

Clinical Reports

Hikkui Disease in Koi (*Cyprinus carpio*)

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Abstract—Hikkui disease causes skin lesions in nishikigoi (koi), a domesticated variety of the common carp. The disease occurs primarily in Kohaku, Sanke, and Showa (red and white, and red, black and white) color varieties of koi. These color varieties have a significant amount of Hi (red) pigmentation. Ogon, chagoi, karasu and other color varieties lacking red pigmentation in the same pond with affected koi are not affected. The disease typically starts in the red colored areas of the skin, but can spread into other colored skin regions (especially the white area). A variety of possible etiologies have been suggested, but no definitive cause has yet been identified. Fish rarely die from the primary skin lesions, which often heal with skin coloration changes. Topical treatments tend to hasten healing of the skin lesions, but even without treatment they often regress spontaneously. Seasonal recurrences are common.

Key words—koi, nishikigoi, carp, skin lesions, hikkui.

Introduction—This is a skin disease of Nishikigoi fish (koi) that causes epidermal inflammation, hyperplasia and erosion. Originally it was called “Hi Kui Wa-mu” by the Japanese koi breeders because the red color on the fish’s skin was eaten away. In Japanese this literally means the “red eating worm.” It was shortened to one word: Hikkui, with the double ‘k’. Hikui spelled with one ‘k’ is a different word and means “short” in Japanese!

Case Description—The disease starts as epithelial hyperplasia (Figure 1), especially on red pigmented skin. The skin becomes thickened, sometimes hemorrhagic, and then sloughs off. The skin can become discolored and scarred, and pigmentation can change. Red areas often become white, but white areas can also become pigmented with erythrophores. Lesions may clear spontaneously and recur periodically in the same fish.



Figure1 - hyperplasia of epithelium on koi operculum.

Signalment & History: Both male and female koi are affected. Lesions rarely occur on belly or low on sides, most common on dorsum and top of head. Hyperplasia is an abnormal increase in the amount of the cells of a tissue causing it to increase in size. It may be due to any number of causes including chronic inflammation, infections or neoplasia. In Hikkui, lesions start with epidermal hyperplasia but progress to skin erosion and ulceration. Unlike the raised lesions of Carp Pox (*CyHV-1*), the Hikkui lesions can be scraped off easily. There is often hemorrhage or erythema associated with the skin lesions.

Differential Diagnoses:

Infectious:

- Parasites - “Red-eating worm”
- Protozoa
- Fungus – dermatophytes or aflatoxins
- Bacteria
- Virus– herpesvirus

Environmental: toxins, sunburn, nutritional, poor water quality, high organic load

Neoplasia: skin cancer, fibrosarcoma

Genetic (Hereditary)-Inbred susceptibility

Clinical Evaluation: Figure 2 shows typical skin lesions and change in coloration (loss of red pigmentation).



Figure 2 - red areas turning white and hemorrhagic sore.

Clinical Test Results: Skin scrape examinations and biopsies sent for histopathology on affected tissues have found no signs of bacteria, fungi, parasites or protozoa. Secondary bacterial or fungal infections could possibly occur on the damaged, necrotic skin of untreated Hikkui wounds. However, bacteria or fungi have not been found on the skin scrapes of these lesions, or grown in bacterial culture from the lesions. Even using special histopathology stains has not found them. Tissue samples submitted for PCR DNA testing for Koi Herpesvirus (*Cyprinid Herpesvirus-3*) were negative.

Treatment Options: Skin hyperplasia can be wiped off with cotton balls. The skin is then treated with any topical disinfectant. Many medications have been tried with equal results. Antibiotic injections are given to prevent secondary infections. Healed skin lesions often recur.

Discussion & Conclusions—No conclusions yet on this disease! Please send your comments and suggestions to me at: Saint-Erne@Q.com.