

## Phytochemical Investigation from Leaf and Stem Parts of *Cajanus scarabaeoides* (L.) Thouars.

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### Abstract:

The leaf and stem samples of the plant *Cajanus scarabaeoides* (L.) Thouars. were selected for the investigation of phytochemical present in the plant specimens of the genus *Cajanus* Adans. The results procured showed the presence of compounds viz., total moisture content, total ash, water soluble ash and acid insoluble ash from leaf and stem powder samples respectively. In the investigation of phytochemical present in the plant specimens the results obtained, revealed the presence of total moisture content (9.20), total ash (12.80), water soluble ash (2.9) and acid insoluble ash (2.2) from leaf powder sample whereas total moisture content (8.6), total ash (6.90), water soluble ash (1.3) and acid insoluble ash (1.4) from samples prepared of stem part.

It was observed that the variations occurred in the concentrations of total moisture content, total ash, water soluble ash and acid insoluble ash from leaf and stem powder samples prepared from plant specimen.

**Keywords:** *Cajanus scarabaeoides* (L.) Thouars, Phytochemicals, Moisture content, Water soluble ash, Acid insoluble ash.

### Introduction:

*Cajanus scarabaeoides* (L.) Thouars belongs to the family Fabaceae. This species is the closest wild relative to *Cajanus cajan* (L.) Millsp. *Cajanus scarabaeoides* (L.) Thouars. is reported to be used as ethnomedicine by the tribal healers around different states of India. Tribal people in the northern part of the country use the plant decoction as a tonic after delivery; the fresh leaf paste is applied on swellings of leg. The pods are also eaten for this purpose, the root paste applied with coconut oil to check falling hairs to cure baldness (Sharma and Kumar 2013). *Cajanus scarabaeoides* possesses wound healing, anti-diabetic, anti-inflammatory, hepatoprotective, anti-diarrheal, anti-bacterial activities (Pattanayak *et al.*, 2011). Significance of *C. scarabaeoides* as a source of ethnobotanical in terms of carotenoids content was recorded (Dey and Sinha, 2015). *Cajanus. scarabaeoides* was also reported to have higher levels of draught tolerance, and resistance to insect pests compared to cultivated types (Tikka *et al.*, 1997). Pharmacognostic standardization including physicochemical analysis and phytochemical screening of a number of medicinal plants have been carried out to develop the pharmacopoeial standards which are successfully employed in identification and authentication of the crude drugs obtained from the respective plant sources (Saha and Rahman, (2013); Pal and Rahaman, (2014); Ghosh and Rahaman, 2015, 2016). However, no such work has been done earlier to study the pharmacognostic standards of the crude drugs obtained from different parts of *Cajanus scarabaeoides* (L.). Pharmacognosy is a simple and reliable tool which provides complete information about the crude drugs for its proper identification (Baker *et al.*, (2007); Shariff, (2001); Costa *et al.*, (2015); Silva-Beltrán *et al.*, (2015) and Harvey, 2000). However, little such work has been done earlier to study the pharmacognostic compounds obtained from different parts of *C. scarabaeoides*. In view of the above context, the present study has been undertaken to evaluate the phytochemical properties of *Cajanus scarabaeoides* (L.) Thouars which may serve as standard reference for proper identification of further study in detail.

## Material and Methods:

The plant specimens of selected genus *Cajanus* Adans. were collected from different localities of Maharashtra region. The collected fresh parts of plant species viz., stem and leaves were washed thoroughly under running tap water and then dried for making in powdered form, ground them into powder and finally kept the powdered samples in airtight containers separately for future use. The dried plant powders were used for phytochemical analysis.

**Determination of moisture content:** The leaf sample (5gm) were weighed and dried for few days, incubated for one hour at 80°- 90°C temp. The dish was removed after 2 hours, cooled in the desiccator and weighed and finally weight of the sample was taken to calculate the moisture content (%) and further ash values were recorded.

**Calculation:** Moisture percent 
$$= \frac{(W_2 - W)}{W_1 - W} \times 100$$

**Determination of Total Ash:** The dried material was ignited in the dish left after the determination of moisture with the flame of a burner till charred. It was transferred to a muffle furnace maintained at 550 - 600°C and ignition was continued till grey ash was obtained. It was cooled in a desiccator and weight was measured. The process was repeated for heating, cooling and weighing at half hour interval till the difference in weight in two consecutive weighing was less than 1 mg. The lowest weight was recorded.

### Calculation:-

Total ash on dry basis percent by weight= 
$$\frac{(W_2 - W) \times 100}{W_1 - W}$$

**Acid soluble ash (ASA):** The % of acid soluble ash was calculated by subtracting the value of % of acid insoluble from Total ash.

**Water soluble Ash (WSA):** The ash was boiled for five minute with 25 ml of Dist water. Insoluble matter was collected in ash less filter paper and washed with hot water, ignited and weighed; the weight of insoluble matter was subtracted from the wt of ash. The difference in weight represents the water soluble ash.

**Water insoluble ash:** The % of water insoluble ash was calculated by subtracting the value of the % of water soluble ash from that of total ash. (Ref: *Indian Standard Specification for Wheat Atta, Repr. June 2006 and Manual of Food Analysis Methods, 2012*).

## Results and Discussion:

**Moisture content and Ash value:** Moisture content, ash values (total ash, water soluble ash and acid insoluble ash) of the leaf powdered sample and stem powder sample are provided in tabular form (Table No 1). The moisture contents of leaf and stem powder are 9.20%, 8.6% respectively. Ash value is 12.80% for leaf, 6.90% for stem. In leaf, percentage of water soluble ash and acid insoluble and is 2.9% and 2.2%, respectively. Percentage of water soluble ash and acid insoluble in stem is 1.3% and 1.4%, respectively. Among the physical constants ash value is

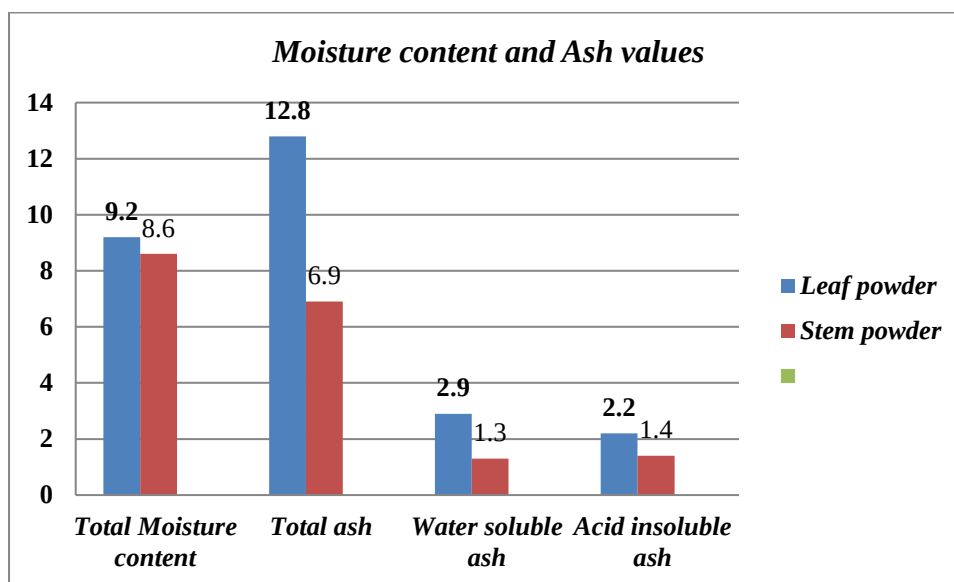
considered as an important tool in appraisalment of purity and identity of a crude drug also. It is considered as an indicator for mineral constituents of the crude drugs or medicinal plants. The total ash content was found greater in leaf (12.80%) than stem (6.90%) and this indicates that leaf part consists of more amounts of inorganic minerals like carbonate, oxalate, phosphate including silica and siliceous earthy matters. Interestingly, a marked difference between values of acid insoluble ash of leaf (2.2%), stem (1.4%) was observed. It is possibly due to presence of greater amount of siliceous matter and metallic salts in leaf tissues than that of other two parts of this. The water soluble ash content is estimated by measuring the amount of ash soluble in water which includes mostly the phosphate salts and some oxalate and carbonate salts. In leaf part, water soluble ash value is 2.9% that is higher than the stem (1.3%). The results obtained during the present investigation are in accordance with the results recorded from Ray and Chowdhury (2018).

**Table No. 1** The moisture content and ash value obtained from *Cajanus scarabaeoides* plant specimen

| Samples prepared from parts of plant specimen | Total Moisture content | Total ash | Water soluble ash | Acid insoluble ash |
|-----------------------------------------------|------------------------|-----------|-------------------|--------------------|
| Leaf powder                                   | 9.20                   | 12.80     | 2.9               | 2.2                |
| Stem powder                                   | 8.6                    | 6.90      | 1.3               | 1.4                |

(The values are shown in %)

**Graph 1:**



Values for various parameters of ash observed in leaf and stem parts of this plant are different and distinct from one another which can be used as identifying marker in authentication of the crude drugs occur in *Cajanus scarabaeoides* (L.) Thouars. It is now well established fact that

phytochemicals present in the medicinal plants play a very important role in curing the diseases and those bioactive phytochemicals provide the lead molecules from which novel drugs are developed. Chemical analysis and biological assay are considered as very important aspects in pharmacognostic evaluation of medicinal plants (Harborne and Williams, (1994), Zheng *et al.*, (2013) and Sudhakar and Reddy, 2017).

### Conclusion:

Medicinally, the plants are the major source of different drugs beneficial for human kind. The leaf and stem parts of *Cajanus scarabaeoides* (L.) Thouars have secondary metabolites and those carry significance for source of phytochemical for new drug findings. Hence, it is recommended that further detailed work needs to be carried out in order to extract various phytochemicals in the form of new drugs that may have importance for human in curing certain diseases. The results indicate that leaf and stem parts of this medicinal plant is therapeutically very potent. Therefore, further scientific investigation of these parts of plant specimen needs to be carried out to standardize the important bioactive compounds.

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