Phytochemical, pharmacological and pharmaceutical investigations on *Euphorbia prostrata* were carried out in order to identify the active constituents, to evaluate its pharmacological activity, and to design a suitable formulation containing the pharmacologically active extractive and/or constituent(s).

The extractives of the plant obtained were tested for several organic constituents. The preliminary testing indicated particularly the presence of triterpenoids, sterols flavonoids and amino acids. The ash estimation in the plant has also been done.

From the petroleum ether extractive of the plant, various non-nitrogenous constituents have been isolated, identified as saturated and unsaturated hydrocarbons (C$_{31}$H$_{64}$, C$_{34}$H$_{68}$ and C$_{34}$H$_{70}$), long chain alcohol (C$_{31}$H$_{59}$OH), β-sitosterol and cycloart-23-ene-3,25-diol on the basis of IR, NMR and mass spectral data. The isolation of cycloart-23-ene-3,25-diol forms the first report of occurrence of rearranged triterpene in this species of *Euphorbia*.

The ethanolic extractive was partitioned into solvent ether, ethyl acetate, n-butanol and aqueous extractives. The solvent ether extractive yielded n-alkane (C$_{32}$H$_{66}$), methyl esters of long chain fatty acids (C$_{31}$ and C$_{32}$), β-sitosterol,
ellagic acid, 3,3'-dimethoxy ellagic acid, 7-hydroxy-6-methoxy coumarin and quercetin. The ethyl acetate extractive yielded five flavonoidal components. These have been characterized as quercetin, luteolin, 5,7,3',4'-tetrahydroxy-6-methoxy-flavone-3-galactoside, apigenin-7-galactoside and luteolin-7-galactoside on the basis of UV spectral data in the presence of shift reagents, HPLC and IR spectral data. The butanol extractive afforded flavonoid compounds as, luteolin-7-galactoside and apigenin-7-galactoside, and two unidentified compounds. The aqueous extractive indicated the presence of free amino acids identified as alanine, iso-leucine, 2-amino-n-butyric acid, ornithine hydrochloride and threonine.

Preliminary pharmacological screening showed that the ethanolic extractive, when administered orally, had a significant antiinflammatory activity against acute carrageenan-induced paw oedema in rats. Of its partitioned fractions, ethyl acetate extractive, in an oral dose of 200 mg/kg inhibited 76% of inflammation as compared to the control. 'Fraction T' isolated from the ethyl acetate extractive inhibited 57% oedema in a dose of 8 mg/kg. The extractive and 'Fraction T' inhibited the histamine-induced oedema suggesting the suppression of first phase of acute inflammatory reaction. These were also found to be active as topical antiinflammatory agents when tested on carrageenan-induced paw oedema and croton oil ear antiinflammatory models in mice. The antiinflammatory activity of butanol extractive was not as significant as that of the ethyl acetate
extractive. Solvent ether and petroleum ether extractive showed no antiinflammatory activity in carrageenan-induced paw oedema.

No significant change in the gross behaviour of mice was observed on oral administration of ethyl acetate extractive, however, sedation after 90 min was observed. Studies on the locomotor activity revealed a decrease in the activity which could be attributed to mild CNS depressant action. The extractive showed a fall in rat blood pressure and a mild stimulant effect on guinea pig ileum but 'Fraction T' did not show any effect. The latex of the plant showed no irritant effect in the concentration range tested.

Pharmaceutical studies have been carried out on solid dosage form (capsules) and semi-solid dosage form (ointments) formulations containing the purified ethyl acetate extractive consisting of flavonoids and their glycosides mainly apigenin, luteolin and their glycosides. To evaluate the characteristics of the formulations, in vitro release rate of the active ingredient(s) and kinetic studies were carried out. In case of capsule dosage form, all the formulations released 80% of the drug with 20 min and kinetic parameters indicated formulation I, II, IV and VI to be stable as they retained 90% of their potency after storing under various conditions. Formulation VI was found to be most stable at room temperature with a shelf-life of five years.
The in vitro release of flavonoids from the ointments was studied using aqueous diffusion and agar-gel diffusion medium. The release rate was found to be in the order of polyethylene glycol base > greaseless base > hydrophilic ointment base > hydrophilic petrolatum base > lanolin ointment base, but no diffusion was observed for the latter two in the agar-gel diffusion medium. A linear relationship was observed between the concentration of the drug released against logarithmic time. The kinetic data indicated polyethylene glycol base ointment to be most stable with a shelf-life of seven and three months at 12 and 37° respectively.

The antimicrobial screening of the extractives against gram negative and gram positive microorganisms showed the solvent ether extractive to be effective against gram negative microorganisms viz., B. cereus, E. coli and P. aeruginosa.