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Phytochemical screening of some pteridophytes from Ratnagiri District of Maharashtra

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ABSTRACT

Pteridophytes are resistant to microbial infection which may be one of the crucial factors for their evolutionary success and the fact that they lasted for more than 350 million years. The present study screened the phytochemical properties of ten pteridophytes. The parameters studied are Moisture, Ash, Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, Sulphur, Sodium, Zinc, Ferrous, Copper, Manganese, Molybdenum, and Boron. The study revealed the presence of many medicinally active constituents in ten species investigated, suggesting that several pteridophyte species have the potential to synthesis useful metabolites.

Keywords: Pteridophytes, chemical, medicinal importance, metabolites.

I. INTRODUCTION

It has been suggested that the distribution of ferns is mostly determined by factors of climate and habitat due to relatively low limitations in ferns for dispersal and establishment[1]. Appropriate plant nutrition is crucial to plant health and for adequate growth of the plants with maximal productivity. There are ample amount of evidences of herbs used in the treatment of diseases and for revitalizing body systems in almost all ancient civilization. There are many references for use of plant has curative properties in various diseases. Among the nutrients in plants N, P, K, Ca, Mg and S are in large quantities while Na, Zn, Fe, Cu, Mn, Mo, and B are in trace amount. The immense potentiality of Pteridophytes in modern medicine. Some common known taxa used in ayurvedic and homeopathic and siddha system of pathy are believed by tribal, rural and common people of whole world. This is common known facts that the herbal medicines having no side effect, thus, pteridophytic plants used as better herbal preparation, but before its use requires proper testing, screening, and validity of compounds [2]. The determination of macro and micronutrients in plant tissues is an important measure, used to analyze plant nutrient status, resistant to microbial infection, and to evaluate the possible requirements of soil type for their better growth also it gives information about soil type of that locality. Ferns and fern allies have engaged the attention of the botanists and horticulturists because of their beauty and graceful foliage. Besides this, these have been successfully used in the past in Ayurvedic, Unani, Siddha, Homeopathic and other preparations. For their use as horticultural plant or in the medicinal preparations, ferns are being removed from their natural shady habitats in the forests [3], which draw our intension towards the conservation of these much neglected group. The medicinal values of ferns have been known to many for more than 2000 years. The Greek botanist Theophrastus (327-287 B.C) mentioned medicinal values of ferns in his book Historia plantarum. Phytochemical analysis ferns of India are studied by many pteridologists uses [4,5,6,7]. May published a detailed review the uses of ferns and listed 105 medicinal ferns. The microbial resistance potential of

some pteridophytes is also reviously studied. In our study ten medicinally ferns of Ratnagiri district of Maharashtra have been assessed for their phytochemical screening.

II. METHODS AND MATERIAL

The material was collected from Ratnagiri district which is situated between 17.2478 N and 73.3709 East. The average temperature range is about 20^{O}-40^{O} with 3364 mm annual average rainfall. During present investigation ten species of pteridophytes M. minuta L, C parasitica (L.) H.Lev, P. lanceolata, Farwell., A. Philippens. L., A.hohenackeranum (Kunze) T. Moore A.incisum Forssk., P.vittata L., P.calomelanos (L) Link., H.crenatum (Forssk.) Kuhn D. quercifolia (L.) J.Smith. from Ratnagiri District of Maharashtra state were collected for analysis. The specimens were identified by the Pteridophytic flora of South India [8]. Plant species collected and washed with water to remove soil and debris then plants were dried in oven and powdered and powdered material were directly subjected to analysis in Atomic absorption spectrometry (AAS).

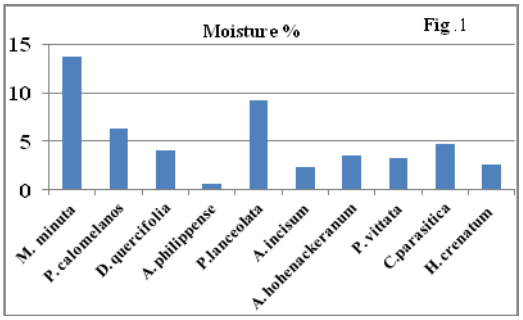
III. RESULTS AND DISCUSSION [Page Style]

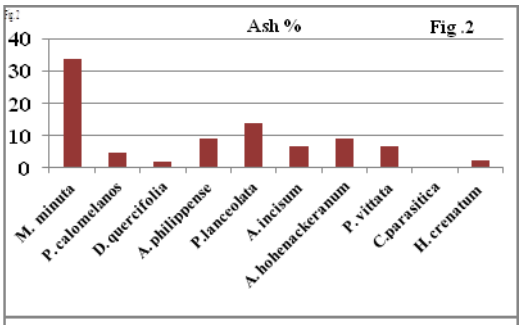
The phytochemical components of each extract are presented separate in fig, 1 to 15 viz. Moisture, Ash, Nitrogen, Phosphorous, Potassium, Calcium, Magnesium, Sulphur, Sodium, Zinc, Ferrous, Copper, Manganese, Molybdenum and Boron. Element concentration in 10 pteridophytes (whole) where measured by relative methods of AAS using multi element standards as comparators these are listed. In order to compare the main elements concentration on each species for N, P, K, Ca, Mg, S, Na, Zn, Fe, Cu, Mn, Mo, and B are plotted in separate Fig (1-15).

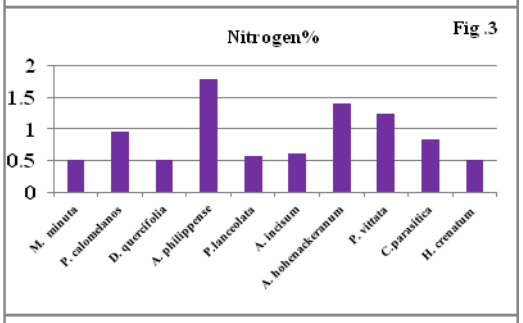
The moisture content in M. minuta have highest percentage (13.7%) and lowest in A. philippens (0.6%) followed by P. lanceolata, P. calomelanos, C. parasitica, D. quercifolia, A.hohenackeranum, P. vittata, H.crenatum, A. incisum (Figure 1). Highest Ash Produced in M. minuta (33.56%) and lowest in C. parasitica (0.5%) followed by P. lanceolata, A. Philippens A.hohenackeranum, A. incisum, P. vittata, P. calomelanos, H.crenatum,, D. quercifolia (Figure 2). Highest Nitrogen content present in A.Philippens (1.79%) and lowest in D. quercifolia , M. minuta, H.crenatum equally i.e. (0.5%) followed by A.hohenackeranum, P. vittata,P.calomelanos, C. parasitica, A. incisum, P. lanceolata (Figure 3). Highest Phosphorus content present in H.crenatum (0.28%) and lowest in A.hohenackeranum followed by P. lanceolata, A. Philippens, A. incisum, M. minuta, P. vittata, P. calomelanos, D. quercifolia, C. parasitica (Figure 4). Highest Potassium content present in A.hohenackeranum (1.89%) and lowest in A. incisum (0.21%) is followed by C. parasitica, H.crenatum, M. minuta, P. lanceolata, P. vittata, A. Philippens, P. calomelanos, D. quercifolia (Figure 5). Highest Calcium content present in A. hohenackeranum (2.83%) and lowest in A. incisum (0.31%) is followed by C. parasitica, H.crenatum, M. minuta, P. lanceolata, P. vittata, A. Philippens, P. calomelanos, D. quercifolia (Figure 6). Highest Magnesium content present in A. hohenackeranum (6.30%) and lowest in A. incisum (0.70%) is followed by C. parasitica, H.crenatum, M. minuta, P. lanceolata, P. vittata, A. Philippen, P. calomelanos, D. quercifolia (Figure 7). Highest Sulphur content present in A. hohenackeranum (1.81%) and lowest in P. lanceolata (0.48%) is followed by A. incisum, A. Philippens, C. parasitica, D. quercifolia, M. minuta, P. calomelanos, H.crenatum, P. vittata. (Fig 8). Highest Sodium content present in A. hohenackeranum (2.61%) and lowest in A. incisum (0.29%) is followed by C. parasitica, H.crenatum, M. minuta, P. lanceolata, P. vittata, A. Philippens, P. calomelanos, D. quercifolia (Figure 9). Highest Zinc content present in A. hohenackeranum (120 PPM) and lowest in A. incisum (13.32 PPM) is followed by H.crenatum, M. minuta, P. lanceolata, P. vittata, C. parasitica, A. Philippens, P. calomelanos, D. quercifolia (Figure 10).

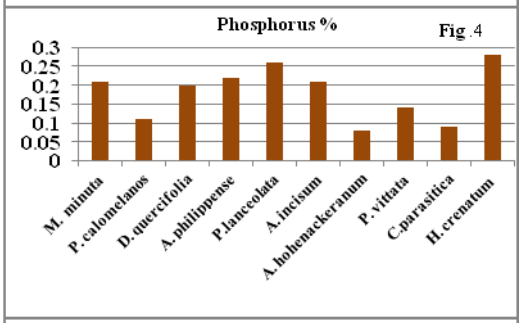
A. Highest Ferrous content present in A. hohenackeranum (128.5 PPM) and lowest in A. incisum (14.28 PPM) is followed by C. parasitica, H.crenatum, M. minuta, P. lanceolata, P. vittata, A. Philippens, P. calomelanos, D. quercifolia (Figure 11). Highest Copper content present in A. hohenackeranum (54.18 PPM) and lowest in A. incisum (6.02 PPM) is followed by C. parasitica, H.crenatum, M. minuta, P. lanceolata, P. vittata, A. Philippens, P. calomelanos, D. quercifolia (Fig12). Highest Manganese content present in A. hohenackeranum (180.2 PPM) and lowest in A. incisum (20.02 PPM) is followed by C. parasitica, H.crenatum, M. minuta, P. lanceolata, , P. vittata, A. Philippens, P. calomelanos, D. quercifolia(Fig13).. Highest Molybdenum content present in A. hohenackeranum (9.72 PPM) and lowest in A. incisum (0.21 PPM) is followed by C. parasitica, P. vittata, M. minuta, A. Philippens, P. calomelanos, D. quercifolia, P. lanceolata, H.crenatum. (Figure 14).Highest Boron content present in A. Philippens (8.22 PPM) and lowest in , P. calomelanos (1.27 PPM) is followed by A.hohenackeranum, H.crenatum, C. parasitica, P. lanceolata, , D. quercifolia, A. incisum, P. vittata, M. minuta. (Figure 15).

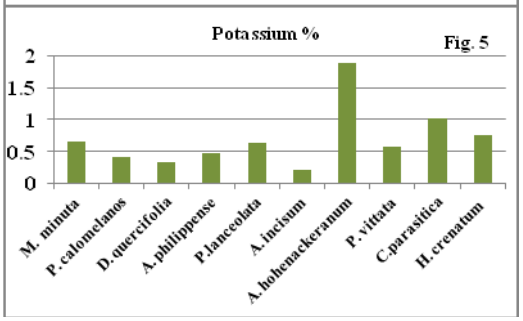
Out of 1000 species of pteridophytes occurring in India, 170 species have been informed to be used as food, flavor dye, medicine, bio fertilizers, oil, fiber and biogas production. The medicinal importance of pteridophytes against bacteria, fungi, virus, cancer rheumatism, diabetes, inflammation, consultant, fertility, diuretic pesticides, hepatoprotective and sedative has been reported besides sugar, starch, proteins and amino acids ferns contain a variety of alkaloids , glycosides, flavonoids, terpenoids, sterols, phenols, sesquitorpens etc. as potential components used in various industries [8]. Nitrogen is required to debelope proper green colour in ferns; weather primary macronutrients Nitrogen (N), Phosphorus (P), Potassium (K) are needed for growth of ferns, three secondary macronutrients: Calcium (Ca), Sulphur (S), Magnesium (Mg) are also important for growth of fern and fern allies. The micronutrients/ trace minerals: which required by pteridophytes are Boron (B), Manganese (Mn), Iron (Fe), Zinc (Zn), Copper (Cu), Molybdenum (Mo).

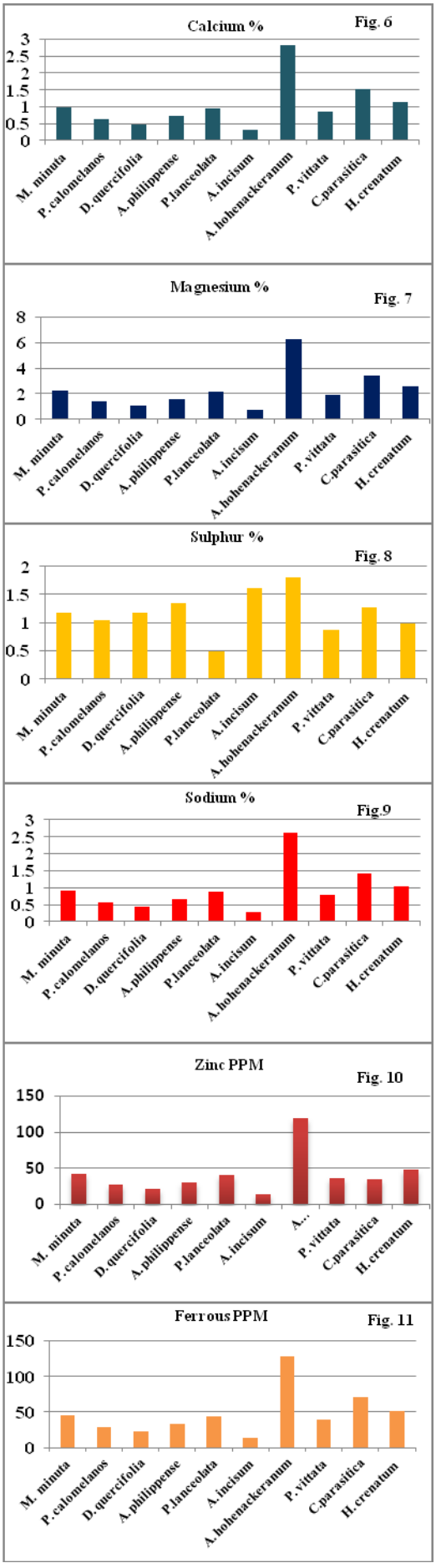


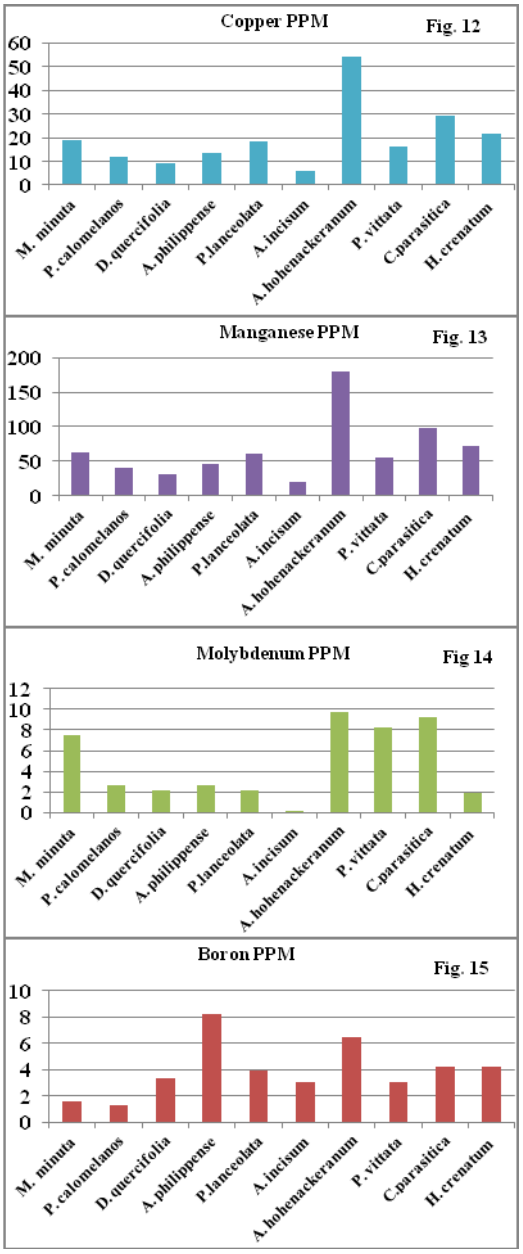












Figyre (1-15). Phytochemical screening of ten pteridophytes from Ratnagiri district of Maharashtra . 1. Moisture (%) 2. Ash (%) 3. Nitrogen (%) 4. Phosphorus (%) 5. Potassium (%) 6. Calcium (%) 7. Magnesium (%) 8. Sulphur (%) 9. Sodium (%) 10 Zinc PPM 11.Ferrous PPM 12. Copper PPM 13. Manganese PPM 14. Molybdenum PPM 15. Boron PPM

IV. ACKNOWLEDGMENT

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V. CONCLUSION

Current work would be helpful for developing and updating the database of the studied species and also to undertake specific project based on conservation strategies of the species.

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