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MbiSa Congo : Fish diversity in the Congo Basin

TOWARDS ITS CONSERVATION AND SUSTAINABLE MANAGEMENT THROUGH THE ELABORATION OF COLLABORATION, CAPACITY BUILDING AND KNOWLEDGE SHARING

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Introduction

- The Congo basin

With a surface area of over 120 times Belgium, the Congo basin is by far the largest of the African continent. With 1250 valid species described (Snoeks *et al.*, 2011), it harbours the most species rich ichthyofauna of the continent, thought large parts of its fauna remain unexplored.

- The protected areas

Since their conception, the protected areas within the basin have principally been delineated in order to protect the terrestrial fauna of large emblematic mammals. Consequently, their ichthyofauna, has often been neglected as witnessed by (1) the absence of a specific management plan and (2) the persistent perception of fish as a mere resource and not as a subject of conservation.

- Human impacts

Various kinds of human impacts - deforestation, mining, introduction of exotic species, dam building, the use of mosquito nets, etc. - are becoming problematic even within these protected areas. Moreover, due to the dwindling of the bushmeat caused by intensive hunting and poaching, the pressure of the fisheries on the ichthyofauna has steadily increased (Nasi *et al.*, 2008).

MbiSa Congo

- Presentation of the project

The MbiSa** Congo project (2013-2018), is a North-South collaboration project (administered by the RMCA) comprising seven local partners: one partner from Burundi, five partners from the Democratic Republic of the Congo, and one partner of the Republic of the Congo. The project studies the ichthyofauna of 10 protected areas (see map Fig. 1), all situated within the Congo basin.

In order to consolidate the local expertise in African ichthyology, five DEA and four PhD students – one on the local level (DRC) and three at the KU Leuven (Belgium) – have been integrated in the project. Further, study visits to the RMCA have also been incorporated for all partners.

** The name MbiSa Congo derives from « Mbisi », meaning 'fish' in Lingala and « Samaki » also meaning 'fish' but in Swahili; the two most widespread languages throughout the Congo basin.

- Objectives of the project

The project's objectives are: (1) establish an inventory of the ichthyofauna of these protected areas, which is often poorly studied; and (2) carry out basic ecological studies through standardised sampling. A guidebook to the fishes of each of these protected areas will be compiled, including the current state of affairs on threats and conservation, and guidelines for conservation and sustainable management of their exceptional natural diversity.

Fig. 1a. Imboulou Hydroelectric Dam on the Léfini River (LFR) .

Fig. 1b. Introduced cichlid, *Haplochromis* cf. *aeneocolor*, from the Bango River (neighbourhood OWR) .

Fig. 1c. Illegal, semi-industrial, mining activities on the Ituri River (OWR).

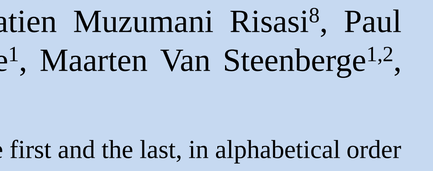

Fig. 1d. A new sawfin barb, from the Luka River (KBNP).

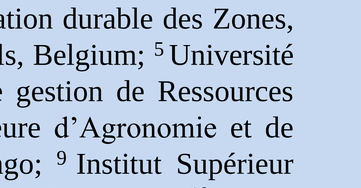

Fig. 1e. A new elephant fish from the Lowa River (neighbourhood KBNP).

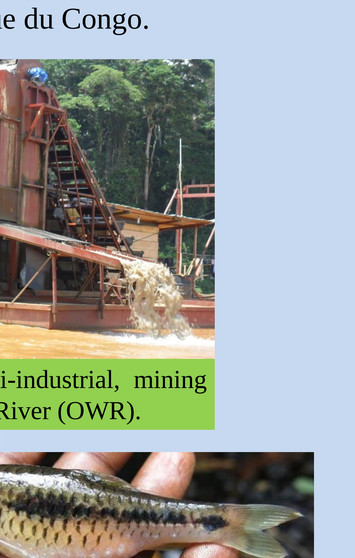

Fig. 1f. Lofoi or Kabola Falls on the Lofoi River (KNP).

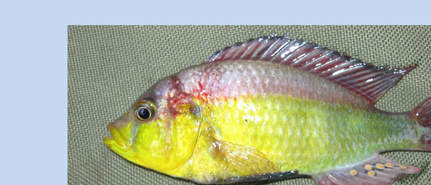

Fig. 1h. A new cichlid from the Kalule Nord River (UNP).(UNP) .

Fig. 1i. Cleansing of illegal mosquito nets (kabouze) at Lac Kisale (UNP) .

Fig. 1g. A new chubbyhead barb from the Kundelungu Plateau (KNP).

Fig. 1. Map of the Congo basin with the different partners and the 10 selected protected areas highlighted. (1) - Mangrove National Park (MNP / DRC); (2) - Luki Biosphere Reserve (LBR / DRC); (3) - Lefini Faunal Reserve (LFR) (Lésio-Louna) [Republic of the Congo (Congo-Brazzaville); (4) - Yangambi Biosphere Reserve (YBR / DRC); (5) - Okapi Wildlife Reserve (OWR / DRC); (6) - Rusizi National Park (RNP /Burundi & DRC); (7) - Malagarazi Reserve (MR / Burundi); (8) - Kahuzi-Biega National Park (KBNP / DRC); (9) - Upemba National Park (UNP / DRC); and (10) - Kundelungu National Park (KNP / DRC).

- A lack of knowledge

The extent of our current lack of knowledge is illustrated by the discovery of numerous new species: a new species of elephant fish (Mormyridae: *Marcusenius*) from the Lowa River (KBNP) (Fig. 1e); a new species of small barb (Cyprinidae: *Enteromius*) mainly restricted to the rivers of the Kundelungu plateau (KNP) (Fig. 1g); as well as several other new species (Figs. 1d and 1h). The limits of our current knowledge are further exemplified by the significant increase in species numbers. For the UNP, for instance, the number of species has increased by more than 100% (from 116 up to 234 species), As for the KBNP, no fish survey had ever been undertaken before while, until now, 49 species have been sampled. These observations undeniably point to the pressing need to further build and consolidate a network of local experts in African ichthyology.

References

Nasi R., Brown D., Wilkie D., Bennett E., Tutin C., van Tol G., & Christophersen T. 2008. Conservation and use of wildlife-based resources: the bushmeat crisis. Secretariat of the Convention on Biological Diversity, Montreal, and Center for International Forestry Research (CIFOR), Bogor. Technical Series no. 33, 50 pages.

Snoeks J., Harrison I.J. & Stiassny M.L.J. 2011. The status and distribution of freshwater fishes. In: Darwall, W., K. Smith, D. Allen, R. Holland, I. Harrison & E. Brooks (eds.) The diversity of life in African freshwaters: Underwater, under threat. An analysis of the status and distribution of freshwater species throughout mainland Africa: 42-91. IUCN, Gland (Switzerland) and Cambridge (UK).