

ON THE DECAPSULATION TECHNIQUE OF DRY CYSTS IN THE INDIAN STRAIN OF *ARTEMIA SALINA* L.

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ABSTRACT

The decapsulation technique in the Indian strain of *Artemia salina* is described where the outer hard core of membrane shell of the cryptobiotic cysts is removed. The importance of temperature for decapsulation and the advantages of the decapsulated cysts over non-decapsulated ones are discussed.

Although populations of *Artemia salina* are cosmopolitan in nature, fundamental studies for most geographical strains are scarce and applied techniques quite primitive. Seale (1933) and Rollefsen (1939) have been pioneers in identifying the potential of *Artemia* as excellent food for fish fry and larger crustaceans. Since then, most of the works have been focussed on the easily accessible strain from the Bay of San Francisco (Sorgeloos, Baeza-Mesa, Benizts and Persoone, 1976). Investigations on the Indian strain other than the works of Royan (1975 and 1976) and Royan, Wafar and Sumitra-Vijayaraghavan (1978) have been related only to their occurrence (c. f. Royan, Wafar and Sumitra-Vijayaraghavan, 1978).

The present communication is a part of a detailed study in progress on the Indian strain and deals with the decapsulation technique of the cysts. The usual process of hatching is from the inactive dry cysts collected from the banks of salt pans and lagoons. These when immersed in sea water, hydrate, the embryo gets activated, breaks the outer hard core and emerges in a thin hatching membrane, which after a few hours bursts to release the young nauplius. Nakanishi, Iwasaki, Okigaki and Kato (1962) and Morris and Afzelius (1967) had remove the outer shell covering, while maintaining the viability of the embryos. This however, was not done in quantities needed for aquaculture purposes except recently by Sorgeloos, Bossuyt, Lavina, Beaza-Mesa and Persoone (1977) on the Californian strain.

Procedure: 1 g of dry cysts collected from Tuticorin, South India were hydrated in boiling tubes (larger test tubes would do) in 20 ml tap water and air bubbled from the bottom of the tube continuously. This helped in the continuous suspension of the cysts. After 1 hr hydration, the suspension was diluted with an equal volume of hypochlorite solution (Sodium hypochlorite 5% activity). Aeration was resumed and oxidation set in immediately. The chorion (outer shell) started dissolving and could be very clearly observed as the dark brown cysts become dirty white and finally disappears revealing the pinkish orange embryos. The complete process from the time of addition of hypochlorite lasted 10 minutes. The decapsulated cysts were washed immediately in tap water

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several times removing all traces of hypochlorite. They were then hatched in sea water directly or were stored for later use on immediate dehydration in a saturated solution of NaCl in tap water for 3 hr with continuous aeration. They were stored in small vials of concentrated brine in a cool, dark place. Studies on the best storing conditions and hatching efficiency for decapsulated cysts are underway for the Indian strain. Existing data of 8 weeks has been reported so far as the maximum preservation time for the Californian strain (Sorgeloos, Bossuyt, Lavina, Baeza-Mesa and Persoone, 1977). Temperature was one criterion very essential to be observed during the decapsulation process. Sorgeloos, Baeza-Mesa, Benijts and Persoone (1976) reported maximal hatching efficiency below 40°C for the Californian strain and Royan (1976) 30°C for the Indian strain. Hence, precooled hypochlorite (10°C) when used for suspensions at room temperature (27±1°C) was found to be ideal and the hatching efficiency was 100%.

In the decapsulation process of the cysts of Indian strain the following observations are also noteworthy. The hydration time required increases with the age of the cysts; cysts two years old require 1½–2 hr of hydration. Again, if the hypochlorite solution is not strong enough, then the decapsulation will not be completed within 10 minutes, and either the time of treatment or the strength of the hypochlorite should be increased suitably. Lastly, when the decapsulated eggs are left for hatching, continuous aeration is essential, otherwise hatching does not take place.

Remarks

In aquaculture of fish, prawns etc., where the *Artemia* nauplii are given to the fish fry or larval stages of the crustaceans, immediate separation of the newly hatched *Artemia* nauplii is essential. If this is not done, mortality due to the blockage of the alimentary tract of these larval forms (fish and crustaceans) by empty egg shells (Herald and Rackowicz, 1951; Morris, 1956; Rosenthal, 1969 and Stults, 1974) and also by bacterial infections (Gilmour, McCallum and Allan, 1975; Shelbourne, 1964 and Macfarlane, 1969) will occur. The separation, however, is usually inefficient, as many *Artemia* nauplii are lost in the process unless specific separator boxes (Sorgeloos and Persoone, 1975) are used. Decapsulation, therefore, is more advantageous than physical separation in that newly hatched nauplii are free of debris and can be used directly for feeding. In addition treatment with hypochlorite ensures, disinfection of the cysts.

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