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A new tropical eastern Pacific labrid fish, *Halichoeres discolor* endemic to Isla del Coco, Costa Rica

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Abstract: A new wrasse, *Halichoeres discolor,* is described from 136 specimens taken at 14 inshore sites at Cocos Island, Costa Rica, the only known locality. The species has a distinctive juvenile color phase that resembles the coloration of juvenile *Halichoeres nicholsi* from the eastern Pacific mainland. The adult coloration of the new form is dark gray above, yellow-brown below with blue stripes on the head and forebody and the fins mostly salmon-colored.

The first major collection of Cocos Island (Isla del Coco) fishes was made by R.E. Snodgrass and E. Heller during the Hopkins-Stanford Galapagos Expedition of 1898-1899. They provided a list of 36 shore fishes for the island (1905). More recently Briggs (1974) recorded a total of 82 species of shore fishes from Cocos Island.

Four expeditions made in recent years to Cocos Island have increased the number of species of shore fishes known from the island to over 200 (R.J. Lavenberg and W.A. Bussing, in prep.). The first cruise obtained numerous rotenone collections from the northern side of the island and trawl collections from around the entire island, and was made by scientists aboard the R/V "Searcher" in 1972. Further shallow-water trawl stations were made around the island by the R/V "Velero IV" during June 1973 in conjunction with a midwater sampling program. Scientists and fishermen aboard a sportsfishing vessel, the "Qualifier 105", preserved examples of pelagic fishes and made many rotenone collections on the northern side of the island. A fourth series of collections were made at several sites including the eastern and southern sides of the island in March 1978 by ichthyologists aboard the yacht "Jubilee". All of these collections are deposited either at the Natural History Museum of Los Angeles County (LACM) or the Museo de Zoología, Universidad de Costa Rica (UCR). Type material of *Halichoeres discolor* is deposited at LACM, UCR and the National Museum of Natural History (USNM). A study of the labrids of the Pacific coast of Costa Rica is planned (Bussing, in prep.).

Halichoeres discolor, new species
(Fig. 1)

Holotypes: LACM 32260-23: an adult male 108.0 mm standard length, collected in Bahía Weston, about midway between Isla Pájara and rocky headland protruding from mid-bay (5°33'21"N, 87°03'15"W) Isla del Coco. Collected with ichthyocides using SCUBA gear at 12 m depth on April 2, 1972 by G. Bakus, W. Bussing, G. Green, R. Lea, M. Murillo, S. Schultz and P. Wild aboard the R/V Searcher.

Paratypes: All paratypes were collected at Isla del Coco and are listed by expedition. All lengths are expressed in standard length (SL). Place names are based on a map of Isla del Coco published by the Instituto Geográfico de Costa Rica in 1963.

Janss Expedition, 1972: UCR 709-17: SW side of Isla Pájara, Bahía Weston; 5°33'23"N, 87°03'20"W; depth 15 m; 31 March; 1 specimen (69.9 mm SL). LACM 32254-31: 200 m N Punta Quirós, NW side of Bahía Chatham; 5°33'29"N, 87°02'48"W; depth 10.5-11 m; 31

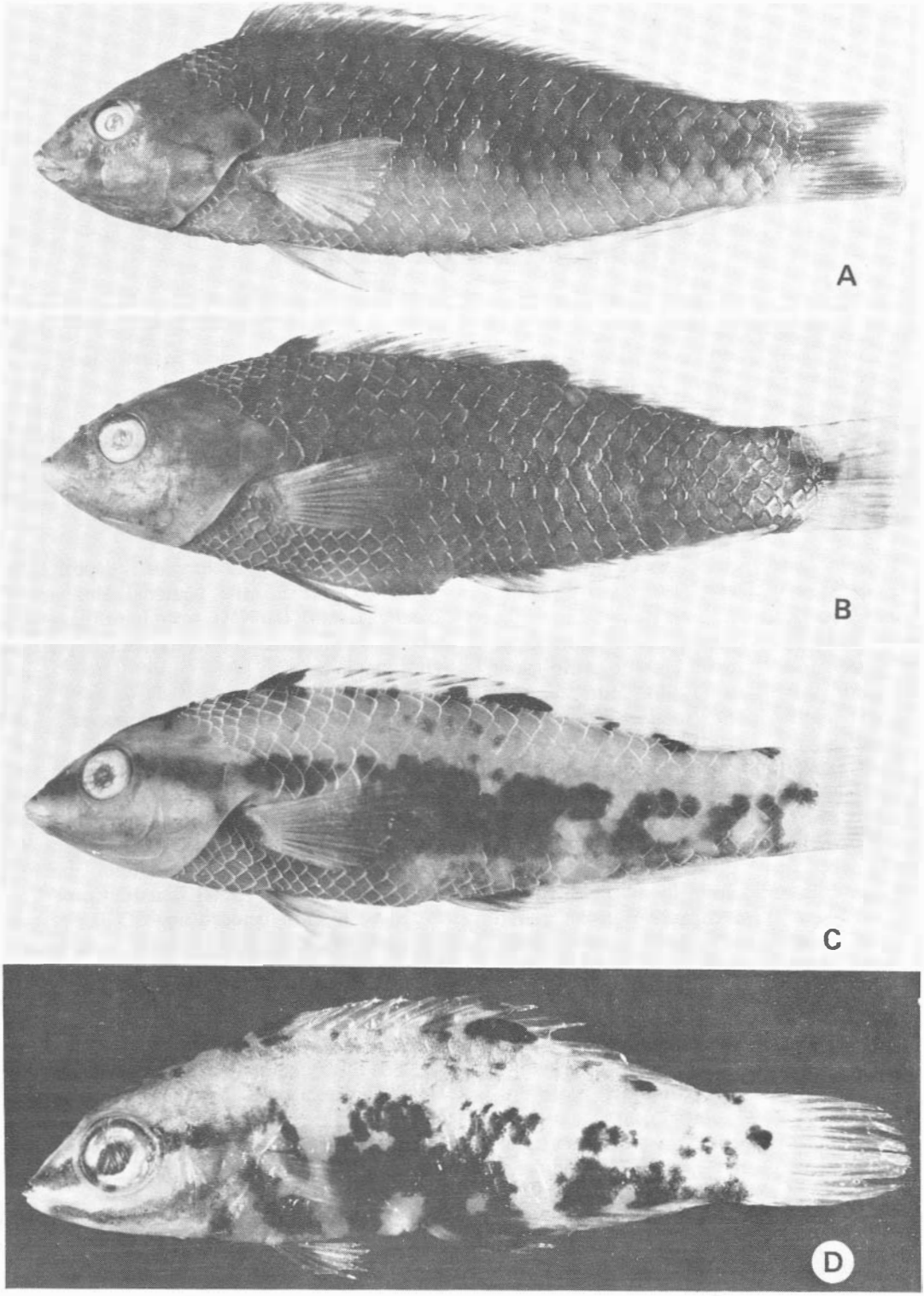

Fig. 1. *Halichoeres discolor,* new species, collected from Isla del Coco. A. LACM 32260-23, male holotype 108.0 mm SL; B. 32254-31, paratype 79.4 mm SL; C. LACM 32256-25, paratype 63.1 mm SL; D. UCR 863-7, paratype 23.2 mm SL.

March: 47 specimens (17.2-95.2 mm SL). LACM 32256-25: between Punta Pacheco and Punta Ulloa, due E of Bahía Chatham; 5°33'12"N, 87°02'14"W; depth 4.5-6 m; 1 April; 10 specimens (11.6-74.4 mm SL). LACM 32260-24: same data as holotype; 9 specimens (14.0-95.2 mm SL). UCR 729-3: S side of Isla Cáscara (Isla Yglesias), Bahía Wafer; 5°33'07"N, 87°03'57"W; depth 31 m; 4 April; 2 specimens (47.7-63.7 mm SL). USNM 236417: S side of Roca Gissler, Bahía Wafer; 5°32'45"N, 87°03'49"W; depth 5 m; 4 April; 15 specimens (24.0-81.6 mm SL). UCR 733-1: 50 m N of Punta Gissler, W end of Bahía Wafer 5°32'45"N, 87°04'22"W; depth 24 m; 5 April; 2 specimens (22.2-36.5 mm SL). UCR 741-17: 100 m S of Península Presidio, Bahía Wafer; 5°32'55"N: 87°03'47"W; depth 4.5-10.5 m; 6 April; 3 specimens (29.4-63.5 mm SL).

Doheny Expedition, 1975: UCR 857-14: S side of Roca Gissler, Bahía Wafer; 5°32'45''N, 87°03'50"W; depth 7 m; 17 April; 3 specimens (32.0-58.3 mm SL). UCR 863-7: 100 m N of Roca Pan de Azúcar: 5°32'41"N, 87°04'55" W; depth 10 m; 19 April; 9 specimens (13.5-68.0 mm SL). UCR 867-5: S side of Isla Pájara, Bahía Weston; 5°33'24''N, 87°03'20"W; depth 21 m; 21 April; 3 specimens (16.1-121.7 mm SL).

Steele Expedition, 1978: UCR 1154-3: 100 m N of Isla Muela, Bahía Yglesias; 5°30'N, 87°04' W; depth 7-10 m; 23 March; 7 specimens (13.0-35.7 mm SL). UCR 1155-22: 300 m SW Cabo Descubierto; 5°31' N, 87°02' W; depth 20 m; 24 March; 12 specimens (12.3-43.1 mm SL). UCR 1156-12: 850 m N Cabo Atrevido; 5°32' N, 87° 01W: depth 10 m; 26 March; 12 specimens (12.1-61.0 mm SL).

Diagnosis: A new labrid of the genus *Halichoeres* with multipored scales in the anterior lateral line (usually 3 pores per scale, but range of variation 1 to 5), a low gill raker count (14-17) and ontogenetic polychromatism. In tropical eastern Pacific waters it can be distinguished from *aestuaricola* and *dispilus* by having multipored anterior lateral line scales rather than unipored scales. *H. discolor* differs from *chierchiae* by having a variegated-marked juvenile rather than striped, and by lacking a dark ocellus above the pectoral fin. The mottled phase of *discolor* is similar to juvenile *nicholsi*, although the latter has large dark blotches on the head and upper half of the flanks and a yellow-edged black ocellus on mid-dorsal fin that consistently distinguishes it; adult *nicholsi* with their black dorsal saddle and blue markings covering the body and fins are quite distinct from adult *discolor*. The new species differs from all its eastern Pacific congeners in the lower total gill raker number (14-17, $\bar{x}$ = 15.6 vs. 16-20, $\bar{x}$ = 17.0-18.7).

TABLE 1

Body proportions in percentage of standard length of holotype (LACM 32260-23) and ten paratypes (LACM 32254-31) of Halichoeres discolor, *new species.*

	Holotype	Paratypes (5) Juvenile color	Paratypes (5) Adult color
Standard length	108.0 mm	36.9-72.1 mm	72.0-95.2 mm
Head length	32.6	33.5-37.9	34.5-35.8
Eye diameter	4.4	7 2-9.8	6.3-8.3
Snout length	10.6	9.5-10.7	10.8-11.4
Bony interorbital	5.6	5.4-6.3	5.5-6.0
Suborbital width	6.1	4.3-5.3	5.1-6.4
Body depth (at P_2 origin)	28.5	26.8-28.7	28.3-29.6
Least depth caudal peduncle	14.3	13.9-14.6	13.9-17.7
Length of caudal peduncle	12.0	12.0-12.5	11.6-12.7
Predorsal distance	30.7	32.3-35.0	32.5-34.5
Preanal distance	55.6	56.1-58.8	55.6-61.0
Length caudal fin	20.0	19.7-22.2	19.2-20.3
Length first dorsal-fin spine	5.7	6.1-7.3	5.5-7.1
Length last dorsal-fin spine	8.8	9.2-11.7	9.5-10.5
Length pelvic fin	17.2	14.9-16.8	15.3-16.7
Length pectoral fin	21.3	19.9-21.7	19.5-21.8

Description : *H. discolor* conforms to recent diagnoses of *Halichoeres* (Schultz, 1960; Randall and Böhlke, 1965). Proportions in percentage of standard length are shown in Table 1.

Dorsal rays IX,11; anal rays III,12 (one aberrant individual with I,11); pectoral rays 13 (first two unbranched); pelvic rays I,5; principal caudal rays 14 (outer ones unbranched); total gill rakers including rudiments (frequencies in parentheses) 14 (1), 15 (4), 16 (1, holotype), 17 (5); upper lateral line scales 19, 2 descending scales, lower lateral line scales (plus one posterior to caudal base) 6; scales above lateral line 3; scales below lateral line 8; vertebrae 9 + 16 = 25 (7), 10 + 15 = 25 (3).

Body moderately deep in adults, greatest depth at pelvic fin origin 3.4-3.7 times in SL; dorsal and ventral profiles evenly convex. Least depth of caudal peduncle 2.3-2.6 times in HL (head length); caudal peduncle length (2.7-3.0 times in HL).

Head length 2.6-3.1 times in SL. Eye diameter 3.8-5.5 times in HL. Snout length greater than eye diameter except in specimens smaller than 35 mm SL, 3.1-4.0 times in HL. Mouth terminal; maxillary reaching to a vertical from anterior margin of eye. One pair of curved

canine teeth anteriorly in upper jaw, two pairs of curved canines anteriorly in lower jaw; small conical rounded-tipped teeth continuing to back of jaw; one or occasionally two canine teeth at rictus of upper jaw. Gill rakers of moderate length, longest equal to one-half length of longest gill filament of first gill arch.

Scales cycloid, breast scales smaller (about one-half exposed width) than scales above pectoral fin base; no patch of scales on upper part of opercle; predorsal scales 6 or 7, not crossing nape; number of pores per lateral line scale usually three, but on single fish some scales with from one to five pores may occur.

Dorsal fin originating above first lateral line scale; predorsal distance 2.3-3.1 times in SL; first dorsal-fin spine 5.1-6.1 times in HL; last dorsal-fin spine 3.0-3.7 times in HL. Anal fin arising directly below a point between spinous and rayed portions of dorsal fin; preanal distance 1.6-1.8 times in SL. Pectoral fin origin directly below dorsal fin origin, its tip not reaching to tip; length of pectoral fin 1.5-1.8 times in HL. Pelvic fin origin below middle of pectoral fin base, its tip not quite reaching vertical from tip of pectoral; length of pelvic fin 1.9-2.3 times in HL. Caudal fin truncate or very slightly convex; length of caudal fin 1.6-1.8 times in HL.

Color of young in preservative (Figs. 1C & 1D) pale with irregular dark brown blotches on lower two-thirds of body; a brown stripe through eye and a tan curved stripe below eye; a diagonal brown stripe on base of pectoral fin; an irregular brown spot on base of mid-caudal rays and on upper procurrent caudal rays. Several dark brown blotches along dorsal midline, some extending onto dorsal fin; a prominent dorsal fin spot between first and third dorsal fin spines and another between first and fifth soft dorsal rays. A dark blotch on first five elements of anal fin.

In transition phase (Fig. 1C) dark blotches on lower third of body begin to disappear. Older specimens (Fig. 1B) become uniformly dark brown or lightly blotched. Large adults (Fig. 1A) mottled brown on upper half of body; median fins dusky; two undulating stripes below eye and one on base of pectoral fin.

Color of recently captured juvenile, ca. 40 mm SL: Ground color tan above, white below; irregular jet black blotches on lower two-thirds of body; a black band transecting eye from near snout tip to posterior margin of opercle and continuing a short distance on body; a curved black band below eye from behind lower lip to opercular margin, interspace and lips pale yellow, isthmus white. Iris red-orange with black on posterior margin. Median fins yellowish; dorsal fin with a black spot on first spines, a smaller spot on last spines, a large oval spot on first soft rays, a dot on base of seventh soft ray and small blotch at base of last dorsal rays; an irregular orange dorsal margin becoming wider and subterminal on soft dorsal; anal fin with large black blotch on first elements, a wide orange stripe along entire margin of fin; caudal fin with black spot at upper base and blotch at mid-base, basal portion yellowish, middle third orange fading out on posterior third of fin. Lateral edge and most of basal portion of pelvic fin black, rest of fin transparent; pectoral fin transparent with rays finely outlined in black.

A juvenile, 66 mm SL, as above with following differences: an overall salmon color to body and head; pale interspace below eye yellow, but outlined in white; margin of dorsal fin and nearly entire anal and caudal fins salmon color.

A young adult, 81.5 mm SL: General appearance of upper body and head dark gray with salmon-brown hue on ventrum; iris bright orange; head and anterior third of body with pale blue markings; a curved blue line from posterodorsal margin of eye extending part way to nape, another from eye's diameter behind eye to upper margin of gill opening, a long irregular blue stripe from midline of snout above lip running below eye nearly to opercular margin at which point extending vertically ventrad to opercular margin, a discontinuous blue stripe from lower lip to opercular margin, two blue marks along posterior margin of preopercle, six blue marks along subopercle; a blue stripe on base of pectoral fin; other irregularly arranged blue spots and dashes on body above pectoral fin. Median fins bright salmon colored; dorsal fin with scattered dusky areas; anal fin solid salmon colored and caudal fin with two yellow-orange blotches bordering a dusky area at midcaudal base, a dorsal and ventral dark blotch on upper and lower caudal margins and central area salmon-colored shading to yellow on posterior border. Lateral rays of pelvic fin dusky salmon, median rays transparent; pectoral fin rays transparent with

dusky area basally.

A large adult, the holotype (Fig. 1A), 108.0 mm SL: General appearance dark gray above, lower half of head and body yellow-brown. Iris bright orange. Stripes on head dark blue, forming same pattern as above. Basal half of dorsal fin dark gray, spinous portion entirely gray anteriorly with salmon-colored middle portion posteriorly, distal half of rayed portion salmon-colored; anal fin bright salmon color , dusky portion at very base edged in blue; caudal fin dark gray except for crescent-shaped yellow posterior border. Pelvic fin dusky yellow, pectoral fins transparent.

Etymology: The species name is derived from the Latin *discolor,* variegated or parti-colored, in reference to the juvenile coloration.

Remarks: The striking difference in color pattern between young and adult individuals is not unusual in the family Labridae, nor in the genus *Halichoeres.* The mottled juvenile color phase persists in some individuals up to 75 mm SL, a transitional phase occurs between sizes of 55 to 70 mm SL and the adult coloration may be present in individuals as small as 65 mm SL. Considerable sexual maturity was attained by some of the largest females still in the mottled color phase, which appeared to contain nearly ripe eggs.

The peculiar mottled phase found in the juveniles of *discolor, nicholsi* and also in the Indo Pacific *Halichoeres hortulanus* suggests a close relationship between these species.

Distribution: The new species is known only from Isla del Coco located about 480 km SW of the Costa Rican mainland. It was collected at scattered sites around the island at depths between 4.5 and 31 m and was most common in association with live corals, less common over sand not closely adjacent to patch reefs.

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RESUMEN

Se describe una especie nueva de lábrido, *Halichoeres discolor.* La descripción se basa en 136 ejemplares colectados en 14 sitios costeros de la Isla del Coco, y conocidos únicamente de esa localidad. Los juveniles de esta especie presentan una coloración que los distingue de los adultos y que se asemeja al patrón de coloración de los juveniles de *Halichoeres nicholsi* de la costa continental del Oceáno Pacífico oriental. La coloración de los adultos de la nueva especie es gris oscuro arriba, amarillo parduzco abajo con rayas azules en la cabeza y en la parte anterior del cuerpo. En las aletas impares resalta el color salmón.

LITERATURE CITED

Briggs, J.C. 1974. Marine zoogeography. McGraw-Hill, New York, 475 p.

Randall, J.E., & J.E. Böhlke. 1965. Review of the Atlantic labrid fishes of the genus *Halichoeres.* Proc. Acad. Nat. Sci. Philad., 117:235-259.

Schultz, L.P. 1960. Family Labridae, p. 121-238. *In* L.P. Schultz *et al.* (eds.)., Fishes of the Marshall and Marianas Islands. Bull. U.S. Nat. Mus., 202.

Snodgrass, R.E. & E. Heller. 1905. Papers from the Hopkins-Stanford Galapagos Expedition, 1898-1899. XVII. Shore fishes of the Revillagigedo, Clipperton, Cocos and Galapagos Islands. Proc. Wash. Acad. Sci., 6:333-427.