



EFFECT OF LIGHT ON PERCENTAGE HATCHING OF *ARTEMIA* CYSTS IN A COMMERCIAL HATCHERY FROM GOPALPUR, ODISHA, INDIA

Suravi Muduli and Lakshman Nayak

Department of Marine Sciences, Berhampur University, Berhampur, Odisha, India

*Corresponding Author Email: suravimuduli1992@gmail.com

ABSTRACT

The impact of light on hatching percentage of *Artemia* cysts are studied over a period of two years in a commercial hatchery. For this study light intensities are altered from 500 lux to 4000 lux. It is evident from the present results that the maximum % (91%) of hatching was recorded at light intensity of 2000 lux, whereas minimum of 29%, 22% was observed at 500 lux and 4000 lux light intensities respectively

KEY WORDS

Light intensities, Lux, *Artemia* cysts.

INTRODUCTION

Shima Masoudi Asil *et al.*, [1] studied the influence of light (Intensity and Duration) on the cysts hatching parameters and nauplii growth of *Artemia urmiana* (Günther 1890). Raj Kumar and Babu [2] studied the effect of light, temperature and salinity on the growth of *Artemia*. The current study was planned to determine the hatching percentage of *Artemia* against various light intensities in a commercial hatchery system. Very few reports are available on effect of light intensities with respect to hatching percentage of *Artemia* cysts. Hence the purpose of the present investigation is to determine the suitable light intensity for optimal hatching in a commercial hatchery of Gopalpur, Odisha.

MATERIAL AND METHODS

The *Artemia* cysts of Inve Company were used for the experimentation and the cysts are incubated under standard hatching conditions as recommended by Lavens and Sorgeloos [3]. For studies on effect of light on % of *Artemia* hatching electric bulbs having different intensity (lux) were used (500 to 4000 lux).

The percentage of *Artemia* hatching can be calculated by using the formula:

$$\% \text{ Hatching (H)} = \frac{N}{C} \times 100$$

Where H = Hatching percentage of *Artemia nauplii*; N = Number of nauplii obtained/gram cysts; C = Number of cysts obtained/gram.

RESULTS AND DISCUSSION

Effect of light intensity on hatching performance of *Artemia* cysts

In this study, the light was adjusted from 500 lux to 4000 lux, and the percentage of hatching was estimated by counting the number of nauplii/ml. It has been observed from the present results that, the maximum hatching % of 91% was observed at 2000 lux. Minimum hatching % of 28% and 20% was observed at light intensities of 500 lux and 4000 lux respectively.

Table 1. Light intensities and their impacts on hatching percentage of *Artemia* cysts during the year 2016

S.NO	Light Intensity in (Lux)	Percentage Hatching (%)
1	500	29
2	1000	45
3	1500	74
4	2000	91
5	2500	73
6	3000	59
7	3500	33
8	4000	22

Table 2. Light intensities and their impacts on hatching percentage of *Artemia* cysts during the year 2017

S.NO	Light Intensity in (Lux)	Percentage Hatching (%)
1	500	28
2	1000	46
3	1500	72
4	2000	91
5	2500	72
6	3000	59
7	3500	34
8	4000	20

Environmental factors play a critical role on the production of cyst, quality and percentage of hatching [4]. According to Lavens *et al.*, [5] the good quality and % of hatching was attributed due to nature and availability of food particles in culture environment, but gene type doesn't have any contribution [4]. The impact of biotic and abiotic factors on the % of hatching of *Artemia* cysts are well studied, interestingly direct correlation was noticed with temperature, salinity and light [6-7]. In this study also, direct correlation was noticed on % of hatching of *Artemia* cysts against varied light intensities. The reported values on hatching percentage of *Artemia* cysts are in well agreement with the previous workers reported elsewhere [1].

In the present study the percentage of hatching at different light intensities and were taken into consideration. When light intensity was taken into

consideration high percentage of hatching (91%) was observed during *Artemia* hatching at 2000 lux, minimum % of 29%, 22% was observed at 500 lux and 4000 lux light intensities respectively. These results were well coinciding with the previous studies conducted by Raj Kuamr and Babu [2].

ACKNOWLEDGEMENTS

The authors are grateful to the Head, Department of Marine Science, Berhampur University for providing necessary laboratory facilities to carry out this work and also thanks to KKR aquatic shrimp hatchery, Gopalpur, Bandar, Berhampur for providing hatchery facilities to carryout experiments during the study period.

REFERENCES

- [1] Shima Masoudi Asil, Abolghasem Esmaeili Fereidouni, Hossein Ouraji and Khosrow Jani Khalili, The Influence of Light (Intensity and Duration) on the Cysts Hatching Parameters and Nauplii Growth of *Artemia urmiana* (Günther 1890), World Journal of Zoology, 7(1), (2012), 60-64.
- [2] G. Raj Kumar, D.E. Babu, Effect of light, temperature and salinity on the growth of *Artemia*, International Journal of Engineering Science Invention., 4(12), (2015), 07-14.
- [3] P. Lavens, P. Sorgeloos, Manual on the production and use of live food for aquaculture. FAO. Tech. Paper, 361, (1996), 295 p.
- [4] R.A. Browne, S.A. Sallee, D.S. Grosch, S. Segreti, S.M. Purser, 1984. Partitioning genetic and environmental components of reproduction and lifespan. *Artemia Ecology*, 65, (1984), 949-960.
- [5] P. Lavens, W. Tackaert, P. Sorgeloos, Review on the cryptobiotic states of *Artemia* cysts and its diapause deactivation. In: *Artemia* research and its application. Vol.3. P. Sorgeloos, D. Bengtson, A. Declair, E. Jaspers, (eds.). Universa Press, Wetteren, Belgium, (1986).
- [6] D. Versichele, P. Sorgeloos, Controlled production of *Artemia* cysts in batch culture: In: Brin'e shrimp *Artemia*. Vol 3. Ecology, Culturing, Use in aquaculture. G. Persoone, P. Sorgeloos, E. Roels, O. Jaspers, (Eds.). Universa press, Wetteren, Belgium, (1980), 231-246 pp.
- [7] P. Lavens, P. Sorgeloos, Controlled production of *Artemia* cysts under standard conditions in a recirculating culture system. *Aquacultural Engineering*, 3 (1984), 221-235.

Received:06.05.18, Accepted: 09.06.18, Published:01.07.2018

***Corresponding Author:**

Suravi Muduli*

Email: suravimuduli1992@gmail.com