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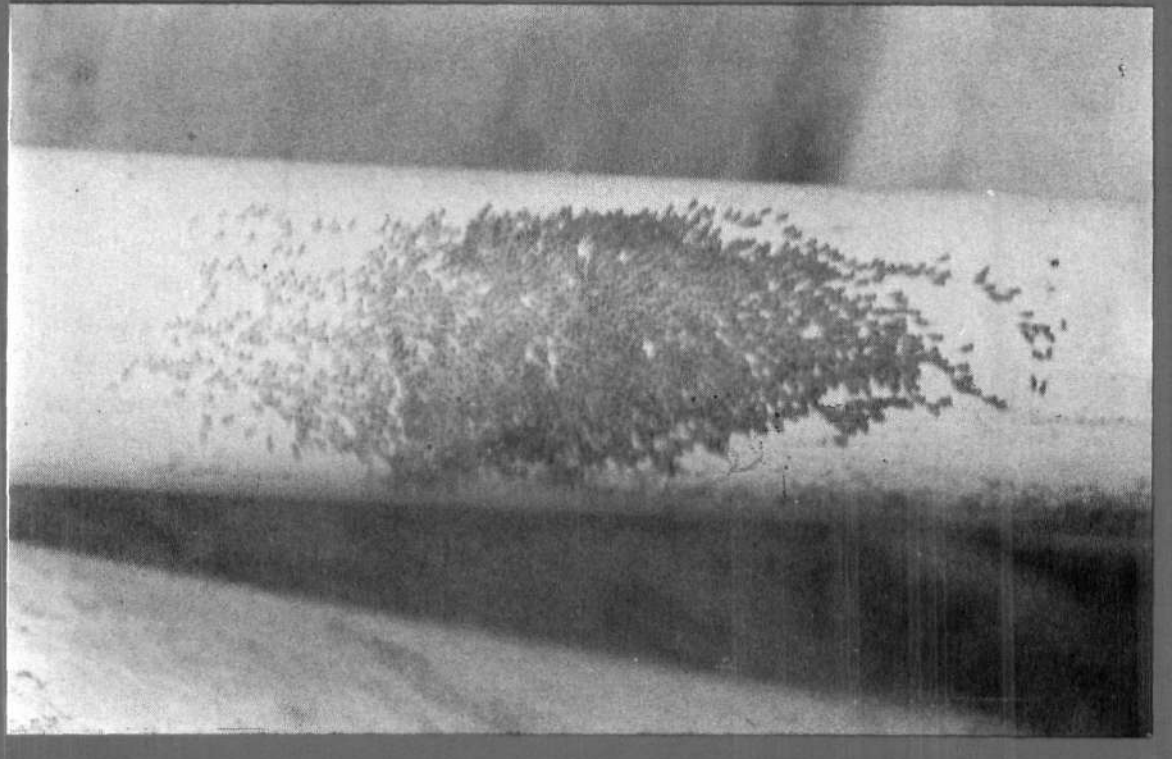

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908 ON THE FECUNDITY AND INTER-SPAWNING PERIODICITY IN AN EXOTIC SPECIES OF BRINE SHRIMP COLLECTED FROM THE SALT PANS AT TUTICORIN

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The brine shrimp *Artemia* inhabiting salt pans, coastal lagoons and inland salt lakes is widely distributed on the five continents. In India, this species has been reported to occur in the salt pans in Tamil Nadu, Maharastra, Gujarat and also in the inland salt lakes in Rajasthan. In all these places only parthenogenetic strain of the brine shrimp namely, *A. parthenogenetica* has been recorded so far. But recently the occurrence of *A. franciscana*, an exotic sexual strain was recorded for the first time from the salt pans at Tuticorin. As the entry of the exotic species into the natural ecosystem may result in a competition with the native species, some aspects of the reproductive biology of the species viz. fecundity and inter-spawning periodicity were studied under laboratory conditions and the same are presented here.

In order to study the fecundity and inter-spawning periodicity, experiments were carried out with the brine shrimps collected from the salt pans at Veppalodai on 5-3-'98. The salinity and pH in the natural ecosystem, from where samples were collected, were 143.4 ppt and 7.5 respectively. The brine shrimps were transported to the Laboratory at Karapad, Tuticorin and were distributed to two different perspex tanks containing about 50 l of filtered sea water, with salinity at 35.9 ppt. On the next day morning a few were found dead. The remaining animals maintained outside under open sun light were fed with *Isochrisis galbana*, which was cultured separately. From this stock a total of 15 pairs in riding position were collected and each pair was transferred to individual transparent plastic container of 500 ml capacity containing about 350 ml of filtered sea water on 16-3-'98 and was fed with *I. galbana* daily after removing about 50 ml of the medium. The containers were observed daily in the morning and when nauplii were noticed they were counted and the parents were released back into the same container with fresh medium for further spawning.

The fecundity and inter-spawning period in *A. franciscana* is given in Table 1. It can be seen from the Table that the number of nauplii released by each pair during the entire period of the experiment ranged from 19 to 117 with the inter-spawning period varying from 2 to 9 days. Out of the 15 pairs experimented, the spawning was found to be partial in two females which released nauplii in two consecutive days. In the first spawning the number of nauplii released by each pair ranged from 19 to 100 with maximum number of females (46.7 %) releasing nauplii in the range of 61-80. Only 6.7 % of the spawners released less than 20 nauplii. The second spawning was observed

only in 13 pairs. The number of nauplii recorded in the second spawning ranged from 22 to 92 with the inter-spawning period ranging from 2 to 9 days. In the second spawning 30.8 % of the spawners released nauplii in the range of 61-80 with equal number of spawners releasing nauplii in the higher range of 81-100. The third spawning was observed only in 9 pairs with the fecundity ranging from 58 to 117 numbers. The interval between the second and the third spawnings also ranged from 2 to 9 days. One of the pairs released nauplii on the second day also in both second and third spawnings indicating partial spawning. In the third spawning 44.4 % of the spawners released nauplii in the higher range of 101-120. The fecundity in the third spawning was above 58 nauplii/brood unlike first and second spawning which registered a low fecundity of less than 20 nauplii/brood. The fourth spawning was observed only in one female after an inter-spawning period of 5 days with a production of 68 nauplii.

In all 38 spawnings were observed in 15 females with the maximum percentage of females (34.2) releasing nauplii ranging from 61 to 80. Only 10.5 % of the females released more than 100 nauplii (Table2).

During the period of the experiment the ambient temperature ranged from 31 to 37° C; the salinity from 33.7 to 35.9 ppt and the pH from 8.1 to 8.3.

It has been reported that *A. franciscana* is more euryhaline exhibiting better reproductive characteristics in broader range of salinities as against parthenogenetic population which presents relatively low survival at the salinity of 35 ppt. In the present investigation the experiment was carried out at a lower salinity level ranging from 33.7 to 35.9 ppt with the ambient temperature varying between 31 and 37° C and the fecundity was found to be high in most of the spawnings with 34.2 % of the females experimented showing a fecundity ranging from 61 to 80. Apart from the ambient temperature the salinity of the medium may also affect the fecundity. However, the present investigation was aimed at finding out the fecundity at sea water salinity level and the results clearly indicate that the fecundity exceeds 100 nauplii/brood in 10.5 % of the total spawnings observed.

TABLE 1. *Fecundity and inter-spawning period in* A. franciscana *fed with* Isochrisis galbana

Sl.No of pairs	No. of spawning							
	I		II		III		IV	
	No.of Nauplii	Interval (Days)	No.of Nauplii	Interval (Days)	No.of Nauplii	Interval (Days)	No.of Nauplii	
1	59	2	85					
2	55	2	62					
3	55	2	82	9	58			
4	76	1	22	5	106			
5	84	3	75	3	84			
6	73	5	34					
7	57	2	81	3	117			
8	48	9	56					
9	100	5	28	1	103			
10	68	2	67	2	88	5	68	
11	79	4	23	2	115			
12	19	3	92	8	99			
13	73	5	62	5	62			
14	68							
15	78							

TABLE 2. *Percentage distribution* of franciscana *in relation to fecundity*

No.of nauplii/ brood	No.of spawning								Total number of spawning observed	Percentage frequency
	I		II		III		IV			
	No of spawners	%	No of spawners	%	No of spawners	%	No of spawners	%		
0-20	1	6.7	-	-	-	-	-	-	1	2.6
21-40	-	-	4	30.8	-	-	-	-	4	10.5
41-60	5	33.3	1	7.7	1	11.1	-	-	7	18.4
61-80	7	46.7	4	30.8	1	11.1	1	100.0	13	34.2
81-100	2	13.3	4	30.8	3	33.3	-	-	9	23.7
101-120	-	-	-	-	4	44.4	-	-	4	10.5