

Huner, J. V. 1994. Use of bilateral eyestalk ablation to enhance crawfish molting. In R. Reigh (editor) Pages 44-45 in Proceedings of the Louisiana Aquaculture Conference, Baton Rouge, La., LSU.

USE OF BILATERAL EYESTALK ABLATION TO ENHANCE CRAWFISH MOLTING

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Introduction

The crawfish molting cycle is controlled by hormones produced by paired organs called y-organs located behind and below the eyestalks and paired organs called x-organs located in the eyestalks. The y-organs produce the molting hormone called ecdysterone, a steroid compound. The x-organs produce a molt inhibiting hormone, a peptide compound, which is stored in sac-like sinus glands near the x-organs.

Removal of both eyestalks at their bases is called bilateral eyestalk ablation. This removes the source of molt inhibiting hormone and induces intermolt crawfish to molt within 6-10 days when temperatures are 75-85°F. This applies to both red swamp crawfish, Procambarus clarkii, and white river crawfish, Procambarus zonangulus. The operation is more effective in immature crawfish than it is in mature crawfish.

There is much interest in using bilateral eyestalk ablation to produce soft-shell crawfish because system turn-over time is increased roughly 8-fold. It normally takes about 40 days for an immature crawfish introduced into such a system to molt.

Practical Application

Bilateral eyestalk ablation is a labor intensive process. However, our collaborators, Drs. Ronald Malone and Shulin Chen, at Louisiana State University have modified a pair of fine-tipped needle nose pliers to permit an individual to remove both eyestalks almost as fast as the crawfish can be picked up. Since most crawfish in soft-shell systems must be checked by hand anyway, there is not much added labor involved.

Some people object to "blinding" crawfish even though the operation appears to be without pain and the crawfish immediately begin to feed. As a result, our collaborator, Dr. Milton Fingerman, at Tulane University is working to develop a laser system to destroy the x-organs and sinus glands without having to physically remove the eyestalks. His results have been encouraging to date and Drs. Malone and Shulin are confident that laser neutralization of the x-organs and sinus glands can be automated.

We have found that the success of the ablation process can range from 25-90%. Success is inversely proportional to the mortality rate of the non-ablated crawfish in our experiments. That is, if the mortality rate of non-ablated crawfish is high, the success of the ablation process in producing soft-shell crawfish will be low. Therefore, anyone considering use of bilateral eyestalk ablation should hold crawfish for several days before ablating them. If mortality is high, the group should not be ablated. Note that this has been the experience of commercial soft-shell crawfish producers who have experimented with the ablation process.

While most crawfish molt during the day, ablated crawfish may molt throughout a 24 hour period. However, most molt on the 7th and 8th day after ablation, so operators can prepare for a large number of molts if they are using batches of ablated crawfish.

Ablated crawfish eat quite a lot. They are roughly 130% larger than untreated controls. This is a real increase in tissue mass and not simply swelling due to water uptake.

Should you use eyestalk ablation to produce soft-shell crawfish?

We advise anyone considering this option to experiment with it on a small scale. Preferably, throughout an entire production season. If satisfactory results are achieved, it can be used the following season. It is probably a viable option only with immature crawfish.

Acknowledgments

This work has been funded primarily by the Louisiana Sea Grant College Program whose assistance is acknowledged with great appreciation.