Family Pyrolaceae Dumort.	
Chimaphila umbellata (L.) W. Barton (common pipsissewa)	0.33
Ortilia secunda (L.) House	0.39
Pyrola minor L. (snowline pyrola)	0.20
Family Monotropaceae Nutt.	
Hypopitus monotropa Crantz.	0.63
Family Empetraceae S. F. Gray	
Empetrum subholarcticum V. Vassil.	0.93

Calluna vulgaris (I), Chamaedaphne calyculata (II), Chimaphila umbellata (III), Ortilia secunda (IV), and Hypopitus monotropa (V) were investigated with the aim of isolating triterpenoids of neutral nature. Chloroform extracts of the epigeal parts of the plants, after the separation of the triterpene acids, were chromatographed of silica gel with elution by benzene—chloroform mixtures. Uvaol was found in (I) and (II) and taraxerol in (III) and (IV), while β-sitosterol was isolated from (I), (II), and (V). The identities of the substances obtained were confirmed by IR spectra and mixed melting points.

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IDENTIFICATION OF ECDYSTEROIDS OF HEXACTINIC CORALS

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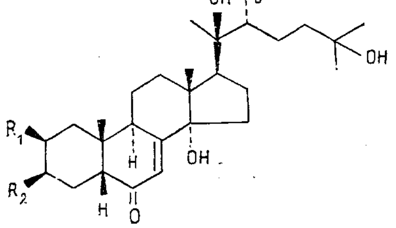
Until recently, ecdysteroids had been isolated only from insects, crustaceans, and terrestrial plants [1, 2]. In 1982, Italian workers first reported the isolation of crustecdysone from a marine animal not belong to the Arthropoda type — the hexactinic coral Gerardia savaglia [3].

On studying alcoholic extracts of hexactinic corals Palythoa sp. and Parazoanthus sp. gathered during the thirteenth voyage of the Scientific Research Ship Professor Bogorov on the shores of Vietnam, we isolated 20-hydroxyecdysone (I) and, for the first time from marine invertebrates, its 2- and 3-acetoxy derivatives [(II) and (III), respectively]. The extracts were chromatographed on Polikhrom ($H_2O \rightarrow 50\%$ ethanol) and silica gel [$CHCl_3$:EtOH (6:1)]. The mixture of (II) and (III) was separated by the HPLC method (Zorbax C-8; 4.6 × 250 mm; 30% EtOH in H_2O; 1 ml/min; λ 248 nm). The structure of (I) [mp 235-238°C, $[\alpha]_D^{20}$ +57° (c 1.0; CH_3OH)] was established by a comparison of ^{13}C and ^{1}H NMR high-resolution spectra, and also by UV, IR and mass spectroscopy and literature information [3-9]. After acetylation, compounds (I), (II), and (III) gave one and the same derivative (IV). The positions of the acetate groups in (II) and (III) were determined from their ^{13}C NMR spectra (Table 1). In solutions, compounds (II) and (III) were partially converted into one another as a result of the epimerization described previously [8, 10].



I. $R_1 = R_2 = R_3 = OH$
II. $R_1 = OAc$; $R_2 = R_3 = OH$
III. $R_1 = R_3 = OH$; $R_2 = OAc$
IV. $R_1 = R_2 = R_3 = OAc$

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TABLE 1. ^{13}C NMR Spectra of Ecdysteroids (I)-(IV)

Atom	Chemical shift, ppm				Atom	Chemical shift, ppm			
	I	II	III	IV		I	II	III	IV
C-1	37,8	33,7	38,6	34,4	C-15	31,7	32,0	31,9	31,7
C-2	68,0	72,5	66,2	69,1	C-16	21,3	21,6	21,7	22,1
C-3	68,0	65,2	71,3	67,7	C-17	50,0	50,0	50,1	50,3
C-4	32,2	32,2	29,6	29,5	C-18	17,8	17,8	17,9	17,7
C-5	51,2	51,1	51,9	51,5	C-19	24,4	24,2	24,3	24,0
C-6	203,3	202,6	202,1	201,0	C-20	76,8	76,8	76,8	76,1
C-7	121,6	121,6	121,4	121,3	C-21	21,0	21,4	21,4	21,1
C-8	165,9	166,1	166,4	165,9	C-22	77,5	77,5	77,5	80,3
C-9	34,4	34,4	34,5	34,4	C-23	27,4	27,4	27,5	26,0
C-10	38,5	38,7	38,5	38,4	C-24	42,5	42,6	42,6	41,6
C-11	20,4	21,2	21,1	20,9	C-25	69,6	69,6	69,5	69,1
C-12	31,6	31,7	31,7	31,5	C-26	30,0	30,0	30,1	29,6
C-13	48,0	48,0	48,1	48,0	C-27	30,0	30,2	30,1	30,2
C-14	84,2	84,2	84,1	84,0					

In *Palythoa* sp. compound (I) made up 0.001-0.003% of the dry weight of the animals, and in *Parazoanthus* sp. 0.25%, which is close to its amount in *G. savaglia*.

Ecdysteroids have not previously been detected in the genera *Palythoa* and *Parazoanthus*. Since these compounds have now been found in representatives of three different genera it may be assumed that they are widely distributed among hexactinic corals.

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