



STUDIES IN THE PROXIMATE ANALYSIS OF *XANTHIUM STRUMARIUM L* LEAVES FROM TISGAON (PIN CODE 431002) OF TALUKA AND DISTRICT AURANGABAD, INDIA

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Abstract - In the tropical regions of India, *Xanthium Strumarium L.*, a member of the Compositae family, is frequently seen growing along roadsides, in fields, and in hedges. The word "xanthium" refers to the seedpods, which change from green to yellow as they ripen (later they become deep yellow to brown), and is derived from the ancient Greek words "xanthos," which means "yellow," and "Strumarium," which means "cushion-like swelling." It is frequently referred to as "chota-gokhru" because of the fruit's resemblance to a cow's toe. It is used to treat the common condition hemicrania and is known as adhasisi in various parts of India. There are 25 species in the genus *Xanthium*, all of which are native to America. The medicinal plants *Xanthium Spinosum Linn.* and *X. Strumarium Linn.* are used in Europe and North America. *Xanthium Strumarium L* showed anti-oxidant, anti-inflammatory, anti-cancer activities as well as various medicinal significances hence it created sufficient interest to investigate proximate studies of leaves of *Xanthium Strumarium L* of Tisgaon (PIN Code 431002) of Taluka and District Aurangabad, India which is heither to unknown from this region. Recently proximate studies of leaves of *Xanthium Strumarium L* of Tisgaon were successfully carried out and the present work deals with the quantitative analysis and identification of ash content moisture content as well water solubility, acid and base solubilities of *Xanthium Strumarium L.* which is important and essential part of herbal drugs in pharmacokinetics and pharmacodynamics of that particular drug. These factors directly hamper pharmacokinetics and pharmacodynamics of particular drugs and ultimately drug activity and drug effect of any synthetic, semisynthetic and herbal drugs, hence it become essential to carry out proximate analysis of leaves of *Xanthium Strumarium L* as they possess medicinal applications and significances. Leaves of *Xanthium Strumarium L* found to contain many medicinal and nutritious components viz. sodium, potassium, calcium, chloride, nitrate, phosphate, fluoride, bicarbonate along with terpenoids, coumarins, steroids, glycosides, flavonoids, thiazides, anthraquinones, naphthoquinones, polyphenols, alkoaloidsetc so it became essential to carry out proximate analysis of leaves of *Xanthium Strumarium L.*, during this study it is investigated that, the leaves of *Xanthium Strumarium L.* contain moisture and ash contents as well as acid-insoluble ash value, is

determination of solubilities in cold water, hot water, and 1 percent NaOH, HCl, CH₃COOH are also investigated.

Keywords: *Xanthium Strumarium L*, proximate studies, quantitative analysis.

Introduction:

Aurangabad is one of the oldest historical city in Maharashtra state of India having rich flora and fauna of herbal drugs. Warmer climates are where *X. Strumarium L* typically thrives. It is an annual herb that can grow up to 1 m tall and has a short, sturdy, hairy stem. The leaves are broadly alternating, triangular ovate or suborbicular in shape, light and bright green in colour, irregularly lobed, with few to no visible teeth, 5–15 cm long, frequently three-lobed, with prominent veins, a long petiole, and scabrous on both sides. Round or slightly ribbed and frequently spotted stems. *Xanthium Strumarium L* is traditional herbal medicine and extensively used to treat diseases¹⁻⁸ viz. bacterial, fungal, urticaria and rheumatism infections as well as for the treatment of arthritis, rhinitis, nasal sinusitis, headache, gastric ulcer, malaria, cancer, leprosy and leucoderma. As a wider program of this laboratory on natural products; various proximate investigations of different plants of various regions have been investigated in sufficient details⁹⁻¹³, considering all these facts it was thought interesting to investigate proximate constituents present in leaves of *Xanthium Strumarium L*. of Tisgaon (PIN Code 431002) of Taluka and District Aurangabad, India.

Materials and Methodology:

All chemicals used during the research work were of A.R. grade. Freshly prepared solutions were used throughout the research work. The solvents were purified by known literature methods¹⁴.

Sample Preparation: The plants were collected from farms of Tisgaon of Taluka and District Aurangabad, India in May 2023. The plants were cut along with the stem and shade dried. Dried leaves were taken in mortar pestle and crushed to prepare fine powder. This fine powder is used for proximate studies by known literature methods¹⁵.

Proximate Analysis:

The determination of physicochemical parameters such as moisture content, total ash value, acid-insoluble ash value, and solubility of the sample was carried out by the known literature methods¹⁵. Solubility of the sample was checked in cold water, hot water and 1 percent NaOH, HCl, CH₃COOH solution. Percentage of moisture and ash contents and acid insoluble ash are determined by using following formula,

$$\% \text{ of moisture} = \frac{\text{Loss of weight of sample}}{\text{Weight of sample taken}} \times 100$$

while,

Percentage of solubility is determined by using following formula,

$$\% \text{ of Solubility} = (\text{loss of weight of sample}) / (\text{weight of sample taken}) \times 100$$

The results obtained are given in **Table-1**

Table-1

Sr. No	Proximate Parameters	Loss of weight of sample	Amount of sample taken (in grams)	%
1	Moisture content	0.119	1	11.90
2	Total ash content	0.081	1	8.10
3	Acid insoluble ash value	0.35	1	35.15
4	Coldwater solubility	0.45	1	44.50
5	Hot water solubility	0.25	1	25.00
6	NaOH solubility	0.34	1	34.00
7	HCl solubility	0.42	1	41.65
8	CH ₃ COOH solubility	0.117	1	10.65

Result and Discussion:

Moisture content in any part of plant provides information for an activity of water-soluble enzymes and coenzymes needed for the metabolic activities of that plant and it is observed from Table No.-1 that, total moisture content in leaves of was found to be 11.90% which is good for metabolic activities in the plant growth and development of the plant. It was found that the total ash content obtained from dry leaves is 8.10% and acid insoluble ash value is 35.15% which are good and these proximate parameters of plant organs are useful for the determination of the mineral contents. Coldwater solubility and hot water solubility were found to be 44.50% and 25% respectively; these proximate parameters will give information regarding water soluble neutral, acidic, basic and hydrocarbons present in the samples in herbal chemistry. HCl solubility and CH₃COOH solubility were found to be 41.65% and 10.65% respectively, these proximate parameters give information regarding basic organic components present in the sample and NaOH solubility was found to be 34.00% which gave information regarding acidic organic components present in the sample.

Conclusion:

The Results obtained during proximate analysis were good and it can be conclude that, in leaves of *Xanthium Strumarium L.* of Tisgaon (PIN Code 431002) of Taluka and District Aurangabad, India contain good proximate parameters and the physicochemicals as well as physiological and anatomical activities of *Xanthium Strumarium L.* herbs at Tisgaon (PIN Code 431002) of Taluka and District Aurangabad, India are in natural form and can be use for medicinal purpose.

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Conflict of Interest:

The authors declare that, they have no known financial or personal conflicts that would have appeared to have an impact on the research presented in this study.

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