**EXECUTIVE SUMMARY**

**UNIVERSITY GRANTS COMMISSION BAHADUR SHAH ZAFAR MARG**

**NEW DELHI – 110 002**

**PROFORMA FOR SUBMISSION OF INFORMATION AT THE TIME OF SENDING THE FINAL REPORT OF THE WORK DONE ON THE PROJECT**

1. Name of Principal Investigator: **Dr.Britto Joseph.K, Associate professor,** UGC Ref. No.1.MRP(S)/13-14/KLCA 019/UGC-SWRO
2. Dept. of University/College: **Department of Zoology, St.Thomas, College, (Autonomous), Thrissur, Kerala**
3. UGC Ref. No.1.MRP(S)/13-14/KLCA 019/UGC-SWRO, dated 15-02-2014’
 2. MRP(s)-0605/13-14/KLCA019/UGC/SWRO, dated 28th March 2014

 3. MRP(s)-0605/13-14/KLCA019/UGC/SWRO, dated 28th March 2016.

1. **Date of implementation: 28th March 2014.**
2. **Tenure of the project : 2 years**
3. **Total grant allocated; Rs . 1,50,000 (One lakh fifty thousand only)**
4. **Total grant received:** Rs. 1, 45,500 (One lakh forty five thousand and five hundred only.)
5. **Final Expenditure: 1,52,864.00**

 **9.** Title of the Research Project **“Developing mass culture techniques of selected species of fresh water Cladocera from Thrissur district, Kerala”.**

**10. Objective of the project:**

1. To make a field survey of Cladoceran fauna of Thrissur district for identifying suitable species for culture.
2. To develop suitable culture medium for providing food to Cladocera.
3. To study the influence of medium in cladoceran culture.
4. To standardize the method for production and mass culture of the most ideal species.

**11. Whether objectives are achieved: Yes, details attached**

**12. Achievements from the project: Details attached**

**13. Summary of findings**. Finished the cladoceran survey of freshwater bodies in and around Thrissur. 19 species of cladocerans were identified. A successful culture of *S.serrulatus* , *Moina micrura, Moinodaphnia macleayi,* and *Diaphanosoma sarsi* were done in the laboratory using algal and chicken manure medium. Ephippium along with resting eggs were separated in  *S.serrulatus*. Experiments were done to find out the most important factor responsible for hatching of this species so as to make its resting eggs available for mass culture and the data was published. Details are attached in the report.

**14. Contributions to the society.**

**Two M.Sc students have done their project work using the equipments and facilities.**

1. **Whether any Ph.D enrolled or produced out of the project: Nil**
2. **Number of publications: One, *Scientia,* ISSN: 0976-8289,** Janu-Dec 2015
3. **“Studies on the influence of light in ephippial production of *Simocephalus serrulatus* (Koch,1841)”. Vol-11.No.1, Janu-Dec 2015, pp 34-38. (Publication attached)**

 **(PRINCIPALINVESTIGATOR)**

 **PRINCIPAL**

 **SEAL**

 **REPORT**

**TITLE OF THE PROJECT** : “**Developing mass culture techniques of selected species of fresh water Cladocera from Thrissur district, Kerala”.**

**OBJECTIVES OF THE PROJECT**

1. To make a field survey of Cladoceran fauna of Thrissur district for identifying suitable species for culture.
2. To develop suitable culture medium for providing food to Cladocera.
3. To study the influence of medium in cladoceran culture.
4. To standardize the method for production and mass culture of the most ideal species.

**WHETHER OBJECTIVES WERE ACHIEVED**

 **Yes,** The field collections were made from different localities of Thrissur district of Kerala state which was one of the main objectives of the minor research project. The Cladocerans coming under five families such as Sididae, Daphniidae, Moinidae, Macrothricidae and Chydoridae were identified from the collection sites. A total number of 19 species of cladocerans were identified from the samples collected from different localities.

 The mass culture was found successful in *Moina micrura, Moinodaphnia macleayi, Simocephalus serrulatus* and *Diaphanosoma sarsi. S. serrulatus* is experimentally proved to be good for the mass culture in laboratory conditions due to their large size and high reproductive potential. The techniques for the mass culture was developed using algal medium enriched with ground nut oil cake and chicken manure. Attempts were also done to develop techniques for the hatching the resting egg of *S. serrulatus* and the data is published. Light exposure duration was found to be one of the important stimulus which control the ephippia formation and resting egg production in *S. serrulatus.* Ephippia thus formed can be stored and used for developing mass cultures when required.

**ACHIEVEMENTS FROM THE PROJECT**

The fish and prawn, particularly in the larval and juvenile stages depend to a great extend on live feed organisms. Even though, fishes produce several thousands of young ones, majority of them fail to attain maturity due to the lack of availability of suitable and ideal food for their growth. Cladocerans have high nutritive value and hence development of culture can ensure ideal live feed for their growth. In order to ensure availability of the required species for mass culture throughout the year, techniques were developed for the hatching of resting eggs using ephippia.

**SUMMARY OF THE FINDINGS**

 Cladocerans were periodically collected from freshwater bodies by using very small mesh sized net from 25 different localities of Thrissur district and brought to laboratory for identification. They were sorted out by using Stereo zoom and binocular research microscopes. A total number of 19 species were identified from the collections which include *Pseudosida bidentata, Latonopsis australis,*  *Diaphanosoma sarsi,*  *Diaphanosoma excisum, Ceriodaphnia cornuta, Scapholeberis kingi,*  *Simocephalus serrulatus, Moina micrura, Moina brachiata,*  *Moinodaphnia macleayi,*  *Ilyocryptus spinifer*, *Macrothrix spinosa,* *Macrothrix triserialis, Macrothrix laticornis*, *Pleuroxus aduncus,* *Alona pulchella,*  *Alona rectangulata , Chydorus sphaericus*  and *Oxyurella singalensis*.

An **algal stock culture** was prepared and maintained in the laboratory to ensure a ready availability of unicellular algae. Water containing *Chlorella* sps.was filtered through bolting silk of 70µm mesh size and transferred into different tanks of 50 liter capacity containing well water, aerated and was kept under fluorescent light. This was enriched with ground nut oil cake (50 ppm) and chicken manure (40ppm). The algal bloom occurs in 4-5 days. The algal culture flourished and attained a dark green colour within 8-9 days.

**The Cladoceran stock culture** was developed using live specimens collected from the field using a scoop net of 70µm mesh size and was taken to the laboratory. The cladocerans were sorted out and were transferred to different beakers containing the algal culture medium as food. The neonates produced were transferred to separate glass aquariums containing algal medium and was kept as the stock culture. This attains a peak density after 10-12 days and formation of ephippia was also observed in stock culture. The ephippia were sorted out using a fine brush and used for hatching experiments. Water in the stock culture was renewed partially every day with fresh culture media to prevent overcrowding.

The **mass culture** of cladocerans were done in tanks filled with 50 liters of water using the algal medium containing *Chlorella* sps (2x106 cells ml-1) enriched with ground nut oil cake (50 ppm) and chicken manure (40ppm) at a temperature 25±2, pH 6.8±2. Cladocerans were inoculated into this water at a rate of 30-40 individuals per liter of water. This attains a peak density after 7-8 days of inoculation. In this condition it can be harvested using a fine mesh net to feed the fish fry. The culture medium was partially renewed periodically with fresh algal medium to ensure enough food for their growth.

 **CONTRIBUTION TO THE SOCIETY**

 A survey of cladoceran fauna of Thrissur district was conducted and the cladocerans from 25 localities were identified. Preparation of an egg bank of selected species (*S.serrulatus*) was developed and the conditions for hatching were standardized, the influence of light in ephippial production was studied and the data is published. Mass culture techniques are helpful for ensuring a constant supply of Cladocera as a live feed in aquaculture.

**Name of publication: “Studies on the influence of light in ephippial production of *Simocephalus serrulatus* (Koch,1841)”. *Scientia,* Vol-11.No.1, Janu-Dec 2015, pp 34-38. ISSN: 0976-8289.**