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NOTE

Karyomegaly in *Baryancistrus* sp. (Loricaridae) from Amazonian Brazil

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ABSTRACT: Vesicular karyomegaly of the liver hepatocytes is described from *Baryancistrus* sp. (Loricaridae), in 3 out of 7 fish, collected from Rio Xingu in central Amazonian (neutral water) Brazil and kept about 2 wk in a holding facility fed with acid water (pH 5.0 to 5.5). Altered cells also occurred in the gill epithelium. The vesicles in the liver were shown to contain a periodic acid-Schiff (PAS)-positive substance or residue.

KEY WORDS: Vesicular karyomegaly · Hepatocytes · PAS-positive residue · Gill epithelium · *Baryancistrus* sp. · Loricaridae · Brazil

Aberrant nuclei have been reported in the hepatocytes of several fish. In striped bass and in salmon, this condition coincided with megalocytic hepatopathy and was linked to toxic environmental factors (Kent et al. 1988, Groff et al. 1992). In arctic char, the vesicular enlargement was shown to result from glycogen storage in the nuclei in fish exposed to acid waters (Hofer et al. 1997). The present note describes a case report of karyomegaly among wild-caught neotropical loricarid (plecostomid) catfish, 2 wk after being stocked into an aquarium holding system.

Materials and methods. Loricarid fish, an unidentified species of *Baryancistrus* ('large white-spotted gold nugget') were collected for the ornamental fish trade in the neutral waters (~pH 7.0) of the Xingu river, in the central Amazon region. They were brought to a fish-holding facility near Manaos, which is fed by acid water (pH 5.0 to 5.5) from the riverine source of the Rio Negro system. Fish were examined within 2 wk of being brought to the depot. Fish were fed on fishmeal-based paste with vitamin-mix additive (~45% protein). Food consumption of acclimatizing fish was low-to-none. At necropsy, fish were seemingly in sound clinical condition and in reproductive interface. Small (2 to 4 mm^3) segments of the fish tissue were fixed for histology in 10% neutral-buffered formalin and embedded in glycol methacrylate medium (GMA, Agar Scientific Ltd, UK). Sections (2.0 to 3.0 µm) were cut in a Sorval JB4 glass-knife microtome and stained with Meyer's haemalum eosin (H&E) and by periodic acid-Schiff solution (PAS).

Results. Karyomegaly was found in livers of 3 out of 7 examined fish. Many hepatocyte nuclei were enlarged and vesicular, with their nucleoplasm and nucleolus displaced to the margins. Nuclei at early stages of their transformation, which were not yet enlarged, developed small or compartmentalized vesicles (Figs. 1 & 2). The vesicular nuclei contained variable amounts of PAS-positive deposit, usually residual. The small vesicles, in the not yet enlarged nuclei, retained heavy a PAS-positive deposit. Limited karyomegaly also occurred in the gill epithelium (Fig. 3) of the same and 1 additional fish without changes in the hepatocytes. The karyomegaly coincided with very limited or no megalocytosis. In 1 fish, karyomegaly coincided with proliferative sphaerosporosis in the blood and kidneys (see Fig. 1; Paperna & DiCave 2001).

Discussion. The ethiology of the described pathology remains unclear. Exposure to toxic factors is not likely to be relevant in the present case, where fish were obtained from a pristine natural habitat and kept

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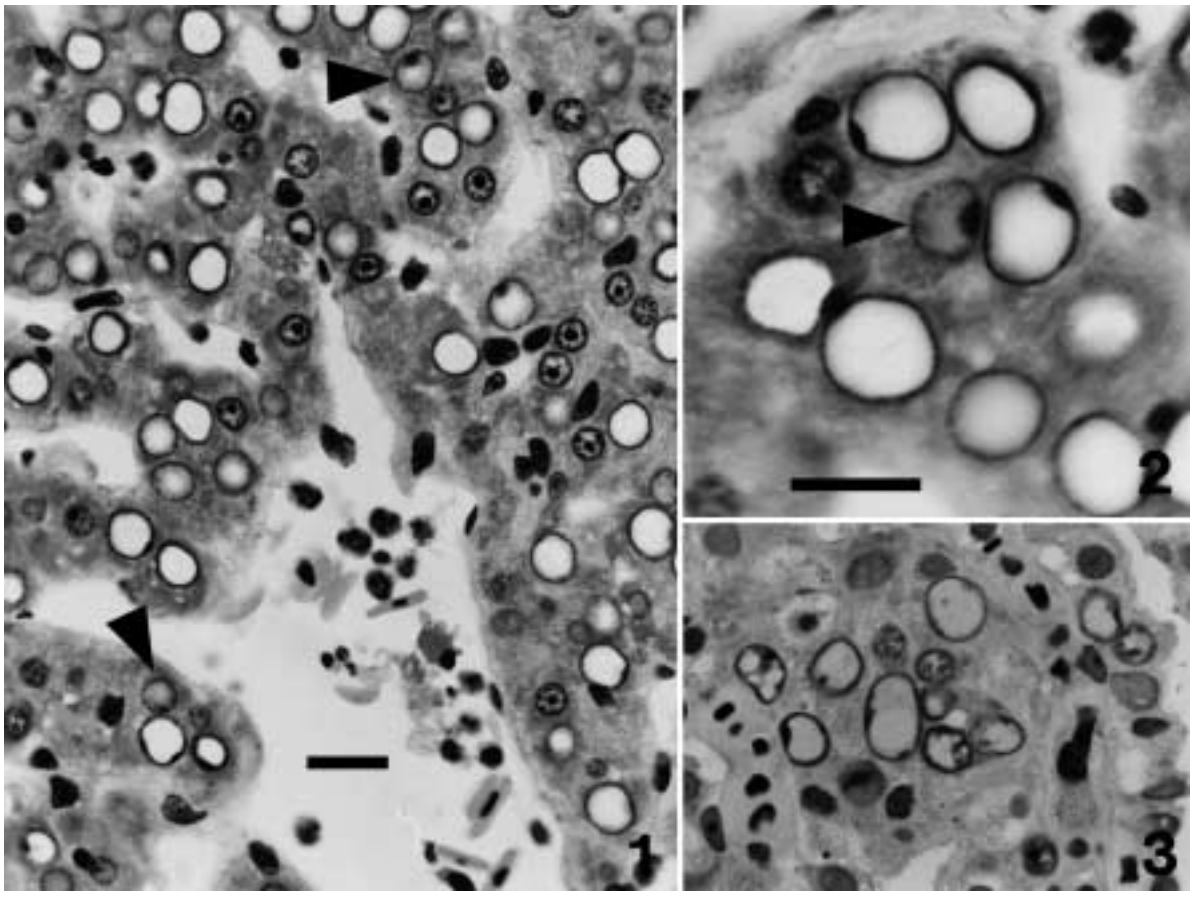

Figs. 1 to 3. Fig. 1. Karyomegaly in the liver of *Baryancistrus* sp. Arrowheads: nuclei at early stages of their transformation. (H&E). Fig. 2. Enlarged view of affected nuclei (H&E). Fig. 3. Vesiculate nuclei in the gills of *Baryancistrus* sp. (H&E, same magnification as Fig. 1). Scale bars = 10 µm

in an open system fed by a rain-forest riverine source. Furthermore, only 3 out of 7 fish, kept in the same aquarium, developed such liver pathology (and none of the histologically examined 26 fish species of diverse families from this facility; authors' unpubl. data). Vesicular nuclei in char hepatocytes with PAS-positives deposit were linked to life in acidic water (Hofer et al. 1997). We have neither sufficient circumstantial evidence nor controlled observations to link the presently reported histopathology, as similar it may be, to the condition in char exposed to acid waters. Fish were exposed for a relatively short time and at entirely different ambient temperatures (arctic vs tropical, i.e. 24 to 28°C).

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