

**A STUDY ON SOME BIOLOGICAL  
ASPECTS OF BRINE SHRIMP (*Artemia*)  
AND ITS USE AS LARVAL FOOD OF  
COMMON CARP *Cyprinus carpio* AND  
GRASS CARP *Ctenopharyngodon idella***

**A THESIS**

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## ABSTRACT

Natural raining pool adult *Artemia* have been collected from Al-latifiyia , Al-Suwera and Al-Hussainia regions and brought up to the postgraduated laboratory in the Animal Resources Department, Agriculture college, Baghdad university. Since arrival , *Artemia* distributed in different shapes and volumes of aquaria with 1cm silty clay layer on the bottom in order to culture. Culture media was made of granules salt dissolved in tap water to form a solution with 35ppt salinity , 25<sup>5</sup>c temperature and pH 8.

Stocking rates of adult *Artemia* have been tested experimentally .6adults/l with 318 to 452 released nauplii per adult was the best. Age of maturation was ranged between 19 and 22 days and a best nauplii rearing rate was 200 nauplii/l.

Survival and growth rates (mean total length ) have been studied for adult and nauplii of *Artemia* fed six different experimental diets (treatment). After 23 days , T6 (soyabean and rice bran 1:1 with vitamins) showed 80.5% survival rate and 7.852mm mean total length (T.L).

Natural pool adult *Artemia* showed high temperature resistance which was reached to the 40<sup>5</sup>c , and tolerated releasing nauplii at 30<sup>5</sup>c with sex ratio 29.24:70.50% male:female. These results were similar to which obtained from adult *Artemia* reared under laboratory conditions (34.4:65.6%).

Eggs of *A. parthenogenetica* (Baghdad) and *A. franciscana* (Basrah) (from local market) have been incubated and hatched into zugg jars (locally made) under laboratory conditions (salinity = 35ppt, temp = 25<sup>5</sup>c, pH = 8, lighting = 2000lux/hr. and continuous aeration). The results showed that the best hatching percentage (H%) 40.217% and hatching efficiency (HE) 60667 nauplii/gm dry cysts within 24 hrs. were obtained with Baghdad eggs. Whereas the H% (69.713% and HE (105633 nauplii/gm dry cysts) of basrah eggs were best at 48hrs.

Decapsulated cysts of both strains of *Artemia* eggs have been followed using hypochlorite solution. Eggs have been analysed biochemically and the results showed that protein were 52.4 and 53.04%, and lipids were 10.58 and 12.71% for both Baghdad and Basrah eggs respectively. It is noticed the increase of protein (57.2%) and decrease of lipid (5.8%) and ash (11%) of flesh of laboratory adult *Artemia*, comparably with natural pool adult, where protein was 39.6%, lipid 12.52% and ash content was 16.861%. Whereas the chemical analysis of nauplii body composition of Baghdad showed low protein and ash content (40.8%) (8.5%) respectively but high lipid (15.7%) contrast with *Artemia* adult and eggs.

Common carp *Cyprinus carpio* and Grass carp *Ctenopharyngodon idella* larvae were brought from middle east fish farm, Al-exanderia/Babilon to the postgraduated laboratory Agriculture college. The mean weight was  $0.173 \pm 0.05$  gm under 7 days age. Grass carp larvae were fed on five various diets which was:

1. *Artemia* nauplii only. (Treatment 1)
2. *Artemia* nauplii and artificial diet. (Treatment 2)
3. Artificial diet only. (Treatment 3) (35% soya bean:35% fish meal:20% starch:10% vitamins and minerals).
4. *Artemia* decapsulated cysts only. (Treatment 4)
5. *Artemia* decapsulated cysts and artificial diet. (Treatment 5)

Survival rate, growth rate, daily growth increment, weight rate, relative growth rate and specific growth rate of the experimental fish larvae were determined. The results showed that best cultured period was 15 to 30 days for grass carp larvae. Decapsulated cysts (T4) give the highest growth parameters. T5 showed the highest survival rate at 15 days comparably with other treatment, at 15, 30 and 45 days. Larvae of T4 had the highest weight (1.645 gm) and best growth rate (0.037) for the period ranged between 15 to 30 days, whereas daily growth increment was 0.043 gm, relative growth rate was 267% and SGR reached to 14.4% during 30 to 45 days.

Common carp larvae were fed on three different diets (Treatments) which was:-

1. Artemia nauplii only.(Treatment 1)
2. Artemia nauplii and artificial diet. (Treatment 2)
3. Artificial diet only. (Treatment 3)(35%soya bean:35% fish meal:20% starch:10% vitamins and minerals).

The results showed that T3had the lowest growth rates whereas T1 showed highest survival rate (100%),highest growth rate (0.123gm) and highest daily growth rate increament (0.088gm) and relative growth rate during 45 days.However the highest specific growth rate (9.52%)was also for T1 but during the first 2weeks of feeding experiment.