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SHORT COMMUNICATION

INSECT MOULTING HORMONE FROM *ACHYRANTHES ASPERA*

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Abstract—Ecdysterone (I) has been isolated from the methanolic extract of *Achyranthes aspera* roots.

Achyranthes aspera (Amaranthaceae) is a common Indian weed and is used widely in folk medicine.[1] The pronounced insect moulting hormonal activity of the extracts of the roots has been found to be due to the presence of ecdysterone (I).

The methanolic concentrate of the roots of *A. aspera* was fractionated into $CHCl_3$ and *n*-butanol soluble portions. The butanol extract on column chromatography on silica gel followed by preparative TLC and crystallizations (MeOH–ether) furnished a colourless crystalline compound (m.p. 237–39°, 90 mg/kg) having a molecular formula $C_{27}H_{44}O_7$. The colour reactions, NMR and mass spectra suggest it to be a polyhydroxyphytosterol. U.v. (242 nm) and i.r. (1642 cm^{-1}) absorptions indicate the presence of 7-ene-6-one chromophore. Treatment of the compound with HCl–MeOH gives two products having u.v. maxima at 241 and 296 nm and indicates the presence of 14-hydroxy-7-ene-6-one system.[2] The mass spectrum shows the characteristic fragmentation of the side-chain of the ecdysones (*m/e* 99 and 81).[3] The data discussed above agree with those of ecdysterone (I) and inokosterone (II).[4] However, the presence of five tertiary *m/e* signals at δ 1·05 ($C_{19}H_3$), δ 1·17 ($C_{18}H_3$), δ 1·34 ($C_{26}H_3$ and $C_{27}H_3$) and δ 1·55 ($C_{21}H_3$) as seen in the NMR spectrum favours structure I. Further, an acetate (Ac_2O/pyridine, 25°, 16 hr.) was obtained which corresponded in TLC (R_f 0·4, SiO_2, EtOAc–hexane, 8:2) to ecdysterone-2,3,22-triacetate; II, under similar conditions, gives inokosterone-2,3,22,26-tetraacetate which is readily differentiated by TLC (R_f 0·72). The identity of the compound as ecdysterone was finally established by a direct comparison with an authentic sample (mixed m.p., TLC, i.r., u.v. and NMR).

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