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Application of phytochemical screening and a combined FTIR spectroscopy and principal component analysis for effective discrimination of two varieties of *Eclipta alba* (L.) Hassk.

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Abstract : *Eclipta alba* Hassk syn. *E.prostrata* L. and *E.erecta* L., belonging to the family Asteraceae, is a common herb with two types of habit, viz. erect and prostrate. The common name of this herb is karisalnganni or bhringraj. There are four varieties of this herb which are identified with their flowers pink, blue white or yellow. Out of these, the white and yellow varieties are widely used in the medical world and home dishes. They are called as Vellai Karisalanganni and Manjal Karisalangnni based on type of flowers they bearing such as white coloured flowers and yellow coloured flowers, respectively. A literature survey of this plant revealed that many studies have been carried out in this plant in order to characterize or understand their various medicinal properties. For this purpose they have used different parts of this plant without considering the varietal difference. Hence, in the present investigation, an attempt was made to discriminate two varieties of *E. alba* such as White Karisalanganni (WK) and Manjal Karisalanganni (MK) by applying phytochemical screening and a combined FTIR spectroscopy and principal component analysis (PCA). After authentication, leaves of these two varieties were dried and finely powdered. Methanolic and chloroform leaf extracts were prepared using these powders following cold extraction method. After thorough drying, the filtrate of both the extracts were subjected to primary qualitative screening and FTIR analyses. Then, FTIR spectral data were subjected to PCA. In FTIR analysis, both the varieties are differed from each other in specific functional groups. MK variety only shows C=H and C=O stretches which represent the presence of functional groups of alcohol and ester, respectively. Chloroform extract of WK variety only shows alkyne group. To summarize, both the varieties are chemically differed from one another very slightly based on their score plots and also their Eigen value percentage of variance when FTIR data subjected to PCA analysis. Thus, phytochemical screening and a combined FTIR spectroscopy and PCA are used for effective discrimination of both the varieties of this plant. The result of this investigation will facilitate proper authentication of these two varieties for research purpose as well as for food and pharmaceutical applications.

Keywords : *Eclipta alba,* Phytochemical screening, FTIR spectroscopy, PCA analysis, Varietal difference, Methanolic extract, Chloroform extract.

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