

Phytochemical, Proximate and Nutrient Analysis of *Cassia Tora* Seeds

Rahimullah Shaikh¹, Imran Zainuddin Syed²

¹Department of Chemistry, Govt. Vidharbha Institute of Science and Humanity Amravati,, India.

²Department of Chemistry, Govt. Vidharbha Institute of Science and Humanity Amravati,, India.

Abstract: Recently Proximate analysis and phytochemical analysis and nutrient analysis of seeds of *Cassia tora* L. from the campus of Government Vidharbha Institute of Science and Humanity, Amravati had been investigated. The seeds sample contained tannin, saponin, protein, steriods, terpenoids, carbohydrate, alkaloids, flavonoids and glycosides. Proximate analysis of moisture, ash, fat and mineral analysis of calcium, magnesium, iron, nitrogen and solubility were check. The values of it is moisture (56%), cold water (52%), hot water (54%), 1%NaOH (43%), 1%HCl (61%), benzene +alcohol (35%), ash content (17%). These results indicate that the seeds of these *Cassia tora* L. contains mineral and nutrients elements that will be useful in nutrition. Also the existence of some phytochemicals like tannin, saponin and steroids illustrated medicinal action of the plant in its therapeutic uses. The result of their phytochemcial screening could justify the observed activities and validate their use in herbal medicine.

Keywords: Proximate composition, Phytochemical analysis, Nutrient analysis,

I. Introduction

In the recent years, there has been a gradual increase of interest in the use of medicinal plants in developing countries as herbal medicines are safe and without any adverse side effects compared to synthetic drugs. Plants in general contribute to the mineral, vitamin and fiber contents of diets. Among the plants, vegetables are excellent sources of minerals and contribute to the recommended dietary allowance (RDA) of these essential nutrients. Minerals are very important ingredients for normal metabolic activities of body tissues. They are constituents of bones, teeth, blood, muscles, hair and nerve cells. Vitamins cannot be properly assimilated without the correct balance of minerals. FAO(1986) report indicated that at least one billion people are thought to use wild plants in their diet. Thus a search for new drugs with better and cheaper substitutes from plant origin are a natural choice. The medicinal value of these plants lie in some chemical substance that produce a definite physiological action on the human body^[1-2]. The exhaustive literature survey reveals that only proximate and phytochemcial analysis of leaves of *Cassia tora* L. have been investigated but proximate and phytochemical analysis of seeds is still lacking hence this work had been carried out.

Cassia tora L is an annual foetid herb with a height of 25cm to 100cm. It is found in Asian region but in India it is mainly found in Satpura region in Maharashtra. *Cassia tora* is very stress tolerant and is an easy plant to grow in India, it occurs as wasteland rainy season weed. Seeds extract can be used as a energy drink.

Proximate analysis of food is the determination of the major components of food which include moisture, protein, solubility, ash, proximate analysis is a system of analysis of nutrients also termed “conventional analysis” in which the gross components (protein, fat, carbohydrate, ash) of the food material rather than individual nutrients (amino acid, fatty acid, monosacharides) are determined^[3].

Phytochemical are chemical compounds derived from plants that are non-nutritive secondary metabolic compounds occurring in different parts of plants. They are important as protective and disease fighting compounds which help the body to prevent of fight against diseases and so are required by the human body to sustain life. Their therapeutic use in prevention or fighting a number of diseases is the basis of their extensive use in traditional medicine. Some of the phytochemicals are water soluble while others are not^[4].

II. Materials And Methods

Plant collection and Preparation:

The seeds of *Cassia tora* L. were collected from campus of G.V.I.S.H. Amravati, Maharashtra, India from 15th November to 25th December 2014. They were properly shade dried indoors in an airy place, crushed, powdered and stored in dry opaque bottles.

Proximate analysis:

Moisture, ash and solubility were determined using the Association of official analytical chemists methods^[5]. The crude proteins were obtained according to the AOAC(1990). Crude lipid was determined by extracting the samples with petroleum ether in a soxhlet extractor, while crude fiber was estimated from the loss

in weight on ignition of dried residue following digestion of fat-free samples. Soluble carbohydrate was obtained by the difference method^[5].

Phytochemical analysis :

The phytochemicals in the leaves were determined by elemental analysis of magnesium, calcium, sulphur, iron, sodium and chlorine were investigated by color test using appropriate chemicals and reagents and also the filtrate used to test for phenols, tannins, saponins, glycosides, flavonoids, steroids and alkaloids^[6].

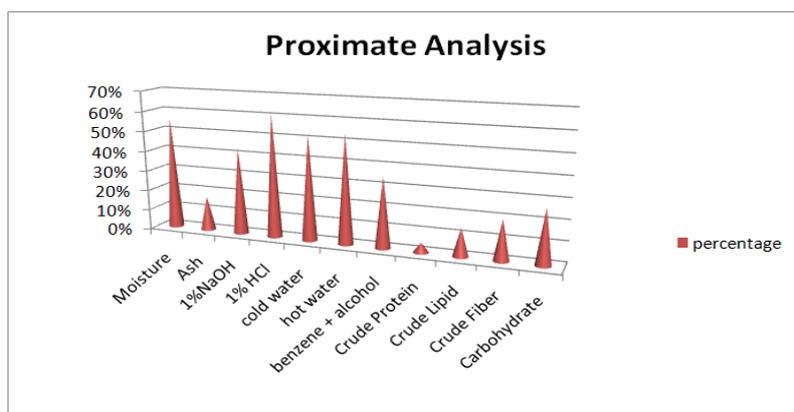
Preparation of extract :

Oven dried sample(5gm) was packed in extraction thimble, made up of filter paper and placed into soxhlet extractor. The extraction was carried out with ethanol-benzene(1:2, 100ml) for six hours with the rate of 6 cycle/hour on water bath. The residue was first dried in air and finally dried in oven at 100C (±1C).

III. Result

Proximate analysis of the *Cassia tora* Leaves

| Sr. No. | Content | Per 100gm | Percentage |
|---------|-------------------|-------------|------------|
| 1 | Moisture | 44gm (±2gm) | 56% |
| 2 | Ash | 83gm (±1gm) | 17% |
| 3 | 1% NaOH | 57gm (±1gm) | 43% |
| 4 | 1% HCl | 39gm (±1gm) | 61% |
| 5 | Cold water | 48gm (±1gm) | 52% |
| 6 | Hot water | 46gm (±1gm) | 54% |
| 7 | Benzene + alcohol | 65gm (±1gm) | 35% |
| 8 | Crude Protein | -- | 4.8% |
| 9 | Crude Lipid | -- | 14% |
| 10 | Crude Fiber | -- | 20% |
| 11 | Carbohydrate | -- | 27% |



Phytochemical analysis of the *Cassia tora* L. leaves

| Sr. No. | Content | Result |
|---------|--------------|--------|
| 1 | Alkaloids | + |
| 2 | Tannin | + |
| 3 | Saponin | + |
| 4 | Flavonoids | + |
| 5 | carbohydrate | + |
| 6 | Protein | + |
| 7 | Steroids | + |
| 8 | Terpenoids | - |
| 9 | Glycosides | + |

“+” = present, “-” = absent

Nutrient Analysis of *Cassia tora* L. seeds

| Sr. No. | Content | Result |
|---------|-----------|--------|
| 1 | Magnesium | + |
| 2 | Calcium | + |
| 3 | Sulphur | + |
| 4 | Iron | + |
| 5 | Sodium | + |
| 6 | Chlorine | + |
| 7 | Potassium | + |

“+” = present, “-” = absent

IV. Discussion

The proximate analysis revealed that moisture content is very high so growth of microorganism and life span of stored samples would be less. Ash content was found to be 17% which is a reflection of the good amount of mineral elements are present in samples. *Cassia tora* L. seeds contains lower fiber content^[6]. Proteins are also found in good proportion and they are important and act as enzyme, hormones and antibodies, proteins also helps in the formation of bones, hair and it contributes less energy than 30calories and thus prevent obesity and other related disease. A diet of fat providing 1-2% is sufficient for a human being. High amount of carbohydrates is essential for maintenance of life in plant and animals and also provide raw material for many industries^[7].

The presence of flavonoids inferred that the seeds has the biological functions like antioxidant, allergies protection, free radical, inflammation, ulcers, hepatotoxins, tumor and viruses^[8]. Flavonoids are water soluble free radical and antioxidants which prevent oxidative cell damage, and have strong anti-ulcer and anticancer activity^[9]. Saponin content suggest that usefulness of the seeds as a productivity agent. The saponin level is low, either compared with the results from another works. Alkaloids are the most efficient medicinally significant bioactive substances in plants. Alkaloids and the synthetic derivatives are used as medicinal agents because of their bactericidal and analgesic properties. Tannins healing of wounds and inflamed mucous membranes. This are water soluble phenolic compounds which precipitate proteins. They exist in all plants. Tannins add to proteins making them bio-unavailable^[10].

Potassium was the most abundant element. Potassium helps to control body weight and improve water and electrolyte balance in the blood and tissues. The calcium content was determined. It helps in the improvement of muscle contraction required by infants and fetuses for bones and teeth development. The concentration of sodium was low, this vegetable is useful in the treatment of heart related diseases. Excess sodium utilization leads to hypertension. Iron is an important element in the diet of pregnant women, nursing mothers, infants and the elderly to prevent anemia diseases. Magnesium also plays necessary roles in most reaction involving phosphate transfer. It is important in the structural stability of nucleic acids. It plays a powerful role in the internal absorption of electrolyte in the body. Its defect in man includes severe diarrhea and migraines^[11].

V. Conclusion

This type of study will be applicable for the pharmaceutical, medicinal, agricultural, industrial and biochemical sciences. This study also shown that proximate, phytochemical, mineral analysi of *Cassia tora* L. seeds as a balanced and rich source of macro- and micronutrients. The seeds was also used by rural people as a substitute of tea or coffee that's mean it was used a energy drink. So the further study will be carry out on this plant.

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