Poster

A way of preserving Caenorhabditis elegans

Juan Carlos Montes Jiménez (1), Manuel Muñoz Ruiz (1)

(1) Centro Andaluz de Biología del Desarrollo (CABD), Universidad Pablo de Olavide, Ctra. de Utrera, Km 1, 41013 Sevilla.

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ABSTRACT

Aquaculture is a "breeding" of recent implantation that needs many improvement processes. One of the problems that arise is the feeding of fish larvae, which need live food. It has been proven that these fish larvae can be fed from the Caenorhabiditis elegans nematode, which is easy to grow. In order to carry out the industrial application it is necessary to develop a method in which the nematodes are kept as long as possible, thus ensuring their survival. All this to be able to transport them efficiently. (Brüggemann, 2012).

One of these methods can be dehydration from salts. In C. elegans the larval stage known as dauer survive desiccation after preconditioning, which consist in a reduction of humidity for several hours (Erkut et al. 2011, Erkut et al. 2013, Honnens et al.2013). It has also been shown that C. elegans can uptake trehalose from the medium increasing resistance to stress. In addition to the trehalose another method to improve the adaptation to stress is that C.elegans is in the larval Dauer state. Another method of preservation that is used is the freezing of these nematodes (WormBook.org).The keys to a successful freeze are using animals at the correct stage of development, the addition of glycerol to the freezing media, and a gradual cooling to -80°C. Freshly starved young larvae (L1-L2 stage) survive freezing best. A 15% final volume of glycerol in the freezing solution is used. Finally the C.elegans are defrosted at room temperature.

To observe the results of the dehydration method, we must hydrate the nematodes with M9 solution and see what their survival rate is. For now with this method the results are not totally satisfactory since the nematodes hold very little time in dry state. If you want to observe the results of the survival rate of thawed worms, you have to transfer them to a nutritious medium at a temperature of 20ºC and after 24 hours you count the survival rate of these worms. The results of the thawing is around 10% after a 4 month period.

Although the performance of both experiments are not totally satisfactory at the moment, we will try to improve the methodology used to obtain higher survival rates in a longer time in a preserved state. The objective of this work is to find the method and the most effective way to develop the preservation method that obtains the best survival rate and for the longest time.

REFERENCES

Brüggemann, J., 2012. Nematodes as live food in larviculture — a review. J. World Aquacult. Soc. 43, 739–763

Erkut C, Penkov S, Khesbak H, Vorkel D, Verbavatz JM, Fahmy K, Kurzchalia TV. Trehalose renders the dauer larva of Caenorhabditis elegans resistant to extreme desiccation. Curr Biol. 2011 Aug 9;21(15):1331-6

Erkut C., Andrej Vasilj, Sebastian Boland, Bianca Habermann, Andrej Shevchenko, Teymuras V. Kurzchalia. Molecular Strategies of the Caenorhabditis elegans Dauer Larva to Survive Extreme Desiccation. PLoS One. 2013

Honnens,H., Assheuer, T., Ehlers, R.-U., 2013. Desiccation and storage of Panagrolaimus sp. (strain NFS-24-5). Nematology 15, 557–566.

Hu P, (2007) WormBook, ed. The C. elegans Research Community, WormBook, doi/10.1895/wormbook.1.7.1, http://www.wormbook.org