Parasitic Infestations in [illegible]astal Mediterranean Pelagic Copepods

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Althou[illegible] [illegible]cri[illegible] [illegible]s of parasitic infest[illegible] [illegible] of [illegible] by [illegible]flagellate [illegible]ate [illegible] to the last century, [illegible] late li[illegible] infor-mation is avai[illegible]le on the occurrence and inci[illegible] of pa[illegible] in marine copep[illegible]. Most of the available information is con[illegible] in the monographs of [illegible]ttor (1920) and Sewell (1951). The vast [illegible]ity of other papers c[illegible] [illegible] brief observations on [illegible] prese[illegible] in-[illegible]nal parasit[illegible].

During t[illegible] course of our studies on plankt[illegible] copep[illegible] in the [illegible]f of Naple[illegible] we have observed that most copep[illegible] species [illegible]nging to common gen[illegible] such as [illegible], *Claus*[illegible], [illegible] [illegible]ntro-[illegible], *Acart*[illegible] and *Corycaeus* are infested with in[illegible] dino-flagellate pa[illegible]tes and unidentified forms of [illegible]tozoa, [illegible] and bacteria. Su[illegible] infections can generally be grou[illegible] into [illegible] main ca-tegories incl[illegible] coelomic parasites that inva[illegible] the ent[illegible] [illegible]y ca-vity of their [illegible]ts and parasites of the digest[illegible] tract. [illegible] common-est form of [illegible]elomic i[illegible] [illegible]n has been observed [illegible] [illegible] [illegible] [illegible]vus infested [illegible] *Syndin*[illegible] [illegible] that induces drastic change[illegible] [illegible]e ex-ternal morphology of t[illegible] [illegible] (Fig. 1a). This is [illegible] most [illegible]ting form of inf[illegible]ion since [illegible] always leads to sex[illegible] castra[illegible] (Fig. 1b) and, most pr[illegible]bly, de[illegible] the host. Ianora [illegible] al. (1[illegible]) [illegible]port infection r[illegible] of up [illegible] for this species.

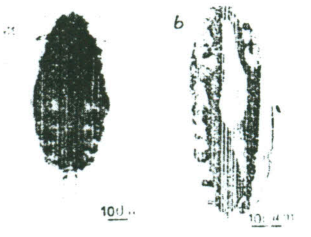

Fig. 1. *Paracal*[illegible] [illegible] infested by *Syndi*[illegible] sp. (a) dorsal view; [illegible]stol[illegible] [illegible] [illegible]ion sho[illegible] the [illegible] [illegible] struct[illegible] the [illegible].

Another [illegible] [illegible]mon for[illegible] coelomic infestation [illegible] due to [illegible] that do not indu[illegible] any appa[illegible] changes in the exter[illegible] morphol[illegible]. Internal-ly, however, infection [illegible] to lead to sterility since mat[illegible] [illegible]cytes have never been observed [illegible] such in-dividuals (Fig. 2a). O[illegible]ally, copepods have been foun[illegible] [illegible]ested [illegible] unidentifie[illegible] fungal [illegible] protozoan parasites [illegible]gs 2b a[illegible]. In the former, the pa[illegible]ite is dispersed in the entire body cavi[illegible] [illegible] in the latter ca[illegible] the parasite occupies most of t[illegible] prosome [illegible] com-pressed the st[illegible]ch [illegible] the dorsal part of the [illegible]rapace. [illegible]th cases, the gonads [illegible] the host [illegible] comple-tel[illegible] destro[illegible].

Fig. 2. Histol[illegible]al s[illegible]tion of (a) *Clausoca*[illegible] [illegible] infested [illegible] bacte[illegible] [illegible] infested by fung[illegible] [illegible] infested by a [illegible]otozoan.

The most common [illegible] infe-station by parasites [illegible] with-in [illegible]igestive tract of [illegible] hosts is due to dinoflagell[illegible] [illegible]long-ing to the genus *Bla*[illegible] (Fig. 3a). Such infestation [illegible] to be les[illegible] devastating sin[illegible] the hi-stomorphological leve[illegible] gonads contain oocytes in di[illegible] sta-ges of development (F[illegible]). However, we have neve[illegible] [illegible]rved ma-ture oocyte[illegible] in such [illegible]duals and specimens of dif[illegible] species maintained in the lab[illegible] do not produce egg[illegible].

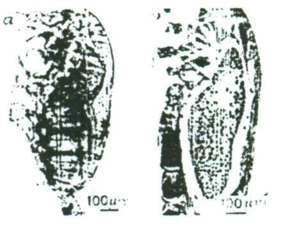

Fig. 3. *Clauso*[illegible] [illegible] infes-ted by [illegible] sp. (a) latera[illegible] [illegible] histologi-cal [illegible].

REFERENCES

[illegible]atton, E. ([illegible]). Les péridiniens parasites. Morpholog[illegible] [illegible]oduc-tion, éth[illegible]ie. Archs Zool. exp. gén. 59: 1-475.

Ianora, A., M[illegible] Mazzocchi and B. Scotto di Carlo (1987). [illegible] of parasitis[illegible] and intersexuality on Mediterranean popula[illegible] of *Para-calanus* [illegible] (Copepoda: Calanoida). Dis.aquat.Org. [illegible]-36.

Sewell, R.B.S. [illegible]951). The epibionts and parasites of the [illegible]ktonic Copepoda [illegible] the Arabian Sea. John Murray Expedition. [illegible] B. M. (N.H.) [illegible] 255-394.

Salinity a decisive factor in the length of Cephalothorax of Acartia clausi from three different areas (Greece and Ivory Coast)

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The purpose of this paper was to study and complete the data relating to the influence of environmental factors (primarly salinity) on the body size of *Acartia clausi* (Copepoda).
We thus, compared the length of cephalothorax of female adult *Acartia clausi* living a) in Greek waters and especially in Saronicos gulf with a common Mediterranean sea salinity, in Amvrakicos gulf (brackishwater area), source : Moraitou-Apostolopoulou *et al.* 1976 & 1986. b) in the lagoon of Ebrié - Ivory Coast (brackishwater area), source : Saint-Jean & Pagano 1984 and unpublished data.

MATERIAL AND METHODS:

Sampling was carried out at different periods during 1978-79, 1981 and 1983 for Greece and every month in 1981-82 and 1984-85 for Ivory Coast. Simultaneous measurements for temperature, salinity and phytoplankton were also performed. About 100 mature female *Acartia* were examined from each sample. In order to estimate the interacting influences of different environmental parameters we performed correlation and regression analysis between the length of cephalothorax and the three environmental factors.

RESULTS:

The ranges of salinity, temperature, phytoplankton and length of cephalothorax were:

	Salinity (%.)	Temperature (°C)	Phytoplankton	cephalotorax (m)
Saronicos	37.7-38.2	13.7-23.7	1 - 492 *	941 - 995
Amvrakicos	7.0-36.0	7.0-27.0	669 - 1634 *	919 - 950
Ebrié	0.0-30.0	25.0-31.0	2 - 128 **	604 - 933

* 103 cell/ml ** mg(chla + pheopig.)/m3.

The correlations between the length of cephalothorax of *Acartia* and the environmental factors are shown in table 1.

		Temp.(°C)	Sal.(%.)	Conc.(phytopl.)
GREECE	simple	0.520 NS	0.881 ***	-0.747 *
(n=7)	partial	0.450 NS	0.528 NS	-0.081 NS
IVORY COAST	simple	0.168 NS	0.795 ***	0.137 NS
Tot.(n=114)	partial	-0.055 NS	0.791 ***	-0.113 NS
S > 7%.	simple	0.462 **	0.615 ***	-0.101 NS
(n=38)	partial	0.447 **	0.580 ***	-0.146 NS
S < 7%.	simple	0.236 *	0.474 ***	0.407 ***
(n=76)	partial	0.011 NS	0.301 **	0.175 NS

Tab. 1.- Simple and partial correlations between cephalothorax and Temperature,Salinity & Phytoplankton concentration. NS no significant.
* 95%, ** 99%, *** 99.99% significant.

The correlations procved that, among the three environmental factors considered, salinity appears to be the primary factor influencing the formation of the body size of *Acartia clausi* for the three examined areas.

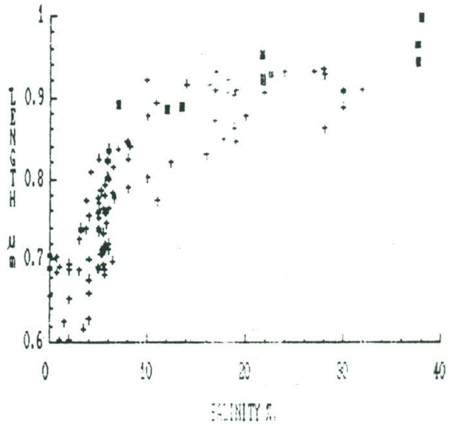

Fig.1.- Relationship length - salinity for Greece (■) and Ivory Coast (+)

For low salinities, between 0 and 7 %., the relationship length-salinity is expressed by an important increase; for higher salinities, 7-38.5%., the increase is less important (fig.1).
There is no statistically significant (t-test) difference between the examined areas : linear models for S > 7 %. with slopes of 0.0034 and 0.0028 for the Ivory Coast and Greece respectively and intercepts of 0.86 and 0.82.

CONCLUSION :

From the study of the data the following were observed : a) increases in salinity leads to increased length of cephalothorax, b) temperature and phytoplankton concentration play a secondary role as opposed to what happens when salinity does not vary (marine environments).

REFERENCES :

M.MORAITOU-APOSTOLOPOULOU & G.VERRIOPOULOS.1979.Rev.Int.Ocean.Med.53-54,77-86.
M.MORAITOU-APOSTOLOPOULOU, G.VERRIOPOULOS & N.TSIPOURA.1986.Arch.Hydr.105(4), 453-469.
L.SAINT-JEAN & M.PAGANO. 1984.Rev.Hydrob.Trop.17(3).235-244.