Bio Vet Innovator Magazine
(Fueling The Future of Science…)
Volume 3 (Issue 7) JULY 2026
OPEN ACCESS World Zoonosis Day – 06th July 2026 Popular Article

National Fish Farmers Day: Celebrating India's Aquaculture Revolution through Scientific Innovation and Capacity Development

***Satam, S.B.; Chaudhari, K.J.; Pagarkar, A.U.; Ghughusakar, M.M.; Dhamagaye, H.B.; Chogale, N.D.; Sadawarte, V.R.; and Sawant, A.N.**
Marine Biological Research Station,
(Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli)
Zadgaon, Ratnagiri, Maharashtra, India
***Corresponding Author:** sachinfish@gmail.com
DOI: https://doi.org/10.5281/zenodo.21465526

Received: July 18, 2026
Published: July 21, 2026

Abstract:

National Fish Farmers Day is celebrated every year on 10 July to mark the achievement of Prof. Dr. Hiralal Chaudhuri and Dr. K. H. Alikunhi who demonstrated induced breeding in Indian major carps in 1957, a breakthrough achievement that changed freshwater aquaculture in India. This paper emphasizes the scientific importance of this technological advancement and records the "National Fish Farmers Day 2026" workshop on "Live Feed Production for Ornamental Fish" organized by the Marine Biological Research Station, Ratnagiri. The objective of the workshop was to upgrade the technical knowledge and practical skills of ornamental fish farmers, entrepreneurs, students and fisheries professionals through expert lectures, live demonstrations and interactive discussions. The main topics were the production and use of microalgae, infusoria, rotifers, Artemia, Moina, Daphnia, Tubifex, bloodworms, grindal worms, microworms, black soldier fly larvae and mealworms as live feeds for hatcheries of ornamental fish. The programme also included live-feed enrichment technologies, hatchery management, water quality, larval nutrition and sustainable aquaculture practices. The workshop was a success in the promotion of the transfer of scientific knowledge to field applications, entrepreneurship, improvement of seed quality, increasing the larval survival and environmentally aquaculture. Overall, the article stresses that continuous capacity building, effective fisheries extension, and farmer–scientist collaboration are important for strengthening the ornamental fisheries sector in India and supporting the wider Blue Economy objectives.

Keywords: National Fish Farmers Day; Ornamental fish culture; Live feed; feed enrichment; Capacity building; Hatchery management

Introduction:

Aquaculture is one of the fastest-growing food production sectors globally, contributing to global

food security, nutrition, employment, and rural development. In 2022, the production of fisheries and aquaculture worldwide reached over 223 million metric tons. More than half of all aquatic animals produced for human consumption now come from aquaculture. India is the second-largest country to produce fish in the world today. Indeed, inland aquaculture has contributed considerably to the evolution of fisheries in India. This has been made feasible through advances in induced breeding, hatchery management, nutrition, disease management, and extension service for farmers. (FAO, 2024)

July 10, every year, is celebrated as National Fish Farmers Day, and it is a special place in the long list of milestones in Indian fisheries. The occasion is the successful demonstration of induced breeding in Indian major carps by Prof. Dr. Hiralal Chaudhuri and Dr. K. H. Alikunhi on 10 July 1957, which revolutionized freshwater aquaculture in India. The advent of hypophysation technology enabled the production of quality fish seed round the year, reduced dependence on natural spawning, and hastened the process of commercialization of aquaculture all over the country (Jhingran, 1991). To commemorate this great achievement, the Govt. of India officially declared 10 July as National Fish Farmers Day from the year 2001 onwards.

Live feeds are a good source of highly digestible proteins, essential amino acids, polyunsaturated fatty acids, vitamins, digestive enzymes, and bioactive compounds that are vital for the successful development of fish larvae in their first feeding stages (Conceição et al., 2010; Sorgeloos et al., 2001).

Significance of Induced Breeding in Indian Aquaculture:

Fish farmers depended almost entirely on naturally available fish seed collected from rivers during monsoon season, as induced breeding technology was not available. Such dependence led to irregular seed availability, mixed species composition, poor survival and limited opportunities for large scale aquaculture. The pioneering research work done by Prof. Dr. Hiralal Chaudhuri under the guidance of Dr. K. H. Alikunhi showed that spawning could be induced successfully by injecting hormones from the pituitary gland and controlled seed production was possible under hatchery conditions (Jhingran, 1991).

This technological innovation has revolutionized freshwater aquaculture, allowing mass production of genetically superior seed year-round. It also helped in setting up hatcheries all over India, thereby raising fish production significantly and supporting the Blue Revolution of the country. Induced breeding is one of the important technologies used in hatcheries today for Indian major carps, Chinese carps, catfishes, and a number of commercially important freshwater species (ICAR-CIFA, 2024).

The scientific contribution of Prof. Chaudhuri and Dr. Alikunhi was not confined to breeding technology. Their work established the basis for systematic hatchery management, broodstock development, seed quality improvement, and scientific aquaculture practices which continue to underpin the rapidly growing fisheries sector in India. Their accomplishments keep motivating fisheries scientists, educators, and fish farmers throughout the country.

Significance of Ornamental Fish Culture:

The ornamental fish industry is one of the fastest-growing sectors in global aquaculture. International trade in ornamental fish comprises more than 5,000 freshwater and marine species and is an important contributor to job creation, export earnings, and small-scale entrepreneurship. India has outstanding biodiversity, favorable climatic conditions, and rising domestic demand; thus, ornamental fisheries are an important part of the country's blue economy (Tlusty, 2002). Scientific hatchery management, especially during the larval and juvenile stages, is crucial for the successful production of ornamental fish. Highly digestible live feeds that are of suitable size, nutritional composition, and movement characteristics are needed to stimulate feeding behavior and optimize survival of newly hatched larvae. Therefore, live-feed organisms of good quality have become one of the most important factors determining the success of hatcheries in ornamental aquaculture (Conceição et al., 2010).

Understanding this technology need, the organizers chose “Live Feed Production for Ornamental Fish” as the main theme of the workshop. The program was targeted at enhancing the knowledge of farmers on live feed culture, improving the productivity of hatcheries, promoting scientific ornamental fish farming, and creating sustainable entrepreneurship opportunities for rural youth and fisheries graduates.

MBRS, Ratnagiri, celebrates National Fish Farmers Day:

On the occasion of National Fish Farmers Day 2026, a one-day workshop on "Live Feed Production for Ornamental Fish" was organized by the Marine Biological Research Station (MBRS), Zadgaon, Ratnagiri, working under Dr. Balasaheb Sawant Konkan Agricultural University (DBSKKV), Dapoli, in association with Ornamental Fish Farmers Trust and Fisheries Engineering Polytechnic, Shirgaon, Ratnagiri. The workshop has evoked a huge response from ornamental fish farmers, breeders, entrepreneurs, researchers, students, and fisheries professionals from different regions of Maharashtra. The program started with floral tributes to the portraits of Prof. Dr. Hiralal Chaudhuri and Dr. K. H. Alikunhi for their pioneering contribution to induced breeding technology in Indian aquaculture.

Live Feed: A Foundation for Successful Ornamental Fish Breeding

Dr. M. M. Shiradhankar, former principal, Fisheries Engineering Polytechnic, Shirgaon, spoke on the importance of live feed in ornamental fish breeding and larval rearing. “The availability of nutritionally balanced live feeds directly impacts spawning success, larval growth, feed acceptance, disease resistance, and overall hatchery productivity,” he said. He appealed to the farmers to embrace modern live-feed production technologies as a key ingredient to profitable ornamental fish farming. He stated that scientific knowledge and entrepreneurship should work together for sustainable success.

Cultivating a “Knowledge Pilgrimage”:

The function was presided over by Dr. K. J. Chaudhari, Head, MBRS, Ratnagiri, who gave an inspiring address on the necessity of continuous interaction between scientists and fish farmers. Drawing a parallel

with the annual pilgrimage to Pandharpur, he urged farmers to undertake a "knowledge pilgrimage" and visit universities and research stations once every year. Such interactions, he said, would allow farmers to stay up to date on new technologies and give researchers important insights into problems at the field level and the practical needs of farmers. He also assured the participants that MBRS will continue to provide technical guidance, training programs, and scientific support to strengthen sustainable fisheries development in Maharashtra. He stressed that quality live feed production is crucial not only for ornamental fish hatcheries but also for improving seed quality, larval survival, and commercial aquaculture production.

Capacity Building through Technical Sessions and Demonstrations:

The technical sessions of the workshop were designed to link scientific research and practical hatchery management. Resource persons delivered detailed lectures and live demonstrations on culture techniques, nutritional significance, and commercial production of different live-feed organisms commonly used in ornamental fish hatcheries. Participants received training in scientific protocols such as live feed culture, water quality maintenance, and enhancing larval survival via appropriate nutritional management.

Marine Microalgae:

Dr. A. N. Sawant delivered the first technical lecture on cultivation of marine microalgae and their importance in live-feed production. Microalgae form the base of aquatic food webs and are critical to hatchery operations. Species like Nannochloropsis, Isochrysis, Chlorella and Tetraselmis are widely cultured for their high protein, essential fatty acid, pigment, and vitamin content. In addition to serving as a food source for zooplankton, microalgae improve water quality by assimilating dissolved nutrients and producing oxygen through photosynthesis (Lavens and Sorgeloos, 1996). The "green-water technique" was frequently applied because of its positive effects on the feeding efficiency of fish larvae, water quality stability, and stress reduction in fish larvae (Conceição et al., 2010).

Infusoria:

Dr. H. B. Dhamagaye presented a detailed account of the preparation and maintenance of infusoria cultures, one of the smallest live-feed organisms used during the very early larval stages. Infusoria are microscopic protozoa and ciliates, naturally found in decaying organic matter. Their small size makes them especially suitable for larvae of small ornamental species such as guppies, tetras, rasboras, and gouramis, just after yolk-sac absorption. Well-maintained cultures of infusoria provide an economical and readily available first feed for hatchery operations (Conceição et al., 2010).

Brachionus spp. (Rotifers):

Rotifers are one of the most important live feeds used in commercial hatcheries worldwide. They are ideal for the larvae of ornamental fish in both marine and freshwater environments owing to their

small size (100-250 µm), slow swimming speed, and ease of mass production (Lubzens et al., 2001). Rotifers can also be nutritionally enriched with DHA, EPA, vitamins, and probiotics before feeding, which greatly enhances larval growth and survival. Rotifers, if not treated, may not have enough essential fatty acids for fish larvae (Sorgeloos et al., 2001). Thus, the employment of enrichment technology has become a standard practice in modern hatcheries.

Artemia Nauplii:

One of the practical demonstrations was given by Prof. Narendra Chogale and Mrs. Varsha Sadawarte on Artemia hatching techniques. Participants observed the entire hatching process, cyst decapsulation, harvesting techniques, and feeding practices. Due to their ideal size, high digestibility, and ease of storage as dormant cysts, Artemia nauplii are globally regarded as the "gold standard" live feed in aquaculture. Nauplii provide high quality proteins, lipids and energy needed after hatching during early larval development. Bioencapsulation with essential fatty acids, vitamins, probiotics and immunostimulants might lead to further improvement of their nutritional value (Lavens and Sorgeloos, 1996).

Moina & Daphnia:

Shri Fahad Jamadar, a breeder of ornamental fish, explained the culture techniques of Moina and Daphnia and their importance in the rearing of the juveniles. These freshwater cladocerans are rich in proteins, essential amino acids, and carotenoids. They are introduced when the larvae have outgrown rotifers and Artemia, generally because they are relatively larger. The rapid reproduction of Moina and Daphnia makes them inexpensive live feeds for small hatcheries and ornamental fish farms.

Bloodworms and Tubifex:

Dr. M. M. Ghughuskar took up the production and use of Tubifex worms and bloodworms in the culture of ornamental fish. Tubifex worms are a good source of protein and are frequently used to condition broodstock and to promote rapid growth of the young. Bloodworms are highly valued for their nutrition and acceptance rate for ornamental carnivorous species. The speaker, however, emphasized the need for hygienic production, proper disinfections, and disease-free culture practices to avoid transmission of pathogens in hatchery systems.

Black Soldier Fly Larvae & Mealworms:

During the workshop, the introduction of the Black Soldier Fly (BSF) larvae and mealworms as alternative sustainable protein sources for aquaculture was highlighted. BSF larvae are efficient bio-converters of organic waste into high-quality insect protein and lipids, endorsing principles of circular bioeconomy and environmentally sustainable aquaculture. Recent studies have shown that insect meals can partially replace fishmeal without any negative impacts on fish growth and health, making them a promising potential ingredient for aquafeeds in the future (Henry et al., 2015; Tacon and Metian, 2015).

Grindal Worms and Microworms:

Shri Rajkumar Koli and Dr. M. M. Ghughuskar conducted the workshop demonstrations on the culture of grindal worms and microworms. They are inexpensive to culture under laboratory or home conditions and are especially useful for feeding juvenile ornamental fish. They are a perfect live food supplement for small hatcheries and aquarium hobbyists, as they reproduce continuously and have a high nutritional value.

Live Feed Enrichment Technologies:

One of the most significant developments in hatchery research has been the introduction of live-feed enrichment methods. Examples of organisms enhanced with emulsified omega-3 fatty acids, vitamins, probiotics, carotenoids, and immune stimulants prior to feeding are rotifers and Artemia. This mechanism greatly enhances survival of larvae, skeletal development, pigmentation, immunological competence, and resilience to environmental stress (Conceição et al., 2010; Radhakrishnan et al., 2020). Deformities have been greatly reduced, and hatchery productivity has improved with modern enrichment protocols, making them an indispensable component of the production of ornamental fishes in commercial hatcheries.

Farmer-Scientist Interaction:

The program featured an interactive discussion between the participants and experts, which was a key element. Farmers, students, and entrepreneurs sought advice on hatchery management, water quality, live-feed culture, disease prevention, and commercialization strategies. Such exchanges help to enhance extension education by translating scientific knowledge into practical technologies that are easily applicable at the farm level. The practical demonstrations helped to improve the participants' understanding by allowing them to see the culture techniques, equipment operation, and feed preparation procedures under the supervision of the experts. This practical approach significantly promotes technology adoption and stimulates entrepreneurship in ornamental aquaculture.

Effect on Ornamental Aquaculture:

The workshop on "Live Feed Production for Ornamental Fish" successfully achieved its objective of strengthening the scientific knowledge and technical skills of ornamental fish farmers, hatchery operators, entrepreneurs, students, and researchers. Participants acquired a thorough knowledge of the production, maintenance, enrichment, and utilization of various live feed organisms, which are crucial to successful ornamental fish breeding and larval rearing, through expert lectures, practical demonstrations, and interactive discussions.

One of the main achievements of the program was the successful combination of scientific research with its application at the field level. The workshop concluded that the sustainability of ornamental aquaculture depends not only on quality broodstock and hatchery infrastructure, but also on the continuous supply of nutritionally balanced live feed. The participants appreciated the hands-on

demonstration on Artemia hatching, microalgae production, rotifer culture, infusoria preparation, and cultivation of Moina, Daphnia, Tubifex, bloodworms, grindal worms, microworms, mealworms, and black soldier fly larvae. These technologies are economically viable for small- and medium-scale hatcheries and can significantly improve the efficiency of seed production (Conceição et al., 2010; Radhakrishnan et al., 2020).

The workshop also promoted diversification into commercial live-feed production as a stand-alone operation. Hatcheries require a continuous supply of live feed organisms, and this production provides good chances for revenue generation, employment, and entrepreneurship, notably for rural youth and fishery graduates. Low-cost culture techniques can reduce hatchery production costs and boost larval survival and fish quality.

The Significance of Fisheries Extension and Capacity Building:

The success of aquaculture is not only dependent on science but also on the successful transfer of technologies to farmers. Fisheries extension initiatives are an important link between research results from the laboratory and commercial production systems. Through seminars, demonstrations, farmer training programs, and interactive conversations farmers can comprehend the scientific principles and apply improved management techniques under local farming settings (FAO, 2024). The Marine Biological Research Station (MBRS), Ratnagiri has been contributing to the fisheries development by way of research, technology validation, training and extension education. The institution continues to strengthen collaboration among scientists, entrepreneurs, students, and farming communities through the organization of programs like the present workshop. The initiatives promote evidence-based decision-making and the uptake of innovative technologies for sustainable aquaculture.

One of the key messages coming out of the workshop was a notion of a “knowledge pilgrimage” where fish farmers could be encouraged to visit universities and research centers regularly to be kept up to date with the latest technological developments. The two-way communication occurs through constant interaction between scientists and farmers so that scientists learn of problems in the field, and farmers receive practical, science-based solutions. This cooperation helps to promote innovation and contribute to the long-term development of fisheries.

Live Feed Production and Blue Economy:

India’s Blue Economy strategy sees fisheries and aquaculture as key enablers of sustainable economic growth, job creation, nutritional security, and rural development. Although the ornamental fish sector is smaller than the aquaculture sector for food fish, it has a significant economic potential due to increasing domestic demand and expanding international trade. Efficient hatchery methods, particularly the generation of live feed, are critical to enhancing seed quality and developing the sector (FAO, 2024).

Environmental advantages of sustainable live-feed production Microalgae, zooplankton and insect-

based proteins such as Black Soldier Fly larvae are helping to recycle resources and reduce our reliance on traditional fishmeal. These approaches are aligned with the concepts of the circular bioeconomy that aims at transforming organic waste into valuable aquaculture inputs with low environmental repercussions (Henry et al., 2015; Tacon and Metian, 2015).

Similarly, developments in live-feed enrichment techniques have improved larval nutrition through the addition of omega-3 fatty acids, probiotics, vitamins, carotenoids, and immunostimulants. Such advances improve growth performance, disease resistance, pigmentation, reproductive success, and overall hatchery production, thus improving the sustainability and profitability of ornamental fish farming (Radhakrishnan et al., 2020).

Significance of Live Feed in Ornamental Fish Hatcheries:

One of the most important stages of ornamental fish production is feeding the larvae. The digestive system of 1st-feeding-stage fish larvae is incomplete, so formulated diets are not efficiently digested. Live feeds are therefore still necessary because they provide easily digestible nutrients, trigger natural feeding behavior through their movement, and contain crucial enzymes that help with digestion (Conceição et al., 2010).

Live feeds, as opposed to artificial diets, provide a balanced supply of proteins, essential amino acids, highly unsaturated fatty acids (HUFAs), vitamins, carotenoids, minerals, digestive enzymes, and beneficial micro-organisms. These nutrients are known to improve growth rate, survival, pigmentation, stress tolerance, and disease resistance during early developmental stages of ornamental fishes (Sorgeloos et al., 2001; Radhakrishnan et al., 2020).

Studies have shown poor nutrition during the larval period may lead to poor skeletal development, delayed metamorphosis, increased mortality, and reduced hatchery productivity. Hence, successful ornamental fish hatcheries depend greatly on a continuous supply of high-quality live feeds throughout the breeding season (Conceição et al., 2010).

Nutrient Requirements of Ornamental Fish Larvae:

The nutritional requirements of the newly hatched larvae are very different from those of juvenile and adult fishes. Larvae need digestible protein (45–60%); amino acids; essential omega-3 fatty acids such as DHA and EPA; vitamins A, C, D, and E; carotenoids for pigmentation; minerals; digestive enzymes; and probiotics that help develop the gut. As these features are absent in many formulated feeds during the first feeding, live organisms are the preferred nutritional source until the digestive tract is fully functional (Conceição et al., 2010).

Future Outlook:

Ornamental aquaculture has a promising future in India with the increasing demand of consumers, growing domestic markets, suitable climatic conditions, and the country's rich biodiversity of freshwater

species. But sustained expansion requires ongoing investment in scientific research, hatchery modernization, farmer training, disease surveillance, and live feed production technologies. Research institutions should work towards developing low-cost live feed culture systems that are suitable for small-scale farmers and promote climate-resilient aquaculture practices. Digital extension platforms, online advisory services, and public-private partnerships can further accelerate technology dissemination and boost entrepreneurship among young professionals entering the fisheries sector.

Cooperative programs between universities, research institutes, government departments, and farmer organizations will be essential in continuing to ensure that scientific innovations reach end users effectively. These integrated efforts would result in better fish productivity, better livelihoods, better export potential, and sustainable development of India's ornamental fisheries sector.

Summary:

The National Fish Farmers Day is not only a celebration of a historical event, but it is also the scientific revolution in Indian aquaculture initiated by Prof. Dr. Hiralal Chaudhuri and Dr. K. H. Alikunhi, who successfully developed induced breeding technology. Their pioneering work established the basis for modern hatchery management and is still benefiting millions of fish farmers all over the country.

The workshop on "Live Feed Production for Ornamental Fish" organized by the Marine Biological Research Station, Ratnagiri, was successfully conducted to translate scientific knowledge into practice through expert lectures, demonstrations, and farmers' interaction. The program emphasized the necessity of live feeds in ornamental fish hatcheries and concentrated on sustainable production technologies, entrepreneurship development, and ongoing capacity building.

Acknowledgments:

The successful organization of the workshop was made possible with the guidance and encouragement of Dr. Sanjay Bhave, Hon'ble Vice-Chancellor; Dr. Atul Mohod, Director of Extension Education; and Dr. Prashant Shahare, Director of Research, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli.

References:

Conceição, L.E.C., Yúfera, M., Makridis, P., Morais, S., and Dinis, M.T. (2010) 'Live feeds for early stages of fish rearing', *Aquaculture Research*, 41(5), pp. 613–640. https://doi.org/10.1111/j.1365-2109.2009.02242.x

FAO (2024) The State of World Fisheries and Aquaculture 2024: Blue Transformation in Action. Rome: Food and Agriculture Organization of the United Nations. https://doi.org/10.4060/cd0683en

Henry, M., Gasco, L., Piccolo, G., and Fountoulaki, E. (2015) 'Review on the use of insects in the diet of farmed fish: Past and future', *Animal Feed Science and Technology*, 203, pp. 1–22.

https://doi.org/10.1016/j.anifeedsci.2015.03.001

ICAR-CIFA (2024) *Annual Report 2023–24*. Bhubaneswar: ICAR–Central Institute of Freshwater Aquaculture, 170 pp.

Jhingran, V.G. (1991) *Fish and Fisheries of India*. Rev. and enl. 3rd edn. New Delhi: Hindustan Publishing Corporation (India), 727 pp.

Radhakrishnan, K.D., AkbarAli, I., Schmidt, B.V., John, E.M., Sivanpillai, S., and Thazhakot Vasunambesan, S. (2020). 'Improvement of nutritional quality of live feed for aquaculture: An overview', *Aquaculture Research*, 51(1), pp. 1–17. https://doi.org/10.1111/are.14357

Lavens, P. and Sorgeloos, P. (1996) *Manual on the Production and Use of Live Food for Aquaculture*. FAO Fisheries Technical Paper No. 361. Rome: FAO.

Lubzens, E., Gibson, O., Zmora, O. and Sukenik, A. (1995) 'Potential advantages of frozen algae (*Nannochloropsis* sp.) for rotifer (*Brachionus plicatilis*) culture', *Aquaculture*, 133(3–4), pp. 295–309. https://doi.org/10.1016/0044-8486(95)00010-Y

Sorgeloos, P., Dhert, P. and Candreva, P. (2001) 'Use of the brine shrimp, *Artemia* spp., in marine fish larviculture', *Aquaculture*, 200(1–2), pp. 147–159. https://doi.org/10.1016/S0044-8486(01)00698-6

Tacon, A.G.J. and Metian, M. (2015) 'Feed matters: Satisfying the feed demand of aquaculture', *Reviews in Fisheries Science & Aquaculture*, 23(1), pp. 1–10. https://doi.org/10.1080/23308249.2014.987209

Tlusty, M.F. (2002) 'The benefits and risks of aquaculture production for the aquarium trade', *Aquaculture*, 205(3–4), pp. 203–219. https://doi.org/10.1016/S0044-8486(01)00683-4