



ISSN:2394-2371
CODEN (USA):IJPTIL

REVIEW PAPER

Verbesina Encelioides: A Valuable Herb

Monika Karnawat*¹, Chaya Nenarsia²

¹Asst. Professor, School of Agriculture Sciences, Career Point University Rajasthan, Kota-324005, Rajasthan, India

²Biotech Scholar, School of Agriculture Sciences, Career Point University Rajasthan, Kota-324005, Rajasthan, India

*Corresponding Author: **Monika Karnawat**

ABSTRACT

Verbesina encelioides (Cav.) Benth. & Hook. Fil ex Gray (Asteraceae) appeared as an infamous weed and a decorative lawn plant has observed diverse makes use of in people's medicinal drug in one-of-a-kind components of the world. This plant possesses analgesic, emetic, febrifuge and insecticidal movements however is mildly poisonous to small ruminants, that is attributed to the relative quantity of galegine. *V. encelioides* additionally produces some of metabolites like flavonoids, terpenoids, sesquiterpenes and important oils, etc. in considerable yields. Some of those compounds have exhibited considerable antimicrobial, antiviral, antitumor, hypoglycemic, antiimplantation and anti-inflammatory activities. Medicinal herbs are an important source of phytochemicals that offer traditional medicinal treatment of various ailments. Flavonoids are phytochemical compounds that provide protection against ultraviolet let radiations. Flavonoids have effect on human nutrition and health as antioxidant and chelating compounds. Phenols are phytochemical compounds that function in nutrient uptake, protein synthesis, enzyme activity, structural components and allelopathy in herbs. The paper is an outline of the capability usage of *V. encelioides*, a valuable herb.

Keywords: - *Verbesina encelioides*, Analgesic, Terpenoids, Antiviral, Allelopathy.

INTRODUCTION

During Plants have been applied as a supply of vitamins and healthcare merchandise on the grounds that historic times. A weed is a collective call given to vegetation that develop and compete with the cultivated vegetation and are discovered to be resistant to maximum of the microbial illnesses. Plants are a reservoir of various forms of bioactive chemical dealers and have frequently been applied both withinside the shape of conventional arrangements or as natural energetic principles. It is affordable to employ domestically to be had vegetation, domesticated or wild, that would replacement the artificial arrangements. The recuperation powers of traditional natural medicines were verified with the aid of using numerous workers. The use of herbs as complementary and opportunity medicinal drug has

***Corresponding Author:**

Monika Karnawat

Asst. Professor, School of Agriculture Sciences,
Career Point University Rajasthan, Kota-324005, Rajasthan, India

E.Mail: monika.karnawat@cpur.edu.in

Article Published: July-Sept. 2021

Cite this article as:

Karnawat M, Nenarsia C. *Verbesina Encelioides: A Valuable Herb*. Int. J. Pharm. Technol. Biotechnol. 2021; 8(3): 41-46.

accelerated dramatically within the last 20–25 years [2]. Emergence of more than one drug resistant traces of microorganisms due to indiscriminate use of antibiotics has generated a renewed hobby in natural medicines. Weeds, normally described as a vegetation that grows out of vicinity and are competitive, chronic and pernicious, part of civilization and many historic files point out approximately people combating weeds within the crop fields [3]. Traditional healers recognized their medicinal capacity and applied them for the remedy of human ailments. Weeds also are discovered to be proof against maximum of the microbial illnesses whilst in comparison to the cultivated vegetation.

Asteraceae (compositae) is usually called the aster, daisy or sunflower family. It is certainly considered one among the biggest households of vascular plant life having extra than 22,750 species. The institution has extra than 22,750 currently regular species, unfold throughout 1620 genera and 12 subfamilies [1]. Along with the Orchidaceae this makes it one of the 2 biggest flowering plant households within the world [4].

Verbesina encelioides (Cav.) Benth. & Hook. Fil ex Gray (Asteraceae), normally called golden crown beard, is one of the maximum vast species. The plant is an upright to sprawling annual normally of 30-50 cm height. Its leaves are toothed or lobed with white hairs on each leaf and stem, flower heads are located on elongated stalks and resemble small sunflower, 2.5-5. cm in period and includes several disk plants and about 12 ray plants, which blooms from April to October [5]. The seeds (achenes) are greyish-brown, flat and winged alongside the margins and additionally included with great hairs. The local variety of *V. encelioides* is usually taken into consideration to be North and South America, especially Mexico and the Southwestern United States of Texas, Arizona [6]. It is an added weed in South Africa and has prolonged its variety inside the United States together with Hawaii, and to numerous Latin American nations in addition to Australia and India. It is tremendous instance of an extraordinary invasive plant that actually suffocated and killed local plants, in addition to engulfed open area used as nesting sites and disturbed habitats look like best for different plants [7,8]. Much has been written on its encroaching habitat, techniques of eradication and control. The species has low financial importance, as it's far used limitedly as an ornamental, being toxic to livestock. The plant is appealing to bees, butterflies and/or birds and proof against deer. A range of feature aids within the competitive pleasant of this plant consist of speedy developing abilities, its vivid colours, drought tolerant property, appropriate for landscaping and xeriscaping, cap potential to deal with an extensive variety of developing conditions, speedy growth, allelopathic impact on different plants, excessive seed manufacturing and dispersal cap potential, excessive intervals of seed dormancy and excessive germination rates. In the paper, ethnopharmacology, allelopathy, phytochemistry, toxicity and bio

efficacy of *V. encelioides* has been mentioned and might offer a foundation for the assessment of the plant as a beneficial supply of renewable material [9,10].

Taxonomical Classification

Kingdom – Plantae

Subkingdom – Tracheobionta

Division – Magnoliophyta

Class – Magnoliopsida

Subclass – Asteridae

Order – Asterales

Family – Asteraceae

Genus – *Verbesina*

Species- encelioides



Figure 1- *Verbesina encelioides* flower



Figure 2- *Verbesina encelioides* plant

Allelopathy

In allelopathy, secondary compounds inhibit germination and increase of different flowers and as chemical protection towards herbivory [11]. Allelopathic results of *V. encelioides* have additionally been mentioned and attributed to its dominant insurance and achievement in inhibiting local plant growth [12]. The competitive and dominant increase cap potential of *V. encelioides* prevents the increase of much less competitive local flowers including *Seaveola sericea* and *Ipomea pessaries*. Peanut farmers in State Texas taken into consideration *V. encelioides* a “troublesome” weed because of its cap potential to speedy infest fallow peanut fields. Allelopathic capacity of its roots and the probably involvement of allelopathy in its interference achievement has been demonstrated [13,17].

Phytochemical Screening:

The preliminary paintings at the terpenoids became concerned with the structural elucidation of β -sitosterol and β -sitosterol-D-(+)-glucoside, hentriacontol, pseudotaraxasterol, pseudotaraxastenone and pseudotaraxasteryl acetate from the entire plant [21,22]. This became the primary file of isolation of triterpenoids from a *Verbesina* species. Three-flavonoid glycosides quercetin 3-galactoside, quercetin-3-galactoside-7- glucoside and quercetin-3-xyloside-7-glucoside from the plants have additionally been reported. This became the primary file of quercetin-3-galactoside-7-glucoside in nature and *V. encelioides* particularly [22]. Subsequently, triterpenoids as α - and β -amyrins, benzyl-2, 6- dimethoxy benzoate, bornyl ferulate, linoleic acid, linolenic acid, phytol, stigmasterol and taraxasterol acetate have been remoted from the roots and aerial parts [23].

Ancient uses

The weeds had been utilized in distinctive components of the arena and are a crucial supply of drug treatments for indigenous peoples [14,15]. *V. encelioides* determined use in people treatments for cancer, gastro-intestinal disturbance, pores and skin ailments, snakebite, warts and haemorrhoids. North Dakota Hopi Indian tribes and early settlers make use of *V. encelioides* for the remedy of spider chew signs and symptoms and pores and skin diseases [18].

Pharmacological Importance

Some researchers have used exclusive extracts / fractions of the plant for the exclusive bio efficacies like antibacterial, antifungal, antiviral, antitumour, hypoglycaemic and anti-implantation activities [24]. According to those results, best antimicrobial hobby became confirmed with the aid of using root extract (IZ 15 mm) in opposition to *Streptococcus faecalis*. Out of numerous enriched fractions, the important oils and flavonoids exhibited maximal inhibitory hobby in opposition to *S. faecalis* and *Curvularia lunata*, respectively. Substantial antiviral hobby became additionally confirmed with the aid of using the plant extract in opposition to the take a look at viruses. Aqueous infusion of roots indicates a sizeable antitumour inhibitory hobby (11-40%) [16]. Galegine remoted from plant life exhibited an preliminary growth withinside the blood glucose stage with the aid of using 32.79 ± 2.69 (%) after. five hrs after which confirmed a non-stop impact accomplishing a most of 60.63 ± 2.78 (%) inside 2 hrs of its administration. A small impact on rat being pregnant on the examined dose tiers of the roots extract became observed, which became additionally powerful in decreasing the ratio of implantation sites and corpus luteum. Methanolic extract of the heads of *V. encelioides* has a greater infamous antimicrobial hobby in opposition to Gram +ive microorganisms and *C. albicans* than in opposition to Gram -ive bacteria, having no hobby in opposition to *Citrobacter freundii* [25].

Antimicrobial Activity

The ethyl acetate extract of stem part of *V. encelioides* plant inhibited both the clinical isolated *Staphylococcus aureus* strains and ATCC strains like *Escherichia coli*, *Klebsiella pneumoniae* and

Pseudomonas aeruginosa strains with a concentration of 10 ul. [26]. It has been reported that antibiotics are not the only antibacterial agents and this study observed the effective potency of the studied plants extracts on the selected pathogenic bacterial strains known for causing diseases in humans. One problem in the use of medicinal plants is the quantity desired to effect cure hence most times, medication is basically on unspecified quality of decoctions and infusions. Irrespective of the plant's parts in this study and methods of extraction exhibited appreciable inhibitory values on the tested bacterial species.

CONCLUSION

The phytochemical, pharmacological and antimicrobial properties of *V. encelioides* showed potential applications in medical science and could be more in the future upon extensive study on this important medicinal plant.

REFERENCES

1. Wagner W L, Herbst D R & Sohmer S H, Manual of the Flowering Plants of Hawaii, Vol 1, (University of Hawaii Press, Hawaii), 1990.
2. Ball W S, Crafts A S, Raynor R N & Robbins W W, Principles of Weed Control, In: Weeds of California, (California Agricultural Extension Service, Circular No 97, Weed Control), 1951, 13.
3. Robbins W W, Bellue M K & Ball W S, Weeds of California, (Sacramento, CA State Department of Agriculture, California), 1951, 505.
4. Parker K F, An Illustrated Guide to Arizona Weeds, (University of Arizona Press, Arizona), 1972, 322.
5. Everist S I, Common Weeds of Farms and Pastures, (A H Tucker, Government Printer, Brisbane), 1957, 10.
6. Torrey M D & Gray A, A Flora of North America, (Hafner Publishing Company, New York), 1969, 359.
7. Tutin T G, Heywood V H, Burges N A, Moore D M & Valentine D H, Flora Europa, Vol 4 (Cambridge University Press, Cambridge), 1976, 142.
8. Al Farraj M M, Effect of drought on growth of *Xanthium brasiliicum* Vell., *Verbesina encelioides* Benth. and *Datura innoxia* Mill. seedlings, *Phyton*, 51 (1990) 89.
9. Kaul M L H & Mangal P D, Phenology and germination of Crown beard (*Verbesina encelioides*), *Weed Sci*, 35 (1987) 513.
10. Stepp J R & Moerman D E, The importance of weeds in ethnopharmacology, *J Ethnopharmacol*, 75 (2001) 25.

11. Harborne J B, Introduction to Ecological Biochemistry, 4th edn, (Harcourt Brace and Company, London) 1993.
12. Goel U, Allelopathic effects of *Verbesina encelioides* Cav., *Annals Arid Zone*, 26 (1987) 287.
13. Inderjit A C & Dakshini K M, Allelopathic potential of *Verbesina encelioides* root leachate in soil, *Can J Bot*, 77 (1999) 1419.
14. Schmutz E M, Freeman B N & Reed R E, *Livestock Poisoning Plants of Arizona*, (University of Arizona Press, Tucson), 1968, 153.
15. Kingsbury J M, *Poisonous Plants of the United States and Canada*, (Prentice-Hall Inc., New Jersey), 1964, 38.
16. Oelrichs P B, Vallely P J, MacLeod J K & Lewis I A S, Isolation of galegine from *Verbesina encelioides*, *J Nat Prod*, 44 (1981) 754.
17. Keeler R F, Johnson A E & Stuart L S, Toxicosis from and possible adaption to *Galega officinalis* in sheep and the relationship to *Verbesina encelioides* toxicosis, *Vet Hum Toxicol*, 28 (1986) 309.
18. Keeler R F, Baker D C & Panter K E, Concentration of galegine in *Verbesina encelioides* and *Galega officinalis* and the toxic and pathological effects induced by the plants, *J Environ Pathol Toxicol Oncol*, 11 (1992) 11.
19. Lopez T A, Campero C M, Chayer R, Cosentino B & Caracino M, Experimental toxicity of *Verbesina encelioides* in sheep and isolation of galegine, *Vet Hum Toxicol*, 38 (1996) 417.
20. Petricic J & Kalodera Z, Galegine in the goat's rue herb: Its toxicity, antidiabetic activity and content determination, *Acta Pharm Jugosl*, 32 (1982) 219.
21. Tiwari H, Rao P & Sambasiva V, Constituents of *Verbesina encelioides*: Isolation of triterpenoids from a *Verbesina* species, *Indian J Chem*, 16 (1978) 1133.
22. Glennie C W & Jain S C, Flavonol 3, 7-diglycosides of *Verbesina encelioides*, *Phytochemistry*, 19 (1980) 157.
23. Joshi K C, Singh P & Singhi C L, Chemical constituents of *Verbesina encelioides* and *Holmkioldia sanguinea*, *J Chem Soc*, 60 (1983) 905.
24. Jain S C, Purohit M & Sharma R, Pharmacological evaluation of *Verbesina encelioides*, *Phytother Res*, 2 (1988) 146.
25. Toribio M S, Oriani D S, Fernandez J G & Skliar M I, Antimicrobial activity of *Verbesina encelioides*, *Indian Vet*, 7 (2005) 41.
26. Borkataky, M., Katakya, B. B., Saikia, R.L. (2013) Antimicrobial Activity and Phytochemical Screening of Some Common Weeds of Asteraceae Family. *Int. J. Pharma. Sci. Rev. Res*, 23(1) 116-120.