



Phyto-physicochemical screenings of *Eclipta alba* (L.) Hassk. (Asteraceae)

¹B. Nazeema Banu and ^{2*}X. Baskaran

¹Department of Biotechnology, Periyar Maniammai University, Thanjavur- 613 403

²Department of Botany, St. Joseph's College, Tiruchirappalli- 620 002, Tamil Nadu, India

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Abstract

The qualitative phytochemical and physicochemical characteristics were analyzed in powdered leaf material of *Eclipta alba*. Results showed that the percentage of total ash, water soluble ash, acid soluble ash, sulphated ash, loss on drying and crude fiber content were high. The qualitative phytochemical analysis revealed that the presence of alkaloids, carbohydrates, glycosides, phytosterols, saponins, tannins, proteins, fixed oils, flavonoids and lignin. The present studies provide referential information for the correct identification of the crude drug of *E. alba*.

Keywords: *Eclipta alba*, phytosterols, flavonoids, crude drug.

As we know well, India is a veritable emporium of medicinal and aromatic plant. It has been estimated that out of 15,000 higher plants occurring in India, 9000 are commonly used, of which 7500 are medicinal, 3900 are edible, 700 are culturally important, 525 are used for fiber, 400 are fodder, 300 for pesticides and insecticides, 300 for gum, resin and dyes and 100 for incense and perfumes (Anonymous, 1994). The World Health Organization (WHO) estimates that up to 80% of the world's people rely on plants for their primary health care. Plants contain chemical constituents such as tannins, flavonoids, steroids, saponins, glycosides, phenolics, terpenes, alkaloids, waxes, essential oils, carbohydrates, amino acids, proteins etc. (Stace, 1980).

Asteraceae (Compositae) is an advanced and botanically highly specialized family of mainly herbaceous plants. They are widely distributed in the tropics and warm temperate regions of South, South- East and East-Asia, Africa including Madagascar and central South

America. The family is represented by about 950 genera and 20000 species over the globe (Sharma, 2004). *Eclipta alba* belongs to Asteraceae family and very common in tropical and subtropical regions. Traditionally, it is extensively used against jaundice, in treatment for night blindness, headache and diseases pertaining to hair and its growth. It is also considered as a rejuvenator (Sivarajan, 1994). The herb has been used in the treatment of infective hepatitis in India (Wagner *et al.*, 1986) and snake venom poisoning in Brazil (Melo *et al.*, 1994). It has been reported that the leaves of this herb are used in the case of gastritis and respiratory disorders like cough and asthma (Kobari *et al.*, 2004). In this present investigation, the physicochemical and qualitative phytochemical analysis of *Eclipta alba* were studied.

Pharmacognosy

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*Author to whom correspondence should be addressed.

Email: fernsbaskar@gmail.com

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Materials and Methods

Plant material preparation

The leaves of *E. alba* were dried under shade and powdered by using wearing blender. And they were subjected to pulverization to get coarse powder. The coarsely powdered leaves were used for physicochemical, phytochemical and fluorescent analysis.

Physicochemical and fluorescent analysis

Physicochemical studies were performed using standard method (Anonymous, 1996). The fluorescent analysis was carried out by prescribed method (Chase and Pratt, 1949; Kokoski *et al.*, 1958).

Qualitative phytochemical analysis

The shade dried coarsely powdered leaves of *E. alba* was extracted with ethanol using Soxhlet's apparatus. After completion of extraction, the solvent ethanol was removed by distillation under reduced pressure. The extract was then stored in desiccator for qualitative phytochemical analysis by using standard procedures (Kokate, 1994).

Results and Discussion

Physicochemical analysis

The physicochemical characters of leaf powder were studied. The percentage of total ash and crude fiber content of *E. alba* were in high. It shows higher sulphated ash (20.13 %) water soluble extractive value (17.4%) respectively. The leaf material has significant crude fiber content (24.0%). The results were tabulated in table-1.

Table 1: The physicochemical characters of the powdered leaf of *E. alba*

Parameter	Values (% W/W)
Total Ash (%)	15.5
Water Soluble ash (%)	8.02
Acid insoluble ash (%)	4.2
Sulphated ash (%)	20.13
Loss on drying (%)	1.03
Water Soluble Extractive (%)	17.4
Alcohol Soluble Extractive (%)	5.76
Crude fiber content (%)	24.0

Fluorescence analysis

The leaf powder of *E. alba* showed dissimilarities in ordinary and UV light with various chemical reagents. It shows fluorescent yellow under ultra violet light for dried powder and also with NaOH. The leaf powder with HCl, H₂SO₄ and HNO₃ shows dark green under UV light (Table-2).

Qualitative phytochemical analysis

The qualitative phytochemical analysis for ethanol leaf extract was carried out. It shows the presence of carbohydrates, alkaloids, phytosterols, saponins, tannins, phenolic compounds, flavonoids and lignin. The result reveals that *E. alba* has potential with bioactive principles. Phytochemical constituents such as tannins, flavonoids, alkaloids and several other aromatic compounds are secondary metabolites of plants that serve as defense mechanisms against predation by many microorganisms, insects and herbivores (Lutterodt *et al.*, 1999; Marjorie, 1999). The presence of the phytochemical constituents are indicated by the + sign in table-3.

Table 2: Fluorescence analysis of leaf powder of *E. alba*

Treatment	Under ordinary light	Under ultra violet light
Powder	Greenish yellow	Fluorescent yellow
Powder + 1N aqueous NaOH	Pale green	Fluorescent yellow
Powder + 1 N alcoholic NaOH	Light greenish yellow	Dark greenish yellow
Powder + 1 N HCl	Dark green	Dark green
Powder + 50% H ₂ SO ₄	Light green	Dark green
Powder + 50% HNO ₃	Dark green	Dark green

**Table 3:** Qualitative analysis of plant metabolites of ethanol extract of *E. alba*

Plant constituents	Presence or absence
Alkaloids	+
Carbohydrates	+
Glycosides & glycone	+
Phytosterols	+
Saponins	+
Tannins	+
Phenols	+
Proteins & Free amino acids	+
Fixed oils & fats	+
Flavonoids	+
Lignin	+

+: Presence

Conclusion

Physicochemical characteristics and preliminary phytochemical studies are corroborating evidence in drug standardizations and which may help to identify the standard plant material of *E. alba*.

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