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ARTEMIA CYST POTENTIAL AT PALAVI SALTERNS

by

JOSEPH P. ROYAN
National Institute of Oceanography, Dona Paula Goa, India.

and

JANAKA De SILVA, MALKANTHIE FONSEKA & RAMESH PERERA
National Aquatic Resources Agency.

ABSTRACT

Studies on the natural population of *Artemia* in the salterns at Palavi, indicate that the population is completely parthenogenetic. The potential annual yield of *Artemia* cysts is 24.0 kg/ha. By utilising the salt pans available in Sri Lanka production of *Artemia* cysts can be greatly enhanced.

INTRODUCTION

The importance of *Artemia* as a live feed in aquaculture is well documented (Persoone and Sorgeloos, 1980). In Sri Lanka, Sunderam and Royan (1984) have located two natural grounds of *Artemia* at Palavi and Hambantota salterns. Cyst production of *Artemia* at Hambantota salterns has been estimated (Sunderam & Royan, 1985). The present study deals with natural populations, density and cyst yield of *Artemia* at Palavi salterns. Such studies are of importance in order to assess the productive potentials and cyst availability for aquaculture development in Sri Lanka.

MATERIALS AND METHODS

The Palavi salterns cover an area of 243 ha. and have many smaller units used as reservoirs, condenser pans and crystallizer pans. Some of the condenser pans were found to support natural populations of *Artemia*. For the present study two such units (Pond No. 3 & No. 6) were selected and had an area of 1.47 ha. and 2.46 ha. respectively. At the time of sampling, the salinity in the condenser pans was found to be 150‰ and the temperature was 30°C. This study was conducted in March 1985.

In order to study *Artemia* populations, water samples were collected from 25 to 30 different points in each pond and filtered through 50 um bolting nylon net. The sampling was done between 6.30 and 7.30 a.m. in order to avoid patchiness in distribution caused by increased temperature and wind action which might lead to sampling errors. Animals thus collected were pooled and preserved in 5% formalin. The different stages of *Artemia*, length measurements, estimation of egg production and annual yield were determined following the procedure outlined earlier by Sunderam and Royan (1985).

RESULTS AND DISCUSSION

The percentage composition of different stages of *Artemia* is given in Table 1. In pond No. 3 juveniles constituted the major portion of the population while, in pond No. 6, the adults were found to be predominating.

TABLE 1.

PERCENTAGE COMPOSITION OF DIFFERENT STAGES OF ARTEMIA

Stages	*Pond No.*	
	3	6
Nauplii	2.22	1.1
Metanauplii	7.04	5.5
Juveniles	63.7	22.53
Adults—		
Non - egg bearing	6.67	34.07
Egg bearing	20.37	36.81

As no males were found in the samples it was evident that the population was parthenogenetic. The natural population of *Artemia* at Hambantota has also been reported to be parthenogenetic (Sunderam & Royan, 1985).

TABLE 2.

ANNUAL ESTIMATED YIELD OF ARTEMIA CYSTS AT PALAVI SALTERNS

Pond No.	*Density No./M*^{3}	*No. of animals/ pan* (x10^4)	*Percentage of mature animals*	*Average Eggs/ animal*	*Egg Production per day (million)*	*Annual Egg Production*		*Production/ha*	
						Million	*(kg)*	*Dry wt. (kg)*	*Less 50% (kg)*
3	6988	6708	27.04	24	108.8	13056	65.28	44.41	22.21
6	4522	6152	70.88	19	207.13	248565	124.28	50.52	25.26
								Average	23.74

Table 2 summarizes the density of animals and cyst production in these two selected ponds. The maximum size attained by the adults was 10 mm. The average number of eggs produced per animal ranged from 19 to 24. Density of the adult population recorded at Palavi salterns compares favourably with that recorded at lake Urmi (Parker, 1900), Mono lake (Mason, 1967) and at Tuticorin saltern (Royan *et al.*, 1978).

The calculated annual egg production in these ponds amounted to 108.8 and 207.13 millions, which is equivalent to 65.28 and 124.28 kg respectively. Allowing for a loss of 50% of the eggs by wind, predation, mortality and for those left over for development in succeeding years, the net yield would amount to 22.21 and 25.26 kg for ponds 3 and 6. The average yi eld would be 24 kg/ha/year.

TABLE 3.

COMPARATIVE ACCOUNT OF CYST PRODUCTION

Locality	*Country*	*Harvest*	*Reference*
1. Marina - Salina California	U.S.A.	50 kg°/ha/yr	Boone and Baas-Becking (1931)
2. San Francisco Bay, California	U.S.A.	18 kg/ha (4 months/yr)	Rakowicz in Helfrich * (1973)
3. Tuticorin salterns	India	30 kg/ha (6 months/yr)	Royan *et al* (1978)
4. Mundra salterns	India	30 kg/ha	Project Report NIO (1981)
5. Hambantota salterns	Sri Lanka	38 kg/ha (6 months/yr)	Sunderam and Royan (1985)
6. Palavi salterns	Sri Lanka	24 kg/ha (4 months/yr)	Present study

* Reference not available.

Table 3 gives a comparative account of reported values of cyst production. A strict comparison is not possible due to differences in geographical location and in the estimation. It has been stated by Persons and Sorgeloos (1980) that a good *Artemia* biotype produces 10 to 20 kg of eggs/ha/season. Considering this, the estimation for Palavi salterns is very reasonable.

Production of *Artemia* cysts can be greatly enhanced in Sri Lanka by undertaking the culture of *Artemia* and by maximum utilization of salt pans available.

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