

ted by the Administration. In all the country on either side of the valley, i.e. Nyasaland and Mozambique to the sea on the east and the lake areas on the west, it does not exist. I am convinced that the former distribution of African water has had much to do with the distribution of its present fauna and native races.

Giraffe, Oryx, one Gazelle, the Springbuck, White Rhino, and Ostrich are South African forms (south of Zambesi). They are also North African forms. There are many other instances. In the intervening belt, with its east to west distribution, they are unknown in the Central Lake areas. They probably reached South Africa by way of the Loangwa Valley on the east and Damaraland and Angola on the west. This theory I base on the present lines of zoological distribution. Conclusive evidence can only be obtained from the geology and palæontology of these regions (Loangwa and Bangweolo), about which, in these respects, very little is known.

The report of the Irrigation Commission on the Orange River basin, carried out some twelve or fifteen years ago by engineers from India, also contains some interesting facts regarding desiccation.

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## { GAME FISH IN TANALAND

BY R. SKENE

### KOLI-KOLI

#### *Scombridae—near Tuna Group*

*Migratory Habits.*—During the first days of June the first koli-koli are caught—that is, as soon as the big rains are over and the sea inshore has become clear. They continue to increase in numbers till the end of September, when they reach their maximum. In October they begin to decrease, and go on decreasing till about the end of January. In February and March there are very few indeed. In April and

May there are none at all, except, perhaps, one or two may be caught well out to sea.

*Breeding.*—It is not known where they breed. The roe found in the fish is about the size of millet. No young fish have been seen in the vicinity of Lamu.

*Haunts.*—They frequent both shallow and deep water, preferably the latter. It is not known whether they migrate to and from the Persian Gulf, but they are also to be found there.

*Bait and Methods of Capture.*—This fish is frequently caught with a hook and line, the best bait being 'kamba' (prawns), 'dome' (octopus), and 'mkisi' (mullet). It is also caught in nets dragged to the shore between two canoes and then pulled up on to the shore. It is found also in fish-traps in the creeks and harbours.

*Other Information.*—The koli-koli is called the 'maridadi' (dandy) of the sea owing to its liking for clear water, and its refusal of any bait that is not absolutely fresh and untainted.

## KAMBISI

### *Scombridae*

*Migratory Habits.*—The habits of this fish are very similar to those of the koli-koli.

A few are caught during June. They then go on increasing in numbers till September, during which month they reach their maximum. In October they begin to decrease, and go on decreasing till January. In February and March very few are to be found. In April and May there are none at all.

*Breeding.*—It is not known where they breed. The size of the roe is about that of millet. No young fish have been found in the vicinity of Lamu.

*Haunts.*—They frequent both shallow and deep water.

*Bait and Methods of Capture.*—When fishing with a hook and line the most acceptable bait to the kambisi is 'kamba' (prawns), 'dome' (octopus), and 'mkisi' (mullet). It is also caught in nets dragged to the shore between two canoes, and it is frequently to be found caught in the fish-traps set up in the creeks and inlets.

## TENGESI

*Barracuda*

*Migratory Habits.*—This fish is said to come from the Arabian coast. They come south with the north-east monsoon, and a few of them may already be caught during November in the waters of Lamu. They increase in numbers up till January, when they reach their maximum on their southward journey. During the north-east monsoon they can be seen travelling in a southerly direction. They do not linger at all near the Lamu archipelago, and are only caught as they travel past. They decrease in numbers during February, and as soon as the monsoon begins to die down they turn round and can be seen travelling with their heads turned in a northerly direction. By the beginning of the rainy season—that is to say, in the first days of April, they have already entirely disappeared from the vicinity of Lamu, and are not to be seen again till the beginning of the next north-east monsoon. While travelling north, much fewer are to be seen than when they are going in a southerly direction.

*Breeding.*—It is not known where the tengesi breeds. The roe is generally slightly larger than millet. No young fish have been caught here.

*Haunts.*—This fish very rarely comes into the creeks and inlets of the coast, but keeps to the open sea.

*Bait and Methods of Capture.*—The tengesi is not common in the fish markets of the Lamu archipelago, as it is neither caught in nets nor in fish-traps. The only method of fishing for it here is by artificial bait consisting of a piece of white rag fixed on a hook and line and towed behind a fast-sailing dhow. The line used is about the thickness of a pencil. Sometimes a small white fish called 'dagaa' is put on the hook instead of the white rag.

## FULUSI

*Coryphaena sp. (Dolphin)*

*Migratory Habits.*—This fish is only to be found in Tanaland waters towards the end of the north-east monsoon, during a period of about two months—that is, during February and

**March.** As soon as the rainy season begins they disappear from these waters.

*Breeding.*—It is not known where this fish breeds. The roe is very small indeed, not much bigger than a pin's head. No young fish have been caught here.

*Haunts.*—The fulusi does not come into the creeks and inlets of the coast, but generally keeps well out to sea. It may occasionally be seen near the coast in the vicinity of an open bay where the bottom is sandy and deep, and free from seaweed.

*Bait and Methods of Capture.*—Like the tengesi, the fulusi is not a common fish in Lamu waters. Owing to its generally keeping well out to sea, it is not caught in nets nor in fish-traps. It is only fished for with an artificial bait consisting of a white rag fixed on a hook and line towed behind a fast-sailing dhow. They are rarely found in the markets of the islands.

## NGURU

### *King-fish (Scombridae)*

*Migratory Habits.*—The nguru is a common fish in Lamu waters, which it inhabits in more or less numbers all the year round. From April till October it is less frequently found, but in November it begins to increase in numbers till it reaches its maximum about the end of December. It then begins to decrease till March, when its numbers remain more or less constant till they begin to increase again in the following November.

*Breeding.*—It is not known where the nguru breeds. The roe is somewhat larger than the size of millet seed. No young are found in these waters.

*Haunts.*—This fish frequents the creeks and inlets as well as the high seas, where they are more often found, however, than in the creeks.

*Bait and Methods of Capture.*—It is caught in fish-traps, but not in nets. It is also fished for with a hook and line, the best bait being 'kamba' (prawns) and 'mkisi' (mullet). But it can be more successfully caught by an artificial bait consisting of the usual white rag fixed on a hook and line towed behind a fast-sailing dhow.

## MTUMBU

*Migratory Habits.*—This fish is said not to migrate, but frequents the Tanaland waters in large numbers, comparatively to other game fish. It is most common in July and August.

*Breeding.*—It breeds on this coast, young fish being found in the creeks all the year round. Opinions of fishermen vary as to the time of year when the roe is largest. Some say the fish spawn at the end of one or other monsoon, while others say that spawning time is in January or February.

*Haunts.*—The younger fish keep to the creeks, while full-grown fish prefer the open sea.

*Bait and Methods of Capture.*—It is caught in fish-traps, nets, and with hook and line, the best bait being 'mkisi' (mullet), and 'dome' (octopus).

## MKISI

*Mullet—used for bait*

*Migratory Habits.*—This fish is said not to migrate from this coast, and are to be found here in plenty all the year round. According to information obtained from Arabs, it is not to be found in Arabian waters.

*Haunts.*—The mkisi rarely goes out to the open sea, but lives in the quiet waters of mangrove creeks. It prefers a muddy bottom to a sandy one.

*Breeding.*—Young fish are found in the vicinity of the Lamu archipelago. The roe is described as being the size of grains of sand. In some individuals the roe is white, and in others it has a reddish-brown tinge which is considered by Lamu fishermen to be a sign that the fish is in a full-blooded, healthy condition.

*Bait and Methods of Capture.*—The mkisi is not fished for here with hook and line, as it will not take the ordinary kinds of dead bait used by natives, who consequently look upon this fish as a vegetarian. Its food is believed to be weeds and other vegetable matter to be found round about the roots of mangrove trees.

It is fished for by means of nets and fish-traps. Another method is practised by night, and consists of lighting a straw fire in a canoe so as to produce a tall flame. Attracted by the light, the fish jump towards it and fall into the canoe.

NYUNA (OR UNA)

*Scombridae, a small silvery bait fish*

*Migratory Habits.*—This fish is to be found all the year round in Lamu waters, but is more plentiful from March till November. They are said to be much more numerous in Arabian waters than here, but it is not known whether they actually migrate.

*Haunts.*—The nyuna lives in the open sea, but prefers land-locked bays with a sandy bottom—like Manda Bay, for instance.

*Breeding.*—It is not known if they breed here. The roe is extremely small, and is described as being like grains of sand. Lamu fishermen believe that they do not spawn at all, but that they fall from heaven with the rain, as they always become much more plentiful as soon as the rainy season begins in March.

*Bait and Methods of Catching.*—This fish is caught in nets, traps, and with a hook and line, the best bait being crab meat, sea slugs, and octopus meat.

A NATURAL HISTORY EXPEDITION THROUGH  
THE KEDONG VALLEY, B.E.A.

BY A. LOVERIDGE

The object of this trip was to collect the eggs of vultures and buzzards, which we were told nested in the rocky fastnesses of the Kedong Valley, an arid region lying almost due south of Lake Naivasha. The only data we had to go upon as to the right season to procure eggs was an account of the nesting of an augur buzzard, whose eggs hatched on August 22, and