

## Chapitre 4

### THE DISTRIBUTION OF AFRICAN FRESHWATER FISHES

### *RÉPARTITION DES POISSONS D'EAU DOUCE AFRICAINS*

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The distribution of fishes in the rivers, lakes and other waterbodies of Africa has always been of great interest to naturalists, scientists, ichthyologists and others involved with the African fauna. By the second half of the 19th Century sufficient knowledge on the distribution of African freshwater fishes was at hand to provoke a few general comments by Günther (1880). Systematic knowledge increased rapidly after this and by the turn of the century Boulenger (1905) presented the first detailed synthesis of the distribution of African freshwater fishes. This was followed by Pellegrin's (1912) account before Boulenger's (1909-1915) classic Catalogue appeared and set the stage for the surge of systematic literature on these fishes over the past sixty years or so. Much of this literature has dealt with the fauna of particular rivers, lakes or regions so that the broad details of African fish distribution are now known. Poll (1973) and Roberts (1975) have summarized and discussed this distribution on a pan African scale.

This chapter presents a systematic summary of present knowledge of distribution of fishes in the continental waters of Africa. Attention is focussed on families, with noteworthy generic and specific examples being mentioned. No attempt is made to provide a biogeographical analysis as this requires detailed knowledge of both the phyletic relationships of the taxa and the overall geological and geographical history of the continent (Greenwood, 1983). Furthermore, current biogeographical analyses demand pattern analysis incorporating different plant and animal groups, information which is not easily available at present.

Unlike most other animal groups, the distribution of freshwater fishes is conveniently restricted to well-defined water bodies such as lakes and rivers. To illustrate the distribution of fishes in African waters, a series of rivers and lakes have been selected and the presence or absence of fishes at the family level plotted (Tables 1 and 2). Figure 1 indicates the geographical location of the rivers and lakes used in the Tables. The particular water bodies were selected primarily to provide an even geographical coverage but selection was also based on the availability of adequate knowledge of their fish faunas.

#### 1 - SELECTED REGIONAL LITERATURE ON THE DISTRIBUTION OF AFRICAN FRESHWATER FISHES

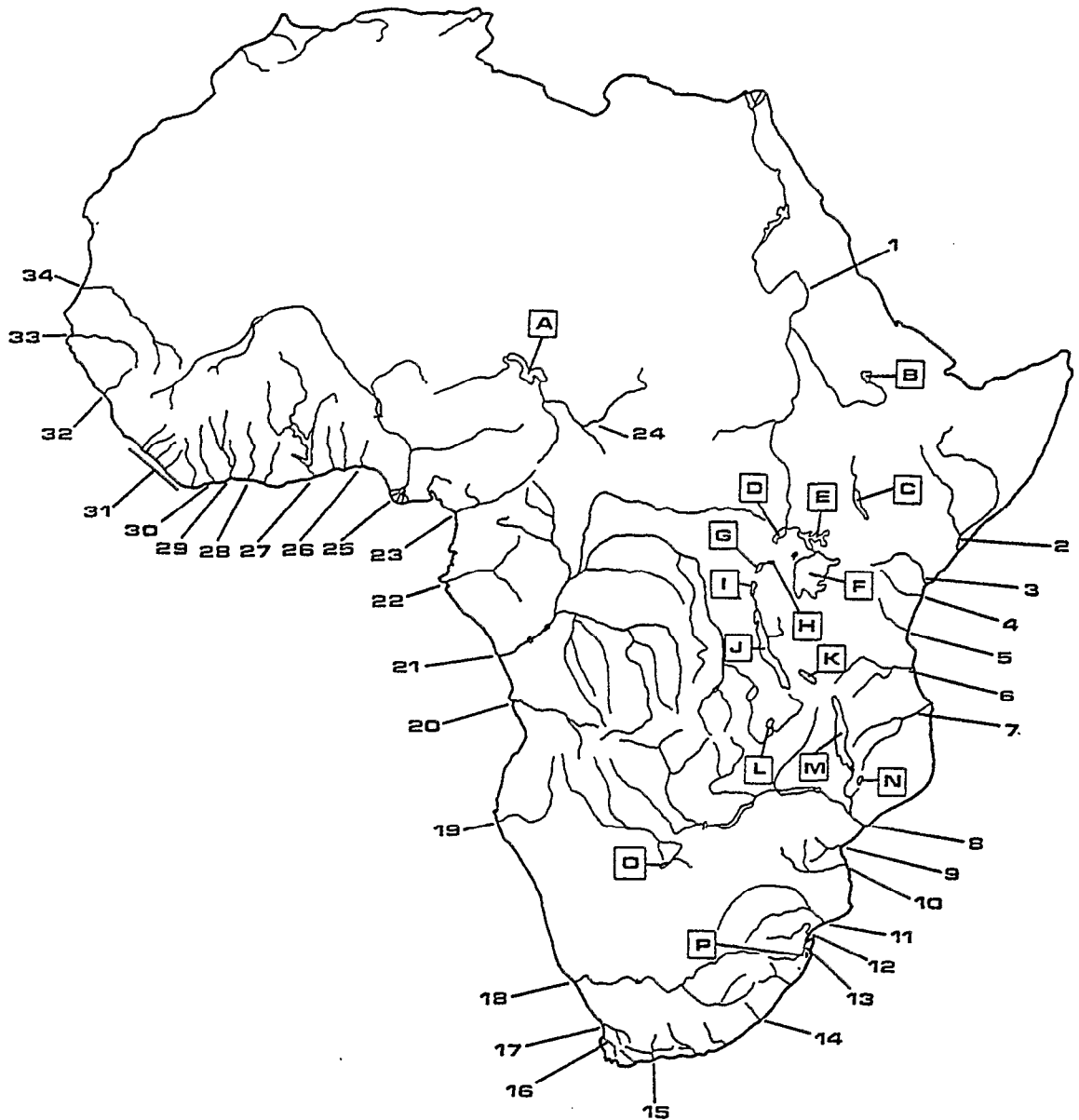
The literature dealing with the distribution of African fishes is voluminous (see e.g. Matthes, 1973) and is frequently buried in obscure journals. This brief review of selected references is designed to assist the newcomer or interested student to the fauna of each region. For a general overall account the recent review by Roberts (1975) is an excellent synthesis of available knowledge. Both Beadle (1974) and Lowe-McConnell (1975) provide general overviews of the tropical fish fauna and include bibliographies. Poll (1957, 1973) also gives recent summaries of the subject. Although the checklist of freshwater fishes of Africa (CLOFFA) will effectively supplant all other accounts, at this stage the earlier classical works by Boulenger (1905, 1909-16) are still indispensable overviews.



**Table 2 :** Fish families present in African lakes. Lakes labelled as in Fig. 1 and ordered in general north-south sequence. Table compiled from literature sources given in the text.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	CHAD	TANA	TURKANA	ALBERT	KIOGA	VICTORIA	EDWARD	GEORGE	KIVU	TANGANYIKA	UKUKWA	BANGWEULU	MALAWI	CHILWA	NGAMI	SIBAYA
LEPIDOSIRENIDAE	○		○	○	○	○	○	○		○						
POLYPTERIDAE	○		○	○						○	○					
ANGUILLIDAE													○			
CLUPEIDAE									○	○						○
OSTEOGLOSSIDAE	○															
NOTOPTERIDAE	○															
MORMYRIDAE	○			○	○	○	○		○		○	○	○	○	○	○
GYMNARCHIDAE	○		○	○												
KNERIIDAE										△						
HEPSETIDAE	○														○	
CHARACIDAE	○		○	○	○	○				○	○	○	○	○	○	
DISTICHODONTIDAE	○		○	○						○		○			○	
CITHARINIDAE	○		○	○						○						
CYPRINIDAE	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
COBITIDAE		○														
BAGRIDAE	○			○	○	○	○	○		○	○	○	○	○	○	
SCHILBEIDAE	○		○	○	○	○				○	○	○	○	○	○	
AMPHILIIDAE	△		△	△	△	△	△	△	△	△	△	△	△	△		
CLARIIDAE	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MALAPTERURIDAE	○		○	○						○						
MOCHOKIDAE	○			○	○	○				○	○		○	○	○	
CYPRINODONTIDAE	○		○	○	○	○	○	○		○	○	○	○	○	○	○
CHANNIDAE	○															
CENTROPOMIDAE	○		○	○		●				○						
CICHLIDAE	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
GOBIIDAE														○		○
ANABANTIDAE	○					○	○	○		○		○	○		○	○
MASTACEMBELIDAE	○				○	○				○		○	○		△	
TETRAODONTIDAE	○		○							○						
ELEOTRIDAE	○															
ATHERINIDAE																○

Key : ○ Present    ● Introduced    △ In affluent rivers.



**Figure 1 :** Selected rivers and lakes of Africa as referred to in Tables 1 and 2.

Rivers : 1-Nile; 2-Guba-Schebel; 3-Tana; 4-Athi; 5-Pangani; 6-Ruaha; 7-Ruvuma; 8-Zambezi; 9-Buzi; 10-Save (Sabi-Lundi); 11-Limpopo; 12-Incomati; 13-Pongolo (Maputa); 14-Umzimvubu; 15-Gourits; 16-Berg; 17-Olifants; 18-Orange; 19-Kunene; 20-Cuanza; 21-Zaire; 22-Ogôoué; 23-Sanaga; 24-Shari; 25-Niger; 26-Ogun; 27-Volta; 28-Komoe; 29-Bandama; 30-Sassandra; 31-"Liberia"; 32-Konkoure; 33-Gambia; 34-Senegal.

Lakes : A-Chad; B-Tana; C-Turkana; D-Albert; E-Kioga; F-Victoria; G-Edward; H-George; I-Kivu; J-Tanganyika; K-Rukwa; L-Bangweulu; M-Malawi; N-Chilwa; O-Ngami; P-Sibaya.

A few larger regional accounts are worth noting. Pellegrin (1921) summarized the freshwater fish fauna of the northern half of the continent. This account has recently been updated by Daget & Durand's (1981) chapter on the fishes of the Sahelo-Sudanian region. Pellegrin (1923) and Irvine (1947) provided useful accounts of West African fishes. The Zaire basin and central west Africa are well covered in the literature (see below) but apart from Copley's (1958) book and Greenwood's (1966) account of fishes of Uganda there has been no overview of East African fishes. Southern Africa has been well catered for on the broad scale by Gilchrist and Thompson (1913-1917), Jubb (1967) and Bowmaker *et al.* (1978). Poll's (1967a) synopsis of Angolan fishes is unique for that large area.

Boulenger's (1907) detailed account of the fish fauna of the Nile is still the most comprehensive work on that system (Greenwood, 1976b). The account of the fisheries of Lake Nasser (Aswan Dam) by Abdel Latif (1974) includes an extensive systematic section. In addition, Sandon (1950) and Greenwood (1966) provide reviews of the Nilotic ichthyofauna. Greenwood (1963, 1976) and Abu Gideiri (1967) are useful supplementary accounts of the fishes of particular sections of the system.

Parts of Ethiopia are dealt with by Boulenger (1907) and the general fauna of Ethiopia and Somalia is summarized by Roberts (1975). Several papers by Vinciguerra (1895, 1896, 1897, 1921, 1927) form the backbone of knowledge of Somalian fishes. Papers by Ercolini *et al.* (1982), Poll (1961), Poll & Sassi, (1972) and others have added to our knowledge of the fauna of this region.

There is surprisingly little recent literature of Kenyan rivers and the most useful reference remains Copley (1958). Whitehead (1959) reported on a collection of fishes from the river Tana and Bailey (1969) provides an annotated list of the fishes from Tanzanian rivers. There is no generally available literature on fishes in Mozambique rivers north of the Zambezi.

The Zambezi River fish fauna has been well documented in recent years by Jackson (1961a, b), Jubb (1961, 1967), Bell-Cross (1972, 1976) and Balon (1974). Rivers to the south have been documented by Jubb (1961, 1967), Bell-Cross (1972, 1976), Gaigher (1973), Gaigher & Pott (1972) and Pienaar (1978). Further south in Natal and Maputaland, Crass (1964, 1966) and Branton & Kok (1980) provide detailed accounts.

In the Cape, Jubb's (1965a, 1967) papers are basic references but the earlier account by Barnard (1943) and the most recent by Gaigher *et al.* (1980) combine to present comprehensive coverage for the region. These references are also generally good for the fauna of the Orange River which was recently reviewed by Skelton & Cambray (1981) and Cambray (1984) for the lower reaches.

The fishes of the Okavango delta in Botswana are described by Jubb & Gaigher (1971) and Skelton *et al.* (1985). The Kunene River has not been the subject of any specific report but its fauna is given by Bell-Cross (1965), Ladiges (1964), Poll (1967a) and Bowmaker *et al.* (1978). Trewavas (1936) is an important if not comprehensive report on fishes in south-west Africa and southern Angola.

The Zaire basin has been the subject of numerous studies of greater or lesser extent. Boulenger (1901) provided a valuable base which was supported by his catalogue of 1909 to 1916. Nichols & Griscom (1917), Fowler (1936), David and Poll (1937) and Poll (1938) are important pre-1940 reports. Post-1940 accounts include Poll (1952, 1957, 1959, 1967a, 1976), Lambert (1961), Gosse (1963, 1966, 1968). Poll & Gosse (1963), de Kimpe (1964), Matthes (1964), Bell-Cross (1965/6), Roberts & Stewart (1976), Thys (1963a, b), Daget (1978), Bailey & Banister (1979) and Balon & Stewart (1983).

The Chiloango region to the north of the Zaire mouth has been reviewed by Pellegrin (1928) and David and Poll (1937). The Ogôoué system in Gabon is reported by Pellegrin (1915) and Thys (1966). The fishes of Rio Muni are described by Roman (1971). The fishes of the Cameroons are described by Pellegrin (1929) and Holly (1930) and more recently by Daget & Stauch (1963), Daget (1978, 1979b) and Daget & Depierre (1980).

Blache (1964) gives an extensive and authoritative account of the Lake Chad basin and of Mayokebbi. The fish fauna of the Niger has been described by Blanc & Daget (1957), Daget (1954, 1959), Daget & Stauch (1963), Daget & Durand (1981), Lewis (1974) and Reid & Sydenham (1979). Sydenham (1977) provides a useful list of the fishes of a smaller Nigerian river, the

Ogun. The fishes of Ghana and in particular those of the Volta system are discussed by Trewavas & Irvine (1947), Blanc & Daget (1957), Daget (1960c), Daget & Iltis (1965), Daget & Durand (1981) and Roman (1966). Daget & Iltis (1965) provide an extensive account of the fishes of the Ivory Coast. Schültz (1942) deals with the freshwater fishes of Liberia. Daget (1950) and Boulenger (1919a) give lists of fishes from Sierra Leone and Daget (1962) accounts authoritatively for the fishes of Guinea and Fouta Djallon. The fishes of the Gambia River are extensively dealt with by Svensson (1933), Johnels (1954) and Daget (1960a, 1961). There appears to be no single account of the fishes of the Senegal River but recently a series of reports by Reizer and co-workers (Reizer *et al.*, 1972a, b, 1373a, b; Marquet *et al.*, 1979) have begun to fill the gap. Daget (1960b, 1969) reports on collections from this river which is also generally accounted for by Daget & Durand (1981).

Many of the larger and smaller African lakes have been well studied over the years and the basic nature of their fish fauna is well known. In most cases the fauna of a particular lake is reported by one or a few main publications with several minor contributions adding to or refining the list. The references provided in Table 3 are for the main part from the first category.

Table 3 : Selected references to the fish fauna of certain African lakes.

Lake	References
Albert	Worthington (1929), David & Poll (1937), Greenwood (1966)
Bangweulu	Worthington (1933a), Ricardo-Bertram (1943), Jackson (1961b)
Chad (Tchad)	Blache (1964)
Chilwa	Kirk (1967), Furse <i>et al.</i> (1979)
Edward	David & Poll (1937), Poll (1939b)
George	Worthington (1929), Greenwood (1966)
Kivu	David & Poll (1937), Poll (1939b)
Malawi	Worthington (1933b), Ricardo-Bertram <i>et al.</i> (1942), Jackson (1961a), Bowmaker <i>et al.</i> (1978) Ribbink <i>et al.</i> (1983)
Rudolf (Turkana)	Pellegrin (1935), Worthington & Ricardo (1936), Roberts (1975)
Rukwa	Ricardo (1939a, b)
Sibaya	Bruton (1979)
Tanganyika	Poll (1953, 1956)
Victoria	Greenwood (1966, 1974), Lowe-McConnell (1975)

Table 2 outlines the distribution of fish families in certain African lakes. Most of these lakes are tropical and have a high fish diversity. In certain cases families are recorded from a lake when the species are really only known from affluent rivers (e.g. the Amphiliidae) or shallow swampy margins (e.g. *Protopterus*). Undoubtedly the most outstanding feature of many African lakes, especially the larger rift valley lakes, is the high species diversity of endemic cichlids.

Boulenger (1905, 1909-16), Greenwood (1983), Pellegrin (1911, 1921) and Roberts (1975) have indicated that the depauperate fauna of north-west Africa or the Magreb region shows affinities more with Europe than with tropical Africa. This is particularly true for cyprinids which include species of *Barbus*, *Varicorhinus* and the European genus *Pseudophoxinus*. The cyprinodontid species of *Aphanius* also have European affinities (Parenti, 1981). The fauna also includes the European *Cobitis taenia* and isolated mountain populations of *Salmo trutta*. The peripheral species, *Blennius fluviatilis* and *Gasterosteus aculeatus*, are found near the coast. The European eel *Anguilla anguilla* ascends the rivers. Finally three cichlid species are also found in this region, viz. *Tilapia zillii*, *Astatotilapia desfontainesii* and *Hemichromis bimaculatus*. Dumont (1982) discusses the aquatic fauna of the Sahara and illustrates the role of the Atlas Mountains of isolating the fauna of the Magreb from the Afro-tropical region.

## 2 - SELECTED ASPECTS OF AFRICAN FRESHWATER FISH DISTRIBUTION

**2.1 - The sporadic marine component in rivers.** Tables 1 and 2 do not include a number of marine families which sporadically occur in freshwater stretches of rivers. Families such as the Gobiidae, Eleotridae, Mugilidae, Clupeidae and Tetraodontidae are, however, included as member species which regularly form part of certain freshwater communities. In the lower Zambezi, Bell-Cross (1972, 1976) recorded as many as twenty peripheral species with several found as far inland as Zimbabwe or the lower Shire River in Malawi. The fish fauna of West African rivers includes a distinct marine component (e.g. Svensson, 1933; Irvine, 1947; Daget & Iltis, 1965; Daget & Durand, 1981). The freshwater stingray *Dasyatis garouensis* is a notable inhabitant of the Benue River, a tributary of the Niger, with a breeding population as far as 1 200 km from the coast (Daget & Durand, 1981; Reid & Sydenham, 1979). Records of species such as the Zambezi shark *Carcharhinus leucas*, the saw fish *Pristis microdon*, the oxeve tarpon *Megalops cyprinoides* and the sparid *Acanthopagrus berda* in rivers of south-east Africa many kilometers from the sea are given by Crass (1964), Jubb (1967), Pienaar (1978) and Bruton & Kok (1980). Marine fish species constitute 30 % of the freshwater fauna in Maputaland. In the southern and eastern Cape the marine components represent as much as 40 % of the indigenous freshwater fish community (Skelton, 1983).

**2.2 - Widespread taxa.** One of the outstanding features of the African fish fauna is the widespread distribution of certain families and sub-familial taxa (Greenwood, 1983). Equally significant are the restricted ranges of other families, a pattern pertaining also to certain genera and species of widespread families. The Cyprinidae, Characidae, Bagridae, Schilbeidae, Amphiliidae, Clariidae, Mochokidae, Cyprinodontidae, Cichlidae and Gobiidae are found in most east and west Afro-tropical rivers systems. Of these the Cyprinidae are most ubiquitous from the Nile and Senegal Rivers to the southernmost rivers of the continent. Cyprinids also occur throughout the Magreb region (Roberts, 1975).

An assessment of the significance of widespread taxa is problematical because of confusion and uncertainty about the relationships and taxonomy of many of these units. For example, the majority of the cyprinids in Africa are currently incorporated into two large genera (*Barbus* and *Labeo*) of which the interrelationships are poorly understood. Both these genera are distributed throughout the Afro-tropical region but it appears reasonably certain that they are polyphyletic assemblages. As shown by Skelton's (1980) study of the redfin minnows of the southern Cape, the biogeographic interpretation of distribution depends on phylogenetic information of the organisms involved. Only once the phyletic lineages within these large cyprinid genera have been established will the biogeographical significance of the distributions of the various taxa become manifest.

*Barbus* is probably the only true pan-African genus. Several other genera are nevertheless extremely widespread, at least over the Afro-tropical region. *Protopterus* is known from the Gambia River in West Africa to the Limpopo River basin in south-east Africa (Fig. 3) (Poll, 1954; Pienaar, 1981). It is surprisingly absent from Angola and the Okavango-Upper Zambezi drainages (Fig. 3). The mormyrid genera *Petrocephalus*, *Marcusenius*, *Mormyrus*, *Mormyrops* and *Gnathonemus* are widespread in the Afro-tropical region but are not present in the Orange River or rivers of the Cape Province. *Hydrocynus* is found from Maputaland (Bruton & Kok, 1980) along the eastern seaboard as far north as the Wami River in Tanzania (Bailey, 1969). It is not present in the Kunene (Bell-Cross, 1965) but occurs in the Okavango River and upper swamp (Skelton *et al.*, 1985) and throughout the Zaire and West African rivers as well as the Nile (Daget & Durand, 1981). The genera *Alestes* and *Micralestes* are equally widespread (Poll, 1967b) both extending as far south as Maputaland on the east coast (Bruton & Kok, 1980) the Kunene on the West coast (Bell-Cross, 1965) and from Senegal to the Nile in the north (Daget & Durand, 1981). *Distichodus* is probably the most widespread distichodontid genus, ranging from the Zambezi mainly north and west to the Sahelo-Sudanian region (Bell-Cross, 1976; Daget & Durand, 1981). Several catfish genera are widespread and common in Afro-tropical waters from the Senegal and Nile southwards. These include *Auchenoglanis*, *Chrysichthys*, *Schilbe*, *Eutropius*, *Amphilius*, *Clarias*, *Heterobranchus*, *Malapterurus*, *Chiloglanis* and *Synodontis*. The southern-

most limit of natural siluroid distribution in Africa is the Olifants River system (31° 40' S, 18° 15' E) on the Cape south-west coast (Barnard, 1943; Jubb, 1965a, 1967; Gaigher *et al.*, 1980, Skelton, 1981) and the Umtamvuna River (31° 05' S, 30° 12' E) on the east coast (Crass, 1964, 1966).

The cyprinodontid genus *Aplocheilichthys* is widespread in the Afro-tropical region. The genus *Nothobranchius*, whilst not strictly riverine nor common, is found in isolated localities from Senegal across to Somalia and down the eastern half of Africa as far south as Maputaland (Jubb, 1981; Parenti, 1981).

A number of cichlid genera are widespread in Africa. *Tilapia* species are found continuously through Africa from the eastern Cape in South Africa to Senegal in the west and the Nile and beyond to the Middle East in the east. *Tilapia sparrmanii* was naturally distributed as far south as the Orange River system but has since been translocated to the extreme south coastal rivers. Recent taxonomic changes have restricted the geographic ranges of genera such as *Sarotherodon*, *Oreochromis* and *Haplochromis* (Greenwood, 1979; Trewavas, 1981a, b). *Hemichromis elongatus* is distributed from the Upper Zambezi to West Africa but the genus apparently does not occur over the eastern half of the continent.

Two African anabantid genera are recognised, *Sandelia*, which is restricted to the south and east Cape rivers, and *Ctenopoma* which is widespread from Maputaland northwards to the Nile and West Africa (Fig. 8). The distribution of *Afromastacembelus* is fairly similar to that of *Ctenopoma*. *Afromastacembelus* is known from the Okavango, the Upper Zambezi, and northwards through Angola and Zaire to West Africa. On the eastern side of the continent it is known from the Shire (lower Zambezi) and the Ruaha (Matthes, 1967; Tweddle & Willoughby, 1979) and also the Nile (Boulenger, 1907). The rivers to the north and south of the Zambezi in Mozambique are poorly explored and future surveys may extend the range of this and other genera.

Species with widespread distributions are also encountered, in several cases overriding the «ichthyofaunal» boundaries proposed by Roberts (1975) and Poll (1957) on the basis of more restricted taxa. For example *Barbus paludinosus* and *Barbus trimaculatus* are found from the Orange River system in the south (Jubb, 1967) through to the rivers of Kenya and even Somalia (Greenwood, 1962; Vinciguerra, 1897). These are not necessarily isolated examples e.g. the clariid *Clarias gariepinus* ranges from the Orange River system to north Africa, the Middle East and Turkey (Teugels, 1986). An *Amphilius* species frequently referred to as «*A. platyichir*» but now known to be *A. uranoscopus* is found from the Pongolo River in the south through to East African rivers (Skelton, 1984). Other widespread species extend from southern through to West Africa (e.g. *Alestes imberi* and *Micralestes acutidens*; Daget & Durand, 1981; Paugy, 1979-80). The African pike *Hepsetus odoe* and the electric catfish *Malapterurus electricus* occur from the Upper Zambezi through western Central Africa to West Africa. *Malapterurus electricus* is also found in the Nile (Fig. 7).

**2.3 - The regional concept.** Boulenger (1905) divided the Afro-tropical region into three parts: the megapotamian sub-region, the eastern sub-region and the southern sub-region. The megapotamian sub-region included all the major tropical rivers and lakes as far south as the Zambezi but excluded the rivers to the east of the rift valley from Ethiopia to the Zambezi. This latter region constituted the eastern sub-region and the rivers south of the Zambezi the southern sub-region. Boulenger's divisions were determined in part by the impoverished nature of the fauna in the eastern and southern sub-regions relative to the great number and diversity of the fauna in the megapotamian sub-region. The division was also influenced by the absence of groups such as the Polypteridae from the eastern and southern regions. Pellegrin (1911) divided Boulenger's megapotamian region into several parts: the *upper equatorial* region which included the large rivers north of the equator, Lake Chad and the Nile; the *equatorial* region including the Zaire basin, Ogdoué, the Cameroons and Angola; the *lower equatorial* region which included the Zambezi and Okavango drainage; and the *Great Lake equatorial* region which included Lakes Victoria, Tanganyika and Malawi (Nyasa). Later authors such as Blanc (1954), Poll (1957) and Roberts (1975), working with a vastly increased knowledge of the fauna, proposed further divisions of the ichthyofaunal regions (Fig. 2a, b). Whilst the concept of ichthyofaunal regions is undoubtedly useful for descriptive and comparative purposes (e.g. as in Roberts, 1975, and Daget & Durand, 1981), it is also subject to several important limitations as far as biogeogra-



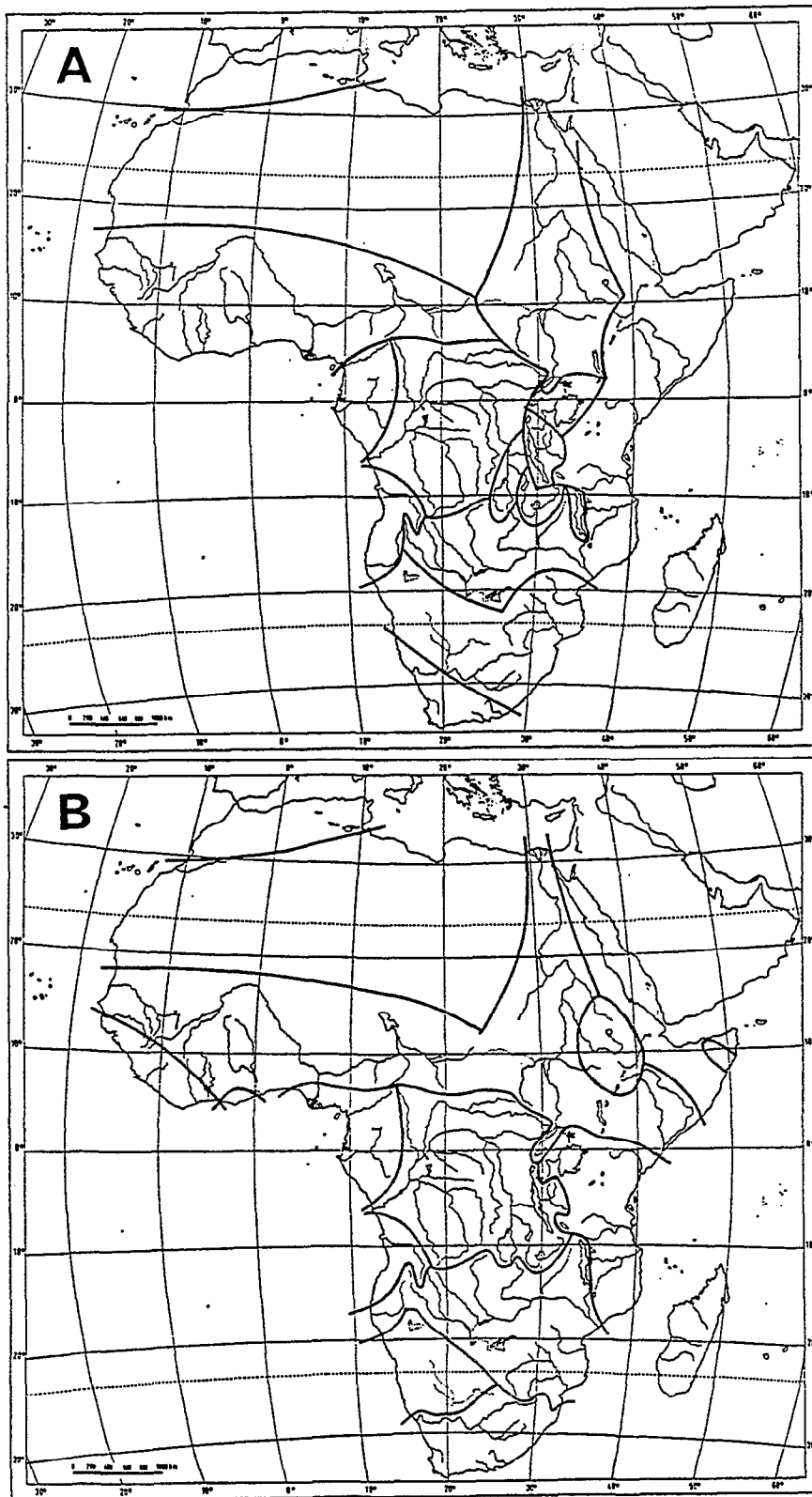


Figure 2 : Ichthyofaunal regions of Africa after (A) Poll (1957) and (B) Roberts (1975).

phical studies are concerned (Thys van den Audenaerde, 1979; Greenwood, 1984). Such regions are subjective constructions often based on inadequately detailed data and sometimes misleading taxonomy (Reid & Sydenham, 1979). Furthermore they are seldom, if ever, related to the distribution of groups whose phylogenetic (cladistic) relationships are well researched. Restricted taxa are frequently used to define, but seldom individually conform to, the geographical bounds of the regions themselves.

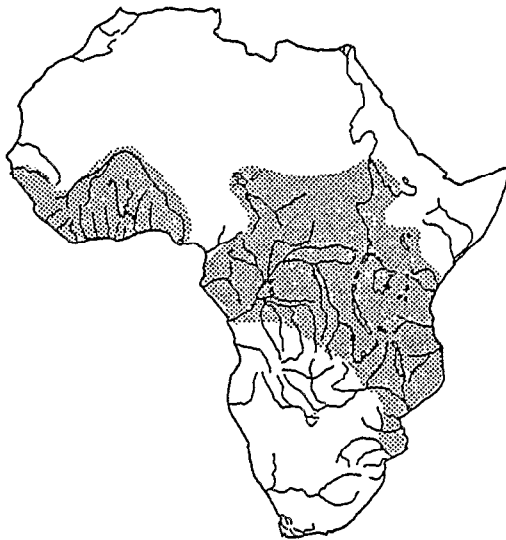
### 3 - SYSTEMATIC SECTION

#### Protopteridae

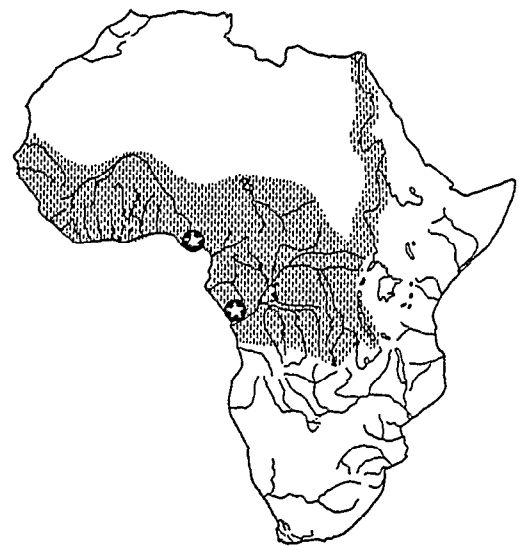
A single genus (*Protopterus*) and four species of lungfishes are found in Africa (Fig. 3). *Protopterus annectens* is the most widespread species and was recently reported from south of the Limpopo River (Pienaar, 1981). It is also found in Central, East and West Africa (Daget & Durand, 1981; Poll, 1954; Trewavas, 1954).

#### Polypteridae

The polypterids comprise two genera (*Polypterus* and *Erpetoichthys*) and 10 species in Africa. Details of their distribution are given by Poll (1954). The family is restricted to the Nile, the Zaire basin, Lake Tanganyika and West African rivers as far north as the Senegal River (Fig. 4). The only species of *Erpetoichthys*, *E. calabaricus*, is found in the Niger Delta and the Chiloango basin north of the mouth of the Zaire River.



**Figure 3 :** Distribution of the lungfishes (Protopteridae) in Africa. After Poll (1954) with extension from Pienaar (1981).



**Figure 4 :** Distribution of Polypteridae (after Poll, 1954).  
⊗ localities for *Erpetoichthys calabaricus*.

### Anguillidae

Five or possibly six freshwater eel species are known from African rivers. Boulenger (1907) reported the European eel *Anguilla anguilla* from the Nile. *Anguilla anguilla* ascends the rivers of the Atlas mountains or Magreb region (Pellegrin, 1921; Roberts, 1975). Four species of eels are known from rivers of the eastern African seaboard entering the Indian Ocean (Jubb, 1965a, b; 1967). These include two mottled species, *Anguilla marmorata* and *Anguilla bengalensis labiata*, and two plain species, *A. mossambica* and *A. bicolor*. Further south in rivers of the Cape, Transkei and Natal *A. mossambica* is probably the most abundant species but further north in Mozambique, Tanzania and Kenya *A. bengalensis labiata* is more common.

### Clupeidae

Poll (1974) summarized the distribution of Clupeidae in African continental waters. Thirteen genera and twenty-three species are found from northern Angola to Senegal including the entire Zaire River system and Lake Tanganyika. A further two species of the tribe Ehirava are known from south-eastern rivers of Africa: *Gilchristella aestuaria* is distributed from Cape Agulhas to Maputaland and Mozambique (Poll *et al.*, 1965; Bruton & Kok, 1981; Whitfield, 1981), and *Ehirava madagascariensis* has been recorded from the Buffalo River in the eastern Cape Province, South Africa (Poll *et al.*, 1965). Boulenger (1907) records *Alosa finta* from the lower reaches of the Nile. Two species are endemic to Lake Tanganyika (*Stolothrissa tanganica* and *Limnothrissa miodon*) and thirteen species are known from the Zaire River system including Lake Moero (Poll, 1974).

### Denticipitidae

This monotypic clupeoid family is known from the rivers of western Nigeria (Clausen, 1959) and from fossils in Tanzania, East Africa (Greenwood, 1960).

### Osteoglossidae

The only African osteoglossid, *Heterotis niloticus*, has a Sahelo-Sudanian distribution in the Nile, Lake Chad, the Niger, Volta, Gambia and Senegal Rivers. It also occurs in coastal rivers of Togo-Dahomey (Daget & Durand, 1981) and the Cross River to the east of the Niger (Roberts, 1975).

### Pantodontidae

A monotypic family (single species: *Pantodon buchholzi*) found in the lower reaches of the Ogun (Sydenham, 1977), the Niger and Benue rivers, as well as rivers of the Cameroons and the Zaire system (Poll, 1957; Poll & Goss, 1963).

### Notopteridae

There are two African notopterid species, *Papyrocranus afer* and *Xenomystus nigri*. *P. afer* is found in West African rivers from the Gambia River (Johnels, 1954) to the Niger (Daget, 1962; Daget & Durand, 1981) but is absent from the Volta (Daget, 1957). It is also present in the Zaire basin (Boulenger, 1909; Matthes, 1964; Poll & Goss, 1963; Gosse, 1963). *X. nigri* occurs in the Zaire basin, the Niger, Lake Chad drainage and the Nile (Daget & Durand, 1981).

### Mormyridae

Mormyrids are extremely widespread in African rivers (Table 1) and are only absent from the Magreb and the Cape ichthyofaunal province. At least two species, *Petrocephalus catostoma* and *Marcusenius macrolepidotus* are widespread in eastern Africa from Maputaland (Bruton & Kok, 1981) to the Tana River in Kenya (Bailey, 1969; Whitehead, 1959; Whitehead & Greenwood, 1959). There are also widespread species in West and Central Africa e.g. *Mormyrops deliciosus*, *Petrocephalus simus*, *Petrocephalus bovei*. Taverne (1972) listed 16 genera and 203 species in the family and as many as seventy five species are known from the Zaire basin (Poll & Gosse, 1963).

### **Gymnarchidae**

The only species, *Gymnarchus niloticus*, is characteristically a Sahelo-Sudanian form (Daget & Durand, 1981) distributed in the Nile and certain west African rivers such as the Niger, the Volta, Gambia and Senegal. Sydenham (1977) reported the species from the lower reaches of the Ogun River.

### **Salmonidae**

Several species of trouts (*Salmo* and *Salvelinus* spp.) have been introduced into southern and east African rivers. Natural isolated mountain populations of *Salmo trutta* occur in the Magreb region (Dumont, 1982; Pellegrin, 1921).

### **Galaxiidae**

A single galaxiid species (*Galaxias zebratus*) is currently recognized from African freshwaters (McDowell, 1973). It is distributed in southern Cape rivers from the Keurbooms River in the east to the Olifants River on the west coast (Barnard, 1943; Jubb, 1965a, 1967; Gaigher *et al.*, 1980).

### **Cromeridae**

The only species, *Cromeria nilotica*, has a Sahelo-Sudanian distribution (Daget & Durand, 1981; Poll, 1973) (Fig. 5). *C. nilotica* is found in the Nile (Boulenger, 1907), the Niger and the Volta, but not in the Lake Chad drainage (Blache, 1964).

### **Kneriidae**

Two genera are described with species known from both east and central-west Africa (Fig. 5). The southern most populations of *Kneria* species are isolated in tributaries of the Incomati River of the Transvaal (Jubb, 1967; Gaigher & Pott, 1972). *Kneria spekii* is Tanzanian (Wami and Ruaha Rivers, Bailey, 1969) but the majority of species occur in the southern tributaries of the Zaire River system in Zaire and Angola (Poll, 1967a, 1973). *Parakneria* species are known from Mozambique (Jubb & Bell-Cross, 1974), Angola (Poll, 1965, 1967a, 1973; Penrith, 1973), the Zaire basin and the Cameroons (Poll, 1965).

### **Phractolaemidae**

*Phractolaemus ansorgei* is distributed in the central Zaire basin and also in the lower reaches of the Niger and western Nigerian rivers (Poll, 1973, Fig. 5).

### **Grasseichthyidae**

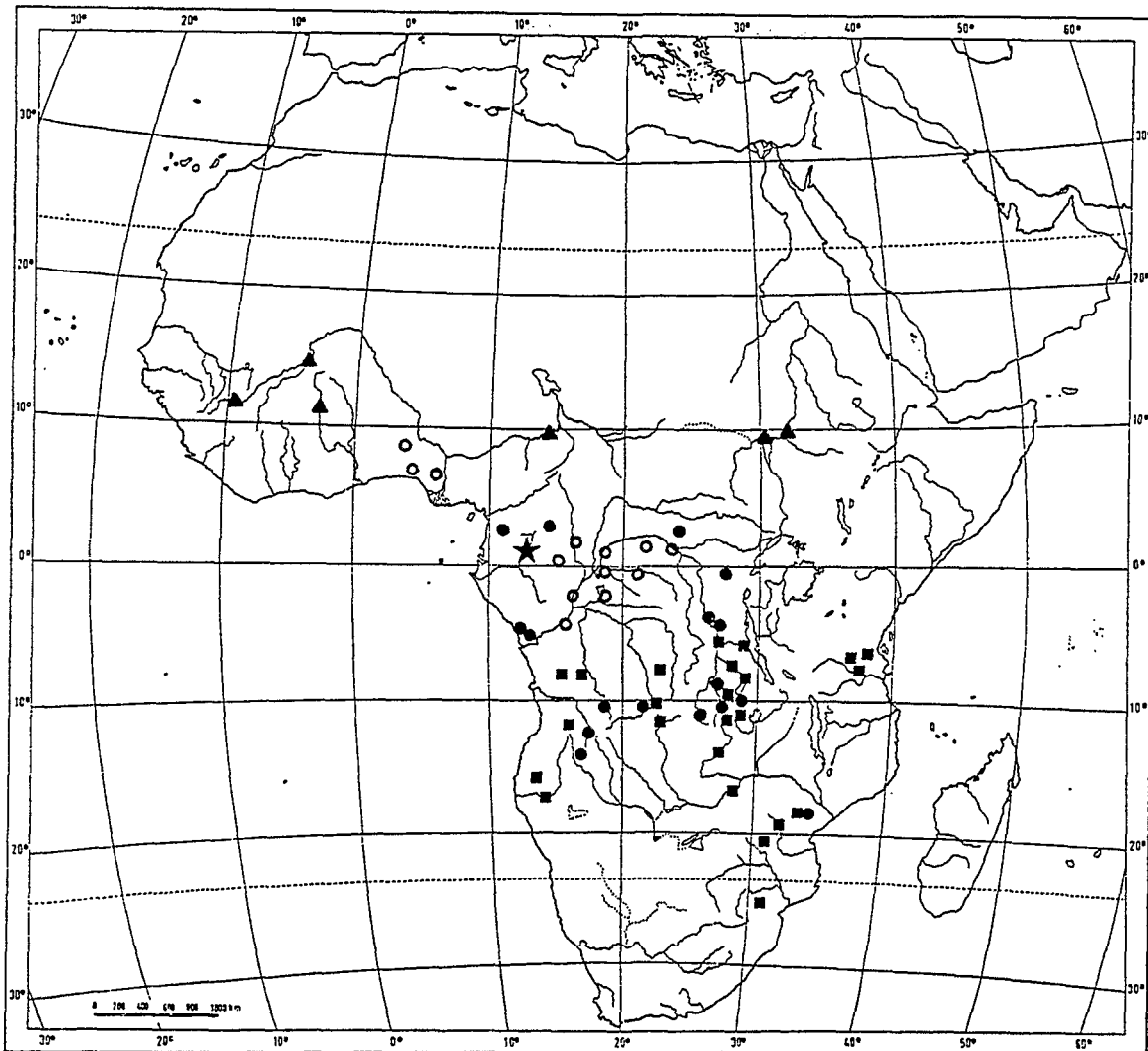
*Grasseichthys gabonesis* is restricted to the Ivindo branch of the Ogôoué River system (Gery, 1964, 1965; Poll, 1973) (Fig. 5).

### **Hepsetidae**

The unique African characoid fish *Hepsetus odoe* has a wide distribution in tropical and West Africa. Its southernmost locality is the Okavango Delta in Botswana (Jubb & Gaigher, 1969). It is found in the Upper Zambezi (Bell-Cross, 1972), throughout Angola (Poll, 1967a), the Zaire basin (Poll & Gosse, 1963) and West Africa from the Zaire to Senegal (Daget & Durand, 1981; Trewavas & Irvine, 1947). It is present in the Lake Chad basin (Blache, 1964) but is absent from the Nile and the east African Great Lakes.

### **Characidae**

The characins form a large and diverse group of fishes which are widespread in tropical waters. They are absent from the Magreb and from the Cape ichthyofaunal province (sensu Roberts, 1975). The genus *Hydrocynus*, the famed «tigerfish» of African freshwaters, occurs practically throughout the range of the family in Africa. On the east coast *H. vittatus* occurs from the Pongolo River in Maputaland (Bruton & Kok, 1981) as far north as the Wami River in Tanzania (Bailey, 1969) but is absent from Lake Malawi and the rivers of Kenya and Somalia. On the western side of the continent *Hydrocynus* species are not present in the Kunene River



**Figure 5** : Distribution of Gonorhynchiform fishes in Africa (after Poll, 1973).

- |                        |                        |
|------------------------|------------------------|
| ▲ <i>Cromeria</i>      | ● <i>Parakneria</i>    |
| ★ <i>Grasseichthys</i> | ○ <i>Phractolaemus</i> |
| ■ <i>Kneria</i>        |                        |

or coastal rivers of Angola (Poll, 1967a) but occur from the Zaire basin to Senegal in the west as well as in Lake Chad and the Nile (Daget & Durand, 1981; Blache, 1964; Boulenger, 1907). Many of the smaller characins were revised by Poll (1967b) but the taxonomy of many species and genera is not stable. Certain genera such as *Alestes*, *Micralestes*, *Petersius* and *Rhabdales-tes* are extremely widespread, for example *Alestes* and *Micralestes* cover the entire range of the family in Africa.

#### **Distichodontidae**

The recent classification of Vari (1979) is followed here for this family and the Citharinidae. The Distichodontidae includes fifteen genera distributed widely over tropical Africa. Only two

genera (*Distichodus*, *Citharinus*) are found in eastward flowing rivers with the exception of the Zambezi River in which three genera are recorded viz. *Distichodus*, *Hemigrammocharax* and *Nannocharax* (Bell-Cross, 1972). The southernmost record of the family is the Save River in Mozambique in the east (Jubb, 1967) and the Kunene River in the west (Bell-Cross, 1965; Ladiges, 1964). Some of the genera are widespread e.g. *Distichodus*, *Nannocharax* (Fig. 1 in Poll, 1973) whereas others e.g. *Dundocharax*, are restricted (to a tributary of the Kasai-Zaire system). The northern limits for the family are the Senegal River (Daget & Durand, 1981) and the Nile (Boulenger, 1907). *Distichodus* is found in several of the Great Lakes including Turkana, Albert, Tanganyika and Chad (Roberts, 1975; Greenwood, 1966; Poll, 1953; Blache, 1964). Poll (1973) provides a map of the distribution of genera formerly included in the family Ichthyoboridae.

#### Citharinidae

Vari (1979) restricted this family to two genera, *Citharinus* and *Citharidium*. *Citharinus* is widespread across the Sahelo-Sudanian region (Daget & Durand, 1981) including the Nile and Senegal Rivers as well as the Upper and Lower Guinean ichthyofaunal regions (Roberts, 1975; Daget & Iltis, 1965) and the Zaire basin (Poll & Gosse, 1963). Citharinids are absent from the Angolan provinces south of the Zaire River (Poll, 1967a) and the Zambezi system (Bell-Cross, 1972). On the east coast Bailey (1969) records *Citharinus* from the Ruvuma and Rufigi systems.

#### Cyprinidae

This is one of the most abundant and widespread of all African freshwater fish families. There are a few extremely large, systematically unwieldy and geographically widespread genera which include the majority of species, as well as a number of smaller but more precisely defined, coherent and relatively restricted genera. *Barbus* species are numerous and found throughout the continent including the Magreb region. Species of this genus dominate the riverine faunas of southern, south-eastern and eastern Africa (Copley, 1958; Bailey, 1969; Bowmaker *et al.*, 1978). The systematic status of various *Barbus* groups is unsatisfactorily defined or resolved at present and in some cases revisionary studies have been restricted to «large» or «small» species (e.g. Banister, 1973; Greenwood, 1962). Thus, while it is evident that there are relatively more «large» *Barbus* with longitudinally striated scales in east and southern Africa (Banister, 1973; Jubb, 1967) than there are in western drainages, the biogeographic significance of this observation is still obscure. Small *Barbus* species with radiately striated scales and a serrated dorsal fin spine are relatively more numerous in eastern and southern Africa than in West Africa. Species of the subgenus *Enteromius* are more numerous in West Africa (e.g. Hopson & Hopson, 1965) than in southern Angolan and east African rivers where a single widespread species (*Barbus radiatus*) is represented (Stewart, 1977). *Labeo* species are extensively distributed in Afro-tropical Africa to as far south as the Clanwilliam Olifants River in the south-west Cape. The genus *Varicorhinus* is at present under systematic review and is likely to be extensively redefined (Banister, pers. comm.). Nominal species are known from south-eastern Africa (Jubb, 1967), the Zaire basin (Banister & Bailey, 1979; Poll, 1976) through to West Africa and the Nile. *Varicorhinus maroccanus* occurs in the Magreb region (Pellegrin, 1921; Roberts, 1975). *Garra* is an Afro-Asian genus with African species in the Nile, the Chad basin, the Niger, the Zaire and east coast rivers as far south as the Pangani (Bailey, 1969; Daget & Durand, 1981; Menon, 1964; Poll & Gosse, 1963). The distribution of bariliine cyprinids is also widespread in Africa and has been summarized by Howes (1980a). The genera *Leptocypris* occurs in the Nile, Niger and Zaire basins (Lévêque & Bigorne, 1983); *Engraulicypris* in Lake Malawi and the Upper Shire River; *Opsaridium* in the Zambezi, Zaire, Quanza and Lower Guinean ichthyofaunal provinces (sensu Roberts, 1975); and *Raiamas* in the Nile and Sahelo-Sudanian region as well as the Guinean and Zairean ichthyofaunal provinces (sensu Roberts, 1975). Howes (1980a) separated the three African genera *Neobola*, *Rastineobola* and *Chelaethiops* from the bariliine groups. Howes (1984) later divided *Neobola* into 2 genera *Neobola* and *Mesobola*. *Mesobola* is widespread in eastern rivers from Somalia to Maputaland and is also found in the Orange, Kunene and Zaire River systems on the west coast. *Neobola* occurs in Somalia and north-east

Kenyan rivers as well as L. Turkana. *Chaelaethiops* is found in the Zaire system as well as Lakes Tanganyika and Rukwa. Several smaller cyprinid genera have relatively restricted distributions e.g. *Raddabarbuis*, *Sanagia* and *Prolabeops* are all restricted to the Cameroons (Banister & Thys van den Audenaerde, 1973; Thys van den Audenaerde, 1965, 1971).

#### Cobitidae

A single endemic cobitid species (*Nemachilus abyssinicus*) is known from a single specimen reputedly found in Lake Tana (Boulenger, 1907; Poll, 1957; Roberts, 1975). The common European species *Cobitis taenia* occurs in the Magreb (Pellegrin, 1921).

#### Bagridae

This catfish family is widespread in Afro-tropical waters. *Chrysichthys*, with approximately thirty species, is the largest genus (Jayaram, 1966) and is distributed from the Senegal River in the West, across the Sahelo-Sudanian region to the Nile (Daget & Durand, 1981) and south to the Zaire basin. *Chrysichthys hildae* is isolated in the Buzi River system in Mozambique (Bell-Cross, 1973a) and possibly represents the only species of the genus in eastern rivers. *Bagrus* is also widespread from the Senegal and Nile through West Africa to the Zaire basin and in eastern rivers south to the Rufiji (Bailey, 1969) and possibly the Ruvuma. Other widespread genera include *Parauchenoglanis* from Nigeria to Zaire, *Auchenoglanis* from the Okavango Delta through the Zaire basin to West Africa. The genus *Gephyroglanis* was shown to be polyphyletic (Skelton *et al.*, 1984) and is now restricted to species from the Zaire basin to the Cameroons. The southern African species, which have been placed in a separate genus *Austroglanis* (Skelton *et al.*, 1984) represent the southernmost catfish in Africa. *Clarotes* is found in the Senegal, Volta, Niger, Chad basin, the Nile and in the Tana and Athi rivers in Kenya (Copley, 1958; Whitehead, 1959). Other bagrid genera are less widespread e.g. *Gnathobagrus*, *Amarginops* and *Rheoglanis* are monotypic genera from the Zaire basin. *Notoglanidium* is found in Ghana, Sierra Leone (Irvine, 1947) and a new species was recently reported from the Zaire River (Roberts & Stewart, 1976). *Liauchenoglanis* is known from Sierra Leone. *Pardiglanis* is restricted to the Juba River of Somalia (Poll *et al.*, 1972), and *Platyglanis* to the Sanaga system in the Cameroons (Daget, 1979a). The small *Leptoglanis* species are known from the Cameroons, the Zaire basin, southern Angola including the Kunene River, the Zambezi and certain east coast rivers (Ruaha and Save). *Phyllonemus* and *Lophiobagrus* are both endemic to Lake Tanganyika (Poll, 1953).

#### Schilbeidae

This family of eight genera has a Afro-tropical distribution. *Schilbe* and *Eutropius* are widespread genera from the Senegal River and the Sahelo-Sudanian region, including the Nile, southwards to the Zambezi (*Schilbe*) and Maputaland (*Eutropius*). *Schilbe mystus* is one of the most widespread African fish species, from the Zambezi and Kunene Rivers to the Senegal and Nile in the north including east coast rivers. *Physailia* is known from the Senegal, Volta, Niger, Chad and Nile (Daget & Durand, 1981) as well as Somalia and the Tana River in Kenya (Whitehead, 1959). *Parailia* occurs in the Gambia River and the Zaire basin (Daget & Durand, 1981; Poll & Gosse, 1963). *Siluranodon* is a typically Sahelo-Sudanian form i.e. in the Nile, Chad basin, Niger and Volta Rivers (Daget & Durand, 1981). *Eutropiella* is found in Zaire, and west coast rivers to the Cameroons (Trewavas, 1943). *Pareutropius* is Zairean and is also present in east coast rivers from the Kingani to the Ruvuma. *Irvinea voltae* is known only from the Volta River (Trewavas, 1943; Trewavas & Irvine, 1947) and Trewavas (1964) described a second species of this genus from the Juba River in Somalia.

#### Amphiliidae

The largest and most widespread genus is *Amphilius* with species known from the Senegal River and throughout West, Central and East Africa as far south as the Umkomaas River in Natal (Crass, 1966). Surprisingly, *Amphilius* is not recorded from the Kunene River in Angola nor from the Nile beyond the Ugandan reaches of the system. *Paramphilius* species are restricted to streams in the Guinea, Sierra Leone and Liberia. *Doumea* is known from Guinea, Fouta

Djalon and Ivory Coast (Daget, 1962; Daget & Iltis, 1965) in West Africa, the Cameroons and the Ogôoué basin in Gabon (Pellegrin, 1915, 1921, 1929) and the Zaire basin (Poll & Gosse, 1963) as well as the Angolan coastal province (Poll, 1967a). Several *Phractura* species occur in the Zaire basin (Poll & Gosse, 1963) but the genus extends through Gabon and the Cameroons to the Niger and the Upper Volta (Blanc & Daget, 1957). *Belonoglanis* and *Trachyglanis* are restricted to the Zaire River system and *Andersonia* is reported from the Nile, Lake Chad and the Niger (Daget & Durand, 1981).

### Clariidae

*Clarias* species are extremely widespread in Africa apart from the Magreb region (Teugels, 1982, 1986), and occur naturally as far south as the Orange River (west) and the Umtamvuna River (east) (Jubb, 1967; Crass, 1966). The distribution of *Clarias gariepinus* (= *Clarias lazera*) in the Sahara is illustrated by Dumont (1982). The genus *Heterobranchus* is present in the Nile, Chad basin, Niger, Volta, Gambia and Senegal as well as the Zaire and Zambezi systems and Lake Tanganyika. Several more specialized clariid genera also occur in tropical Africa. *Clariallabes* is present in the Nile, Zaire, Ogôoué and Zambezi systems. *Gymnallabes*, *Channallabes* and *Dolichallabes* are all Zairean genera. The genus *Dinotopterus* is restricted to Lakes Tanganyika and Malawi (Greenwood, 1961). *Tanganikallabes mortiauxi* is a Lake Tanganyika endemic (Poll, 1953) and *Eugitglanis zammaronoi* is a cave-dwelling species endemic to Somalia (David, 1936, Ercolini *et al.*, 1982).

### Malapteruridae

Two species of electric catfish are known from Africa (Poll & Gosse, 1968). *Malapterurus electricus* is widespread from the Senegal River through West Africa to the Nile and Zaire systems as well as the Middle and Lower Zambezi (Fig. 7). It is present in Lake Tanganyika, Lake Chad, Lake Albert and the Omo River, the major affluent river to Lake Turkana. The second species, *Malapterurus microstoma*, is restricted to the Zaire system.

### Mochokidae

The largest and most widespread genus is *Synodontis* which occurs throughout the Afro-tro-



Figure 6 : Distribution of Amphiiliidae in Africa.

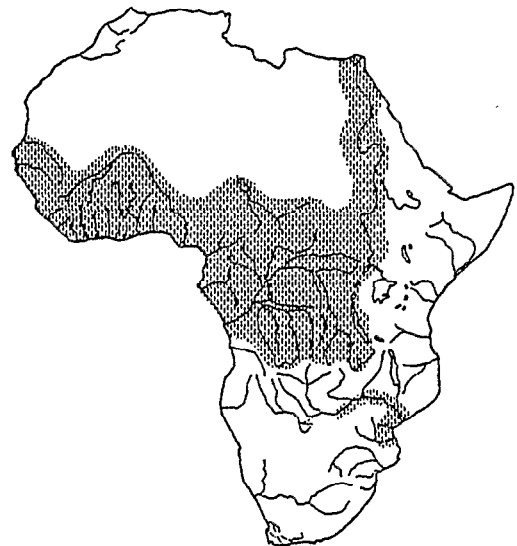


Figure 7 : Distribution of Malapteruridae in Africa (after Thys van den Audenaerde, 1967).



pical region as far south as the Pongolo River in Maputaland (Poll, 1971). *Hemisynodontis* is a monotypic genus from the Nile, Chad, Niger, Senegal, Gambia and Volta. The monotypic genus *Brachysynodontis* has a similar distribution but is absent from the Volta. *Microsynodontis* is a small genus known from the Zaire system and the Upper Niger River. *Mochokiella* is a recently described genus (Howes, 1980b) from Sierra Leone. *Mochokus* is known from the Nile, Chad Basin, Lake Rudolf and the Niger. *Acanthocleithron*, *Euchilichthys* and *Atopochilus* are distributed in the Zaire basin. The genus *Chiloglanis* is again widespread, from the Pongolo River in the south through central to West Africa and the Nile. On the west coast the southern limit for the genus is the Kunene River (Poll, 1967a) and the northern limit appears to be near the border between Liberia and the Ivory Coast (Daget & Iltis, 1965). On the east coast *Chiloglanis* is reported as far north as the Tana River in Kenya (Copley, 1958).

#### « Cyprinodontidae » (Cyprinodontiformes)

The most recent classification of the «Cyprinodontidae» (Parenti, 1981) elevates the family to ordinal status and includes several families within the order. The following families and genera are found in Africa (summarized from Parenti, 1981) : Family Aplocheilidae : *Pachypanchax* - coastal lowlands of Mozambique and Zanzibar north of the Zambezi River; *Epiplatys* - West and Central Africa from Senegal to the Ethiopian highlands and southward west of the Rift Valley to Katanga and the east coast; *Aphyosemion* - West and Central Africa from Zaire to Gambia; *Fundulopanchax* - Zaire Basin; *Adamas* - Zaire Basin; *Nothobranchius* - West, Central and East Africa from Senegal to Ethiopia and Somalia and thence south to Maputaland. Family Poeciliidae (sub-family Aplocheilichthyinae) : *Aplocheilichthys* - Central and East Africa; *Lamprichthys* - Lake Tanganyika; *Pantanodon* - Tanzania and Mozambique; *Procatopus* - Zaire basin; *Cynopanchax* - *Plataplochilus* - Nga River, Cameroons; *Hypsopanchax* - Zaire basin and Upper Zambezi. Family Cyprinodontidae : (Sub-family Cyprinodontinae) *Aphanius* - North African coast including the Magreb.

#### Channidae

The snake head *Parachanna obscura* is distributed from the Zaire basin through West Africa as far as the Senegal River in the west and the Nile in the east. A report of the species from Mozambique (Smith, 1950) is unconfirmed. A second species, *Parachanna africana* is found in West Africa (Poll, 1957; Teugels & Daget, 1984). *Parachanna insignis* was recently rehabilitated by Teugels & Daget (1984) and occurs from Cameroon to the Zaire basin.

#### Centropomidae

The genus *Lates* (including the subgenera *Lates* and *Luciolates*) is widely distributed in the Nile, Niger, Senegal, Volta and Zaire Rivers and also Lakes Chad, Albert, Rudolf and Tanganyika (Greenwood, 1976a). *Lates niloticus* has been introduced to Lake Victoria.

#### Nandidae

A single species of *Polycentropsis* (*P. abbreviata*) occurs in West Africa, from Dahomey just east of the Oueme River to Gabon (Daget & Iltis, 1965). *Afronandus sheljuzkoi* is found in the Banco and Mè Rivers in Ivory Coast (Daget & Iltis, 1965).

#### Cichlidae

A large family which is particularly speciose in the African Great Lakes and widespread throughout the continent. In the south the natural distribution extends to the Orange River on the west coast and the Bushmans River in the eastern Cape Province on the east coast (Jubb, 1965a, 1967). In the north cichlids are present in the Magreb region and the Nile as well as in several relict localities in the Sahara (Dumont, 1982). The taxonomy of genera in the family is currently being revised (e.g. Greenwood, 1979, 1980; Trewavas, 1981a, 1981b, 1983) and it is difficult to accurately characterize the distribution of many taxa. Certain genera such as *Tilapia*, *Sarotherodon*, *Oreochromis*, *Hemichromis* and *Serranochromis* are evidently widespread (e.g. Thys van den Audenaerde, 1963; Trewavas, 1964b, 1966a, 1983; Loiselle, 1979). Endemism at the specific and generic level is high especially within the Great Lakes and the large and ecologically diverse river systems such as the Zaire. Large species flocks of haplochromine

cichlids occur in some African Lakes, and groups of species are also found in tropical rivers as far south as the Zambezi.

#### **Anabantidae**

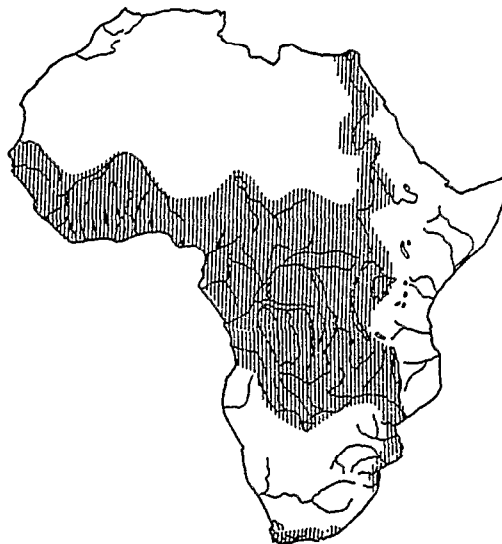
The African anabantids are divided into two geographically separate genera - *Ctenopoma* and *Sandelia*. *Sandelia* is restricted to the coastal rivers of the Cape from the Buffalo River in the east to the Berg River and adjacent streams in the west (Gaigher *et al.*, 1980). *Ctenopoma* species have a tropical distribution from Maputaland in the south to the Nile and Senegal Rivers in the north. They appear to be absent from east coastal rivers north of the Zambezi River, a surprising fact considering their general hardiness and air-breathing abilities. On the west coast anabantids have not been recorded from the Kunene River system but have a continuous distribution from the Angolan coastal province to Senegal.

#### **Mastacembelidae**

The southernmost distribution of the spiny-eels is the Upper Zambezi and Okavango River and Delta (Skelton, 1976). On the west coast species are known from Angola north of the Kunene River, the Zaire basin through to the Fatale and Konkoure Rivers in Guinea (Daget, 1962). *Afromastacembelus victorianus* is known from Lake Victoria and the Victoria Nile (Greenwood, 1966). On the east coast the southernmost record is the Shire River, a tributary of the lower Zambezi (Tweddle & Willoughby, 1979). Other east coast records include the Ruaha River (Bailey, 1969) and the Athi River in Kenya (Copley, 1958). The family is particularly speciose in Lake Tanganyika (Poll, 1953) and the Zaire River (Roberts & Stewart, 1976).

#### **Tetraodontidae**

*Tetraodon lineatus* is reported from the major river systems of West Africa including the Senegal, Volta, Niger and the Chad basin (Daget & Durand, 1981). In the Nile it occurs as far upstream as the Bahr-el-Jebel region (Boulenger, 1907) and is also present in Lake Turkana (Worthington, 1932; Roberts, 1975). Several species are present in the Zaire system (Poll & Gosse, 1963) and *Tetraodon mbu* is found in the lower courses of affluent rivers of Lakes Tanganyika (Poll, 1953). Bell-Cross (1972) records *Chelonodon laticeps* from the lower Zambezi River.



**Figure 8 :** Distribution of Anabantidae in Africa.

### Gobiidae

Gobies are regularly reported from the accessible lower reaches of African rivers (which in certain cases can be extensive). *Chonophorus aeneofuscus* and *Glossogobius giurus* are found in east coast rivers from the Athi and Ruvuma respectively southwards to Natal (Copley, 1958; Bailey, 1969; Jubb, 1967). Poll's (1961) *Gobius scortecii* from the north of Somalia is apparently closely related to *Chonophorus aeneofuscus*. *Glossogobius callidus* is known from the rivers of the eastern Cape to Natal. *Redigobius dewaali* is found in the Pongolo River and other localities in Maputaland and Natal (Bruton & Kok, 1980). In West Africa, Daget & Iltis (1965) record several species from the coastal lagoons of Ivory Coast with one species in particular, *Chonophorus*, entering freshwater reaches of the rivers. Pellegrin (1915) records *Chonophorus lateris-triga* from the Ogôoué and Pellegrin (1928) *Nematogobius maindroni* from the coastal rivers of Cameroon.

### Eleotridae

Whilst eleotrids have not been commonly reported from east coast rivers they are present there e.g. Bruton & Kok (1980) record three species from Maputaland (*Eleotris fusca*, *Eleotris melanostoma* and *Hypseleotris dayi*). The genus *Kribia* is common and well known in West Africa from Senegal to Zaire (e.g. Daget, 1962; Daget & Iltis, 1965; Daget & Durand, 1981; Pellegrin, 1915, 1929; Poll & Gosse, 1963; etc.). The common West African species, *Kribia nana*, is also present in the Nile (Boulenger, 1907).

### Other families

A number of other fish families are reported from African continental waters. These are generally groups of marine peripheral groups which have either established freshwater populations or are sporadic invaders of the lower reaches of rivers. The Zambezi shark *Carcharhinus leucas* is an inhabitant of south-east coastal rivers, at least from the Zambezi (Bell-Cross, 1976) to Maputaland (Pienaar, 1978; Bruton & Kok, 1980). They are also reported from West African rivers e.g. the Gambia (Daget, 1961). Saw-sharks (Pristidae) are also sporadic freshwater invaders both in south-east Africa (Bell-Cross, 1976; Bruton & Kok, 1980) and West Africa (Daget, 1961). One species of the rajiform family Dasyatidae (*Dasyatis garouaensis*) inhabits the Benue River, a tributary of the Niger (Reid & Sydenham, 1979). Synbranchid eels and syngnathid pipe-fish are frequently reported from the lower reaches of West African rivers. Mulletts (Mugilidae) are well known invaders of freshwater and they are important inhabitants of rivers in regions such as the eastern Cape Province (South Africa) which have depauperate faunas (Bok, 1979). The tarpon *Megalops cyprinoides* (Megalopidae) also enters of south-east African (Pienaar, 1978; Bruton & Kok, 1980) and West African rivers (Pellegrin, 1921). Other families reported from African rivers include the Monodactylidae, Lutjanidae, Polynemidae, Carangidae, Atherinidae, Sciaenidae, Belonidae, Sphyraenidae, Centropomidae, Teraponidae, Sollaginidae, Leio-gnathidae, Kuhliidae, Pomadasyidae, Sparidae, Mullidae, Gerreidae, Periophthalmidae, Cynoglossidae, Ariidae and Plotosidae.

## RÉSUMÉ

La répartition des poissons d'eau douce africains a beaucoup intéressé les ichtyologistes et il existe une littérature abondante. Ce chapitre tend à résumer les travaux les plus importants et présente une ébauche de la répartition des différentes familles, sans considérations biogéographiques.

On s'est plus particulièrement intéressé à certains aspects comme la contribution des poissons d'origine marine à la faune des eaux douces, l'existence de taxons à très large répartition, et le concept régional dans la répartition des poissons d'eau douce.

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