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Chimica. — *p-Hydroxy acetophenone-β-D-glycoside and triterpenes from* Chuquiraga huamampinta *Hieron, a plant used in folk medicine in Peru* (*). Nota di AMILCAR BERNABEL ZAVALA (**), FRANCO DELLE MONACHE, FRANCO FERRARI e GIOVANNI BATTISTA MARINI-BETTÒLO, presentata (***) dal Corrisp. G. B. MARINI-BETTÒLO.

RIASSUNTO. — È stata studiata la composizione di *Chuquiraga Huamampinta* (Compositae), una pianta usata nella medicina popolare peruviana. È stato possibile isolare ed identificare quattro triterpeni (lupeolo, β-amirina, e i rispettivi acetati) e un glucoside (*p*-idrossiacetofenone-β-D-glucoside), al quale è attribuibile l'attività biologica della pianta.

In the course of our investigations on the active biological substances from South American plants [1] we investigated the composition of a plant used in Peru in folk medicine, the *Chuquiraga huamampinta* Hieron (Compositae) [2].

This plant is a small shrub, commonly known as "*huamampinta*", which grows in the highlands of Peru between 2000 and 3200 meters. Its stems, leaves and flowers are used to prepare an infusion used in popular medicine as a diuretic and as an anti-inflammatory agent in urinary diseases.

The previously dried and powdered plant (160 g) was percolated at room temperature with methanol. A crude product (16 g) was obtained by evaporation, and was extracted with benzene at room temperature.

The residue dissolved in acetone-benzene 1/1 was chromatographed on a silica gel column and eluted with the same solvent.

Two substances were obtained, one of which in a very minute amount. The major one crystallised from water and melted at 193-5 °C, $[\alpha_D] = 85°$; λ_{max} (MeOH) 264 mn (log ε 4.14); ν_{max} 1660 cm^{-1} (Ar—CO—); δ_{max} (60 Mc, DMSO—d_6) 7.9 δ (2 H, *d*, J 9 Hz), 7.1 δ (2 H, *d*, J 9 Hz), 5.33 δ (1 H anomeric proton), 5.33-3.2 δ (other glycosidic protons), 2.5 *d* (3 H, s, $-COCH_3$); MS 298 (M^+, 2), 201(2), 179(3), *163*(12), *145*(12), *144*(10), 136(62), *127*(8), 121(100), 107(8), *97*(9), 93(16), *73*(30), 65(20), *60*(25), *57*(27).

These data agree with those of [3] *p*-hydroxyacetophenone-β-D-glucoside. The identification was confirmed by acetylation of the substance to a tetracetyl derivative (m.p. 171-2 °C from ethanol) and by acid hydro-

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lysis to *p*-hydroxy acetophenone (m.p. 180-9 °C, mixed m.p. not depressed) and D-glucose (paper chromatographic identification in three different systems).

The mass spectrum of the compound was in good agreement with the proposed structure. The reduced abundance of the molecular ion can be ascribed to the glycosidic character of the substance. The ion m/e 163 and the underlined ions arise from the easy cleavage of the glycosidic link with loss of the glycosidic hydroxyl. The ions m/e 136, 121, 93 and 65 are due to the fragmentation of the *p*-hydroxyacetophenone.

The benzene soluble part was chromatographed on a silica gel column, with benzene as the eluent, to yield three fractions. The first consisted of a mixture of triglyceride; the second was a mixture of β-amyrin acetate and lupeol-acetate, and the third a mixture of β-amyrin and lupeol. Identification of the triterpenes was made by NMR, IR, MS and by comparison (mixed m.p., and TCL) with authentic specimens.

p-Hydroxy-acetophenone-D-glycoside was found in several plants of different families. It was first described in *Coniferae* (Pinus excelsa) and named *picein*, in *Rosaceae* as *ameliaroside*, and in *Salicaeae* as salinigrin or *salicinerein*.

The presence of the pentacyclic triterpenes β-amyrin and lupeol and their acetates is reported for other genera of *Compositae*.

The pharmacological activity of the extract may be therefore attributed to the presence of *p*–Hydroxy-acetophenon-β-D-glycoside, both for the known diuretic activity of the glycosides and also for the presence of the $ArCOCH_3$ group responsible for various pharmacological actions.

References

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