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CHANNEL CATFISH (ICTALURUS PUNCTATUS) LARVAL REARING AND GROWTH PERFORMANCE IN AQUACULTURE CONDITIONS OF UZBEKISTAN

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Abstract: The study focuses on the rearing and growth performance of channel catfish (*Ictalurus punctatus*) under aquaculture conditions in Uzbekistan. The effectiveness of different feed types for larvae was evaluated. Results demonstrated that larvae fed with live auloforus exhibited high survival rates, stable growth, and optimal water quality, whereas those fed with fish meal showed lower survival and deteriorating water conditions. The findings provide a theoretical and practical basis for developing efficient and sustainable strategies for intensive channel catfish propagation in aquaculture systems.
Keywords: channel catfish, *Ictalurus punctatus*, aquaculture, larvae, live feed, growth, survival.

Introduction. At present, global demand for high-quality protein is steadily increasing due to population growth. As the capacity of traditional livestock production systems is limited, aquaculture plays a crucial role in meeting this demand. The cultivation of fast-growing and highly productive fish species, along with the improvement of effective methods for rearing their larvae and juveniles, represents a pressing scientific and practical task in ensuring the population's supply of high-quality protein.

In Uzbekistan, aquaculture production primarily relies on a limited range of fish species, which restricts both the biological and technological diversity of the sector. Therefore, the development of intensive fish farming systems with higher efficiency compared to conventional methods, as well as the acclimatization of new fish species, represents a pressing scientific and practical issue. One of the most promising species is the channel catfish, and this study focuses on investigating the theoretical foundations of its propagation, examining its reproductive biology, and applying effective technological methods for its cultivation.

Considering the bioecological characteristics of channel catfish, specifically Ictalurus punctatus, as well as their significance in agriculture and the aquaculture industry, and based on international experience and the use of intensive technologies, they can be utilized as a valuable species for commercial aquaculture [1].

Materials and methods. The study was conducted in May–June of the current year, employing ichthyological and hydrobiological methods. In addition, zoological and hydrochemical approaches were applied. Phenological observations were carried out following the methodologies described by Pravdin [3,4] (1966) in Guide to the Study of Fishes and Guide to the Study of Fish Feeding in Natural Conditions, Zinovev & Mandritsa (1980) in Methods for the Study of Freshwater Fishes, and Kotlyar [2] (1985) in Methods of Fisheries Research (Ichthyology). Statistical analysis of the collected data was performed according to generally accepted standards and the methods outlined by Smetanin [5] (1971) in Statistical Methods in Fish Ecology.

Experiments were carried out in controlled pond systems, with each trial lasting one month. Water quality parameters—including temperature, dissolved oxygen, total ammonia nitrogen, and pH—were measured twice daily. Temperature control was maintained under diurnal regulation due to its dependence on gas column pressure.

Live feed organisms required for the experiments were pre-cultured. Substrates, including straw or alternative materials, were prepared and incubated at 25°C for three days. The resulting cultures were transferred to 400 L holding ponds and provided daily to experimental fish as live

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feed. Experiments were conducted using these live organisms, with parallel trials involving other feed representatives for comparison.

Larval growth was monitored by measuring mean body weight at the beginning, at weekly intervals, and at the end of the experiment. Larval behavior and survival rates were recorded throughout the trial. Feeding rates were calculated as a percentage of the total biomass in each pond.

Results. Channel catfish larvae fed with auloforus exhibited high survival rates and active behavior. Auloforus, due to its small size, proved to be an effective live feed for small- and medium-sized larvae. Careful separation from the substrate and proper portioning prevented water quality deterioration.

From day 7, auloforus was provided in minced form, with particle size adjusted according to larval size. In this feeding regime, larval weight increased steadily, and growth rates were similar across experimental groups. Water quality remained stable and clear throughout the experiment, and daily mortality was low (1–2 individuals) (Table 1).

Table 1

Comparative survival of larvae in experimental ponds

Pond	**7 days**	**10 days**	**15 days**	**20 days**
Larval weight (mg)	20–50	70–100	100–250	400–500
Survival (number of dead larvae)				
№ 1	14	17	11	6
№ 2	25	24	18	21

In contrast, larvae fed with fish meal experienced rapid water quality decline after feeding, leading to higher mortality rates as larval weight increased.

Unminced auloforus could be introduced to African catfish larvae from 5–7 days of age, and incorporation into the diet positively influenced larval growth and activity. Overall, auloforus proved to be a highly effective live feed, ensuring high survival, stable growth, and optimal water quality for channel catfish larvae (Table 2, Figure 1.).

Table 2

The effect of the initial feed type on larval growth

Feed Type	**Stocking density, ind/l**	**Initial weight, mg**	**Final weight, mg**	**Feed conversion ratio (per unit of growth)**
Mixed feed with added minced fish	800	6.7	36.6 ± 2.6	6.3
Live Auloforus	800	6.7	33.6 ± 6.8	10.0 (3.0 per dry matter)

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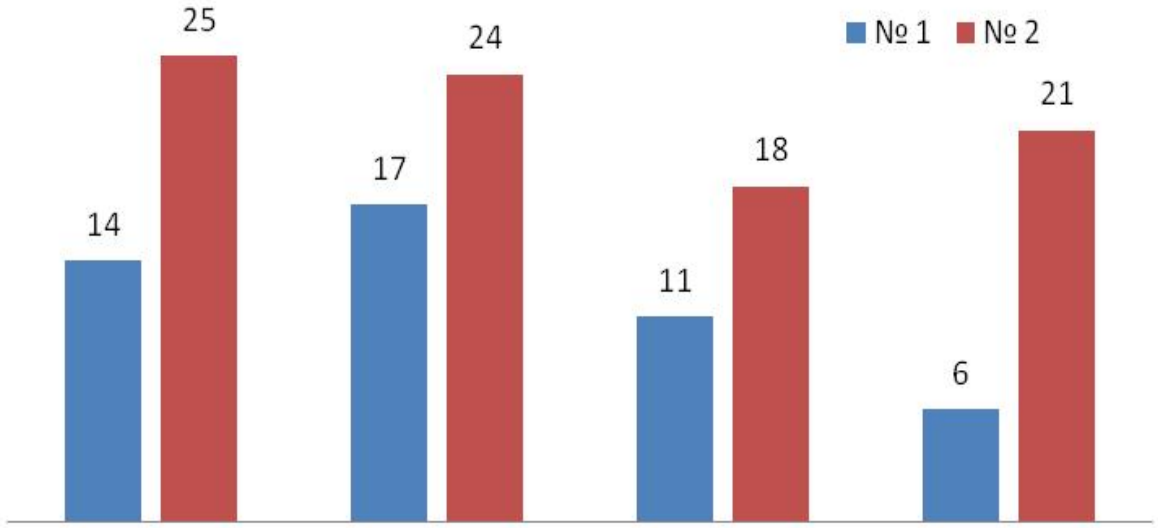

Figure 1. Larval weight and mortality in the experimental ponds

Conclusion In conclusion, The present study demonstrates that the larval rearing of channel catfish (Ictalurus punctatus) can be effectively optimized using live auloforus as a primary feed. Larvae fed with minced auloforus exhibited high survival rates, consistent growth, and stable water quality throughout the experimental period, whereas larvae provided with fish meal experienced reduced survival and deteriorating water conditions. These findings highlight the critical role of live feed selection in larval development and suggest that auloforus can serve as an efficient and sustainable nutritional strategy for intensive aquaculture systems. Consequently, the study provides a theoretical and practical basis for the large-scale propagation of channel catfish, contributing to the diversification and intensification of aquaculture in Uzbekistan and similar regions..

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