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## TWO NEW SPECIES OF CICHLID FISHES FROM LAKE MALAWI (FORMERLY KNOWN AS LAKE NYASA)

by

D. H. ECCLES

*Senior Fisheries Research Officer, Fisheries Department, Malawi.*

The work of Fryer (1959) summarised our knowledge of the ecology and taxonomy of the fishes of the rocky shores of Lake Malawi. In these areas the fauna is dominated by a group of cichlid genera known locally as 'Mbuna' and characterised by the small size of the scales on the nape, chest and cheek. Fryer showed that some populations of these were remarkably restricted in distribution. In the past decade a thriving export trade in 'mbuna' has developed for the aquarium market. This has led to the exploitation of populations not previously investigated, and to the discovery of a number of new species of restricted distribution. The present paper describes two of the more striking of these.

**Notes on the measurements.** Measurements have been made with direct reading vernier calipers reading to 0.1 mm. Length measurements were obtained by holding the fish on a measuring board with its head touching the block, and measuring the perpendicular distance from the block to the reference point on the fish. Head length is measured from the foremost point of the longer jaw; where the lower jaw protrudes the snout is measured by subtracting the distance between the anterior ends of the jaws from the distance to the anterior border of the eye. The eye is measured across the diameter of the cartilaginous border of the orbit. Other measurements are those used by Trewavas (1935).

Spines of dorsal and anal fins are measured along the posterior border of the spine—Pectoral length is measured from the upper part of the axilla. Pelvic spines are measured from their articulation, pelvic length also being measured from this point.

Scale counts used are as follows: Lateral line, as measured by Trewavas (1935). "Dorsal to lateral line" is the number of scales from the first dorsal spine to, but not including, the lateral line scale lying on an oblique series from and behind the spine. "Pectoral to pelvic" is the number of scales between the bases of these fins. Cheek scales are counted as series below the orbit and as the total number along the upper margin of the scaled area bordering the orbit.

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*Melanochromis simulans*. spec. nov.

**MATERIAL EXAMINED**

The holotype, an adult female of total length 81,5 mm and standard length 69 mm, collected near Cape Ngombo on the eastern shore of Lake Malawi at about 13° 45'S, 34° 50'E. Deposited in the United States National Museum.

**DESCRIPTION**

**Proportions.** In Standard length: Depth of body 3,8 (26%); Head 3,0 (33%) Caudal peduncle 7 (14,8%).

In Head: Eye 4,0 (25%); snout 2,9 (35%); lower jaw 2,5 (40%) pre-orbital depth 5,3 (19%); inter-orbital width 5,1 (20%); premaxillary pedicel 3,6 (28%).

Caudal peduncle 1,2 times as long as deep.

**Fins:** Dorsal XVIII, 8; first spine 6,7 times (15%), last spine 2,5 times (40%); in head length. Anal III, 8 the first spine 6 times (17%) and the last spine 2,6 times (39%) in head length. Longest rays of dorsal and anal not reaching end of caudal peduncle. Pectorals shorter than head, 5,1 times (20%) in S.L., not reaching vent. Pelvics longer than pectorals, 4,6 times (22%) in S.L., but not reaching vent. Caudal slightly emarginate, but somewhat eroded in the single specimen seen.

**Scalation.** 34 scales in the lateral line, the upper and lower lines overlapping by one scale on one side and not overlapping on the other. Scales of nape and chest small, 8 from dorsal to lateral line and 7 between pectoral and pelvic. Cheek scales small and inconspicuous, scaled area about 4 scales deep and 14 along border of orbit.

**Dentition.** The upper jaw with 4-5 rows anteriorly, the outer row with a total of 50 teeth of which the last eight on each side are simple and increase in size posteriorly, the remainder of the teeth of this row being unevenly bicuspid. Inner rows unevenly tricuspid. The lower jaw with 4 rows anteriorly, similar to those of upper jaw but posterior teeth not enlarged. A total of 49 teeth in the outer row. Pharyngeal moderately slender, the anterior blade almost as long as the toothed area. Posterior border of bone emarginate, slightly convex on either side. Teeth well spaced on surface of bone, 10 in longest medial series, 33 in row across posterior margin, the teeth of this row appreciably larger than those immediately anterior to them.

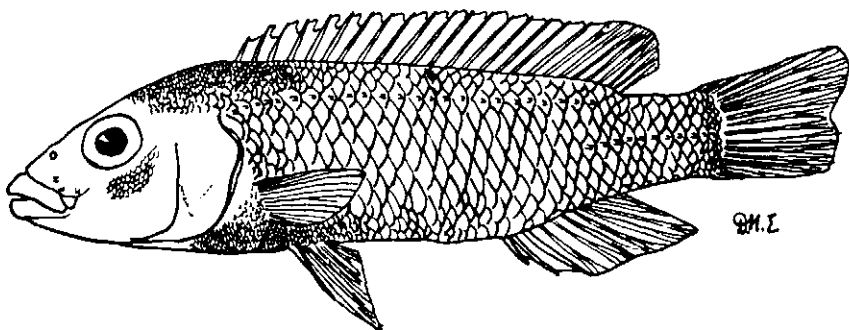
**Gill rakers.** 10.1.3.

**General shape.** Head somewhat pointed, jaws equal anteriorly, maxilla not quite reaching level of eye, premaxillary pedicel reaching level with end of nasals. Snout and inter-orbital area straight, nape gently curved to origin of dorsal which is the point of greatest depth. Margin of back almost straight below dorsal fin with sharp double inflection below last soft ray.

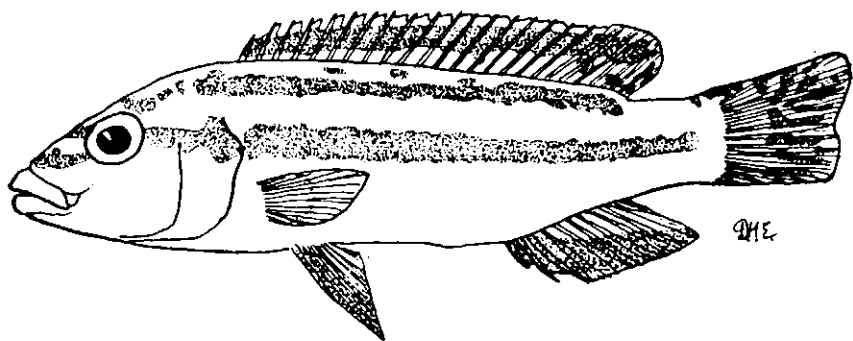
**Coloration.** Recently preserved material. Two horizontal dark bars across the snout. An irregular dark bar between the eye and the opercular spot, from which a dark stripe with scalloped edges extends to the end of the caudal peduncle. Nape with irregular dark patches, continued posteriorly by another irregular dark stripe just below the base of the dorsal and extending to below the posterior end of that fin. A few dark spots between upper stripe and base of dorsal. Dorsal with a black bar running parallel to the margin of the fin from the first spine to the end of the fourth branched ray. There are a few isolated irregular black spots on the rayed part of the fin. The lappets are pale.

Anal pale with a dark sub-terminal bar the whole length of the fin. Caudal pale with dark stripes between the rays and scattered dark spots.

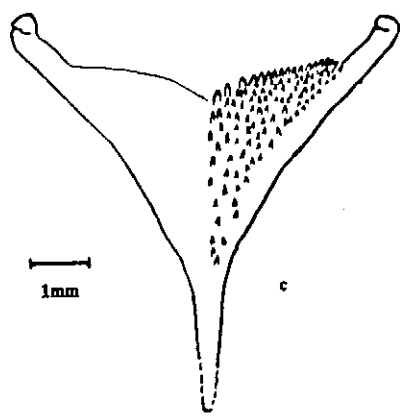
Pectoral pale with scattered dark spots. Pelvic dark externally, pale on inner half. In the live fish the pale areas of body are bright yellow, with narrow white zones



10mm



10mm



1mm

Fig. 1. *Melanochromis similans* spec. nov.  
(a) Holotype  
(b) Colour pattern  
(c) Lower pharyngeal bone of holotype



edging the black stripes. Pale parts of the fins are white. A colour photograph of the holotype in life is expected to be published in Tropical Fish Hobbyist for September, 1973.

#### ECOLOGY

Little is known of the ecology of this species. It was collected by professional exporters of aquarium fish in an area of scattered reefs some 20 miles from Monkey Bay. The gut was empty.

#### REPRODUCTION

The ovary contained ripening eggs and it appears as if the breeding season may be around the middle of the year. As with the other fishes of the "mbuna" group the right ovary is well developed but the left one is only about half the size of the right, although containing well developed oocytes.

#### AFFINITIES

The genus *Melanochromis* Trewavas (1935), with the exception of *M. labrosus* which appears to belong to the heterogeneous assemblage of species currently included in the genus *Haplochromis*, forms a well defined group within the "mbuna".

*Melanochromis* was described by Trewavas (1935) and differs from the closely allied *Pseudotropheus* by a lower degree of specialisation of the dentition. The pharyngeal teeth are not closely set, and those of the posterior row are appreciably larger than those immediately anterior to them. The teeth of the outer rows of the jaws are less closely spaced than in *Pseudotropheus* and the posterior teeth of the upper jaw are less sharply differentiated from the anterior ones than in that genus. In *Melanochromis* the head is usually more elongate and the snout more pointed than in *Pseudotropheus*, the form of the head and mouth being more suited to predation on small invertebrates than to feeding on or among "aufwuchs" as is the case with most *Pseudotropheus*.

In *Melanochromis* the colour pattern appears invariably to consist of either horizontal bars or to be uniformly dark. This colour pattern is also found in two species of *Pseudotropheus*. *M. simulans* resembles *M. melanopterus* in form and proportions but differs strikingly in colouration, *M. melanopterus* being a dark fish with obscure horizontal bars and plain caudal while *M. simulans* is a pale coloured fish with an ornate caudal.

#### GENERAL

The trivial name applies to the striking resemblance in colour pattern between this species and *Pseudotropheus auratus* (Boulenger). A very similar colour pattern is also shown by *Julidochromis ornatus* Boulenger from Lake Tanganyika, yet another parallel between the cichlid fishes of that lake and Lake Malawi.

#### *Pseudotropheus johannii* spec. nov.

#### MATERIAL EXAMINED

One male of total length 84,5 mm (Std. length 68,5 mm) and one female of total length 84,3 mm (Std. length 70 mm). Both collected 16th May, 1973 near Cap Ngombo in the same area as the holotype of *Melanochromis simulans*, Spec. Nov.

**Holotype.** The female, a mature specimen with developing oocytes. **Paratype.** The male, a mature specimen. Both deposited in the United States National Museum.

#### DESCRIPTION

(Where holotype and paratype differ the holotype is given first).

**Proportions:** In Standard Length: Depth of body 3,4, 3,3 (29-30%); Head 3,4, 3,5 (29%); Caudal peduncle 8,4, 7,7 (12-13%)<sub>3</sub>

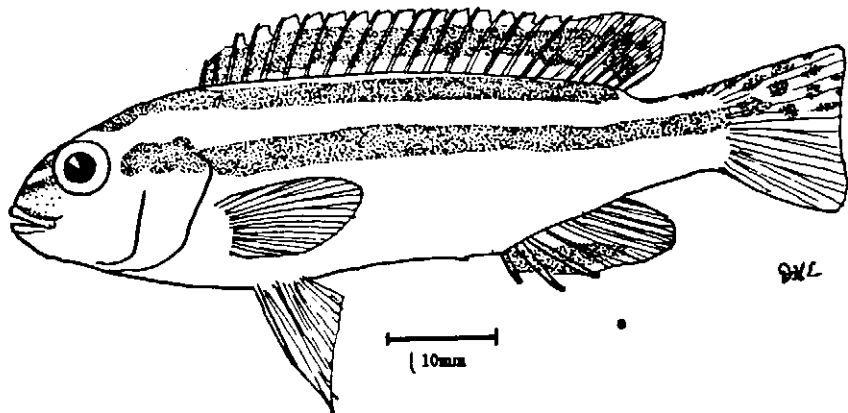
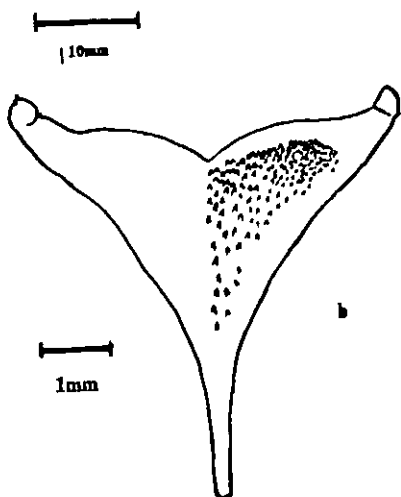
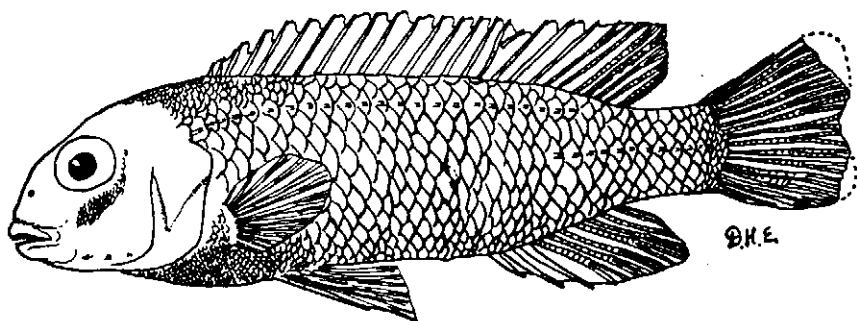


Fig. 2. *Pseudotropheus johannii* spec. nov.

(a) Holotype

(b) Lower pharyngeal bone of holotype

(c) *Pseudotropheus auratus* (Boulenger). Colour pattern. Photographed by Dr. H. R. Axelrod  
United States National Museum.

In Head: Eye, 3,3, 3,5 (30, 29%); snout 4,1, 4,1 (24%); lower jaw 2,9, 3,0 (34, 33%); pre-orbital depth 5,1, 5,3 (20, 19%); inter-orbital width 3,9, 3,4 (26, 29%); premaxillary pedicel 3,6, 3,5 (28, 29%).

Caudal peduncle as long as deep.

**Fins:** Dorsal XIX 7 (8), XVIII 8 (9); first spine very short, 8,5, 8,9 (12, 11%) times last spine 2,0, 2,1 (50, 48%) times in head length. Anal III 7 (8), the first spine 5,1, 6,1 times (19, 16%), last spine 2,1, 2,2 times (48, 45%) in head length. The longest rays of dorsal and anal reaching about to the end of the caudal peduncle. Pectorals shorter than head, rounded, 4,2, 4,6 times, (24, 22%) in standard length. Pelvics equal to pectorals in holotype, not reaching vent. In male pelvics 3,3 times (30%) in S.L. reaching almost to A1. Caudal of holotype eroded, slightly emarginate in paratype, scaled on basal half.

**Scalation:** 33 scales in lateral line (but holotype with 34 on left side) upper and lower lines not overlapping. Scales of nape and chest small, holotype with 7 and paratype with 6 from dorsal to lateral line. Holotype with 7 and paratype with 9 from pelvic to pectoral. Cheek scales small and inconspicuous, scaly area 5 scales deep and 12-14 long in holotype and 6 deep and 11 long in paratype.

**Dentition:** Upper jaw with 6-7 rows anteriorly, the outer bicuspid and the inner evenly tricuspid. The outer row with a total of 49 (48) close-set teeth. In the holotype the last 6 on the right side are conical, but not enlarged while all those on the left side are bicuspid. In the paratype the last 5-6 outer teeth of the upper jaw on each side are simple and slightly enlarged.

Lower jaw anteriorly similar to upper jaw, outer row with a total of 41 teeth. Pharyngeal moderate, blade appreciably shorter than toothed area. Posterior border emarginate, either side markedly convex in plan and extending behind toothed area. Teeth well spaced anteriorly holotype with 11 and paratype with 13 in longest median series, but small and densely crowded postero-laterally. 41 (40) teeth across posterior margin of bone, the teeth of this row similar in size to those of the row immediately anterior to them except postero-laterally.

**Gill Rakers:** 10.1.2; 8-9.1.3-2.

**General Shape:** Head blunt, lower jaw slightly shorter than upper, maxilla extending to below anterior part of eye. Premaxillary pedicel reaching level of nostril. Snout shorter than eye, steeply sloping, more so in holotype. Maximum curvature of profile in inter-orbital area. Greatest depth at about first dorsal spine, margin of back below dorsal gently curved, moderately inflected below last soft rays.

**Coloration:** Recently preserved specimens.

Holotype (female) generally yellow-orange, snout and opercular spot darker, chin white. Body paler below, with a suggestion of two darker longitudinal bands, one at mid-flank and one just below the base of the dorsal fin. Fins pale yellowish, the left pelvic showing a slight blackening at the tip. Dorsal with a very faint darker sub-terminal bar on the spiny portion, rayed portion with a darker yellow patch distally. Caudal paler distally.

Paratype (male) generally intense black with a pale blue horizontal stripe across the snout immediately above the nostrils and another across the inter-orbital region extending back to above the posterior border of the pre-opercular bone. A pale blue stripe, interrupted just behind the pectoral, from behind base of pectoral to end of caudal peduncle. Another from behind inter-orbital stripe below base of dorsal to top of caudal peduncle. Dorsal with a row of pale blue spots basally in membrane.

appears pale blue. Anal with distal part of membrane of spiny part pale blue and with  
two yellow "egg spots" near posterior corner. Upper and lower edges of caudal lined  
blue as is the anterior edge of the pelvic.

Colour photographs of the living holotype and paratype are expected to appear  
regularly in Tropical Fish Hobbyist.

### ECOLOGY

Not known, collected in the same area as *Melanochromis similans*. The guts of  
both specimens were empty when examined.

### REPRODUCTION

The left ovary of the holotype is rudimentary, with no sign of developing oocytes.  
The oocytes in the right ovary were developing. The male had apparently ripe testes.  
If breeding is seasonal it would appear to take place in the cool season, May to July.

### AFFINITIES

Within the genus *Pseudotropheus* only two species are known with longitudinal  
striping and no cross-bars. These are *P. auratus* (Boulenger) and the present species.  
In this respect these species resemble *Melanochromis*, but their short snouts, small  
mouths, close-set dentition and fine pharyngeal dentition are all characteristic of  
*Pseudotropheus*. *P. johannii* differs from *P. auratus* in the colouration and in the steeper  
shorter snout.

### GENERAL

Named in memory of John James, a collector of fishes for the aquarium trade.  
I am grateful to Dr. Herbert R. Axelrod for making the specimens available for  
me and to Mr. T. E. Davies for information on the locality.

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