



Original Research Article

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## QUALITATIVE AND QUANTITATIVE ANALYSIS OF THREE *BOLBITIS* SPECIES

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**ABSTRACT:** The objective of the current study was to find out the occurrence of phytochemicals in the petroleum ether, benzene, chloroform, methanol and aqueous extracts of three fern *Bolbitis* species by both qualitative and quantitative screening methods. In qualitative analysis, the bioactive compounds such as Alkaloids, Steroids, Tannin, Saponin and Glycosides were screened in methanol solvent extracts. The methanol extract of the *Bolbitis species* indicated positive results for 6 phytochemical tests. In quantitative analysis the important secondary metabolites such as alkaloids, Steroids, and Glycosides, proline, phenol, saponins and tannins were tested in all the extracts of the fern. The methanol extract showed highest amount of phytochemicals

**KEYWORDS:** Phytochemical constituents, Medicinal ferns, *Bolbitis species*, bioactive compounds, Secondary metabolites

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### 1.INTRODUCTION

*Bolbitis species* such as *B. virens*, *B. appendiculata*, *B. presliana* also known as the African water fern, creeping fern, and Congo fern, is native to subtropical and tropical Africa, from Ethiopia west to Senegal; and down to northern South Africa. As well as India [1] *Bolbitis heudelotii*, called for the botanical surveyor of West Africa Jean-Pierre Heudelot (1802- 1837), [2] is an aquatic Polypody fern rising waterlogged in rivers and streams, fond of to rocks or wood by the fragile rootlets

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spreading from its rhizomes. It has dark green, pinnate leaves 15–40 cm long and 15–25 cm broad. It grows waterlogged. The water in its innate habitat is fast-moving over covered in dust or rocky bottoms, very clean, not very hard and a little acidic. The roots cling to rocks and the sandy beds. In the aquarium, *B. heudelotii* requires water temperatures of 20–28 °C and moderately acidic ('soft') to not taking sides water with a pH range of 5.0–7.0,[3] but stands a wide range of light levels. It does best in flowing water. [6] This species is habitually used as a midground specimen plant in stifling freshwater aquaria. Propagation is from partitions and cuttings from the rhizome.[7] It appears to be intolerant to being crowded and to fish excreta.[8] It is best fully-fledged secured to a section of wood rather than planted direct in the substrate. Extra CO<sub>2</sub> seems to boost growth and it grows best in a somewhat shady position. Propagation is by division of the rhizome [6].

## 2. MATERIALS AND METHODS

### Collection of plant material

The whole plant of *Bolbitis species* such as *B. virens*, *B. appendiculata*, *B. presliana* were collected from the Castle Rock, Karnataka India. They were identified and authenticated by the Department of Botany herbarium, Jaysingpur College Jaysingpur, Kolhapur, India

### Preparation of Extract:

30 gm of air dried plant powder soaked in 300 ml organic solvents (Methanol, Hexane & Chloroform) for 24 hrs in round bottom flask for room temperature. Extract filtered through Whatman No. 1 filter paper. Filtrate allowed drying at room temperature & extracts were obtained. Condensed extracts were weighed & stored in air tight containers at 40C till further investigate.

### Qualitative phytochemical analysis

Qualitative phytochemical analysis of methanol extracts of *B. virens*, *B. appendiculata*, *B. presliana* was conducted following the standard procedures [7-11].

### Quantitative phytochemical analysis

The phytochemicals which are present in the methanol extracts of *B. virens*, *B. appendiculata*, *B. presliana* were determined and quantified by standard procedures.

## 3. RESULTS AND DISCUSSION

### Qualitative phytochemical analysis

In qualitative analysis of methanol extracts of *Bolbitis species* such as *B. virens*, *B. appendiculata*, *B. presliana* exhibited positive results for ten phytochemical tests. 10 phytochemical tests were positive in methanol extract of the fern *B. virens*, *B. appendiculata*, *B. presliana* extract 9 tests were positive. In methanol extracts of the ferns *B. virens*, *B. appendiculata*, *B. presliana* 7 tests were positive (Table 1).

**Table No. 1- Qualitative tests for Alkaloids, Steroids, Tannin, Saponin and Glycosides.**

Sr. No.	Name of the Species	Alkaloids	Steroids	Glycosides
1.	<i>B. virens</i>	+	-	+
1	<i>B. appendiculata</i>	+	-	+
12.	<i>B. presliana</i>	+	-	+

[Note: (+) Present; (-) Absent]

### Quantitative phytochemical analysis

The amount of phytochemicals which are initiate in the three ferns extract was quantitatively determined by standard procedures. Completely the extracts of *Bolbitis species* such as *B. virens*, *B. appendiculata*, *B. presliana* displayed different amount of phytochemicals. Between the three components alkaloids content was highest in all the selected ferns followed by alkaloids and glycosides compounds (Table 2). The amount of tannins and saponins are very low in the *Bolbitis species* such as *B. virens*, *B. appendiculata*, and *B. presliana* ferns extract.

### Quantitative tests

**Table 2: Alkaloids, Steroids, Glycosides contents in the species studied.**

Sr. No.	Name of the Species	Alkaloids %	Steroids %	Glycosides %
1.	<i>B. virens</i>	21.10	-	1.57
2.	<i>B. appendiculata</i>	24.09	-	1.12
3.	<i>B. presliana</i>	18.10	-	2.31

## 4. CONCLUSION

In the present study all the *Bolbitis species* such as *B. virens*, *B. appendiculata*, and *B. presliana* ferns extract. *Bolbitis species* extracts presented the existence of alkaloids and glycosides. This study also leads to the supplementary research in the mode of isolation and identification of the active compound from the selected *Bolbitis species* using chromatographic and spectroscopic techniques.

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