

Phytochemical Investigation of *Parthenium hysterophorus* and its Antibacterial Activity

Dr. Anjali Bhargava
PGT Govt.H.S.S.,Sehore

Dr. Reena Upadhyaya
Guest faculty, B.U. Bhopal

Abstract:- *Parthenium hysterophorus*, which is an invasive weed. it is Native of Mexico, comes under Asteraceae. Our study Area is at Hameedganj, which is a village comes in sehore district. *Parthenium* is a species of flowering plant, its leaves look like carrot leaf so it is also known as Carrot Grass. its pollen are very harmful and causes itching when it is touched. It spreads very fast and cause harm to useful crops like Wheat. its adaptability is very high preferring semi arid and dry conditions. Once it grows, it spreads very fast, so Globally various weed control strategies are applied to control its population but there are certain limitation with conventional methods. So Management of *parthenium* is a Global problem and still remains a focused view. Our research is to investigate its phytochemical analysis and its Antibacterial property, so that it can be managed and used Economically.

Keywords:- *Parthenium*, *Phytochemical*, *Antibacterial Property*, *Carrot Grass*, *Hameedganj*.

I. INTRODUCTION

Parthenium hysterophorus is an offensive weed and it is present everywhere. it is herbaceous (annual) and erect. it is not native of India. it is native of America and comes to India with seed containment with wheat (PL 480). This harmful weed is often spotted on waste lands, developing residential colonies around the towns, railway tracks, roads, drainage and irrigation canals, etc. This weed grows luxuriantly in established gardens, plantations and vegetable crops. Due to its high fecundity, a single plant can produce 10,000 to 15,000 viable seeds and these seeds can disperse and germinate to cover large areas. This plant has capacity to Regenerate if its parts are broken or cut so to control its population it has to be uprooted properly. and green Manure is formed by it.



Fig 1: Uprooted *Parthenium* Plant



Fig 2: Pollen of *Parthenium*

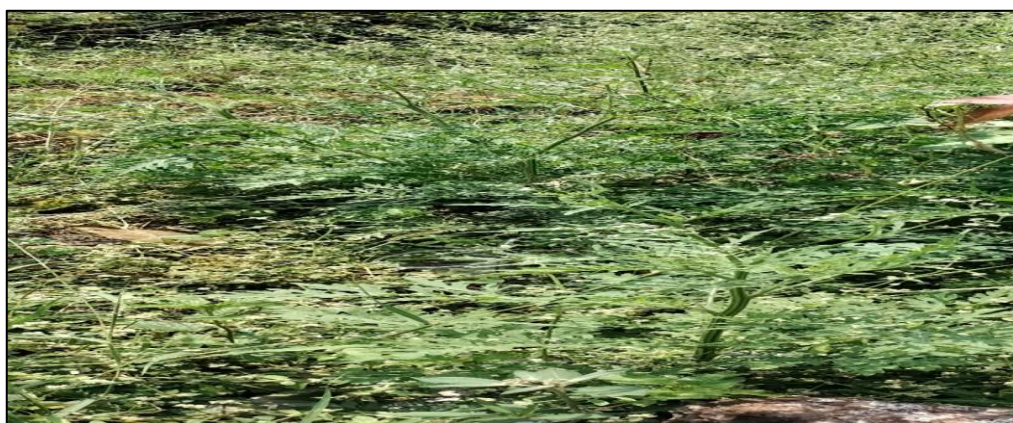


Fig 3: Erect *Parthenium* Plant

II. REVIEW OF LITERATURE

Maishi et al. (1998) concluded that *P. hysterophorus* contains a bitter glycoside parthenin, a major sesquiterpene lactone. Other phytotoxic compounds or allelochemicals are hysterin, ambrosin, flavonoids such as quercelaetin 3,7-dimethylether, 6-hydroxyl kaempferol 3-0 a Singh et al. (2003) examined that the allelopathic properties of unburnt (UR) and burnt (BR) residues of *P. hysterophorus* on the growth of winter crops, radish and chickpeas.

Dhileepan (2007) observed dwindling effect of *P. hysterophorus* on grass biomass of grazing fields in Queensland, Australia.

III. METHODOLOGY

➤ Phytochemical Analysis

After washing ,plant material was dried by keeping in shade for Approximate 7 days.After that fine powder was made with the help of mechanical Grinder.then this powder is stored in container which is Air Tight at Room temperature.then extraction process was conducted with the help of Soxhlet -Appartus.



Fig 4: Extract of Gajar Gras



Fig 5: Seeing Pollen of Parthenium

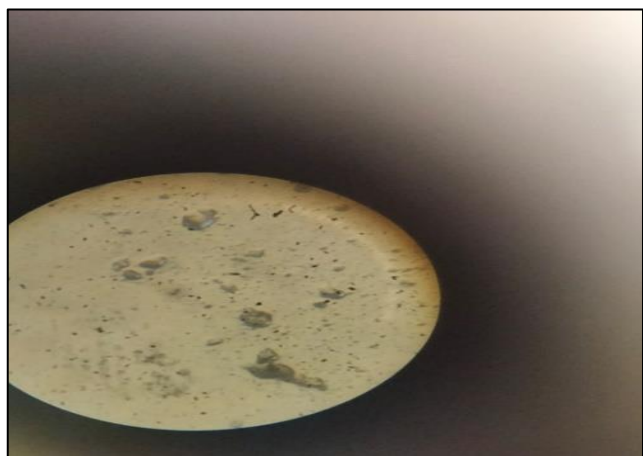


Fig 6: Pollen of Parthenium



Fig 7: Working in Laminar for Antibacterial Activity

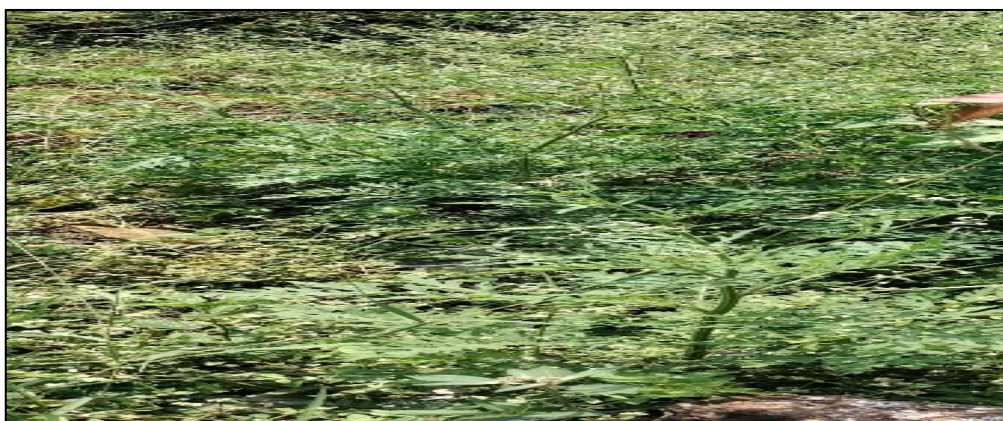


Fig 8: Erect Parthenium

IV. OBSERVATION AND RESULT

Table 1: Phytochemical Analysis of Parthenium hysterophorus Whole Plant Extract

S. No.	Plant constituents	Tests/Reagents	Results
1.	Carbohydrate Test	Molish test	-
		Cobalt chloride test	-
	Test for non-reducing polysaccharides:	Iodine test	-
	starch		-
2.	Protein Test	Biuret test	-
		Millions test	-
		Xanthoprotein test	-
3.	Amino acid Test: cysteine		-
4.	Steroid Test	Salkowski reaction	-
5.	Glycosides Test: deoxysugar	Keller - Killiani test	-
6.	Anthraquinone Glycosides Test		-
7.	Flavonoids Test		+
8.	Alkaloids Test		+
9.	Test for Tannins and phenolic compound	5% Fecl3 sol.	+
		Lead acetate sol.	-
		Gelatin sol.	-
		Acetic acid sol.	-
		Dilute iodine sol.	-
		Dil. potassium permagnate sol.	-
10.	Test for Organic acid: Oxalic acid		-
11.	Test for Inorganic acid:	(i) carbonate	-
		(ii) chloride	+
		(iii) Nitrate	-
12.	Coumarine Glycosides		-

Table 2 Antimicrobial Activity: *Parthenium*

	25 mg/ml	50 mg/ml	75 mg/ml	100 mg/ml
<i>E.coli</i>	11	7	10	12
<i>p.aeruginosa</i>	10	11	11	10

It has been found that minimum zone of inhibition is found at 50 mg/ml and maximum zone of inhibition is found at 100 mg/ml for *E.coli*.for *p. aeruginosa* maximum zone of inhibition is found at two concentration i.e. 50mg/ml and 75 mg/ml and minimum zone of inhibition is found at two concentration i.e. 25 mg/ml and 100mg/ml.so parthenim shows better antibacterial activity for *p.aeruginosa*.

➤ Method for Antibacterial Activity

Grow over night culture in liquid broth, Maintain O.D at 660 nm up to (1×10^6) then Spread the culture on MHA agar medium, Place the 6 mm watt man filter paper No. disc of different conc. of plant extract 75 mg/ml dilution (25,50,75,100 %). Incubate at 37°C for 8 hr. then Measure the zone of inhibition in mm by zonal scale (Hi-Media). (Doughari et al 2008)

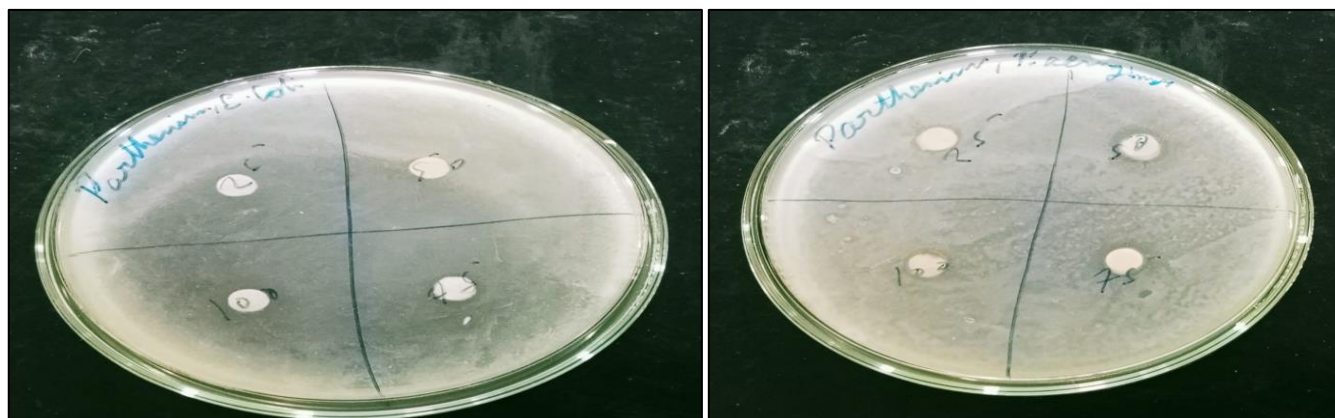


Fig 9: Zone of inhibition of *E.coli* and *p.aeruginosa*

V. CONCLUSION

It has been concluded that parthenium has so many harmful effects but it can be converted into useful products and with the help of its phytochemical investigation it is found that it has Flavonoids and Alkaloids, so it can be used to treat human disease parthenium shows good Antibacterial activity for *P. aeruginosa* as compared to *E. coli*. so it can be used as Antibiotic.

REFERENCES

- [1]. Anita Saini, Neeraj k. Aggarwal : Utility potential of *Parthenium hysterophorus* for its strategic Management,
- [2]. Seema Patel : Harmful and beneficial aspects of *Parthenium hysterophorus* : an update
- [3]. Salau Kaljimuran, Tain-junn cheng et al : Mitigation of indoor parthenium weed pollen exposure by protective window screens evaluated in chamber study
- [4]. Mehwish jamil Noor et al : Playnological studies of melliferous and allergenic flora of Pakistan : A key to pollen and spore identification, *Journal of Apicultural Research* 56(1):1-10
- [5]. AOAC (2005) Official Methods of Analysis. W. Horwitz and G. W. Latimer. 18th ed. AOAC International Press USA, pp 81–95
- [6]. Ghazala Begum, Ghulam Dastagir et al (2020) : Pharmacognostic characteristics and phytochemical profile of various parts of *Parthenium hysterophorus*
- [7]. Bashir H.M.K., Juraimi A.S., Ahmad-Hamdani M.S., Uddin M.K., Asib N., Anwar M.P., Rahaman F. A Mystic Weed, *Parthenium hysterophorus*: Threats, Potentials and Management. *Agronomy*. 2021;11:1514. doi: 10.3390/agronomy11081514. [CrossRef] [Google Scholar]
- [8]. Chib R., Shah B.A., Andotra S.S., Bharadwaj V., Gupta R.K., Taneja S.C., Khajuria R.K. Quantification of sesquiterpene lactones in *Parthenium hysterophorus* by normal-phase HPLC. *J. Chromatogr. Sci.* 2013;51:950–953. doi: 10.1093/chromsci/bms195. [PubMed] [CrossRef] [Google Scholar]