3

, No. 29, pp. 319–330 15 August 1975

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

SMITHSONIAN
AUG 26 1975
LIBRARIES

LABIDOCHROMIS TEXTILIS, A NEW CICHLID FISH (TELEOSTEI: CICHLIDAE) FROM LAKE MALAWI

By Michael K. Oliver
Department of Ichthyology, American Museum of Natural History, New York, N.Y. 10024

An aquarist (Johnson, 1974a) recently published brief descriptions of two new species of *Labidochromis*, a genus of cichlid fishes endemic to Lake Malawi, Africa. He based one of them, *L. joanjohnsonae*, on a holotype and paratype belonging to two species that differ strikingly from each other in coloration and oral dentition. Although he gave conflicting statements both of standard length and total length of the paratype in different paragraphs, Johnson (1974a: 15) clearly designated the smaller of the two specimens as the holotype, and since they differ in standard length by nearly 10 mm there is no doubt as to which this is. The number of dorsal fin spines (sixteen in the holotype, seventeen in the paratype) corroborates his designation. It might be noted, however, that Johnson's counts of segmented dorsal rays are inaccurate for both specimens.

I have examined the types of all species described by Johnson (1974a and 1974b) and found that the holotype of *L. joanjohnsonae* Johnson is a specimen of *L. fryeri* Oliver *in* Davies (1973); *L. joanjohnsonae* is therefore a junior synonym of that species. The manuscript name *Labidochromis fryeri* and a diagnosis of this taxon were unfortunately published in an aquarium magazine in a letter from T. E. (Peter) Davies, who specifically (and correctly) attributed to me the name, the diagnosis, and my intention eventually to publish them. Regrettably, by Articles 11 and 13 (a) (i) of the International

Code of Zoological Nomenclature the name *Labidochromis fryeri* is clearly available, and by Article 50 I am its author. I am preparing a full description of that species, with a designation of type-specimens, for publication elsewhere.

The paratype of *L. joanjohnsonae*, figured by Johnson (1974a: 16, fig. 2) but wrongly captioned the holotype, is recognizable in his color photograph because of its proportions and fin markings. It represents an undescribed species of *Labidochromis* discovered by Mr. Richard Furzer on the Mozambique shore of Lake Malawi and first exported by him to the American aquarium trade in January 1973. The same species has since been collected at Likoma Island by T. E. Davies and party. I was already preparing a description of this *Labidochromis* before Johnson became interested in it. Since Johnson (1974a: 14) expressed a wish to avoid "even greater duplication of Mr. Oliver's forthcoming work on this genus," I do not hesitate to describe it at this time. It is hoped that this comely species will not continue to circulate in the aquarium trade under the name *L. joanjohnsonae*, junior synonym of the quite distinct species *L. fryeri*.

Counts and measurements herein employed follow Greenwood (1973), except that vertebral counts include the fused first preural and ural centra supporting the parhypural and hypurals; my counts of caudal and total vertebrae are therefore one greater than his. Pectoral rays, scales, gill rakers, and teeth were counted on both sides of each fish. Standard deviation (SD) and standard error (SE) were calculated for the principal morphometric ratios.

Labidochromis textilis, new species

Brocade Cichlid

Figures 1–5

Labidochromis joanjohnsonae Johnson, 1974a: 15, in part, paratype only, by original designation, p. 15; incorrectly designated as holotype in fig. 2 (Likoma Island).

Labidochromis sp. Axelrod, 1974: 224, in part, lower photograph only (Likoma Island). Fish in upper photograph possibly *L. caeruleus* Fryer, 1956.

Labidochromis caeruleus "likomae" Scheuermann, 1974: 441, trade name only, in part, "weibchen" only, lower photograph, non *caeruleus*

Fryer, 1956 (Likoma Island). Fish in upper photograph possibly *L. caeruleus*.

Labidochromis spec. nov. (*marineatus*) Neergaard, 1974: 74–75 and photograph p. 75, trade name only (Likoma Island).

Notes on synonymy: The collectors who export aquarium fishes from Lake Malawi commonly coin pseudo-scientific trade names for species they cannot identify. This practice is strongly to be discouraged because it promotes nomenclatural instability and confusion when, as frequently happens, such names are published in the aquarium literature. An example is the name *Labidochromis caeruleus "likomae."* Scheuermann (1974) did not intend to propose this as a formal scientific name; as the following evidence shows he: (1) attributed the name to an unspecified dealer of aquarium fishes; (2) always included it between quotation marks whereas he used no quotation marks for the established species *Labidochromis caeruleus* and its implied subspecies *L. c. caeruleus*; (3) did not write in the style of an original description; (4) provided no formal diagnosis; (5) designated no type-material; and (6) did not clearly assign a rank to the taxon, saying only that its treatment as a subspecies is "an assumption to which I also incline" (eine Annahme, zu der auch ich neige) but later in the same sentence that it is one of several "phenotypes" (Erscheinungsformen) of *L. caeruleus*. These facts indicate that *L. c. "likomae"* is merely a trade name, without standing in formal zoological nomenclature. A second trade name mentioned by Scheuermann (1974), *L. c. "nkatae,"* is apparently not a synonym of *L. textilis*; rather, it is a nomen nudum since it was published without any diagnosis or indication and from the text it cannot be identified with any species.

Neergaard (1974) also employed several names that are clearly not available. For the present species he used *Labidochromis spec. nov.* as the scientific name and the parenthetical *marineatus* as the trade name, not as a formal specific epithet (Neergaard, 1974: 26–27 and personal commun.); moreover the term *marineatus* is not associated, in the meaning of the Code, with a generic name because of the intervening words.

Collectors of aquarium fishes would serve the best interest of aquarist and ichthyologist alike if they proposed a simple common name such as "Brocade cichlid" for each unidentified species or form, instead of a troublesome and deceptive pseudo-scientific term.

Holotype: British Museum (Natural History) (BMNH) Reg. No. 1975.5.27: 9, a mature male 76.5 mm standard length (SL), an aquarium specimen exported from Lake Malawi and probably collected at Likoma Island by T. E. Davies and party; donated by Mrs. Virginia Egolf.

Paratypes: Aquarium specimens exported from Lake Malawi by T. E. Davies and R. E. Furzer: BMNH Reg. Nos. 1975.5.27: 10–12 (3 specimens, 43.0, 45.5, 53.0 mm SL); 1975.5.27: 14–15 (2, 47.0–50.0 mm); 1975.5.27: 13 (1, 53.5 mm); 1975.5.27: 16–17 (2, 33.0–37.0 mm).

TABLE 1. Principal morphometric ratios of *Labidochromis textilis*. % = percent of head length, † = percent of standard length, * = paratype of *Labidochromis joanjohnsonae*

Character	Mean	SD	SE	Paratypes											*	Holo-type
Standard length (mm)				33.0	37.0	43.0	45.5	47.0	49.5	50.0	50.5	53.0	53.5	66.0	68.0	76.5
Body depth (†)	31.7	0.87	0.25	32.7	31.4	30.2	30.8	31.1	31.9	32.0	30.5	32.1	32.0	32.6	33.1	31.6
Head length (†)	32.2	1.54	0.44	31.2	29.7	34.9	32.5	30.4	32.7	30.6	33.1	33.4	33.1	34.1	31.5	31.4
Head breadth (%)	46.7	2.80	0.81	50.5	50.9	42.7	45.9	49.0	45.1	51.0	46.1	44.1	44.1	44.4	46.7	46.7
Preorbital depth (%)	19.2	2.15	0.62	14.6	16.4	18.7	18.9	18.2	19.1	19.6	20.4	19.8	19.2	20.4	20.1	23.8
Interorbital width (%)	20.7	1.93	0.56	18.4	20.9	18.0	18.9	23.1	19.8	24.2	21.0	19.2	19.8	21.3	22.0	22.9
Snout length (%)	31.3	2.90	0.84	25.7	29.1	32.0	29.1	30.8	32.1	29.4	32.3	31.6	29.9	34.2	33.6	37.5
Orbit length (%)	30.9	3.40	0.98	36.9	34.5	32.0	31.8	32.2	30.9	33.3	31.1	31.1	29.9	26.7	25.7	25.0
Cheek depth (%)	20.0	2.57	0.74	17.5	18.2	17.3	20.9	21.0	17.3	22.2	19.8	21.5	17.5	20.0	20.6	26.3
Postorbital head length (%)	43.5	2.17	0.63	45.6	47.3	40.0	42.6	45.5	41.4	46.4	43.1	42.4	41.8	42.7	44.4	42.1
Upper jaw length (%)	26.7	1.12	0.32	26.2	26.4	26.7	26.4	25.9	24.7	27.5	28.1	27.1	25.4	27.6	26.2	28.8
Premaxillary pedicels (%)	27.4	1.44	0.41	24.3	25.5	26.7	28.4	28.0	27.2	28.1	29.9	28.8	27.1	27.1	27.1	28.3
Lower jaw length (%)	33.6	1.96	0.57	34.0	33.6	33.3	33.8	30.1	34.0	30.7	31.1	33.9	35.6	35.6	34.6	36.7
Predorsal length (†)	33.3	1.91	0.55	33.0	30.5	36.5	35.4	30.4	33.3	32.2	32.9	35.3	33.1	35.6	31.9	33.3
Dorsal fin base length (†)	57.2	2.66	0.77	62.1	59.7	50.9	56.9	57.9	56.4	57.4	55.4	56.0	56.1	57.6	59.9	57.8
Caudal peduncle length (†)	15.1	0.95	0.27	17.0	15.1	14.4	15.8	15.7	13.7	16.2	14.1	15.3	15.1	13.8	15.0	15.4

American Museum of Natural History (AMNH) 32413 (2, 49.5–66.0 mm); AMNH 32414 (1, 50.5 mm); AMNH 33465 (1, 68.0 mm, paratype of *L. joanjohnsonae*).

Etymology: The trivial name, from the Latin for woven, refers to the life coloration which suggests brocade cloth.

Diagnosis: *Labidochromis textilis* differs from all other species of *Labidochromis* in having about 12 alternating horizontal stripes of orange and pale blue or blue-green on side of body in life, and distinct, oval orange spots (brown in preserved fish) on dorsal and caudal fins of adults.

Description: Based on holotype (Fig. 1) and twelve paratypes, 33.0–76.5 mm SL. Principal morphometric ratios given in Table 1.

Dorsal profile of head usually straight from tip of snout to over rear of orbit in mature fish; snout slightly concave in large specimens. Dorsal margin of orbit lying below dorsal profile of head when fish viewed laterally; premaxillary pedicels not entering profile. Snout 0.9–1.25 times broader than long. Angle of premaxillary pedicels 30°–40° to horizontal; frontal angle 25°–40°. Cephalic lateral line pores and canals not hypertrophied.

Posterior tip of maxilla usually reaching level of anterior orbital or ocular margin. Jaws pointed or narrowly rounded anteriorly when fish viewed from above or below. Lower jaw projecting slightly, 1.1–1.4 times longer than broad, its angle 30°–40°.

Caudal peduncle 1.02–1.30 (mean, M = 1.17) times longer than deep.

Fins: Dorsal with 25 (in 8 specimens), 26 (4), or 27 (1) elements, comprising 16 (2), 17 (10), or 18 (1) spines and 8 (6) or 9 (7) segmented rays; last spine 13.6–16.2 (M = 15.0) % of SL. Anal with 10(9) or 11 (4) elements, comprising 3 spines and 7 (9) or 8 (4) segmented rays; last spine 14.2–16.7 (M = 16.0) % of SL. Pectorals 20.2–25.3 (M = 23.4) % of SL; with 13–15 (mode 14) rays, comprising 2 upper unbranched, 9–11 (mode 10) branched, and 1–3 (mode 2) lower unbranched rays. Caudal slightly rounded to emarginate, lobes rounded and subequal; scaled on proximal ¼–⅔ (medially) or ⅖–⅘ (dorsally and ventrally), extent of scale coverage positively correlated with standard length. Pelvics 23.5–29.7 (M = 26.0) % of SL, longest in mature males, first ray slightly produced in both sexes; spine 13.5–16.8 (M = 15.0) % of SL.

Scales: Ctenoid. Lateral line with 30–32 (mode 31) scales, upper part with 20–24 (mode 24), lower with 8–12 (mode 10). (50.0 mm paratype abnormal in lacking lower part of right lateral line; scales in that area appear normal and unregenerated, completely lacking canals and pores. Upper part of right lateral line comprising 20 scales; on left side upper part with 22, lower 10, total 32.) Cheek with 4–6 (mode 5) rows. About 5–8 scales between dorsal fin origin and upper part of lateral line. Seven to 9 scales between pectoral and pelvic fin

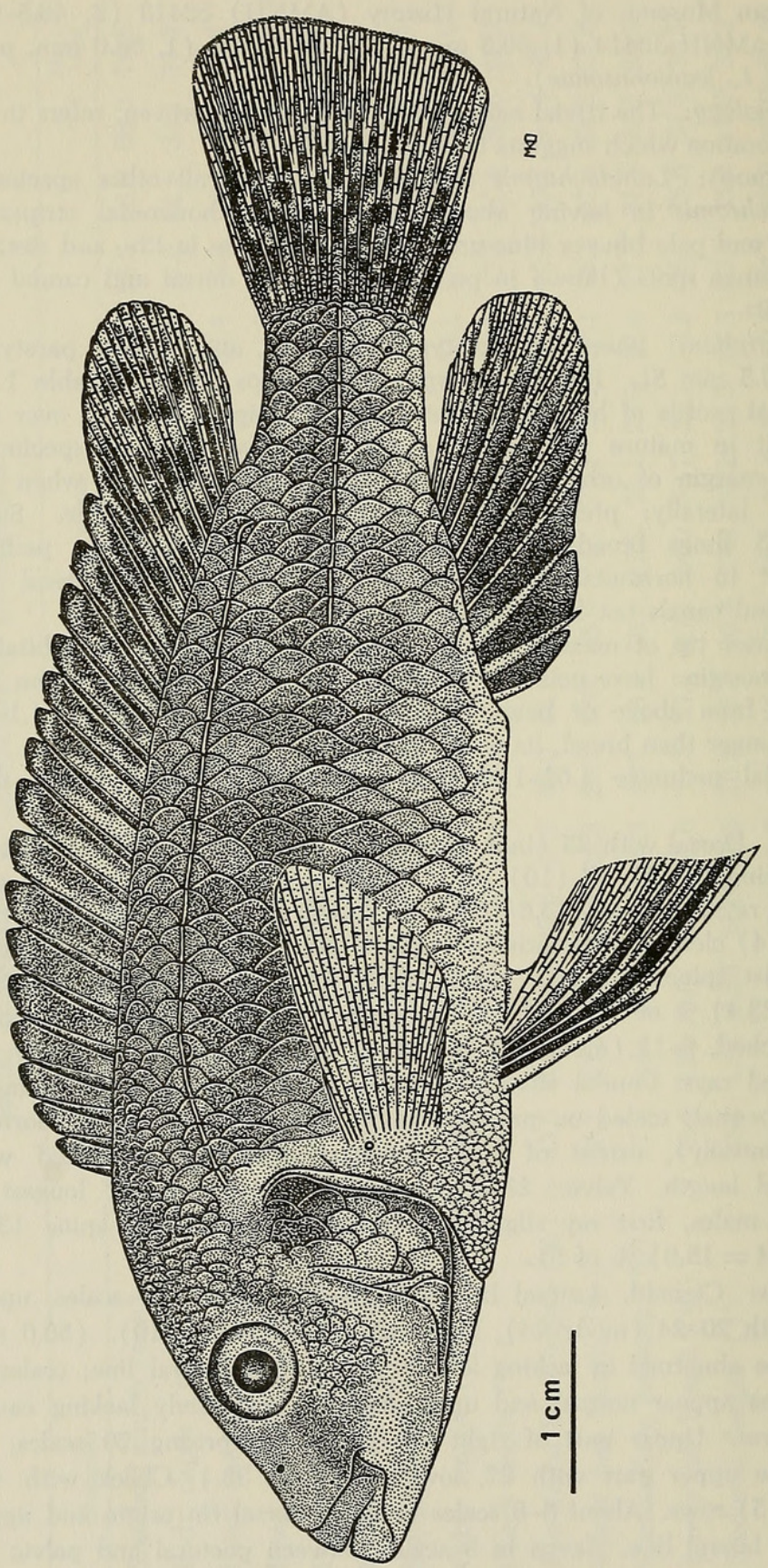

FIG. 1. *Labidochromis textilis*. Holotype.

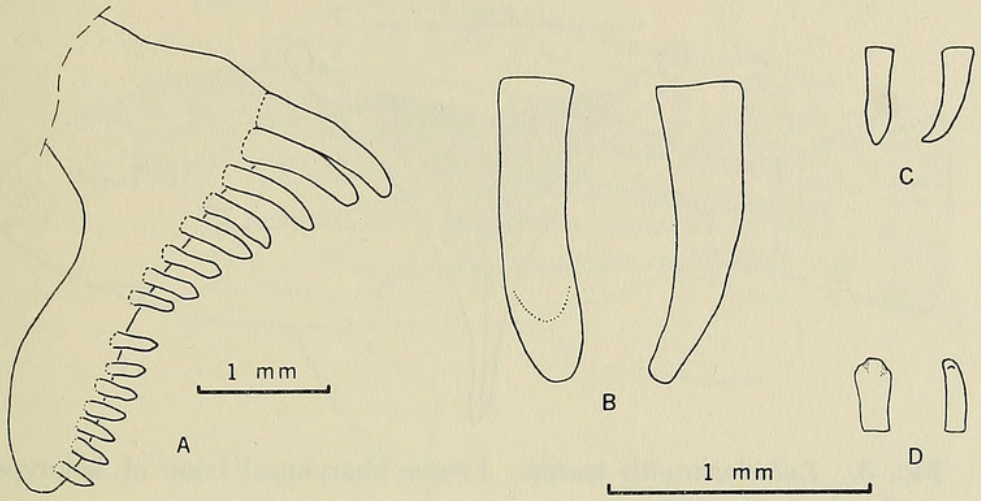

FIG. 2. Oral dentition of *Labidochromis textilis*, drawn from 53.0-mm paratype. (A) Right premaxilla, viewed from a lateral and slightly dorsal position. (B) Anteriormost tooth of right premaxilla. Lingual view at left, lateral view at right. (C) Fourth tooth from posterior tip of right premaxilla. Lingual view at left, lateral view at right. (D) Tooth of outermost inner row of right dentary, anterior in position. Lingual view at left, lateral view at right.

bases; small thoracic scales grade gradually into larger scales of belly. Sixteen scales around caudal peduncle.

Gill rakers: 2–4 (mode 3) on epibranchial + 1 + 8–10 (usually 9 or 10) on ceratobranchial of outer arch. Upper ceratobranchial rakers simple, rather short; lower 2 or 3 rudimentary.

Teeth (*Fig. 2*): Outer row of upper jaw with a total of 27–33 (M = 29.4) teeth in all but two smallest specimens (33 and 37 mm SL), both with 19. About 4 anterior teeth on each side slightly procumbent and markedly longer and coarser than lateral and posterior teeth, into which they grade in size. All teeth unicuspid (a single exceptional unequally bicuspid tooth present laterally in 50.0 mm paratype), crowns acute, isoscelene in outline, compressed in curved plane of premaxilla, and somewhat incurved. Teeth of outer row of lower jaw similar in form to those of upper jaw, but anterior ones strongly procumbent. Inner teeth of each jaw miniatures of outer teeth, generally unicuspid but sometimes weakly tricuspid. Crowns compressed in curved plane of jaws, and incurved. Anterior inner teeth markedly larger than adjacent lateral teeth of inner rows and grading into them in size; 1 or 2 inner rows in each jaw, and sometimes a short third row anteriorly in large specimens.

Lower pharyngeal bone (Fig. 3) triangular in outline, 1.19–1.46 (M = 1.28) times broader than long, its length 20.0–24.0 (M = 22.0) % of head length, its breadth 51.9–67.2 (M = 60.4) % of head breadth. Joint uniting two halves straight, not sinuous; blade shallow, not angled

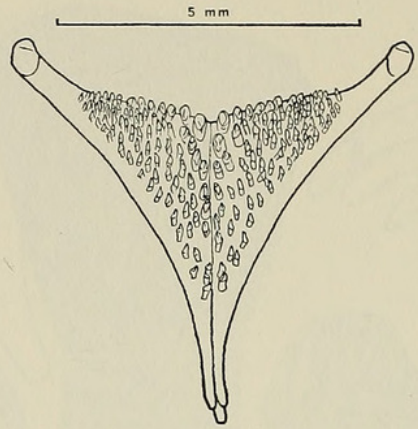

FIG. 3. *Labidochromis textilis*. Lower pharyngeal bone of holotype, in occlusal view.

relative to plane of dentigerous surface. Dentigerous area 1.4–1.6 (rarely almost 1.8) times broader than long. Teeth rather small but not densely crowded; crowns compressed, bicuspid. About 4 postero-median teeth slightly or markedly coarser than adjacent anterior and lateral teeth but crowns always compressed; 22–32 (M = 29.0) teeth in posterior row, 7–11 in an antero-posterior row, and 5–8 in an oblique row.

Vertebral counts in 13 specimens radiographed: 29 (in 3), 30 (9), or 31 (1), comprising 13 (4) or 14 (9) abdominal and 15 (1), 16 (9), or 17 (3) caudal centra. Modal combination 14 + 16 (in 7).

Caudal skeleton: Patterns of hypural fusion include no fusion (in 6), 1 and 2 fused (2), 3 and 4 fused (2), and 1 fused with 2 as well as 3 fused with 4 (3). No correlation between length of fish and degree of fusion.

Coloration in life: Live fish of both sexes, adult but sexually quiescent, light blue to blue-green on the head and body, becoming white on ventral surfaces. Distinctive pattern of about 6 to 9 irregular, horizontal orange stripes on the flanks superimposed on this ground color (Fig. 4). No apparent correlation between number of stripes and length of fish. Head with irregularly shaped orange stripes and blotches, among which invariably occurs an oblique stripe that extends from upper end of operculum upwards and forwards to nape. Blackish markings on head, generally indistinct, include a lachrymal stripe, an opercular spot, and 1 horizontal stripe crossing interorbital region and another crossing snout. About 8 dusky vertical bars on flanks below dorsal fin base, rarely apparent except as a "fright pattern." Dorsal fin is light iridescent blue, frequently with a narrow, broken orange stripe basally; lappets are orange distally, bluish white proximally. A broad submarginal band in spinous portion sometimes dark brown and composed of vertical marks between spines, forming an almost continuous horizontal stripe,

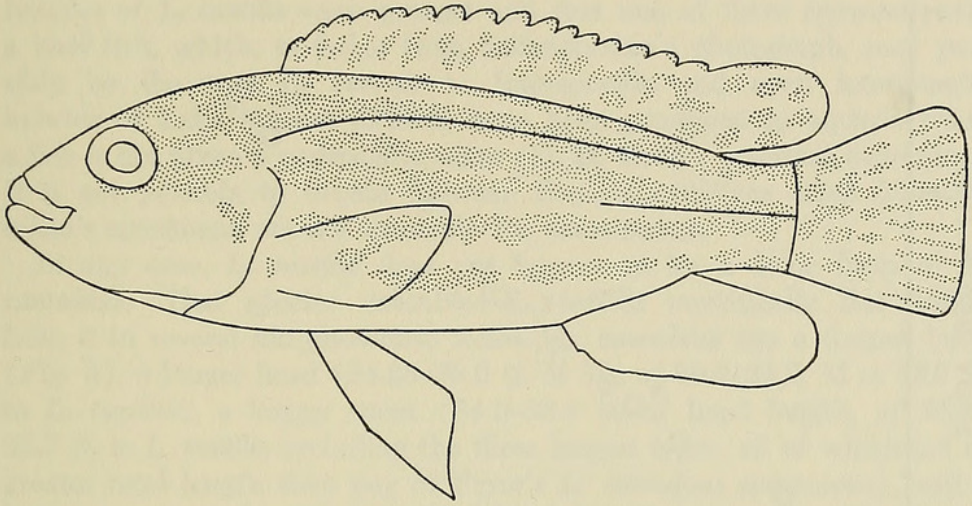

FIG. 4. Orange coloration (stippled) of live specimens of *Labidochromis textilis*. The pattern shows much individual and ontogenetic variation, particularly on fins and head. Semidiagrammatic.

or sometimes consisting of isolated oval orange spots between spines. (It is possible that there is an ontogenetic development from the former condition to the latter, or that the two conditions represent sexual dimorphism, but neither possibility can be verified with the limited material available.) Soft portion of dorsal fin with 2 to 4 rows of oval orange spots, relatively smaller and more numerous in larger fish; fin sometimes with a narrow orange to brick-red margin. Caudal iridescent pale blue with bluish white dorsal and ventral edges and sometimes an orange to brick-red posterior margin. Proximal portion of fin with several vertical rows of orange spots; distal half to ¾ sometimes spotted, or rays orange posteriorly, producing horizontal orange stripes alternating with blue of membrane. Anal fin whitish to iridescent pale blue, sometimes with a fairly distinct, dusky submarginal stripe on spinous portion. The anal ocelli numbering 1 to 5 and deep yellow. Pelvic fins dirty white to dusky, darkest anteriorly except for bluish white leading edge.

Coloration of breeding individuals unknown.

Preserved coloration: Both sexes with head and body brown, darker dorsally. Orange markings of body and head usually lost, but a few specimens retaining horizontal stripes of flanks in dark brown contrasted to paler ground color. Orange markings of dorsal and caudal fins always retained, becoming dark brown. About 8 dark vertical bars on flanks usually evident.

Ecology: Nothing is known of the ecology of *L. textilis* except that it inhabits shallow inshore water.

Breeding: Scheuermann (1974) reported that *L. textilis* is a female mouth brooder (see below under Relationships, however, uncertain as

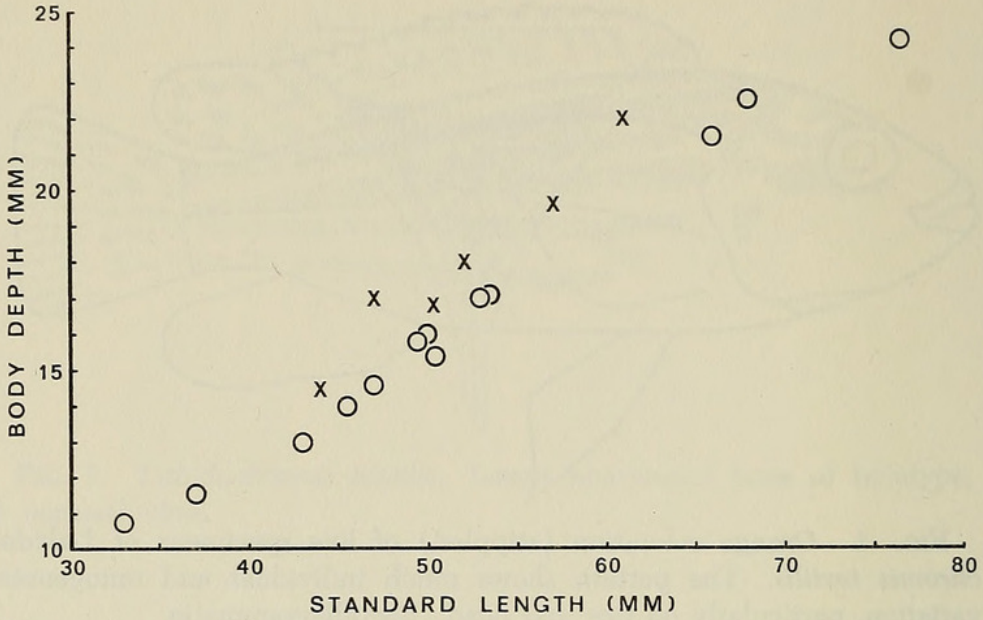

FIG. 5. Relationship of body depth to standard length in *Labidochromis textilis* (○) and *L. caeruleus* (×). Data for *L. caeruleus* replotted from Fryer (1956).

to the identity of the male parent of the broods he observed). *L. textilis* matures at a small size. The smallest adult male is the 53.0 mm SL paratype, ripe or nearly so. The smallest mature female is the 43.0 mm SL paratype, a ripe individual in which the left ovary is undeveloped and the right ovary contains seven ripe ova, all of about the same size and bright orange, the largest measuring 4.0 × 2.8 × 1.8 mm. These ova so distend the ovary that it nearly fills the abdominal cavity.

Relationships: An analysis of the phylogenetic relationships of *L. textilis* must await the description or redescription of all other known species of *Labidochromis*, a project which I have undertaken as part of a larger study of the systematics of Lake Malawi *Haplochromis* and related species. For the present it is necessary only to examine the statement of Scheuermann (1974) that *L. textilis* represents the female of a color form or subspecies of *L. caeruleus* Fryer of which the male is blue and lacks orange markings. Axelrod (1974: 224) also believed that a similar blue fish and the orange striped fish represent male and female of a single *Labidochromis* species, although he did not identify the species by name. This suggestion is refuted by the finding of both male and female fish among the type-series of *L. textilis*, all of which had orange stripes in life. Scheuermann claimed that one of his orange striped females spawned in his aquarium with an unstriped blue male; however, he stated (1974: 440) that he did not observe the spawning itself. It is therefore possible (a) that the male parent was also one of his orange striped fish (i.e. was also *L. textilis*), or (b) that only

females of *L. textilis* were present and that one of them spawned with a blue fish, which, to judge from Scheuermann's photograph, may possibly be the true *L. caeruleus*. Interspecific and even intergeneric hybrids of Lake Malawi cichlids have been produced in aquaria when a fish is not given a conspecific mate (D. H. Eccles, personal commun.). It is not possible to decide between these alternatives since Scheuermann's specimens are not available for examination.

In any case, *L. textilis* does not appear to be a color form of *L. caeruleus*. That species resembles *L. textilis* meristically but differs from it in several morphometric ratios. *L. caeruleus* has a deeper body (Fig. 5), a longer head (34.25–36.0 % of SL, *cf* 29.7–34.9, M = 32.2 % in *L. textilis*), a longer snout (34.0–38.9 % of head length, *cf* 25.7–32.3 % in *L. textilis* excluding the three largest types, all of which are of greater total length than any of Fryer's *L. caeruleus* specimens), and a longer snout relative to postorbital head length (snout "a trifle shorter than post, orbital [sic] part of head" [Fryer, 1956: 88], *cf* snout = 0.56–0.80, M = 0.70 times postorbital head in *L. textilis*). Such differences are conceivably ascribable to geographic variation, but I have not encountered comparable geographic variation in morphometrics among other species of Malawi cichlids.

Acknowledgments

Drs. C. Lavett Smith and Donn E. Rosen provided valuable commentary on the tangled nomenclatural problems encountered in this study. Mrs. Virginia Eglof, Mr. Robert C. Brooks, and Mr. Paul V. Loiselle supplied most of the type-specimens of *L. textilis*. Mr. Brooks also provided color transparencies of living specimens, as did Mr. Rick Johnson. Mr. Søren Neergaard furnished a copy of his book and comments on the names therein employed. Finally, Dr. James W. Atz gave incisive criticism of the manuscript and much additional help. To all of these generous persons I am most grateful.

Literature Cited

Axelrod, H. R. 1974. African Cichlids of Lakes Malawi and Tanganyika. Second ed. T.F.H. Publications, Inc. Ltd., Hong Kong. 256 pp.

Davies, P. 1973. [Letter] p. 65. *In* H. R. Axelrod, African cichlids of Lakes Malawi and Tanganyika. Trop. Fish Hobbyist 22(3): 42–43, 45–48, 52–55, 57–59, 61–65.

Fryer, G. 1956. New species of cichlid fishes from Lake Nyasa. Rev. Zool. Bot. Afr. 53(1–2):81–91.

Greenwood, P. H. 1973. A revision of the *Haplochromis* and related species (Pisces: Cichlidae) from Lake George, Uganda. Bull. Brit. Mus. nat. Hist. (Zool.) 25(5):139–242.

Johnson, D. S. 1974a. New cichlids from Lake Malawi. Today's Aquarist [Norwalk, Connecticut] 1(1):12, 14–17, 4 figs.

———. 1974b. Three new cichlids from Lake Malawi. Today's Aquarist [Norwalk, Connecticut] 1(3):38–42.

NEERGAARD, S. 1974. Nyasa-Cichlider. J. Fr. Clausens Forlag, Copenhagen. 88 pp.

SCHEUERMANN, H. 1974. Beobachtungen bei Labidochromis caeruleus "likomae." Aquarium Aqua Terra [Wuppertal] 8(64):439–441.

Oliver, Michael K. 1975. "Labidochromis textilis, a new cichlid fish (Teleostei: Cichlidae) from Lake Malawi." *Proceedings of the Biological Society of Washington* 88, 319–330.

View This Item Online: https://www.biodiversitylibrary.org/item/107516
Permalink: https://www.biodiversitylibrary.org/partpdf/44191

Holding Institution
Smithsonian Libraries and Archives

Sponsored by
Biodiversity Heritage Library

Copyright & Reuse
Copyright Status: In copyright. Digitized with the permission of the rights holder.
Rights Holder: Biological Society of Washington
License: http://creativecommons.org/licenses/by-nc-sa/3.0/
Rights: https://biodiversitylibrary.org/permissions

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at https://www.biodiversitylibrary.org.

This file was generated 22 September 2023 at 04:29 UTC