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Research Article

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In-vitro antioxidant activity of *Xanthium strumarium* L. extract

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Abstract

Plants have been used for medical purposes from the beginning of time and constitute the bedrock of modern medicine. Chemicals obtained and derived from plants or their synthetic derivatives make up the majority of antioxidant activity-fighting chemotherapeutic drugs. Our hypothesis was that whole plant extracts selected based on ethnobotanical sources of historical use might contain many antioxidant components that could be especially beneficial in the fight against oxidation. *Xanthium strumarium* L. extracts one entire plant (ethanol extraction) (Asteraceae).

Keywords: Photochemical, spectral analysis, Radical Scavenging activity.

Introduction

Plant extracts offer medicinal properties that have been employed by many cultures. The active components in such extracts from the foundation of herbal medicine systems have been utilised for thousands of years and are still being used today to heal people. [1-2] According to the World Health Organization (WHO), 65–80 per cent of poor countries rely on traditional medicine for health care due to a lack of access to modern treatment or poverty. Plants have traditionally been utilised to treat human disorders such as antioxidants, which are one of the top causes of death globally.[3] Plants with therapeutic characteristics are crucial in the treatment of free radicals. Natural chemicals or their counterparts, such as Vinca alkaloids, Taxus diterpenes, Camptotheca alkaloids, and Podophyllum lignans, were estimated to produce 40% of antioxidants drugs between 1940 and 2002. [5-7]According to studies, flavopiridol, taken from the Indian tree Dysoxylum binectariferum, and meisoindigo, obtained from the Chinese plant Indigo fera tinctoria, exhibit anti-oxidants characteristics with less toxicity than typical chemotherapy drugs.

Natural compounds or their derivatives, such as Vinca alkaloids, Taxus diterpenes, Camptotheca alkaloids, and Podophyllum lignans, are thought to have accounted for 40% of antioxidants medications developed between 1940 and 2002. Flavopiridol, derived from the Indian tree *Dysoxylum binectariferum*, and meisoindigo, derived from the Chinese plant Indigo fera tinctoria, have been shown to have anti-oxidants properties with less toxicity than typical chemotherapy medications.[8-9]

Materials and Methods

Collection and Identification of plant material

The plants that were finally picked for screening and segregation of vigorous major beliefs belong to the family Asteraceae, which is in favour of revising the antioxidant activity of the family Asteraceae. The plant's *Xanthium strumarium* L. taxonomy identification Plants of the Asteraceae family with anti-oxidant properties.

Preparation of plant extracts

The plant material was carefully cleaned with tap water and allowed to dry in the shade at room temperature before being ground to powder (40-60 mesh), weighted, and stored. Soxhlet extraction was used to make crude plant extract. About 500g of powdered plant material was put uniformly into a thimble and extracted individually with 500 ml of different solvents. Ethanol, acetone, and petroleum ether were utilised as solvents. The extraction procedure continues for 24 hours or until the solvent in the extractor's syphon tube becomes colourless. The extract was then placed in a beaker and cooked on a hot plate at 30-400C until all of the solvents had evaporated. The dried extract was stored at 40°C in the refrigerator for future phytochemical study. Aerial components from xanthium strumarium (50g) were macerated in 500 ml of 95 percent ethanol for 4 days for biological examination. After the extract was filtered, the solvent was removed in vacuo. The final yield was 24.48 percent. On a 40 cm long, 2.5 i.d. column, the methanol extract (1 g) was treated to CC using n-hexane and EtOAc (1: 1) on a silica gel (70–230 mesh). The flavonoids' elution was monitored using thin-layer chromatography with n-hexane and EtOAc (1: 1) as the developing solvent. Flavonoids were discovered using UV light after the plates were washed with 1 percent AlCl3 in 95 percent EtOH (255 and 367 nm). The final yield was 5.98 percent.

Results and Discussion

A preliminary qualitative phytochemical selection of *X.strumarium* L. was done on crude extracts. Glycosides, steroids, tannins, flavonoids, and terpanoids have all been discovered in Alkaloids were discovered in *X. strumarium*, and phytochemical analyses confirmed the presence of many secondary metabolites in X. strumarium, including flavonoids, glycosides, steroids, and terpanoids (sesquiterpenoids). Plants contain alkaloids, reducing sugars, glycosides, tannins, flavonoids, and terpanoids (sesquiterpene lactones) Plants that are hypoglycemic or antihyperglycemic may include one or more chemical components. Caffeic acid, carboxyatractyloside, and phenolic compounds, among other plant-derived chemicals and compounds, have been demonstrated to reduce blood glucose levels in *X.strumarium.*

Table-1 Showing the UV value of Xanthium *strumarium* L.

S. NO.	Plant Material	Observation
1.	Xanthium strumarium	Maxima was found at 208 nm and 270 nm

Table-2 Shows the IR value of Xanthium *strumarium* L.

S. NO.	Wave NO.	Functional group
1	3621.8	Free O-H Stretching
2	3540.3	Broad intermolecular Hydrogen bonding O-H stretch
3	2923.9	C-H asymmetric stretch
4	2339.8	C=C stretch
5	1650.8	C=O Stretch
6	1387.1	C-O-H bending bond

Biological evaluation:

Table: 3 DPPH radical scavenging activity of compounds concerning standard drug

Concentration (µg/ml)	Percentage inhibition of DPPH radical scavenging activity	
	Standard	Compounds
20	50.19	32.20
40	60.27	46.61
60	71.26	48.35
80	82.63	55.10
100	89.28	58.27

Antioxidant activity of *Xanthium strumarium* shows maximum Percentage inhibition of DPPH radical scavenging activity at 58.27% at 100 µg/ml (Refer to table 3 of this report).

Conclusion

In this article, we summarise current research on many popular alkaloids with in vitro antioxidant properties, as well as some of their characteristics. According to a recent study, alkaloids with antioxidant properties differ in at least three ways. To begin with, there are numerous anti-oxidant alkaloids available. The majority of the alkaloids listed above come from various families, and their biosynthesis differs as well. The *X. strumarium* methanol extract and ethyl acetate fraction tested in this study appear to have weak larvicidal activity, but the cytotoxic activity appears to be promising. Future studies will include purification and further analysis of the activity of *X. strumarium* phytochemicals, as well as the synthesis of novel active derivatives for biological applications.

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