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A NEW EASTERN PACIFIC LABRID (PISCES),
DECODON MELASMA, A GEMINATE SPECIES OF
THE WESTERN ATLANTIC *D. PUELLARIS*¹

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The genus *Decodon* was erected by Günther (1861) for *Cossyphus puellaris* Poey 1860, a species differing from other members of the genus *Cossyphus* (= *Bodianus*) primarily in lacking scales on the membrane of the soft dorsal fin. For over a hundred years *Decodon* was thought to be monotypic with a distribution restricted to the deeper shelf waters of the Western Atlantic between North Carolina and Brazil. Recent collections from along the Pacific Coast of Central and northern South America in depths similar to those in which *D. puellaris* is often taken in the Atlantic, however, have yielded a second, geminate species. As in many other closely related labrids, differences between the two species are largely in color pattern while counts and measurements are nearly identical. Furthermore, two species from the Indo-West Pacific presently placed in allied genera are referable to *Decodon*, though not treated here.

METHODS

Terminology follows that of Hubbs and Lagler (1958) except: caudal-ray count includes dorsal unsegmented rays + dorsal segmented, unbranched rays + segmented, branched rays + ventral segmented, unbranched rays + ventral unsegmented rays; pectoral-fin rays are indicated with unbranched

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rays in lower case Roman numerals and branched, segmented rays in Arabic (the dorsalmost pectoral ray in labrids is typically short, unsegmented and unbranched; the second ray is typically long, segmented and unbranched); first lateral-line scale is the anteriormost free, pored scale not attached to upper end of posterior opercular membrane; scales below lateral line are counted diagonally forward and upward from the first moderately sized body scale laterally adjacent the first anal-fin spine to but not including the lateral line (small scales in vicinity of anus and first anal-fin spine are ignored for standardization of counts); gill-raker counts include rudiments; orbital length is a horizontal measurement. Figures enclosed by parentheses following meristic counts indicate number of specimens or structures (e.g., pectoral fins) exhibiting count. Measurements were made with needlepoint dial calipers and recorded in millimeters; morphometric dimensions are given as ranges in percent of standard length; all body length measurements are expressed as the standard length (SL) in mm. Color descriptions of the new species are based on photographs and color notes supplied by Lloyd T. Findley and transparencies loaned by Richard H. Rosenblatt; comparative color transparencies of *D. puellaris* were made available by Patrick L. Colin.

Type specimens and study material are deposited in the following institutions: Academy of Natural Sciences of Philadelphia (ANSP); California Academy of Sciences (CAS); Los Angeles County Museum (LACM); Museum of Comparative Zoology, Harvard University (MCZ); Scripps Institution of Oceanography, University of California (SIO); University of Arizona (UA); University of Costa Rica (UCR), also temporarily housing Searcher specimens; School of Marine and Atmospheric Sciences, University of Miami (UMML); U.S. National Museum of Natural History, Smithsonian Institution (USNM); University of California at Los Angeles (W).

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Decodon Günther

Günther 1861, p. 384. Type-species by monotypy, *Cossyphus puellaris* Poey 1860.

Decodon puellaris, the new species and two species from the Indo-West Pacific form a natural group within the bodianine labrids (e.g., *Bodianus*, *Choerodon*, *Pimelometopon*), here recognized at the generic level. A treatment of the species occurring in the Indo-West Pacific, together with an examination of the general systematic status of *Decodon*, is deferred until a study of the bodianine labrids by the author is complete. A combination of the following characters separates *Decodon* from other closely related genera of bodianines: absence of scales on basal portion of dorsal and anal-fin membranes; dorsal-fin rays XI, 9–10; anal-fin rays III, 10; pored lateral-line scales 26–30; trunk scales deciduous; predorsal area scaled from dorsal-fin origin to anterior nostrils; preoperculum completely scaled.

Decodon melasma, new species

(Figure 1)

Holotype: USNM 210859 (139.6), Mexico, Gulf of California, Baja California Sur, 3 miles (4.8 km) off Buena Vista, small reef surrounded by sand, depth 55 fathoms (100 m), collected by Ray Cannon and Boyd W. Walker, 15–16 March 1961, field station no. W61-33, hook and line.

Paratypes: USNM 210860 (4, 56.2–106.9), Mexico, Gulf of California, Baja California Sur, Bahia Santa Inex, 26° 56.9' to 58.3'N, 111° 51.9' to 53.5'W and 26° 59.2' to 57.7'N, 111° 51.5' to 51.0'W, water depth 40–45 fathoms (82 m), 40' otter trawl, collected by W. Baldwin and party, field station no. RR 65-51, 14 July 1965, 1410–1510 and 1535–1615 hours; CAS 28809 (4, 52.2–150.1), LACM 33722-1 (4, 59.7–149.3) and SIO 65-305 (50, 37.8–200.0), same data as USNM 210860.

Other material: Gulf of California, SIO 65-250 (6, 78.6–128.9), 65-257-50 (1, 87.7), 65-294 (1, 118.8), 65-304 (4, 69.6–147.8), 65-313

(1, 79.3), 68-67 (1, 91.1), 68-71 (1, 27.6), 68-75 (4, 44.1-99.3), UA 67-59-4 (2, 68.7-86.2), 70-21-5 (4, 128.3-136.1), 70-41-2 (4, 83.0-126.8), W61-79 (1, 132.8), W63-148 (2, 129.2-129.5); Costa Rica, UCR 139-23 (1, 141.5), 339-1 (1, 135.5), 353-1 (2, 104.4-167.3), 510-5 (1, 116.7), Searcher 484 (1, 61.6), 485 (4, 36.8-88.7); Isla del Coco, Searcher 521 (4, 100-139), 522 (1, 169), 539 (1, 55.2); Gulf of Panama, UMML 26461 (1, 104.3), 26462 (1, 94.5), USNM 210711 (1, 48.2), 210712 (1, 48.7), 210713 (1, 126.4); Ecuador, USNM 210710 (2, 122.4-128.4).

Diagnosis: Pectoral-fin rays ii, 15, rarely ii, 16; lateral-line scales 28; adults with vertically elongate dark spot below seventh dorsal-fin spine extending from just above lateral line (eighth pored lateral-line scale) to midside; juveniles with up to 6 vertical dusky bars on side of body, usually confined to dorsal half.

Description: Dorsal-fin rays XI, 10 (72), XII, 9 (1); anal-fin rays III, 10 (72), III, 9 (1); caudal-fin rays 9 (42), 10 (20) + 2 (61), 1 (1) + 12 (61), 13 (1) + 2 (47), 3 (15) + 8 (10), 9 (40), 10 (12); pectoral-fin rays ii, 15 (133), ii, 16 (9), ii, 12 (1), ii, 14 (1); pelvic-fin rays I, 5; vertebrae 11 + 17 = 28 (61), 11 + 18 = 29 (1); lateral-line scales 28; scales above lateral line 2½; scales below lateral line 8; caudal peduncular scales 16; predorsal scales approximately 20; gill rakers 5 (3), 6 (16), 7 (6) + 9 (3), 10 (15), 11 (6), 12 (1).

Body compressed, elongate, greatest depth in large specimens at about level of dorsal-fin origin, body depth 20.3-31.6, increasing with increase in SL; caudal peduncle 11.6-14.8, increasing with increase in SL. Scales on trunk large, cycloid, deciduous; scales not extending onto bases of dorsal and anal fins; lateral line smoothly curved, uninterrupted; lateral-line scales posteriorly notched, possessing unbranched medial canal with single posterior pore.

Head blunt, length 32.2-38.0; forehead gently curved, curve more pronounced in large specimens; snout 6.1-11.8, increasing with increase in size; eye 6.9-10.6, decreasing with increase in SL. Head almost totally scaled; scales on nape and forehead small, reaching anteriorly to just in front of anterior nostrils; underside of head and chest with small scales reaching anteriorly to symphysis of jaw; small scales covering cheeks and infraorbital area forward to angle of mouth; preopercle scaled to edge; preopercular edge finely serrate; operculum mostly covered by large deciduous scales; opercular membrane naked posteriorly. Opercular membranes united and free from isthmus; ventral end of gill opening reaching anteriorly to below posterior part of eye. Pseudobranch present; diagonal series of 5 or 6 fleshy, gill raker-like appendages present on inner surface of operculum opposing ventral gill rakers of first arch; gill rakers on first gill arch moderately long, narrow, usually simple; dorsal-most gill raker on lower limb of arch occasionally bifurcate. Lower lip narrow, not differentiated from chin at tip of jaw; upper lip broad, smooth, not fleshy, covering lower lip completely when mouth closed. Teeth in jaws caniniform, more or less uniserial (Figure 2). Upper jaw

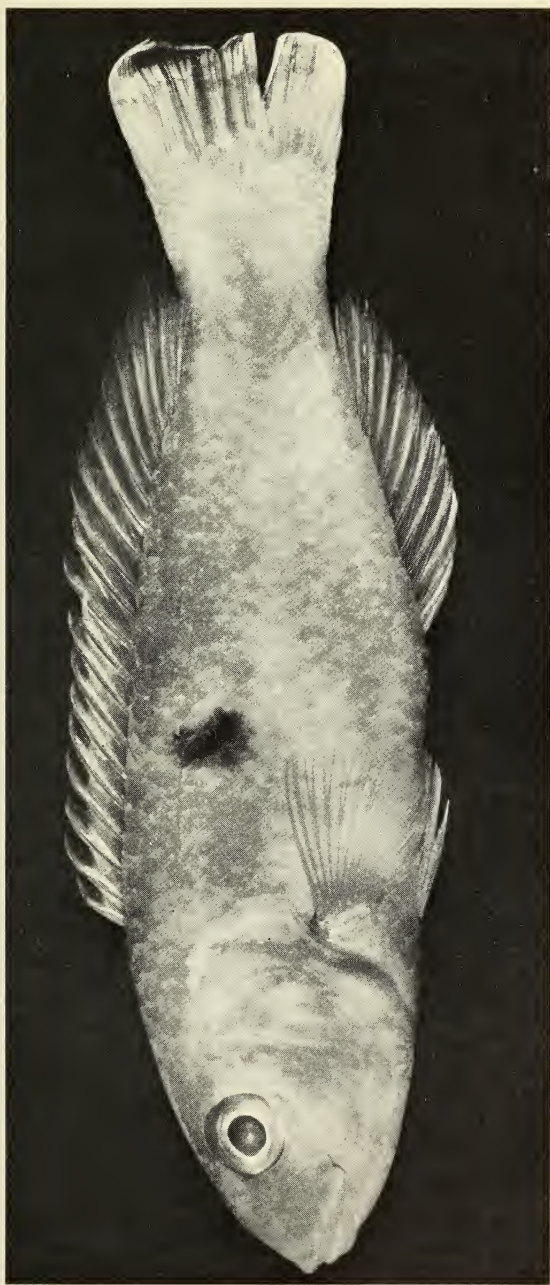


FIG. 1. *Decodon melasma*, USNM 210859, holotype, 139.6 mm SL.

with two widely spaced, large, curved canines on either side of symphysis at anterior outer margin of premaxillary, followed posteriorly by row of approximately 5 to 8 equally short canines arising from narrow bony ridge on ventral edge of premaxillary; ridge prominent anteriorly, forming relatively tall cutting edge along mesial side of bases of anterior canines, becoming less distinct posteriorly; several small teeth often present along mesial side of bony ridge; usually one or two (0-3) anteriorly curved canines present at posterior end of upper jaw. Lower jaw with two large curved canines on each side of symphysis at anterior outer margin of dentary; first canine directed anteriorly next to symphysis; second canine widely spaced and larger than first, angled slightly laterally; large canines followed by row of 3 to 5 short posteriorly longer canines arising from narrow bony ridge similar to that in upper jaw, and in turn, followed by second row of shorter canines of equal length; second series of short canines based on separate bony ridge immediately posterior to first ridge, also forming cutting edge with short blunt teeth in large specimens.

Dorsal fin low, continuous, origin slightly anterior to posterior extent of opercular margin; first dorsal-fin spine shortest, subsequent spines slightly longer and nearly equal in length; 11th dorsal-fin spine 10.5-12.6; each spine with filamentous membrane at tip; dorsal fin pointed posteriorly, not reaching base of caudal fin. Anal fin low; spines progressively longer posteriorly, 3rd anal-fin spine 8.6-11.7, fin pointed posteriorly, not reaching base of caudal fin. Caudal fin rounded to truncate in small specimens, truncate with dorsal and ventral rays produced in large specimens. Depressed pectoral-fin tip reaching perpendicularly below 7th or 8th dorsal-fin spine; length of pectoral fin 17.2-21.3. Pelvic-fin tip reaching slightly more than half way from pelvic-fin origin to anus; pelvic-fin length 12.0-18.0, increasing with increase in SL.

A comparatively small species of bodianine; largest specimen examined 200.0 mm SL.

Reproduction: Adults appear to be synchronous hermaphrodites in practically all but very large individuals. Six of seven small adult paratypes (98.3-106.9) examined have a large, well developed ovary with advanced oocytes on each side of the body and a lobe of testicular tissue about one-fourth or one-fifth the size of each ovary present next to the ovary of the left side, no testis on the right. The seventh specimen has a single testis approximately the same size as the testicular lobe in each of the other specimens and two strands of connective tissue which appear to represent spent ovaries. Smaller adult specimens consistently have two distinct ovarian lobes and a single testicular lobe. The ovary does not appear to degenerate at any particular adult size as further exemplified by two paratypes, 149.3 and 150.1 mm SL, with well-developed ovaries, and the holotype, 138.3 mm SL, with only a single narrow testis on the right side and no vestige of ovarian development. The largest specimen examined, a paratype (200.0), has testicular tissue proportionate in size to that of other paratypes and no sign of functional

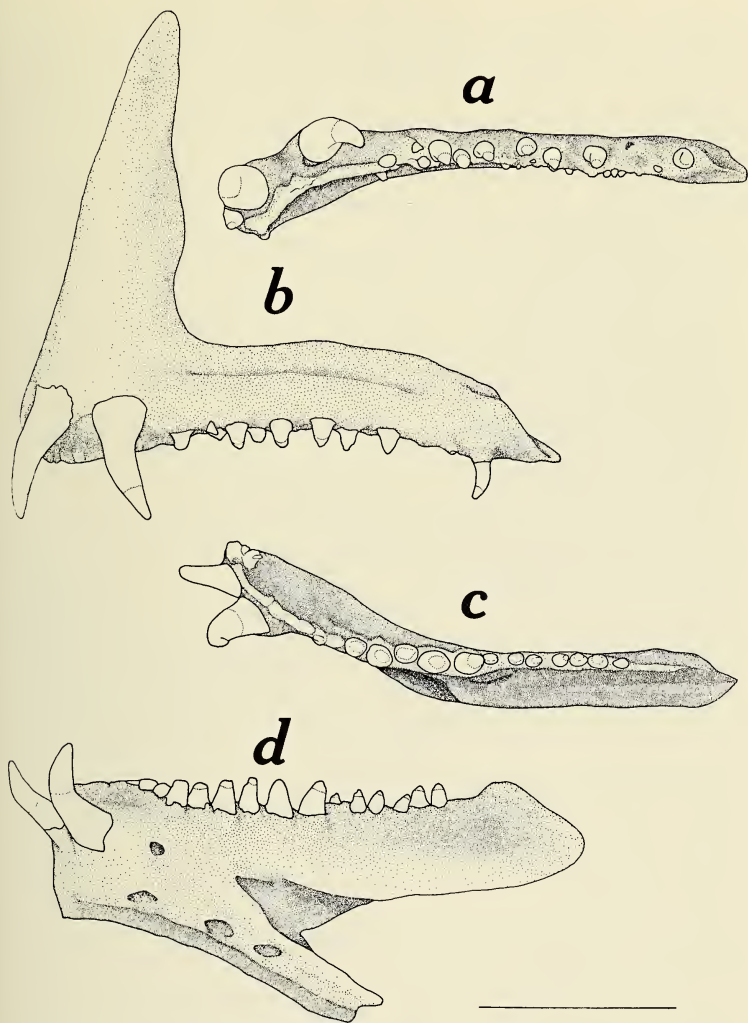


FIG. 2. Dentition in upper and lower jaws of *D. melasma*. Premaxillary: (a) ventral view, (b) lateral view. Dentary: (c) dorsal view, (d) lateral view. USNM 210713, 126.4 mm SL. Line indicates 5 mm.

ovaries. The highly convoluted appearance of the testis in this specimen, however, suggests that development of testicular tissue may also have taken place in the walls of the spent ovaries.

Color in alcohol: (Specimens larger than about 130 mm) Head and

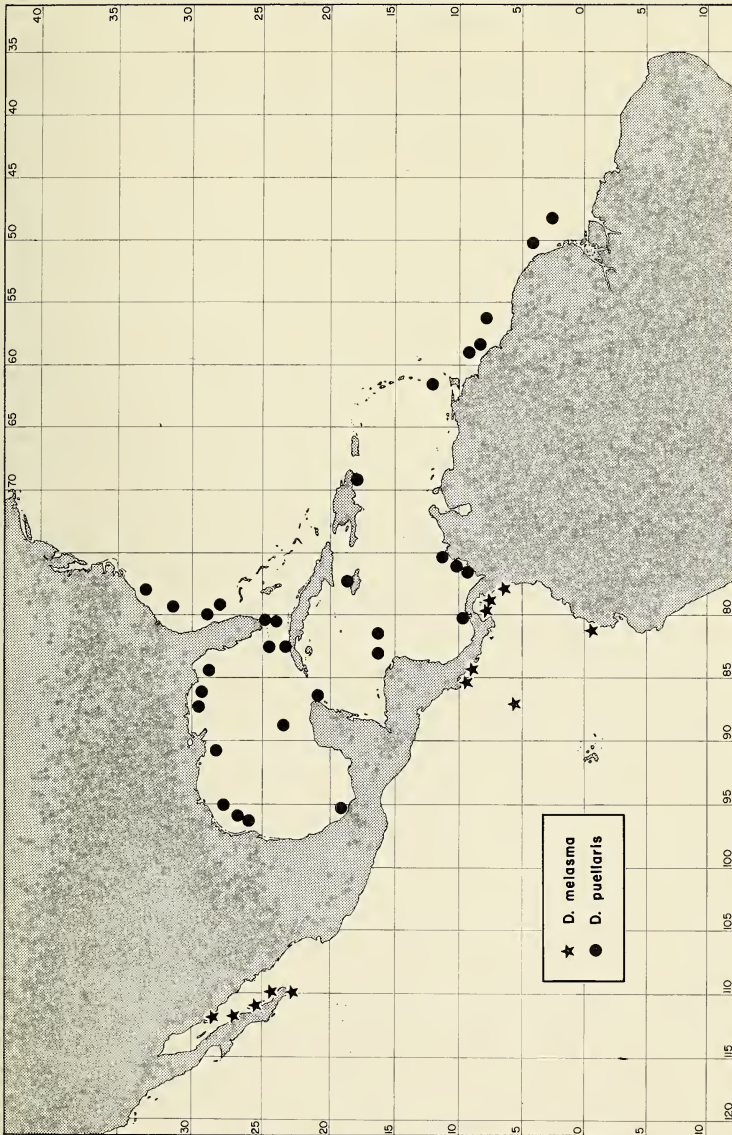
body pale; underside of head, throat and chest with underlying white pigmented layer visible; moderately large, often faint, diffuse, dusky spot present on dorsal midline of nape just anterior to dorsal fin origin; vertically elongate dark spot dorsolaterally on body below seventh dorsal-fin spine, extending from just above lateral line almost to midside. Fins transparent.

(Specimens smaller than about 130 mm) Markings better developed in smaller specimens, fainter in larger ones. Head and body pale; large dusky spot present on nape anterior to dorsal-fin origin; as many as six, usually faint, broad, dusky, vertical bands present on dorsal half of body; bands reaching or nearly reaching dorsal body contour dorsally and usually extending to or just below lateral midline ventrally; very small specimens with bands reaching ventral body contour; anteriormost band positioned below second dorsal-fin spine, second band below seventh dorsal-fin spine, third band below ninth or tenth dorsal-fin spine, fourth band below fifth segmented dorsal-fin ray, fifth band on caudal peduncle just posterior to dorsal fin, fourth and fifth bands often very faint or absent. Small, dusky spot present middorsally on caudal peduncle just anterior to caudal fin, remnant of sixth band on basal edge of caudal fin in very small specimens. Anal, caudal, pectoral and pelvic fins transparent; dorsal fin transparent in specimens larger than about 45 mm, smaller specimens with large dark spot in center of dorsal fin usually extending from first to third segmented rays.

Color in life: Head and body pinkish red above, white below. Head pinkish red on snout and top of head, becoming pinkish white below level of eye and white below level of mouth. Three curved, moderately broad, chrome yellow stripes on head; dorsalmost stripe originating on dorsal margin of orbit, encircling orbital margin dorsoposteriorly, then curving posteriorly across preopercle and opercle to opercular margin at upper level of pectoral base where it turns ventrally and forms short, broad, yellow posterior margin on gill flap; second stripe anteriorly confluent with corresponding stripe of opposite side across snout from anterior edge of orbit, encircles orbital margin ventrally and is directed ventroposteriorly from ventroposterior edge of orbit across cheek to ventroposterior angle of gill flap; third stripe forms narrow margin on free edge of upper lip (confluent with that of opposite side anteriorly) and is directed posteroventrally from angle of mouth, becoming broader ventrally and terminating just below ventral edge of preopercle. Chrome yellow blotch on nape at anterior end of lateral line. Faint purplish blue area on opercle above upper level of pectoral-fin base. Trunk pinkish red above level of posterior lateral line, becoming pinkish white ventrolaterally and white ventrally. Large, vertically elongate, black spot on body below seventh dorsal-fin spine extending from just above

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FIG. 3. Distribution of *D. melasma* and *D. puellaris*.



lateral line (eighth pored lateral-line scale) almost to midside (approximately 2 to 2½ scale rows high).

Pectoral fin pinkish red. Pelvic fin dusky white; bases of membranes between inner rays chrome yellow. Dorsal fin pinkish red on spinous portion, pinkish white on anterior segmented ray portion with chrome yellow highlights to rays and whitish posteriorly. Anal fin white with narrow, horizontal, chrome yellow stripe parallel with ventral body contour near base of fin. Caudal fin pinkish red with some chrome yellow on bases of outer rays.

Distribution: Present only in the Eastern Pacific from the northern Gulf of California to off Ecuador (Fig. 3). The absence of specimens from the central portion of this range (Fig. 3) is probably related to poor collecting efforts. This species is rather common in shrimp-trawl hauls made in depths of 40 to 160 m. Areas of capture usually have flat sandy to slightly soft bottoms often with some rocky rubble or patch reefs, very similar to those areas in the Western Atlantic inhabited by *D. puellaris*.

Etymology: *melasma*, a Greek noun meaning black spot, in reference to the characteristic single black mark on each side of the body in large specimens. *Melasma* is here used as a noun in apposition.

Relationships: *D. melasma* and *D. puellaris* differ in counts only in the number of pectoral-fin rays, ii, 14 (ii, 15 in 2 of 50 counts) in *D. puellaris* versus ii, 15 (ii, 16 in 9 of 142 counts) in *D. melasma*, and number of lateral-line scales, 28 in *D. melasma* versus 27 in *D. puellaris*. Proportional measurements in specimens of the two species show no significant differences.

Preserved specimens of *D. melasma* and *D. puellaris* are virtually identical in appearance with the exception of the presence of a single, dark, lateral body mark in large specimens and several vertical, diffuse, dark bands on the sides of smaller individuals of *D. melasma*, in contrast to the virtual absence of dark pigment in all specimens of *D. puellaris* (both *D. melasma* and *D. puellaris* possess a dark spot on the anterior branched, segmented-ray portion of the dorsal fin in specimens smaller than about 45 mm). Life colors of both are basically pinkish red dorsally grading to white ventrally with distinct chrome yellow markings on the head, body and fins. Specimens of *D. puellaris* possess a number of chrome yellow spots on the operculum and apparently on most of the lateral body scales. These spots are not present in specimens of *D. melasma*. Specimens of *D. puellaris* also have a basal row of yellow spots on the anal fin rather than the basal stripe of *D. melasma*, and possess a narrow yellow line along the distal margin of the fin as well as a number of yellow spots scattered on the midportion of the fin. The two species also appear to differ in dorsal-fin coloration, although available photos are not sufficiently clear to evaluate this aspect adequately. Both species, however, possess an identical pattern of yellow stripes radiating from the eye and have a distinctive chrome yellow upper lip.

Both appear to inhabit the same ecological niche in the same depth range (a relatively unique ecological distribution for bodianines, as most species are shallow water reef forms or are associated with sheer rocky conditions) and are distributed almost identically along their respective coasts of North, Central and South America in continental shelf conditions.

Adults of both species have an identical blunt head profile in contrast to the more typically pointed, *Bodianus*-like head of their two congeners occurring in the Indo-West Pacific. This fact suggests a closer and more recent ancestry of the new world species than of either with the Indo-West Pacific species. The greatest similarities in structure, appearance and ecology of the two probably point to their recent evolution, thus affording a good example of a geminate species pair of the tropical Western Atlantic and Eastern Pacific faunas as envisioned by Jordan (1905) and discussed by Robins (1972). An interesting aspect concerning the two species lies in their rather deep vertical distribution, making them the first documented consistently deep water geminate pair; all other Central American geminates occur in shallow marine or estuarine habitats (Jordan, 1905).

COMPARATIVE MATERIAL

Comparative material of *Decodon puellaris* includes: South Carolina, USNM 151868 (1, 97); Georgia, USNM 156600 (1, 63); northeast Florida, UMML 29567 (1, 164); eastern Florida, UMML 1236 (1, 73); Florida Keys, UMML 10206 (2, 41-43); Tortugas, UMML 20527 (3, 33-89), USNM 116960 (5, 45-135); northwest Florida, UMML 4925 (5, 74-115), USNM 156599 (1, 62), 158826 (2, 112-143), 210636 (1, 145), 210638 (2, 114-117); Louisiana, USNM 185304 (1, 138); Texas, USNM 156616 (1, 58), 185441 (1, 179), 210634 (4, 132-171), 210637 (2, 116-143); Mexico, USNM 210644 (2, 108-116); Yucatan, UMML 28613 (4, 36-73); Honduras, UMML 2712 (1, 93), USNM 185045 (1, 71), 185260 (15, 52-103); Panama, USNM 210645 (2, 64-101), 210646 (1, 91); Colombia, UMML 16295 (2, 96-112), 22290 (4, 39-62), USNM 210640 (3, 109-116), 210641 (1, 92), 210643 (1, 92); Venezuela, USNM 185297 (1, 122); Guyana, USNM 210635 (1, 133), 210639 (1, 105), 210642 (1, 122); Surinam, UMML 4974 (1, 142); Brazil, USNM 185031 (2, 80-86), 185052 (1, 83), 185065 (1, 91), 185192 (2, 67-70); Cay Sal Bank, UMML 9968 (3, 51-79); Cuba, ANSP 90775 (1, 148), MCZ 14339 (2, 140.0-151.5, types), USNM 4753 (1, 135), 12564 (1, 122), 24941 (1, 183); Jamaica, UMML 29888 (1, 157); Dominican Republic, UMML 29564 (2, 40-89); Grenada, USNM 178125 (1, 122).

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