ABSTRACT

In the present study, Antioxidant and Hepatoprotective activities of *Ecbolium viride* (Forssk.) Alston roots and *Rhynchosis beddomei* Baker leaves including Pharmacognostical and Phytochemical studies were carried out.

*Ecbolium viride* (Forssk.) Alston is a small shrub belonging to the family Acanthaceae. In the ethno medicinal practices, the traditional healers use the *Ecbolium viride* (Forssk.) Alston roots in the treatment of various ailments like jaundice, menorrhagia, rheumatism and dysuria. *Rhynchosis beddomei* Baker belongs to the family Papilionaceae (Fabaceae). It has been reported that, the leaves are used as an abortifacient, antifungal, hepatoprotective as well as in the treatment of wounds, cuts, boils and rheumatic pains by adivasi tribes.

Plant material was collected from Tirumala hills and it was identified and authenticated by Dr. Madhava chetty, Asst.Professor, Botany Dept, Sri Venkateswara University, Tirupati. The Pharmacognostical study was carried out, which comprises of macro and microscopical characters of parts used including macerate studies. *Ecbolium viride* (Forssk.) Alston root exhibited some special diagnostic characters like crushed cork, air chambers, cystolith and *Rhynchosis beddomei* Baker showed veriform trichomes, cells of different region with yellow content, spiral and reticulate vessels. Proximate analysis was carried out and which gave the valuable information about moisture content, ash values and extractive
values of both the drugs. Phytochemical studies included preparation of extracts by successive solvent extraction and phytochemical screening of the extracts. Methanolic extract of both the drugs revealed the presence of maximum number of constituents like alkaloids, phenolic compounds, tannins, flavonoids, sterols and saponins. The total phenolic content of methanolic extract of *Ecbolium viride* (Forssk.) Alston and *Rhyncosia beddomei* Baker was determined according to the Folin-Ciocalte method. Phenolic content of *Rhyncosia beddomei* Baker was found to be higher than that of *Ecbolium viride* (Forssk.) Alston. HPTLC analysis of flavonoids in methanol extract was carried out. *Ecbolium viride* (Forssk.) Alston revealed 4 peaks under 254 nm, 9 peaks under 366 nm and 4 peaks under 425 nm and *Rhyncosia beddomei* Baker revealed 5 peaks under 254 nm, 10 peaks under 366 nm and 2 peaks under 425 nm. Based on the results of phytochemical screening methanolic extract was selected for further studies.

The methanolic extract of both the drugs was subjected to isolation process by column chromatography. β-sitosterol and aconifine were isolated from *Ecbolium viride* (Forssk.) Alston and *Rhyncosia beddomei* Baker respectively and confirmed by spectral analysis.

*In vitro* antioxidant studies of methanolic extract of both the drugs was performed by DPPH, Nitric oxide, reducing power, hydrogen peroxide, super oxide anion and β- Carotene scavenging assays. Both MEEV and MERB showed potent effect against DPPH and NO radical.
Moderate effects were shown by MEEV against rest of the radicals with IC$_{50}$ values of 165, 330, 310 and 86 µg/ml respectively. However, MERB showed potent scavenging activity with IC$_{50}$ values of 78, 66, 160 and 24 µg/ml respectively.

The pharmacological studies include acute toxicity, *in vivo* antioxidant and hepatoprotective activity studies. Acute toxicity studies were carried out according to OECD 423 guidelines and methanolic extract of both the plants were found to be non toxic and nonlethal upto 2000mg/kg b.w. *In vivo* antioxidant activity studies were performed against CCl$_4$ and paracetamol intoxicated rats. Both MEEV and MERB demonstrated significant *in vivo* antioxidant activity, brought back the levels of malondialdehyde, catalase, SOD and glutathione to their normal level. Hepatoprotective activity was evaluated against CCl$_4$, paracetamol and ethanol induced hepatotoxicity. Treatment with MEEV and MERB brought back the elevated serum levels of SGPT, SGOT, ALP, total bilirubin, triglycerides and reduced the levels of total proteins near to normal levels. Histopathological observation revealed that treatment with MEEV and MERB has reversed the hepatic damage by CCl$_4$, paracetamol, and ethanol.

The observed significant antioxidant and hepatoprotective activity may be due to the presence of constituents like flavonoids and phenolic compounds in the roots of *Ecbolium viride* (Forssk.) Alston and *Rhyncosia beddomei* Baker leaves.