

A Revision of the Genus *Parapercis*, Family Mugiloididae¹

GEORGE E. CANTWELL²

THIS STUDY describes the genus *Parapercis* Bleeker and its 26 species. The descriptions are based on anatomical studies, each structure having been analyzed statistically to determine its variation within a species and its value in identification. An effort has been made to employ those characters with the least variation within species to establish possible affinities between species, to define species groups, and to determine relationships among them. The geographic range has been determined from actual specimens and the literature.

Over 80 nominal species have been described in or placed in the genus *Parapercis*, but no previous attempt has been made to compare the species on a world-wide basis or to determine the value of morphological characters in the identification of them. Studies of the genus by Cuvier and Valenciennes (1829) and by Günther (1860) each included 13 nominal species. Subsequent reports have been made on a regional basis, the more important of which are listed below, along with the number of nominal species: Day (1876), India, 3; Jordan and Seale (1906), Samoa, 6; Jordan, Tanaka, and Snyder (1913), Japan, 7; McCulloch (1929), Australia, 14; Okada (1938), Japan, 12; Kamohara (1950), Japan, 11; and Beaufort and Chapman (1951), Indo-Australian Archipelago, none. The only records of *Parapercis* from outside the Indian and Pacific oceans are by Vaillant (1887) and Cadenat (1937), from the Cape Verde Islands off the west coast of Africa, each based on a single specimen. Arambourg (1927) identified a fossil from Oran as belonging to the genus.

Since the completion of this study, Kamohara (1960) has described a new species *Parapercis okamurai* from Japan. No attempt has been made to incorporate *P. okamurai* in this study, as no material was available for examination.

MATERIAL STUDIED

The author is grateful to the authorities of the following institutions for the use of specimens that form the basis of this study: Academy of Natural Sciences of Philadelphia (ANSP); Australian Museum, Sydney (AM); Bernice P. Bishop Museum, Honolulu (BPBM); British Museum (Natural History), London (BMNH); California Academy of Sciences, San Francisco (CAS); Chicago Natural History Museum (CNHM); Dominion Museum, Wellington (DM); George Vanderbilt Foundation, Stanford University (GVF); Museum of Comparative Zoology, Harvard University (MCZ); Naturhistorisches Museum, Wien (NHMW); Rijksmuseum Natuurlijke Historie, Leiden (RVNH); Stanford Natural History Museum (SNHM); Tokyo University (TU); University of California, Los Angeles (UCLA); University of Michigan, Museum of Zoology, Ann Arbor (UMMZ); University of Washington, Seattle (UW); United States National Museum, Washington, D. C. (USNM); the Western Australian Museum, Perth (WAM).

The author wishes to thank Dr. L. P. Schultz, Dr. E. A. Lachner, Dr. W. R. Taylor, Mr. R. Kanazawa of the U. S. National Museum, and Dr. G. W. Wharton of the University of Maryland for their help and advice; Dr. C. M. Clifford, University of Maryland, for information on type specimens in the British Museum; Dr. K. A. Tabler, U.S. Department of Agriculture, for aid and advice on statistical analyses; and the staff of the Smithsonian Institution's Photographic Laboratory for photographs.

DEFINITION OF TERMS

Measurements of body parts were made with dividers and the distances recorded to the nearest half millimeter. These measurements are expressed as thousandths of the standard length.

Total length: the distance from the anterior tip of the upper lip to the tip of longest caudal fin ray (except on one species, *P. schauinslandi*,

¹ Manuscript received July 17, 1963.

² 1 Greentree Pl., Greenbelt, Md.

which has long filamentous projections from the caudal fin; in this species it was impossible to determine how much, if any, of these filamentous rays were broken; therefore the total length was taken from the anterior tip of the upper lip to the posterior end of the shortest branched caudal fin ray).

Standard length: the distance from the anterior tip of the upper lip to the posterior end of the hypural plate. When necessary the end of the hypural plate was determined by dissection or probing with a needle.

Greatest depth: the greatest vertical distance of the body at its deepest part.

Depth of caudal peduncle: least vertical distance at the caudal peduncle.

Snout length: the distance from the anterior tip of the premaxillary (upper lip) to the front edge of the orbit.

Eye diameter: the greatest horizontal distance between the margins of the bony orbit.

Postorbital length: the distance from the rear edge of the orbit to the rearmost tip of the fleshy operculum.

Interorbital width: the least distance between the bony edges of the orbits on the dorsal surface of the head.

Head length: the distance from the anterior tip of the upper lip to the posterior tip of the fleshy operculum.

Gill rakers: the anterior rightmost arch was exposed by dissection. The count includes all gill rakers and rudiments on the first arch.

Fin rays: spines are represented by Roman numerals, simple soft rays by lowercase Roman numerals, and branched soft rays by Arabic numbers. Each ray with a separate base was counted.

Abdominal vertebrae: those vertebrae from the head to, but not including, the first vertebra with transverse processes that meet midventrally.

Caudal vertebrae: those vertebrae from the most anterior one with transverse processes that meet midventrally to, but not including, the urostylar vertebra. Vertebral counts were made directly from radiographs and were confirmed in some instances by dissection.

Scales in a longitudinal row: the number of oblique rows of scales that cross the first lengthwise row just above the lateral line, counting

from the upper angle of the gill opening along the body to the base of the caudal rays.

Scales from the soft dorsal to the lateral line: the number of scales in an oblique row running down and back from the first soft dorsal ray to the lateral line. The lateral line scale is not included in this count. Small scales near the dorsal fin are counted as whole scales.

Scales from the anal opening to the lateral line: the number of scales in an oblique row running up and back from the anterior margin of the anus to the lateral line. The lateral line scale is not included in this count.

Scales around the caudal peduncle: the number of scales in a zigzag row around the least vertical depth of the caudal peduncle.

DIAGNOSTIC CHARACTERS

Neither the measurements nor meristic data may be used alone to identify species. Although most of the characters vary within themselves and overlap with those of other species, in certain instances there is no variation of a character within a species nor overlapping between species.

The color pattern is of great value in identifying members of this genus when specimens are recently and/or well preserved. Very old and poorly preserved specimens, even recent poorly preserved specimens, tend to fade, and in time lose all or most of their color pattern. No sexual dimorphism in color pattern was observed.

The mean (\bar{y}), variance (s^2), and standard deviation (s) were obtained for all characters involving measurements or count data. In those instances where a comparison was made between species involving these data, the standard error of the difference was calculated in order to determine the statistical significance of the difference of the sample means.

GILL RAKERS: The total number of rakers varies between species from 9 to 25, but within each species the variation is usually 3 or 4 (Table 6). The upper arch has from 1 to 11 rakers and the lower from 7 to 15.

FIN RAYS: There is little variation, if any, in the fin ray counts. Without exception the pelvic fin ray count was I, 5. The caudal fin ray formula for branched rays was 8 above and 7

TABLE 1
NUMBER OF DORSAL FIN RAYS FOR SPECIES OF *Parapercis*

SPECIES	SPINES			SOFT RAYS				
	IV	V	VI	20	21	22	23	24
<i>ramsayi</i>	3	—	—	—	—	—	—	3
<i>aurantiaca</i>	—	1	—	—	—	—	1	—
<i>multifasciata</i>	1	25	—	—	—	1	23	2
<i>bimivirgata</i>	—	3	—	—	—	—	3	—
<i>sexfasciata</i>	—	39	—	—	—	1	32	7
<i>mimaseana</i>	—	1	—	—	—	—	1	—
<i>muronis</i>	—	3	—	—	—	—	3	—
<i>colias</i>	—	16	1	17	—	—	—	—
<i>allporti</i>	—	9	—	—	9	—	—	—
<i>gilliesi</i>	—	7	—	—	7	—	—	—
<i>schauinslandi</i>	—	25	—	—	24	1	—	—
<i>filamentosa</i>	—	3	—	—	—	3	—	—
<i>alboguttata</i>	—	4	—	—	—	4	—	—
<i>emeryana</i>	—	8	—	—	—	8	—	—
<i>nebulosa</i>	—	25	—	—	1	23	1	—
<i>baackei</i>	—	9	—	—	—	9	—	—
<i>cylindrica</i>	—	25	—	—	24	1	—	—
<i>snyderi</i>	—	8	—	—	8	—	—	—
<i>pulchella</i>	—	31	—	—	29	2	—	—
<i>ommatura</i>	—	26	—	—	—	26	—	—
<i>cephalopunctata</i>	52	—	—	1	51	—	—	—
<i>clatibrata</i>	24	3	—	2	25	—	—	—
<i>hexopbthalma</i>	—	13	—	—	12	1	—	—
<i>polyopbthalma</i>	—	18	—	—	17	1	—	—
<i>tetracantha</i>	—	14	—	2	12	—	—	—
<i>xanthozona</i>	—	19	—	—	19	—	—	—

below (8 plus 7), except for a few individuals in the species *P. snyderi*, in which it was 7 plus 7. The dorsal spines (Table 1) were either IV or V, with little variation within a species. The soft dorsal rays ranged from 20 to 24, and they varied little within a species (Table 1). The first ray of the anal fin was always unbranched, followed by 16 to 19 branched rays (Table 2).

PECTORAL FIN RAYS: The upper ray of the pectoral fin was always simple and unbranched, followed by 14 to 21 branched rays (Table 2). The variation within species usually did not exceed 4.

SCALE COUNTS (Tables 3, 4, 5): The number of oblique rows of scales crossing the lateral line from rear of head to base of caudal fin rays ranges from 40 to 89. The range within the genus of the number of scales from the lateral line to the anus was from 10 to 25; within each species the variation was up to 6, though usually less than 4. The number of scales from the lateral line to the first soft dorsal ray varied from

3 to 11 within the genus and up to 4 within species. The variation within a species of the number of scales around the caudal peduncle was up to 8, and the range within the genus from 15 to 44.

VERTEBRAE: The number of abdominal vertebrae remained constant at 10, whereas the number of caudal vertebrae ranged from 18 to 22. There was practically no variation in the number of caudal vertebrae within a species (Table 6).

BODY MEASUREMENTS: These data show more variation, both within and among species, than the meristic data, and therefore are not used at all.

DENTITION: Good diagnostic characters that do not vary within a species are the presence or absence of palatine teeth. The number of canine teeth in the outer row of the lower jaw was either 6, 8, or 10. The dentition of each species is diagrammed in Figures 2, 3, and 4.

Two other characters that show no variability

TABLE 2
ANAL AND PECTORAL FIN RAYS FOR SPECIES OF *Parapercis*

SPECIES	TOTAL ANAL					TOTAL PECTORAL										y	s
	17	18	19	20	21	28	30	32	34	36	38	40	42				
<i>ramsayi</i>	-	-	1	2	-	-	-	6	-	-	-	-	-	32.0	-		
<i>aurantiaca</i>	-	-	-	1	-	-	-	-	-	-	-	2	-	40.0	-		
<i>multifasciata</i>	-	-	-	24	2	-	-	-	7	35	7	2	38.2	1.25			
<i>bivirgata</i>	-	-	-	3	-	-	-	-	-	1	5	-	39.7	0.58			
<i>sexfasciata</i>	-	-	1	31	8	-	-	71	9	-	-	-	32.5	0.68			
<i>mimaseana</i>	-	-	-	1	-	-	-	-	-	-	2	-	38.0	-			
<i>muronis</i>	-	-	-	3	-	-	-	-	-	-	6	-	40.0	0.69			
<i>colias</i>	15	2	-	-	-	-	-	-	1	6	25	2	39.7	1.11			
<i>allporti</i>	-	9	-	-	-	-	-	-	-	5	12	1	39.4	1.01			
<i>gilliesi</i>	-	7	-	-	-	-	-	-	-	5	9	-	39.3	0.95			
<i>schauinslandi</i>	-	24	1	-	-	-	6	43	1	-	-	-	31.8	0.58			
<i>filamentosa</i>	-	-	3	-	-	-	-	6	-	-	-	-	32.0	-			
<i>alboguttata</i>	-	-	4	-	-	-	-	-	1	5	2	-	36.3	0.13			
<i>emeryana</i>	-	-	8	-	-	-	-	-	16	-	-	-	34.0	0.53			
<i>nebulosa</i>	-	1	23	1	-	-	-	-	4	43	3	-	34.0	0.61			
<i>baackei</i>	-	-	9	-	-	1	17	-	-	-	-	-	29.9	0.33			
<i>cylindrica</i>	-	25	-	-	-	6	42	2	-	-	-	-	29.8	0.72			
<i>snyderi</i>	-	7	1	-	-	15	1	-	-	-	-	-	28.1	0.35			
<i>pulchella</i>	-	29	2	-	-	-	-	27	35	-	-	-	33.1	0.76			
<i>ommatura</i>	-	-	25	1	-	9	40	3	-	-	-	-	29.8	0.94			
<i>cephalopunctata</i>	1	51	-	-	-	-	-	4	88	12	-	-	34.1	0.66			
<i>clatrata</i>	-	27	-	-	-	-	-	4	42	8	-	-	34.0	0.90			
<i>hexophthalma</i>	-	12	1	-	-	-	-	-	14	12	-	-	35.1	1.04			
<i>polyophthalma</i>	-	17	1	-	-	-	-	-	16	20	-	-	35.0	1.19			
<i>tetracantha</i>	1	13	-	-	-	-	-	-	4	24	-	-	35.7	0.60			
<i>xanthozona</i>	-	19	-	-	-	-	-	9	28	1	-	-	33.6	0.90			

within a species are the shape of the spinous dorsal and its connection to the soft dorsal (Fig. 1). The shape of the spinous dorsal falls into two categories: (1) the middle spines are longer than the last; or (2) the spines become progressively longer posteriorly. The membranous connection between the two fins is from the tip of the last spine to the base of the first soft ray (deeply notched), or from the spine tip to the first soft ray at a level with the tip of the spine (no notch).

Along with dentition and the shape and connection of the spinous dorsal fin, other characters determined to be most useful because of their small degree of variability are the number of caudal vertebrae and the number of rays of the dorsal, anal, and pectoral fins.

GENUS *Parapercis* Bleeker

Parapercis Bleeker, 1863, p. 236 (type species, *Sciaena cylindrica* Block).

Neopercis Steindachner and Döderlein, 1884, p. 212 (type species, *Parapercis ramsayi* Steindachner).

Osurus Jordan and Evermann, 1903, p. 206 (type species, *Parapercis schauinslandi* Steindachner).

Chilias Ogilby, 1910, p. 40 (type species, *Percis stricticeps* De Vis).

Neopercis was erected using the presence of palatine teeth as the only character distinguishing it from the genus *Parapercis*. Whitley (1932) discovered *Parapercis cylindrica*, the type of *Parapercis*, also had palatine teeth. Thus *Neopercis* is a synonym of *Parapercis*.

The only character used by Jordan and Evermann to distinguish *Osurus* from *Parapercis* was the deeply forked caudal fin of *P. schauinslandi*, which I regard as an insignificant character. Ogilby did not give any valid reason for distinguishing *Chilias* from *Parapercis* and none were found.

Bloch (1801), erected the genus *Percis*, using as the type species *Percis maculata*. The genus *Percis* Bleeker (1844 and 1876), Dumeril (1856), and Günther (1880), is preoccupied by Scopoli, 1777, in which he used *Cottus japonicus* Pallas as its type species. More recent authors have placed some parapercids in the genus *Percis*; however, the type of Bloch's genus *Percis maculata* cannot be defined as a parapercid, hence *Percis* and *Parapercis* cannot be considered synonymous.

Berg (1947) and Schultz et al. (1960) place the genus *Parapercis* in the family Mugiloididae. The two other genera, *Mugiloides* Lacepède (1802) [*Pinguipes* Cuvier (1829)] and *Prolatilus* Gill (1865) [*Pseudopercis* Ribeiro 1904], are restricted to South America. Characters common to the family Mugiloididae as well as the super-family Trachinoidea (of Berg) are: gill arches, 4; branchiostegals, 6; pelvics, I, 5; nostrils, two pairs, the anterior being tubular; no scales on the dorsal or anal fins; and one oper-

cular spine. Other characters shared by the genera of the family are: branched caudal fin rays, 8 plus 7; complete dorsal fin with IV to VII spines followed by 19 to 28 branched rays; anal fin with one simple non-cross-striated ray followed by 16 to 26 branched rays.

Mugiloides and *Prolatilus* differ from *Parapercis* as follows: the vertebrae and fin ray counts are greater in number in the South American genera than in the Indo-Pacific genus *Parapercis*. Vertebrae: *Mugiloides* and *Prolatilus*, 15 or 16 abdominal and 20 or 21 caudal; *Parapercis*, 10 abdominal and 18 to 21 caudal. Dorsal fin formula: *Mugiloides*, VI or VII, 26 to 28; *Prolatilus*, IV, 28; *Parapercis*, IV or V, 19 to 23. Anal fin formula: *Mugiloides*, I, 22 to 26; *Prolatilus*, I, 23; *Parapercis*, I, 16 to 19.

The dentition of *Parapercis* differs from the South American genera by having the outer row of canine teeth at the anterior end of the lower jaw well developed but separated from those teeth on the sides of the jaw by an edentulous

TABLE 3
NUMBER OF LONGITUDINAL SCALE ROWS FOR SPECIES OF *Parapercis*

SPECIES	40	45	50	55	60	65	70	75	80	85	n	y	s
	to 44	to 49	to 54	to 59	to 64	to 69	to 74	to 79	to 84	to 89			
<i>ramsayi</i>	-	-	-	-	3	-	-	-	-	-	3	61.0	1.00
<i>aurantiaca</i>	-	-	-	-	1	-	-	-	-	-	1	61.0	-
<i>multifasciata</i>	-	-	-	4	21	1	-	-	-	-	26	60.9	1.35
<i>binivirgata</i>	-	-	-	-	-	3	-	-	-	-	3	66.3	0.58
<i>sexfasciata</i>	-	-	-	-	25	15	-	-	-	-	40	64.2	0.88
<i>mimaseana</i>	-	-	-	-	1	-	-	-	-	-	1	64.0	-
<i>muronis</i>	-	-	3	-	-	-	-	-	-	-	3	53.0	0.57
<i>colias</i>	-	-	-	-	17	-	-	-	-	-	17	62.1	0.86
<i>allporti</i>	-	-	-	-	9	-	-	-	-	-	9	61.9	1.17
<i>gilliesi</i>	-	-	-	-	-	7	-	-	-	-	7	66.3	1.11
<i>schauinslandi</i>	-	-	-	14	11	-	-	-	-	-	25	59.2	1.22
<i>filamentosa</i>	-	-	-	3	-	-	-	-	-	-	3	58.7	0.58
<i>alboguttata</i>	-	-	-	4	-	-	-	-	-	-	4	58.8	0.60
<i>emeryana</i>	-	-	-	-	-	-	3	5	-	-	8	74.1	0.83
<i>nebulosa</i>	-	-	-	-	-	-	-	3	20	2	25	82.5	2.29
<i>baackei</i>	-	6	3	-	-	-	-	-	-	-	9	48.8	1.05
<i>cylindrica</i>	-	20	5	-	-	-	-	-	-	-	25	48.1	2.34
<i>snyderi</i>	8	-	-	-	-	-	-	-	-	-	8	40.5	0.53
<i>pulchella</i>	-	-	-	9	22	-	-	-	-	-	31	60.5	1.55
<i>ommatura</i>	-	-	-	25	1	-	-	-	-	-	26	57.9	1.14
<i>cephalopunctata</i>	-	-	-	31	21	-	-	-	-	-	52	59.3	1.12
<i>clathrata</i>	-	-	-	23	4	-	-	-	-	-	27	58.7	0.95
<i>hexophtbalma</i>	-	-	-	-	3	7	3	-	-	-	13	66.6	3.29
<i>polyophtbalma</i>	-	-	-	-	2	14	2	-	-	-	18	66.9	2.29
<i>tetracantha</i>	-	-	-	6	8	-	-	-	-	-	14	59.9	1.00
<i>xanthozona</i>	-	-	-	10	9	-	-	-	-	-	19	59.7	1.20

TABLE 4

SCALES AROUND CAUDAL PEDUNCLES AND BELOW LATERAL LINE IN SPECIES *Parapercis*

SPECIES	SCALES IN A ZIG-ZAG ROW AROUND CAUDAL PEDUNCLE								SCALES FROM LATERAL LINE TO ANAL OPENING									
	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	y	s	10 to 11	12 to 13	14 to 15	16 to 17	18 to 19	20 to 21	22 to 23	24 to 25	y	s
<i>ramsayi</i>	-	1	2	-	-	-	25.7	1.53	-	-	3	-	-	-	-	-	14.3	0.58
<i>aurantiaca</i>	-	-	1	-	-	-	26.0	-	-	-	1	-	-	-	-	-	15.0	-
<i>multifasciata</i>	-	-	26	-	-	-	26.1	0.98	-	3	17	6	-	-	-	-	15.0	1.09
<i>binivirgata</i>	-	-	3	-	-	-	27.0	1.73	-	-	-	3	-	-	-	-	16.0	-
<i>sexfasciata</i>	-	-	-	40	-	-	31.3	1.22	-	-	14	26	-	-	-	-	15.0	-
<i>mimaseana</i>	-	-	1	-	-	-	27.0	-	-	-	1	-	-	-	-	-	15.7	0.88
<i>muronis</i>	-	3	-	-	-	-	24.0	-	-	3	-	-	-	-	-	-	12.0	-
<i>colias</i>	-	-	-	11	6	-	34.4	0.70	-	-	-	-	13	4	-	-	19.1	0.60
<i>allporti</i>	-	-	9	-	-	-	26.8	1.20	-	-	-	9	-	-	-	-	16.7	0.50
<i>gilliesi</i>	-	-	-	7	-	-	30.9	0.69	-	-	-	-	7	-	-	-	18.3	0.49
<i>schauinslandi</i>	-	1	24	-	-	-	25.7	0.63	-	-	25	-	-	-	-	-	14.4	0.51
<i>filamentosa</i>	-	-	1	2	-	-	29.7	0.58	-	-	3	-	-	-	-	-	14.0	-
<i>alboguttata</i>	-	-	4	-	-	-	26.0	-	-	-	4	-	-	-	-	-	14.3	0.60
<i>emeryana</i>	-	-	-	-	4	4	37.6	1.92	-	-	-	-	-	8	-	-	19.4	0.52
<i>nebulosa</i>	-	-	-	-	15	10	39.7	2.34	-	-	-	-	-	8	15	2	21.9	1.01
<i>baackei</i>	-	9	-	-	-	-	20.7	0.50	-	8	1	-	-	-	-	-	12.3	0.71
<i>cylindrica</i>	-	25	-	-	-	-	21.8	1.11	-	17	8	-	-	-	-	-	13.3	0.56
<i>snyderi</i>	8	-	-	-	-	-	18.8	0.46	8	-	-	-	-	-	-	-	10.5	0.53
<i>pulchella</i>	-	-	1	30	-	-	31.2	1.15	-	-	20	11	-	-	-	-	15.4	1.09
<i>ommatura</i>	-	1	25	-	-	-	25.7	0.80	7	19	-	-	-	-	-	-	11.7	0.45
<i>cephalopunctata</i>	-	-	52	-	-	-	26.4	0.80	-	23	29	-	-	-	-	-	13.5	0.70
<i>clatbrata</i>	-	-	27	-	-	-	26.2	0.53	-	23	4	-	-	-	-	-	12.6	0.80
<i>hexophthalma</i>	-	-	1	12	-	-	30.5	1.13	-	-	7	6	-	-	-	-	15.7	0.79
<i>polyophthalma</i>	-	-	2	16	-	-	30.0	0.69	-	-	13	5	-	-	-	-	15.1	0.79
<i>tetracantha</i>	-	-	6	8	-	-	29.2	1.20	-	-	10	4	-	-	-	-	15.1	0.70
<i>xanthozona</i>	-	-	2	17	-	-	30.2	0.80	-	2	16	1	-	-	-	-	14.6	0.70

space. *Mugiloides* has both vomerine and palatine teeth, whereas both are absent in *Prolatilis*. Vomerine teeth are always present in *Parapercis*, whereas the palatines may be present or absent.

GENERIC DIAGNOSIS: Scales ctenoid, those of head and breast often cycloid; upper and lower jaws with a row of hooked conical teeth inside of which occur a band of villiform teeth. Three, four, or five canine teeth in outer row on either side of symphysis of lower jaw; vomerine teeth present; palatine teeth present or absent; upper jaw protractile; spinous dorsal rounded or progressively higher posteriorly; dorsal rays IV or V, 19 to 23, the soft portion higher than the spinous one; anal fin with I, 16 to 19 rays. Opercular spine single and sharp pointed. Caudal fin with seven branched rays in lower lobe and eight in upper lobe, except on one species, *P. snyderi*, in which a few specimens have seven; caudal truncate or slightly rounded, except in *P. schauinslandi*; pelvic fin with a short spine and five rays, the fourth longer than the others; pelvic fins inserted slightly anterior to pectorals;

abdominal vertebrae 10, caudal 18, 19, or 21.

DOUBTFUL SPECIES: The first record of the genus *Parapercis* taken outside the Indo-Pacific Ocean was *Neopercis* [*Parapercis*] *atlantica* Vaillant (1887) from the Cape Verde Islands off the west coast of Africa. In 1937 Cadenat recorded *Neopercis ledamoisi* based on a single specimen. Arambourg (1943) examined both specimens and claimed they were identical and resembled his Miocene fossil specimen *Neopercis mesogea*. An attempt was made, without success, to borrow these specimens.

Five species that Cuviers and Valenciennes recognized remain doubtful after examination of the description and/or figures: *Percis ocellata*, *P. punctata*, *P. punctulata*, *P. semifasciata*, and *P. nicthemera*. Other nominal species that are dubious are *Percis millepunctata* Günther (1860), *P. rose* Lienard (1893), *Neopercis macrophthalmalma* Pietschmann (1911), and *N. striolata* Weber (1913). The examination of *Neopercis flavofasciata* Kamohara (1936) showed it to have a subequal lower jaw and a dorsal fin formula of

TABLE 5
SCALES ABOVE LATERAL LINE IN *Parapercis*

SPECIES	3	4	5	6	7	8	9	10	11	s
<i>ramsayi</i>	—	3	—	—	—	—	—	—	—	—
<i>aurantiaca</i>	—	—	—	—	1	—	—	—	—	—
<i>multifasciata</i>	—	—	2	7	15	2	—	—	—	0.74
<i>binivirgata</i>	—	—	—	3	—	—	—	—	—	—
<i>sexfasciata</i>	—	—	—	19	21	—	—	—	—	0.55
<i>mimaseana</i>	—	—	—	1	—	—	—	—	—	—
<i>muronis</i>	—	—	—	3	—	—	—	—	—	—
<i>colias</i>	—	—	—	—	—	—	—	10	7	0.51
<i>allporti</i>	—	2	7	—	—	—	—	—	—	0.44
<i>gilliesi</i>	—	—	—	1	6	—	—	—	—	0.38
<i>schauinslandi</i>	—	—	7	18	—	—	—	—	—	0.46
<i>filamentosa</i>	—	—	3	—	—	—	—	—	—	—
<i>alboguttata</i>	—	—	4	—	—	—	—	—	—	—
<i>emeryana</i>	—	—	—	—	—	—	—	8	—	0.52
<i>nebulosa</i>	—	—	—	—	—	7	14	4	—	0.67
<i>baackei</i>	7	2	—	—	—	—	—	—	—	0.44
<i>cylindrica</i>	4	21	—	—	—	—	—	—	—	0.37
<i>snyderi</i>	8	—	—	—	—	—	—	—	—	—
<i>pulchella</i>	—	2	20	9	—	—	—	—	—	0.58
<i>ommatura</i>	25	1	—	—	—	—	—	—	—	0.20
<i>cephalopunctata</i>	—	—	—	36	16	—	—	—	—	0.52
<i>clathrata</i>	—	—	—	19	8	—	—	—	—	0.47
<i>hexophthalma</i>	—	—	—	—	5	5	3	—	—	0.87
<i>polyophthalma</i>	—	—	—	1	9	7	1	—	—	0.69
<i>tetracantha</i>	—	—	—	—	2	12	—	—	—	0.40
<i>xanthozona</i>	—	—	—	2	13	4	—	—	—	0.60

TABLE 6
NUMBER OF GILL RAKERS AND CAUDAL VERTEBRAE FOR SPECIES OF *Parapercis*

SPECIES	GILL RAKERS										CAUDAL VERTEBRAE					
	9- 10	11- 12	13- 14	15- 16	17- 18	19- 20	21- 22	23- 24	25- 26	y	s	18	19	20	21	22
<i>ramsayi</i>	-	-	-	-	1	2	-	-	-	19.0	1.00	-	-	-	3	-
<i>aurantiaca</i>	-	-	1	-	-	-	-	-	-	14.0	-	-	-	-	1	-
<i>multifasciata</i>	-	2	18	6	-	-	-	-	-	13.9	1.20	-	2	1	23	-
<i>binivirgata</i>	-	-	3	-	-	-	-	-	-	13.0	-	-	-	-	3	-
<i>sexfasciata</i>	-	-	7	16	17	-	-	-	-	16.1	1.28	-	2	-	34	4
<i>mimaseana</i>	-	1	-	-	-	-	-	-	-	12.0	-	-	-	-	1	-
<i>muronis</i>	-	-	3	-	-	-	-	-	-	14.0	-	-	-	-	3	-
<i>colias</i>	-	-	-	-	-	-	1	12	4	23.7	0.16	17	-	-	-	-
<i>allporti</i>	-	-	-	7	2	-	-	-	-	15.7	0.87	9	-	-	-	-
<i>gilliesi</i>	-	-	-	1	2	4	-	-	-	18.0	1.29	7	-	-	-	-
<i>schauinslandi</i>	-	2	14	9	-	-	-	-	-	14.2	1.32	-	25	-	-	-
<i>filamentosa</i>	2	1	-	-	-	-	-	-	-	11.0	-	-	3	-	-	-
<i>alboguttata</i>	-	-	-	-	-	3	1	-	-	21.5	1.00	-	4	-	-	-
<i>emeryana</i>	-	-	-	-	5	3	-	-	-	18.3	0.71	-	8	-	-	-
<i>nebulosa</i>	-	2	16	5	2	-	-	-	-	13.8	1.51	1	23	1	-	-
<i>baackei</i>	3	6	-	-	-	-	-	-	-	11.0	0.71	-	9	-	-	-
<i>cylindrica</i>	14	11	-	-	-	-	-	-	-	10.4	0.76	-	24	-	-	-
<i>snyderi</i>	-	7	1	-	-	-	-	-	-	11.8	0.71	1	7	-	-	-
<i>pulchella</i>	-	7	14	9	1	-	-	-	-	13.8	1.46	-	31	-	-	-
<i>ommatura</i>	14	11	1	-	-	-	-	-	-	10.6	1.02	-	25	1	-	-
<i>cephalopunctata</i>	-	-	16	29	7	-	-	-	-	15.2	1.12	-	52	-	-	-
<i>clathrata</i>	-	-	-	5	19	3	-	-	-	17.4	0.93	-	27	-	-	-
<i>hexophthalma</i>	-	1	3	7	2	-	-	-	-	14.8	1.40	-	13	-	-	-
<i>polyophthalma</i>	-	-	3	14	1	-	-	-	-	15.5	1.00	-	18	-	-	-
<i>tetracantha</i>	-	-	-	-	7	6	-	-	-	18.1	1.00	-	13	-	-	-
<i>xanthozona</i>	-	-	-	1	9	9	-	-	-	18.3	1.20	-	19	-	-	-

II, 22, which are not characters of the genus *Parapercis* as herein defined. Recently Kamohara (1960) made *N. flavofasciata* the type species of the new genus *Kochia*. Kamohara later (1961) discovered that the generic name *Kochia* was preoccupied and substituted for it the name *Kochichtbys*.

ARTIFICIAL KEY TO SPECIES OF THE GENUS *Parapercis*

- 1a. Palatine teeth present.
- 2a. Teeth in outer row of lower jaw number ten.
- 3a. Soft dorsal rays 22; anal rays 18; no dark longitudinal streaks across premaxilla.....*baackei*
- 3b. Soft dorsal rays 21; anal rays 17; four dark streaks running longitudinally across premaxilla.....*cylindrica*
- 2b. Teeth in outer row of lower jaw six or eight.
- 4a. Teeth in outer row of lower jaw six.
- 5a. Thirteen brown bars on back; scales above lateral line 66 to 67; scales from lateral line to anus 16.....*binivirgata*
- 5b. Seven or eight brown bars on back; scales above lateral line 59 to 64; scales from lateral line to anus 12 to 15.
- 6a. Small light spot ringed in brown at each side of origin of spinous dorsal; brown transverse bar ringed with white across head.....*multifasciata*
- 6b. No spots or bars on head or nape.....*aurantiaca*
- 4b. Teeth in outer row of lower jaw eight.
- 7a. Dorsal spines longer posteriorly.
- 8a. One canine tooth on palatine; total pectoral rays 16–17; scales around caudal peduncle 30 to 34; 5 V-shaped dark markings on body between head and caudal fin.....*sexfasciata*
- 8b. More than one tooth on palatine; total pectoral rays 19; scales around caudal peduncle 27; no V-shaped markings on body.....*mimaseana*
- 7b. Dorsal spines longest at middle.
- 9a. Spinous dorsal connected by membrane to first soft ray near base.....*snyderi*
- 9b. Spinous dorsal connected by membrane to first soft ray along a line opposite tip of last spine.
- 10a. Dorsal spines four; soft dorsal rays 24; pectoral rays 16.....*ramsayi*
- 10b. Dorsal spines five; soft dorsal rays 23; pectoral rays 20.....*muronis*
- 1b. Palatine teeth absent.
- 11a. Teeth in outer row of lower jaw six.
- 12a. Spinous dorsal connected by membrane to first soft ray near base.
- 13a. Soft dorsal rays 21; anal rays 18; upper and lower caudal rays greatly elongated.....*schauinslandi*
- 13b. Soft dorsal rays 22; anal rays 19; caudal rays not elongated.
- 14a. Oblique rows of scales above lateral line 56 to 60; scales from lateral line to anus 11 to 14; scales from lateral line to base of first soft dorsal 4–5; scales around caudal peduncle 22 to 30.
- 15a. Pectoral rays 16; scales around caudal peduncle

- 30; gill rakers 11; anterior soft dorsal rays greatly elongated.....*filamentosa*
- 15b. Pectoral rays 18-19; scales around caudal peduncle 26; gill rakers 21-23; anterior soft dorsal rays not elongated.....*alboguttata*
- 14b. Oblique rows of scales above lateral line 70 to 83; scales from lateral line to anus 20 to 24; scales from lateral line to base of first soft dorsal 9-10; scales around caudal peduncle 39 to 44.
- 16a. Oblique rows of scales above lateral line 70-71; scales from lateral line to soft dorsal 10; scales around caudal peduncle 39-40; pectoral rays 17; gill rakers 18-19.....*emeryana*
- 16b. Oblique rows of scales above lateral line 80 to 83; scales from lateral line to soft dorsal 9; scales around caudal peduncle 42 to 44; pectoral rays 15-16; gill rakers 11 to 15.....*nebulosa*
- 12b. Spinous dorsal connected to first soft ray opposite tip of last spine.
- 17a. Dorsal spines four; scales around caudal peduncle 25-29.
- 18a. Dark ocellus-like spot above operculum; one horizontal row of spots on anal fin; no rectangular white patch on caudal fin.....*clatibrata*
- 18b. No ocellus above operculum; no spots on anal fin; rectangular white patch on posterior half of caudal fin.....*cephalopunctata*
- 17b. Dorsal spines five; scales around caudal peduncle 26-32.
- 19a. Large dark ocellus above lateral line at posterior part of operculum; wide dark band across cheek from below eye to interopercle; distal exposed part of each soft anal ray dark; vertical bars meet at mid-ventral line of body.....*tetracantha*
- 19b. No ocellate spot behind or above rear of head; small dark bands across cheek; tips of soft anal rays not dark; vertical bars on body not continuous to anal fin; soft dorsal fin with 3 lengthwise rows of dark spots on membranes.....*xanthozona*
- 11b. Teeth in outer row of lower jaw eight.
- 20a. Dorsal spines longer posteriorly; caudal vertebrae 18.
- 21a. Soft dorsal rays 20; anal rays 17; scales from lateral line to base of first soft dorsal ray 10-11; gill rakers 23-26.....*colias*
- 21b. Soft dorsal rays 21; anal rays 19; scales from lateral line to base of first soft dorsal ray 4-7; gill rakers 15-19.
- 22a. Scales from lateral line to anus 16 to 17; scales around caudal peduncle 25 to 29.....*allporti*
- 22b. Scales from lateral line to anus 18 to 19; scales around caudal peduncle 30 to 32.....*gilliesi*

- 20b. Dorsal spines in middle portion longest; caudal vertebrae 19.
- 23a. Spinous dorsal connected by membrane to base of first soft ray.
- 24a. Soft dorsal ray 21; anal rays 18; no dark spot at base of caudal fin.....*pulchella*
- 24b. Soft dorsal rays 22; anal rays 19; and ocellus at dorsal base of caudal fin.....*ommatura*
- 23b. Spinous dorsal connected by membrane to first soft ray opposite tip of last spine.
- 25a. Two horizontal rows of brown spots across cheek; five to seven ocellus-like spots on body between pectoral and caudal fins.....*polyophthalma*
- 25b. Four to eight oblique bars across cheek; three to five ocellus-like spots on body between pectoral and caudal fins.....*hexophthalma*

DESCRIPTIONS OF SPECIES

The descriptive data include individuals of both sexes when available. No sexual dimorphism was observed. Under "Specimens Studied" the first number refers to the total number of individuals examined. The numbers following in parentheses give the range of the total length in millimeters. In parentheses following the museum number is the number of specimens examined under that museum number.

Parapercis ramsayi Steindachner

Figs. 1A, 2A, 5A

Parapercis ramsayi Steindachner, 1884, pp. 1072–1073 (type locality, Saint Vincent Gulf). McCulloch, 1914, p. 158 (Port Jackson); 1922, p. 101, pl. 31, fig. 274b (New South Wales). Waite, 1923, pp. 161–162, fig. p. 162; 1928, p. 8 (South Australia). McCulloch, 1929, pp. 331–332; 1934, p. 75, pl. 31, fig. 274b. Whitley, 1957, 40 pp.

Percis novae-cambriae Ogilby, 1885, pp. 228–229 (Port Jackson).

Parapercis novae-cambriae Waite, 1899, p. 111, pl. 25. McCulloch, 1929, pp. 331–332 (South Australia).

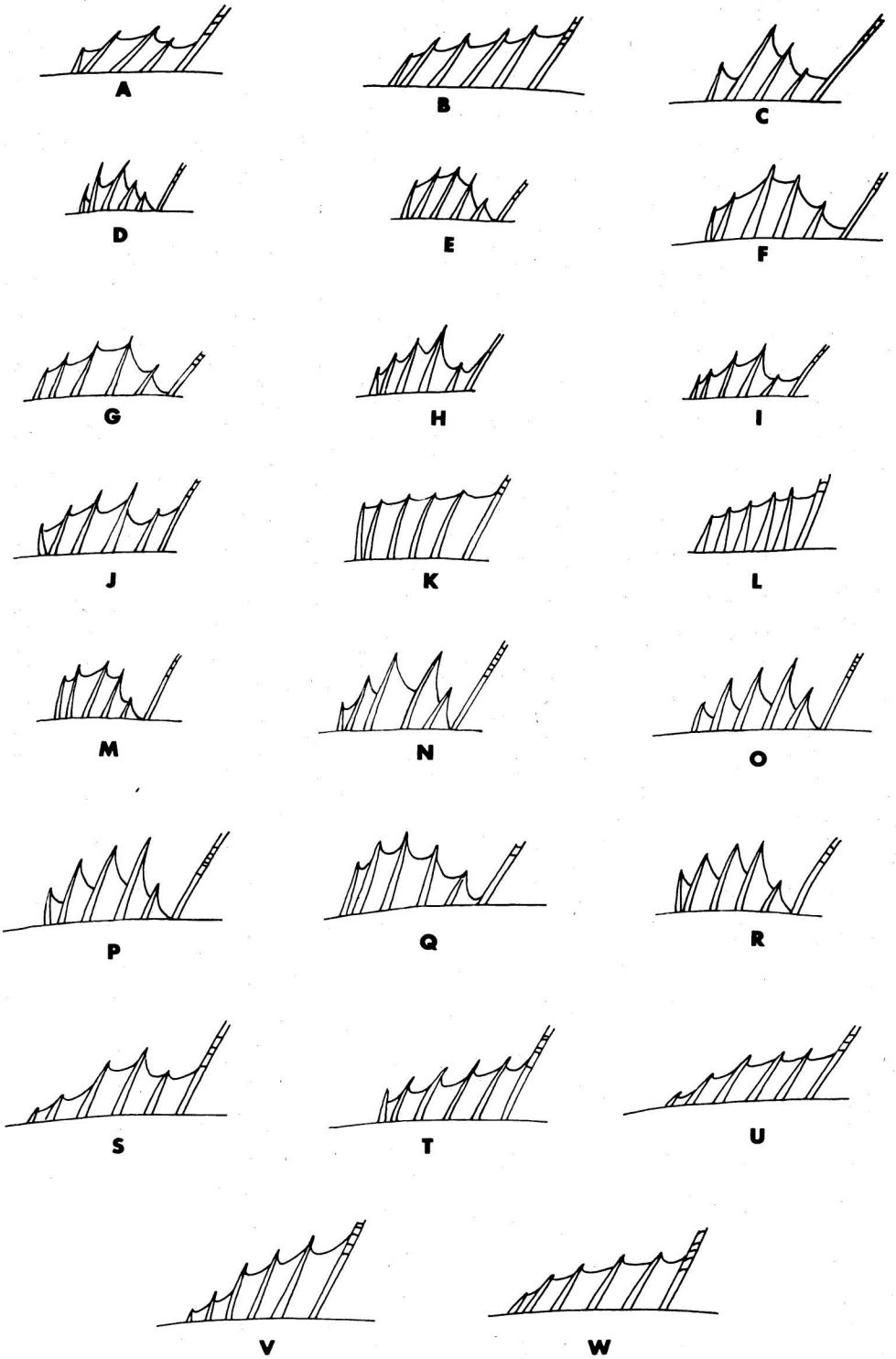
Neopercis novae-cambriae Waite, 1904, p. 50.

SPECIMENS STUDIED: 3 (166–192): New South Wales; Botany Bay AM IA4114 (1); Long Bay AM IA2480 (1); Newcastle USNM 179798 (1).

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth present; middle dorsal spines longest; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y four; dorsal rays y 24.33; anal rays 19.67; caudal vertebrae 21; no serrations on opercles.

COLOR IN ALCOHOL: Background yellow, seven oblong dark brown spots below lateral line from back of pectoral fin to caudal peduncle; a thin dark line runs from dorsal base of pectoral fin to mid-dorsal base of caudal fin, above this line are seven wide dark brown bars reaching to dorsal fin; lower $\frac{2}{3}$ of spinous dorsal black; anterior $\frac{2}{3}$ of soft dorsal fin with many very fine specks, posterior $\frac{1}{3}$ with oblique brown bars; a large dark brown spot at dorsal base of caudal fin and one at ventral base; ventral and posterior margins of caudal fin black; no markings on pectoral fin; dusky gray blotch on medial portion of pelvic fin; tip of anterior anal fin dark gray posteriorly becoming darker and including more of the fin; nape dark brown; two dark spots on opercle, one on preopercle just under the eye; upper lip gray.

RANGE: New South Wales and South Australia.



Parapercis aurantiaca Steindachner and Döderlein

Figs. 1V, 4V, 9F

Parapercis aurantiaca Steindachner and Döderlein, 1884, pp. 191–192, pl. 3, figs. 2 and 2a. Tomiyama and Abe, 1958, p. 120, fig. 352. Kamohara, 1960, pp. 1–13.

Neopercis aurantiaca Jordan and Snyder, 1902, pp. 467–469 and 496. Smith and Pope, 1906, p. 493 (Urado). Franz, 1910, pp. 81–82 (Yokohama and Misaki). Jordan, Tanaka, and Snyder, 1913, pp. 364–366. Tanaka, 1914, pp. 289–291, pl. 79, fig. 272 (Tokyo), 1931, p. 40. Kamohara, 1933, p. 244; 1938, p. 1452. Okada, 1938, pp. 252–253 (Honsyu; Formosa). Okada and Matsubara, 1938, p. 389. Kamohara, 1938, p. 63; 1950, p. 259 (Tosa and Kishu); 1952, p. 86. Matsubara, 1955, p. 691. Kamohara, 1958, p. 67.

SPECIMEN STUDIED: One (162.5 mm): Joga Shima light, Japan. USNM 195872.

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth present; dorsal spines gradually longer posteriorly; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines 5; dorsal rays 23; total anal rays 20; caudal vertebrae 20.

COLOR IN ALCOHOL: Background tan; dorsal fin with several oblique brown bars posteriorly; caudal fin with 5 or 6 wavy bars vertically; pelvics, pectorals, and anal light cream; no markings on lips.

RANGE: Japan.

Parapercis multifasciata Steindachner and Döderlein

Figs. IV, 4V, 5B

Parapercis multifasciatus Steindachner and Döderlein, 1884, pp. 190–191, pl. 6, figs. 2 and 2a (type locality, Tokyo Bay). Tomiyama and Abe, 1958, p. 120, fig. 353. Kamohara, 1960, pp. 1–13.

Percis multifasciata Nystrom, 1887, p. 28 (Japan).

Neopercis multifasciata Jordan and Snyder, 1902, p. 369 (Tokyo); 1902, pp. 467–468 and 496 (Tokyo to Nagasaki). Smith and Pope, 1906, p. 492 (Hamashima, 5–10 fathoms). Franz, 1910, pp. 81–82. Jordan and Thompson, 1914, p. 292 (Misaki). Jordan, Tanaka, and Snyder, 1913, pp. 364–366. Tanaka, 1918, pp. 486–489 (Tokyo; Sagami Bay; Suruga Bay; Owari Bay; Nagasaki). Tanaka, 1931, p. 40. Kamohara, 1938, p. 1452. Okada, 1938, pp. 252–253. Okada and Matsubara, 1938, p. 390. Kamohara, 1938, p. 63 (Shikoku); 1950, p. 259; 1952, p. 86. Matsubara, 1955, p. 691. Kamohara, 1958, p. 67.

Neopercis roseoviridis Gilbert, 1905, pp. 642–643; pl. 83 (Hawaii). Jordan and Seale, 1906, p. 414 (Samoa). Jordan and Jordan, 1922, p. 79 (Maui). Fowler, 1938, pp. 177 and 185; 1928, p. 424. Gosline and Brock, 1960, pp. 72, 239–240, fig. 110, (Hawaiian Islands).

Neopercis decemfasciata Franz, 1910, pp. 81–82, pl. 9, fig. 78 (Misaki, Aburatsubo, and Yokohama). Tanaka, 1931, p. 40. Kamohara, 1938, p. 1452. Okada and Matsubara, 1938, p. 390. Kamohara, 1938, p. 63 (Prov. Tosa); 1952, p. 87. Matsubara, 1955, p. 691. Kamohara, 1958, pp. 67–68 (Tokyo to Formosa).

Parapercis decemfasciata Tomiyama and Abe, 1958, p. 119, fig. 351. Kamohara, 1960, pp. 1–13.

SPECIMENS STUDIED: 31 (45 to 162.6 mm): Pusan, Korea UMMZ 176692 (1); Japan: Ose Saki light USNM 149519 (1); Tayama Bay UMMZ 176718 (2); Owari Bay USNM 50307 (1); Yeopshima CNHM 55610 (1); Chirin Jima USNM 177908 (1); Misak CNHM 5307 (1), 58832 (1); Hamashima USNM 59644 (1); Tokyo ANSP 26161–62 (2), SU 4984 (2), NHMW (2); Oki Shima USNM 150560 (2); Kagoshima Bay UMMZ 142750 (1); Obama Bay UMMZ

FIG. 1. Diagrams of spinous dorsal fins of species of the genus *Parapercis*: A, *ramsayi*; B, *colias*; C, *clathrata* and *cephalopunctata*; D, *snyderi*; E, *cylindrica*; F, *schauinslandi*; G, *pulchella*; H, *xanthozona*; I, *tetracantha*; J, *polyophthalma* and *bexophthalma*; K, *allporti*; L, *gilliesi*; M, *baackei*; N, *ommatura*; O, *filamentosa*; P, *alboguttata*; Q, *emeryana*; R, *nebulosa*; S, *muronis*; T, *sexfasciata*; U, *mimaseana*; V, *multifasciatus*, *muronis*, and *aurantiaca*; W, *binivirgata*. In each instance the first soft branched ray of the soft dorsal fin is shown to the right of the last dorsal spine.

176713 (2); Totomi Bay USNM 50308 (1); Joga Shima light USNM 148862 (2); Nagasaki UMMZ 176702 (1); Suruga Bay UMMZ 176711 (1); Yokohama NHMW (2); Kobe-Hiogo NHMW (1); locality unknown SU 23511 (1); Sagami Bay USNM 177765 (1).

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth present; dorsal spines gradually longer posteriorly; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y 4.93; dorsal rays y 23.04; total anal rays y 20.07; caudal vertebrae y 20.93; brown bar ringed in white across head.

COLOR IN ALCOHOL: Background tan; eight brown bars on back extend from soft dorsal to midside; small light spot ringed in brown at each side of origin of spinous dorsal; brown transverse bar ringed with white across head; no color markings on lips; spinous dorsal with brown blotches on upper half of membranes between spines; first $\frac{2}{3}$ of soft dorsal fin with brown streaks between rays, last $\frac{1}{3}$ of fin with oblique brown rows; brown patch at midbase of caudal fin, five brown bars across caudal fin; anal, pelvics, and pectorals light tan.

RANGE: Japan; Hawaiian Islands.

Parapercis binivirgata (Waite)

Figs. 1W, 4W, 5C

Neopercis binivirgata Waite, 1904, pp. 236–238, pl. 25, fig. 3 (type locality, New South Wales); 1904, p. 50.

Parapercis binivirgata McCulloch, 1922, p. 101, pl. 31, fig. 274a; 1929, pp. 331–332 (Coogee); 1934, p. 75, pl. 31, fig. 274a. Whitley, 1957, 40 pp.

SPECIMENS STUDIED: Three (142–163) New South Wales USNM 179800 (1); Sidney 179799 (1); Gunnamatta Bay AM IB3756 (1).

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth present; dorsal spines gradually longer posteriorly; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y five; dorsal rays y 23; total anal rays y 20; caudal vertebrae y 21; no serrations on opercles.

COLOR IN ALCOHOL: Body light brownish yellow with 13 dark brown bars over back reach-

ing down to the midline, the most anterior over the nape, the next two extend from the spinous dorsal, the next nine from the soft dorsal and the last over the caudal peduncle; a dark spot at the dorsal base of the caudal fin rays; seven dark oblique bars over upper $\frac{3}{4}$ of caudal fin; a small dark brown spot at dorsal base of pectoral fin rays; middle third of median two rays of pelvic fin dark brown; anal fin with no markings.

RANGE: New South Wales.

Parapercis sexfasciata (Temminck and Schlegel)

Figs. 1T, 4T, 5D

Percis sexfasciata Temminck and Schlegel, 1843, pp. 25–26 (type locality, Japan). Richardson, 1846, p. 211 (Japan). Bleeker, 1857, p. 66; 1860, p. 235. Günther, 1860, p. 241 (Sea of Japan). Karoli, 1881, p. 162 (Singapore, Yokohama, Hakuri). Nyström, 1887, p. 28. Boeseman, 1947, p. 39.

Parapercis sexfasciata Bleeker, 1869, p. 238 (Japan); 1873, p. 127 (China); 1879, p. 18. Steindachner and Döderlein, 1884, p. 190. Ishikawa, 1897, p. 46. Jordan and Snyder, 1902, p. 369 (Tokyo). Tomiyama and Abe, 1958, p. 119.

Neopercis sexfasciata Jordan and Snyder, 1902, p. 758 (Yokohama and Tokyo); 1902, pp. 467–468 (Tokyo southward along coast of Japan). Smith and Pope, 1906, p. 492 (Kagoshima). Franz, 1910, pp. 81–82, pl. 9, fig. 78. Tanaka, 1912, pp. 164–167, pl. 43, figs. 167 and 168, pl. 45, fig. 174 (Tokyo to Nagasaki). Jordan, Tanaka, and Snyder, 1913, pp. 364–366. Jordan and Metz, 1914, p. 41 (Pusan). Jordan and Thompson, 1914, p. 292 (Shimonoseki). Jordan and Hubbs, 1925, p. 311 (Kobe; Misaki; Toyama; Fukui; Shizuoka). Tanaka, 1931, p. 40. Kamohara, 1938, p. 1452. Okada, 1938, pp. 252–253 (Honsyu to Formosa). Okada and Matsubara, 1938, p. 390. Kamohara, 1938, p. 63; 1950, p. 258 (Tosa and Kishu); 1952, p. 86 (Mimase; Susaki). Matsubara, 1955, p. 691. Kamohara, 1958, p. 67 (Ibaraki Pref. to Ariake Sea).

SPECIMENS STUDIED: 151 (78–164): Ningpo, China USNM 130538 (3); Pusan, Korea UMMZ 176691 (5); Japan USNM 57516 (3), 57732

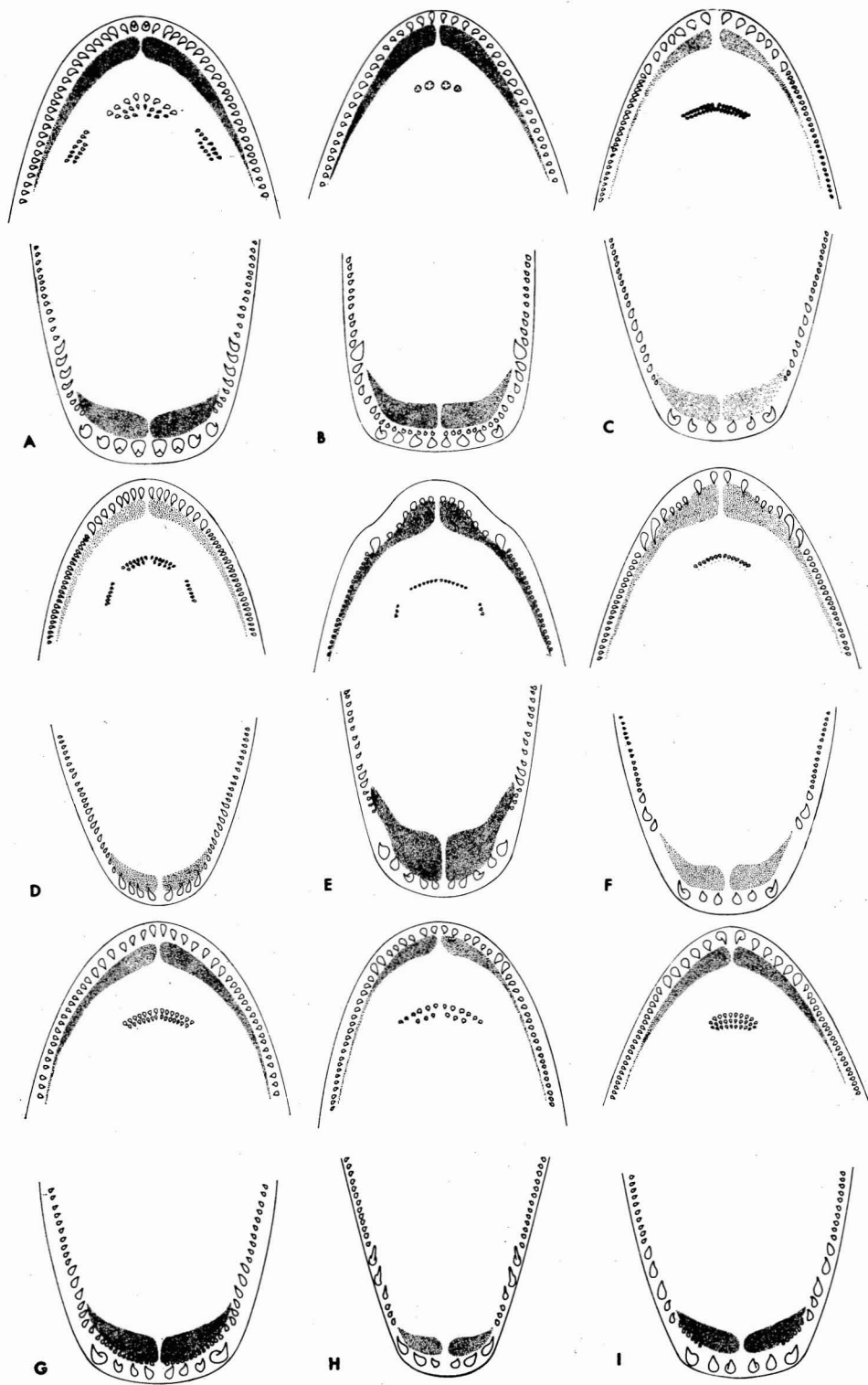


FIG. 2. Diagrams of dental patterns of species of the genus *Parapercis*: A, *ramsayi*; B, *coii*; C, *clatbrata* and *cephalopunctata*; D, *snyderi*; E, *cylindrica*; F, *schauinslandi*; G, *pulchella*; H, *xanthozona*; I, *tetracantha*.

(2), 26242 (6), 57534 (1), 151835 (1), 26242 (1); UMMZ 176688 (13), 176681 (4), 142746 (2); Chirin Jima USNM 149599 (1); Kobe ANSP 26309-17 (9); USNM 152484 (2); Misaki UMMZ 176683 (2); Wakasa Bay UMMZ (3); Toyama Bay UMMZ 176699 (1); Obama Bay USNM 76536 (1); Tokyo USNM 71017 (8), 49499 (1), 142745 (2); TU (3); Sagami Bay USNM 22512 (1), 177764 (1); UMMZ 176714 (1); Wakanoura USNM 50255 (6); ANSP 26227-39 (13); Kagoshima USNM 59643 (1); Tsuruga Bay USNM 50259 (4); UMMZ 176708 (1), 176712 (1), 176720 (1), 176689 (1); 83 (9); Usetsu Bay UMMZ 176701 (1); Tateyama Bay UMMZ 176715 (1); Nagasaki UMMZ 176706 (1), 176690 (5); Boshuy coast UMMZ 176685 (3); Fukui-Ken UMMZ 142749 (1); Matsue UMMZ 176693 (1); Bingo USNM 50257 (2); Sea of Japan: off Kyogamisaki UMMZ 176704 (3); off Niigata UMMZ 176700 (3); off Yoro UMMZ 176696 (2); off Miyazu UMMZ 176695 (14).

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth present; dorsal spines gradually longer posteriorly; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y 4.98; dorsal rays y 23.15; total anal rays y 20.20; caudal vertebrae y 21.08; no serrations on opercles.

COLOR IN ALCOHOL: Background brown; posterior edge of upper body scales dark brown; four large dark brown V-shaped marks on the side between the pectoral and caudal fins, these marks extend from the soft dorsal fin down over the side but do not reach the midventral line; on some well-preserved specimens a wide dark brown bar extends from the anterior margin of the spinous dorsal fin to the base of the pectoral fin; two transverse brown stripes over the head posterior to the eyes; a wide, slightly oblique-brown bar across cheek; upper lip dusky, lower lip light tan; lower half of membrane between dorsal spines I and IV dark brown; dark brown spots at base of rays and membranes where the four large V marks on body meet the soft dorsal fin; five or six faint vertical bars on caudal fin; ocellus at dorsal base of caudal fin; anal fin light tan, tip of each soft ray slightly darker; large dark brown spot at base of pectoral fin; pelvic fin dusky.

RANGE: Japan; north China; Korea.

Parapercis mimaseana (Kamohara)

Figs. 1U, 4U, 5E

Neopercis mimaseana Kamohara, 1937, pp. 189-190, fig. 3 (type locality, off Province of Tosa, 100-200 fathoms); 1938, p. 1452, fig. 3. Okada and Matsubara, 1938, p. 390, pl. 93, fig. 1 (Kochi; Kumono-nada). Kamohara, 1938, p. 63, fig. 34 (Mimase); 1950, p. 258 (Tosa and Kishu); 1952, p. 86, fig. 83. Matsubara, 1955, p. 691, pl. 74, fig. 248. Kamohara, 1955, p. 58, fig. 4; 1958, p. 67 (Mie Pref. to Kochi).

SPECIMEN STUDIED: One (126.5) Kochi Shikoku TU 7814.

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth present; dorsal spines gradually longer posteriorly; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y five; dorsal rays y 23; total anal rays y 20; caudal vertebrae y 21.

COLOR IN ALCOHOL: Background light tan; upper half of body tessellated; head gray; front of upper and lower lips gray; spinous dorsal black; soft dorsal rays gray; six vertical gray bars on dorsal $\frac{2}{3}$ of caudal fin; tips of anal fin rays gray, pelvic fins gray except at tips; lower $\frac{1}{3}$ of pectoral fins gray; gray specks on branchiostegals.

RANGE: Japan.

Parapercis murois (Tanaka)

Figs. 1S, 4S, 6A

Neopercis murois Tanaka, 1918, pp. 536-538, pl. 139, fig. 390 (type locality, Tanabe Prov., Japan). Tanaka, 1931, p. 40. Kamohara, 1938, p. 1452 (Prov. Tosa). Okada, 1938, pp. 252-253 (Honsyu). Okada and Matsubara, 1938, p. 390, pl. 93, fig. 2. Kamohara, 1938, p. 63 (Tanabe Prov.); 1950, p. 259 (Tosa and Kishu); 1952, p. 87 (Tanabe). Matsubara, 1955, p. 691. Kamohara, 1958, p. 67 (Wakayama Pref.).

SPECIMENS STUDIED: Three (52 to 113) Kochi TU 7815; locality unknown TU 8316; China Sea USNM 150910.

DIAGNOSIS: Eight canine teeth in outer row

of lower jaw; palatine teeth present; middle dorsal spines longest; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y five; dorsal rays y 23; total anal rays y 20; caudal vertebrae y 21.

COLOR IN ALCOHOL: Background light tan; five dark brown bars on each side extend from the dorsal fin to below the midline; the lower part of each bar being darker; a light brown bar across nape; spinous dorsal light brown; soft dorsal with one or two light brown patches on the membranes between rays; tips of anal rays light gray; five vertical brown bars on caudal fin; brown patch on middle third of pelvics; no color on pectoral fins or lips.

RANGE: Japan.

Parapercis colias (Bloch)

Figs. 1B, 2B, 6B

Gadus colias Bloch, 1901, p. 54 (locality, unknown).

Percis colias Cuvier and Valenciennes, 1829, pp. 273–274 (New Zealand). Richardson in Dieffenbach, 1843, p. 207 (Queen Charlotte's Sound). Bleeker, 1855, p. 6. Günther, 1860, p. 242 (New Zealand). Hutton and Hector, 1872, pp. 25 and 113, pl. 6, fig. 38 (New Zealand). Sherrin, 1866, pp. 15–16 (New Zealand). Sandager, 1888, p. 129 (Mokohinou Islands). Hutton, 1889, p. 279 (New Zealand). Thomson, 1892, pp. 209–210 (Cape Maria Van Dieman, Somes Island, Centre Island, Poison Bay).

Parapercis colias Gill, 1893, p. 99 (New Zealand). Hutton, 1904, p. 43 (New Zealand). Waite, 1911, p. 244 (Chatham Islands). Phillipps, 1918, p. 270 (Chatham and South islands). Thompson and Anderson, 1921, pp. 92–94, fig. p. 94. Phillipps, 1921, pp. 123 and 125. Phillipps and Hodgkinson, 1922, p. 96 (near Auckland). Phillipps, 1920, pp. 133–134, fig. 8 (Chatham Islands, French Pass); 1927, p. 43. Sladden and Falla, 1928, p. 290 (Alderman Islands). Young, 1929, pp. 147–148, pl. 17, figs. 2, A and B (Chatham Islands). Phillipps, 1948, p. 130 (Wellington). Laird, 1951, p. 305 (Cannibal Cove, Marlborough Sounds, New Zealand). Graham, 1953, pp. 288–293, fig. p. 289.

Enchelyopus colias Whitley and Phillipps, 1939, p. 235 (South Island, New Zealand).

SPECIMENS STUDIED: 17 (180.5 to 386) New Zealand: D'Urville Island BM 1890.2.26.69 (1); Wellington harbor BM 1873.12.12.30–34 (5); Auckland USNM 176802 (2), 176803 (1); Cook Strait DM 2093 (1); NHMW 7402 (1); Lyall Bay DM 957 (1); Makara DM 1167 (1), 1123 (1); Sinclair Head DM 2615 (2); New Zealand NHMW 59940 (1).

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y 4.11; dorsal rays y 20; total anal rays y 17.12; caudal vertebrae y 18; no opercular serrations; number of scales from lateral line to soft dorsal and total number of gill rakers are greater than in any other species of *Parapercis*: proportionately larger head, snout length, and interorbital width to standard length than for any other species of *Parapercis*.

COLOR IN ALCOHOL: Upper half of body brown, lower half light tan; head brown; upper lip brown, spinous dorsal with very fine brown specks; membrane between soft dorsal rays with three or four brown spots; caudal slightly brown at base; anal with two longitudinal rows of brown spots; light brown patch at base of pectoral fin.

RANGE: New Zealand; Chatham Islands and Alderman Islands.

Parapercis allporti (Günther)

Figs. 1K, 3K, 6C

Percis allporti Günther, 1876, p. 394 (type locality, Tasmania); 1880, p. 28 (Bass Straits, 38 fathoms, Twofold Bay, 120 fathoms). Macleay, 1881, p. 564. Johnston, 1883, p. 115; 1891, p. 33.

Parapercis ocularis Waite, 1899, pp. 109–111, pl. 24 (off Barranjoey); 1904, p. 49 (New South Wales). McCulloch, 1929, pp. 331–332. Newcastle Bight to near Wallongong, 38–84 fathoms). Whitley, 1957.

Parapercis allporti Waite, 1899, p. 111. McCulloch, 1914, p. 157 (Port Stephens and Newcastle, 22–60 fathoms, Gabo Island, 200 fathoms, Bass Strait, 30 fathoms, Oyster

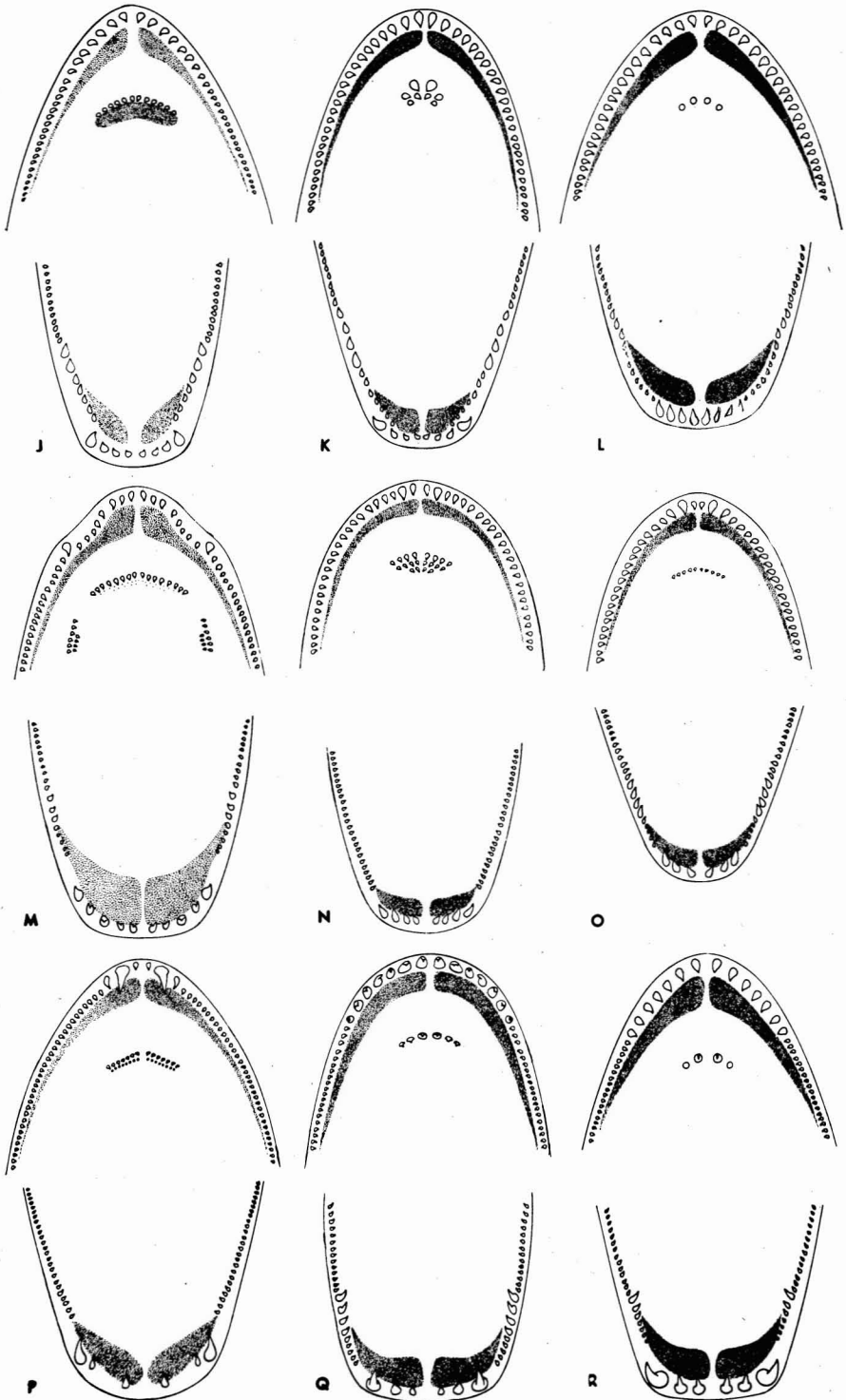


FIG. 3. Diagrams of dental patterns of species of *Parapercis*: J, *polyophthalma* and *hexophthalma* K, *allporti*; L, *gilliesi*; M, *baackei*; N, *ommatura*; O, *filamentosa*; P, *albugittata*; Q, *emeryana*; R, *nebulosa*.

Bay, 40–60 fathoms, South of Cape Wiles, 75 fathoms, Great Australian Bight west to the meridian of Eucla, 70–120 fathoms); 1922, p. 101. Waite, 1923, pp. 161–163, fig. p. 163; 1928, p. 8. McCulloch, 1929, pp. 331–332; 1934, p. 75.

Neopercis allporti Waite, 1904, p. 50.

Parapercis naevosa Serventy, 1937, pp. 72–74 and 85, pl. 2 (type locality, Western Australia).

SPECIMENS STUDIED: Nine (166 to 242) New South Wales USNM 176847 (1), 176848 (3); Tasmania; Bass Strait AM 10039 (1), USNM 179797 (3); Oyster Bay WAM P251 (1).

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth absent; dorsal spines gradually longer posteriorly; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spine y five; dorsal rays y 21; total anal rays y 18; caudal vertebrae y 18; no serrations on opercles.

COLOR IN ALCOHOL: Background brown; seven dark brown bars extend from dorsal fin down over back, the anterior four reach below the lateral line, the posterior three above the lateral line, a dark brown transverse bar on nape; no color markings on pelvic, pectoral, anal or spinous dorsal fins.

RANGE: New South Wales; Tasmania; and South Australia.

Parapercis gilliesi (Hutton)

Figs. 1L, 3L, 6D

Percis gilliesi Hutton, 1879, p. 53 (type locality, Brighton near Dunedin); 1889, p. 279 (New Zealand). Whitley and Phillipps, 1939, p. 235.

Parapercis gilliesi Hutton, 1904, p. 43. Waite, 1911, pp. 244–245, pl. 53 (Bay of Plenty 66–94 fathoms). Thomson and Anderton, 1921, p. 94. Phillipps, 1927, p. 43.

SPECIMENS STUDIED: Seven (234 to 330) Mayor Island DM 2019 (1); Caswell Sound DM 1726 (1); Solander Island DM 2213 (3); Cape Campbell DM 2192 (1); between Plate and Whale islands DM 2535 (1).

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth absent; dorsal spines gradually longer posteriorly; membrane from

spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y five; dorsal rays y 21; total anal rays y 18; caudal vertebrae y 18; opercles not serrated.

COLOR IN ALCOHOL: Background light cream, two dark gray parallel bands extend the length of the body, the lower band from the midbase of the pectoral fin to the ventral base of the caudal fin, the upper band from above the dorsal base of the pectoral fin to the mid-dorsal base of the caudal fin; ten dark gray unevenly spaced bars extend down from the mid-dorsal line, the most anterior over the nape, the second at the origin of the spinous dorsal, the third at the beginning of the soft dorsal; the next six from the soft dorsal and the last over the caudal peduncle; the tip of the entire dorsal fin dark gray; the base of the soft dorsal dark gray where the vertical bars meet the fin; other fins with no color markings.

RANGE: New Zealand.

Parapercis schauinslandi (Steindachner)

Figs. 1F, 2F, 6E

Percis schauinslandi Steindachner, 1900, p. 175 (type locality, Hawaii); 1901, pp. 496–497, pl. 3, fig. 5.

Parapercis pterostigma Jenkins, 1901, pp. 402–403, fig. 15 (Honolulu). Böhlke, 1953, pp. 89–90.

Parapercis schauinslandi Seale, 1902, pp. 15–16 (Hilo, Hawaii). Fowler, 1928, pp. 424–425. Herre, 1933, p. 11; 1934, p. 95. Fowler, 1938, p. 300. Wahlert, 1955, p. 325. Gosline and Brock, 1960, pp. 239–240.

Osurus schauinslandi Jordan and Evermann, 1903, p. 206 (Hawaiian Islands). Jenkins, 1903, p. 505. Snyder, 1904, p. 536. Jordan and Seale, 1906, p. 414. Gilbert, 1905, pp. 642–643. Jordan and Jordan, 1922, p. 79.

Osurus schauinslandi Jordan and Evermann, 1905, pp. 474–476, figs. 209 and 209a.

SPECIMENS STUDIED: Thirty-one (34 to 121) Hawaiian Islands CNHM 47646 (2), 4237, 4238 (2), 37088 (1); BPBM 4900 (1), 278 (1); SNHM 8543 (2), 7689 (4); UW 4728 (2); USNM 177907 (3); USNM 151573 (1); 55301–2–3–4–5 (5), 51672 (1), 126544 (2), 78087 (2), 51054 (1), USNM 49701 holotype of *Parapercis pterostigma*, Jenkins.

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected near base of first soft ray; dorsal spines y five; dorsal rays y 21.04; total anal rays y 18.04; caudal vertebrae y 19.04; no serrations on opercles; only species with deeply forked caudal fin in the genus *Parapercis*.

COLOR IN ALCOHOL: Background light tan; spinous dorsal membrane dusky, one lengthwise row of dark spots on soft dorsal; a faint spot at base of caudal fin; faint spots on membranes between caudal rays; dorsal and ventral extensions of caudal fin dark brown, pectoral, pelvic, and anal fins unpigmented; upper lip brown, lower lip light tan.

RANGE: Hawaiian Islands.

Parapercis filamentosa (Steindachner)

Figs. 10, 30, 7A

Percis filamentosa Steindachner 1879, pp. 386, 388 (type locality, Singapore).

Parapercis hainanensis Lin, 1933, pp. 95-96, fig. 2 (Southern Hainan).

Parapercis longifilis Herre, 1944, pp. 5-6 (Singapore).

Parapercis filamentosa Beaufort and Chapman, 1951, pp. 21-22 (Singapore).

SPECIMENS STUDIED: Three (85 to 117) Singapore MCZ 12887 (2); NHMW (1).

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected near base of first soft dorsal ray; dorsal spines y five; dorsal rays y 22; total anal rays y 19; caudal vertebrae y 19; first few soft dorsal rays greatly elongated; lowest mean ratio of head length to standard length than for any other species of *Parapercis*.

COLOR IN ALCOHOL: Background light tan; upper half of body with six faint V-shaped brown markings; cheek below eye light brown; upper lip light brown; lower lip light brown at symphysis; membrane between dorsal spine I and III brown; a lengthwise row of brown spots at base of soft dorsal; brown spot at dorsal base and a smaller one at ventral base of caudal fin; tips of caudal rays brown; tips of anal rays brown; pectorals yellow, pelvics brown at posterior half.

RANGE: Singapore; southern Hainan.

Parapercis alboguttata (Günther)

Figs. 1P, 3P, 7B

Percis alboguttata Günther, 1872, p. 424 (type locality, Misol Island); In Brencley, 1873, p. 422, pl. 32, fig. B. Boulenger, 1888, p. 662 (Muscat).

Parapercis alboguttata Jordan and Seale, 1906, p. 414. Beaufort and Chapman, 1951, pp. 27-28.

Neopercis tessellata Herre, 1950, pp. 344-345 (Manila Bay).

SPECIMENS STUDIED: Four (134 to 253) Manila Bay, Philippine Islands UW 10298 holotype of *Parapercis tessellata* Herre; China Sea 6.5 miles S.W. of Monja Islands USNM 179804 (2); Muscat, Arabia BM 1887.11.11.226 (1).

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth absent; middle spines of dorsal fin longest; membrane from spinous dorsal connected near base of first soft dorsal ray; dorsal spines y five; dorsal rays y 22; total anal rays y 19; caudal vertebrae y 19; smallest mean depth at the caudal peduncle of all species in the genus.

COLOR IN ALCOHOL: Background reddish brown; traces of about 10 blackish vertical bars below lateral line from behind pectoral fin base to caudal fin base; each scale above the lateral line margined with black; a dark diffuse spot at dorsal base of caudal fin; the middle third of the caudal fin darkened posteriorly; dorsal and anal fins with traces of dark pigment.

Parapercis emeryana (Richardson)

Figs. 1Q, 3Q, 7C

Percis emeryana Richardson, 1842, pp. 130-131 (type locality, Depuch Island); 1843, p. 4, pl. 1, fig. 1. Bleeker 1853, p. 26; 1855, p. 6.

SPECIMENS STUDIED: Eight (129.5 to 233) West Australia BM 1884.5.1.3 (1); Ex Mouth Gulf, West Australia AM IB3022 (1); N.W. Australia BM 1887.5.16.5 (1); Dampier Archipelago AM IB3074 (1); Shark Bay WAM P4284 (1); Mandurah WAM 71 (1); Queensland; Wide Bay WAM P249 (1); 20 miles off Bustard Head WAM P250 (1).

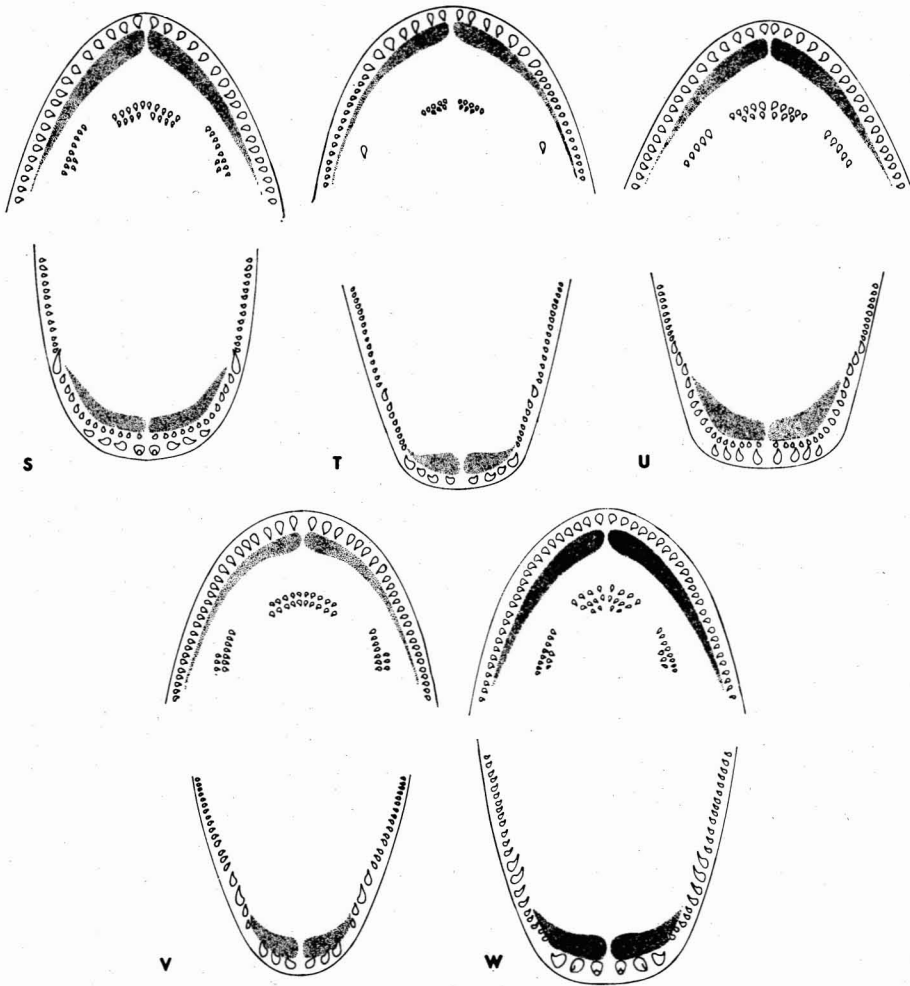


FIG. 4. Diagrams of dental patterns of species of *Parapercis*: S, *muronis*; T, *sexfasciata*; U, *mimaseana*; V, *multifasciatus* and *aurantiaca*; W, *binivirgata*.

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected near base of first soft dorsal ray; dorsal spines y five; dorsal rays y 22; total anal rays y 19; caudal vertebrae y 19; no serrations on opercles; three dark stripes across interorbital space.

COLOR IN ALCOHOL: Background brown on back, light tan ventrally, five brown bars extend from soft dorsal over the sides, the bars are narrower than the light interspaces; cheek brown; three dark stripes connecting eyes across

the interorbital; two dark stripes reaching from anterior margin of each orbit to upper lip, the inner two of which are connected to each other by a transverse dark stripe; lower lip with a dark band on posterior $\frac{2}{3}$; spinous dorsal black between spines I and V; soft dorsal with dark spots on distal part of rays and membranes; four or five wavy bars across posterior half of caudal; eight to ten oblique stripes on membranes between soft anal rays; pelvics dusky between rays.

RANGE: From Bustard Head, Queensland to Dampier Archipelago, Western Australia.

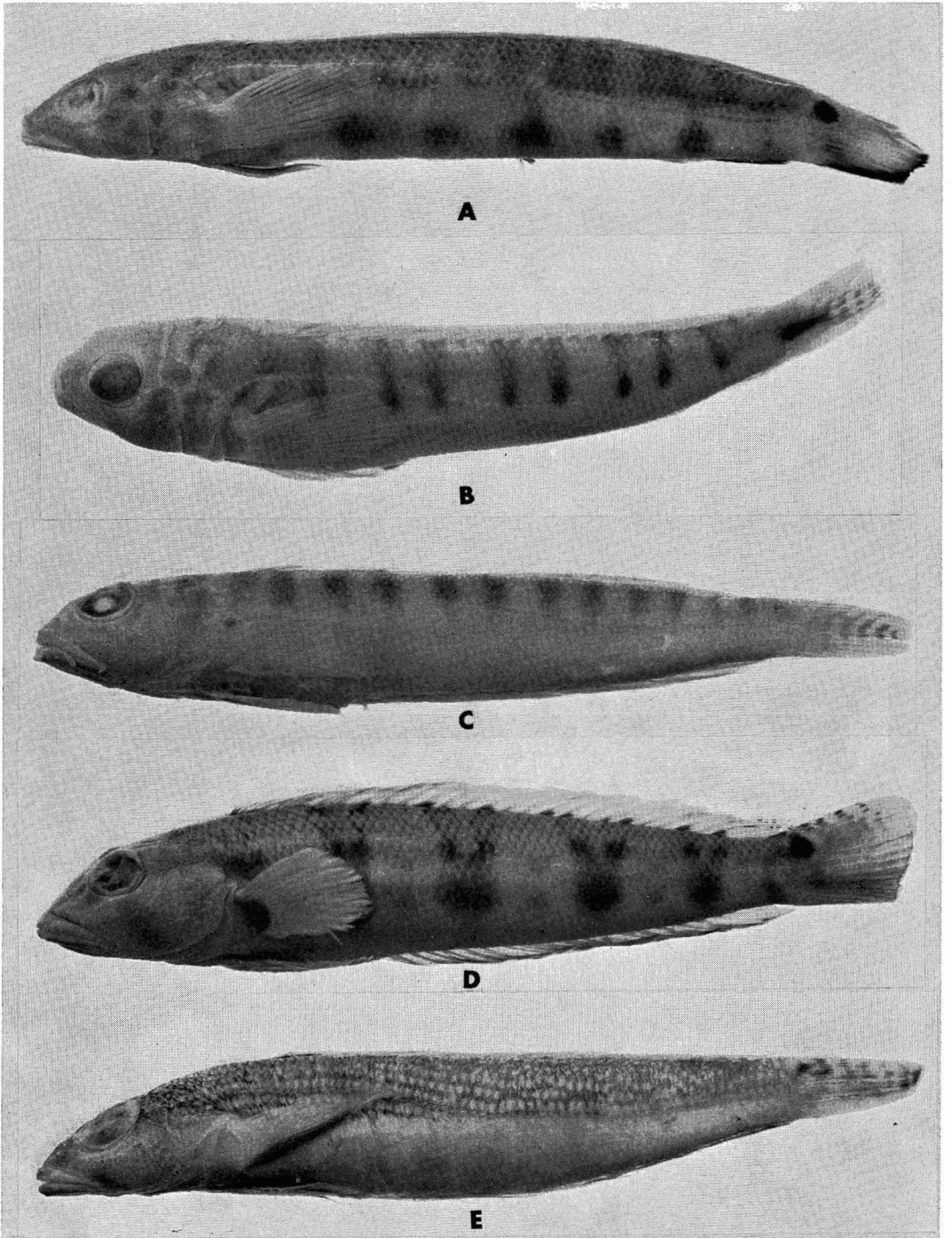


FIG. 5. A, *Parapercis ramsayi* AM IA 2480 Sidney, New South Wales, total length 236 mm; B, *P. multifasciata* UMMZ 176702 Japan, total length 173 mm; C, *P. binivirgata* AM IA 531 New South Wales, total length 142 mm; D, *P. sexfasciata* USNM 176715 Tateyama Bay, Japan, total length 157 mm; E, *P. mimaseana* TV 7814 Kochi, Japan, total length 126.5 mm.

Parapercis nebulosa (Quoy and Gaimard)

Figs. 1R, 3R, 7D

Percis nebulosa Quoy and Gaimard, 1824, pp. 349–350 (type locality, Baie des Chiens-Marins). Cuvier and Valenciennes, 1829, pp. 260–264 (Bourbon Island). Bleeker 1853, p. 26 (Japan); 1855, p. 6. Günther, 1860, pp. 237–238 (Ile de France, New Holland). Castelnau, 1879, p. 351 (New South Wales). Macleay, 1881, pp. 563–564 (Port Jackson). Boulenger, 1888, p. 662 (East Coast of Arabia). Waite, 1905, p. 75 (Mandurah). Gilchrist and Thompson, 1908, pp. 191–192 (Coast of Natal). Ogilby, 1910, pp. 40–42. Gilchrist and Thompson, 1916, p. 280; 1917, p. 414, (Natal). Bonde, 1923, p. 34 (25 fathoms).

Parapercis nebulosa Bleeker, 1875, p. 78 (Madagascar and Reunion). McCulloch, 1922, p. 101 (New South Wales). Barnard, 1927, pp. 441–442. McCulloch, 1929, pp. 331–332 (Sharks Bay, West Australia); 1934, p. 75. Fowler, 1934, p. 509; 1935, p. 406 (Durban). Smith, 1949, p. 177, pl. 13, fig. 381 (Algoa Bay, down to 30 fathoms); 1955, p. 309.

Percis coxii Ramsay, 1883, p. 179 (Port Jackson). McCulloch, 1929, pp. 331–332.

Percis concinna De Vis, 1885, p. 546 (Moreton Bay).

Parapercis nebulosus Waite, 1899, p. 111. Waite, 1904, p. 49 (New South Wales). McCulloch, 1914, p. 156 (Queensland, off Bustard Head lighthouse, 11–21 fathoms; Frazer Island, 14–16 fathoms; Double Island Point, 29 fathoms; mouth of Wide Bay). Whitley, 1948, p. 27 (D'Entrecasteaux Point to Eighty Mile Beach). Ogilby, 1954, p. 84, fig. 99.

Percis coxi Waite, 1899, p. 111.

Parapercis robinsoni Fowler, 1929, pp. 261–262, fig. 5 (Natal). Smith, 1949, p. 178, fig. 383 (Durban).

Chilias nebulosa Myers, 1940, p. 202.

SPECIMENS STUDIED: 25 (71 to 275) Persian Gulf USNM 147985 (18); Durban, Natal ANSP 63834–5 (2); 53451 (1); Natal Coast ANSP 55222 (1), 54824–5 (2), 55310 (1).

DIAGNOSIS: Six canine teeth in outer row of

lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected near base of first soft ray; dorsal spines y five; dorsal rays y 22; total anal rays y 19; caudal vertebrae y 19; no serrations on opercles; greatest mean number of oblique rows of scales above lateral line, scales from lateral line to the anus, and scales in a zigzag row around the caudal peduncle than other species of the genus *Parapercis*.

COLOR IN ALCOHOL: Background grayish brown, back darker than belly; a light brown band extends from the opercular spine to the midbase of the caudal fin; above this band are eight large black V-shaped markings; below this band are nine black bars which may or may not reach the midventral line; these nine black bars are connected dorsally by a black band that extends from the base of the pectoral fin to the midbase of the caudal fin; over the suprascapula there is a large dark blotch that may or may not be partially surrounded by a thin light ring; a faint dark band extends from the top of the snout back to each eye; a light tan bar extends vertically across the cheek; upper lip gray; lower lip tan; spinous and soft dorsal with many very fine dark brown specks; large dark spots scattered over caudal fin; a large black blotch at midbase of caudal fin which may be separated into two distinct spots; anal fin with vertical oblong spots on basal portion of membranes between rays; pectoral fin with a large dark blotch at its base; pelvic fin dusky on medial half.

RANGE: Durban, Natal; Persian Gulf; Madagascar; Reunion; West Australia; New South Wales; Queensland.

Parapercis haackei (Steindachner)

Figs. 1M, 3M, 7E

Percis haackei Steindachner, 1884, pp. 1070–1071 (type locality, Saint Vincent Gulf).

Parapercis haackei McCulloch, 1914, pp. 155–156, pl. 34, fig. 2 (Investigator Strait, South Australia). Waite, 1923, pp. 161–162, fig. p. 162 (Investigator Strait). Waite, 1928, p. 8 (South Australia). Whitley, 1948, p. 27 (Doubtful Bay to Murchison River).

SPECIMENS STUDIED: Nine (59 to 109) Aus-

tralia; Rott Nest Island, West Australia USNM 179832 (4); Albany WAM P1224 (1); Don-garra WAM P2507 (1); Recherche Archipelago WAM P2602 (1); Gulf of St. Vincent NHMW 60747 (1); Investigator Strait NHMW (1).

DIAGNOSIS: Ten canine teeth in outer row of lower jaw; palatine teeth present; middle dorsal spines longest; membrane from spinous dorsal connected to base of first soft dorsal ray; dorsal spines y five; dorsal rays y 22; total anal rays y 19; caudal vertebrae y 19; only species of genus with scales in interorbital space.

COLOR IN ALCOHOL: Background light gray, belly light yellow; a wide dark broken band extends from the posterior edge of the eye to the dorsal base of the caudal fin, this band covers both sides of the lateral line along the front half of the body then is above the lateral line the remaining distance; nine blackish vertical bars below lateral line from behind pectoral fin base to caudal fin base, these bars may or may not reach the midventral line; very dark spot on membranes between dorsal spines II to V; soft dorsal with two or three lengthwise rows of dark spots on membranes, lower row of spots at base of rays; of three rows present upper row of spots smallest; anal fin with two lengthwise rows of dark spots on membranes, proximal row at base of rays; dark vertical bar extends from dorsal to ventral margins at base of caudal fin rays; scattered dark spots on caudal fin; pelvics light yellow; two faint dark lines extending from tip of snout to anterior margin of eye; two dark spots on side of upper lip; dark streak on side of lower lip.

RANGE: From the Gulf of St. Vincent in South Australia to off the mouth of the Murchison River in Western Australia.

Parapercis cylindrica (Bloch)

Figs. 1E, 2E, 8A

Sciaena cylindrica Bloch, 1797, pp. 37–38, pl. 299, fig. 1 (type locality, East Indies).

Bodianus sebae Bloch, 1801, p. 335.

Sciaena cylindrica Cuvier and Valenciennes, 1829, pp. 267–268 (Moluques). Bleeker, 1849, p. 55 (Indo-Australian Archipelago); 1851, pp. 235–236 (Banda); 1857, p. 371 (Sangi Islands); 1858, p. 199 (Goram Archipelago); 1860, p. 43 (Celebes).

Günther, 1860, p. 239 (Amboyna, Philippines, China Seas, Sir Charles Hardy's Island). Bleeker, 1861, p. 56 (Singapore). Schmeltz, 1869, p. 16 (Feejee Inseln). Weber, 1895, p. 267 (Ambon). Ogilby, 1910, pp. 40–42 (Murray Island, Torres Straits, Dunk Island, Lord Howe Island). Fowler, 1927, pp. 295–296 (Philippines). *Parapercis cylindrica* Bleeker, 1863, pp. 236, 252, 271; 1864, p. 361 (Grand-Key Island, Ternate, Timor, Flores); 1865, pp. 99, 100, 149, 191, 292 (Kei Islands, Saparua, Buru, Ceram, Ambon); 1868, p. 288 (Solor); 1873, p. 37 (Aru Islands); 1873, p. 127 (China); 1878, p. 53 (New Guinea). Waite, 1900, p. 209 (Lord Howe and Admiralty islands). Seale and Bean, 1907, p. 248 (Philippines). Beaufort, 1913, p. 148 (Saonek). Weber, 1913, p. 519 (Siau). Fowler, 1928, p. 424 (East Indies). McCulloch, 1929, pp. 331–332 (Queensland). Whitley, 1932, p. 296 (Low Isles). Herre, 1933, p. 11 (Dumaguete, Oriental Negros). Giltay, 1933, pp. 80–82 (Amboine). Herre, 1934, p. 95 (Iloilo, Cebu, Dumaguete, Jolo, Sitankai). Martin and Montalban, 1935, pp. 216–217, pl. 1, fig. 1 (Polillo to Sitankai). Herre, 1936, p. 395 (Fiji). Beaufort and Chapman, 1951, pp. 19–21. Aoyagi, 1954, pp. 235–238 (Riu Kiu Islands). Matsubara, 1955, pp. 691–692. Fowler, 1959, p. 497 (Fiji). Schultz and Collaborators, 1960, pp. 266–273, pl. 112B.

Chilias synaphodesmus Fowler, 1946, pp. 211 and 213, fig. p. 170 (Riu Kiu Islands).

Cilias synaphodesmus Matsubara, 1955, p. 692.

SPECIMENS STUDIED: 187 (61.5 to 125.5) Philippine Islands: Sulu CNHM 40791–92 (2); UMMZ 100359 (3); UW 7601 (9); SNHM 34131 (9), 26498 (4); Cebu UW 7589 (8); USNM 122477 (4), 122478 (4), 122595 (1), 122480 (2), 122475 (1), 122544 (10); CNHM 47383 (3); SNHM 26499 (6); UW 7590 (45); Catbalogan USNM 113227 (1); Romblon USNM 122479 (1); Pandanon USNM 122476 (1), 122545 (3); Guijulugan USNM 122481 (1); Amboina USNM 122386 (1). Fiji Islands: CNHM 47747 (1), 47748 (1), 24867 (1), 37090–92

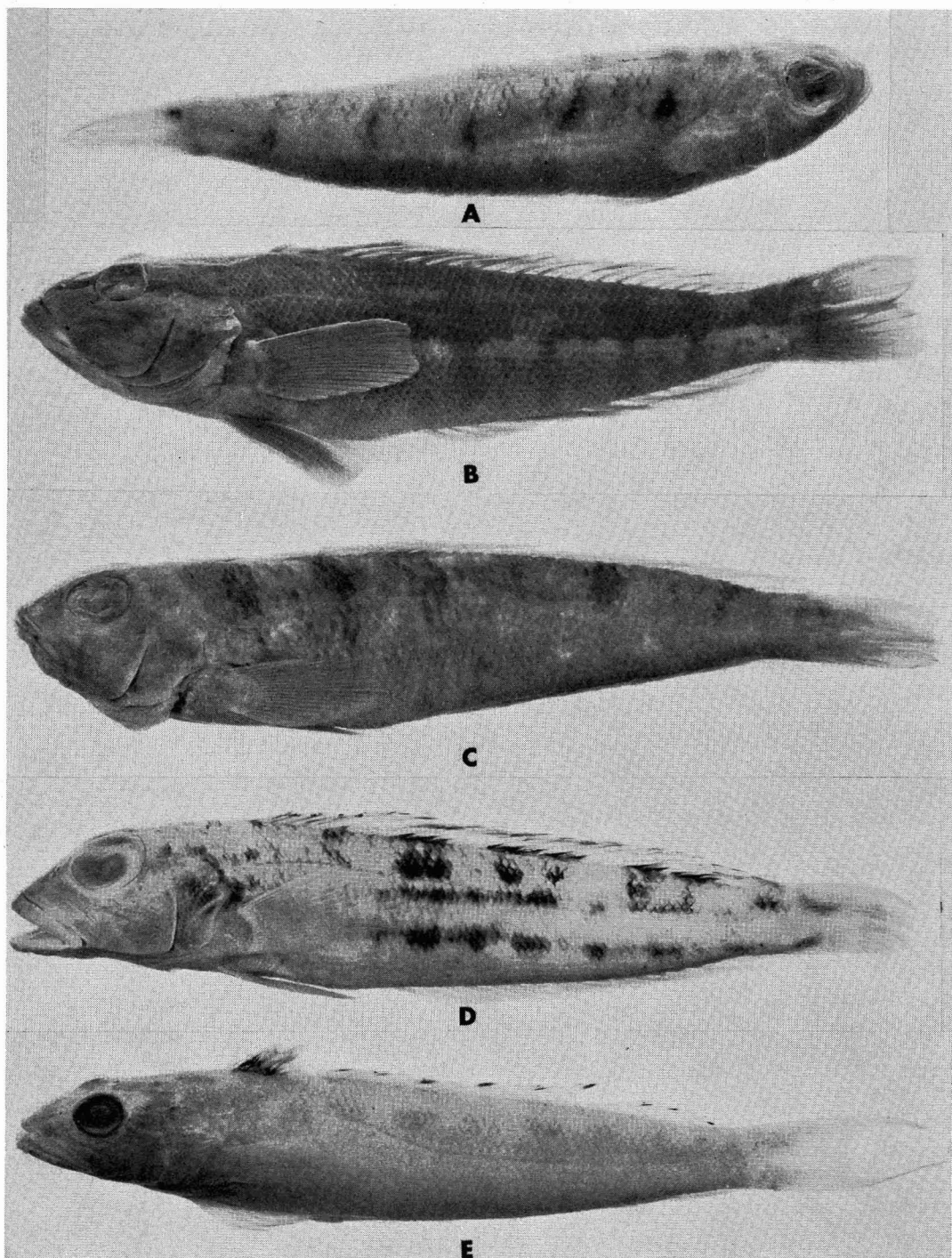


FIG. 6. A, *Parapercis muronis* TU 7815 Kochi, Japan, total length 113 mm; B, *P. colias* DM 957 Lyall Bay, New Zealand, total length 191 mm; C, *P. allporti* AM 10040 Bass Strait, Tasmania, total length 234 mm; D, *P. gilliesi* DM 2535 Bay of Plenty, New Zealand, total length 234 mm; E, *P. schauinslandi* SNHM 37088 Hawaii, total length 108 mm, note deeply crescent caudal fin.

(3), 37093-4(2); USNM 82928 (1); Marshall Islands: UW 10304 (5); USNM 140795 (1). Australia: Hayman Island, Cumberland Group USNM 177914 (3), Green Island, AM IB4073 (1); USNM 179802 (1), 179795 (1); West Cairns USNM 177915 (2); Eclipse Island, Great Barrier Reef MCZ 38508 (1), AM 2343 (1), 2344 (1); Heron Island, Capricorn Group USNM 179795 (1), 179796 (1); Rongelap Atoll USNM 140790 (1); UW 11988 (1). East Indies RVNH 5945 (27), 8537 (8); Celebes RVNH 12638 (1); locality unknown USNM 177904 (2).

DIAGNOSIS: Ten canine teeth in outer row of lower jaw; palatine teeth present; middle dorsal spine longest; membrane from spinous dorsal connected near base of first soft dorsal ray; dorsal spines y five; dorsal rays y 21.04; total anal rays y 18; caudal vertebrae y 19.04; only species with serrated interopercle; mean ratio of greatest depth to standard length larger than other species of the genus.

COLOR IN ALCOHOL: Background light tan, back dark brown with vertical lines extending ventrally to nine wide vertical bars that meet their fellow from other side at the midventral line; a brown vertical bar extends ventrally from under branchiostegals, this bar may or may not reach the midventral line; large brown blotch on spinous dorsal between spines II and V; brown spots scattered over dorsal, caudal, and anal fins; brown bar extends from lower margin of eye over cheek; a light band bordered on each side by brown extends from tip of upper lip to front of eye; lower lip with a brown spot at tip and one oblong brown spot on either side; a long brown streak on side of upper lip; top of head dark brown.

RANGE: Great Barrier Reef and Queensland, Australia; East Indies; Philippines; Riu Kiu; Marshall and Fiji islands.

Parapercis snyderi Jordan and Starks
Figs. 1D, 2D, 8B

Parapercis snyderi Jordan and Starks, 1905, p. 210, fig. 10 (type locality, Korea). Jordan, Tanaka, and Snyder, 1913, p. 323 (Nagasaki). Tanaka, 1931, p. 40. Kamohara, 1938, p. 1451. Okada, 1938, pp. 252-253 (Honszu to Formosa). Okada and Matsubara, 1938, p. 389. Kamohara, 1950,

p. 258 (Tosa and Kishu). Böhlke, 1953, pp. 89-90 (Nagasaki). Kamohara, 1958, p. 67 (Kominato). Tomiyama and Abe 1958, p. 121, fig. 357.

Neopercis snyderi Jordan and Metz, 1914, p. 41, fig. 35.

Ciliias snyderi Matsubara, 1955, p. 692.

SPECIMENS STUDIED: Eight (38 to 88.5) Korea USNM 51498 holotype of *Parapercis snyderi* Jordan and Starks, Japan, USNM 73843 (2), UMMZ 176719 (1), 176707 (4).

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth present; middle dorsal spines longest; membrane from spinous dorsal connected near base of first soft ray; dorsal spines y five; dorsal rays y 21; total anal rays y 18.13; caudal vertebrae y 18.75; lowest mean number of scales in an oblique row above the lateral line, number of scales from the lateral line to the anus, and number of scales in a zig-zag row around the caudal peduncle.

COLOR IN ALCOHOL: Background light tan; four dark V-shaped marks on sides above lateral line; seven faint dark bars on side below lateral line; membranes between dorsal spines dark; soft dorsal fin with three or four lengthwise rows of transparent spots each circled with a dark ring; dark patch at anterior and posterior bases of pectoral fins, pelvics with no markings; upper lip with a dark band from rictus to rictus; lower lip with three dark spots.

RANGE: Korea; Japan to Formosa.

Parapercis pulchella (Temminck and Schlegel)
Figs. 1G, 2G, 8C

Percis pulchella Temminck and Schlegel, 1843, pp. 24-25, pl. 10, fig. 2 (type locality, Nagasaki). Richardson, 1846, p. 211. Bleeker, 1853, p. 26; 1860, p. 235. Günther, 1860, p. 240. Playfair and Günther, 1866, p. 69. Day, 1876, pp. 262-263, pl. 58, fig. 2 (east coast of Africa, Seas of India to Japan). Steindachner and Döderlein, 1884, p. 190 (Tokyo Bay). Nystrom, 1887, p. 28. Ishikawa, 1897, p. 46. Boeseman, 1947, p. 38.

Parapercis pulchella Bleeker, 1873, p. 127 (China); 1879, p. 18. Jordan and Snyder, 1902, p. 759 (Yokohama); 1920, pp. 463-465 and 496 (Wakanoura and Nagasaki).

Smith and Pope, 1906, p. 492 (Kagoshima). Franz, 1910, pp. 81–82 (Yokohama, Fukuura, Aburatsubo, Kagoshima). Jordan and Thompson, 1914, p. 292 (Mitsuki). Jordan, Tanaka, and Snyder, 1913, pp. 364–366 (Tokyo to Nagasaki, Canton). Jordan and Hubbs, 1925, p. 311. Tanaka, 1927, pp. 725–759, fig. 461; 1931, p. 40. Kamohara, 1938, pp. 1293–1294. Smith, 1937, pp. 174–177, fig. 2 (Durban). Okada, 1938, pp. 252–253 (Honszu to China Sea). Okada and Matsubara, 1938, p. 389. Smith, 1949, p. 177, pl. 13, fig. 382 (Durban). Kamohara, 1950, p. 257 (Tosa and Kishu); 1952, p. 86; 1955, p. 58, fig. 3. Fourmanoir, 1954, p. 214 (Comores down to 80 meters). Kamohara, 1958, p. 67. Tomiyama and Abe, 1958, p. 121, fig. 355.

Cilias pulchella Matsubara, 1955, p. 692.

SPECIMENS STUDIED: 73 (59 to 148 mm) paratypes of *Percis pulchella* RVNH 416 (6), Zanzibar MCZ 4494 (2); Hong Kong USNM 7649 (1); Japan USNM 57731 (5), 57517 (1), 131097 (1); CNHM 55544 (1); RVNH 5947 (6); Nagasaki UMMZ 176703 (1); USNM 50256 (5); ANSP 26192–94 (3); SNHM 7062 (2); Kagoshima USNM 59640 (1), 59641 (2); Shimizu Suruga USNM 71466 (2); Misaki UMMZ 176686 (1), 176697 (4), 176682 (1); CNHM 57490 (1); Tateyama Bay UMMZ 176716 (2), 176717 (1); Sagami Sea CNHM 55572 (4); Yokohama ANSP 613 (1); Idzu Sea CNHM 55604 (5); Suruga Bay UMMZ 176687 (6), 176710 (3); Tokyo Bay TU (2); Bali AM IB131 (1); locality unknown TU 17699 (1), 57314 (1).

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected near base of first soft ray; dorsal spines y five; dorsal rays y 21.1; total anal rays y 18.06; caudal vertebrae y 19; dorsal three or four branched rays of caudal fin extending beyond rest of fin; characteristic black 3-shaped mark over nape.

COLOR IN ALCOHOL: Background reddish brown; scales on back and side margined with black; a light band extends from the dorsal base of the pectoral fin to the midbase of the caudal fin; a characteristic 3-shaped black mark over temporal bone; behind this are two V-shaped

black markings; two to four black bars extend over cheek; a black band extends over upper lip back to the eye; a black patch at base of pectoral fin; light spots margined in black on membranes between rays of caudal fin; ventral half of caudal fin has dusky appearance; lower half on spinous dorsal membrane black especially between spines III to V; soft dorsal speckled with many very fine black specks; membranes between anal fin rays with one to four light patches margined with black; near distal tip of each anal ray black, extreme tip light; a dark streak between pelvic rays III and IV, and IV and V; upper lip with black spot over premaxilla; lower lip with black spot over symphysis and one on either side; large black spots over throat region.

RANGE: Durban; Zanzibar; east coast of Africa; Comores; China Sea; Hong Kong; Japan.

Parapercis ommatura Jordan and Snyder
Figs. 1N, 3N, 8D

Parapercis ommatura Jordan and Snyder, 1902, pp. 463–466 and 496 (type locality, Nagasaki). Smith and Pope, 1906, p. 492 (Hamashima, Mie Pref.). Tanaka, 1907, p. 337 (Wakayama Pref.). Jordan, Tanaka, and Snyder, 1913, pp. 364–366, fig. 322 (Inland Sea of Japan; Tsuruga; Kobe). Jordan and Thompson, 1914, p. 292, fig. 68 (Kobe). Jordan and Hubbs, 1925, p. 311 (Toba; Kobe). Tanaka, 1931, p. 40 (Southern Japan). Kamohara, 1933, p. 244 (Urado); 1938, p. 1294 (Tsuruga; Toba to Nagasaki). Okada, 1938, pp. 252–253 (Honszu to Formosa). Okada and Matsubara, 1938, p. 389. Kamohara, 1950, p. 258 (Tosa and Kishu). Böhlke, 1953, pp. 89–90 (Nagasaki, Tsuruga, Echigen). Kamohara 1958, p. 67. Tomiyama, 1958, pp. 1221–1225, pl. 236, fig. 594. Tomiyama and Abe, 1958, p. 121, fig. 356.

Cilias ommatura Matsubara, 1955, p. 692 (Southern Japan).

SPECIMENS STUDIED: 49 (67.5 to 107) Japan: RVNH 4836 (1); Nagasaki USNM 179803 (5); co-types of *Parapercis ommatura* Jordan and Snyder, UMMZ 176705 (1), USNM 50260 (3); Tokyo USNM 50261 (2), Kobe CNHM 57174 (2), ANSP 26000–7 (8), Tsuruga MCZ 29001

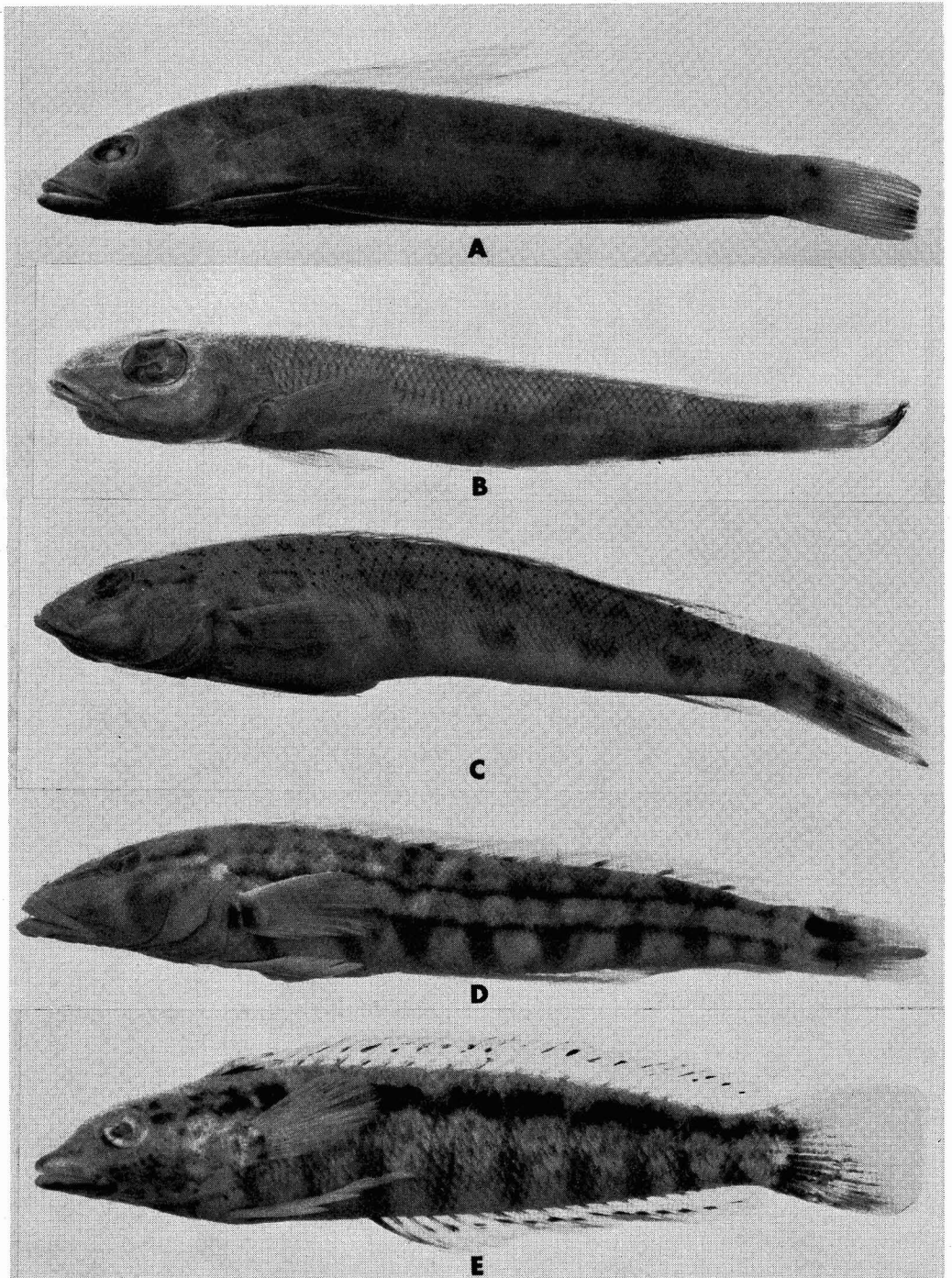


FIG. 7. A, *Parapercis filamentosa* MCZ 12887 Singapore, total length 117 mm, showing the extremely long soft dorsal fin rays; B, *P. alboguttata* UW 10298 Manila Bay, Philippine Islands, total length 134 mm; C, *P. emeryana* AM IB 3074 Dampier Archipelago, North West Australia, total length 129.5 mm; D, *P. nebulosa* USNM 147985 Tarut Bay, Saudi Arabia, total length 158.5 mm; E, *P. haackei* USNM 179832 Rott Nest Island, West Australia, total length 98.5 mm.

(3), USNM (3), Wakanoura ANSP 26307 (1), Obama Bay UMMZ 176698 (3), Toba UMMZ 142751 (5), USNM 151813 (2); USNM 39965 (1), 59644 (1), 57527 (1); Inland Sea of Japan BM 1902.10.31.55-56 (2); Korea USNM 3776 (2); China USNM 6867 (3).

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected near base of first soft ray; dorsal spines y five; dorsal rays y 22; total anal rays y 19.04; caudal vertebrae y 19.04; lowest mean maxillary length to standard length.

COLOR IN ALCOHOL: Background light tan; three or four dark V to Y-shaped marks on sides; two narrow longitudinal dark bands across cheeks; diffuse dark spots on membranes between dorsal spines; soft dorsal fin with three rows of elongate spots on membranes; soft anal rays light yellow with a dark patch near tip; pelvics dark except at base and tips of rays; pectorals yellow; ocellus at dorsal base of caudal fin.

RANGE: North China; Korea; Japan.

Parapercis cephalopunctata (Seale)

Figs. 1C, 2C, 8E

Percis cephalopunctata Seale, 1901, p. 124 (type locality, Marianas).

Parapercis montillai Martin and Montalban, 1935, pp. 224-225, pl. 2, fig. 2 (Mindoro, Mindanao, Calapan).

Parapercis cephalopunctatus Randall, 1955, pp. 208 and 240 (Gilbert Islands). Schultz and Collaborators, 1960, pp. 266-273, pls. 112 C-E.

SPECIMENS STUDIED: 481 (47 to 152.5) Guam BPBM 262 holotype of *Percis cephalopunctata*, Seale; Philippine Islands: Dasol Bay USNM 148506 (1); Dumaguete UW 7609 (1); Fiji Islands; MCZ 28303 (1); CNHM 37098-37102 (5); USNM 82786 (2); Colombo, Ceylon CNHM 47438 (1); NHMW (1); Marshall Islands: Eniwetok UW 10302 (6), 8653 (4), 12209 (1), 9136 (1), 12212 (1), 8871 (1), 12234 (1), 12210 (1); Bikini UW 10282 (2), 10291 (1), 10289 (3), 10300 (1), 10283 (2), 10292 (3), 12208 (2), 10287 (3), 10294 (2), 12211 (2), 10295 (4), 10280 (1), 10284 (4), 10303 (20), 10299 (16), 10309 (2), 10285 (3),

10569 (2), 10281 (3), 10306 (10), 10296 (7), 10420 (4), 10279 (1), 10398 (32), 10287 (2), 10564 (2), 10288 (3), 10305 (1), 10278 (1), 10290 (4), 10307 (20), 10293 (3); Kwajalein UW 10286 (3); Rongelap UW 12207 (2); Arno USNM 140784 (11), 140782 (12), 140785 (24), 140786 (31), 166740 (2), 154584 (25), 140781 (5), 140773 (14), 140777 (16), 140779-80 (6), 140774 (6), 140800 (6), 140794 (10), 140783 (6), 140974 (1), 140776 (8), 140778 (2), 140799 (4), 140798 (4), 142280 (2); Ponape UW 12009 (2); Ifaluk GVF (8); Raroia GVF (3); Riu Kiu Islands USNM 75502 (2); Caroline Islands: Palua GVF (3); Canton Island USNM 115413 (3), 115414 (6); Society Islands: MCZ 12889 (1), Tahiti USNM 177913 (6), 177911 (8); Samoa Islands: Rose Island USNM 115415 (2); Tau Island USNM 115418 (5); 52283 (3); CNHM 37139-37140 (2); Moorea GVF (5); Tuamotu Archipelago GVF (1); Gilbert Islands USNM 167387 (8), AM IA5346 (1), IA5347 (1), IA5348 (1); East Indies RVNH 8536 (1), 8539 (6), 5949 (3); Java RVNH 414; Mauritius NHMW (1); USNM 177905 (3).

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y 4.00; dorsal rays y 20.96; total anal rays y 17.98; caudal vertebrae y 19; large opaque white rectangle at distal end of caudal fin.

COLOR IN ALCOHOL: Background light yellow or reddish-brown; back with nine wide dark bars connected by an irregular band, this band extends ventrally between each of the back bars forming nine other vertical bars extending toward and may reach the midventral line; the nine ventral bars are connected by a thin dark line extending from the pectorals to the lower base of the caudal fin; over the suprascapula there is a dark patch; two dark dots over temporal bone; three dark patches on cheek, seven spots on snout, three spots on upper lip, five spots on lower lip; membrane dusky between dorsal fin spines; soft dorsal fin with three lengthwise rows of dark spots, the ventral row at base of rays; a large dark blotch at base of ventral half of caudal fin; small dark spots scattered over caudal fin; pectoral fin with a large

dark spot at ventral base; pelvics and anal yellowish white, subopercle and interopercle with a faint dark patch.

RANGE: Riu Kiu; Philippines; Marshalls; Gilberts; East Indies; Samoa Islands; Fiji Islands; Canton Islands; Caroline Islands; Guam.

Parapercis clatbrata Ogilby

Figs. 1C, 2C, 9A

Bodianus tetracanthus Lacepède, 1802, pp. 285 and 302 (type locality, unknown).

Percis tetracanthus Kner and Steindachner, 1866, pp. 362–363, table 3, fig. 18 (Samoa Islands). Günther, 1876, p. 158, pl. 93, fig. B (Östindischen Archipels, Fidschi and Pelew Inseln, Schiffer Inseln, Gesellschafts Inseln). Garman, 1903, p. 233 (Fiji Islands).

Parapercis clatbrata Ogilby, 1910, p. 41, Martin and Montalban, 1935, pp. 222–224, pl. 2, fig. 1 (Bataan, Camiguin, Leyte, Balabac). Fowler, 1959, p. 496 (Fiji). Schultz and Collaborators, 1960, pp. 266–273, pl. 112A.

Parapercis quadrispinosa Herre, 1934, p. 95 (Sitankai). Beaufort and Chapman, 1951, pp. 15–18.

SPECIMENS STUDIED: 84 (52.5 to 152.5) Marshall Islands, Eniwetok UW 10577 (1), 12214 (1); Bikini UW 12213 (1), 10301 (2), 10293 (3); USNM 140775 (1); Kwajalein USNM 152960 (2); Rongelap 140792–93 (3), 140791 (5); Arno USNM 166739 (2), 140787–88 (3), 140796–97 (2), 140789 (5); Ponape Islands GVF (1); Ifaluk GVF (16); Caroline Islands: Palua GVF (36); Persian Gulf USNM 196492 (2).

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y 4.11; dorsal rays y 20.96; total anal rays y 19; caudal vertebrae y 19; large opaque white rectangle at distal end of caudal fin; a black ocellus above operculum.

COLOR IN ALCOHOL: Background light yellow or reddish brown; back with nine wide dark bars connected by an irregular band, this band extends ventrally between each of the back bars forming nine other vertical bars extending to-

ward but not reaching the midventral line; the nine ventral bars are connected by a thin dark line extending from the pectorals to the lower base of the caudal fin; these nine ventral bars may be faded so that only nine small isolated black spots remain; over the suprascapula there is an ocellus that may or may not be encircled with a narrow light ring; two dark dots over temporal bone; three dark patches on cheek, seven spots on snout, three spots on upper lip, five spots on lower lip; membrane dusky between dorsal fin spines; soft dorsal fin with three lengthwise rows of dark spots, the ventral row at base of rays; a dark blotch at dorsal and ventral base of caudal fin; small dark spots scattered over caudal fin; pectoral fin with a large dark spot at ventral base; pelvics yellowish white; anal fin with one lengthwise row of dark spots; subopercle and interopercle with a faint dark patch; cream spot at posterior tip of maxillary; light cream blotch on cheek.

RANGE: Philippines; Marshalls; Gilberts; East Indies; Samoa Islands; Fiji Islands; Canton Islands; Caroline Islands; Persian Gulf.

Parapercis hexophthalma (Cuvier and Valenciennes)

Figs. 1J, 3J, 9B

Percis cylindrica Rüppell, 1828, pp. 19–20, pl. 5, fig. 2 (type locality, Djetta and Massaua).

Percis hexophthalma Cuvier and Valenciennes, 1829, pp. 271–272 (Massaua). Bleeker, 1845, p. 527 (Java). Günther, 1860, p. 239 (Louisiade Archipelago, Red Sea). Playfair and Günther, 1866, pp. 68–69 (Zanzibar, Indian Ocean). Schmeltz, 1869, p. 16 (Kandavu, Feejee Inseln). Day, 1876, pp. 262–264, pl. 57, fig. 4 (east coast of Africa; Andamans). Günther, 1880, p. 35 (Levuka, Fiji). Ishikawa, 1897, p. 46 (Japan).

Percis caudimaculata Rüppell, 1835, p. 98. Bleeker, 1849, p. 54 (Indo-Australian Archipelago); 1853, p. 163, Celebes; 1858, p. 459 (Cocos Islands); 1860, p. 275 (Celebes).

Pinguipes didikuar Thiolliere, 1856, pp. 499–500.

Parapercis hexophthalmus, Bleeker, 1868, p.

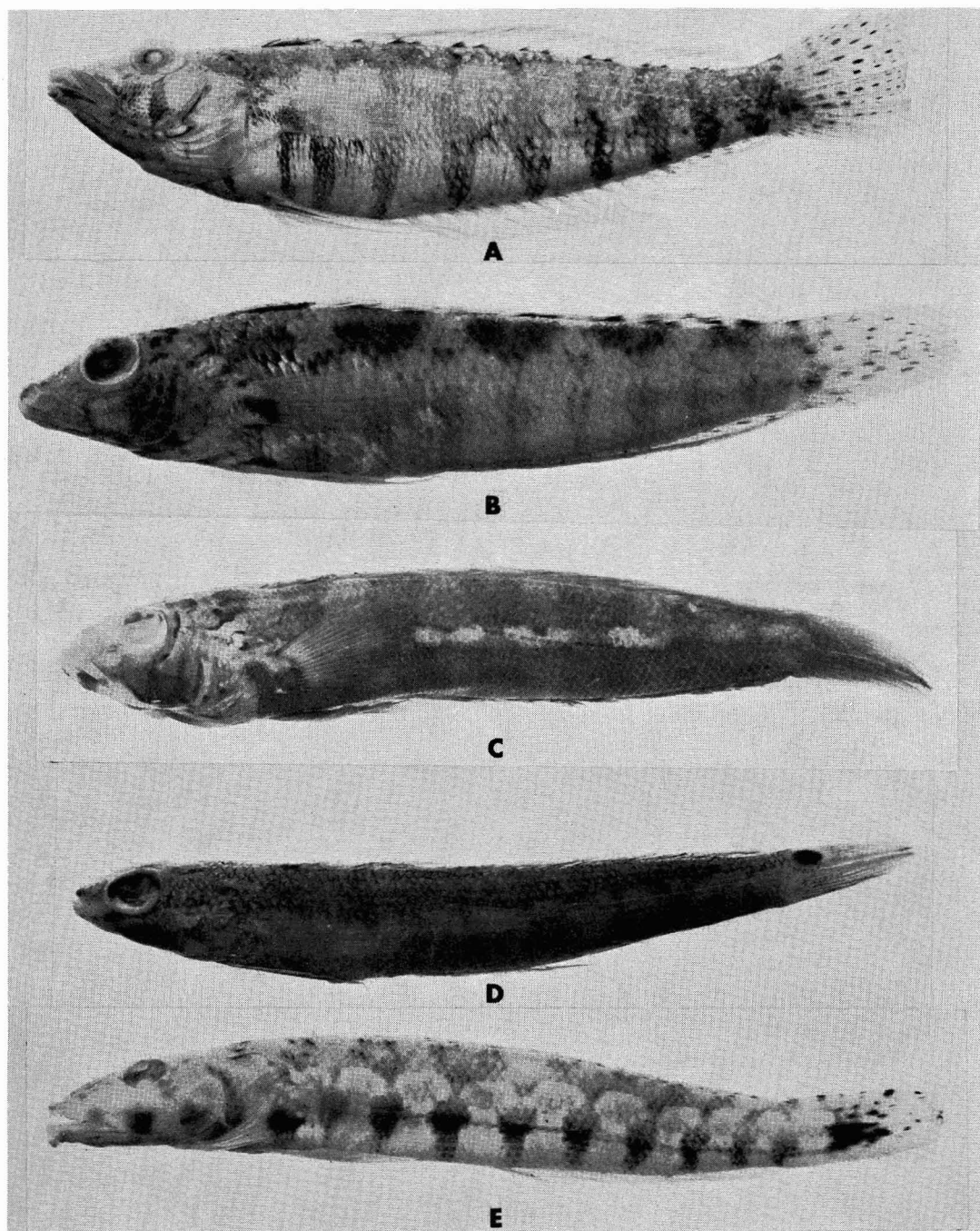


FIG. 8. A, *Parapercis cylindrica* CNHM 47747 Fiji, total length 115 mm; B, *P. snyderi* UMMZ 176719 Japan, total length 88.5 mm; C, *P. pulchella* UMMZ 176682 Japan, total length 140 mm; D, *P. ommatura* SU 6712 Nagasaki, Japan, total length 70 mm; E, *P. cephalopunctata* USNM 177911 Tahiti, total length 135 mm.

272 (Gebe); 1875, p. 78 (Madagascar and Reunion); 1878, p. 53 (New Guinea). Jordan and Seale, 1907, p. 46 (Luzon and Panay). McCulloch, 1929, pp. 331-332 (Massowah, Queensland, India, East Indies, Solomons, Shortland Islands).

Percis caudimaculatum Haly, 1875, p. 269 (North China).

Parapercis hexophthalma Jordan and Snyder, 1902, p. 463 (Riu Kiu Islands). Jordan and Seale, 1906, p. 414 (Lousiades). Evermann and Seale, 1907, p. 103 (Bacon). Snyder, 1912, p. 516 (Okinawa). Weber, 1913, p. 518 (Lamakera, Solor). Barnard, 1927, p. 442 (Mozambique). Fowler, 1928, p. 424 (Society Islands). Martin and Montalban, 1935, pp. 219-220, pl. 3, fig. 1 (Luzon, Tablas, Balabac). Fowler, 1938, p. 300 (Society Islands). Okada, 1938, pp. 252-253 (Ryukyu). Okada and Matsubara, 1938, p. 389. Smith, 1949, p. 177, pl. 13, fig. 380 (Durban). Marshall, 1950, pp. 192-193, pl. 19, fig. 1 (Cocos-Keeling Islands). Beaufort and Chapman, 1951, pp. 24-25 (Pulu Weh, Jacarta, Makassar and Menado, Celebes; Mozambique, Seychelles; Tonkin; Woodlark Island; New Hebrides). Smith, 1955, p. 308 (Aldabra). Rofen, 1958, pp. 211 and 213 (Rennell Island). Fowler, 1959, p. 495 (Fiji).

Parapercis hexophthalma Fourmanoir, pp. 189 and 214 (Comores, 8-15 meters).

Ciliias hexophthalma Matsubara, 1955, p. 692.

SPECIMENS STUDIED: Thirteen (174.5 to 226) Red Sea USNM 49310 (1); Zanzibar MCZ 4493 (1), 1070 (2), 1018 (1), 12891 (1); Society Islands MCZ 12888 (1); Fiji Islands CNHM 37095-7 (3); USNM 82926 (1), 82927 (1); Riu Kiu Islands USNM 75862 (1).

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y five; dorsal rays y 21.09; total anal rays y 18.09; caudal vertebrae y 19.09; no serrations on opercles; three to seven ocelli along side of body; large oblong black spot on caudal fin; head with transverse lines across cheek.

COLOR IN ALCOHOL: Background yellowish

brown with back darker brown and belly lighter yellow, back with many small dark blotches; head spotted; three to four small dark ocelli below midside from below pectoral fin base to opposite rear of anal fin base; three irregular rows of spots or oblong dashes (middle row with smaller spots or dashes) at midside from rear of pectoral fin base to base of caudal fin; a large dark spot on membrane between dorsal spines II to IV; soft dorsal fin with three or four lengthwise rows of dark spots on membranes; on middle of anal fin one row of small dark spots; a large dark oblong blotch on middle of caudal fin, remainder of fin light in color and dark spotted; usually four spots on base of pectoral fin, one or two dark spots on scaled portion of pectoral fin rays; no color markings on pelvics; four to seven transverse light or dark bars extend across cheek, preopercle, subopercle and opercle.

RANGE: Durban, Zanzibar; east coast of Africa; Madagascar; Reunion; Seychelles; Andamans; Red Sea; Cocos Islands; India; Indo-Australian Archipelago; North China; Riu Kiu; Lousiades; Philippines; Queensland; Santa Cruz Islands; Solomons; Society Islands; New Hebrides.

Parapercis polyophthalma (Cuvier and Valenciennes)

Figs. 1J, 3J, 9C

Percis polyophthalma Cuvier and Valenciennes, 1829, pp. 272-273 (Massuah). Playfair and Günther, 1866, pp. 68-69 (Zanzibar). Klunzinger, 1870, pp. 816-817 (east Africa); 1884, pp. 122-123.

SPECIMENS STUDIED: Nineteen (117 to 198) Red Sea CNHM 4030 (1); Zanzibar MCZ 4493 (3), 12891 (1); Rennell Islands CAS 6018 (1); Riu Kiu Islands CNHM 55531 (1); USNM 75862 (2), 75501 (4); Philippine Islands: Luzon USNM 55926 (1); Biri Channel USNM 12233-34 (2), 122484 (1), 122546 (1). Also USNM 111236, New Caledonia, dried specimen.

DIAGNOSIS: Eight canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y five; dorsal rays y 21.05; total anal rays y 18.05; caudal vertebrae

y 19; no serrations on opercles; five to seven ocelli along side of body.

COLOR IN ALCOHOL: Background yellowish brown with back darker brown and belly lighter yellow, back with many small dark blotches; head spotted; five to seven small dark ocelli below midside from below pectoral fin base to opposite rear of anal fin base; three irregular rows of spots or oblong dashes (middle row with smaller spots or dashes) at midside from rear of pectoral fin base to base of caudal fin; a large dark spot on membrane between dorsal spines II to IV; soft dorsal fin with three or four lengthwise rows of dark spots on membranes; on middle of anal fin one row of small dark spots; a large dark oblong blotch on middle of caudal fin, remainder of fin light in color and dark spotted; usually four spots on base of pectoral fin, one or two dark spots on scaled portion of pectoral fin rays; no color markings on pelvics; two horizontal rows of brown spots extend from rictus across cheek.

RANGE: Zanzibar; east coast of Africa; Red Sea; Riu Kiu Islands; Philippines; Rennell Islands.

Parapercis tetracantha (Lacepède)

Figs. 1I, 2I, 9D

Labrus tetracanthus Lacepède, 1800, middle fig. opposite p. 493; 1802, p. 428 (type locality, unknown).

Percis cancellata Cuvier and Valenciennes, 1829, pp. 268–270. Cuvier and Griffith, 1834, pp. 126–127, pl. 24, fig. 2. Cuvier, 1837, p. 98, pl. 18, fig. 2. Bleeker, 1855, p. 501; 1863, p. 156. Karoli, 1881, p. 162 (Singapore).

Percis tetracantha Bleeker, 1853, p. 458 (Java); 1857, p. 371 (Sangi Islands); 1859, p. 331, (Java); 1860, p. 40 (Sumatra). Kner and Steindachner, 1866, pp. 362–363, table 3, fig. 18 (Samoa Islands). Alcock, 1896, p. 316 (Bay of Bengal and Andamans). Boulenger, 1897, p. 373 (Rotuma).

Parapercis tetracanthus Bleeker, 1865, pp. 149 and 292 (Buru and Ambon). Jordan and Richardson, 1908, p. 280 (Calayan). Weber, 1913, pp. 518–519 (Banda). Fowler, 1928, p. 424 (Society Islands); 1938, p. 300 (Society Islands). Schultz, 1943, p. 269

(Samoa Islands). Marshall, 1950, p. 192 (Cocos-Keeling Islands). Beaufort and Chapman, 1951, pp. 26–27, fig. 7 (Singapore).

Percis tetracantha Schmeltz, 1869, p. 16 (Feejee Inseln).

Parapercis tetracantha Snyder, 1912, p. 516 (Okinawa). Martin and Montalban, 1935, pp. 217–219, pl. 1, fig. 2 (Romblan, Calapan, Mindanao). Herre, 1953, p. 783.

Parapercis nipponensis Kamohara, 1936, pp. 929 and 933, fig. 4, p. 934 (off Prov. Tosa in Shikoku); 1938, pp. 1293–1294, fig. 1. Okada, 1938, pp. 252–253 (Koti). Okada and Matsubara, 1938, p. 389. Kamohara, 1950, p. 258 (Tosa and Kishu). Kamohara, 1958, p. 67 (Kochi).

Cilius tetracanthus Matsubara, 1955, p. 692.

SPECIMENS STUDIED: Thirteen (147.5 to 228) Philippine Islands USNM 122338 (1); Jolo UW 7607 (1); CNHM 47548 (1); UMMZ 100560 (2); East Indies RVNH 5948 (2); 8536 (1); 8539 (1); Ambon RVHN 20512 (1); locality unknown USNM 171787 (2); SU (1).

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected to first soft ray opposite tip of last spines; dorsal spines y five; dorsal rays y 20.9; total anal ray y 17.9; caudal vertebrae y 19; color pattern similar to *P. clathrata*; large ocellus over suprascapula.

COLOR IN ALCOHOL: Background yellowish brown with back darker brown and belly lighter yellow; the upper half of the body from nape of neck to base of caudal fin with nine wide dark brown bars, the first three of which extend ventrally to the lateral line; a narrow dark brown band connects these nine bars ventrally; nine other wide dark bars extend ventrally from this longitudinal band, the last eight of which reach the midventral line; anteriorly the ventral bars are directly under the dorsal bars but become progressively more alternating toward the caudal; a narrow dark brown band extends longitudinally from the base of the pectoral fin to the ventral base of the caudal fin connecting the nine ventral bars; over the suprascapula there is a large ocellus the center of which is brown and is surrounded by a thin black ring,

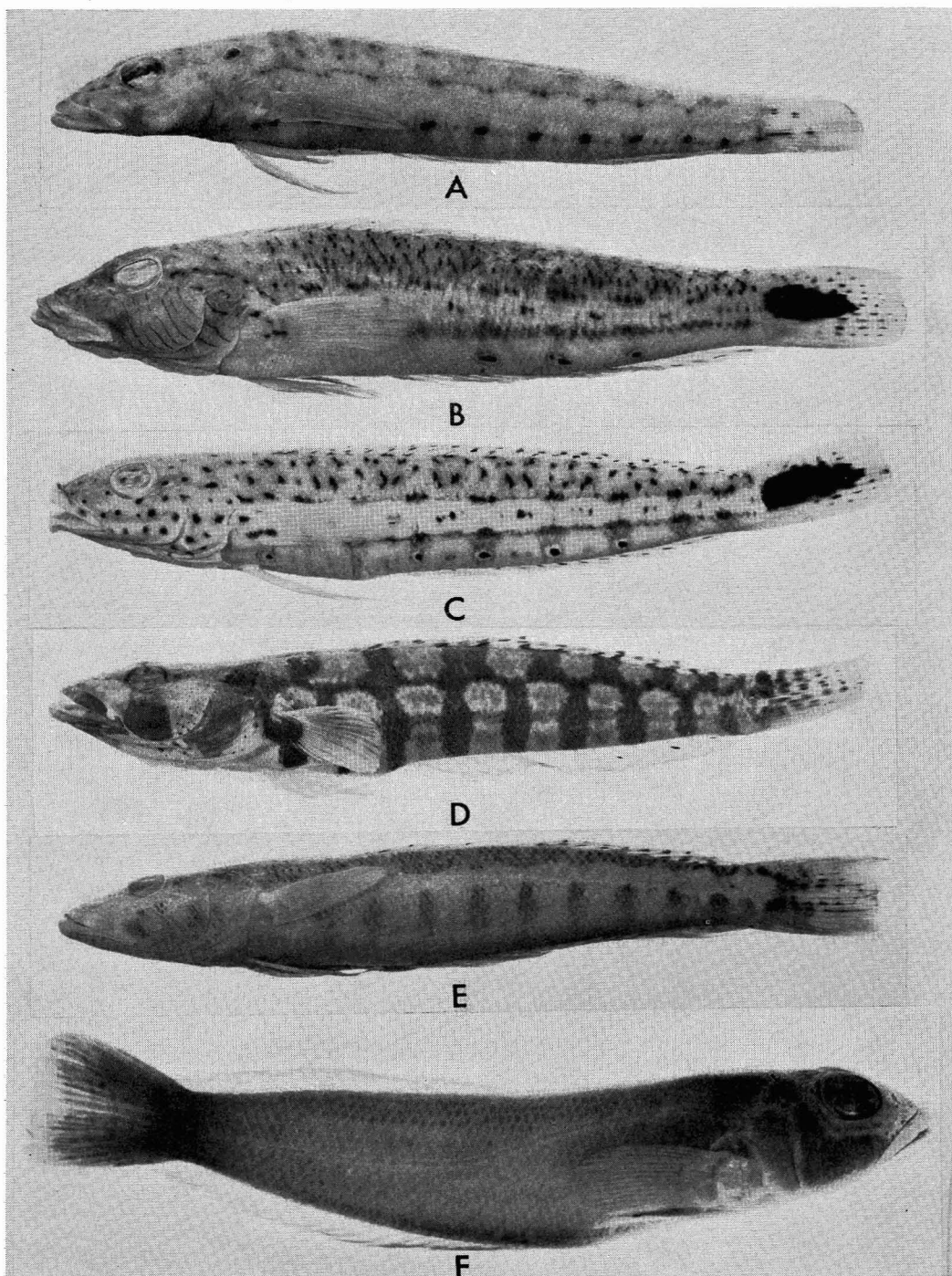


FIG. 9. A, *Parapercis clathrata* UW 12214 Eniwetok, total length 133.5 mm; B, *P. hexophthalma* USNM 147454 Red Sea, total length 187 mm; C, *P. polyophthalma* CAS 6018 Rennell Islands, total length 161 mm; D, *P. tetracantha* RVNM 20512 Ambon, total length 180 mm; E, *P. xanthozona* USNM 109818 Gulf of Siam, total length 142 mm; F, *P. aurantiaca* USNM 195872 Japan, total length 162.5 mm.

this black ring may or may not be surrounded by a thin light tan ring; there is a thin dark streak across the interorbital, and another that connects the eyes just in front of the interorbital; the front half of the cheek is dark brown, the rear half light tan with many very fine dark specks; the posterior fourth of the interopercle is dark brown as well as the other opercles; each side of the upper lip has a dark brown spot at the front and a dark brown oblong spot at the side; the entire side of the lower lip is brown as well as the area immediately below the lower lip; the spinous dorsal is dusky; soft dorsal with three lengthwise rows of dark spots, the upper row near the tips of the rays, the middle row on the membranes between the rays, and the lower row partly on the membrane and rays; caudal fin with dark spots on membranes between rays; each branched anal fin ray with a dark streak near its tip; anal fin with a lengthwise row of dark spots on membrane between rays, the last few anal rays may or may not have a second spot on the membrane; pectoral fin with a dark brown spot at its base; pelvic fin light yellow.

RANGE: Bay of Bengal; Singapore; East Indies; Cocos Islands; Philippines; Society Islands; Samoa Islands; Fiji Islands; Riu Kiu; Japan.

Parapercis xanthozona (Bleeker)

Figs. 1H, 2H, 9E

Percis xanthozona Bleeker, 1849, p. 55 (type locality, Indo-Australian Archipelago). Günther, 1860, p. 240 (Sea of Batavia). Bleeker, 1861, p. 56 (Singapore). Playfair and Günther, 1866, p. 69 (Zanzibar). Weber, 1895, p. 267 (Thursday Island). Steindachner, 1900, p. 427 (Halmahera, Ternate).

Percis stricticeps De Vis, 1885, pp. 545–546 (type locality, Southport).

Percis pleurostigma Sauvage, 1891, pp. 317–318 (Batavia, Maurice, Zanzibar).

Parapercis atromaculata Fowler, 1904, pp. 548–549, pl. 24 lower fig. (Pandang, Sumatra).

Parapercis xanthozona Seale, 1906, p. 86 (Shortland Islands, Solomons). Jordan and Seale, 1906, p. 414 (East Indies). Fowler, 1928, p. 425 (Shortland Islands). McCulloch, 1929, pp. 331–332 (Batavia, Queens-

land). Beaufort and Chapman, 1951, pp. 22–23 (Jakarta, Java, Madagascar, Indo-China, Philippines). Kamohara, 1950, p. 258 (Tosa and Kishu, Japan).

Parapercis stricticeps McCulloch, 1913, p. 386; 1929, pp. 331–332.

Neopercis xanthozona Kamohara, 1938, p. 1452. Matsubara, 1955, p. 691. Kamohara, 1958, p. 67.

SPECIMENS STUDIED: 19 (121 to 195) Padang, Sumatra ANSP 27780 (1), holotype of *Parapercis atromaculata* Fowler; NHMW 60759 (1); Fiji Islands: CNHM 24866–7 (1); Sulu, Philippine Islands CNHM 47548 (1); Gulf of Siam USNM 109818 (2); Shortland Islands BPBM 1225 (1); Singapore RVNH 16366 (1); Amboina NHMW 60263 (1); Queensland AM I11527 (1); East Indies RVNH 5946 (8), 8538 (1).

DIAGNOSIS: Six canine teeth in outer row of lower jaw; palatine teeth absent; middle dorsal spines longest; membrane from spinous dorsal connected to first soft ray opposite tip of last spine; dorsal spines y five; dorsal rays y 21; total anal rays y 18; caudal vertebrae y 19.

COLOR IN ALCOHOL: Background and belly light tan; upper scales on back margined with brown; below these darker scales, from the base of the pectoral fin to the base of the caudal fin occurs a light tan lengthwise band; below this band occur nine dark vertical bars; 8 to 10 dark spots on head behind the eyes; soft dorsal fin with three lengthwise rows of dark spots on membranes, lower row at base of fin; on middle of anal fin one row of spots; caudal fin with dark spots on membranes between rays; seven transverse dark bars extend across cheek and opercles on some specimens, no color markings on pelvic or pectoral fins.

RANGE: Zanzibar; Madagascar; Singapore; Gulf of Siam; Philippines; East Indies; Thursday Island; Queensland; Solomons; Japan.

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