



## **Rapid Assessment of Fish Biodiversity of Ajenjua Bepo and Mamang River Forest Reserves, Eastern Region, Ghana**

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## Chapter 6

### Rapid Assessment of Fish Biodiversity of Ajenjua Bepo and Mamang River Forest Reserves, Eastern Region, Ghana

E. K. Abban

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#### SUMMARY

Fish fauna, mainly of dry-season pools at the time of study, in Ajenjua Bepo and Mamang River forest reserves were surveyed using mini-seine nets and a battery of four mini-gill nets with four different mesh sizes of net for fish capture. The present study was part of a baseline documentation of flora, fauna and ecology of the forest reserves. Eighteen fin-fish species belonging to eleven genera and seven families and the reed shrimp were encountered. Of the fish species, 7 were recorded from Ajenjua Bepo and 16 were recorded from Mamang River. Eight of the fin-fish species recorded are not typical forest fishes. Their occurrence was attributed to some locations sampled being at the fringes of the forest area and parts of the reserves being intensely deforested. The record of *Barbus pobequini* at Mamang River was, according to the literature, the first record of this species in Ghana.

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#### INTRODUCTION

Previous inland fish surveys in Ghana with biodiversity documentation as a major objective have centered on the Volta River system, Lake Bosomtwi and the main course of the Pra River (e.g. Trewavas 1983, Lowe-McConnell 1972, Irvine 1947) except for one survey reported by Dankwa et al. (1999) which covered the Brim River, a tributary of the Pra. No previous surveys are known to have taken place in the areas covered by our current study, partially attributable to the fact that forest streams have not been recognized to contain fish of food importance. The areas of study, the Ajenjua Bepo and Mamang River forest reserves, are both situated in the Eastern Region of Ghana. Fishes of water systems in the reserves were assessed as part of a comprehensive assessment of the biological status of the reserves.

Fishes are considered important to conserve in the reserves should development activities commence because of the following reasons:

- i) Fishes constitute a major food item in over 40 African countries including Ghana. The area of study was observed to be far removed from any major fish source in Ghana, thus available edible fish resources in the area must be conserved.
- ii) Forest streams and rivers have fish fauna which generally can be used as indicators of aquatic ecosystem habitat quality. Thus this assessment could be used to identify species of ecological importance which can be used by those implementing development projects as indicators of degradation in the forest areas and aquatic ecosystems.
- iii) In tropical countries, forest streams such as those studied in the present work contain fish with aesthetic value for aquarium trade.

It was appropriate to include fishes as a taxon in this rapid biological survey of the forest reserves because it was possible to obtain an overview of fish fauna in streams without the deployment of complex gear and approaches.

## STUDY AREA AND METHODS

Fish, mainly of dry season pools and other remains of the forest's drainage system, were sampled using two methods. Sampling was primarily carried out using a mini-seine net of 2 mm mesh nylon netting. This was deployed by two persons holding either end of the net and sieving together through the water body. Deployment was effected between 18:00H – 06:00H. The second method involved a battery of four mini-gill nets, each measuring 6-m long and 1-m deep (thus having a surface area of 6 m<sup>2</sup>) with various mesh sizes of multifilament netting (12.5 mm, 15 mm, 17.5 mm or 20 mm). The gill nets were deployed where a water body was considered too expansive for the seine net to be effective. When deployed, the gill-nets were set together for a 'night' at a time (18:00H -06:00H). All specimens caught were identified based on the keys of Dankwa et al. (1999) and Paugy et al. (2003).

The two reserves contain major headwaters of the Pra River, a major river system in Ghana and West Africa. While some of the streams entered the Pra system almost directly, others contribute to the Mamang River, which is a major tributary of the Pra. At the time of study, virtually all streams in the forest reserves were dried up. Therefore, the majority of waters inventoried for fish were dry season pools at the periphery of the reserves. The pools existed in areas which were at lower elevations compared to other areas within the reserves.

## RESULTS AND DISCUSSION

Table 6.1 presents fish species encountered in dry season

pools and streams of and associated with Ajenjua Bepo and Mamang River in the Eastern region of Ghana. Results include 18 fin-fish species belonging to 11 genera and 7 families and the reed shrimp, *Caridina africana*. Of the fish species, 7 were recorded from Ajenjua Bepo and 16 were recorded from Mamang River.

Of the 18 fish species encountered in associated waters of the two forest reserves, six species are more typical of open-field waters than forest-area waters because their known food habits depend on photosynthetic-based food webs. These six fishes include the two *Heterobranchus* species, and one species each of *Clarias*, *Sarotherodon*, *Tilapia* and *Hemichromis*. Their occurrence was attributed to some sample sites being at the edges of or just outside the reserve areas and the intense deforestation of parts of the reserves. Of the remaining 12 fish species shown in Table 6.1, five were common to both reserves. This can be attributed to both reserves' drainages being eventually part of the basin of the Pra River. Considering the proximity of the two reserves and the possibility of overflow during times of flooding, aquatic elements shared between the two reserves could have been expected to be higher.

Due to the extremely dry state of the forest streams, the 18 species encountered can be considered a high number. However, because some localities sampled were outside the forest reserves, more thorough analysis of the data would be necessary to predict the overall richness of the study areas. In spite of the dry streams in the forest, typical forest stream fishes were found, including members of Cyprinidae which occurred in some pools.

The record of *Barbus pobequini* at Mamang River was, according to the comprehensive literature (Paugy et al.

**Table 6.1.** Fish fauna of Ajenjua Bepo (AJ) and Mamang River (MR) Forest Reserves, Eastern Region, Ghana

Family	Genus	Species	AJ	MR
Mormyridae	<i>Perocephalus</i>	<i>bovei</i>		+
Alestidae	<i>Bryconus</i>	<i>imberi</i>		+
		<i>longipinnis</i>		+
		<i>elongatus</i>		+
Cyprinidae	<i>Barbus</i>	<i>ablades</i>	+	+
		<i>trispilos</i>	+	+
		<i>punctitaeniatus</i>		+
		<i>macrops</i>	+	+
		<i>pobequini</i>	+	+
Poeciliidae	<i>Micropanchax</i>	<i>paffi</i>		+
Aplochelidae	<i>Epiplatys</i>	<i>longiventralis</i>		+
		<i>togolensis</i>		+
Claridae	<i>Heterobranchus</i> <i>Clarias</i>	<i>longifilis</i>	+	
		<i>bidorsalis</i>	+	
		<i>gariepinus</i>		+
Cichlidae	<i>Sarotherodon</i> <i>Tilapia</i> <i>Hemichromis</i>	<i>galilaeus</i>		+
		<i>zillii</i>		+
		<i>fasciatus</i>	+	+
<b>Total No:</b>	<b>7</b>	<b>11</b>	<b>18</b>	

2003), the first recording of this species in Ghana, although it has been recorded in other West African countries including Senegal, Gambia, and Côte d'Ivoire (which shares a border with Ghana).

### CONSERVATION RECOMMENDATIONS

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- Limit cattle grazing in and near forest areas to allow growth of forest ground cover as well as saving soils from trampling by cattle.
- Control deforestation to increase availability of forest fish food species (i.e., fruits, seeds, and insects) which fall from trees.
- Limit all activities that contribute to reduced rainfall and reduced retention of rainfall (deforestation in particular) in the two forest reserves to conserve the streams and their fish, the forest environment in the reserves, and the wider Pra River system, which contributes to domestic and industrial water needs in large areas of Ghana.

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