Differentiation of the populations productivity parameters between two geographical strains of *Tisbe holothuriae*

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The marine copepod *Tisbe holothuriae* HUMES, which presents a widespread distribution in the coastal environment, is refered to in the literature as an appropriate organism for use as a live prey for young fish stages in aquaculture (KAHAN *et al.*, 1982).

In order to discern the most favourable conditions for mass culture of *Tisbe*, we have performed studies concerning the importance of various environmental factors on its population dynamics (MILIOU and MORAITOU-APOSTOLOPOULOU, 1991a, 1991b). In the present research we have comparatively studied the population dynamics of two greek strains of *T. holothuriae* to investigate if there are differences in the productivity of animals from different geographical areas.

Wild animals (G1) were collected: a) from the Aegean Sea (Saronikos Gulf) and b) from the Ionian Sea (Astakos Gulf). The culture conditions in the laboratory have been described in our previously mentioned papers.

The following parameters of population dynamics of *Tisbe* were measured and are shown in Table 1:

1) Time between the hatching of the egg sac G1 and the appearance of the first egg sac G2 (Development time).
2) Time between the appearance of the egg sac and its hatching (Maturation time of egg sac).
3) Time between the hatching of the last egg sac and the appearance of the next egg sac (Interval time between egg sacs).
4) Number of nauplii at the time of hatching (Number of offspring per egg sac).
5) Time between the appearance of G2 specimens and their death (Longevity).
6) Total offspring per female and their sex ratio.

The measurements of the mentioned parameters enables the determination of the demographic variables T, Ro, r_m, which allow for the prediction of the capacity of *Tisbe* for proliferation. The mean generation time (T) is defined as $T=\sum(x \cdot Ux)/\sum Ux$, where x is the age (in days) of females (G2) at the time of hatching of nauplii and Ux is the number of female nauplii per offspring. The Net reproductive rate Ro=G3/G2 indicates the replacement rate of ovigerous females (G2) by their female progeny (G3) from one generation to another. The Intrinsic rate of natural increase (r_m) results from the relation r_m=LnRo/T. The method applied to *Tisbe* population is given by GAUDY & GUERIN (1977).

Mean generation time does not show important differences between the two areas. High values of Net reproductive rate were noticed for the Aegean Sea population, but this was valid only for the G2 generation, while in G3 values dropped to slightly superior than those of the Ionian Sea population. Likewise, the Intrinsic rate of natural increase of the Aegean strain, which was significantly higher in the G2, dropped to values similar to the Ionian strain at the G3 level.

Because of the generally high values of measured parameters the Aegean population of *Tisbe holothuriae* seems more suitable for mass production, but due to the sharp decrease of these values in the G3 generation further investigations are needed for definitive conclusions.

Table 1. Mean values* of the parameters and the demographic variables of population dynamics of *Tisbe holothuriae* for the generations G2, G3 and for two geographical areas: A = Aegean Sea, I = Ionian Sea.
* (due to limitation of space standard deviations are not shown)

	Maturation time of egg sacs in days					Interval time between egg sacs in days				
No egg sac	1st	2nd	3rd	4th	5th	1-2	2-3	3-4	4-5	5-6
G2A	2.93	3.07	2.57	3.27	2.83	0.14	0.28	0.58	2.81	3.00
G2I	4.41	3.73	2.92	3.83	4.00	1.06	1.42	2.25	3.33	4.00
G3A	2.33	1.94	3.05	3.37	3.60	0.17	0.55	2.05	1.92	2.25
G3I	2.55	2.67	2.73	4.25	4.00	1.65	1.53	2.58	2.50	3.00

	Development time in days	Egg sacs per female	No of offspring per egg sac 1st	2nd	3rd	4th	5th
G2A	12.43	4.86	77.07	15.75	11.18	7.10	5.60
G2I	12.59	2.64	47.70	8.89	12.20	4.00	4.25
G3A	11.72	5.00	43.94	9.67	7.22	7.23	7.88
G3I	7.65	3.20	34.00	6.80	3.75	5.55	3.00

	Total adults per female	Longevity in days	Sex ratio (females)	T	Ro	r_m
G2A	83.90	30.78	51.89	15.89	36.84	0.23
G2I	15.81	31.28	47.70	17.75	10.37	0.13
G3A	32.27	25.68	45.35	14.43	14.63	0.19
G3I	23.00	24.10	43.87	12.92	10.09	0.17

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