

Patent: Method for enhancing nematodes for their utilisation in aquaculture and aquariums through the use of microorganisms

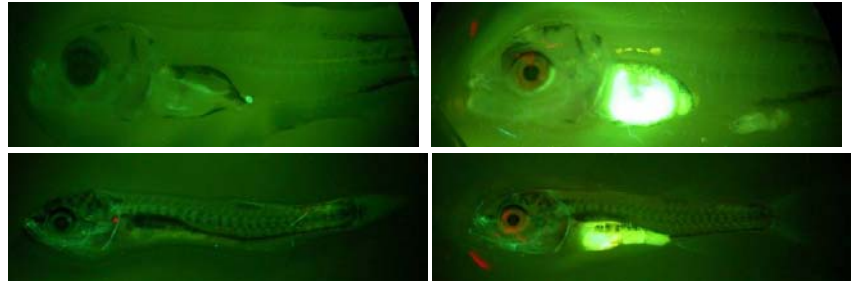
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Description

This invention refers to the use of the nematode *Caenorhabditis elegans* as live food in the larval breeding of species in aquaculture and aquariums, after its enrichment

in essential fatty acids by feeding it with microorganisms producing them. *C. elegans* evidences a series of exceptional advantages when compared with the traditional feeding with artemia and rotifers, because it facilitates the design of a food suitable for the needs of larvae in aquaculture.



Need or problem solved and how

- This patent makes it possible for the nematode *C. elegans*, enriched in essential fatty acids by feeding it with bacteria producing them, to serve as food for cultured aquatic species in their larval phase. Currently, the most popular species in aquaculture is the crustacean artemia, which is not cultured and is captured in large salty lakes and, therefore, its availability is highly irregular and its price is high.
- Nematodes can also be used as part of the fattening food for organisms of interest in aquaculture, once they have completed their larval stage. Currently, foods contain fish meal obtained from fishing activities and, consequently, aquaculture is not sustainable from an environmental point of view. Moreover, in the case of fish requiring diets rich in polyunsaturated fatty acids, food need to be manufactured using marine organisms, such as algae and phytoplankton, that, although indeed cultivable, are hard to include in the diet of most fish of interest in aquaculture because they are carnivorous.
- The invention could also be applied to other nutrients, vitamins, hormones, antibiotics, growth factors or other compounds that are not naturally carried by the nematode.

Advantages/Innovative issues/Competitive advantages

- **À la carte diets:** *C. elegans* is one of the most researched model species because, along with their plasticity, they make it possible to offer customised solutions to the needs of each aquaculture farmer. For instance, *C. elegans* can function as a vector for the provision of vitamins and even for strengthening the immunological system.
- Artemia is an overexploited natural resource and its availability is a limiting factor in aquaculture. *C. elegans* is an alternative and sustainable food that reduces producers' costly dependence on the unstable international artemia market. Furthermore, saline artemia is an invasive species with a significant impact upon ecosystems in contrast to the *C. elegans* nematode, which is a native species to the Iberian peninsula.
- The optimisation of the *C. elegans* culture could make it possible to obtain a high-quality product at a sustainable lower price than that of artemia.
- Artemia is an important vector of pathologies in aquaculture and, consequently, *C. elegans* could **help to reduce pathologies and the international movement of pathogenic organisms.**
- Experts in the field have been able to breed fish larvae in fresh water (zebra fish), as well as gilthead (Sparus aurata) and sea bass (*Dicentrarchus labrax*), by feeding them exclusively with these nematodes.



Types of interested companies

Companies in the aquaculture and aquarium sector