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SCREENING OF PHYTOCHEMICALS OF *BLECHNUM ORIENTALE* L. COLLECTED FROM KOTHIYAR, KANYAKUMARI DISTRICT, TAMIL NADU, INDIA

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Abstract:

The aim of the present study was to screen the phytochemicals in the methanolic extract of Blechnum orientale L. collected from Kothiyar, located in Kanyakumari district, Tamil Nadu, India. The phytochemical screening of methanolic extract was analyzed using the standard procedure using UV-Visible spectroscopic and FTIR. The UV-Visible spectrum was found to have the presence of the compounds separated at the nm of 536, 606, 662, 718, 741.5, 783.5, 797.5, 820.5 and 890.5 of with the absorption of 0.822, 0.675, 1.499, 0.317, 0.304, 0.276, 0.275, 0.268 and 0.265 respectively. The FTIR analysis showed the presence of functional groups such as aldehydes, monosubst benzenes, 1,2,4-trisubst benzenes, organophosphorus, siloxanes, pyridine n-oxides, aliphatic nitro compounds, hydrochlorides, amino acid, esters and primary amines.

Key words: *Blechnum orientale, Phytochemicals, UV-Visible, FTIR*

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INTRODUCTION:

In recent years, secondary plant metabolites, previously with pharmacological activities have been extensively investigated as a source of medicinal agents [1]. Thus, it is anticipated that phytochemicals with adequate bioactivity efficacy will be used for the treatment of various diseases [2]. Pteridophytes are not infected by microbial pathogens which may be one of the important factors for the evolutionary success and the fact that they survived for more than 350 million years. Considering the rich diversity of Indian medicinal plants including pteridophytes, it is expected that the screening of plant extract for phytochemicals may be beneficial for humans and plants diseases [3].

The medicinal value of ferns has been known to many for more than 2000 years. The Greek botanist Theophrastus (372-287 B.C.) has referred to the medicinal value of ferns in the book *Historia Plantarum*. Medicinal ferns of India were studied by Singh *et al.* [4] and described 27 species of ferns having varied medicinal uses and published a detailed review of the uses of ferns and listed 105 medicinal ferns. Pteridophytes by virtue of their possessing great plant variety and fascinating foliage have drawn the attention and admiration of horticulturists and botanists for centuries. After the introduction of ethnobotanical survey, many attempts were made on scientific research regarding the medicinal importance of pteridophytes. A number of angiosperms with phytochemicals have been reported in literatures [5,6]. However, very less information is available at present in the literature regarding the phytochemical information of pteridophytes. Hence, an effort was taken to study the presence of phytochemicals in the methanolic extract of *Blechnum orientale* L.

MATERIALS AND METHODS:

Collection of plant materials

The plant material selected for the present study was *Blechnum orientale* L. which belongs to the family Blechanaceae was collected from Kothiyar, located in Kanyakumari district, Tamil Nadu, India, during the month of December, 2016 and identified and confirmed by Pteridophyte flora of the Western Ghats – South India [7].The collected materials were washed thoroughly with tap water to remove the sediment particles. Then the samples were brought in polythene bag to the laboratory, followed by washed using distilled water. They were stored in refrigerator for further use.

Preparation of extracts

For the preparation of methanolic extract, the plant specimens were washed thoroughly and placed on blotting paper and spread out at room temperature in the shade condition for drying. The shade dried samples were grounded to fine powder using a tissue blender. The powdered samples were then stored in the refrigerator for further use. 30g powdered samples were packed in Soxhlet apparatus and extracted with methanol for 8h separately [8].

UV-Vis spectral analysis

The methanolic crude extract containing the bioactive compound was analyzed UV-Visible spectroscopically for further confirmation. The methanolic crude extract of *Blechnum orientale* L. was scanned in a wavelength ranging from 200-900nm using a Shimazdu spectrophotometer and characteristic peaks were detected [9].

FTIR analysis

FTIR analysis was performed using Perkin Elmer Spectrophotometer system, which was used to detect the characteristic peaks and their functional groups. The peak values of the FTIR were recorded. Each and every analysis was repeated twice and confirmed the spectrum [10].

RESULTS AND DISCUSSION:

UV-Visible spectrum analysis

The UV-Visible spectrum of the methanolic extract of *Blechnum orientale* L. was selected at the wavelength of 200nm to 900nm due to the sharpness of the peaks and proper baseline. The methanolic spectrum of *Blechnum orientale* L. showed the compounds separated at the nm of 536, 606, 662, 718, 741.5, 783.5, 797.5, 820.5 and 890.5 with the absorption of 0.822, 0.675, 1.499, 0.317, 0.304, 0.276, 0.275, 0.268 and 0.265 respectively (Figure 1 and Table 1).

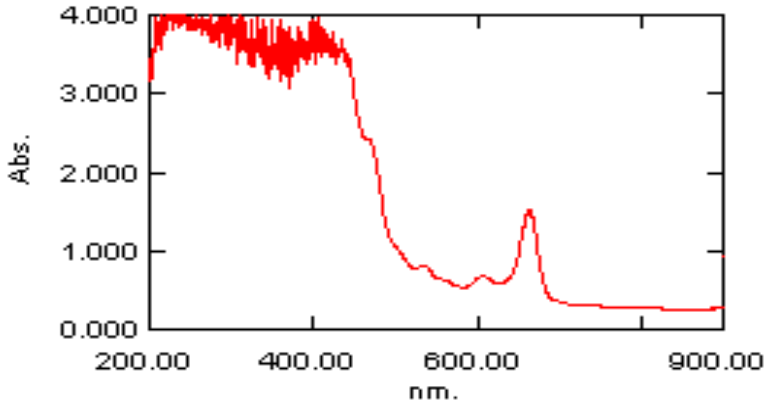

Fig.1: UV-Visible spectrum of methanolic extract of *Blechnum orientale* L.

Table 1: UV-Visible spectrum of methanol extract of *Blechnum orientale* L.

Nm	536	606	662	718	741.5	783.5	797.5	820.5	890.5
Abs	0.822	0.675	1.499	0.317	0.304	0.276	0.275	0.268	0.265

FTIR ANALYSIS

The FTIR spectrum was used to identify the functional group of the active components based on the peak value in the region of infra red radiation. The crude methanolic extract of *Blechnum orientale* L. was passed into the FTIR and the functional groups of the components were separated based on its peak ratio. As illustrated in Figure 2 and Table 2, the results of FTIR analysis of methanolic extract showed different peaks at 686.61, 769.54, 821.62, 1052.10, 1107.06, 1285.47, 1370.33, 1444.58, 1525.59, 1608.52, 1740.64, 2926.78 and 3420.52cm^{-}[1]. It was confirmed the presence of functional groups such as aldehydes (C-C-CHO bending), monosubst benzenes (CH out-of-plane deformation), 1,2,4-trisubst benzenes (CH out-of-plane deformation), organophosphorus (P-O-C antisym stretch), siloxanes (Si-O-Si antisym stretch), pyridine n-oxides (N-O stretch), aliphatic nitro (NO_2 sym stretch), aliphatic (CH_3 antisym deformation), amino acids or hydrochlorides (NH_3^+ deformation), amino acid (NH_2 deformation), esters (C=O stretch), aliphatic (CH antisym and sym stretch) and aromatic, primary amines (NH stretch).

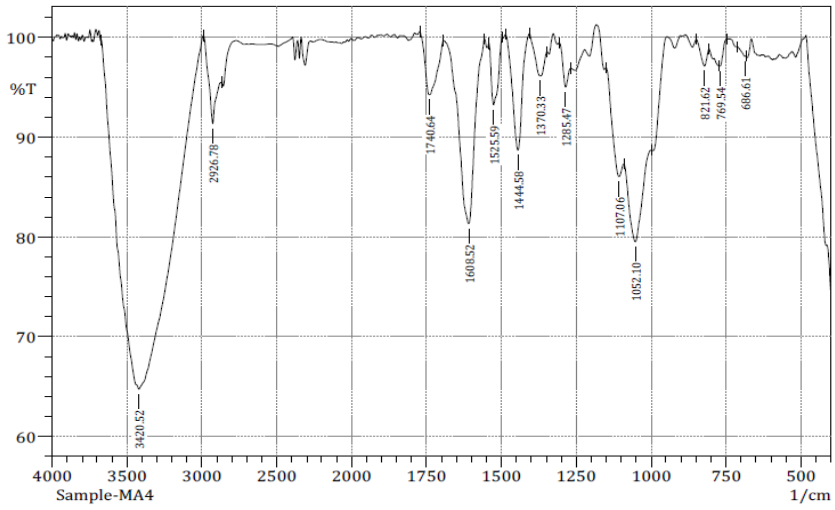

Fig. 2: FT-IR spectrum of methanolic extract of *Blechnum orientale* L.

Table 2: FTIR spectrum analysis of methanolic extract of *Blechnum orientale* L.

Peak value	Functional group	Assignment
3420 .52	Aromatic, primary amines	NH stretch
2926.78	Aliphatic	CH anti sym and sym stretch
1740.64	Esters	C=O stretch
1608.52	Amino acid	NH_2 deformation
1525.59	Amino acids or Hydrochlorides	NH_3^+ deformation
1444.58	Aliphatic	CH_3 anti sym deformation
1370.33	Aliphatic nitro	NO_2 sym stretch
1285.47	Pyridine N-oxides	N-O stretch
1107.06	Siloxanes	Si-O-Si anti sym stretch
1052.10	Organophosphorus	P-O-C anti sym stretch
821.62	1,2,4-trisubst benzenes	CH-out-of-plane deformation
769.54	Mono subst benzenes	CH-out-of-plane deformation
686.61	Aldehydes	C-C-CHO bending

CONCLUSION:

From the present study, it was concluded that UV-Visible spectrum showed the compounds separated at the nm of 536, 606, 662, 718, 741.5, 783.5, 797.5, 820.5 and 890.5 of with the absorption of 0.822, 0.675, 1.499, 0.317, 0.304, 0.276, 0.275, 0.268 and 0.265 respectively. The FTIR analysis showed the presence of functional groups such as aldehydes, monosubst benzenes, 1,2,4-trisubst benzenes, organophosphorus, siloxanes, pyridine n-oxides, aliphatic nitro compounds, hydrochlorides, amino acid, esters and primary amines.

REFERENCES:

1. Krishnaraju AV, Rao TVN, Sundararaju D. Assessment of bioactivity of Indian medicinal plants using Brine shrimp (Artemia salina) lethality assay. Int. J. Appl. Sci. Eng, 2005; 2:125-134.
2. Balandrin MF, Kjocke AJ, Wurtele E. Natural plant chemicals: Sources of industrial and mechanical materials. Science, 1985; 228:1154-1160.
3. Sharma BD, Vyas MS. Ethanobotanical studies on the fern and fern allies of Rajasthan. Bull of Bot Survey of India, 1985; 27:90-91.
4. Singh LS, Singh PK, Singh EJ. Ethnobotanical uses of some Pteridophytic species in Maipur. Indian Fern J, 2001; 18:14-17.
5. Garrat DC. The quantitative analysis of drugs. 3rd Ed. Chapman and Hall Ltd, Japan, 1964; P.456-458.
6. Gehlot D, Gupta VB, Bohra A. Antibacterial activities of leaf extracts of some ferns from Pachmarhi Hills. National Symosium on Researches in Pteridophytes, Abs. of papers. 1995; P.5-7.
7. Manickam VS, Irudayaraj V. Pteridophyte flora of the Western Ghats-South India. B.I. Publications Pvt. Ltd, 1991; Pp.652.
8. John Peter Paul J, Muthu Sheeba M. Atomic Absorption Spectroscopic determination and comparison of some mineral elements in Ulva rigida C.Ag. from Hare Island, Thoothukudi, Tamil Nadu, India. World Journal of Pharmaceutical Research, 2014; 3(4):785-795.
9. John Peter Paul J. Phytochemical studies on Turbinaria ornata (Turner) J.Ag. American Journal of PharmTech Research, 2012; 2(6):582-589.
10. John Peter Paul J, Shri Devi SDK. Phytochemical Screening of Padina tetrastromatica Hauck. American Journal of PharmTech Research, 2013; 3(5):214-222.