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# Cultivation Of Zooplankton: Microalgae as A Valuable Feed Source

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**Abstract:** The aim of this study is to study the protein and fat storage of *Daphnia magna* when used in microalgae as a food source for industrial cultivation. It is known that in world practice it is widely used in the production of protein biomass from *Chlorella*, *Ankistrodesmus* and *Scenedesmus* microalgae, as well as in the cultivation of zooplankton *(Daphnia, Moina)* under artificially controlled conditions. From zooplankton, the culture of *Scenedesmus quadricauda* is widely used in the reproduction of species such as *Daphnia magna*, pulex and longispina. Based on the studies, the morphological and biological properties and average sizes of algologically purified microflora were determined depending on the generation.

**Keysword**: Daphnia, Chlorella, Scenedesmus, Ankistrodesmus, Chlorococcum, algae, zooplankton.

According to statistics, by 2050, there will be a problem in providing food to more than 9 billion people [1]. Significant research is being conducted to further develop the fishing industry and provide the fishing industry with nutritious feed and supplements, including important research on the production of live feed and their role and importance in nature. One of the important tasks was to fully provide the fishing industry with live feed and to demonstrate their importance in practical research. Zooplankton are one of the important natural sources in the cultivation of fish fry with the storage of crude protein, amino acids, fat kilos, minerals and enzymes. Of the amino acids, lysine and methionine are especially important in that they are found in very small amounts in other types of feed, that is, in large quantities, and in large quantities in zooplankton. All species of zooplankton Numerous scientific studies are being carried out in order to increase arni on an industrial basis and to create a continuous supply for the fishing industry [2]. In this research, microflora, mostly *Chlorella* or *Scenedesmus* species, were used to breed zooplankton.

The aim of this study is to study the protein and fat storage of *Daphnia magna* when used in microalgae as a food source for industrial cultivation. It is known that in world practice it is widely used in the production of protein biomass from *Chlorella*, *Ankistrodesmus* and *Scenedesmus* microalgae, as well as in the cultivation of zooplankton *(Daphnia, Moina)* under artificially controlled conditions. From zooplankton, the culture of *Scenedesmus quadricauda* is widely used in the reproduction of species such as *Daphnia magna*, pulex and longispina. Based on the studies, the morphological and biological properties and average sizes of algologically purified microflora were determined depending on the generation.

As a result of the study, it was noted that the output of dry matter from microalgae relative to wet biomass varies on average from 22.99 to 28.84% In particular, the strains of the *Ankistrodesmus* generation produced an average of 3.24-3.42 grams of dry biomass from 11.36–12.62 grams of wet biomass, which was found to be 27.10-28.52 % of the total wet biomass. In Scenedesmus strains, 10.66-11.44 g/1 of wet biomass accounted for 2.48-3.08. g/l of dry biomass, or 23.26-26.92% of the total humus biomass, Although similar results were obtained for *Chlorella* and *Chlorococcum strains*, it was noted that this figure was relatively low in *Botryococcus strains*. It was observed that *Botryococcus strains* accounted for 8.62-9.22 g/l of wet biomass, 2.04-2.12 g/i of dry biomass, or 22.99-23.67% of the total wet biomass. In particular, microalgae belonging to the genus *Ankistrodesmus* contain 43.2- 46.4 % protein and 27.4-32.2 % fat (*Ankistrodesmus sp*.20: *Ankistrode smus sp*.15). In the same nutrient medium, micronutrients belonging to the genus *Scenedesmus* can be seen to store up to 48.8-52.8% protein and 27.4 28.6% fat, respectively (*Scenedesmus sp*.7. and *Scenedesmus sp*.1). According to the results of the study, representatives of the genus *Botryococcus* were recorded as a microflora offspring that retained relatively small amounts of protein (46.2-46.8%) and fat (26.2-26.4%).

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Studies have shown that members of the *Chlorococcum* and *Chlorella* lineages have high protein retention (46.4-48.8%) but very low fat retention (15.6-18.4%) compared to all micronutrient generations studied. In scientific sources, 46.5% of the strain *Chlorococcum macrostigmatum* UT4 and 35.4% of the strain *Chlorella* sp.2 were studied for fat synthesis. This can be explained by the control of temperature, $SO_2$ and light levels under growing conditions, and the fact that the study focused on fat synthesis. Subsequent studies have determined the growth rate of *Daphnia magna Straus*, depending on the composition of the nutrient medium. It was noted that the results obtained varied depending on the generation of micronutrients and their nutritional value (based on the amount of protein and fat). In particular, the growth rate of daphnia depending on the composition of the nutrient medium, relative to the controlled nutrient medium (lake water + 20% cattle manure) *Ankystrodesmus* - 0.4969, Scenedesmus - 0.4181. Botryococcus -0.5644, *Chlorella* - 0.3267 and *Chlorococceum*-0.7357 percent. In contrast to scientific sources, the average growth rate of daphnia based on the strains of the genus *Chlorella* was 1.3267%, while the strains of the genus *Chlorococcum* - 0.7357%, 55.5% higher than the strains of the genus *Scenedesmus* - 43.1% higher than the strains of the genus *Chlorella*. found to be this can be explained by the fact that the cells of the strains of the genus *Chlorella* are thicker and more difficult to break down than other species. Although the cell structure and thickness of Scenedesmus strains do not differ significantly from those of *Chlorococcum*, the difference in growth rate is due to the relative size of the cell of *Chlorococcum strains*, protein content less than that of *Scenedesmus* strains (47.8-48.2%), low fat content (16.8– 48.2%). 8-18.4%), which may have led to proteins. Subsequent studies have studied the protein and fat storage of the grown *Daphnia magna Straus* relative to dry matter in a nutrient medium prepared on the basis of algae generations. According to the results obtained, *Daphnia magna* Straus, fed on the basis of representatives of the *Ankistrodesmus* generation from microalgae relative to the control, recorded 28.67% protein and 3.9% fat. The Scenedesmus genus has 29.07% protein, 4.03% fat, Botryococcus 31.36% protein, fat, Chlorococcum 34.10% protein and 3, 84% fat retention was found. When the results were analyzed, it was found that Daphnia magna (31.36%) fed with Botryococcus offspring synthesized 2.76% more protein and 0.48% more fat storage than *Chlorella offspring*. Similar results were observed for *Daphnia magna* fed *Chlorococcum*, which synthesized 5.03% more protein and 0.19% more fat synthesized than *Daphnia magna* fed *Scenedesmus*. Daphnia magna was reported to synthesize 2.69% more protein than *Ankistrodesmus*, 2.29% more than *Scenedesmus*, and 2,76% more than Chlorella when fed to members of the *Botryococcus genus*. *Daphnia magna* fed with representatives of the botryococcus genus. was found to synthesize 0.22% more fat than *Ankistrodesmus*, 0.28% more than Chlorococcum, and 0.48% more than *Chlorella.*

Therefore, it is advisable to use zooplankton from the representatives a of *Chlorococcum* and Botryococcus genera in fisheries, namely *Daphnia species*, as source of reproduction and feeding of small fish fry.

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