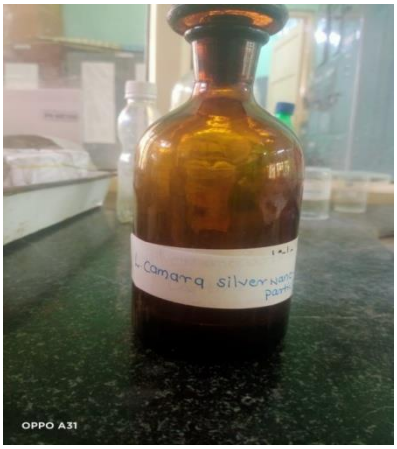
In the control medium the mortality 0%. The mortality rate is strong in 5% concentration of Soxhlate extract of Lantana camara that is 90%.(Shows in Table no.2).

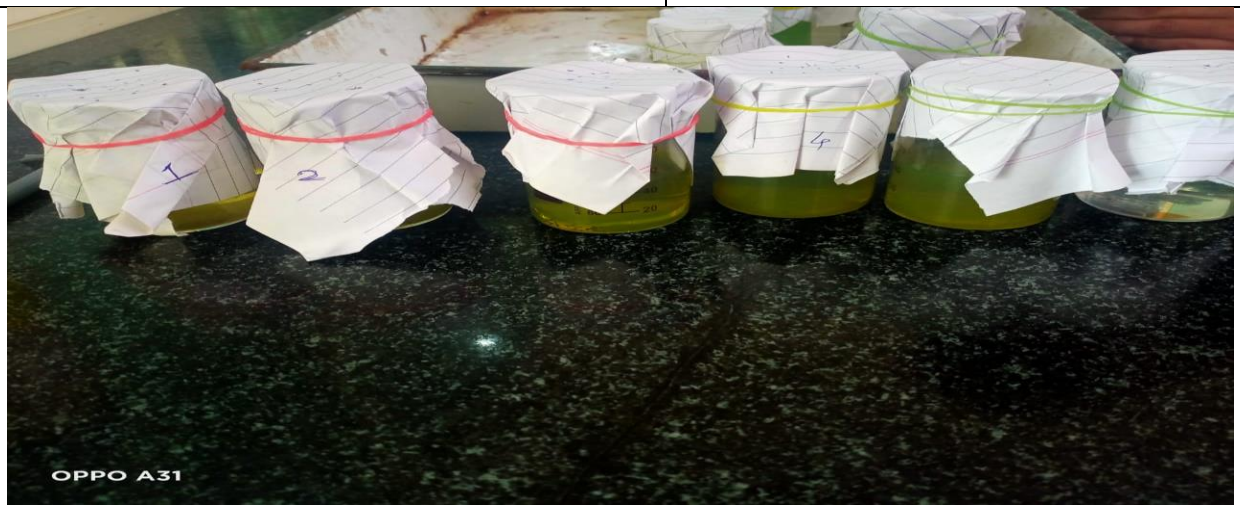
Table (3) :- showing Larvicidal activity silver nanopartical from leaf. Lantana camara Linn.

SR.NO.	CONCENTRAL	TOTAL NO.OF LARVAE EXPOSED	NO.OF LARVAE DEAD [TIME]					PERCENT OF MORTALITY
			5hr	10hr	15hr	20hr	25hr	
1.	Control	10	0	0	0	0	0	00%
2.	1%	10	0	1	3	4	5	50%
3.	2%	10	1	1	3	5	6	60%
4.	3%	10	2	3	3	4	7	70%
5.	4%	10	3	5	6	7	8	80%
6.	5%	10	3	5	7	9	10	100%

The mortality rate in 5% of silver nanoparticles solution of Lantana camara shows strong or 100% effect on the mosquito larvaes.(Shows in Table no.3).

PHOTOGRAPHS SHOWING PHYTOCHEMICAL SCREENING, SILVER NANOPRTICLES FORMATION PROCESSES, AND LARVICIDAL ACTIVITY





5. CONCLUSION

This study evaluated and compared the effect lantana camara leaf extract alone and its AgNo3 preparation on the mosquito. The obtained result indicated that AgNo3 preparation showed better biocidal activity agents mosquitos larva and is highly efficient compared to plant extract alone.

It is evident that the plant products are emerging as a potential source of mosquito control. Cured extract or isolated bioactive compounds from the plant L.camara could be used in larvae of mosquito

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