

Policy on the Use of Clove Oil for Anesthesia and Euthanasia University of Notre Dame IACUC

The IACUC, in consideration of the endorsement of the Guidelines for the Use of Fishes in Research by the American Fisheries Society, American Institute of Fisheries Research Biologists, and the American Society of Ichthyologists and Herpetologists on the use of Clove Oil anesthesia, will not permit its use in any field studies.

The IACUC will review proposed Clove Oil use as an anesthetic on a case by case basis in fish that will not leave the laboratory and will not be used for human or animal food.

Clove Oil has been used at the following concentrations:

50 mg/L water for salmon¹

1 ml/gallon water for carp²

10 mg/L water for trout³

The efficacy and safety range of Clove Oil varies according to age, size and species of fish in addition to the concentration and purity of the Clove Oil.

Commonly used and approved anesthetics for fish include⁴:

Benzocaine – 1 ml stock solution (10g Benzocaine powder dissolved in 100 ml 95% Ethanol) per 1 liter tap water. Immerse to effect.

MS-222 (Tricainemethanesulfonate) – 1 to 3 g /L tap water buffered to pH 7.0 – 8.0 with sodium bicarbonate (1 – 4 g/L). Immerse to effect

2-phenoxyethanol – 0.1 to 0.5 ml/L tap water. Immerse to effect.

CO₂ from bottled soda water – For immobilization only, immerse to effect.

The IACUC recognizes that Clove Oil has been used as an anesthetic agent in fish. Clove Oil appears to be an effective anesthetic in some fish species,¹ but is not currently approved by the Food and Drug Administration as a fish anesthetic.⁵ Because it has not been approved by the FDA, the 2004 Guidelines for the Use of Fishes in Research states that Clove Oil in any form must not be used on any fish “that could possibly be consumed by humans, even if that treatment occurs in a laboratory setting. This includes endangered species or species that otherwise may be released into public waters where they would be available for human consumption.”⁶ The AVMA Panel on Euthanasia⁷ specifically states that Clove Oil is Not Acceptable as a euthanasia method.

The IACUC prohibits Clove Oil as a euthanasia agent for all species of fish.

1. Woody, C. A., J. Nelson, and K. Ramstad. 2002. Clove oil as an anaesthetic for adult sockeye salmon: field trials. *Journal of Fish Biology* 60:340-347.

2. Koi Health, 2006, 2007. <http://www.koihealth.org/index.html>

3. Velisek, J., Svobodova, Z., Piackova, V. Effects of Clove Oil Anaesthesia on Rainbow Trout. *ACTA Vet. BRNO* 2005, 74: 139-146

4. UND IACUC Policy Guide for Anesthesia and Analgesia of Laboratory Animals, 2008.

5. U.S. Department of Health and Human Services, Food and Drug Administration, Center for Veterinary Medicine: FDA Guidance 150 Concerns Related to the Use of Clove Oil as an Anesthetic for Fish, April 24, 2007 www.fda.gov/cvm/Guidance/guide150.pdf

6. UFR (Use of Fishes in Research) Committee. 2004. Guidelines for the Use of Fishes in Research. American Fisheries Society, Bethesda, Maryland. pp 38-39.

7. 2007 AVMA Guidelines on Euthanasia, September 15, 2008. http://www.avma.org/issues/animal_welfare/euthanasia.pdf