

CHEMICAL STUDIES ON PLATYCODOSIDE C, A NEW GLYCOSIDE FROM *Platycodon grandiflorus* (Jacq.) A.DC.

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Previously platycodin (platycodigenin + two molecules of glucose) was isolated from *P. grandiflorus* [1].

From the same source we have isolated an individual glycoside, namely platycodoside C (I), m.p. 216-221°, $[\alpha]_D^{20} - 34.6^\circ$, which gave its acetate, m.p. 147-149°, $[\alpha]_D^{20} - 40.8^\circ$ [3]. On hydrolysis with 20% HCl it gave platycodogenin (IIIa), $C_{30}H_{46}O_6$ (M^+ 502), m.p. 347-350°, $[\alpha]_D^{20} - 11.7^\circ$ (C_5H_5N), IR: 1765-1748 cm^{-1} (γ -lactone). Acetylation of IIIa with acetic anhydride and pyridine at room temperature gave triacetate IIIb (M^+ 628), m.p. 283-285.5°, $[\alpha]_D^{20} - 18.8^\circ$ ($CHCl_3$). IIIa proved to be a conversion product of platycodigenin (IIa) [2]. (IIa) was obtained on hydrolysis of I with 2N H_2SO_4 . The platycodigenin, $C_{30}H_{48}O_7$ (M^+ 520), m.p. 240-241.5°, $[\alpha]_D^{20} + 32^\circ$ (C_5H_5N), IR KBr : 1710 cm^{-1} ($-COOH$), and its methyl ester (IIb) (M^+ 534), m.p. 243-246°, were identified with authentic samples.*

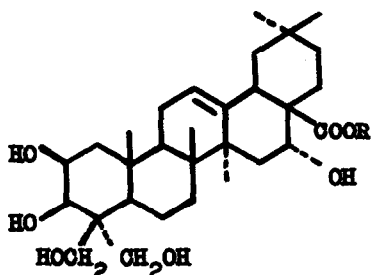
IIIa resulted when IIa was treated under conditions identical to those under which platycodoside C was hydrolysed with HCl. Treatment of IIIa with diazomethane did not yield methyl ester.

Treatment of IIIa with acetone and toluene-p-sulphonic acid gave the acetonide IVa, $C_{33}H_{50}O_6$ (M^+ 542), m.p. 328-330°, $[\alpha]_D^{20} + 7.62^\circ$ ($CHCl_3$), IR $CHCl_3$: 1765 cm^{-1} (γ -lactone). Since IIIa does not oxydise when treated with sodium periodate, the formation of IVa confirms the presence of a 1,3-glycol group on platycodogenin.

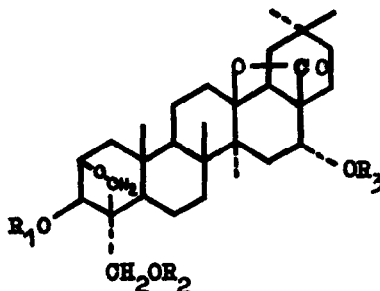
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The IR-spectrum of the acetonide monoacetate (IVb) (M^+ 584) had no hydroxyl group absorption band; hence, one oxygen atom belonged to an epoxy bridge.

On examining the carbohydrate part of platycodside C, we detected glucose, xylose, rhamnose and arabinose. Preliminary data showed them to be in the relationship of 2:1:1:1. Further studies to establish the complete structure of platycodside C are under way.



IIa, R = H
b, R = CH₃



IIIa, R₁=R₂=R₃=H
b, R₁=R₂=R₃=Ac
IVa, R₁, R₂=C(CH₃)₂; R₃=H
b, R₁, R₂=C(CH₃)₂; R₃=Ac

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