

# EFFECT OF LIGHT ON THE HATCHING AND GROWTH OF *ARTEMIA SALINA*

Joseph P. Royan

National Institute of Oceanography, Dona Paula, Goa — 403004.

## ABSTRACT

Dry cysts of the brine shrimp, *Artemia salina* (Indian strain) were exposed to different light intensities ranging from 1500 to 6000 lux and the percentage of hatching was found to be nearly 50% in all the four intensities. Cysts kept in total darkness had only 23% hatching. Nauplii, which were kept in total darkness, grew faster than the ones which were exposed to continuous light. This is due to lesser activity and uniform distribution which helped the nauplii to convert all the available food energy for their growth.

Many arthropods have resting eggs in their life cycle and further development of the embryo inside the eggs is possible only when they are exposed to one or more exogenous stimuli (Andrewartha, 1952 and Lees, 1955). Ehippial eggs of *Daphnia pulex* are stimulated to hatch when exposed to continuous fluorescent light (Pancella and Stross, 1963). Sorgeloos (1973) found out that hatching efficiency in three strains of *Artemia* cysts was higher under continuous light than in darkness.

Light is considered to be one of the four essential pre-requisites to restart further development of the embryo inside the dormant eggs before hatching into nauplii, the other three being salinity, temperature and oxygen. 35‰ salinity and 30°C temperature are found to yield optimum hatching in the Indian strain of *A. salina* cysts (Royan, 1976). The present study reveals the effect of light and darkness on the hatching of brine shrimp cysts. Experiments were also conducted to find out the influence of both light and darkness on the growth of the brine shrimp nauplii.

Results obtained from such studies will not only throw light in understanding more about the behaviour of this Indian strain brine shrimp but would also help in the commercial culture of this organism.

Cysts of brine shrimp used in the present studies were collected from the salt pans at Tuticorin (March 1976). To study the effects of light on the hatching, four replicates of 100 cysts were kept in beakers containing 200 ml of 35‰ salinity. The tem-

perature was maintained at 30°C. The beakers were kept 3 inches in front of vertical fluorescent tube lights of known intensity. A similar set of beakers was kept in total darkness. The experimental beakers were adequately aerated.

For growth experiments, 2500 nauplii (48 h old) were introduced in 3 l of filtered sea water of 35‰ salinity containing approximately 20,000 *Tetraselmis gracilis* / ml and kept 3 inches away from vertical tube lights and a similar set was kept in complete darkness. The water was changed once in three days. A sample of 15 nauplii from each container was removed daily for size measurements for a period of eleven days, when the experiments were concluded.

Table I gives the results of the percentage of hatching in different intensities and also in darkness. It is evident from the present study that hatching is almost uniform in all the four intensities, whereas it is only 23% in the dark.

These results confirm the results obtained by Sorgeloos (1973) on three strains of *Artemia* (Bulgaria & USA: Utah and California) and prove that light, irrespective of its intensity, influences the hatching mechanism in the brine shrimp cysts.

Studies on the growth of *Artemia* nauplii (Figure 1) show that nauplii kept in total darkness grew faster than the ones kept under continuous illumination except for the first five days when the growth rate was uniform in both the conditions. This

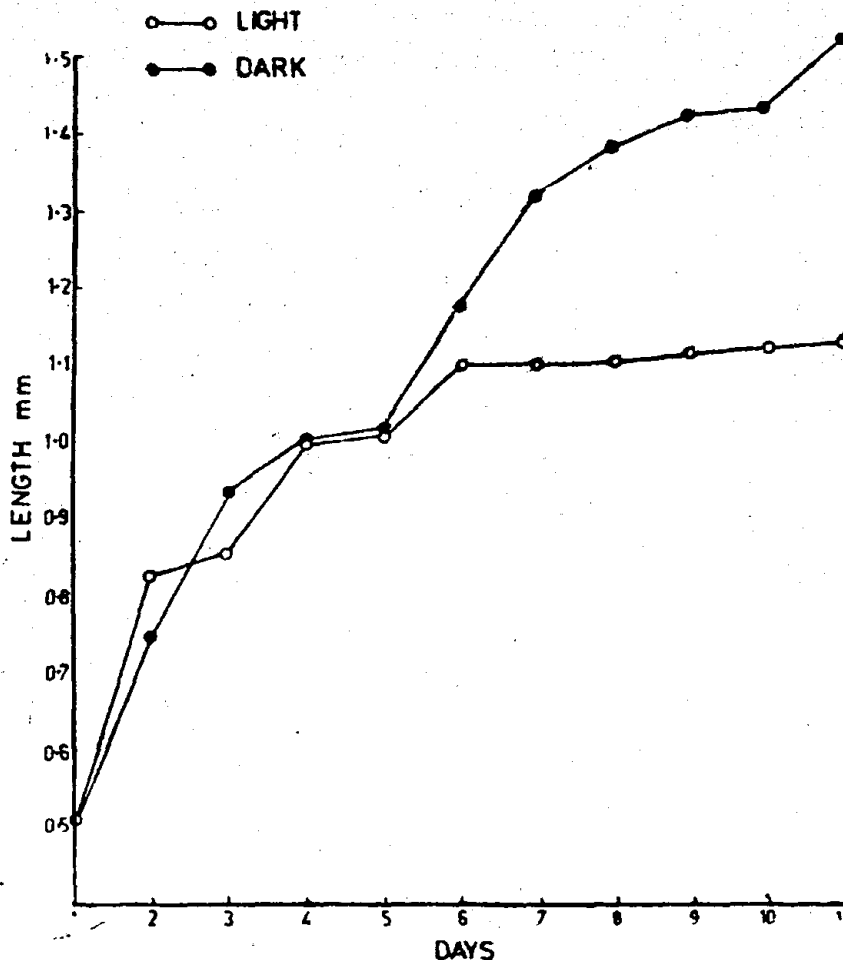


Fig. 1. Growth of *Artemia salina* nauplii in light and dark.

Table I: Percentage of hatching in different light intensities

Light intensity lux.	Hatching %
1500	50
3000	49
4500	46
6000	47
Dark	23

may be due to the time taken by the nauplii to ingest and assimilate food. *Artemia* being positively phototactic seems to crowd in one particular spot forming a pocket which

leads to quick exhaustion of the available food in the medium and in addition creating competition among the nauplii. In the continuous light they were also found to swim very actively and thus spending more energy. On the contrary, the nauplii kept in the dark are less active and also uniformly distributed in the medium. This helps them to convert all the available food energy for their growth and hence faster growth occurs in the dark.

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