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TWO NEW SNAPPERS (TELEOSTEI: LUTJANIDAE: APSILINAE): *PARACAESIO PARAGRAPSIMODON* ANDERSON AND KAILOLA FROM THE WESTERN PACIFIC AND *P. WALTERVADI* ANDERSON AND COLLETTE FROM THE WESTERN INDIAN OCEAN

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Abstract.—Two new species of *Paracaesio, P. paragrapsimodon* Anderson & Kailola (from off Ponape, Caroline Islands, and from off Port Moresby, Papua New Guinea) and *P. waltervadi* Anderson & Collette (from Walters Shoals, Madagascar Ridge, western Indian Ocean), are described from two specimens each. *Paracaesio paragrapsimodon* is easily distinguished from all other species of *Paracaesio* by the presence of prominent exserted canine teeth at anterior ends of upper and lower jaws and by its coloration in life (mostly deep metallic blue with some pale yellow on proximal halves of soft dorsal and soft anal fins, along middle of each caudal-fin lobe, and on dorsalmost parts of back and caudal peduncle), and *P. waltervadi* is recognized by the following combination of characters: tubed lateral-line scales 69 or 70, maxilla with scales, caudal-fin lunate, and coloration in life blue. A key to the species of *Paracaesio* is provided, nominal species of the *Paracaesio xanthura* complex are discussed, and brief comments on relationships of the species of *Paracaesio* are provided.

During the last several years, specimens of two previously undescribed species of the apsiline lutjanid genus *Paracaesio* have become available for study. One of these new species was collected off Ponape (now Pohnpei, according to M. Gawel, Marine Resources Division, Federated States of Micronesia, pers. comm.), Caroline Islands, and off Port Moresby, Papua New Guinea; the other, over Walters Shoals, western Indian Ocean. The goals of this paper are to describe the two new species, to compare them with other species of *Paracaesio,* to provide a key to the species of *Paracaesio,* to remark upon the nominal species of the *P. xanthura* complex, and to provide comments on the relationships of the species in the genus.

The Lutjanidae occur worldwide in warm seas. Adults of the family are largely bottom-associated, feed mainly on fishes and crustaceans, and are found from shallow inshore areas to depths of about 550 m. Some species enter estuaries and even fresh water. Early developmental stages are unknown for most species, but the early stages that have been described are pelagic. There are 17 genera and about 105 species (including the 2 described herein) of lutjanids, currently classified in 4 subfamilies—Etelinae (5 genera and 19 species), Apsilinae (4 genera and 12 or 13 species), Paradicichthyinae (2 genera and 2 species), and Lutjaninae (6 genera and 72 species). Some lutjanids reach sizes as great as 100 to 120 cm. Many are important to sport and/or commercial fishermen, and many are fine food fishes, although some are ciguatoxic in certain areas.

Institutional abbreviations follow Leviton et al. (1985); nm denotes nautical miles; SL, standard length; TL, total length; ICZN,

the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature 1985).

Methods

Methods for making counts and measurements follow Randall et al. (1987), except as noted below. Osteological data were taken from radiographs. Gillrakers and pseudobranchial filaments were counted on the right side. The most anterior scale in dorsal midline was considered the first predorsal scale; counts of predorsal scales were made in midline, as nearly as possible, and did not include smaller scales at base of first dorsal spine. The first vertebra with a haemal spine was considered the first caudal vertebra; the urostylar vertebra, the last. Postorbital length of head was distance between posteriormost point of fleshy orbit and posteriormost point of opercular membrane. Lower jaw to branchiostegal membranes was measured from symphysis of dentaries to junction of branchiostegal membranes. Maxilla width was greatest width of posterior expansion of maxilla. Length of lower jaw was measured from anteriormost point on dentary to posteriormost point on angular. Interorbital width was least bony measurement. Internarial distance was distance between posterior border of anterior naris and anterior border of posterior naris. Posterior naris to orbit was measured from posterior border of posterior naris to anterior border of fleshy orbit. Teeth were measured from points where they emerge from jaws (as nearly as possible) to their distal tips. (The point of emergence of a tooth can be difficult to ascertain due to the large amount of fleshy tissue overlying the alveolar surfaces of the jaws.) Depth of body was taken vertically from base of first dorsal spine. Length of caudal peduncle was distance from posterior end of base of anal fin to mid-base of caudal fin. Length of anal-fin base was from anteriormost point of base of first anal spine to posteriormost point of base of last anal soft ray. Length of anal fin was from anteriormost point of base of first anal spine to distal tip of anal fin with fin depressed against body. Upper and lower lobes of caudal fin were measured from mid-base of caudal fin to distal tip of longest ray in each lobe. Most measurements are given as percentages of SL, a few as percentages of snout length and postorbital head length, and some as quotients of SL or head length rounded to the nearest 0.05.

Sketches of caudal-fin shapes (Fig. 1), except Fig. 1H, were made by photocopying the maximally spread fins of the specimens illustrated, tracing the outlines of the photocopied fins, and photoreducing the tracings to approximately the same sizes. The same procedure was used for Fig. 1H, except an illustration from Kyushin et al. (1982) was photocopied.

Apsilinae

There are no known synapomorphies distinguishing the species of Lutjanidae from those of other percoid families. Johnson (1981:1) treated the Lutjanidae as a natural group because of "the obvious intermediacy of the Apsilinae between the Etelinae and Lutjaninae." Although we are not aware of any synapomorphies for the Apsilinae, the following combination of traits characterizes the subfamily. Nares on each side close together; posterior flap of anterior nostril when reflected typically reaching anterior border of posterior nostril. Vomerine teeth present. Dorsal and anal fins naked. Dorsal-fin rays X, 10 (rarely X, 9). Anal-fin rays III, 8 (occasionally III, 9). Anterior dorsal and anterior anal soft rays not produced into filaments. Ultimate soft ray of dorsal fin and anal fin not produced or produced only slightly, usually shorter than penultimate soft ray. Caudal fin emarginate to deeply forked. Procurrent caudal-fin rays 11 to 13 dorsally, 10 to 13 ventrally. Interorbital region transversely somewhat flattened to strongly convex. Posteriormost 4–8 com-

plete pterygiophores of dorsal fin and posteriormost 5–7 complete pterygiophores of anal fin trisegmental. Adductor mandibulae without division A_1'. For more detailed descriptions of the Lutjanidae and Apsilinae, see Johnson (1981) or Anderson (1987). The genera of Apsilinae are: *Apsilus* (2 species), *Lipocheilus* (1 species), *Parapristipomoides* (1 species), and *Paracaesio* (about 8 or 9 species).

Paracaesio Bleeker, 1875

Paracaesio Bleeker, 1875:38 (type species *Caesio xanthura* Bleeker, 1869, by monotypy).

Vegetichthys Tanaka, 1917:7 (type species *Vegetichthys tumidus* Tanaka, 1917 [=*Caesio xanthura* Bleeker, 1869], by monotypy).

Aetiasis Barnard, 1937:59 (type species *Aetiasis cantharoides* Barnard, 1937 [apparently = *Caesio xanthura* Bleeker, 1869], by monotypy).

Diagnosis.—A genus of apsiline lutjanid fishes characterized by the following: interorbital region transversely strongly convex; anterior end of upper lip without a thick fleshy protrusion; gillrakers 7 to 12 + 16 to 24—total 26 to 35; adductor mandibulae section A_1 without an anterodorsal extension; ultimate dorsal soft ray 50 to 90% length of penultimate; ultimate anal soft ray 65 to 95% length of penultimate; pectoral fin about 90 to 125% of head length (in specimens more than about 150 mm SL, almost always 102 to 125% of head length).

Gender.—Most authors have treated *Paracaesio* as if it were a masculine noun, but George C. Steyskal has advised that it is feminine. Consequently, adjectival specific names for species of *Paracaesio* that have been spelled with the *-us* termination must be emended to end in *-a* (ICZN, Article 31b). (See Carpenter 1987:5 for a discussion of the gender of *Paracaesio*.)

Species of Paracaesio.—Anderson (1987) recognized six species of *Paracaesio*; recent work indicates that there are about eight or nine species. Based on numbers of tubed scales in the lateral line, the genus appears to be made up of two natural groups of species—one with from 47 to 50 scales in the lateral line, the other with from 68 to 73. Within a species group the best characters for identification are maxillary squamation (presence or absence), coloration, and shape of the caudal fin. Museum specimens can be very difficult to identify because coloration is usually lost and the caudal fins are often damaged. *Paracaesio* ranges widely through the Indo-Pacific.

Key to Species of *Paracaesio*

1a. Tubed lateral-line scales 68–73. Caudal fin forked or lunate (Fig. 1A–F) 2

1b. Tubed lateral-line scales 47–50. Caudal fin lunate or emarginate (Fig. 1G–J) 5

2a. Several prominent exserted canine teeth at anterior ends of upper and lower jaws (longest anterior tooth in upper jaw 6.3–8.7% postorbital head length, longest anterior tooth in lower jaw 6.5–6.9% postorbital head length; Fig. 2A). Maxilla without scales ..... *P. paragrapsimodon,* n. sp.

2b. Teeth at anterior ends of jaws smaller, rarely prominent (longest anterior tooth in upper jaw 2.4–5.9% postorbital head length, $\bar{X}$ = 3.96; longest anterior tooth in lower jaw 1.3–6.0% postorbital head length, $\bar{X}$ = 3.08; Fig. 2B, C). Maxilla with or without scales 3

3a. Caudal fin lunate (Fig. 1F). Coloration in life blue, without any yellow. Maxilla with scales ..... *P. waltervadi,* n. sp.

3b. Caudal fin forked (Fig. 1B–E). In life caudal fin and much of upper body yellow or if yellow absent,

general body color dark violet. Maxilla with or without scales .. 4

4a. General body color dark violet; fins reddish brown. Preopercle with one to three rows of scales peripheral to and usually distinctly separated from main group of cheek scales. Maxilla without scales .... *P. sordida* Abe & Shinohara, 1962; Indo-west Pacific

4b. Caudal fin, upper part of caudal peduncle, and upper side of body to anterior end of dorsal fin yellow; remainder of body mostly blue. Preopercle without rows of scales peripheral to main group of cheek scales. Maxilla with or without scales ..... *P. xanthura* complex

5a. Maxilla with scales. Caudal fin lunate (middle of distal margin of caudal fin of *P. kusakarii* becoming rounded with age, Fig. 1G, H) ... 6

5b. Maxilla without scales. Caudal fin lunate or emarginate (Fig. 1I, J) .. 7

6a. Yellow band running from anterior end of lateral line obliquely to about middle of dorsal fin. Eight broad dark vertical bars in life (still recognizable on holotype when examined in Dec 1982, several years after preservation). Nape without pronounced hump. Middle of distal margin of caudal fin not rounded with age ..... *P. gonzalesi* Fourmanoir & Rivaton, 1979; western Pacific[1]

6b. No oblique yellow band on side of body. Four broad dark vertical bars on upper side of body. Large individuals with pronounced hump on nape as a result of higher supraoccipital crest. Middle of distal margin of caudal fin becoming rounded with age (Fig. 1G, H) (Senta in Kyushin et al. 1982:68) ..... *P. kusakarii* Abe, 1960; central and western Pacific

7a. General color cerulean blue, without vertical bars. Caudal fin lunate (Fig. 1I) .... *P. caerulea* (Katayama, 1934); western Pacific

7b. General color light brown dorsally and silver ventrally with four or five broad brown to dark gray vertical bars on body extending from dorsal surface to midline or below midline laterally. Caudal fin emarginate (Fig. 1J) .... *P. stonei* Raj & Seeto, 1983; central and western Pacific

[1] Raj & Seeto (1983) reported that *P. gonzalesi* has a naked maxilla, but the first author examined the holotype of this species and found scales on the maxillae. Maxillary squamation may be a labile character in *P. gonzalesi*, as it is in the *P. xanthura* complex.

Paracaesio paragrapsimodon Anderson & Kailola, new species, and *P. waltervadi* Anderson & Collette, new species

Because *Paracaesio paragrapsimodon* and *P. waltervadi* are identical in many traits, it is appropriate, in order to avoid repetition, to characterize these two species under a single heading and then to elaborate as necessary under the respective species accounts. The observations presented herein apply to the four type specimens of these two new species.

Dorsal-fin rays X, 10. Anal-fin rays III, 8. Pectoral-fin rays 17. Pelvic-fin rays I, 5. Principal caudal-fin rays 9 + 8; branched rays 8 + 7. Branchiostegal rays 7. Cheek scale rows 7. Vertebrae 24 (10 precaudal + 14 caudal). Formula for predorsal (=supraneural) bones, anterior neural spines, and anterior dorsal pterygiophores 0/0/0 + 2/1 + 1/1/ (using symbolization of Ahlstrom et al. 1976). Pleural ribs on vertebrae 3 through 10. Parhypural and five hypurals present; hypurals: 1 & 2 fused, 3 & 4 fused, 5 autogenous. Epurals 3.

Mouth terminal. Premaxillae protrusile.

Maxilla reaching posteriorly to a vertical well past anterior border of eye. No supramaxilla. Preopercle without spine at angle. Free margin of interopercle smooth. Dorsal fin single, not incised between spinous and soft portions. Ventral (trailing) edge of anal fin almost parallel to ventral body contour. Pectoral fin asymmetrical, longest rays in dorsal part of fin. Lateral line complete, running parallel to dorsal body contour below dorsal fin and near mid-lateral axis of body on caudal peduncle. Scales finely ctenoid, with rows of ctenial bases (Hughes 1981) present proximal to marginal cteni. No secondary squamation. Cheek, interopercle, subopercle, opercle, and temporal region scaly; predorsal scales extending anteriorly to about level of middle of eye; fairly wide naked band ventral and posterior to orbit, this band continuous with naked lachrymal region anteriorly and naked part of interorbital region posterodorsally; naked band running obliquely from interorbital region anteriorly to scale bone (superficial projection of posttemporal bone) posteriorly—this naked band separating temporal scales from predorsal scales; temporal scales usually in two groups separated by a scaleless area—anteroventral group composed of small scales, posterodorsal group of large scales (of about same size as other head scales); remainder of head without scales (except maxilla scaly in *P. waltervadi*). Dorsal and anal fins without scales; other fins scaly basally; pelvic axillary and interpelvic processes well developed.

Paracaesio paragrapsimodon
Anderson & Kailola, new species
Figs. 1A, 2A, 3; Table 1

Holotype.—USNM 269287, 275 mm SL, male; Ponape, Caroline Islands; R. Croft; 1984.

Paratype.—AMS I.31427-001, 197 mm SL, male; Basilisk Passage, off Port Moresby, Papua New Guinea; 200 m; L. Aitsi; Feb 1988; handline.

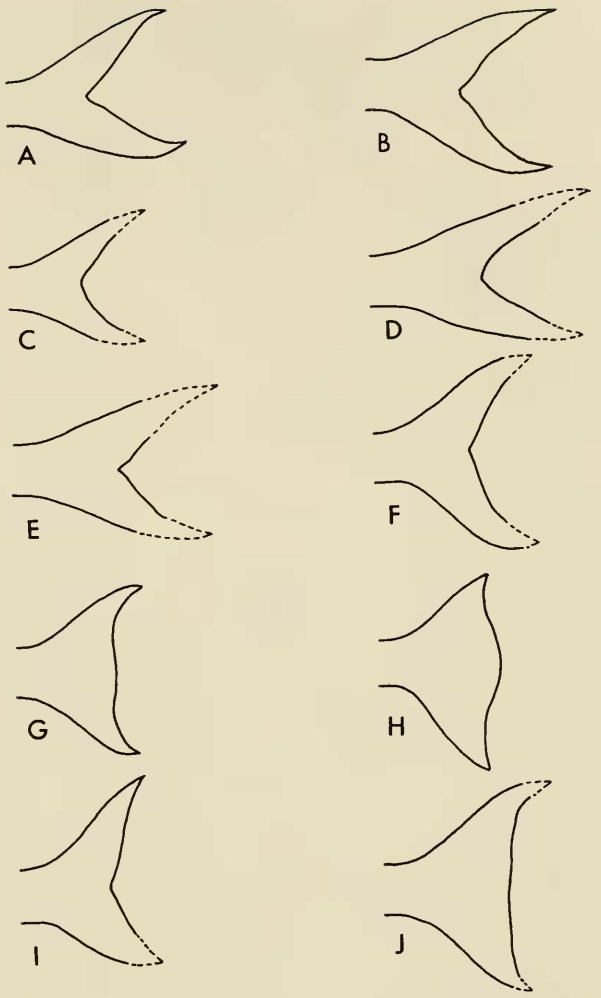

Fig. 1. Caudal-fin shapes in species of *Paracaesio*. A, Paratype of *P. paragrapsimodon*, AMS I. 31427-001, 197 mm SL; Basilisk Passage, off Port Moresby, Papua New Guinea. B, *P. sordida*, BPBM 11143, 269 mm SL; Ua Pou, Marquesas Islands. C, Putative syntype of *Caesio xanthura* (=*P. xanthura*), RMNH 3948, 128 mm SL; off Madagascar. D, Holotype of *P. pedleyi* (may = *P. xanthura*), AMS I. 13885, 306 mm SL; off Lord Howe Island. E, Putative holotype of *Aetiasis cantharoides* (apparently = *P. xanthura*), SAM 18430, 355 mm SL; off Durban, Natal, Republic of South Africa. F, Holotype of *P. waltervadi*, USNM 307769, 412 mm SL; Walters Shoals, Madagascar Ridge. G, *P. kusakarii*, GMBL 76-436, 353 mm SL; Dumbéa Pass, New Caledonia. H, *P. kusakarii* (redrawn from Kyushin et al. 1982), 544 mm SL. I, *P. caerulea*, BPBM 19170, 315 mm SL; fish market, Naha, Okinawa. J, *P. stonei*, GMBL 81-65, ca. 400 mm SL; off Masefau, Tutuila Island, American Samoa. (Broken lines indicate reconstructions of broken caudal-fin lobes.)

Diagnosis.—A species of *Paracaesio* distinguished by the presence of several prominent exserted canine teeth at anterior ends of upper and lower jaws (compare Fig. 2A,

Table 1.—Data on morphometric characters for *Paracaesio paragrapsimodon* and *P. waltervadi*. Standard lengths are in mm; other measurements, in percentages of standard length; > = slightly damaged, bk. = broken.

Character	*P. paragrapsimodon*		*P. waltervadi*	
	Holotype USNM 269287	Paratype AMS I. 31427-001	Holotype USNM 307769	Paratype IOAN uncat.
Standard length	275	197	412	429
Head, length	28.7	30.2	27.0	27.5
Snout, length	9.1	8.5	8.3	9.0
Orbit, diameter	8.0	10.2	6.8	6.6
Postorbital length of head	12.1	13.2	12.1	12.8
Lower jaw to branchiostegal membranes	10.2	12.2	10.0	9.8
Upper jaw, length	11.2	11.5	10.0	10.7
Maxilla, width	3.3	4.1	3.0	3.0
Lower jaw, length	13.3	14.2	11.7	12.2
Interorbital width	9.1	9.6	9.3	10.5
Suborbital depth	1.9	1.9	1.8	2.0
Internarial distance	0.36	0.33	0.44	0.29
Posterior naris to orbit	2.7	2.6	2.7	2.9
Longest tooth, upper jaw	1.05	0.84	ca. 0.36	0.30
Longest tooth, lower jaw	0.84	0.86	ca. 0.39	0.33
Body, depth	32.9	34.9	34.9	34.4
Predorsal length	37.2	37.6	36.3	36.5
Preanal length	60.4	62.3	65.8	62.2
Caudal peduncle, length	18.7	21.9	22.0	21.0
Caudal peduncle, depth	8.1	9.0	9.0	9.8
Pectoral fin, length	>31.9	35.6	28.4	25.5
Pelvic fin, length	20.1	20.8	18.9	18.9
Anal fin base, length	19.8	21.0	18.6	21.4
Anal fin, length	29.7	33.4	>28.5	>30.5
Upper caudal-fin lobe, length	30.5	32.9	>30.8	bk.
Lower caudal-fin lobe, length	29.5	32.9	>27.8	bk.
Caudal concavity	ca. 16.7	20.0	ca. 13.7	—
First dorsal spine, length	ca. 5.9	>5.7	6.3	6.9
Third dorsal spine, length	bk.	14.7	11.3	>11.6
Longest dorsal spine, length	bk.	>15.5 (4th)	12.3 (4th)	bk.
Penultimate dorsal soft ray	>12.4	17.0	>11.3	bk.
Ultimate dorsal soft ray	>8.8	10.8	10.1	bk.
First anal spine, length	>3.5	5.0	4.3	>3.6
Second anal spine, length	>7.1	9.0	6.0	>6.8
Third anal spine, length	bk.	9.8	>6.8	>7.7
Penultimate anal soft ray	ca. 11.1	15.0	>11.4	>11.6
Ultimate anal soft ray	8.2	9.6	>10.4	9.7

B, & C; longest tooth in upper jaw 9.9–11.6% snout length, 6.3–8.7% postorbital head length; longest tooth in lower jaw 9.2–10.2% snout length, 6.5–6.9% postorbital head length); tubed scales in lateral line 69 or 70; maxilla without scales; caudal fin deeply forked.

Description.—Characters included in the combined description of *P. paragrapsimodon* and *P. waltervadi* and those in the species diagnosis are part of the species description. Data for the paratype are presented in parentheses where they differ from those for the holotype. Depth of body 3.05 (2.85), length of head 3.50 (3.30) in SL. Length of snout 3.15 (3.55), orbital diam-

eter 3.60 (2.95), interorbital width 3.15 in length of head. Additional morphometric data appear in Table 1. Procurrent caudal-fin rays 13 (12) dorsally, 12 ventrally. Pseudobranchial filaments ca. 46 (ca. 37). Gillrakers 9 + 20 (21)—total 29 (30), no rudiments present. Tubed lateral-line scales 69 left, 70 right. Predorsal scales ca. 22 (21). Scale rows between middle of spinous dorsal fin and lateral line 7 (8). Scales between origin of dorsal fin and lateral line 9 (ca. 9). Scales between origin of anal fin and lateral line 18 (19). Circum-caudal-peduncle scales 28 (ca. 28). Posteriormost 8 (7) complete pterygiophores of dorsal fin and posteriormost 6 of anal fin trisegmental. Epipleural ribs associated with first 8 (9) vertebrae.

Flap on posterior border of anterior naris falling slightly short of posterior naris when reflected. Anteriormost part of fleshy orbit of holotype with numerous short papillae. Both free margins of preopercle almost smooth except for small serrae in region of angle. Free margin of subopercle smooth. Longest gillrakers longer than longest gill filaments. Two dorsalmost and two ventralmost pectoral-fin rays unbranched, other rays branched; pectoral fin reaching to about a vertical through base of second dorsal soft ray (vertical between bases of fourth and fifth dorsal soft rays) and reaching vertical through base of third anal spine (vertical through base of first anal soft ray). Pelvic fin inserted a little posterior to base of pectoral fin, tip reaching vertical through base of tenth dorsal spine, falling well short of anal fin. Caudal fin deeply forked. Anteroventral group of temporal scales composed of one or two rows of small scales, posterodorsal group of three or four rows of large scales.

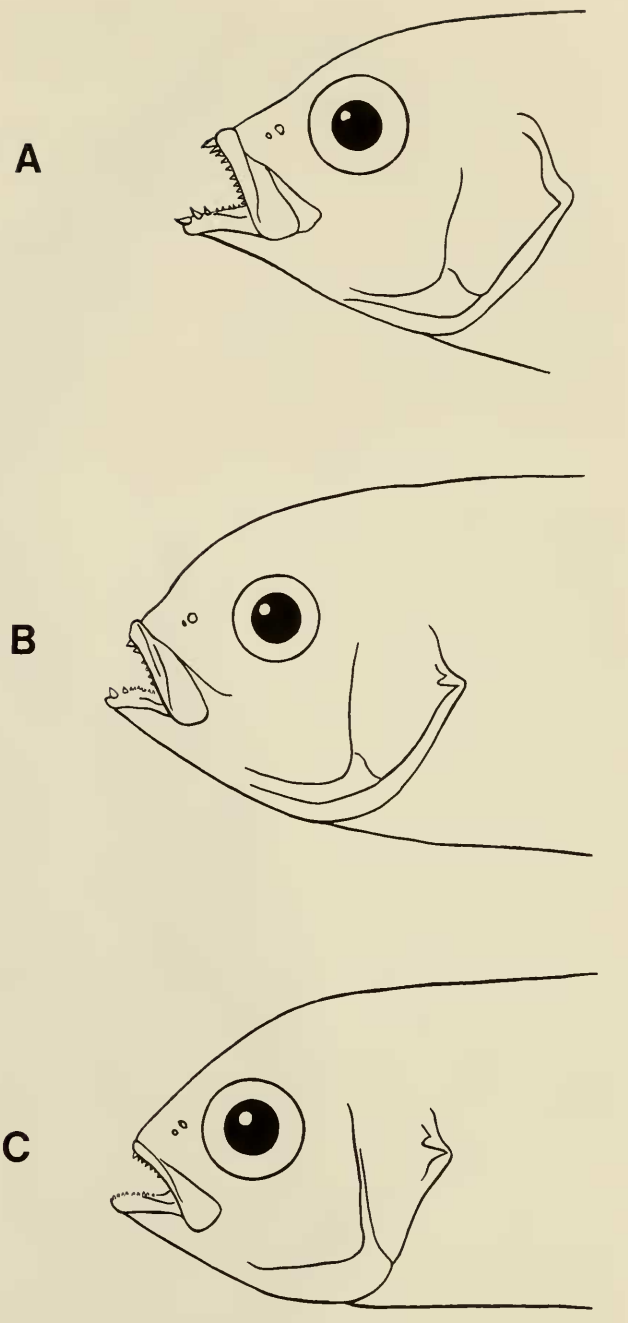

Fig. 2. Anterior jaw dentition in three nominal species of *Paracaesio*. A, Holotype of *P. paragrapsimodon*, USNM 269287, 275 mm SL; Ponape, Caroline Islands. B, Holotype of *P. pedleyi* (may = *P. xanthura*), AMS I. 13885, 306 mm SL; off Lord Howe Island. C, Putative syntype of *Caesio xanthura* (=*P. xanthura*), RMNH 3948, 128 mm SL; off Madagascar.

Dentition.—Holotype: Premaxilla with outer row of caniniform teeth; two very well-developed exserted canines on each side near symphysial diastema; a single caniniform tooth on each side of and immediately adjacent to diastema—these two teeth slightly posterior to most anterior canines; medially a band of very small teeth paralleling outer row of teeth, this band expanded anteriorly into a triangular patch in area adjacent to symphysis. Dentary with outer row of conical teeth along side of jaw; paralleling this row medially a band of smaller conical teeth—band expanded adjacent to sym-

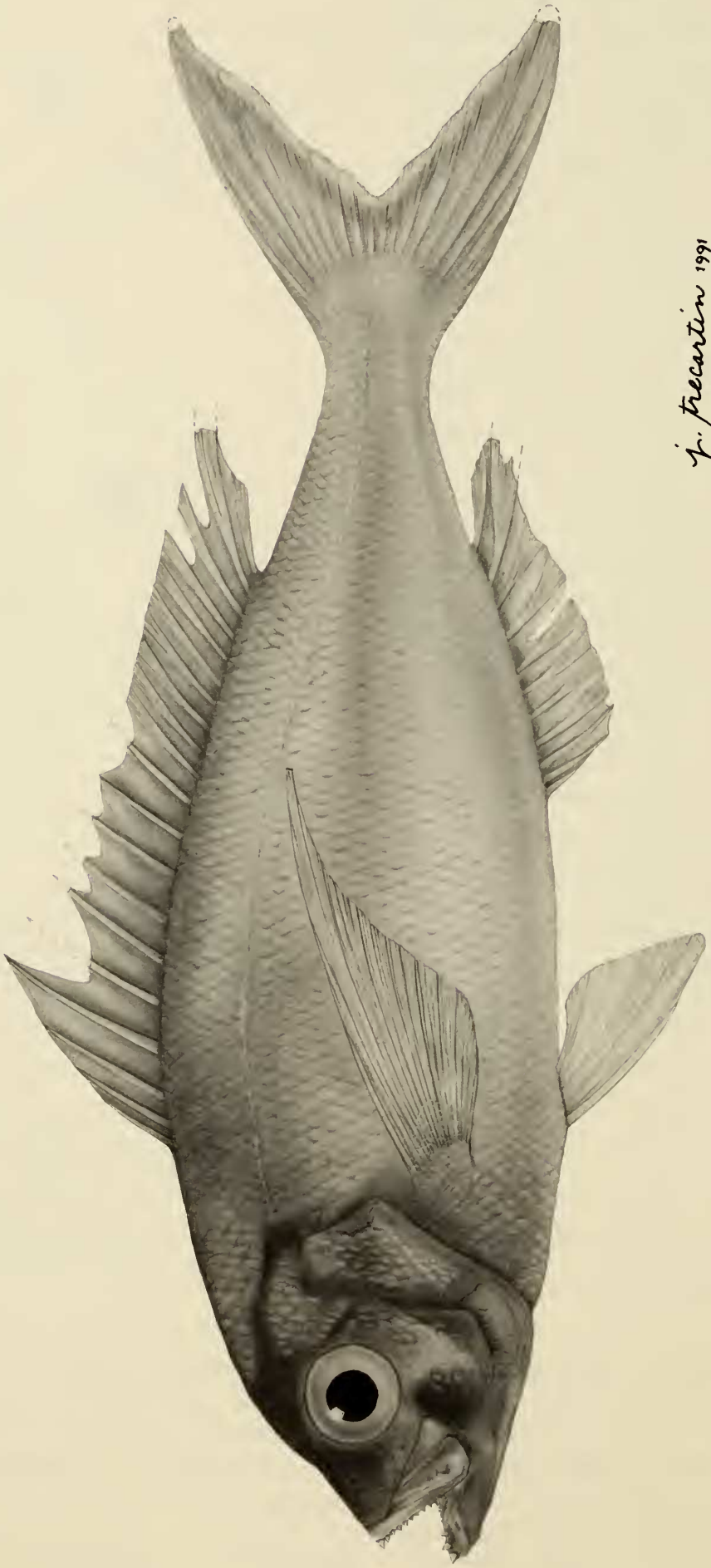

Fig. 3. Holotype of *Paracaesio paragrapsimodon,* USNM 269287, 275 mm SL; Ponape, Caroline Islands.

physial diastema; four very well-developed, strongly exserted canines on left (three on right) at anterior end of jaw; on right a smaller canine close to posterolateral base of exserted canine nearest symphysis. Vomerine teeth small—in roughly triangular patch, with apex of patch directed anteriorly. Palatine with narrow band of small teeth. No teeth on tongue or pterygoids.

Paratype: Dentition similar to that of holotype except teeth in inner band on premaxilla relatively larger than in holotype and band not as expanded anteriorly as in holotype; on dentary inner band of teeth developed only at anterior end of jaw.

Live coloration.—No information available on live coloration of holotype. When freshly caught, body of paratype was deep metallic blue; proximal halves of soft dorsal and soft anal fins pale yellow, with yellow extending onto dorsalmost part of back and dorsal part of caudal peduncle; yellow along middle of each caudal-fin lobe and at posterior margin of caudal fin.

Coloration in alcohol.—Holotype: General body color gray; dorsum of head much darker; evidence of what may have been vertical bars on sides of body; dorsal-fin membrane dusky; pectoral, pelvic, and anal fins mostly hyaline; caudal-fin membrane for most part straw colored to dusky, hyaline distally.

Paratype: Body slate blue dorsally and laterally, grayish ventrally; scaleless part of dorsum of head purplish blue, scaly part darker; sides of head bluish gray to gray, lighter ventrally; fins similar to those of holotype.

Comparisons.—*Paracaesio paragrapsimodon* is readily distinguished from all other species of *Paracaesio* by the possession of prominent exserted canine teeth at anterior ends of upper and lower jaws and by the pattern of coloration; from *P. caerulea, P. gonzalesi, P. kusakarii,* and *P. stonei* by its high count of lateral-line scales (69 or 70 vs. 47–50); from *P. gonzalesi, P. kusakarii,* and *P. waltervadi* by absence of scales on the maxilla; from *P. sordida* by absence of preopercular scales peripheral to main group of cheek scales; and from all species except *P. sordida* and those of the *P. xanthura* complex by shape of the caudal fin (Fig. 1).

Distribution.—Known only from the type specimens, one collected in the western Pacific Ocean off Ponape, Caroline Islands, and the other in Basilisk Passage, off Port Moresby, Papua New Guinea. Depth of capture, 200 m, is known only for the specimen from Basilisk Passage.

Etymology.—The name *paragrapsimodon* is from the Greek—paragrapsimos (exceptional), odon (tooth)—referring to the prominent exserted canine teeth at anterior ends of upper and lower jaws of this new species. The name of this new species is a noun in apposition to the generic name *Paracaesio.*

Paracaesio waltervadi
Anderson & Collette, new species
Figs. 1F, 4; Table 1

Paracaesio sp., Collette & Parin, 1991:11, pl. If (brief description and color illustration; two specimens collected at Walters Shoals during R/V *Vityaz* cruise 17).

Holotype.—USNM 307769, 412 mm SL, male; Walters Shoals, Madagascar Ridge, western Indian Ocean; 33°12′S, 43°52′E; 18–40 m; R/V *Vityaz* cruise 17, station 2751; 22 Dec 1988; handline.

Paratype.—IOAN uncat., 429 mm SL, male; Walters Shoals, Madagascar Ridge, western Indian Ocean; 33°16′S, 43°53′E, 35–40 m; R/V *Vityaz* cruise 17, station 2683a; 11 Dec 1988; handline.

Diagnosis.—A species of *Paracaesio* distinguished by the following combination of characters: tubed scales in lateral line 69 or 70; maxilla with scales; caudal fin lunate; coloration in life blue; jaws without prominent exserted teeth anteriorly (longest tooth in upper jaw 3.4–ca. 4.4% snout length, 2.4–ca. 3.0% postorbital head length; longest

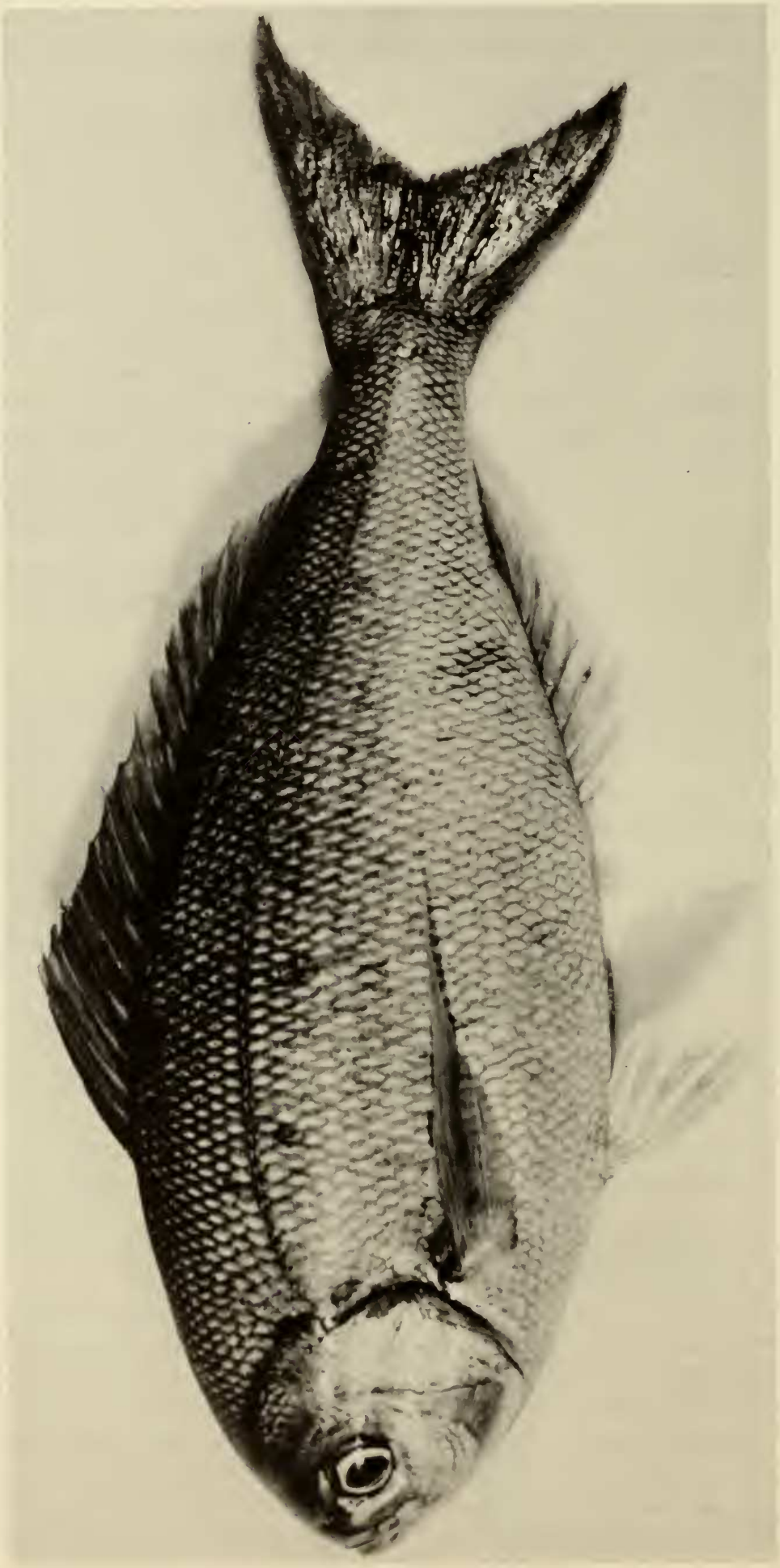

Fig. 4. Paratype of *Paracaesio waltervadi*, IOAN uncat., 429 mm SL; Walters Shoals, Madagascar Ridge.

tooth in lower jaw 3.6–ca. 4.7% snout length, 2.5–ca. 3.2% postorbital head length).

Description.—Characters included in the combined description of *P. paragrapsimodon* and *P. waltervadi* and those in the species diagnosis form part of this description. Data for the paratype are presented in parentheses where they differ from those for the holotype. Depth of body 2.85 (2.90), length of head 3.70 (3.65) in SL. Length of snout 3.25 (3.05), orbital diameter 3.95 (4.20), interorbital width 2.90 (2.60) in length of head. Additional morphometric data appear in Table 1. Procurrent caudal-fin rays 12 (ca. 12) dorsally, 12 (ca. 11) ventrally. Pseudobranchial filaments ca. 56, difficult to count (not counted on paratype). Gillrakers 11 (8) + 22 (21)—total 33 (29), no rudiments present. Tubed lateral-line scales 70 both sides (70 left, 69 right). Predorsal scales ca. 22. Scale rows between middle of spinous dorsal fin and lateral line 7½ (7). Scales between origin of dorsal fin and lateral line 10 (9). Scales between origin of anal fin and lateral line 18. Circum-caudal-peduncle scales 29 (28). Posteriormost 7 complete pterygiophores of dorsal fin and posteriormost 6 of anal fin trisegmental. Epipleural ribs associated with first 8 vertebrae.

Anterior naris with poorly developed flap on posterior border, flap falling well short of (almost reaching on right side of paratype) posterior naris when reflected. Both free margins of preopercle essentially smooth (scalloped in region of angle on paratype). Free margin of subopercle with a few serrae near junction with interopercle on right side, smooth on left (smooth on both sides of paratype). Longest gillrakers shorter than longest gill filaments. Two dorsalmost and ventralmost pectoral-fin rays unbranched, other rays branched; pectoral fin reaching vertical between bases of first and second dorsal soft rays and about reaching vertical through posterior border of vent. Pelvic fin inserted well posterior to vertical through base of pectoral fin; tip about reaching vertical through base of ninth dorsal spine, falling well short of vent. Caudal fin lunate. Anteroventral group of temporal scales in curving row on left, in about three rows of unequal length on right (anteroventral group absent on right of paratype); posterodorsal group of temporal scales in about five rows; space between groups of temporal scales narrowly bridged (not bridged on paratype) by row of scales on left—this row continuous with anteroventral row of scales.

Premaxilla with outer row of conical teeth, anteriorly a few of these teeth enlarged into caniniform teeth; medially a band of very small teeth, band somewhat expanded anteriorly adjacent to symphysial diastema. Dentary with outer row of small conical teeth; medially a band of very small teeth, band expanded anteriorly adjacent to symphysial diastema; at anterior end of jaw several widely spaced caniniform teeth—these teeth jutting somewhat obliquely from jaw. Vomer and palatine with very fine teeth; vomerine teeth apparently in triangular patch, with apex directed anteriorly; palatine teeth in narrow band. No teeth on tongue or pterygoids. (Teeth are especially difficult to examine because most are quite small, alveolar surfaces of jaws are very fleshy, and jaws are difficult to open widely enough to allow easy examination of dentition. Teeth of paratype not examined in detail because jaws are tightly closed.)

Collette & Parin (1991:7, pl. If) published a color photograph of the paratype taken shortly after capture. A color photograph of the holotype shows head and dorsal part of body to be blue, body lighter blue ventrally; dorsal, pectoral, and caudal fins and posterior three-fourths of anal fin blue; anterior part of anal fin and pelvic fin hyaline. In alcohol, body and head slate blue dorsally (except scaleless part of dorsum of head bluer), paler ventrally; dorsal fin and most of caudal fin slate blue; outermost rays of both lobes of caudal fin straw colored, distal margin of caudal fin pale gray to hyaline; other fins grayish to hyaline.

Comparisons.—*Paracaesio waltervadi* is distinguished from all other species of the genus by its coloration in life (blue without any yellow); from *P. caerulea, P. gonzalesi, P. kusakarii,* and *P. stonei* by its high count of lateral-line scales (69 or 70 vs. 47–50); from *P. paragrapsimodon, P. sordida, P. caerulea,* and *P. stonei* by presence of scales on the maxilla; from *P. sordida* by absence of preopercular scales peripheral to main group of cheek scales; and from *P. paragrapsimodon, P. sordida,* the *P. xanthura* complex, and *P. stonei* by shape of the caudal fin.

Distribution.—Known only from the type specimens collected in the western Indian Ocean over Walters Shoals in depths ranging from 18 to 40 m. Walters Shoals, an isolated seamount (33°9–16′S, 43°49–56′E), reaching to within 18 m of the surface, is located about 400 nm south of Madagascar and 600 nm east of South Africa (Collette & Parin 1991).

Etymology.—The name *waltervadi* is derived from Walters and vadum, Latin for shoal.

Species of the *Paracaesio xanthura* Complex

We include four nominal species here; three of them (*Paracaesio pedleyi, P. tumida,* and *P. cantharoides*) were considered by Allen (1985) and Anderson (1987) as junior synonyms of the fourth, *P. xanthura.* As a result of new information, in part derived from examination of additional material, a reassessment of all four species is in order.

Paracaesio xanthura.—The first author has examined the putative syntypes (RMNH 3948, 128 mm SL, and RMNH 5716, 196 mm SL) of *Caesio xanthura* Bleeker, 1869 (=*Paracaesio xanthura*) and 18 other specimens (55–355 mm SL) that he identified as this species. The type locality for *P. xanthura* is off the island of Nossi-Bé (just off the northwest coast of Madagascar in the Mozambique Channel), and the range of the species is generally considered to include much of the Indo-Pacific.

There are inconsistencies in literature descriptions of live coloration and maxillary squamation of *P. xanthura.* In Bleeker's (1869) original description of *Caesio xanthura,* the coloration is given, in part, as—anterodorsal part of body cerulean, posteroventrally a beautiful yellow; caudal yellow dorsally and ventrally, somewhat dark margined. Illustrations in Masuda et al. (1984, pl. 154H) and Allen (1985, pl. XXIV, fig. 89) show a broad yellow band on upper side of body beginning at about anterior end of dorsal fin, continuing over most of caudal peduncle, and extending posteriorly out onto both lobes of caudal fin. Yoshino (in Masuda et al. 1984:168) reported that the maxilla of *P. xanthura* lacks scales, but Allen (1985) and Anderson (1987) stated that scales may be present or absent on the maxilla. Anderson's (1987) statement was based on his examination of a few western Indian Ocean specimens with scaly maxillae that were otherwise indistinguishable from specimens he identified as *P. xanthura* that lacked scales on the maxillae. No scales were found on maxillae of either of the putative syntypes of *Caesio xanthura.*

Dr. Tetsushi Senta informed the first author (in litt., 12 Dec 1990) that while working in Singapore he noticed two kinds of *P. xanthura*; one had a scaly maxilla with the yellow band on the side restricted to the area above the lateral line; the other had a naked maxilla with the yellow band extending above and below the lateral line. (Senta *in* Kyushin et al. 1982:67 mentioned these two kinds of *P. xanthura.*) Specimens identified as *P. xanthura* with naked maxillae and the yellow band extending above and below the lateral line have been collected off Taiwan (Lee 1982:128, fig. 2) and southern Japan (Yoshino *in* Masuda et al. 1984:168; Masuda et al. 1984: pl. 154H).

At the request of Dr. Senta, one of his former students, Mr. Kiyoaki Kanashiro of the Okinawa Prefectural Fisheries Experi-

mental Station, examined more than 5700 specimens identified as *P. xanthura* landed at the fishing port of Itoman from December 1985 to February 1987. All specimens examined by Mr. Kanashiro had naked maxillae. They could be separated into two size groups; one ranged from 180 to 350 mm FL (mode at 270–300 mm FL); the other, from 350 to 470 mm FL (mode at 400–410 mm FL). The first group made up 91% of the specimens examined, and in members of this group the yellow band was relatively wider below the origin of the soft dorsal fin than in specimens of the second group. Some fishermen operating out of Itoman distinguish the two groups of *P. xanthura,* and on occasion catch a few small individuals of the larger size group.

Dr. Phillip C. Heemstra informed the first author (in litt., 30 Jan 1991) of some observations made on *Paracaesio* (apparently *P. xanthura*) by Dr. Allan D. Connell, biologist/diver from Natal. Dr. Connell wrote Heemstra (19 Oct 1988) that while diving at Aliwal Shoal (off Umkomaas, near Durban, Natal) on the previous weekend, he observed a large school of *Paracaesio* overhead. The school included blue-gray and green (uniform olive-greenish gray, Heemstra, in litt., 30 Jan 1991) varieties. As Connell watched, a green individual descended to the bottom (a flat area on top of a reef where two wrasse [blue/black] maintained a cleaning station), and as the snapper became stationary, it suddenly turned silvery and then more slowly to the more familiar blue and yellow pattern. Later, two more individuals from the school went through similar color changes. Connell (undated, but 1985–1987) published a color photograph (pl. 95) of an underwater scene at Landers Reef (off Park Rynie, Natal) which is several kilometers south of Aliwal Shoal. In the middle of this photograph is a *Paracaesio* (labeled *P. xanthura* in the legend). According to Heemstra (in litt., 4 Apr 1991), this is the "uniform green *Paracaesio*" that is capable of changing color to the blue and yellow form. The individual depicted in Connell's photograph is mostly greenish gray with considerable blue on head and caudal fin (especially along dorsal margin of upper lobe) and yellow on distal margin of posterior part of soft dorsal fin and over most of caudal fin.

Data are inadequate to determine whether populations currently going by the name *Paracaesio xanthura* constitute a single variable, wide-ranging species or two (or more) species. Consequently, it seems best to continue recognizing a single species until specimens from the entire geographic range become available for study.

It is interesting to note, that in addition to the similarities in coloration shared by *P. xanthura* and the nominal *P. pedleyi* (see next subsection), that three caesionids, *Caesio cuning, C. teres,* and *C. xanthonota,* and two labracoglossids (scorpidids if one follows Johnson 1984), *Labracoglossa argentiventris* and *L. nitida,* have patterns of coloration that are very similar to that of *Paracaesio xanthura* (compare illustrations in Grant 1982:359, col. pl. 178; Masuda et al. 1984: pls. 135G, 154H; Carpenter 1987: pls. IA & D, VIA, D, & E; Carpenter 1988: 25, pl. I, figs. 43a, b, 44a, 45b; Randall et al. 1990:186), perhaps reflecting ecological similarities. All six (or seven) species have similar body forms; rather poorly developed jaw dentition; long, slender, fairly numerous gillrakers; and well-forked caudal fins—the kinds of adaptations expected in species feeding, at least part of the time, on plankton at some distance off the bottom. (Araga in Masuda et al. 1984:152 noted that *Labracoglossa argentiventris* is "somewhat similar" to *Caesio xanthonota* and *P. xanthura.*)

Paracaesio pedleyi.—The nominal species *P. pedleyi* resembles *P. xanthura* very closely in coloration. In the original description of *P. pedleyi,* McCulloch & Waite (1916: 442) stated that it "has the general characteristics of *P. xanthurus,*" but that it can be "distinguished by the form of the spinous

dorsal and by the distribution of its colours." They wrote that "A dark band crosses the body between the middle of the spinous dorsal and the abdomen, . . ." in the holotype. Recently the first author examined the holotype (AMS I. 13885, 306 mm SL) of *P. pedleyi* from Lord Howe Island (off eastern Australia) and 11 other specimens (45–309 mm SL) from Australian waters that have been identified as *P. pedleyi.* The dark band mentioned by McCulloch & Waite (1916) was still evident on the holotype in mid-1991, and remnants of it are obvious on some of the other specimens identified as *P. pedleyi*; this band is not present in the putative syntypes of *Paracaesio xanthura* (RMNH 3948 & 5716) or in other examined specimens identified as this species. Grant (1982:359, in legend to col. pl. 178) reported that this band "intensifies after death." The spinous dorsal fin of the specimens identified as *P. pedleyi* appears to be more elevated anteriorly than in those identified as *P. xanthura.* There are a few other minor differences in measurements of body parts between specimens of the two nominal species and small differences in mean values for numbers of epipleural ribs (*P. xanthura,* 7–9, $\bar{X} = 7.7$, $n = 18$; *P. pedleyi,* 8–9, $\bar{X} = 8.4$, $n = 9$) and total numbers of gillrakers on the first arch (*P. xanthura,* 28–35, $\bar{X} = 31.3$, $n = 19$; *P. pedleyi,* 30–34, $\bar{X} = 32.1$, $n = 12$). Because of the small number of specimens examined, we defer judgment on the validity of *P. pedleyi* until a thorough study can be conducted.

Paracaesio tumida.—Tanaka (1917) described *Vegetichthys tumidus,* new genus and species, from a single specimen obtained from the Nagasaki fish market. Katayama (1934) placed *V. tumidus* in the synonymy of *V. xanthurus* (=*P. xanthura*). Although Abe & Shinohara (1962) recognized *P. tumida* as a valid species, recent authors have ignored it or considered it a junior synonym of *P. xanthura.* Because we have not examined the holotype of *V. tumidus* and because the original descriptions of the genus and species are in Japanese, we include here portions of an English translation, made in 1950 by Kiyomatsu Matsubara, of Tanaka (1917).

> Body length (to tip of upper lobe of caudal fin) 260 mm. Head 3⅓ in body length (without caudal fin); depth 2⅘. Eye 3⅓ in head; interorbital space 2⅝; snout 4.0; maxillary 2⅝; depth of caudal peduncle 2⅝. D. X, 9; A. III, 7; P. 17; branched caudal rays 15. Scales ctenoid, 66 along lateral line, 10 (above lateral line)—19 (below) in a transverse series. Vomer toothless; weak teeth present on palatines. Several rows of villiform teeth on jaws, outermost ones are canines—especially larger anteriorly. Caudal fin deeply forked. Color in formalin uniformly dark brown.

We have not examined any specimens of *Paracaesio* with 66 lateral-line scales (a count closer to the high count species of the genus—those with 68–73, than to the low count species—those with 47–50), nor have we encountered specimens of the genus with counts of dorsal soft rays or anal soft rays as low as nine and seven, respectively, although there are reports in the literature (e.g., Yoshino *in* Masuda et al. 1984:168) of nine dorsal soft rays for both *P. xanthura* and *P. sordida.* The low counts recorded for the holotype of *V. tumidus* may be the result of Tanaka's using methods for counting that are slightly different from ours. Species of *Paracaesio* typically have poorly developed vomerine dentition; in fact a few specimens that we have examined have almost no vomerine teeth and those present are very small. Accordingly, it is not surprising that Tanaka failed to detect any teeth on the vomer of the holotype of *V. tumidus.*

If *P. tumida* is not a valid species, the count of lateral-line scales and the presence of a deeply forked caudal fin in the holotype point to its being a synonym of either *P. xanthura* or *P. sordida*; both of these species, considering their known ranges, could

have shown up in the Nagasaki market at the time the holotype of *P. tumida* was collected. Abe & Shinohara (1962:169–170) distinguished *P. tumida* from *P. sordida* on the basis of coloration, *P. tumida* having the dorsal part of the body and caudal fin yellow and the rest of the body blue—a pattern essentially that of *P. xanthura* (see subsection on *P. xanthura*). If the populations currently relegated to *P. xanthura* (see subsection on that species) actually represent two or more species, *P. tumida* may be the correct name for one of them. (It should be emphasized that we lack information on live coloration and maxillary squamation for the holotype of *V. tumidus*.) Considering the similarities in coloration between *P. tumida* (as presented by Abe & Shinohara 1962) and *P. xanthura* and despite the low counts for lateral-line scales and dorsal and anal soft rays given by Tanaka (1917), we consider it best to continue recognizing *Vegetichthys tumidus* Tanaka, 1917, as a junior synonym of *Paracaesio xanthura* (Bleeker, 1869) until the populations of *P. xanthura* have been adequately studied.

Paracaesio cantharoides.—*Aetiasis cantharoides* Barnard, 1937, new genus and species, was described from a specimen collected off the coast of Natal, South Africa. Barnard (1937) stated that the single specimen (no catalogue number given, 400 mm in length) upon which the species description was based was obtained by the SAM through "the kindness of Mr. C. L. Biden." The first author has examined a specimen of *Paracaesio* (SAM 18430, ca. 395 mm FL, 355 mm SL) taken off Durban, Natal, that was transferred to the SAM collections from the Hastings collection by C. L. Biden in 1933. Barnard's specimen of *A. cantharoides* had scales on the maxilla and was dissected on the right side of the head to study the morphology of the vomer, palatines, pharyngeal bones, and jaws. The specimen of *Paracaesio* from the SAM (SAM 18430) has scales on the left maxilla and has had the right side of the head dissected. In addition, a glass tube accompanying the specimen contains the bones depicted in Barnard's (1937:60, text-fig. 2) illustration, although Barnard's drawings are not entirely accurate representations of the bones in the glass tube. Barnard provided no information on live coloration and there is no evidence of live coloration remaining on SAM 18430. Although there are some discrepancies between Barnard's description and SAM 18430 (e.g., counts of dorsal-fin rays and branchiostegal rays), we believe that SAM 18430 is the holotype of *Aetiasis cantharoides* because the deposition of the specimen, source and length of the specimen, evidence of dissection, and the disarticulated head bones with the specimen match the information provided in Barnard's description and because there appears to be no other specimen in the collections of the SAM that could be the holotype. In addition, the drawing of the head and anterior part of the body accompanying the original description of *A. cantharoides* in Barnard (1937:60, text-fig. 2) is of a *Paracaesio*.

Abe and Shinohara (1962) recognized *Paracaesio cantharoides* as a valid species, apparently largely on the basis of the presence of scales on the maxilla. Anderson (1987) considered *P. cantharoides* as a junior synonym of *P. xanthura* because he examined a few western Indian Ocean specimens with scaly maxillae that were otherwise indistinguishable from *P. xanthura* (see subsection on *P. xanthura*).

We believe SAM 18430 to be the holotype of *Aetiasis cantharoides* and that further study could show *P. cantharoides* to be a valid species. Therefore, we offer the following descriptive information on SAM 18430: SL 355 mm; dorsal-fin rays X, 10; anal-fin rays III, 8; pectoral-fin rays 17 (both sides); gillrakers 7 + 21—total 28; tubed lateral-line scales 70 (left) 71 (right); cheek-scale rows 7 (both sides); predorsal scales ca. 24; scales between origin of dorsal fin and lateral line 10; scales between origin of

anal fin and lateral line 18; scale rows between middle of spinous dorsal fin and lateral line 6½; circum-caudal-peduncle scales 28; maxilla with scales; caudal fin damaged, but clearly well forked.

Presently, it seems best to consider *Aetiasis cantharoides* Barnard, 1937, a junior synonym of *Paracaesio xanthura* (Bleeker, 1869).

Sexual Dimorphism

Mr. William A. Roumillat examined histological sections of the gonads of the ten specimens identified as *P. pedleyi* (may = *P. xanthura*) that have anterior jaw teeth that are large enough to measure with some degree of precision. With the exception of the upper jaw teeth of one male (247 mm SL), the six males (170–307 mm SL) have slightly longer longest anterior jaw teeth than do the four females (216–309 mm SL), suggesting that tooth size may be sexually dimorphic in *P. pedleyi* (measurements in percentages of postorbital head length: longest upper jaw tooth:—males 3.2–5.9, $\bar{X} = 4.6$—females 3.5–4.1, $\bar{X} = 3.8$; longest lower jaw tooth:—males 3.4–4.9, $\bar{X} = 4.0$—females 2.6–3.2, $\bar{X} = 2.9$). If tooth size is sexually dimorphic in *P. pedleyi,* it is the first external character recognized as such in the Lutjanidae. Too few data are available to determine if there is a correlation between tooth size and sex in other species of *Paracaesio.*

Relationships

The genus *Paracaesio,* as currently understood, consists of about eight or nine very similar species that possess what can be called the "*Paracaesio* look." Despite the fact that these species appear to form a group of closely related species, we know of no synapomorphy uniting them. Two characters, possibly correlated, relative lengths of last two dorsal soft rays and relative lengths of last two anal soft rays, may be synapomorphic, but we lack data to demonstrate this convincingly.

Because we have examined specimens of all nominal species of *Paracaesio* (except *P. tumida*), we offer the following comments on relationships. The evidence suggests that among the Lutjanidae, in general, and the Apsilinae, in particular, that increased numbers of lateral-line scales, barred color pattern in adults, and scaly maxillae are derived conditions. If these character states are synapomorphic, three monophyletic groups of species are recognizable: *P. paragrapsimodon, P. sordida, P. waltervadi,* and the *P. xanthura* complex (with increased numbers of lateral-line scales); *P. gonzalesi, P. kusakarii,* and *P. stonei* (adults with barred color pattern); and *P. gonzalesi* and *P. kusakarii* (with scaly maxillae). A more definitive statement on the relationships of these species will be possible only after much additional study.

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lation of Bleeker's (1869) Latin description of the coloration of *Caesio xanthura*; and G. C. Steyskal advised that *Paracaesio* is a feminine noun. K. E. Carpenter, P. C. Heemstra, M. D. Mullaney, T. A. Munroe, and J. E. Randall reviewed drafts of the manuscript, and T. Senta read a portion of it. Both the Research and Development Committee, Department of Biology, and the Faculty Research and Development Committee, College of Charleston, provided financial assistance. This is GMBL contribution number 104.

Addendum

In May 1992, while in residence as a research fellow at the J. L. B. Smith Institute of Ichthyology in Grahamstown, Republic of South Africa, the first author examined an unusual specimen (RUSI 14863, 391 mm SL, from Aliwal Shoal, Natal) with patterns of dentition and coloration previously unobserved by us in *Paracaesio*. This individual has about six irregular rows of enlarged, strongly exserted caniniform teeth at the anterior ends of the dentaries. The other teeth in both jaws are quite small. The longest of these exserted caniniform teeth is 5.9% snout length, 4.2% postorbital head length, appreciably shorter than the longest lower jaw teeth in *P. paragrapsimodon*. No information is available on live coloration, but in alcohol the specimen is dark dorsally, lighter ventrally. In addition, on the right side only, there is a narrow oblique dark bar running from near bases of first and second anal soft rays anterodorsally to blend into dark background of dorsum of body; anterior to this oblique bar, hints of other oblique bars are visible. There are two rows of small scales on each preopercle peripheral to and distinctly separated from the main group of cheek scales; this is reminiscent of the preopercular squamation of *P. sordida*. Other data for this specimen are: dorsal fin rays X, 10; anal-fin rays III, 8; pectoral-fin rays 17 (both sides); gillrakers 9 + 20—total 29; tubed lateral-line scales 71 (left), ca. 72 (right); maxilla without scales; caudal fin damaged but apparently forked.

Dr. Phillip C. Heemstra received a color transparency of a specimen of *Paracaesio* from Mr. Simon Chater of the Oceanographic Research Institute, Durban, Natal, and subsequently gave it to the first author. In a letter, dated 23 April 1992, Chater wrote Heemstra that the specimen was collected in 40 m off Inhaca Island [Mozambique] and that when freshly caught "it was coppery bronze with two broad powder blue stripes running laterally from just behind the gill flap to base of the peduncle where they converged." Examination of the transparency shows the coloration to be similar to that described in Chater's letter, about 70 tubed lateral-line scales, and a well-forked caudal fin. We have not seen this pattern of coloration previously in *Paracaesio*. Unfortunately, the specimen was not preserved.

With the information available, it is impossible to determine the status of the specimen from Aliwal Shoal (RUSI 14863) or that of the specimen caught off Inhaca Island.

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