STEROIDS ISOLATED FROM *LOPHOGORGIA PLATYCADOS*

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From a chemical point of view, gorgonians are considered among the most interesting of marine organisms due to the biologically active compounds (e.g., diterpenoids, prostaglandins) (1,2) isolated from them. Therefore, we have studied some of the steroidal compounds of the Chilean coral *Lophogorgia platycados* Philippi (1866) (Coelenterata, Gorgonacea).

EXPERIMENTAL

BIOLOGICAL MATERIAL.—Samples were collected in April 1982, at Punta de Parra (Bahia Concepcion, 36° 40′ S, 73° 02′ W), Concepcion, Chile. A voucher specimen (4708) is preserved in the University of Concepcion Zoological Museum (MZUC), Concepcion, Chile.

Spectra were recorded with the following instruments: ir, Pye Unicam 1000; ^{1}H nmr, Varian HA 100; ms, A.E.I. MS9. Adsorbents for tlc and cc were from Merck.

EXTRACTION AND ISOLATION.—The fresh animal material (1800 g) was extracted with $CHCl_3$-MeOH (2:1) at room temperature. Chromatographic separation of the chloroform-soluble extract (28 g) on silica gel and alumina afforded clionasterol peroxide ($C_{29}H_{48}O_3$, mp 148-151°), isolated previously from sponges (3,4), 22-dehydrocholesterol ($C_{27}H_{44}O$, mp 136-138°, $[\alpha]^{\circ}D=-54.3$) and cholesterol, which were identical in all respects with authentic material.

Full details of the isolation and identification of the compounds are available on request to Dr. M. Silva.

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ISOLATION OF COMPACTIN (A HYPOCHOLESTROLEMIC METABOLITE) FROM A NEW SOURCE: *PENICILLIUM CYCLOPIUM*

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While searching for biologically active fungal metabolites, we isolated compactin, a hypocholestrolemic agent undergoing clinical studies (1), from a new source, *Penicillium cyclopium*, in relatively large

quantities. The organism also yielded cyclopenin, cyclopenol, and viridicatin (4-6). Compactin, coded ML-236B, was initially isolated from *Pencillium citrinum* by Endo *et al.*, (2) using an in vitro assay system in which 3-hydroxy-3-methylglutaryl CoA (HMGCoA) reductase was inhibited. This enzyme catalyzes the reduction of HMGCoA to mevalonate, thereby controlling cholesterol biosynthesis. Later, Brown *et al.* (3) isolated compactin from *Penicillium brevicompactin*, reported antifungal properties, but did not elucidate the fungi inhibited.

Because our work involves plant-growth-regulating studies and searching for antimicrobial compounds for use in agriculture and agricultural commodities, we bioassayed compactin against the etiolated wheat colepotile, which detects a wide assortment of biologically active substances (10), and assorted Gram-negative and -positive bacteria, and fungi. Compactin did not induce changes in wheat coleoptiles, and neither were bacteria or fungi inhibited. Our data do not support claims that compactin is a plant-growth inhibitor. [Hashizume *et al.* (9) demonstrated that it inhibits tobacco pith callus.] Further, the spectrum of antimicrobial activity appears limited. We report the isolation of compactin from *P. cyclopium* for the first time.

EXPERIMENTAL

EXTRACTION AND ISOLATION OF COMPACTIN.—*P. cyclopium* was isolated from pecan kernels and cultured on potato dextrose agar. Sterile distilled H_2O was added to the cultures and a spore suspension (ca. 1 ml) was transferred to each of 54 Fernbach flasks (2.8 liters), each containing 100 g shredded wheat, 200 ml Difco mycological broth (pH 4.8), 2% yeast extract, and 20% sucrose (7). After 15 days at 26°, 300 ml of Me_2CO was added to each flask, and the mycelial mat was homogenized. The slurry was filtered through Whatman No. 1 filter paper, and the filtrate (ca. 16 liters) was reduced in volume under vacuum at 50°. This was extracted twice with double its volume of EtOAc. The EtOAc phase was dried over anhydrous Na_2SO_4, concentrated under vacuum at 50° to 302 ml, then added to a silica gel (70-230 mesh) column (9×10) packed in C_6H_6. Elution with 1 liter each of C_6H_6, Et_2O, EtOAc, Me_2CO, and acetonitrile followed. Each solvent was next reduced to 25 ml. After 2 days at 50°, a mixture of cyclopenin and cyclopenol precipitated from the EtOAc fraction. The supernatant was removed, evaporated to dryness (10 g), then added in CH_2Cl_2 to a silica gel column (3.5×95 cm) slurry packed in CH_2Cl_2. Gradient elution with CH_2Cl_2-Me_2CO (95:5, v/v) to (85:15, v/v) followed and yielded crude compactin (2.2 g). Recrystallization from EtOAc gave 1.5 g pure compactin, which possessed spectral properties (uv, ir, ^1H nmr, mass), X-ray crystallographic properties, and mp identical to authentic compactin (3).

BIOASSAYS.—Antibacterial bioassays were conducted by placing 4-mm disks, impregnated with compactin (0-500 μg/disk), on DST-oxoid medium densely streaked with bacteria. Plates were incubated at 37° overnight, and zones of inhibition recorded. Fungi were cultured on potato-dextrose agar and incubated at room temperature 3-5 days. Organisms tested were *Bacillus cereus, Bacillus subtilis, Mycobacterium thermosphactum, Escherichia coli, Escherichia cloacae, Citrobacter freundii, Aspergillus flavus, Chaetomium spinusum*-193, *Chaetomium cochlioides*-189, *C. cochlioides*-195, and *Curvularia lunata*-49. All microorganisms are deposited at the USDA, ARS, Richard B. Russell Research Center, Athens, GA. Etiolated wheat coleoptiles were excised from *Triticum aestivum* L., cv. Wakeland, grown on moist sand, in the dark, at 22±1°, for 4 days. Coleoptile segments were 4 mm long, and ten segments were floated in 2 ml buffer-sucrose solution containing compactin in solution at 10^{-3}, 10^{-4}, 10^{-5}, and 10^{-6} M for approximately 18 h. Details of the bioassay are reported (10,11).

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