



Original Research Article**DOI - 10.26479/2015.0104.02**

QUALITATIVE AND QUANTITATIVE ANALYSIS OF *CYATHEA GIGANTEA* FERNS FROM SOUTH WESTERN GHATS

Manisha V Kale

Department of Botany, Jaysingpur College, Jaysingpur 416 101, Maharashtra, India

ABSTRACT: The recent study was to invention out the presence of phytochemicals in the petroleum ether, benzene, chloroform, methanol and aqueous extracts of fern *Cyathea gigantea* species by composed with qualitative and quantitative screening methods. In qualitative analysis, the bioactive amalgams such as Alkaloids, Steroids, Tannin, Saponin and Glycosides remained screened in methanol solvent extracts. The methanol extract of the of fern *Cyathea gigantea* species point out positive results for 6 phytochemical tests In quantitative analysis the major secondary metabolites such as alkaloids, proline, saponins Steroids, and Glycosides, phenol, and tannins were tested in all the extracts of fern *Cyathea gigantea* species. The methanol extract obtainable determined amount of phytochemicals.

KEYWORDS: Phytochemical constituents, Medicinal ferns, *Cyathea gigantea*, Secondary metabolites, Alkaloids, Steroids, Tannin, Saponin and Glycosides

***Corresponding Author: Dr. Manisha V Kale Ph.D.**

Department of Botany, Jaysingpur College, Jaysingpur 416 101, Maharashtra, India

*Email Address: manishavkale@gmail.com

1.INTRODUCTION

Cyathea gigantea is known as tree fern and its originate generally in moist exposed areas of Northeastern to Southern India as well as Thailand, Nepal and Western Java. The Cyatheaceae is the crispy tree fern family and involve of the world's enormous tree ferns, which range heights up to 20 m [1]. Generally the fresh rhizome of *C. gigantea* mixed with black pepper seeds processed and in use orally through milk twofold times a day for one week in stomach in inconsistency of white discharges [2]. Liver is unique of the important organs of the body which demonstrations a main

part in the metabolism of proteins, carbohydrates, lipids. It is in the same way having general range of functions as well as detoxification, storage of glycogen, vitamin A, D and B12, invention of numerous coagulation factors, growth factors (IGF-1), hormones (angiotensinogen) and biochemical necessary for digestion (bile). Hepatic damage happens due to its multi-dimensional functions, several xenobiotic and oxidative stress leading to distortion of all of its functions [3]. Other plant from the equivalent genus i.e., *Cyathea phalerata* Mart presented antioxidant and hepatoprotective activities [4]. *C. gigantea* have many active ingredients like triterpenes, sterols, saponins, flavonoids, hentriacontane, β -sitostenone, β -sitostanone, diploterol, sitosterol, hopan-29-ol and whole plant holds oleanolic acid [5]. The main study on flavonoids constituents in the genus *Cyathea* was approved out by Harada et al [6] Oleanolic acid is a triterpenoid having antitumor, hepatoprotective and antiviral activity [7], [8] Oleanolic acid is bringing into being to exhibit strong anti-HIV activity [9]. Dietary phytosterols like β -sitosterol is having anticancer activity [10-12].

2. MATERIALS AND METHODS

Collection of plant material

Cyathea gigantea species the whole plant of 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 *Cyathea gigantea* species was directed following the standard procedures [6-11].

Quantitative phytochemical analysis

The phytochemicals which are existing in the methanol extracts of fern *Cyathea gigantea* species were determined and quantified by standard procedures.

3. RESULTS AND DISCUSSION

Qualitative phytochemical analysis

In qualitative analysis of methanol extracts of fern *Cyathea gigantea* species presented that advanced results for ten phytochemical tests. 10 phytochemical tests keep on affirmative in

methanol extract of the *Cyathea gigantea* species extract 9 tests were affirmative. In methanol extracts of the ferns of *Cyathea gigantea* species 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>C. gigantea</i>	+	-	+

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

Quantitative phytochemical analysis

The quantity of phytochemicals which are initiate in the fern *Cyathea gigantea* species extract be there quantitatively determined by using standard procedures. Completely the extracts of fern *Cyathea gigantea* species discovered different quantity of phytochemicals. In the middle of the three constituents alkaloids content was maximum in altogether the selected ferns followed by alkaloids and glycosides compounds (Table 2). The quantity of tannins and saponins are very low in the fern *Cyathea gigantea* species ferns extract.

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

Sr. No.	Name of the Species	Alkaloids %	Steroids %	Glycosides %
1.	<i>C. gigantea</i>	19.09	-	3.09

4. CONCLUSION

In the present study of fern *Cyathea gigantea* species extract. These ferns species extracts offered the existence of alkaloids and glycosides. This study as well signs to the complementary research in the approach of isolation as well as identification of the active composite from selected of fern *Cyathea gigantea* species using chromatographic and spectroscopic techniques.

5.ACKNOWLEDGEMENT

Authors are thankful to UGC, New Delhi for providing financial assistance and also to the principle of Jaysingpur College Jaysingpur for providing laboratory facilities.

REFERENCES

- [1] Large MF, Braggins JE. Tree ferns. Portland, Oregon: Timber Press; 2004, p. 136.
- [2] Rout SD, Panda T, Mishra N. Ethnomedicinal studies on some pteridophytes of similipal biosphere reserve, Orissa. Int J Med MedSci 2009; 1(5): 192–197.
- [3] Wolf PL. Biochemical diagnosis of liver diseases. Indian J Clin Biochem 1999; 14: 59–90.

[4] Appel H, DalBó M, Costa Brighente S, Pizzolatti IM, Curi Pedrosa MG, Ribeiro-do-Valle RM. Antioxidant and hepatoprotective effects of *Cyathea phalerata* Mart. (Cyatheaceae). *Basic Clin Pharmacol Toxicol* 2008; 103(1): 17–24.

[5] Juneja RK, Sharma SC, Tandon JS. Studies on a fern, *Cyathea gigantea*. *J Pharm Biol* 1990; 28(3): 161–162.

[6] Harada T, Saiki Y. Distribution of flavonoids in ferns (2). *Pharmaceutical studies on ferns VIII. Pharm Bull (Japan)* 1955; 3: 469–472.

[7] Wolska KI, Grudniak AM, Fiecek B, Kraczkiewicz-Dowjat A, Kurek A. Antibacterial activity of oleanolic and ursolic acids and their derivatives. *Cent Eur J Biol* 2010; 5(5): 543-553.

[8] RP Zhou, ZM Zhang, L Zhao, CH Jia, S Xu, QG Mai, et al. Inhibition of mTOR signaling by oleanolic acid contributes to its anti-tumor activity in osteosarcoma cells. *J Orthop Res* 2011; 29(6): 846-852.

[9] Bhutani KK, Gohil VM. Natural products drug discovery research in india: Status and appraisal. *Indian J Exp Biol* 2010; 48: 199-207.

[10] Woyengo TA, Ramprasath VR, Jones PJ. Anticancer effects of phytosterols. *Eur J Clin Nutr* 2009; 63(7): 813-820.

[11] P Madhu Kiran et al Investigation of hepatoprotective activity of *Cyathea gigantea* (Wall. ex. Hook.) leaves against paracetamol-induced hepatotoxicity in rats *Asian Pac J Trop Biomed* 2012; 2(5): 352-356

[12] Manisha Kale. Analysis of bioactive compounds on ethanolic extract of whole plant of *cyathea gigantea* 2015 Sept-Oct RJBPCS 1(3) Page No.156-161.

[13]P.N.Ghorpade et al (2015) phytochemical analysis of bioactive components *cheilanthes farinosa* (forssk.) kaulf. RJBPCS 1(1)31 -35

[14]Thakar and Sonawane (2013) Mangrove Infoline Database: A Database of Mangrove Plants with Protein Sequence Information *Current Bioinformatics*, 8, 524-529

[15]Singh, H. B. (1999). Potential medicinal pteridophytes of India and their chemical constituents *Journal of Economic and Taxonomic botany* September 15 23 (1): 67-78.

[16]Singh, S. and Singh, R. (2013). Utilization of pteridophytes of Achankmar Amarkanatak Biosphere Reserve, Central India in woman health and body care products. IRJP 4(1).

[17]Manickam, V. S., Irudayraj, V. (1992) Pteridophyte's flora of Western Ghats, South India, BI Publications, New Delhi.

[18] Manisha V Kale 2015. Qualitative and Quantitative Analysis of Three Bolbitis Species July-August RJBPCS 2(1) Page No.122-125.