# ISOLATION OF CAFFEINE FROM THE GORGONIAN *PARAMURICEA CHAMAELEON*

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*Paramuricea chamaeleon* Koch (family Paramuriceidae) is an intensely red-violet octocoral living in the Marmara Sea at a depth around 30 m. In the course of our investigations on the chemistry of Turkish marine organisms, we have isolated pigments (1,2), terpenes, and lipids (3) from the $Et_2O$ extract of this animal. Cimino and De Stefano (4) have also isolated six, simple, indole derivatives from the *n*-BuOH extract of the same coral collected in the Bay of Naples. In our continuing investigation we have examined the *n*-BuOH-soluble material extracted from the remaining aqueous solution (1). This was chromatographed on a $SiO_2$ column with $CHCl_3$-MeOH (6:4) and only from the first fraction, a compound was crystallized in a very small amount which gave no color with ninhydrin and Dragendorff's reagent. The other fractions containing ninhydrin-positive substances were mixtures. The compound was identified as caffeine by means of ms, $^1H$ nmr, and direct comparison with an authentic sample (mp, tlc, ir).

As caffeine has always been regarded as a plant product, we checked this unusual finding by extracting part of our voucher specimen, and caffeine was again isolated. In addition, the amount of caffeine was determined and found to be 0.045%. To our knowledge this is the first report on the isolation of caffeine from an animal and a marine organism.

## EXPERIMENTAL

ANIMAL MATERIAL.—The corals were collected in the Marmara Sea near Istanbul in July 1979, and identified by Prof. M. Demir, Faculty of Science, University of Istanbul. A voucher specimen was deposited in our department.

ISOLATION OF CAFFEINE.—A part of the voucher specimen (58 g, dried and powdered) was extracted with $CHCl_3$ (Soxhlet), and the residue was chromatographed on a $SiO_2$ column. After elution with $CHCl_3$, caffeine was isolated from the $CHCl_3$-MeOH (20:1) fractions by $SiO_2$ plc ($CHCl_3$-MeOH, 15:1) followed by crystallization from MeOH (ca. 16 mg).

ASSAY OF CAFFEINE.—*P. chamaeleon* (20 g, dried and powdered) was extracted with $CHCl_3$ (Soxhlet). The caffeine in an aliquot was separated on a pre-coated $SiO_2$ 60 $F_{254}$ plate and measured directly on the plate by fluorescence quenching at 523 nm (excitation at 254 nm, filter). For calibration small amounts of caffeine, between 0.40-1.0 μg, were also applied to the same plate. The caffeine content was found to be 0.045%.

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