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Phytochemical And Proximate Determination From Leafof *Cajanus Cajan*(L.) Millsp.

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Abstract:

The leaf samples of the plant *Cajanus cajan* L. were selected for the determination of phytochemical and proximate compounds. The results procured showed the presence of compounds viz., Crude protein, crude fat, crude fibre, carbohydrates, alkaloids, flavonoids, tannins and saponin. In proximate determination the results obtained, showed the presence of crude protein 19.9%, crude fat, 3.10%, crude fibre 8.15%, NFE 61.78%. The phytochemical viz., saponin and other flavonoids have been observed. A.O.A.C (1970) Methods were followed for the determination of proximate constituents. There were variations in the concentrations of, crude protein, crude fat, crude fibre, total ash, acid insoluble ash, nitrogen free extracts.

Keywords: Phytochemical determination, Proximate compounds, Saponin, Flavonoids, crude protein.

Introduction:

Cajanus cajan is a perennial species of the Fabaceae family. Also, known as pigeon pea this plant is a leguminous plant with seeds cultivated in rainfed agriculture in the semi-arid tropical areas, mainly in India. It is used for feeding and treating various diseases such as swelling, pain, malaria (Rong *et al.*, 2017). The extracts or components of pigeon pea are commonly used all over the world for the treatment of diabetes, dysentery and hepatitis (Grover *et al.*, 2002). Now days, these leaves are used for the treatment of wounds, naphtha, bedsores and malaria as well as diet-induced hypercholesterolemia5-6. Chemical constituent's investigations have indicated that

pigeon pea leaves are rich in flavonoids, which are considered responsible for the beneficiaries of the leaves on human health (Zu *et al.*, 2006 and Zheng *et al.*, 2007). Pigeon pea has a rich gene pool in its various wild species. Many of the wild species from the secondary gene pool are compatible with cultivated pigeon pea and have been successfully used to transfer genes and traits of interest (Saxena *et al*., 1992; Saxena and Kumar, 2003; Mallikarjuna and Saxena, 2005). It is an important grain legume, particularly in rain-fed agricultural regions in the semi-arid tropics, as well as an excellent, high-protein cover/forage for livestock (Pal *et al.*, 2011 and Randhawa 1958) which can be intercropped with sorghum and/or millets (Shetty and Rao 1981). The genus Cajanus has 32 species (Mallikarjuna *et al.*, 2012) with 18 occurring in India (Mallikarjuna *et al.*, 2011).

Material and Methods:

Determination of Proximate analysis:

The proximate analysis of the selected fodder crops was determined by standard methods (AOAC, 1970). These include the determination of dry matter, crude protein, crude fat, crude fibre, total ash, acid insoluble ash, nitrogen free extract, total carbohydrate; gross energy and the minerals analyzed include potassium, calcium and phosphorus. The chromic acid oxidation method described by O'shea and Maguire (1962) was followed to determine gross energy (GE).

Crude Fat (CFat) Content: The crude fat content was estimated using soxhlet extractor with chloroform: methanol (70:30) as a solvent The amount of crude fat extracted per 2g of sample was measured and calculated as percent of dry matter by the following equation.

$$\text{Crude Fat (C Fat) \%} = \frac{\text{Weight of the Fat (Extracted)}}{\text{Weight of the Sample}}$$

Crude fibre (CF) Content: A method described by Lees (1968) was employed for the estimation of crude fiber and the amount of crude fibre was calculated on DM basis by the following formula.

$$\text{Crude Fiber \%} = \frac{W_1 - W_2}{W_0} \times 100$$

Where,

W1 = Weight of sample before incineration

W2 = Weight of sample after incineration

W3 = Weight of original sample.

Crude Protein (CP): The nitrogen content (N) was determined by micro-Kjeldahl method (Bailey, 1967) and the crude protein (CP) was expressed as N x 6.25.

Total Ash Content: Total ash content was estimated following the A. O. A. C. (1970) methods and total ash obtained per 2g of sample and was calculated as percent of dry matter (DM).

$$\text{Total Ash \%} = \frac{\text{Weight of ash}}{\text{Weight of sample}} \times 100$$

Acid Insoluble Ash (AIA): AIA content was estimated following the A. O. A. C. (1970) methods The AIA was determined per unit weight of the sample used for ashing and calculated it as per cent of DM.

$$\text{AIA \%} = \frac{\text{Weight of ash X 1}}{\text{Weight of sample}} \times 100$$

NFE and Total Carbohydrate (TC): The Nitrogen free extract was obtained (on dry matter basis) when the sum of crude protein, crude fat, crude fibre and total ash was subtracted from the factor 100.

% NFE = 100- (% CP + % C fat + % CF + % ash)

The total carbohydrate was determined by differential method. This was achieved by subtracting the total protein, lipid, moisture and ash content from 100.

% TC = 100 – (% CP + % C fat+ % ash)

Results and Discussion: The leaf powdered sample when analyzed for phytochemical and proximate screening, the total value observed in the leaves of the selected plant in the form of crude protein 19.90%, crude fat 3.10%, crude fibre 8.15%, total carbohydrate 69.90%, nitrogen free extract 61.78%, total ash 9.30% and acid insoluble ash 0.90% (Table No.1). The Table No.2 denotes the presence of phytochemical viz., alkaloids, flavonoids, tannins and saponin. The presence of the secondary metabolites indicates the medicinal values of the plant. The above results are in agreement with the results of (David Oke, 2014). However, Oshodi *et al.*, (1993)reported 1.5% (fat), 8.1% (fibre) and 57.3%(carbohydrates).

Table 1: Proximate determination from leaf part of *Cajanus cajan* plant

Plant Name	Crude protein	Crude fat	Crude fibre	Total carbohydrate	NFE	Total Ash	Acid Insoluble Ash
***Cajanus cajan* L.**	19.9%	3.10%	8.15%	69.90%	61.78%	9.30%	0.9%

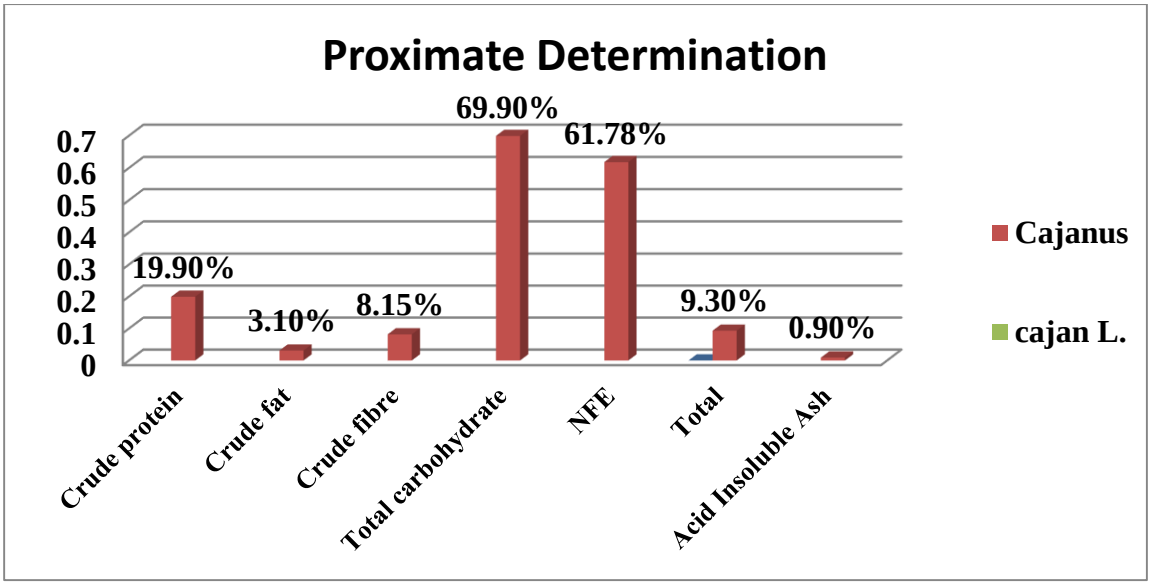
Table 2:phytochemical determination from leaf part of *Cajanus cajan* plant

Plant Name	Alkaloids	Flavonoids	Tannins	Saponins

***Cajanus cajan* L.**	+	+	+	+

(Key: + indicates Present and –indicates Absent)

Graph 1:



Conclusion:

Almost all the plants contain medicinal properties in some or large extent.These medicinal plants are the major source of different drugs beneficial for human kind. The leaves of *Cajanus cajan* contains secondary metabolites and these may be a very significant source of phytochemical for new drug determination. It is recommended that further detailed work needs to be carried out in order to extract lucrative bioactive chemical compounds in the form of new drugs that may be quite useful for human in curing certain diseases.

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