quercetin, kaempferol, and rutin — were isolated. They were identified on the basis of qualitative reactions, melting points, R_f values in various solvent systems, the products of alkaline hydrolysis (for rutin, the products of acid hydrolysis), and the bathochromic shifts of the maxima in the UV spectra with ionizing and complex-forming additives.

Chromatography of the aqueous acetone fraction on a column of polyamide (with chloroform in methanol in various proportions as the eluent) and purification on a column of silica gel (with ethyl acetate as the eluant) gave a small amount of a substance with R_f 0.40 and trace impurities of a substance with R_f 0.45.

The results of UV and PMR spectroscopy, paper chromatography in the solvent system butan-1-ol—acetic acid—water (4:1:5) and 7% acetic acid, the molecular rotation (c 0.5; MeOH) and the results of a study of the products of complete acid hydrolysis showed that this substance was geranin, identical with that isolated previously from *Geranium thunbergii* [6, 7].

When geranin was subjected to stepwise hydrolysis, together with other substances, a compound with R_f 0.45 was detected. Judging from some of its physicochemical properties and chromatographic behavior, it was apparently corilagin — the biosynthetic precursor of geranin [8, 9].

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NITROGEN-CONTAINING METABOLITES OF THE MARINE SPONGE *Acanthella carteri*

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Marine sponges are unusually rich in physiologically active compounds. Our interests include the investigation of the secondary nitrogen-containing heterocyclic compounds containing metabolites of this class of invertebrates. Previously a series of nitrogen-containing heterocyclic compounds containing in their structures pyrrole and imidazole groups, biogenically related to one another, have been isolated from sponges of the families Axinellidae and Agelasidae [1-4]. We have investigated ethanolic extracts of the marine sponge *Acanthella carteri* from the collections of the 12th voyage of the Scientific Research Ship "Professor Bogorov" (island of Madagascar). By column chromatography on silica gel we isolated three compounds.

The physicochemical properties of (I) and (II) and their diacetates showed that one was identical with the "yellow compound" previously isolated from the Australian sponge *Phakellia flabellata* [2], and (II) with a compound from the Mediterranean sponge *Axinella verrucosa* and the sponge *Acanthella aurantiaca* from the Red Sea [4]. After the completion of our work, a report appeared of the isolation of compounds (I) and (II) from the Okinawa

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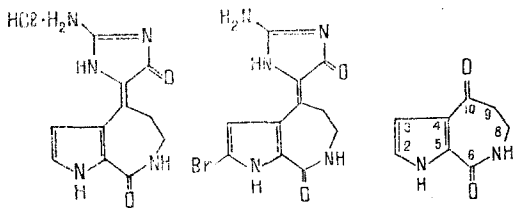

I II III

sponge *Hymeniacidon aldis* (family Hymeniacidonidae), order Halichondrida) [5]. In view of this, it is interesting to note that attempts undertaken previously to use the distribution of bromopyrroles for the systematics of sponges of the families *Axinellidae* and *Agelasidae* [6] were probably unsound.

Compound (III), with the composition $C_8H_8N_2O_2$, was isolated in the form of a yellow powder with mp 275-277°C. The three maxima in the UV spectrum, λ_{max}^{MeOH} 218, 248, and 297 nm, showed the presence of a chromophoric system consisting of a pyrrole ring with two carbonyls in positions 4 and 5 [2], and the NMR spectra showed, in addition, the presence of two neighboring methylene groups. ^{13}C NMR spectrum (DMSO-d): 122.4 d (C-2), 109.6 d (C-3), 123.6 s (C-4), 122.9 s (C-5), 162.3 s (C-6), 43.5 t (C-8), 36.7, t (C-9), 194.3 s (C-10). NMR spectrum (DMSO-d): 2.7 (m, 9-CH_2), 3.4 (m 8-CH_2), 6.5 (t, 3-H), 7.0 (t, 2-H), 8.35 (CONH), 12.2 (pyrrole —NH).

A comparison of the NMR, mass, and UV spectra of compound (III) with those given in [2] for the product of the permanganate oxidation of the "yellow compound" and also a direct comparison of (III) with the compound obtained as the results of the analogous oxidation of (I) confirmed its structure.

Taurine was isolated from the most polar fractions. This amino sulfonic acid is widely distributed in the marine algae. As is well known, marine sponges form a refuge for many microalgae and bacteria and this probably explains the presence of taurine in *A. carteri*.

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