An Episode of Bacterian Haemorrhagic Septicemia with Supraacute Course in Ciprinides in a Farm in Iasi County, Romania

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Abstract: Bacterian haemorrhagic septicemia of ciprinides is caused by *Aeromonas* sp. bacteria, in association sometimes to *Pseudomonas* sp. bacteria.

A semiintensive production farm in Iasi county was taken in study; the fish affected by the disease were the carp and the crucian.

Disease course was supraacute, standing pale gill, intense spots, flushing, lepidortosis, lack of scales and ulceration.

Samples were taken for bacteriological and histopathological examinations, identifying bacteria of the genus Aeromonas; lesions of the skin consisted of balloonizing dystrophy in association with the dermal hemosiderinoverload epidermal cells.

On the histological examination a lymphohystiocytic infiltration of the bowel mainly of the chorion with diffuse character; we also observed a chorionic ectasia and subserosal lymphatic vessels bowel.

Histological examination of liver revealed balloonizing dystrophy of the hepatocytes.

Hepatic congestion and interstitial edema were noticed. In some cases, interstitial edema was located exclusively at the periphery of the biliary ducts.

Key words: carp, crucian-carp, *Aeromonas*, lesions.

INTRODUCTION

*Aeromonas* is among the most common bacteria in freshwater habitats throughout the world and these bacteria frequently cause disease among cultured fishes. Noga (2000) and Ferguson (2006) describe that fish skin consists of a stratified epithelium without keratin pavements but the surface epidermal cells are viable and have the ability to divide.

It is the predominant bacteria isolated from the hemorrhagic lesions and necrotic ulcers in fish skin (Pathiratne et col. (1994)). Bacterial infection of fish constitutes a huge menace for aquaculture farming, leading to disastrous economic loss and health risks for the consumer (Lau, 2007).

The litterature also describes that diseased fish gathers around the shore, slowly swims and shows bleeding at the base of the swimming fins, on the surface of the body and on the palatal mucosa. Gills are pale. Hyperemic spots appear at the surface of the skin. The scales get loose and fall, leaving the open derm; it is just now that variable size ulcerations appear, that can go deep into the muscles; affected areas are quickly invaded by fungi.

Besides these external lesions, changes of the interna organs can be noticed, consisting of haemorrhages, an increase in size of the spleen and of the kidney, a congestion of the liver...
that also shows necrotic areas. (Austin, 2006; Guguianu, 1998; Robert and Moeller Jr., 2008; Vulpe, 1992).

The causal agent of the disease is still under discussion, most of the authors claiming that the disease is caused by mobile species of Aeromonas, especially Aeromonas hydrophila, while others say that Pseudomonas fluorescens is involved (Munteanu and Bogatu, 2003).

**MATERIALS AND METHOD**

The research was performed on samples obtained from 35 crucian carp (Carassius auratus gibelio) and carp (Cyprinus carpio) one summer patients, ranging in size from 15-30 cm, which were subjected to bacteriological and histopathological investigations.

Microbiological examination was performed on blood prelevated from the heart and the liver, seeded on nutritive gelose.

We prelevated fragments of 5 mm from the modified areas and from the internal organs. These samples were fixed in formaldehide 10% and then in Bouin, paraffine embedded, sectioned and stained in Haematoxilin – Eosin – Methylene Blue.

**RESULTS AND DISCUSSIONS**

During april – may 2011, Farm A observed cases of crusian and young carp swimming in crowda at the shores of a pond.

Clinically, a lack of reaction was noticed, and the fact that they were swimming at the surface of the water, with wide open operculae.

Affected fish presented areas of localized, different sized erythema, contrasting with the pale gills. The most affected areas were at the base of the finns, with the apparition of small size ulcers. In some of the individuals, fungi were noticed on the surface of areas with erythema. (Fig. 1, Fig. 2).

When opening the abdominal cavity, the internal organs were highly increased in volume, turgescent, moist, shiny, red and with an increased consistence. (Fig. 3).

Microbiological examination showed that from the blood from the heart and liver of the examined fish, smooth slightly brown colonies developed, that were identified as pure cultures of Aeromonas hydrophila (Fig. 4).

Histological examination of the fragments prelevated from the skin showed a bolinizind dystrophy of the derma, associated with an overload with haemosiderin of the epidermic cells. (Fig. 5, Fig. 6, Fig. 7).

The examination of somatic muscles showed interstitial edematous infiltrations, interfascicular and interfibrilar. Muscle fibers are dissociated by the edematous infiltrate. (Fig. 8).

Subcutaneous adipose tissue showed lymphohystiocytic infiltrations. (Fig. 9).

Histological examination of the liver showed a balonizing dystrophy of the hepatocytes. Structurally, the lesion consisted of tumefied cells, with a fine citoplasm, necrobiotic nuclei and vacuoles. Empty hepatocytes contained a proteic filamentous material. Tructurally, there is a severe, irreversible of the membranes of the hepatocytes and of their organites. (Fig. 10).

Besides this lesion, we also noticed hepatic congestion and interstitial edema. In some cases, interstitial edema was localised exclusively at the periphery of biliary ducts. (Fig. 11).

Histological examination of the intestin showed lymphohystiocytic infiltration of the chorion, either localised or diffuse. (Fig. 12, Fig. 13, Fig. 14). We also noticed the ectasy of the lymphatics in the chorion and intestinal subserosa. (Fig. 15, Fig. 16).
Identification of the Aeromonas strain in the heart proved septicemia, explaining the fast evolution of the disease and the lesions in the liver and intestin.

Fig. 1. Golden carp with small bleedings placed on flipper basis

Fig. 2. Diffused skin bleedings on golden carp

Fig. 3. Edematose aspect of internal organs

Fig. 4. Aspect of Aeromonas hydrophila cultures on nutritive jell after 24 hours of incubation at 25°C

Fig. 5. Skin. Cutaneous ply with superficial edematose infiltrations Col. HEA, x100

Fig. 6. Skin. Flakes. Edematose and hypodermic infiltrations between flakes Col. HEA, x 100
Fig. 7. Skin. Superficial hemosiderosis. 
Col. HEA, x 200

Fig. 8. Skin and somatic muscle. Edematose hypodermic and intrafascicular infiltrations. 
Col. HEA, x 100

Fig. 9. Body surface. Cellular lymphoma histological infiltrations in the hypodermic adipose tissue. 
Col. HEA, x 100

Fig. 10. Liver. Hydric hepatosis (bloating). Hepatocytes filling. Col. HEA, x 400

Fig. 11. Liver. Hydric Hepatosis (bloating). Edematose infiltrations of biliary channels. Congestion. Col. HEA, x 400

Fig. 12. Intestines. Parietal thickening through diffuse hyperplasia. Col. HEA, x100
CONCLUSIONS

- The etiological agent of this bacterian haemorrhagic septicemia, *Aeromonas hydrophila* was identified through classic bacteriological examination.
- Histologic examination of the skin fragments showed balonizing dystrophy of the derm, associated with an overload with hemosiderin of epidermic cells.
- Histologic examination of the intestin showed a lymphohystiocytic infiltration of the chorion, diffuse or focalised, and the ectasy of the lymphatics in the chorion and the intestinal subserosa.
- Histological examination of the liver showed balonizing dystrophy of the hepatocytes, congestion and interstitial edema. In some cases, interstitial edema was localised only at the periphery of biliary ducts.
- Identification of *Aeromonas* strain in the heart showed the septicemia, explaining the fast evolution of the disease and the internal lesions in the liver and intestin.
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