Qualitative phytochemical screening of *Hygrophila spinosa* plant extract

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Abstract

The present study was undertaken to find out the phytochemicals present in *Hygrophila spinosa* plant extract. Fresh leaves and aerial parts of botanically identified plant was collected and were processed for preparation of plant extract using specified technique. The plant extract was then subjected for different qualitative chemical tests to investigate the chemical profile of *H. spinosa* extracts. Analysis showed the presence of alkaloids, carbohydrates, phenolic compounds and tannins in the extact as confirmed by implying different qualitative tests specified for these phytochemicals.

Keywords: Hygrophila spinosa, plan textract, phytochemicals

Introduction

Hygrophila spinosa (Common Bengali name "Kullakhara"; Hindi name "Tal-Makhana", Gokulakanta; Local name "Mokhla"; Sanskrit name "Kokilaksha"; German name "*Langblattriger Steindorn*") is a semi-woody herb of *Acanthacea* family, an inhabitant of damp or swampy area found throughout the planes of India (Hooker, 1885). *Hygrophila spinosa* is a commonly found herb in India, being used as vegetable in some states. Vegetation commences in the rainy season and flowering in autumn. The aerial part is commonly consumed as a vegetable. Different parts (leaves, roots, seeds) of the herb are used in several patho-physiological conditions such as jaundice, rheumatism, renal stone, gonorrhoea, hepatic disorders, anti-tumor activity (Chopra et al., 1956). It is a common practice to feed the hot water infusion of succulent aerial parts of pre-flowering and flowering plant to increase haemoglobin level in anaemia and pregnant women to prevent anaemia. Some reports are available on composition of roots and seeds but no reports are available on the composition hot water infusion of leaf and aerial part of the plant. Due to paucity reference the present investigation was undertaken and different qualitative chemical tests were perform for establishing profile of *H. spinosa* hot water extract (flowering stage) for its chemical composition.

Materials and Methods

Plant materials: Fresh leaves and aerial parts of botanically identified *H. spinosa* at its flowering stage were collected in bulk from waterlogged area of the College of Veterinary science and A. H. campus, Anjora, Durg during the month of October- November in the year 2008. Cleaned leaves and aerial parts were then dried under shade and were ground into a fine powder form using domestic mixer grinder machine. The fine powder of the plant leaves and aerial parts obtained was stored in air tight containers for further processing.

Preparation of extracts: Traditionally the hot water infusion of fresh plant materials is used to increase the haemoglobin level. The powdered leaves and aerial parts of *H. spinosa* were processed to obtain concentrate hot water infusion extracts as described below:

Dried powdered leaves and aerial parts of the plant (80 g) was dispersed in boiled distilled water and cooled at room temperature in a closed glass container. The content was filtered with the help of double layered muslin cloth and the water infusion was collected. The solution was centrifuged at 5000 rpm for 10 minutes and the supernatant was collected for drying in the rotary vacuum evaporator (MAC Rotary Vacuum Evaporator, BUCHI Type; MSW-191) at 600C temperature and low pressure. After complete evaporation of the water the weight of the extracts was noted and the percent (%) of recovery of extracts was recorded on the dry weight basis. The extract was kept in air tight container and preserved in a refrigerator for further use.

Qualitative phytochemical screening: Following different qualitative chemical tests were performed to

investigate the chemical composition of *H. spinosa* extracts.

1. Detection of alkaloids – By Mayer's test (Evans, 1997), Wagner's test (Wagner, 1993), Hager's reagent (Wagner et al., 1996), Dragendroff's reagent (Waldi, 1965).
2. Detection of saponins (Kokate, 1999).
3. Detection of carbohydrates and glycosides (Ramkrishnan et al., 1994): Carbohydrates detection by Molish's test, Benedict's test, Barfoed's test and for detection of Glycosides Bortrager test (Evans, 1997), Legals test.
4. Detection of proteins and amino acids (Fisher, 1968; Ruthmann, 1970): Biuret reagent (Gahan, 1984), Ninhydrin reagent (Yasuma and Ichikawa, 1953).
5. Detection of phytosterols (Finar,1986).
6. Phenolic compound and Tannins: Ferric chloride test, Alkaline reagent test.
7. Fixed oils and fat (Kokate, 1999): By Spots test.
8. Gum and mucilage (Whistler and BeMiller, 1993).

Results and Discussion

The *H. spinosa* extract was analyzed and found the presence of alkaloids, carbohydrates, phenolic compounds and tannins (Table-1).

Table. 1. Showing status of different phyto-chemicals in hot water infusion of plant leaf and aerial parts.

S. No.	Phytochemical tests	Results
1.	Alkaloids	
	Wagner's reagent	Positive
	Hager's reagent	Positive
	Mayer's reagent	Positive
	Dragendroff's reagent	Positive
2.	Saponins	
	Foam test	Negative
3.	Carbohydrates	
	Molish's test	Positive
	Barfoed's test	Negative
	Benedict's test	Positive
4.	Proteins and amino acids	
	Biuret reagent	Negative
	Ninhydrin reagent	Negative
5.	Phytosteroids	
	Libermann-Burchard's test	Negative
6.	Phenolic compound and Tannins	
	Ferric chloride test	Positive
	Alkaline reagent test	Positive
7.	Fixed oils and fat : Spots test	Negative
8.	Glycosides	
	Bortrager test	Negative
	Legals test	Negative
9.	Gum and mucilage	Negative

Hygrophila spinosa contains 1.5% alkaloids (Majumdar and Sengupta, 1978) corroborated with the present result. Additional to this carbohydrates, phenolic compounds and tannins were also detected in the extract contradict the result of previous worker who reported presence of phytosterol, nitrogen, albuminoids, alkaloids, essential oils, myrastic, palmatic, stearic and linolic acids (Majumdar and Sengupta, 1978).

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