

Quantitative Survey of Congo River Biodiversity

(March – April 2003)

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for**

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The purpose of this study is to complete previous investigations on Congo River Biodiversity (in September – October) by Dr Caroly Shumway 's team. The hypothesis is that fishing cannot be allowed all over the year, but only seasonally. Thus for sustainable management of fish stocks, we should first determine the good fishing season. Due to methodology requirements and time constraints during the present survey, we focused on selected target species of fish. These include species with high commercial value as reported by communities themselves. Four species were then analysed : *Distichodus lusosso* (*Distichodontidae*), *Heterotis niloticus* (*Osteoglossidae*), *Mormyrops anguilloides* (*Mormyridae*), *Chrysichthys sp* (*Bagridae*).

When fishermen arrived with their capture, before selling the fish, we randomly selected ten persons and their fish were reported in terms of baskets or basins (one basket or basin weighing about 30 kg, fresh matter). From the basin or basket, we isolated target species only and then divided them into two groups (i.e. adults and juveniles). For each species, we only considered body size (total length). So for :

1. *Distichodus lusosso* (or Mboto), adult means at least 20 cm of total length while juvenile means less than 20 cm ;
2. *Heterotis niloticus* (or Kongo ya sika), adult means at least 25 cm and juvenile meaning less than 25 cm ;
3. *Mormyrops anguilloides* (or Mbongo, Nzanda, Mbese,...), adult means 25 cm at least and juvenile meaning less than 25 cm ;
4. *Chrysichthys sp* (or moponga), adult means 25 cm at least and juvenile meaning less than 25cm.

Finally, when adults and juveniles were separated, we calculated the percentage (%) of each group.

Investigations covered IRM/CREDP area meaning Bandundu (Bandundu and Bokoni), Bas-Congo (Inga), Equateur (Mbandaka/Ngombe) and also Kinshasa/ Malebo Pool (Kinkole and Petro-Congo).

Under Dr Dieudonné Musibono's coordination and initiative, postgraduate students were sent to Mbandaka/Ngombe (i.e. PWEMA), Bandundu/Bokoni (IBANGA), Bas-Congo/Inga (MALUKISA) and Kinshasa/Malebo Pool (Kinkole- Masina Petro-Congo)(MOSEMBULA). All results are reported in the table1 – 6.

Results and discussion

Table 1- *Mormyrops anguilloides* (Nzanda, mbese) status at Mbandaka/ Ngombe (ERGS, march-april 2003)

Basin N°	Fish status		Comments
	Adults	Juveniles	
1	6	51	Most of <i>Mormyrops anguilloides</i> caught were juveniles (about 89%). There is a real threat on the conservation and sustainability of this species.
2	8	47	
3	6	50	
4	6	51	
5	7	50	
6	6	49	
7	5	51	
8	5	49	
9	6	50	
10	7	47	
Total	62	495	
%	11.13	88.87	

Table 2 shows the *Distichodus lusosso* status at Mbandaka/Ngombe (March-April 2003)

Basin N°	Fish status		Comments
	Adults	Juveniles	
1.	7	41	As above from table1.
2	7	39	
3	8	40	
4	6	42	
5	5	41	
6	8	37	
7	6	40	
8	6	39	
9	5	43	
10	7	40	
Total	65	402	
%	13.92	86.08	

Table3- *Heterotis niloticus* status at Mbandaka/ Ngombe (March-April 2003)

Basin N°	Fish status		Comments
	Adults	Juveniles	
			As above for table1.
1	13	34	
2	12	34	
3	10	36	
4	8	37	
5	11	30	
6	12	31	
7	10	33	
8	9	32	
9	11	31	
10	13	28	
Total	109	326	
%	25.06	74.94	

Table4 – *Chrysichthys sp.* status at Mbandaka/Ngombe (March-April 2003)
(Note that only six basins were recorded)

Basin N°	Fish status		Comments
	Adults	Juveniles	
			As above from table1.
1	6	18	
2	8	17	
3	6	19	
4	7	20	
5	5	19	
6	8	18	
TOTAL	40	111	
%	26.49	73.51	

Observations : During this period (march-april), fishing is not good due to the high percentage of juveniles caught (as reported from tables 1, 2, 3 and 4). This is a real threat on biodiversity conservation.

Using the very same methods for Bandundu/Bokoni, Bas-Congo/Inga and Kinshasa/ Malebo Pool (Kinkole-Masina Petro-Congo), the results are summarized in the following table 5.

Table5- Fish status in % at three stations investigated (ERGS, march-april 2003).

Fish species and status	Bandundu/Bokoni		Bas-Congo/Inga		Kinshasa/Malebo Pool (Kinkole-Masina)	
	Adults	Juveniles	Adults	Juveniles	Adults	Juveniles
<i>Mormyrops anguilloides</i>	13.08	86.92	12.45	87.55	17.12	82.88
<i>Distichodus lusussu</i>	8.25	91.75	7.75	92.25	7.48	92.58
<i>Heterotis niloticus</i>	24.19	75.81	16.55	83.45	15.76	84.24
<i>Chrysichthys sp.</i>	11.65	88.35	10.78	89.22	11.21	88.79

Observations : As for Mbandaka/ Ngombe, juveniles are the most caught individuals during this season (March-April). This means that the « biological capital » is threatened. Indeed, the overexploitation of juveniles might lead to fish stock reduction and therefore it endangers fish diversity conservation. All fish species status are summarized in the following table6.

Table 6. Summary of fish species status for all sites investigated (data from tables 1 to 5).

Fish species	Fish status in %		Comments
	Adults	Juveniles	
<i>Distichodus lusussu</i>	9.35	90.65	All the four fish species investigated are endangered through juveniles fishing (% of adults caught being lower than those for juveniles). Economically, there is no sustainability of biodiversity and riverine communities are secured during this period. Alternatives to fishing are strongly needed.
<i>Mormyrops anguilloides</i>	13.42	86.58	
<i>Heterotis niloticus</i>	20.39	79.61	
<i>Chrysichthys sp.</i>	15.03	84.97	

Management measures and biodiversity conservation: - Fishing during this season should be forbidden. This suggests that alternatives activities should be implemented in between two fishing seasons.

- The use of illegal fishing materials should be forbidden, too.

Conclusion

Quantitative survey of fish at Mbandaka/ Ngombe, Bandundu/Bokoni, Bas-Congo/Inga and Kinshasa/Malebo Pool revealed the mismanagement of fish stock through the juveniles destruction. Considering 4 commercial species (i.e. *Distichodus lususu*, *Mormyrops anguilloides*, *Heterotis niloticus* and *Chrysichthys sp.*) size from samples sold, we found that percentages of juveniles were higher than those for adults (e.g. 90.65% > 9.35% for *Distichodus lususu* ; 86.58% > 13.42 % for *Mormyrops anguilloides* ; 79.61 % > 30.39% for *Heterotis niloticus*, and 84.97% > 15.03% for *Chrysichthys sp.*).

If this trend continues, these four species might become rare . This picture supports the declaration from fishermen who recognized that fish populations are decreasing every year.

To get the full fish population dynamics, investigations should be done during fishing season (e.g. from june to september, and in february) during three or four years. However, our preliminary results give the best argument for better management and conservation. It is the way toward sustainability.