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STUDIES ON *ACHRAS SAPOTAL*: PART IV CHEMISTRY AND PHARMACOLOGY OF WOOD

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ABSTRACT

Phytochemical screening of the n-hexane fraction of the alcoholic extract of *Achras sapotal* has shown the presence of oleane and ursane types of triterpenoids. Pharmacology of the alcoholic extract was studied on Wister rats anaesthetized with recommended dose. The extract caused a fall in systolic, diastolic and mean arterial blood pressure (MABP) in a dose depended manner.

INTRODUCTION

We have previously reported about the nature and composition of various amino acids and sugars present in the leaves of *Achras sapota L*. (R. Ahmed *et al.,* 1982). Various amino acids, carbohydrates and polysaccharides present in the fruits have also been reported (Ifzal *et al.,* 1982). Triterpenoid belonging to α/β amyrin and lupeol series were also found to be present in the leaves of *Achras sapota,* obtained by repeated column and preparative layer chromatography, as reported earlier (Ahmed *et al.*, 1989). In this communication we wish to report the pharmacology of the alcoholic extract of *Achras sapota* wood and isolation of some tritepenoids from therein.

METHODOLOGY

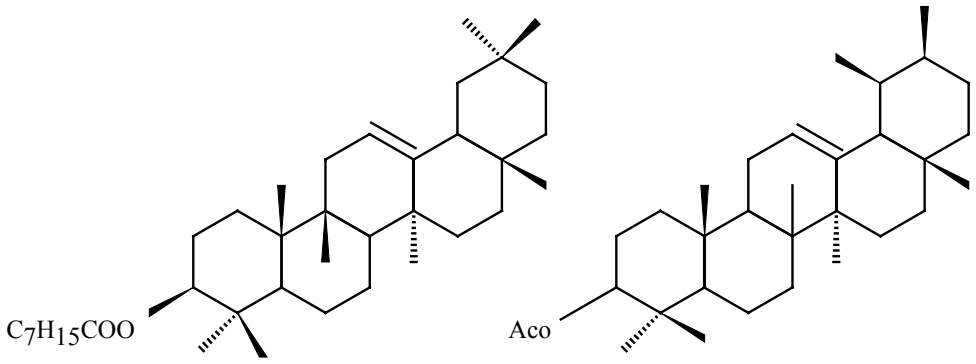
The plant material (2 kg) was percolated with methanol. The methanolic extract was concentrated and the residue obtained upon concentration of the solvent was treated with n-hexane, whereupon a white gummy solid separates out leaving behind hexane extract and the methanol soluble filterate. The hexane extract was evaporated and chromatographed over a column of silica gel. Two compounds were isolated from the non alcoholic fraction of the wood and identified as α –amyrin caprylate (I) and α –amyrin acetate (II) alongwith β –sitosterol.

RESULTS AND DISCUSSION

Compound I

Eluted with pet:ether (70:30), a white waxy solid, gave positive Libermann-Burchard test. On repeated recrystallisation from ethanol:methanol (1:1) afforded a white solid crystalline compound melting at 90ºC. The IR spectra showed apart from the usual peak of terpene, the characteristic peak of an ester at υ_{max}=1735 cm^{-1} and 1180 cms^{-1}.

Fragmentation pattern in the mass spectrum was similar to those of the Δ_{12}-oleane series of triterpinoid (Misra and Mitra, 1968; Budzikweic *et al.,* 1963). Molecular ion peak at m/e 552 underwent a loss of 144 (caprylic acid) mass unit to give a peak at m/e 408. While the peak at 333 and 218 (base peak) were due to loss of Retro-Diels Alder fragmentation. The peak at 190 [333 – 143] was due to loss of an ester moiety from the left half showing that the ester grouping is at the C-3 position. On this basis the compound I was identified as β –amyrin caprylate.



(I) **(II)**

Compound – II

Eluted with pet-ether:benzene (1:1) on crystallization with chloroform:methanol gave a pure crystalline compound melting at 222-226°C, showed M^+ at 468 with a base peak at m/e 218. Its IR spectrum showed strong absorption at υ_{max} 2910, 2870 cm^{-1} due to CH stretching and at 1725 and 1235 cm^{-1} due to ester grouping. Peak at m/e 408 in the mass spectrum arise due to loss of (M^+-60) showing the presence of CH_3COO^- group. Presence of a sharp singlet a δ=2.01 ppm [3H's] in proton NMR spectrum. This spectrum also showed eight methyl singlets. A distorted triplet at δ =5.01 was due to proton at C_{12} i.e. HC=C and a broad singlet a δ =4.62 ppm accounted for C_3 hydrogen bearing the AcO group. On this basis the Compound II was identified as α–amyrin acetate.

Pharmacology of Alcoholic Extract

Effect of the crude extract was studied on Wistar rats, anaesthetized with pentothal sodium (500 mg/kg i.p.). The extract caused a fall in systolic, diastolic and mean arterial blood pressure (MABP) in a dose dependent manner. At the dose of 10mg/kg, the antihypertensive effect ~50% was observed with a duration of one minute. At the same time heart rate was also increased. The MABP was calculated by the formula: diastollic blood pressure plus one third of the pulse width. Changes in blood pressure and heart rate were expressed as percent of control values obtained immediately before the administration of test substance.

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REFERENCES

Ahmed R., Tabassum S. and Ifzal S.M. (1968). *Pak. J. Pharm. Sci*. **2**: 33-36.
Budzikweic H.C., Wilson J.M. and Djerrasi C. (1963). *J. Amer. Chem. Soc*. **85**: 3688-3696.
Ifzal S.M., Ahmed R. and Pervez H. (1982). *J. Chem. Soc. Pak*. **4**: 27-31.
Ifzal S.M., Ahmad R. and Zaidi Z.H. (1982). *J. Chem. Soc. Pak.* **4**: 171-173.
Misra G. and Misra C.R. (1968). *Photochemistry*. **7**: 2173.