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*LETTER TO THE EDITOR*

# ARE FRESH WATER FISH SAFE TO EAT ?

Sir,

( Received on September 17, 2007 )

Fish are widely consumed as a staple food source and rich supply of protein throughout the world. Rivers and waterways are beset with many industrial effluents and pollutants, and accumulation thereof (especially heavy metals) in fish tissue is a real possibility. In this regard, two species - *Clarias gariepinus* (Pisces: Clariidae) (African catfish) and *Rutilus rutilus* (Cyprinidae: Rutilus) (Roach) – may be considered.

*Glorias gariepinus* is a common fresh-water fish found in many river systems in Africa and India, and it is widely consumed there. The literature currently includes a number of studies of the ecology of the fish and adaptations during periods of desiccation and fasting (1, 2). It is also able to thrive in extremely polluted waterways (3). There are reports that in the vicinity of mining complexes, mercury containing effluent results in accumulation thereof in *Glorias* (4) posing potential risks to human health following the consumption of fish contaminated with mercury (5). Similarly, cadmium, vanadium, nickel and other heavy metals concentrating in the water accumulate in the kidney, the gills, the liver and the gut of the catfish and may result long-term health consequences to people who eat the fish (6–8).

*Rutilus rutilus* is one of the most popular whitefish found in the Northern Hemisphere. It is extensively distributed in central Europe and is found in ponds, reservoirs, wet docks, slow rivers, streams and canals. It commonly consumes molluscs, midge larvae and trichoptera (9). Its massive abundance and ability to tolerate poor quality water implies that it is a common fish caught by anglers and therefore eaten. It is therefore a fish commonly exposed to industrial pollutants. In fact, Roach consumption in Europe has been associated with high levels of lead, cadmium and mercury (10, 11). One study of lakes into which mercury extraction elements in gold extraction are pumped as contaminated aquatic sediment, demonstrated low levels of mercury in fish (12). This possibly suggests a significant seasonal, dilutional effect of large water reservoirs. Mercury content in hair samples taken during the dry season was higher than in the wet season, due to increased fishing and sale of fish during the former period (13).

Available information indicates serious toxicological consequences of heavy metal accumulation in fish. For instance, the major source of chromium exposure is through food, the heavy metal having a high absorptive capacity in the gut (14). Fish may react via attenuated survival and growth particularly at chromium concentrations exceeding 10 µg/L (14). Vanadium toxicology (ca. 10 mg/L) in fish is associated with elevations of muscle and tissue lactic acid together with attenuated pyruvic acid suggesting major disruptions in aerobic metabolism (8). In particular, heavy metals disrupt metabolic reaction in the liver interfering with the utilisation of glycogen stores and potentially depriving fish of vital energy reserves during seasons of food scarcity (15).

Still, unfortunately and primarily due to ecology, economy and government policy, contaminated catfish and roach are consumed as a cheap source of protein in many parts of the world. The long-term consequences of this on one's heath and quality of life are real issues that need to be addressed.

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