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PRELIMINARY RESULTS ON THE QUALITATIVE AND QUANTITATIVE COMPOSITION OF THE FAUNA ASSOCIATED WITH LITTORAL SPONGES AT CHALKIDIKI PENINSULA

By ATH. KOUKOURAS, HEL. VOULTSIADOU, CON. DOUNAS,
AM. GOGOU and HAR. CHINDIROGLOU

Numerous animal species are associated in various ways with sponges. Some of these species showed selectivity towards certain sponges. Also, the influence of the environmental factors on the associated with sponges fauna has been observed, as well as, the seasonal changes on the composition of the fauna (PEARSE 1932, ARNDT 1933, PEARSE 1950, BACESCU 1971, FRITH 1976). However, there is little quantitative information on the fauna associated with sponges, since the recent methods, like the ones which, in principle, applied Mc CLOSKEY (1970) to the study of the "coral community" have not been applied to the study of the fauna associated with sponges.

The research, the preliminary results of which are reported here, aims to study the existing relationships between sponges and the associated macrofauna, in order to give an objective and complete knowledge of these relationships.

Eighty seven sponge samples were collected in summer 1975, from twenty one stations in shallow waters (range of depths 3-6m), along the shores of Chalkidiki Peninsula. The following species of sponges were found: *Geodia cydonium, Agelas oroides, Petrosia ficiformis, Verongia aerophoba, Spongia officinalis, Ircinia fasciculata* and *Ircinia muscarum.*

The relative abundance of each animal taxon (I) and the wet weight biomass (B, in grams) for each sponge species are given in Table I.

TABLE I

	G. cydonium		A. oroides		P. ficiformis	
	I	B gr	I	B gr	I	B gr
Polychaeta	254(32.1%)	41.8(74%)	121(38.8%)	6.7(25.7%)	169(22.3%)	2.8(2.8%)
Sipuncula	27(3.4%)	1.2(2%)	23(7.3%)	1.3(5%)	14(1.9%)	1.1(1.1%)
Crustacea	458(57.8%)	7.9(14%)	118(37.8%)	7.4(28.3%)	501(66.3%)	28.3(28.1%)
Mollusca	40(5%)	4.5(8%)	32(10.3%)	9.8(37.2%)	46(6.1%)	67.1(66.5%)
Echinodermata	11(1.4%)	0.5(1%)	18(5.8%)	1(3.8%)	23(3%)	1.4(1.4%)
Others	2(0.3%)	0.5(1%)	–	–	3(0.4%)	0.1(0.1%)
Totals	792	56.4 gr	312	26.2 gr	756	100.8 gr
Total V (cm^3)	22,718		18,719		44,844	

	S. officinalis		V. aerophoba		I. fasciculata		I. muscarum	
	I	B gr	I	B gr	I	B gr	I	B gr
Pol.	301(31.7%)	12.4(19.1%)	204(11%)	10.7(17.2%)	1051(27.4%)	35.5(25.9%)	463(39.9%)	26.6(33.9%)
Sip.	47(5.0%)	7.4(11.4%)	13(0.7%)	0.1(0.2%)	124(3.2%)	10(7.3%)	62(5.3%)	6.2(7.9%)
Cr.	540(56.9%)	27.2(41.8%)	1459(78.5%)	23.2(37.6%)	2259(58.9%)	64.9(47.3%)	469(40.5%)	22.8(29.1%)
Mol.	50(5.3%)	17.7(27.2%)	94(5.1%)	21.8(35.2%)	297(7.7%)	21.9(16%)	141(12.2%)	21.9(27.9%)
Ech.	9(0.9%)	0.3(0.4%)	84(4.5%)	5.8(9.5%)	101(2.6%)	4.3(3.1%)	22(1.9%)	0.8(1%)
Oth.	2(0.2%)	0.1(0.1%)	3(0.2%)	0.2(0.3%)	6(0.2%)	0.5(0.4%)	2(0.2%)	0.1(0.2%)
Tot.	949	65.1 gr	1857	61.8 gr	3838	137.1 gr	1159	78.4 gr
Vol.	16,754		20,329		39,796		24,437	

The animal species, which were found to have the greater frequency (F) and the greater mean dominance (Dm) in every one of the studied sponge species, are given in Table II.

In the sponge *Petrosia ficiformis* the most numerous group was found to be the crustaceans, which had threefold higher number of individuals and tenfold biomass compared to the second numerous group, the polychaetes. This can be attributed to the small number and size of the sponge canals that are considered to be unfavorable to the infaunal species and also to the structure of the sponge which is preferred by the epifaunal species (chiefly crustaceans and molluscs). So, the crustacean *Catapaguroides timidus* had the greater mean dominance (13.76) and frequency (88) in this sponge. The biomass of molluscs (the third in order of dominance group in this sponge) is increased (66.6%) compared to this of the other sponge species. They consist mainly of epifaunal species, some of which (e.g. *Peltodoris atromaculata)* show special preferrence to this sponge.

Crustaceans are also present in great numbers in *Verongia aerophoba,* being seven times as much as polychaetes, but their biomass is relatively low, twice as much as that of polychaetes. This can be explained by the small opening of the sponge canals, which permits the entering of small crustaceans (chiefly amphipodes) as the small sized *Colomastix pusilla* (Dm=30.45).

In *Spongia officinalis* the abundance of crustaceans, as well as their biomass, is also increased. Alpheids show a special preferrence for this sponge (Dm=35.12), chiefly represented by two species (*Synalpheus gambareloides* and *Alpheus dentipes).*

In *Geodia cydonium* crustaceans occur in greater numbers (50% of the total number of indinivuals) compared to the number of polychaetes. However, the latter represent the greater part of biomass (74%) in this sponge. This also could be due to the structure of the sponge. Its large canals permit the settlement of large polychaete individuals.

In *Agela oroides* crustaceans and polychaetes are represented by the same percentages of total animal numbers and of biomass.

Finally, *Ircinia fasciculata* and *Ircinia muscarum* show a great similarity in the composition of their associated fauna, though in *Ircinia fasciculata* crustaceans represent a larger percentage of the total fauna than polychaetes.

TABLE II

Sponge species	Species	Frequency F	Mean Dominance Dm	Sponge species	Species	Frequency F	Mean Dominance Dm
A. oroides	Colomastix pusilla	60	9,62	G. cydonium	Amphitoe ramondi	50	9,60
	Hiatella arctica	90	8,97		Alpheus dentipes	100	7,75
	Potamilla torelli	60	8,65		Nereis costae	63	6,69
P. ficiformis	Catapaguroides timidus	88	13,76		Nereis zonata	100	6,57
	Alpheus dentipes	81	9,93	I. fasciculata	Leucothoe spinicarpa	95	26,50
	Thoralus cranchii	63	6,61		Dynamene torelliae	84	5,15
S. officinalis	Synalpheus gambarelloides	44	28,92		Hiatella arctica	90	4,84
	Leucothoe spinicarpa	44	10,41		Nereis costae	90	4,51
	Alpheus dentipes	78	6,20	I. muscarum	Hiatella arctica	93	9,95
V. aerophoba	Colomastix pusilla	90	30,45		Nereis costae	86	9,78
	Thoralus cranchii	82	10,49		Leucothoe spinicarpa	79	7,14
	Alpheus dentipes	100	7,69				

Summing up: in six out of seven sponge species studied, crust ceans are clearly more numerous and their biomass is higher comp red to the other taxa found. The other taxa follow allways in the sar order: polychaetes, molluscs, sipunculans, echinoderms and others. *Agelas oroides* crustaceans and polychaetes are similar, regarding th relative abundance, but the latter have a greater biomass. The qua tative and quantitative composition of the associated fauna is prin pally depented on the sponge structure.

Further relationships can be found by assessing the biologi indices and by determination of diversity and degree of affinity in the sponge samples.

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Laboratory of Zoology, University of Thessaloni

Discussion

MATSAKIS: Est-ce que des études comparables ont été effectuées da d'autres secteurs de la Méditerranée ou ailleurs ? Et si oui, que enseignements du point de vue zoogéographique ou quelle par cularité écologique éventuelle concernant le secteur que vo avez prospecté, pourrait-on dégager?

KOUKOURAS (traduit du grec): Il y a eu quelques études analogues Océan Indien et aussi près de Cuba où le Prof. Bacescu a trou beaucoup de nouveautés. En fait, il s'agit d'un biotope très par culier et très intéressant dont l'exploration commence à peine qui ne manquera pas de révéler des faits nouveaux. C'est

biotope spécial et il y a des problèmes d'adaptation de forme ou de mode de vie, peut-être même des adaptations de nature plus profonde, chimique ou autres, qui méritent d'être étudiées. On ne peut pas encore envisager le point de vue zoogéographique, mais si l'étude de ce milieu, qui a été trop ignoré, se développe comme elle mérite on y viendra...

ECONOMIDIS: Avez vous trouvé des poissons dans les éponges et dans l'affirmative de quelles espèces s'agirait-il?

KOUKOURAS: Nous avons effectivement trouvé des poissons de la famille des *Gobiidae*; parmi celles-ci trois ne présentent pas d'interêt et seul *Chromogobius quadrivitatus* mérite mention.

ECONOMIDIS: La présence de *Chromogobius quadrivitatus* dans les eaux grecques a été déjà signalée par Miller en 1977 (à Rhodes).