

## *Pascua caudilinea*, a New Genus and Species of Gobiid Fish (Perciformes: Gobiidae) from Easter Island

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(Accepted November 9, 2004)

**John E. Randall (2005)** *Pascua caudilinea*, a new genus and species of gobiid fish (Perciformes: Gobiidae) from Easter Island. *Zoological Studies* 44(1): 19-25. *Pascua caudilinea* is described as a new genus and species of Gobiidae from 33 specimens, 8.1~27.7 mm SL, collected at Easter I. from tidepools to 40 m. It is distinguished by the following characters: head width less than body depth; 1st gill slit closed by membrane; gill opening ending at level of ventral edge of pectoral-fin base; posterior nostril not tubular; a complete cephalic sensory pore system; reduced sensory papillae of cheek; dorsal fins not completely separate, VI-I,8-9 (rarely 8); dorsal fin pterygiophores as found in *Bathygobius*; anal rays I,8; caudal fin rounded, shorter than head, with 17 segmented rays (14 branched); pectoral rays 20 or 21; pelvic rays I,5, fins completely separated, without a frenum; 5th pelvic ray unbranched and clearly shorter than 4th ray; scales ctenoid except a few anteriorly above pectoral-fin base and on abdomen where cycloid, 24~29 in longitudinal series; and no scales on head, nape, prepectoral area, or chest. The closest relative is an undescribed species from Rapa. <http://www.sinica.edu.tw/zool/zoolstud/44.1/19.pdf>

**Key words:** Taxonomy, Gobiidae, *Pascua caudilinea*, Easter Island.

Easter Island in the southeastern Pacific at 27°9'S, 109°26'W is the easternmost inhabited island of Oceania and the most isolated in the Indo-Pacific region. As a result of this isolation, the subtropical latitude, the island's small size, and limited aquatic habitats, its marine fauna is very impoverished (DiSalvo et al. 1988).

The author was privileged to make 3 fish-collecting trips to Easter I. in 1969, 1985, and 1986. From his and other collections, 133 species of shore fishes (i.e. nonpelagic and occurring at less than 200 m) are known from the island. Twenty-nine of these fishes are endemics, hence a level of endemism of 21.8%. This is the 2nd highest percentage of endemism for shore fishes in the Indo-Pacific region after the Hawaiian Is. (Randall 1998).

The fishes of the Gobiidae usually have a higher number of species than any other family of fishes in the tropical and subtropical marine regions of the world. Fish collections at Easter I.,

however, have yielded only 5 species of gobiids, fewer than the fishes of the families Labridae, Carangidae, Chaetodontidae, Muraenidae, and Serranidae. The fishes of these 5 families have pelagic eggs, whereas those of the Gobiidae are demersal (therefore gobies usually have shorter larval life). The Easter I. gobies include *Kelloggella oligolepis* (Jenkins) from rocky pools high in the intertidal zone (surprisingly reported otherwise only from the type locality, the Hawaiian Is.); *Gnatholepis cauerensis pascuensis* Randall and Greenfield, an Easter I. subspecies; *Priolepis* sp., a new species from Easter I. and Rapa to be described by H.K. Larson and D.F. Hoese; *Trimma unisquamis* (Gosline), wide-ranging from the Hawaiian Is. (type locality) to the Comoro Is.; and a species restricted to Easter I. that was first tentatively placed in the genus *Heteroleotris* (Randall et al. 1990). It represents a new genus as well as a new species, the description of which is the subject of this paper.

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## MATERIALS AND METHODS

Type specimens of the new species have been deposited at the following institutions: Institute of Zoology, Academia Sinica, Taipei (ASIZP); Bernice P. Bishop Museum, Honolulu (BPBM); California Academy of Sciences, San Francisco (CAS); Muséum National d'Histoire Naturelle, Paris (MNHN); Museo Nacional de Historia Natural, Santiago, Chile (MNHNC); National Science Museum, Tokyo (NSMT); Queensland Museum, Brisbane (QM); Royal Ontario Museum, Toronto (ROM); and the United States National Museum of Natural History, Washington, DC (USNM).

Lengths of specimens are given as standard length (SL), measured from the most-anterior end of the upper lip to the base of the caudal fin (posterior end of the hypural plate); head length is measured from the same anterior point to the posterior end of the opercular membrane; body depth is the greatest depth; body width is the maximum width just posterior to the gill opening; head length is taken from the front of the upper lip in the median plane to the most-posterior end of the opercular membrane; head width is the maximum width, adjusting for any excessive flaring of the operculum; orbit diameter is the greatest fleshy diameter, and interorbital width the least fleshy width; upper-jaw length is taken from the front of the upper lip to the posterior end of the maxilla; caudal-peduncle depth is the least depth, and caudal-peduncle length the horizontal distance between verticals at the rear base of the anal fin and the caudal-fin base; lengths of the spines and rays of the fins are measured to their extreme bases; caudal-fin length is the horizontal distance from the base of the fin to a vertical at the tip of the longest ray; pectoral-fin length is the length of the longest ray; pelvic-fin length is measured from the base of the pelvic spine to the tip of the longest soft ray. Morphometric data presented in table 1 are given as percentages of the standard length. Proportional measurements in the text are rounded to the nearest 0.05.

The longitudinal scale series is the number of oblique rows of scales from the 1st scale above the pectoral-fin base to the caudal-fin base. The transverse scale count is made from the origin of the anal fin obliquely upward to the base of the 1st dorsal fin. Gill rakers are counted on the 1st gill arch, the number for the upper limb given first. Meristic and morphometric data shown in parentheses refer to paratypes.

## *Pascua* gen. nov.

*Type species: Pascua caudilinea* Randall, described below.

*Diagnosis:* A gobiid with the 1st gill slit fully closed by a membrane; gill opening ending at level of lower edge of pectoral-fin base; dorsal rays VI-1,8-9 (rarely 8), the 6th spine joined by membrane to spine preceding soft portion of fin a short distance above base of fin; first 2 dorsal spines of adult males prolonged, the 1st longest; dorsal pterygiophore formula 3-22110 (fig. 1A of Birdsong et al. 1988); anal rays 1,8; pectoral rays 20 or 21, no rays free from membrane; pelvic fins 1,5, fully separated, without a frenum; 5th pelvic ray distinctly shorter than 4th and unbranched; caudal fin rounded, shorter than head length, with 17 segmented caudal rays, 14 of which are branched; body with 24~29 scales in longitudinal series, ctenoid except a few scales above base of pectoral fin and on abdomen where cycloid; head, nape, prepectoral area, and chest naked; branchiostegal rays 5; vertebrae 10 + 17; sensory papillae of cheek greatly reduced (Fig. 1); cephalic sensory pore system complete (type A as shown in fig. 4 of Lachner and Karnella 1980); posterior nostril not tubular; body depth 4.2~5.3 in SL; head length 3.05~3.1 in SL; head not depressed, its width less than body depth in adults.

*Etymology:* This genus is named *Pascua* from the Spanish word for Easter, the basis for the Spanish name of Easter I., Isla de Pascua, now a dependency of Chile. The island was discovered by the Dutch explorer Jacob Roggeveen on Easter Sunday, 1722. Its Polynesian name is Rapanui.

*Remarks:* The type species of this genus is presently known only from Easter I. in the southeastern Pacific. As mentioned, it was first classified in the genus *Heteroleotris* Bleeker because of the closure of the 1st gill slit by a membrane. *Heteroleotris* was proposed by Bleeker (1874) for the Red Sea species *Gobius diadematus* Rüppell. Smith (1958) placed the genera *Leioleotris* Fowler (type species, *L. zonatus* Fowler) and *Riukiuia* Fowler (type species *R. poecila* Fowler) in the synonymy of *Heteroleotris*. Akihito and Meguro (1981) added the following to the synonymy: *Lioteres* Smith (type species, *L. caminatus* Smith), *Chriolepidops* Smith (type species, *C. nebulofasciatus* Smith), *Satulinus* Smith (type species, *S. zanzibarensis* Smith), *Dactyleleotris* Smith (type species, *D. tentaculatus* Smith), and the subgenus *Pseudolioteres* (type species, *L. simulans* Smith); they synonymized *simulans* with *H. diadematus*

(Rüppell). All share the following characters: tubular anterior and posterior nostrils, most of 1st gill opening closed by a membrane to lower limb of 1st gill arch, a broad isthmus with gill membranes attached to pectoral-fin base, VI dorsal spines, segmented caudal-fin rays 9 + 8, completely separated pelvic fins without a frenum; 5 branchiostegal rays, 10 + 17 vertebrae, a *Bathygobius*-type 1st dorsal pterygiophore formula (Birdsong et al. 1988), an epural, and a pattern of sensory papillae on the cheek featuring 4 transverse rows.

Hoese (1986) followed Akihito and Meguro with respect to the generic synonymy of *Heteroeleotris*. He added that the branched caudal rays are normally 15, with some large adults rarely having 16 or 17. He noted that the 1st dorsal fin is usually connected by membrane to the base of the 2nd dorsal fin, added some osteological characters, and reported “a distinct, single-lobed mental frenum followed by 2 parallel papilla rows.” I prefer the term mental flap for this structure, as used by Winterbottom (1976). In some species of *Heteroeleotris* it is little more than a flaccid median broadening of the lower lip. The 2 rows of papillae that follow are short and not always parallel.

Hoese recognized 13 species of *Heteroeleotris*, 2 of which he described as new. All are confined to the western Indian Ocean and Arabian waters except *H. poecila* (Fowler), described from the Ryukyu Is., but now also known from Taiwan, Sri Lanka, and the Comoro Is.

The gobies that Hoese placed in *Heteroeleotris* exhibit a wide variation of characters. Within the genus there are species with the 1st gill slit 1/2 to fully closed; pelvic fins fused or entirely separate, the rays 1,5 or 1,4; body naked (or with at most 11 scales in longitudinal series on caudal peduncle) or with 24 to 52 scales in longitudinal series; scales, when present, ctenoid or cycloid; dorsal soft rays varying from 8 to 14, anal soft rays from 7 to 12, and pectoral rays from 15 to 19; sensory head pores present or absent, a prominent tentacle over eye present or absent; and posterior nostril tubular or not. One species has 2 spines on the upper part of the operculum.

The type species of the new genus *Pascua* is differentiated from all known species of *Heteroeleotris* by the reduction of the sensory papillae on the cheek (about 8 papillae form a small right-angle series below the posterior part of the eye); having a transverse row of 4 papillae adjacent to posterior edge of the mental flap instead of 2 longitudinal series of papillae; 14 branched caudal rays compared to 15 (rarely 16 or 17); 20 or 21 pectoral

rays instead of 15 to 19 (rarely 19); 1st or 2nd dorsal spines prolonged in adult males, the 1st spine longest; and 5th pelvic ray slender, about 2/3 to 3/4 length of 4th ray, and unbranched. *Pascua* is separable from all but one of the species of *Heteroeleotris* by its head not being depressed (head width less than body depth in adults), and it is distinct from most species in the posterior nostril having a low rim, rather than being tubular.

Nelson (1994) wrote that the Gobiidae comprises “about 212 genera and roughly 1,875 species.” A consideration of the characters that differentiate these many genera reveals that the morphological level that separates some allied genera is far greater than others. Larson in Carpenter and Liem (2001) provided a valuable key to the genera of gobies of the western and central Pacific. Some key characters that separate genera are what one generally finds at the species-level, such as the number of soft rays in the fins, number of scales, size and shape of the caudal fin, and even color. As shown by the excellent series of head drawings of gobiid fishes in Masuda et al. (1984), the pattern of sensory papillae on the cheek is of special importance in the classification of the genera of the Gobiidae. On papilla pattern alone, *Pascua caudilinea* would warrant generic distinction. Given the additional characters listed above that separate *Pascua* from *Heteroeleotris*, generic distinction is clearly warranted.

***Pascua caudilinea* sp. nov.**

(Table 1; Figs. 1-4)

*Holotype*: BPBM 39325, male, 27.9 mm, Easter I., on west coast off Tahai, 30 m, from cracking dead coral, L.H. DiSalvo, 3 Feb. 1986.

*Paratypes*: BPBM 39157, 16.3 mm, Easter I., off Motu Tautara, cave entrance, 18 m, rotenone, J.E. Randall, 6 Feb. 1985; BPBM 39168, 3: 18.6~24.6 mm, Easter I., Hanga Hoonu (= La Perouse Bay), tidepool, 0~0.5 m, rotenone, J.E. Randall, J.L. Earle, and A. Cea Egaña, 10 Feb. 1985; BPBM 39198, 2: 25.0 and 27.7 mm, Easter I., NE coast, Anakena Bay, off east end, sand and isolated small rock and coral, 21.5 m, rotenone, J.E. Randall and L.H. DiSalvo, 14 Feb. 1985; ASIZP P62876, 2: 13.3 and 24.8 mm; CAS 218800, 2: 26.8 and 27.0 mm; MNHN 2004-0001, 2: 18.1 and 18.7 mm; MNHNC 7226, 2: 15.7 and 21.5 mm; NSMT-P 67745, 2: 13.9 and 24.2 mm; QM I.34898, 2: 11.9 and 15.8 mm; ROM 74108, 2: 14.8 and 21.2 mm, all with same data as BPBM

39198; BPBM 39309, 15.2 mm, Easter I., off Motu Tautara, 18.5 m, rotenone, J.E. Randall and J.L. Earle, 1 Feb. 1986; BPBM 39326, 8: 8.1~17.6 mm, same data as for holotype; BPBM 39351, 20.3 mm, Easter I., off Motu Tautara, cave, 40 m, rotenone, J.E. Randall, A. Cea Egaña, L.H. DiSalvo, J.L. Earle, and M. Garcia, 10 Feb. 1986; USNM 375529, 2: 16.2 and 26.4 mm, Easter I., off Ovahe, 24.5 m, rotenone, J.E. Randall and J.L. Earle, 11 Feb. 1986.

**Diagnosis:** Dorsal rays VI-I,8-9 (rarely 8), the 6th spine linked basally by membrane with spine at front of soft portion of fin; anal rays I,8; pectoral rays 20 or 21; branched caudal rays 14; pelvic fins fully separated; scales ctenoid except a few cycloid anteriorly and ventrally on abdomen; longitudinal scale series 24~29; no scales on head, nape, prepectoral area, or chest, body depth 4.2~5.3 in SL; head length 3.05~3.1 in SL; no opening above 1st gill arch (occluded by membrane); lower end of gill opening at level of ventral edge of pectoral-fin base; posterior nostril not tubular; sensory papillae of cheek reduced (Fig. 1); adult males with prolonged 1st 2 dorsal spines, the 1st longest; caudal fin rounded, shorter than head length; pale brown to whitish ventrally, with orangish to dark brown dots (dashes on some specimens) tending to form vertical rows; a longitudinal series of 12 dark blotches the size of pupil or smaller on side of body; a small dark brown spot behind upper part of eye; a dark brown or black line across most of caudal-fin base.

**Description:** Dorsal rays VI-I,9 (9; one of 24 examined with 8); anal rays I,8; all dorsal and anal rays branched, the last to base; pectoral rays 21 (13 of 24 with 20, and 11 with 21), all rays branched except uppermost; pelvic rays I,5, the 4th ray branched as many as 6 times in large adults, the short 5th ray unbranched; segmented caudal rays (of adults) 17; branched caudal rays 14; upper procurrent caudal rays 7; lower procurrent caudal rays 7; longitudinal scale series 26 (24~29); transverse series of scales from origin of anal fin to base of 1st dorsal fin 9; circumpeduncular scales 14; gill rakers 2 + 9 (1 or 2 + 8 or 9); vertebrae 10 + 17; 1st dorsal fin pterygiophore formula 3-22110.

Body depth 4.35 (4.2~5.3) in SL; body width 1.45 (1.2~1.5) in body depth; head length 3.1 (3.05~3.1) in SL; head width 4.7 (4.7~4.8) in SL; snout length 4.35 (4.15~4.5) in head length; eye large, the orbit diameter 3.75 (3.2~3.7) in head length; interorbital very narrow, the least fleshy width 7.15 (6.85~9.1) in orbit diameter; caudal-

peduncle depth 2.2 (2.2~2.45) in head length; caudal-peduncle length 1.4 (1.4~1.5) in head length.

Mouth oblique, forming an angle of about 45° to horizontal axis of head and body; lower jaw strongly projecting; mouth moderately large, maxilla usually reaching to or slightly posterior to a vertical through center of eye, upper-jaw length 2.1 (2.0~2.1) in head length; upper jaw with band of villiform teeth that narrows posteriorly, an outer row of well-spaced slender incurved canine teeth, and an inner row of strongly incurved depressible teeth that are shorter posteriorly; lower jaw with a narrow band of villiform teeth, outer row of 5 pairs of slender incurved canine teeth at front of jaw, and inner row of 6 or 7 strongly incurved canines on each side, the 5th and 6th about 1/2 way back in jaw the largest (these curving more posteriorly than medially); no teeth on palate. Tongue broadly rounded. Mental flap faintly trilobed on lower edge, followed by a transverse row of 4 sensory papillae.

Gill membranes broadly attached to isthmus. Gill opening ending at level of ventral edge of pectoral-fin base. First gill slit closed by membrane. Gill rakers short and tubercle-like.

Anterior nostril tubular, in front of center of eye (as viewed laterally), a little closer to upper lip than to edge of orbit; posterior nostril obliquely dorso-posterior to anterior nostril, adjacent to fleshy edge of orbit, with a low rim. Cephalic sensory pore system complete (type A, as diagrammed by Lachner and Karnella, 1980: fig. 4). Sensory papillae of cheek, as shown in fig. 1, greatly reduced compared to papillae of species of *Heteroleotris*

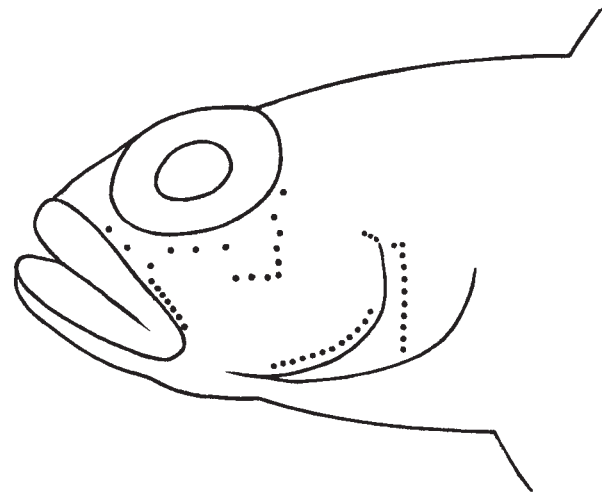


Fig. 1. Diagram of the sensory papillae on the cheek of *Pascua caudilinea* (J. Randall).

(see fig. 3 of Akihito and Meguro 1981 and figs. 3 and 5 of Hoese 1986).

Scales ctenoid except for 1 or 2 oblique rows above pectoral-fin base and ventrally on abdomen where cycloid (may be embedded on abdomen); no scales on head, nape, prepectoral area, or chest; no scales on fins except a vertical row of ctenoid scales on base of caudal fin.

Origin of dorsal fin posterior to a vertical at rear base of pelvic fins; predorsal length 2.9 (2.7~2.9) in SL; 1st dorsal spine longest (2nd spine sometimes subequal or slightly longer in females); the 1st and 2nd spines prolonged in males, 2.5 (2.95~5.75) in SL; 2nd dorsal spine 3.4 (3.9~5.95) in SL; 3rd dorsal spine 4.45 (5.05~6.3) in SL; 6th dorsal spine linked by membrane to 1st spine of 2nd dorsal fin near base; 1st spine of 2nd dorsal fin 2.15 (2.1~2.2) in head length; 2nd and 3rd dorsal soft rays of holotype longest (longest ray varying from 2nd to penultimate in paratypes), 1.6 (1.55~1.7) in head length; origin of anal fin below base of 2nd dorsal soft ray; preanal length 1.6 (1.6~1.75) in SL; anal spine 3.1 (2.95~3.35) in head length; 7th anal soft ray longest, 1.55 (1.5~1.65) in head length; caudal fin rounded, 1.25 (1.2~1.3) in head length; pectoral fins pointed, the 12th or 13th rays usually longest, 1.2 (1.15~1.3) in head length; origin of pelvic fins anterior to pectoral-fin base, the prepelvic length 3.3 (3.3~3.5) in SL; pelvic spine 3.3 (3.05~3.45) in head length; 4th pelvic ray longest, 3.05 (3.0~3.2) in SL; unbranched 5th pelvic ray 2/3 to 3/4 length of 4th ray and closely adherent to it.

Color of holotype in alcohol: pale yellowish with brown dots on upper 2/3 of body tending to form irregular vertical lines; a longitudinal series of 12 indistinct brown blotches on body at level of pectoral-fin base, the 1st 6 as paired blotches; head with scattered brown dots and an oblique quadrangular brown spot behind upper 1/2 of eye; fins pale, except for prominent dark brown line across base of branched caudal rays.

Color of holotype when fresh (Fig. 2): pale pinkish brown with numerous orangish brown dots on head and body, many on body in near-vertical rows; a longitudinal series of orangish blotches of pupil size or smaller on side of body with dark brown centers from grouping of melanophores; an oblique black spot behind upper 1/2 of eye; a pinkish white line extending ventrally from posterior 1/4 of eye; median fins translucent dusky, the base of each dorsal spine and soft ray within a small dark brown spot; basal part of spines of 1st dorsal fin with 3 dark brown spots, the lowermost connected

across fin with an indistinct brown band; spine and soft rays of 2nd dorsal fin crossed with 4 or 5 brown spots, many of these faintly connected across membranes by brownish bands; upper 9 branched caudal rays and membranes with small brownish spots; a black line nearly crossing base of caudal fin; pectoral fins translucent; pelvic fins strongly dusky.

Specimens taken from shallow water, such as tidepools (BPBM 6745, Fig. 3), were more heavily pigmented, whereas a 20.3-mm female paratype



Fig. 2. Holotype of *Pascua caudilinea*, male, BPBM 39325, 27.9 mm SL, Easter I., 30 m (J. Randall).



Fig. 3. *Pascua caudilinea*, male, BPBM 6745, 27.0 mm SL, Easter I., tidepool (J. Randall) (on loan to Australian Museum).



Fig. 4. Paratype of *Pascua caudilinea*, female, BPBM 39351, 20.3 mm SL, Easter I., 40 m (J. Randall).

(BPBM 39351, Fig. 4) collected in 40 m was translucent whitish, the dark dots and spots as seen on shallow-water fish orange or pale red; only the line at the base of the caudal fin retains some dark pigment. The difference in color pattern from the shallows to 40 m (which is probably gradual over this depth range) is undoubtedly related to the diminution of light with depth and a corresponding loss of melanin.

**Etymology:** Named *caudilinea* from the Latin for caudal and line, in reference to the dark line that nearly crosses the base of the caudal fin, the most-consistent and conspicuous color marking.

**Remarks:** This species is known only from Easter I. where it is one of the 16 most common fishes taken with ichthyocide in the depth range of 12~40 m (DiSalvo et al. 1988). It was never seen alive while diving by day or night. When L.H. DiSalvo brought dead coral rock ashore from 30 m

and broke it into pieces, he collected the holotype and 8 other specimens.

This goby is found over a remarkably broad range of depth from tidepools to at least 40 m (rotenone collections were not made deeper than 40 m). Gobies that are normally found in tidepools, such as those of the genus *Bathygobius*, are usually confined to shoal water. The same is true of many species of damselfishes (Pomacentridae). However, the Easter I. *Chrysiptera rapanui* (Greenfield and Hensley), otherwise known only from the Kermadec Is. (Francis et al. 1987) occurs in tidepools at Easter I. and ranges to at least 40 m. With only 5 species of gobiid fishes and only 3 pomacentrid fishes at Easter I., competition is lacking within these families that might otherwise have restricted these 2 species to narrow depth zones.

The closest relative of *Pascua caudilinea* is an undescribed species reported as *Heteroleotris*

**Table 1.** Proportional measurements of type specimens of *Pascua caudilinea* expressed as percentages of the standard length

|                            | Holotype      |               |               | Paratypes     |               |               |               |
|----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                            | BPBM<br>39325 | BPBM<br>39326 | BPBM<br>39168 | BPBM<br>39168 | BPBM<br>39168 | BPBM<br>39198 | BPBM<br>39198 |
| Sex                        | Male          | ?             | female        | male          | male          | male          | female        |
| Standard length (mm)       | 27.9          | 12.8          | 18.6          | 24.3          | 24.6          | 25.0          | 27.7          |
| Body depth                 | 22.9          | 18.8          | 21.6          | 21.2          | 22.8          | 23.8          | 22.8          |
| Body width                 | 16.0          | 12.4          | 16.8          | 17.4          | 16.5          | 17.2          | 16.1          |
| Head length                | 32.2          | 32.8          | 32.7          | 32.5          | 32.5          | 32.7          | 32.6          |
| Head width                 | 21.3          | 21.1          | 20.5          | 20.8          | 20.7          | 20.8          | 21.2          |
| Snout length               | 7.4           | 7.5           | 7.9           | 7.4           | 7.5           | 7.6           | 7.2           |
| Orbit diameter             | 8.6           | 10.2          | 10.0          | 9.0           | 8.9           | 8.8           | 8.9           |
| Interorbital width         | 1.2           | 1.2           | 1.1           | 1.2           | 1.1           | 1.2           | 1.3           |
| Upper-jaw length           | 15.3          | 16.0          | 16.2          | 15.5          | 15.4          | 16.0          | 16.2          |
| Caudal-peduncle depth      | 14.5          | 13.2          | 13.4          | 14.4          | 14.8          | 14.5          | 14.3          |
| Caudal-peduncle length     | 22.7          | 22.6          | 22.2          | 22.9          | 21.8          | 22.8          | 22.5          |
| Predorsal length           | 34.7          | 34.7          | 36.8          | 35.4          | 35.8          | 35.9          | 36.7          |
| Preanal length             | 58.5          | 58.8          | 60.1          | 58.4          | 60.4          | 57.8          | 61.8          |
| Prepelvic length           | 30.6          | 29.8          | 29.7          | 28.5          | 27.9          | 30.5          | 29.2          |
| Base of dorsal fins        | 43.7          | 46.4          | 43.6          | 46.3          | 45.5          | 42.6          | 45.2          |
| First dorsal spine         | 39.6          | 17.4          | 17.4          | 27.2          | 34.1          | 31.1          | 18.7          |
| Second dorsal spine        | 29.4          | 16.8          | 18.9          | 17.8          | 25.8          | 22.0          | 18.0          |
| Third dorsal spine         | 22.6          | 15.9          | 16.8          | 16.0          | 18.0          | 19.8          | 16.1          |
| Spine of second dorsal fin | 15.0          | 14.7          | 14.9          | 14.5          | 15.0          | 15.7          | 15.1          |
| Longest dorsal soft ray    | 20.4          | 19.3          | 21.0          | 20.3          | 20.5          | 20.8          | 21.0          |
| Anal-fin base              | 20.7          | 20.2          | 21.3          | 22.2          | 20.7          | 20.6          | 20.2          |
| Anal spine                 | 10.4          | 9.8           | 10.8          | 10.6          | 11.0          | 10.6          | 10.7          |
| Longest anal ray           | 21.0          | 20.7          | 19.8          | 21.8          | 20.7          | 22.1          | broken        |
| Caudal-fin length          | 25.6          | 24.8          | 26.6          | 25.0          | 25.7          | 26.8          | 25.6          |
| Pectoral-fin length        | 27.2          | 24.9          | 27.2          | 27.8          | 27.7          | 27.9          | 26.1          |
| Pelvic-spine length        | 9.7           | 9.5           | 10.7          | 9.5           | 10.3          | 11.0          | 10.6          |
| Pelvic-fin length          | 32.9          | 31.5          | 32.5          | 31.8          | 32.0          | 33.1          | 32.3          |

sp. by Randall et al. (1990: 34, fig. 44) from Rapa in the South Pacific. It is clearly a species of *Pascua* and very similar in general morphology and color pattern to *P. caudilinea*. The Rapa specimens of this goby have long been on loan to the Australian Museum.

**Acknowledgments:** The author thanks foremost the National Geographic Society that funded his 1969 and 1985 fish visits to Easter I., and the Engelhard Foundation for its support in 1986. He is also grateful to Gerald R. Allen, Louis H. DiSalvo, Alfredo Cea Egaña, John L. Earle, and Henri and Michel Garcia for assistance in the field; to David Catania for x-rays of type specimens; and to Arnold Y. Suzumoto and Loreen R. O'Hara for curatorial help.

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