ABSTRACT

A large number of non-steroidal compounds found naturally in plants have been demonstrated to have hormonal activity. They have received increasing attention because of their interesting biological properties and possible protective role in human cancer and in cardiovascular diseases. The information of use of certain plants in traditional medicine and folklore were ascribed to their oestrogenic properties. The studies reported in this Thesis concentrate on the investigation of the oestrogenic activity of the plant Careya arborea Roxb. The roots of Careya arborea Roxb. were collected, shade dried and moderately powdered. The powdered form was extracted with methanol for 24 hours using Soxlets apparatus after the method described by Kholkute et al. (1978a). In the experimental design different doses of the root extract i.e. 50mg, 100mg, 250mg, 500mg and 1000mg/kg body weight/day were used in the present studies. 17β-estradiol at a concentration of 10μg/kg body weight/day of was used as positive control. Estrogenicity of the root extract in immature mice was determined using the method of Evans et al. (1941). Uterine protein and glycogen were estimated after the method described by Seifter et al. (1950) and Lowry et al. (1951) respectively. Total cholesterol in the serum was estimated after the method described by Zak (1957). DNA and RNA were extracted by the hydrolytic method of Schmidt Thannhauser-Schneider (1946) and was estimated following UV-spectrophotometer method described by Thimmaih, (1998). Histological studies were carried out by routine hematoxylin eosin according to the procedure described by Luna (1968). For evaluation of LD50, the method described by Omkar (1994) was followed. For identification of polyphenolic components of the root extract, thin layer chromatography (TLC) was used followed by GC-MS analysis.
The results of the present study firmly revealed that this plant have shown to influence many aspects of mammalian reproductive processes via effects on the physiological, biochemical and histological alterations of reproductive system in mice. It has been observed that these changes were depended on the dose of exposure to the root extract. The methanolic fraction of the root extract of the plant strongly established the antifertility activity at the concentration of 1000mg of the extract per kg body weight in laboratory mice when treated for 14 days. In the present studies in vivo bioassays using rodent uterotrophic assay established that this plant have oestrogenic activity. The uterine wet-weight was found to be increased to 65.05mg in ovariectomized mice treated with root extract compared to control (14.75mg). The biochemical and histological studies also strongly indicated the oestrogenic nature of the root extract. These findings led to conduct an analysis of the methanolic root extract of the plant using GC-MS for determining the nature of the polyphenolic component of the root extract. From the GC-MS analysis, it was established that the compounds responsible for the oestrogenic activity of Careya arborea Roxb. were hydroquinone, resorcinol, syringic acid, vanillic acid; 4-hydroxy-3-(p-hydroxyphenyl)-5,7-dimethoxy-coumarin; 3-(o-hydroxyphenyl) coumarin; 3′, 4,4′, 7-tetra methoxy-, trans-2, 3, cis-2, 4-(+)-3-Flavanol and 2-Methoxy dibenzofuran.

The present study for the first time established the oestrogenic nature of the plant Careya arborea Roxb. in mice. However, it needs further studies to determine the estrogenic potency and other endocrine activities of these compounds present in the root fractions.