

**DRUG RESIDUES IN CHANNEL CATFISH:
METHYLENE BLUE, ACRIFLAVINE, AND
MALACHITE GREEN**

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The organic dyes methylene blue, acriflavine, and malachite green have been used for treatment of parasitic and fungal infections in fish. Although not regulated for food fish use in the United States, these drugs are widely marketed for treatment of external infections in ornamental (non-food) fish. The potential for misuse of these compounds in aquaculture prompted our studies of their absorption, tissue distribution, and elimination in channel catfish. Analytical methods were developed for determination of residues in the edible flesh. Animals were treated by bath exposures as follows: methylene blue, 1 and 5 ppm for 1 h; acriflavine, 10 ppm for 4 h; and, malachite green, 0.8 ppm for 1 h. Methylene blue and acriflavine were slowly absorbed and distributed in the muscle of catfish during treatment; residue concentrations in muscle (primarily parent drug) were <1% of the initial exposure levels. In contrast, malachite green was extensively absorbed and concentrated in the tissues. The rate of accumulation was directly related to pH of the exposure water. Malachite green was rapidly and extensively metabolized to its reduced, colorless form leucomalachite green. Leucomalachite green was slowly eliminated from muscle with a half-life of 10 days.