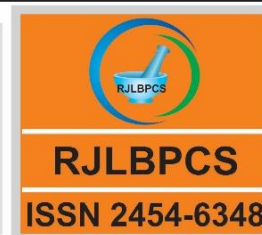




Life Science Informatics Publications

Research Journal of Life Sciences, Bioinformatics,
Pharmaceutical and Chemical SciencesJournal Home page <http://www.rjlbpcs.com/>**Original Research Article****DOI - 10.26479/2015.0104.01****INORGANIC CONSTITUENTS OF TWO *BOLBITIS* FERN SPECIES FROM SOUTH WESTERN GHATS****Manisha V Kale**

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ABSTRACT: Objective: The estimation of inorganic constituents in two *Bolbitis* species of ferns such as *B. virens*, *B. presliana* collected from different localities of South Western Ghats. Methods: For the estimation of inorganic constituents an acid digest method from the oven dried plant material was used as well as the solution was used for estimation of elements & these elements were estimated by using atomic absorption spectrophotometer. Results: In this two *Bolbitis* species studied Ca, Na and K substances are discovered to be determined than the other elements. Mg contents are associated with their chlorophyll contents. Fe, Mn, Zn and Cu substances are in trace quantity as these are the micronutrients. Conclusion: The two *Bolbitis* species are particular members of the genus are often grown as immersed water plants in aquaria terrestrial but there is no definite correlation amongst these constituents. This may be due to the seasonal variation, age of the plant at the time of collection, nature of soil.

KEYWORDS: Inorganic constituents, *Bolbitis* species, Ca, Na, K, Fe, Mn, Zn and Cu substances.

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*Email Address: manishavkale@gmail.com**1.INTRODUCTION**

Pteridophytes also recognized as ferns and Fern-allies as well as it's the midpoint of fascination to botanist, horticulturist and fern lovers since earliest times. Pteridophytes are one of the oldest groups on earth and constitutes a enormous group of vascular plants, which do not produce flowers or seeds, reproducing as a substitute via the production of spores. These plant groups are very conspicuous and element of our present day flora [1]. *Bolbitis species* such as *B. virens*, *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 [2] *Bolbitis heudelotii*, called for the botanical surveyor of West Africa Jean-Pierre Heudelot (1802-1837)[3] is an aquatic Polypody fern rising waterlogged in rivers and streams, fond of to rocks or wood by the fragile rootlets 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. This species is habitually used as a midground specimen plant in stifling freshwater aquaria. Propagation is from partitions and cuttings from the rhizome. [4-7] they display diversity in habit & habitat, mostly herbaceous, a few shrubby & a very few are tree-like. Most of them are terrestrial in habitat.(M V Kale et.al 2005). Inorganic constituent play major role in metabolism of plant. On the other hand the study of inorganic constituents of terrestrial ferns divergent in habitats .Therefore in the current investigation such an effort has been made to study relationship among the amount of inorganic constituents and the habitat. [5-12].

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

Methods: For the estimation of inorganic constituents an acid digest method from the oven dried plant material was used. The material was digested following the method of Toth et.al. (1984).For acid digestion, 0.5gm plant material was taken in 150 ml beaker, 20 ml concentrated HNO₃ was added to it and allowed to stand for 30 min. till initial reaction subsides. Then the mixture was heated until plant material was dissolved, cooled to room temperature & 10 ml Perchloric acid added to it & heated gradually. The mixture becomes clear. Then the volume was reduced to 2-3 ml by heating and cooled to room temperature and adjusted to 100 ml with distilled water and allowed to stand overnight. On the next day it was filtered through Whatman No. 1 filter paper. The solution was used for estimation of elements like, Ca, Mg, Na, K, Fe, Mn, Zn, Cu. These elements were estimated by using atomic absorption spectrophotometer.

3. RESULTS AND DISCUSSION

Inorganic constituents studied in the ferns *Bolbitis species* such as *B. virens*, *B. presliana* have been summarized in Table 1

Sr. No.	Name of the Species	Inorganic Constituents							
		Ca	Mg	Na	K	Fe	Mn	Zn	Cu
1	<i>B. virens</i>	0.26	0.06	0.22	0.24	0.0060	0.0008	0.0228	0.00060
2.	<i>B. presliana</i>	3.22	0.29	0.012	1.18	0.014	0.016	0.0077	0.002

Values are expressed in gm/100gm of dry tissue.

Calcium: Calcium is a constituent of cell wall. It is needed for structural integrity of chromosomes, cell membrane and cell division. It is relatively immobile. Between the two species studied, Calcium is maximum in *B. presliana*. **Magnesium:** Magnesium is a structural constituent of chlorophyll and is needed for nucleic acid synthesis. Redistribution of magnesium from older to younger organ of plants occurs readily. The Mg content is more in *B. presliana*. **Sodium:** Sodium has a micronutrient status. A different pattern of sodium content is observed in two *Bolbitis* species observed. The level of Na is higher in *B. virens*. Na acceptance is dependent on climate and the place where the fern is growing (Shetty 1971). **Potassium:** Potassium is the most significant macronutrient for growth. It is necessary in mitochondrial and cell membrane permeability In *B. presliana* content is higher whereas very low content present in *B. virens* **Iron:** Iron is a essential of cytochrome for respiration and it is vital for chlorophyll formation and electron transport. It is indispensable for synthesis of chlorophyll. Iron content is more in *B. presliana* **Manganese:** Manganese is an significant micronutrient which plays an key role in many enzymatic reactions as a cofactor. It is a structural integral of chlorophyll and is needed for nucleic acid synthesis. The level of Mn is higher in *B. presliana* compare to *B. virens* species. **Zinc:** Zinc is more in *B. virens* compare to *B. presliana* species. It may be depending on soil type and locality. **Copper:** It is a micronutrient and therefore it is mandatory by the plants in minor quantities. It's constituent of plastocyanin which plays a role in protein and carbohydrate synthesis. In two *Bolbitis* species considered copper substances are minimum and in trace amount. In two *Bolbitis* species studied Ca, Na and K substances are found to be extreme. Mg contents are associated with their chlorophyll contents. Fe, Mn, Zn and Cu contents are in trace quantity as these are the micronutrients

4. CONCLUSION

Consequently, the arrangement of inorganic constituents is different in two *Bolbitis* species studied and it is really challenging to draw any type of relationship of these ingredients with their habitats. It has been observed by Hou (1950) that the ecological distribution of fern allies may not be related to supply of Fe, P, Ca & K in soil. As well the habitats of the species, the difference in the quantity of these chemical constituents may be due to the nature of the soil, the age of the plant at the time of collection, seasonal and climatic change.

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