

The use of antibiotics and disinfectants in ornamental fish farms of West Bengal, India

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Keeping of ornamental fish as pet is becoming a popular hobby in the world, next only to photography. About 7.2 million houses in the USA and 3.2 million in the European Union have an aquarium, and this number is increasing day by day. Ornamental fish farming is also growing to meet this demand. In India, the state of West Bengal plays the pioneer role for production of ornamental fishes. The ornamental fish trade also helps, to some extent, in improving the socioeconomic condition of rural people and in upliftment of the condition of rural women in India. A rich diversity of fish fauna, low investment in the business, cheap labor, easy distribution channel and export centers in the adjoining areas of Kolkata help the business to improve most. However, instead of a high demand in foreign markets, the business is a “neglected trade” in the state due to the huge losses faced by culturists by various disease outbreaks. The poor culturists now use various chemicals or disinfectants and antibiotics to get rid of the disease outbreaks.

The commonly used chemicals, used as disinfectants, are formalin, malachite green, potassium permanganate and methylene blue and antibiotics are oxytetracycline, erythromycin, chloramphenicol and nitrofurans. Most of the farms use chloramphenicol, followed by oxytetracycline and erythromycin. These chemicals are used to eliminate the pathogenic problems as, e.g. chloramphenicol,

oxytetracycline and erythromycin for treating the bacterial diseases and, to some extent, parasitological diseases. Formalin, malachite green, potassium permanganate and methylene blue are used to treat the fungal and parasitological diseases. The chemicals are effective mostly prior to the infection or at the preliminary stages of the infection. Mostly, the farmers used prophylactic treatment measures based on eye observations of clinical signs. The Food and Drug Administration (FDA)^[1] legalized five drugs/chemicals in the US aquaculture, such as Oxytetracycline, Sulfamerazine, Ormetoprim, Formalin and Tricaine methanesulfonate. The FDA also legalized the following drugs for use as animal drugs: Tricaine methanesulfonate, Formalin-F, Paracide-F, Parasite-S, Romet 30, Sulfamerazine in Fish Grade, Terramycin-200, Chorulon, Hydrogen peroxide, Aquaflor, Aquaflor-CA1, TERRAMYCIN-343 and Oxytetracycline HCl for fish.

The antibiotics chloramphenicol (mostly used in the farms) and nitrofurans are banned worldwide for use in the production of foods because of their serious side-effects. Chloramphenicol may cause fatal aplastic anemia and nitrofurans are classified as carcinogens.^[2-4] Aftab Uddin *et al.*^[4] reported to control the uses of antibiotics in fish farms due to the risk of development of resistant bacteria. When the bacteria have acquired resistance, it is impossible to get rid of them with antibiotics that caused the resistance. Malachite green is a respiratory poison reported by Dieberg and Kiattisimkul.^[5] In water, potassium permanganate is quickly transformed into non-toxic manganese dioxide, which precipitates out. It is toxic for phytoplankton, as reported by Gräslund and Bengtsson.^[5] Formalin can develop a white precipitate of paraformaldehyde, which is more toxic than pure formalin. The disinfectants were drained in the local water bodies,

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Quick Response Code:	Website: www.jnsbm.org
	DOI: 10.4103/0976-9668.92311

creating pollution. The problems can be eliminated by implantation of laws to control the hazardous drugs. The farms may use procedures to avoid introduction of diseases in fish by regular water quality management, probiotics or other herbal medicines with fewer side-effects. If the farms are infected with diseases, the fish must be treated with approved chemicals.

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How to cite this article: Chanda M, Paul M, Maity J, Dash G, Gupta SS. The use of antibiotics and disinfectants in ornamental fish farms of West Bengal, India. *J Nat Sc Biol Med* 2011;2:139-40.

Source of Support: Nil. **Conflict of Interest:** None declared.

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