10. Pharmacognostic Studies on Phaseolus Vulgaris L. Analytical Studies

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Abstract

Bush bean *Phaseolus vulgaris* L. (Fabaceae) is one such plant, having bean prescribe for Different extracts of Phaseolus vulgaris have been evaluated for pharmacological activities and have shown analgesic, antiobesity, antibacterial, anticancer, antidiabetic, Antifertility, anti-inflammatory, anti-oxidant, hepatoprotective, hypolipidemic ,Litholytic, trypsin and ,α-amylase inhibitor. This crude drug powder study was aimed to develop characteristics of powder crude methods in order to asses the quality of herbal drugs for therapeutic value. Sample subjected to various microscopical characteristics, physicochemical analysis and fluorescence test.

Key Words: physicochemical parameters, crude powder drug, Microscopy.

Introduction

Phaseolus vulgaris L. (Fabaceae), bean is an ancient legumes crop widely grown throughout the world for its vegetable or pulse for human consumption or as animal forage. Herbal medicine has been enjoying renaissance among the customers throughout the world. However, one of the impediments in the acceptance of the ayurvedic medicines is the lack standard quality control profiles. The quality of herbal medicines i.e. the profile of the constituents in the final product has implication inefficacy and safety. Due to the complex nature and inherent variability of the chemical constituents of plant based drugs, it is difficulty to establish quality control parameters. To overcome these problems modern analytical techniques are expected to help in circumventing this problem (Bagul et.al 2005). Between1999 – 2001 the ayurvedic pharmacopeia of India was published in three volumes, which gave the botanical identity of plants, composition, analytical procedures etc. In spite the effort made for the standardization of ayurvedic medicines in actual use are believed to be at least 1000 with many regional variations (Anonymous, 1987). The absence post market surveillance and paucity of test laboratory facilities also make the qualities control of ayurvedic medicines exceedingly difficult at this time. Therefore an attempt has been made to analyse crude power of *Phaseolus vulgaris*

L. used in has been reported to be a analgesic, antiobesity, antibacterial, anticancer, antidiabetic, Antifertility, anti-inflammatory, anti-xidant, hepatoprotective, hypolipidemic, Litholytic, trypsin and, α-amylase inhibitor (Shi John at.al, 2007).

Material & Methods

Plant Material

Phaseolus vulgaris L. (seed) was collected from the local region of Akola (M.S.) and the plant material were authenticated by using flora of Maharashtra. Vaucher specimen of the same have been deposited in the laboratory for future reference.

Preparation of Powder

Crude drug has taken and roasted in a stainless steel pan at a low temperature till it becomes free from moisture. The sample *Phaseolus vulgaris* L. (seed) was powdered in a pulverizer and pass through sieve number 80#. It is packed in tightly closed container to protect from light and moisture.

Physicochemical Parameters

Physicochemical investigation of the drug were carried out and they include determination of moisture, extractive values and ash values. (Asokar et.al 1992).

Determination of Foreign Matter

Drugs should be free from moulds , insects, animal faecal matter and other contamination such as soil, stones and extraneous material.100g of the drug sample to be examined was weighed and spread out in thin layer. The foreign matter (Table 1) was detected by visual inspection, separated, weighed and the percentage present calculated (Pattnayak et.al 2010)

Determination Loss on Drying

It is important that the portion taken was large enough to be representative for the sample. About 10g of accurately weighed drug was dried at 105^0 C for 5 hours, and then weigh again. Percentage was calculated with reference to initial weight (Table 1).

Determination of Total Ash

The determination of total ash (Table 1) is a method to measure the amount of the inorganic residual substance when the drug sample is ignited (Mukhrjee, 2002) .Total ash determination constitutes detecting the physiological ash (ash derived from plant tissue) and nonphysiological ash (ash from extragenous matter, especially sand and soil adhering to the surface of the the drug). For its detection,2g of powdered material was placed in a suitable tared

crucible of silica previously ignited and weighed. The powered drug was spread into an even layer and weighed accurately .The material was incinerated by gradually increased the heat, not exceeding 450^0 C until free from carbon, cooled in desiccator, weighed and percentage ash was calculated by taking in account the difference of empty weight of crucible & that of crucible with total ash.

Determination of Acid Insoluble Ash

The ash obtained as above was boiled for 5min with 25ml of dilute hydrochloric acid; the insoluble matter was collected on an ashless filter paper, washed with hot water and ignited to constant weight. The percentage of acid insoluble ash (Table 1) with reference to the air – dried drug was calculated.

Determination of Solvent Extractive Values

Alcohol Soluble Extractive

5 gm of coarsely powered air – dried drug was macerated with 100ml of alcohol in a closed flask for twenty four hours, shaking frequently during six hours and allowing to stand for eighteen hours. It was then filtered rapidly, taking precautions against loss of solvent 25 ml of the filtrate was evaporated to dryness in a tared flat – bottomed shallow dish at 105^0 C to constant weight and weighed. The percentage of alcohol – soluble extractive (Table 1) was calculated with reference to the air- dried drug & is represented as %. (Mukherjee2002).

Water Soluble Extractive

5 gm of coarsely powered air – dried drug was macerated with 100ml of water a closed flask for twenty four hours, shaking frequently during six hours and allowing to stand for eighteen hours. It was then filtered rapidly, taking precautions against loss of solvent 25 ml of the filtrate was evaporated to dryness in a tared flat – bottomed shallow dish at 105^0 C to constant weight and weighed. The percentage of alcohol – soluble extractive (Table 1) was calculated with reference to the air- dried drug & is represented as %. (Mukherjee2002).

Results and Discussion

In the present study, physicochemical studies were performed. The *Phaseolus vulgaris* L. (seeds) studies for the presence of foreign matter is mentioned in Table 1.

The percentage of moisture content in *Phaseolus vulgaris* was 7.13%, total ash 12.15%, acid soluble ash 2.6%, water soluble ash 3.25%, alcohol soluble extractive 20.1% and water extractive 27.7%. However on the basis of polarity of solvents, the percentage of successive

solvent extractive valued of extracts were in petroleum ether (1.9%), benzene (2.4%), chloroform (16.4%), acetone (18.6%), ethanol (17.4%), and water (21.83%) represented in (Table 1).

The foreign matter was removed and powered was prepared. A part of the pure powdered was kept aside to study the various parameters. Quality test for crude drug powered was performed for moisture content, ash content, water soluble extractive, methanol soluble extractive, acid insoluble ash and water insoluble ash were found to be standard range.

Table 1 – Analytical values of *Phaseolus vulgaris* (L.)

Sr.No.	Parameter studies	Value (% w/w)
1	Total ash value	12.15
2	Acid insoluble ash value	2.6
3	Water insoluble ash	3.25
4	Loss on drying (moisture content)	7.13
5	Solubility percentage in Alcohol Water	 20.1 25.7
6	Extractive values in Petroleum ether Benzene Chloroform Acetone Ethanol Water	 1.9 2.4 16.4 18.6 17.4 21.83

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