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CONSTITUENTS OF *CHERSODOMA JODOPAPPA*

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No chemical investigations have been reported previously on the genus *Chersodoma* (Compositae, Senecioneae). As part of a systematic study of this genus, we report the isolation and identification of two sesquiterpene lactones of the eremophilanolide type and a secopyrrolizidine alkaloid from *Chersodoma jodopappa* (Sch. Bip.) Cabr., which grows in the vicinity of Toconce in the north of Chile. The dried and powdered aerial parts of *C. jodopappa* were extracted with petroleum ether and EtOH. The H_2SO_4 -soluble portion of the ethanolic extract yielded senkirkine (1), 6 β -hydroxy-8 β [H]-eremophila-7 (11)-en-8, 12-olide (6 β -hydroxyeremophilanolide) and 6 β , 8 β -dihydroxy-10 β [H]-eremophila-7 (11)-en-8, 12-olide (6 β , 8 β -dihydroxyeremophilanolide) (2,3).

The chemistry of this first *Chersodoma* species studied agrees with that of the other genera in the tribe Senecioneae (*Petasites*, *Ligularia*, and *Senecio*) (4).

EXPERIMENTAL

PLANT MATERIAL.—*C. jodopappa* was collected in the area of Toconce in the northern Andes of Chile (ca. 4000 m). A voucher specimen is on deposit at the University of Concepcion Herbarium (Chile).

EXTRACTION AND ISOLATION.—The air-dried, aerial parts (4.1 kg) were extracted with light petroleum and with EtOH (20 liters). The ethanolic extract was concentrated in vacuo to a volume of 2 liters, poured into 4% H_2SO_4 (8 liters) and filtered. The filtrate was extracted three times with Et_2O . After drying and evaporation of Et_2O , the yield gave 11.5 g of an "acidic extract" which was chromatographed on 400 g of silica gel. Further purifications of the C_6H_6 -EtOAc (4:1) eluates gave 6 β -hydroxy-8 β [H]-eremophila-7 (11)-en-8, 12-olide (300 mg). C_6H_6 -EtOAc (1:1) eluates yielded 6 β , 8 β -dihydroxy-10 β [H]-eremophila-7 (11)-en-8, 12-olide (318 mg).

After extraction with Et_2O the acidic aqueous layer was made alkaline with concentrated NH_3 to pH 10.5 and extracted five times with 400 ml of CHCl_3 . The concentrated CHCl_3 extract (2.81 g) was chromatographed on Al_2O_3 (150 g, activity I). The C_6H_6 -EtOH (2:1) eluates afforded senkirkine (83 mg).

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STARFISH SAPONINS, PART 28.¹ STEROIDAL GLYCOSIDES FROM PACIFIC STARFISHES OF THE GENUS *NARDOA*²

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Continuing our work on biologically active compounds from starfish (1), we have been working on glycosides of the Pacific starfishes *Nardoa novaecaledonia* Perrier and *Nardoa gomphia* Gray and have isolated several known steroidal glycosides previously found in *Halityle regularis* (2). From *N. gomphia* we have also isolated the sulfated glycosides, marthasteroside A₁ (3), thornasteroside A (4), and halityloside I (2), and two polyhydroxysteroids (25S)-5 α -cholestane-3 β ,6 α , 8,15 β ,16 β ,26-hexol (2), and (24S)-5 α -cholestane-3 β ,6 α ,8,15 β ,24-pentol (5), all known compounds described from starfish. Table 1 summarizes the results.

EXPERIMENTAL

ANIMAL COLLECTION AND EXTRACTION.—*N. novaecaledonia* was collected in October 1983, and *N. gomphia* in March 1984, off Nouméa, New Caledonia, and identified by Mr. Michel Jangoux of the Université Libre de Bruxelles. Samples of each species are deposited in the Centre ORSTOM, Nouméa. The starfish were chopped and soaked with H₂O for 4 h. The aqueous extracts were centrifuged and passed through a column of Amberlite XAD-2 (500 g for each column), which was washed with H₂O (one bed volume) and then with MeOH. The MeOH eluates were taken to dryness to give 2.9 g of glassy material from *N. novaecaledonia* and 4.7 g from *N. gomphia*.

¹For Part 27, see C. Pizza, L. Minale, D. Laurent, and J.L. Menou, *Gazz. Chim. Ital.*, **115**, (1985).

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