STEROL COMPOSITION OF AN ASCIDIAN *Polycitor sp.*

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Continuing an investigation of the steroid composition of marine organisms [1, 2], we have studied the sterol fraction of a colonial ascidian *Polycitor sp.* (type Chordata, subtype Urochordata, class Ascidiaceae, suborder Aplousobranchia, family Polycitoridae). The ascidian was collected by Sigsbee trawl in April, 1991, during the 13th cruise of the Scientific Research Ship (NIS) Akademik Oparin in the Sea of Japan (43°04 N, 134°30 E) from a depth of 90 m.

The fraction of free sterols was isolated as described in [2] and was separated with the aid of HPLC using an Altex Ultrasphere-Si column (10 mm × 25 cm) with elution by hexane–ethyl acetate (5:1) at the rate of 3 ml/min (Du Pont 8800 chromatograph, the detector being an RIDK-102 differential refractometer (Czechoslovakia)). The subfractions obtained were analyzed by ^{1}H NMR. From 400 mg of sterol fraction we obtained 144 mg (49%) of Δ^5-sterols, 121 mg (41%) of stanols, and 28 mg (10%) of Δ^7-steroid alcohols. The sterol components were identified from their retention times (relative to cholesterol) in capillary GLC (phase OV-101, temperature 280°C).

The results of analysis are presented in Table 1. A total of 27 previously known sterols were found in *Polycitor sp.* As can be seen from Table 1, all the steroids from the ascidian studied consisted of C_{26}-C_{29} steroid alcohols (the C_{26} derivatives amounted to 12.4% of the total steroid fraction, C_{27} to 49.74%, C_{28} to 27.95%, and C_{29} to 4.4%). We may note that there was only 33% of sterols with saturated side-chains, and the amount of cholesterol in the mixture was 9.53%.

TABLE 1. Composition of the Sterol Fraction from *Polycitor sp.*

Sterols	Structural features	RRT	%
1. 24-Norcholesta-5,22-dien-3β-ol	$C_{26}\Delta^{5,22}$	0.673	5.31
2. 24-Nor-5α-cholest-22-en-3β-ol	$C_{26}\Delta^{22}$	0.689	6.16
3. 24-Nor-5α-cholesta-7,22-dien-3β-ol	$C_{26}\Delta^{7,22}$	0.755	0.93
4. 27-Nor-24-methylcholesta-5,22-dien-3β-ol	$C_{27}\Delta^{5,22}$	0.880	2.74
5. 27-Nor-5α-methylcholest-22-en-3β-ol	$C_{27}\Delta^{22}$	0.902	1.95
6. Cholesta-5,22-dien-3β-ol	$C_{27}\Delta^{5,22}$	0.913	4.17
7. 5α-Cholest-22-en-3β-ol	$C_{27}\Delta^{22}$	0.938	7.32
8. 27-Nor-5α-24-methylcholesta-7,22-dien-3β-ol	$C_{27}\Delta^{7,22}$	0.989	0.45
9. Cholest-5-en-3β-ol	$C_{27}\Delta^{5}$	1.000	9.53
10. 5α-Cholestan-3β-ol	$C_{27}\Delta^{0}$	1.026	18.67
11. 5α-Cholesta-7,22-dien-3β-ol	$C_{27}\Delta^{7,22}$	1.031	1.80
12. 24-Methylcholesta-5,22-dien-3β-ol	$C_{28}\Delta^{5,22}$	1.112	14.75
13. 24-Methyl-5α-cholest-22-en-3β-ol	$C_{28}\Delta^{22}$	1.127	5.32
14. 5α-Cholesta-7,22-dien-3β-ol	$C_{27}\Delta^{7}$	1.131	3.11
15. 24-Methyl-5α-cholesta-7,22-dien-3β-ol	$C_{28}\Delta^{7,22}$	1.238	1.11
16. 24-Methylcholesta-5,24(28)-dien-3β-ol	$C_{28}\Delta^{5,24(28)}$	1.243	3.47
17. 24-Methylcholest-5-en-3β-ol	$C_{28}\Delta^{5}$	1.243	Trace
18. 24-Methyl-5α-cholestan-3β-ol	$C_{28}\Delta^{0}$	1.274	Trace
19. 24-Methyl-5α-cholest-24(28)-en-3β-ol	$C_{28}\Delta^{24(28)}$	1.274	5.90
20. 24-Ethylcholesta-5,22-dien-3β-ol	$C_{29}\Delta^{5,22}$	1.348	1.21
21. 24-Ethyl-5α-cholest-22-en-3β-ol	$C_{29}\Delta^{22}$	1.355	0.39
22. 24-Methyl-5α-cholesta-7,24(28)-dien-3β-ol	$C_{28}\Delta^{7,24(28)}$	1.401	0.87
23. 24-Methyl-5α-cholest-7-en-3β-ol	$C_{28}\Delta^{7}$	1.401	Trace
24. 24-Ethyl-5α-cholesta-7,22-dien-3β-ol	$C_{29}\Delta^{7,22}$	1.485	0.11
25. 24-Ethylcholest-5-en-3β-ol	$C_{29}\Delta^{5}$	1.528	1.76
26. 24-Ethyl-5α-cholest-22-en-3β-ol	$C_{29}\Delta^{22}$	1.559	0.78
27. 24-Ethyl-5α-cholest-7-en-3β-ol	$C_{29}\Delta^{7}$	1.719	0.15

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The steroid composition of *Polycitor sp.* has not been studied before now. The results that we obtained showed that there is some similarity between the total steroids of *Polycitor sp.* and those from representatives of the Urochordata investigated previously. We have recently isolated polysulfide cytotoxins — varacin and varicins A-C — from the ascidian under study [3]. The presence of these substances in this marine animal probably does not appreciably affect the sterol composition and properties of biomembranes, in contrast to what has been reported for some fungi and holothurians containing cytotoxins [2, 4].

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