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MARINE NATURAL PRODUCTS: 3-FORMYLINDOLE FROM THE RED ALGAE *BOTRYOCLADIA LEPTOPODA*

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3-Formylindole has been isolated from the red alga *Botryocladia leptopoda*. (J.Ag) Kylin.

EXPERIMENTAL

B. leptopoda was collected in April 1985, around Patcha near Karachi, and a voucher specimen has been deposited in the Department of Botany, University of Karachi.

After soaking 1.5 kg (wet weight) of the alga in MeOH for 1 week and evaporation under reduced pressure yielded 5.8 g of crude extract which was partitioned between EtOAc and H_2O. The EtOAc extract thus obtained was subjected to column chromatography. The fraction eluted with hexane-Et_2O (75:25) yielded a crystalline compound (8 mg). Further recrystallization was carried out with MeOH. This compound, mp 180°, was identified as 3-formylindole on the basis of comparison of its mass, ^{1}H-nmr (1) and ^{13}C-nmr spectra with literature values (2).

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CHEMICAL CONSTITUENTS OF THE BARK OF *TERMINALIA ALATA*[1]

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In continuation of our chemical studies on *Terminalia alata* Heyne ex Roth (Combretaceae) (1,2), we report here the isolation of betulic acid (3), arjunic acid (4), arjunolic acid (1,2), arjunetin (5), and ellagic acid (6) from the trunk bark. This is the first report of the isolation of betulinic acid from the genus *Terminalia*. It is also obtained from the heartwood.

[1]CIMAP Communication No. 587.

EXPERIMENTAL

PLANT MATERIAL.—The trunk bark of *T. alata* was obtained from the CIMAP Experimental Station, Hebbale, Coorg District, Karnataka State, India. A voucher specimen is deposited at CIMAP Regional Centre, Bangalore.

EXTRACTION AND ISOLATION.—Air-dried and coarsely powdered trunk bark (1 kg) was extracted with *n*-hexane and MeOH. The extracts were processed according to standard procedures (2). The compounds isolated by column chromatography of the extracts are β-sitosterol (15 mg), betulinic acid (130 mg), arjunic acid (50 mg), arjunolic acid (65 mg), arjunetin (55 mg), and ellagic acid (11 mg). We have also obtained betulinic acid (55 mg) from the less polar fractions of the Et_2O extract of the heartwood (2).

All the compounds isolated were identified by physical properties, spectral data (mmp, co-tlc, ir, uv, ^1H nmr), direct comparison with authentic samples, and preparation of derivatives such as acetates and methyl esters.

Full details of isolation and identification are available on request to the senior author.

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6-METHOXY-7,8-METHYLENEDIOXYCOUMARIN FROM *ARTEMISIA DRACUNCULOIDES* AND *ARTEMISIA VULGARIS*

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In 1970, Herz *et al.* (1) reported the isolation of a new $C_{11}H_8O_5$ coumarin, mp 219-221°, from the above-ground parts of *Artemisia dracunculoides* Pursh. The structure, 6-methoxy-7,8-methylenedioxycoumarin (**1**), followed from its spectroscopic properties and its conversion to fraxetin (**2**) by acid-catalyzed acetal exchange with resorcinol. In the literature, this coumarin is sometimes referred to by the trivial name, dracunculin. This name does not, however, appear in the original publication but can be traced to a 1973 review in which the natural coumarins discovered during 1965-1970 were tabulated and those not already possessing a trivial name assigned one (2).

In 1982, Stefanović *et al.* (3) reported the isolation of 7,8-methylenedioxy-9-methoxycoumarin from *Artemisia vulgaris* L. Reference to the original paper revealed that the authors had used a numbering system in which the fully substituted 4a position was numbered 5 and that the structure proposed for the coumarin, mp 226-227°, was in fact 8-methoxy-6,7-methylenedioxycoumarin (**3**). It was not possible, however, from comparison of the data given in the two publications to conclude whether the two coumarins were isomers as suggested or whether both possessed the same structure with one of the assignments being in error.