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A New Species of *Eviota* with Discussion of the Nominal Genera *Eviota* and *Eviotops*

HELEN K. LARSON

A new species of *Eviota* (Gobiidae), with unbranched pectoral rays, is described. The characteristics previously used to distinguish *Eviotops* from *Eviota* are shown to be inadequate to justify generic separation. *Eviotops* is regarded here as a synonym of *Eviota*.

FOURTEEN specimens of what was thought to be *Eviotops storthynx* Rofen, were found in the University of Guam's fish collection. Upon examination of a paratype of *Eviotops storthynx* and subsequent correspondence with D. F. Hoese of the Australian Museum in Sydney, the 14 specimens were found to represent an undescribed species which is described herein as *Eviota pellucidus* n. sp. Additional specimens were collected recently in the Gilbert Islands by Dr. Hoese. The assignation of the members of the genus *Eviotops* is questioned in the discussion.

METHODS

Measurements and counts are modelled after those of Hubbs and Lagler (1958), body proportions are made in relationship to standard length unless otherwise indicated. Descriptions are based on the average of specimens examined, holotype measurements in parentheses. A paratype of *Eviotops storthynx* was borrowed from the Stanford University collections (SU) now at the California Academy of Sciences (CAS). Specimens of *Eviota sebreei* were on loan from the George Vanderbilt Foundation collection of 1954 (also housed at CAS). Paratypes of *Eviotops infulatus* were borrowed from the Smith Institute of Ichthyology (RUSI). The holotype and two paratypes of *Eviota pellucidus* are deposited at the Bernice P. Bishop Museum (BPBM) in Hawaii, while other paratypes are in the University of Guam fish collection (UG), and at the Australian Museum (AMS) in Sydney.

Eviota Jenkins

Eviota Jenkins, 1903. Type species: *E. epiphanes* Jenkins by monotypy and original designation.

Allogobius Waite 1904. Type species: *A. viridis* Waite by monotypy.

Eviotops Smith 1956. Type species: *E. infulatus* Smith by monotypy and original designation.

Small tropical marine gobies with separate pelvics, the rays many-branched ("fringed"); pectoral rays variably branched; body scaled but for head, nape and (in some species) breast; headpores present; gill opening restricted; teeth in several rows with one or more pairs of enlarged curved teeth towards front of jaws; tongue short, blunt or pointed.

Eviota pellucidus n. sp.

Figs. 1, 2, 3

Holotype.—BPBM 18586, 18.5 mm male, Double Reef between Uruno and Haputo Points, Guam, Mariana Islands, depth 3–8 m.

Paratypes.—BPBM 18585, 2 spec. (18.5–16.5) same data as holotype; UG 5299, 11 spec. (13–19.5), off Gagab Beach, Apra Harbor, depth 12–30 m, Guam, Mariana Islands. AMS I.18043-006, 4 spec. (10.4–21.2), Abaiang Atoll, Gilbert Islands, 4.6–8 m depth. AMS I.18039-002, 1 spec. (16.6). Abaiang Atoll, Gilbert Islands. 3.7 m depth. AMS I.18047-003, 1 spec. (17.3). Abaiang Atoll, Gilbert Islands. 4.6 m depth.

Description.—Body compressed, slender, greatest depth 3.6 (4.0). Length from snout to origin of dorsal fin 2.6 (2.7). Caudal peduncle length 4.6 (4.8), least depth 6.9 (8.2). Head length 3.0 (3.5), head compressed, width of head in head 1.9 (1.8). Eye 3.1 (3.3) in head length, set up high and forming part of head profile, which is slightly pointed. Mouth oblique, terminal, lower jaw slightly projecting. Length of maxillary 2.8 (2.6) in head, upper jaw terminating below anterior half of pupil. Snout 1.6 (1.7) in eye diameter, anterior nostrils in slender tubes which are about $\frac{3}{4}$ the width of upper lip. Least interorbital width 7.5 (5) in eye diameter. Headpore system as in Fig. 1D, with lateral canal and pore absent. A row of papillae below dentary, another row along base of anterior preopercular limb, an irregular row of papillae beginning just above maxillary and continuing anteriorly around eye to posterior

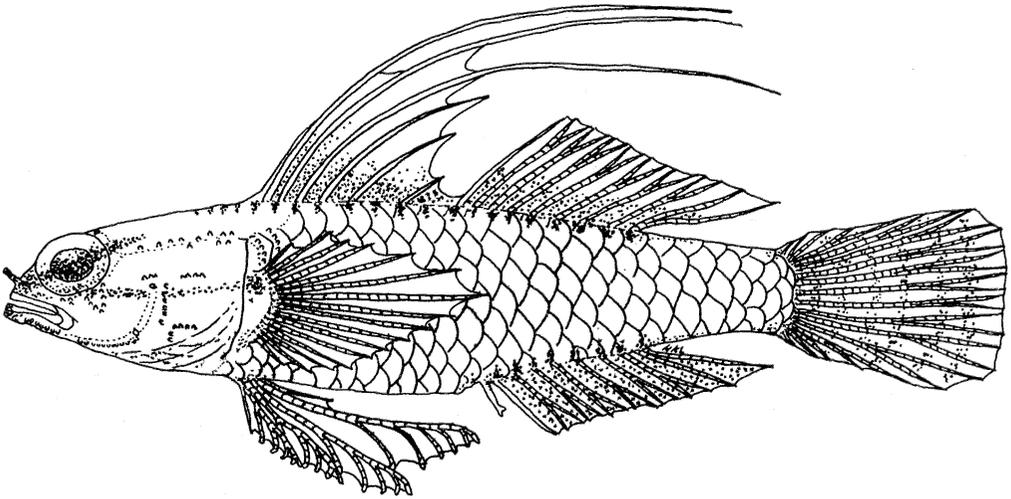


Fig. 1. Holotype of *Eviota pellucidus*, 18.5 mm SL showing color pattern as preserved in alcohol.

nostril; two short rows forming a V from lower eye edge onto cheek; an irregular row from eye across to posterior corner of opercle, several rows on opercle and shoulder (Fig. 1). Dorsal rays VI, 1, 8; anal rays 1, 7; pectoral rays 16 (15); branched caudal rays 11, pelvics 1, 4, i. Soft dorsal and anal pointed posteriorly, last rays when depressed not reaching caudal rays but reaching base of hypural plate. Spiny dorsal usually with first three spines elongate, longest spine (third in holotype) averaging 3.1 (3.2). First and second spines usually equally long and filamentous in both sexes. In males, longest spine may reach caudal base (Fig. 1). Pelvics reaching first or second anal ray; pelvic rays branching terminally with tips connected

by membrane (Fig. 3A). Pectoral long, 3.1 (3.2), all rays unbranched with membrane connecting rays up to just below tips in varying degrees (Fig. 1). Lateral line scales 22–23, with 7 transverse scales. Ctenoid scales cover body but absent from head, nape, and pectoral base. Breast scaled, the scales just overlapping pelvic ray bases (most of breast scales lost from holotype). Gill opening restricted, reaching to just below posterior preopercular border. Three gill arches present, very reduced rakers on the first arch: 1 + 1 + 5 – 6.

Both jaws with three irregular rows of small pointed teeth, teeth on outer row largest. Upper jaw with a widely-spaced outer row of large curved teeth, beginning posteriorly at

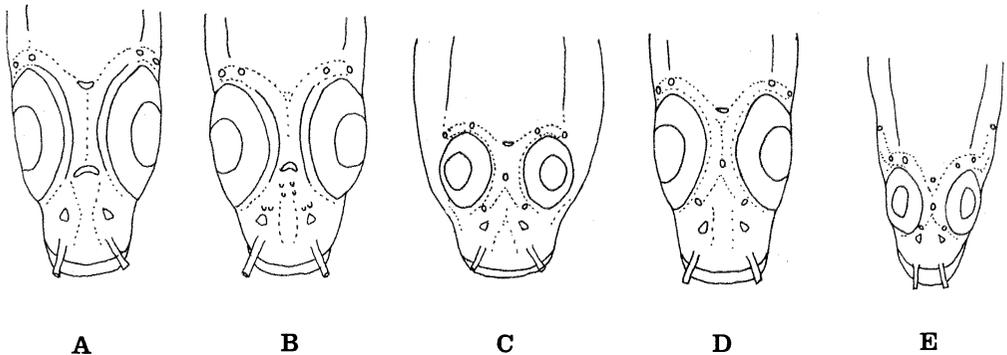


Fig. 2. Diagrammatic dorsal views of headpore patterns of A) *Eviotops infulatus*, B) *Eviota sebreei*, C) *Eviota zonura*, D) *Eviota pellucidus* and E) *Eviotops storthynx* (adapted from Rofen, 1959).

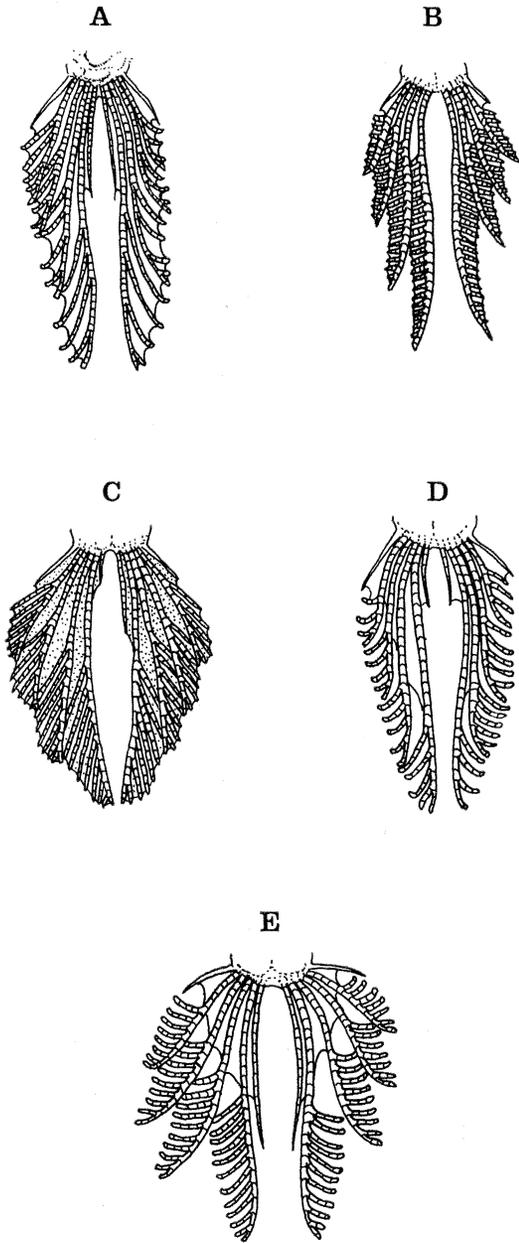


Fig. 3. Pelvic fin structure showing variation in branching of rays in A) *Eviota pellucidus*, B) *Eviota zonura*, C) *Eviota smaragdus*, D) *Eviotops infulatus* and E) *Eviota sebreei*.

middle of sides of jaw. On lower jaw, outer row consists of four to six enlarged curved teeth towards front of jaw; second row composed of closely-packed pointed teeth, with a

third row of larger curved teeth behind it. Tongue narrow and pointed.

Male genital papilla elongate, flattened and slender with an expanded papillate tip which may be slightly bilobed. Female genital papilla short and round with four slender projections at tip.

Name.—"pellucidus" from the Latin, meaning clear or transparent.

Life color.—Entire fish transparent rose pink, with red lines through snout, along dentary and anterior preopercular limb and from snout through center of eye and beyond it to end above opercle. Two short red lines on top of snout entering interorbital. A short diagonal red line present from lower rear of eye across preopercle, becoming faint across opercle and ending as a spot on upper pectoral base. Scale margins outlined in reddish on upper half of body; along mid-dorsal and midventral lines a series of red spots. Caudal fin lightly barred with red spots.

Color in alcohol.—Body plain yellowish, with scales on upper half of body more or less speckled with dusky spots, the duskiess usually following the scale outlines. Dusky spots may reach almost to belly. Pectoral base may be plain or with dusky mottlings or there may be a distinct spot on upper base. Head markings variable, nape may be quite dusky. An elongate to rounded spot may be present just above and behind eye, usually touching eye, or a dusky stripe may be present from snout tip, through eye, to behind eye. Chin, underside of jaws and anterior nostrils dusky. Two dusky streaks from top of upper lip along top of snout to interorbital. Pectorals and pelvics hyaline, caudal hyaline with irregular brown speckles. Spiny dorsal with a basal dusky bar, rest of fin hyaline, soft dorsal hyaline with base dusky. Anal entirely light dusky.

Relationships.—This species resembles *Eviotops storthynx* Rofen. However, it differs in the absence of a posterior lateral canal on the head, the presence of breast scales and the differences in color pattern (in alcohol). These two species also differ from other *Eviota* in possessing unbranched pectoral rays.

GENERIC PLACEMENT OF *Eviotops*

Material examined.—*Eviotops storthynx* Rofen, 1 paratype SU 39853, Philippines.

Eviotops infulatus Smith, paratypes (6) RUSI-636, (1) RUSI-637, Seychelles.

Eviota sebreei Jordan and Seale, (2) CAS 13582, (1) CAS 13576, (1) CAS 13585, (1) CAS 13580, (1) CAS 13583, (4) CAS 13579, (1) CAS 13578, (2) CAS 13584, (1) CAS 13581, (1) CAS 13582, Kapingamarangi Atoll.

Eviota smaragdus Jordan and Seale, (40) UG 4565, Tanguisson Point, Guam.

Eviota distigma Jordan and Seale, (12) UG 5346, Apra Harbor, Guam.

Eviota zonura Jordan and Seale, (29) UG 5621, Pago Bay, Guam.

Eviota nebulosa Smith, (3) UG 4335, Tanguisson Point, Guam.

Eviota afelei Jordan and Seale, (12) UG 5811, Pago Bay, Guam.

Discussion.—Smith (1956) proposed the genus *Eviotops*, stating that *Eviotops* differed from *Eviota* in possessing an elongate anterior nostril tube, a groove behind the orbits, much reduced interorbital, pectoral rays unbranched and very elongate first dorsal spines. In his key, Smith (1958) also noted that species of *Eviota* usually have a pelvic fin formula of I, 4, whereas those of *Eviotops* usually have a formula of I, 5 (the last ray is unbranched).

Rofen (1959) basically agreed with Smith and reported that "*Eviotops* is distinct from all specimens of *Eviota* examined in having all the pectoral fin rays simple instead of branched, and this character together with the extreme length of the nostrils is believed to indicate full generic status."

The genus *Eviota* probably contains 30 to 50 species (D. Hoese, pers. comm.), and variation among species of these particular characters and their combinations may be considerable. In order to gain some idea of this potential variability, six species of *Eviota* were examined for characters which supposedly differentiate that genus from the two species of *Eviotops*. The characters used were degree of pectoral ray branching, anterior nostril tube length (in eye diameter), least interorbital width, head profile (presence of groove behind eyes), headpore pattern, pelvic fin formula and first dorsal spine length (in males).

Among the four species with unbranched pectoral rays, all had pelvic fins I, 4, i. Headpore patterns were as in Fig. 1A, B, D and E. *E. infulatus* and *E. sebreei* had a groove behind the eyes, while *E. storthynx* and *E. pellucidus* did not. Interorbital width varied from five in eye (*E. sebreei*) to eight in eye (*E. pellucidus*). Anterior nostril tube length was from twice in eye (*E. sebreei*) to 7.5 in eye (*E. pellucidus*). The longest dorsal spine may just reach beyond

the caudal fin base (*E. pellucidus*) or just reach the first few soft dorsal rays (*E. sebreei*).

The five species with branched pectoral rays all had similar headpore patterns (Fig. 2C), with lateral canal variably present or absent. Pelvic fin formula varied from I, 4 (*E. afelei*, *E. zonura*, *E. nebulosa*) to I, 4, i (*E. distigma*, *E. smaragdus*). Only *E. nebulosa*, *E. distigma* and *E. smaragdus* had a groove behind the eyes. Interorbital width was from 8.5 in eye (*E. sebreei*) to 10 in eye (*E. distigma*). Anterior nostril tube length varied from 4.5 in eye (*E. smaragdus*) to 8 in eye (*E. distigma*). The longest dorsal spine may reach to the posterior base of soft dorsal (*E. distigma*, *E. smaragdus*) or just reach the first two or three soft dorsal rays (*E. nebulosa*, *E. afelei*, *E. zonura*).

Several of these characters used by Smith (e.g., dorsal spine length, interorbital width, nostril tube length) to separate the genera are highly variable between species and are therefore weak. Four species all possess unbranched pectoral rays and a constant pelvic fin formula. The only constant characters among the other five species are the branched pectoral rays and a similar headpore pattern. Thus, it would appear that the only common character separating the two genera is the nature of the pectoral rays. The degree of pectoral ray branching (rays may branch terminally or from the side) is variable among *Eviota* species. The amount of branching probably increases with size and age. An 8 mm juvenile *E. smaragdus* had all pectoral rays unbranched, whereas 13 to 22 mm adults had all rays branching terminally (except for a few uppermost splints). An 8.5 mm juvenile *E. zonura* had 2 to 3 branched lower pectoral rays, while 12 to 20 mm adults had upper rays unbranched and the lower 5 or 6 rays branching either terminally or from the side. Four out of five of the *Eviota* species examined with branched pectorals had pectoral ray structure similar to *E. zonura*.

Pelvic formula and structure are also quite variable among species of *Eviota*. The pelvics of *E. epiphanes* Jenkins, the type species, are illustrated in Bohlke and Robins (1962) and show one spine and four sidebranched rays. This is similar to the pelvics of *E. zonura* (Fig. 3B). Three out of the five *Eviota* with branched pectoral rays have this type of structure. The other two species have a variously developed fifth ray (which may be rudimentary), as do the five species with unbranched rays. The degree of variation is illustrated by *E. smaragdus* in Fig. 3C. *Eviotops infulatus* and *Eviota sebreei*

both have sidebranching pelvic rays with a fifth unbranched ray, as shown in Fig. 3D and E. The rays of each fin are connected by membrane basally. From the specimens examined, the degree of pectoral ray branching and pelvic formula vary according to species within the genera *Eviota* and *Eviotops* and should therefore not be used to distinguish these genera.

The groove behind the eyes and the interorbital width both vary from species to species according to head shape and eye placement. Dorsal spine length and anterior nostril tube length also vary considerably, although nostril tubes do tend to be longer in the species presently placed in the genus *Eviotops*.

One character not emphasized by Smith (1956) or Rofen (1959) is the headpore pattern. Rofen incompletely described and illustrated the headpores of *Eviotops storthynx*, but overlooked the second preopercular pore, the lateral canal and pore, and did not illustrate the pores behind the posterior nostrils. All *Eviota* species examined follow the pattern illustrated by *E. zonura* (Fig. 2C), with the posterior lateral canal and its posteriorly-opening pore being present or absent. Both *Eviotops infulatus* and *Eviota sebreei* differ from the typical *Eviota* headpore arrangement. Their anterior interorbital pores are enlarged, ovoid, and face anterodorsally. The pores behind the posterior nostrils are absent, as there is no anterior leg of the supraorbital canal (Figs. 2A, B). Furthermore, there is no posterior lateral canal and pore. *Eviotops storthynx*, on the other hand, has a more typical *Eviota* headpore pattern as illustrated in Fig. 2E.

In summary, it would appear that the characters used by Smith (1956, 1958) and Rofen (1959) are weak and vary among the species of *Eviota*. One character which unites most of

the *Eviota* group is the headpore pattern (Figs. 2C, D, E, F), as does the distinctive multiple branching of the pelvic rays. Pelvic fin formula and pectoral ray branching cannot be used to distinguish *Eviota* from *Eviotops*. *Eviotops* is regarded here as a synonym of *Eviota*.

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