

*a D. Ross Robertson,
in cordial homage*

Notes on a collection of chaenopsid blennies from Bahia Azul, Bocas del Toro, Caribbean, Panama

Philip A. HASTINGS* and D. Ross ROBERTSON**

Abstract

We present color photographs of seven species of chaenopsid blennies collected at a relatively remote site in Bocas del Toro, Caribbean, Panama. These include *Acanthemblemaria aspera*, *A. betinensis*, *A. chaplini*, *A. maria*, *A. rivasi*,

Coralliozetus cardonae and *Ekemblemaria nigra*. These records represent a significant range extension for *A. chaplini*, previously known only from Florida and the Bahamas, and shorter range extensions for *A. maria*, *C. cardonae*, and *E. nigra*, previously recorded at other sites in the southern Caribbean.



1



2

Figs 1 and 2. - Small islands at Bahia Azul

P. A. Hastings

All underwater photographs were taken by D.R. Robertson.

*Department of Ecology and Evolutionary Biology, University of Arizona, Tucson, AZ 85721 USA. Fax: 520-621-9190. E-mail: hastings@u.arizona.edu.

**Smithsonian Tropical Research Institute, Balboa, Panama. Mailing address: STRI, Unit 0948, APO AA 34002-0948, USA. Fax: 507-228-0516. E-mail: Robertsr@naos.si.edu.

Introduction

The Chaenopsidae includes nearly 80 species of primarily neotropical reef fishes distinctive for their habit of occupying vacant tests of invertebrates (Hastings and Springer 1994). The chaenopsids of the southern Caribbean have been intensively studied by Acero who published a series of papers (Acero 1984a, 1984b, 1987) focusing on their systematics and biogeography. Greenfield and Johnson (1981, 1990) have also reported on extensive collections of blennioid fishes from the western Caribbean, in Belize and Honduras.

In the summer of 1995 we visited a relatively remote site, Bahia Azul, on the western end of Peninsula Valiente in the province of Bocas del Toro, Panama. This site is approximately 40 kilometers east of the town of Bocas del Toro. Near the entrance to the Bahia Azul embayment are several rocky outcroppings (Figs 1-2) consisting of volcanic Miocene sedimentary rock. One of these, termed Finger Rock, was recently illustrated in Ross (1996 : 115).

We were surprised by the diversity of chaenopsids at this site. Within this cluster of very small islands spanning only several hundred meters we recorded seven species of chaenopsids. As our survey was limited to only a few hours of observations while snorkeling, other chaenopsid species may have been present. For three species, this site is the first distributional record for Panama (one of which is the first record for the southern Caribbean), and for another species, this site represents a range extension within Panama. Abbreviations used include: SL = standard length; UAZ = University of Arizona Fish Collection; ANSP = Academy of Natural Sciences of Philadelphia.

Acanthemblemaria aspera (Longley, 1927). The roughhead blenny was uncommon at Bahia Azul. It was observed in empty worm tubes in dead corals in 1-2 m depth, but may have been more common because we did not search this habitat extensively. The roughhead blenny is distinctive in having an orange eye, dark spots on the dorsal fin between spines II and IV and the lower portion of the head black in breeding males (Figs 3-4).

The roughhead blenny is widespread in the Greater Caribbean having been recorded from southern Florida, Bahamas, Greater Antilles, St. Barthelemy, Dominica, and in the western Caribbean from Yucatán to Islas del Rosario, Colombia (Smith-Vaniz and Palacio 1974; Acero 1984b). Different habitats have been reported for this species in the northern and southern Caribbean (Clarke, 1994). At Bahia Azul, as well as the San Blas Islands, Panama, it is typically found in coral rubble and dead coral heads in relatively shallow water (< 2 m), a habitat similar to that reported by Acero (1984a) for the species in Colombia.



3



4

Figs 3-4. - Underwater photographs of *Acanthemblemaria aspera* at San Blas.

Acanthemblemaria betinensis Smith-Vaniz et Palacio, 1974. Six specimens of the speckled blenny (41-52 mm SL; UAZ 95-30-6 and UAZ 95-30-10) were collected in shelters in rock and dead corals generally at depths greater than 2 m. Its distinctive color pattern, alluded to by its common name, is evident in Fig. 5. The body is covered with rows of white spots and elongate dashes. This species is known only from the southwestern Caribbean, from Puerto Limón, Costa Rica southward throughout Panama to Bahía de Cicto, Colombia (Smith-Vaniz and Palacio 1974; Acero 1984a).



Fig. 5. - Underwater photograph of *Acanthemblemaria betinensis* at Bahia Azul.

Acanthemblemaria chaplini Böhlke, 1957. The papillose blenny was common at Bahia Azul where we collected nine specimens ranging in size from 32.0- 36.8 mm SL (UAZ 95-30-9 and UAZ 95-30-4). Several other individuals were observed but not collected. These specimens agree closely with the description of the species in Smith-Vaniz and Palacio (1974), with specimens from the Bahamas (ANSP 144938), and with the frontispiece in Böhlke and Chaplin (1968). Meristics are as follows (number of specimens with each count are in parenthesis): dorsal-fin spines: XXI (4) or XXII (1); dorsal-fin rays 19 (5); total dorsal-fin elements 40 (4) or 41 (1); anal-fin rays 24 (1), 26 (3), or 27 (2); pectoral-fin rays 13(6). Life colors are illustrated in Figs 6-7. The most prominent bright color is on the anterior dorsal fin. The anterior and dorsal margins of this fin are orange and a prominent black blotch is present between spines I and III. This blotch includes one or two iridescent blue patches. Also, the head and body are tinged with orange and scattered with white spots.

The papillose blenny was previously known from Florida and the Bahamas, with the southernmost record being Cay Sal Bank (Fig. 8; Smith-Vaniz and Palacio, 1974). A single record of this species from St. John, Virgin Islands (Smith and Tyler 1975) is based on a misidentification of *A. aspera* (C. L. Smith, pers. comm., 10 June 1997). The record at Bahia Azul, Panama represents a phenomenal southward range extension of 1,620 km from Cay Sal Bank.

At Bahia Azul, this species was present in shelters on horizontal pavement areas of sedimentary rock in 1 to 2 m depth. This habitat is consistent with that reported for the species in the Bahamas where it occurs on limestone slopes in depths of 2 to 12 m (Böhlke and Chaplin 1968; Smith-Vaniz and Palacio 1974).



6



7

Figs 6-7. - Underwater photographs of *Acanthemblemaria chaplini* at Bahia Azul.

Acanthemblemaria maria Böhlke, 1961. The secretary blenny was uncommon at Bahia Azul, but we collected 6 specimens ranging in size from 24.8 to 37.6 mm SL (UAZ 95-30-8 and UAZ 95-30-5). These specimens fall within the considerable range of morphological variation reported for the species throughout its wide range in the Caribbean (Smith-Vaniz and Palacio 1974). Meristics are as follows: dorsal-fin spines XXII (4); dorsal-fin rays 13 (3) or 14 (1); total dorsal-fin elements 35 (5) or 36 (1); anal-fin rays 23 (3) or 24 (1); pectoral-fin rays 13 (6). Life colors are illustrated in Fig. 9. This species is strikingly colored with large white blotches on the ventral half of the cheek and body, white dorsal saddles, and an orange wash on the head.

The secretary blenny has a wide distribution (Fig. 8) having been recorded in the Bahamas, Cay Sal Bank, Grand Cayman, Puerto Rico (Isla Desecheo) and the Lesser Antilles, including Tobago (Smith-Vaniz and Palacio 1974), and from the western Caribbean at Belize (Greenfield and Johnson 1981) and Providencia (Acero 1984b). The Bahia Azul record represents a range extension of 475 km southward from Isla Providencia.

At Bahia Azul, the secretary blenny was found in barnacles in the shallowest areas of the subtidal, near the zone where *Corallozetes cardonae* was common (see below). The habitat of this species in the Bahamas is reportedly limestone slopes in depths of less than 9 m (Böhlke and Chaplin 1968; Smith-Vaniz and Palacio 1974). It is rare in Belize where it has been recorded on the reef crest or surge zone of the barrier reef (Greenfield and Johnson 1981; Clarke 1994). It is common in St. Croix where it is found in the surge zone in less than 1 m depth, although it is characteristically found in 2-3 m depths on low-relief pavement bottom (Clarke 1994). The habitat of this species at Bahia Azul, in the area of strongest surge, is consistent with that reported for the species at other sites.



Fig. 8. - Underwater photograph of *Acanthemblemaria maria* at Bahia Azul.

Acanthemblemaria rivasi Stephens, 1970. The spotjaw barnacle blenny was common at Bahia Azul in empty worm tubes in corals in 2 to 3 m depth. Seven specimens ranging from 22 to 28 mm SL were collected (UAZ 95-30-3 and UAZ 95-30-7). This species occupies a similar habitat in the San Blas Islands, Panama, where it is often found in massive brain corals. In Colombia, this species is most abundant in heavy surge zones where it occupies vacant barnacles on vertical and tilted surfaces, barnacles surrounded by *Millepora*, and barnacles in the coral *Acropora palmata* (Acero 1984b). Bahia Azul is within its reported distribution of Puerto Vargas, Costa Rica to Morón, Carabobo, Venezuela (Smith-Vaniz and Palacio 1974; Acero 1984a).



Fig. 9. - Underwater photograph of *Acanthemblemaria rivasi* at Bahia Azul.

Coralliozetus cardonae Evermann and Marsh, 1899. The twinhorn blenny was common at Bahia Azul where we collected 11 specimens (UAZ 95-30-1 and UAZ 95-30-12) ranging in size from 15 to 24 mm SL. These specimens agree with the counts for this species reported by **Acero** (1987). Meristics of the Bahia Azul specimens are as follows: dorsal-fin spines XVI (1), XVIII (7); dorsal-fin rays 10 (1), 11 (6), 12 (1); total dorsal-fin elements 28 (2), 29 (6); anal-fin rays 19 (8); pectoral-fin rays 13 (8). Life colors are illustrated in Figs 11-13. The most prominent elements of the color pattern of this species are fine blue spots on the head and body, and the distinctive light subocular bar of males.

This is the only species of the genus in the Caribbean, while five species are known from the tropical eastern Pacific (**Hastings** 1997). The twinhorn blenny is extremely widespread in the Greater Caribbean (Fig. 8), having been recorded from the Bahamas, Puerto Rico, Virgin Islands, Lesser Antilles, Curacao, Colombia and Belize (**Greenfield** and **Johnson** 1981; **Acero** 1984b, 1987). The Bahia Azul record represents a range extension of approximately 880 km westward from Santa Marta, Colombia and approximately 1,100 km southward from Belize.

At Bahia Azul the twinhorn blenny was found in and around vacant barnacles on algae covered rocks in the very shallowest subtidal region (< 1 m). These blennies were especially common along horizontal ridges of rock between small islands where the relatively small amount of surge was concentrated. In Colombia and the eastern Caribbean (St. Lucia), males of this species occur in barnacle tests often surrounded by hydrozoan fire coral (*Millepora*) (**Acero** 1987; **Hastings**, pers. observations).

Ekemblemaria nigra (Meek and Hildebrand, 1928). At Bahia Azul, the moth blenny was present in shelters primarily on medium to large boulders (> 0.5 m diameter). Thirteen specimens ranging from 16 to 53 mm SL were collected (UAZ 95-30-2 and UAZ 95-30-11). This species is cryptically colored with a dark body and dark, mottled head although blue highlights may be present on the lower jaw, and gular region (Figs 14-17). The moth blenny is known only from the southwestern Caribbean, from Colón, Panama to Bahia de Nenguange, Colombia (**Acero** 1984a). The Bahia Azul record represents a westward range extension of approximately 225 km from Colón.

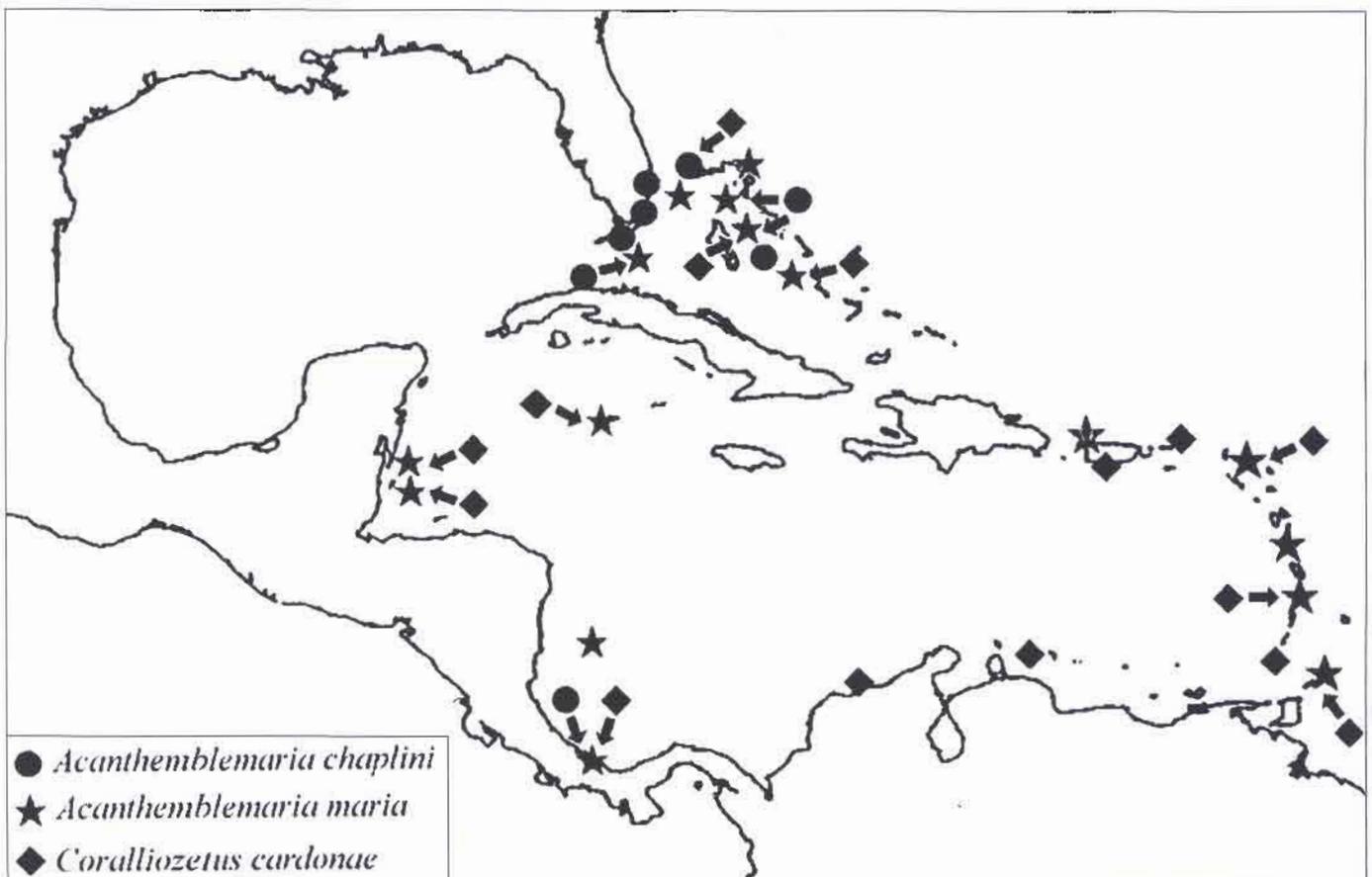


Fig. 10. - Distributional records for three species of tube blennies recorded from Bahia Azul, Panama. Locality records include those of **Smith-Vaniz** and **Palacio** (1974), **Greenfield** and **Johnson** (1981), **Acero** (1984a, 1984b, 1987) and this study.



11



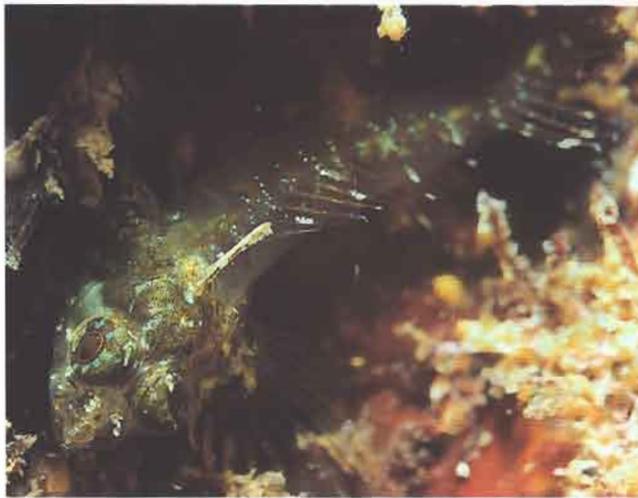
14



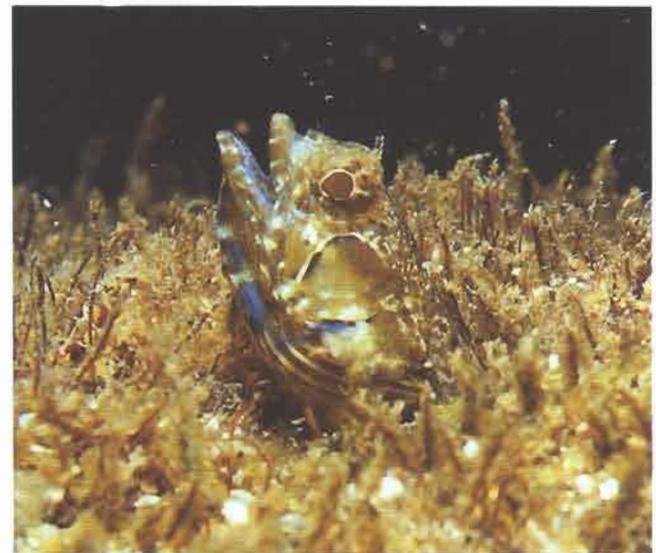
12



15



13



16

Figs 11-13. - Underwater photographs of *Coralliozetes cardonae* at Bahía Azul. 11 and 13 are males, 12 is a female.

Discussion

This small collection of chaenopsid blennies from Bahía Azul includes four distributional records of varying distance. Three of the seven species collected, *A. betinensis*, *A. rivasi* and *E. nigra*, are restricted to the southwestern Caribbean, thus their occurrence at Bahía Azul is not surprising. Similarly, the occurrence at Bahía Azul of three widespread Caribbean species, *A. aspera*, *A. maria* and *C. cardonae*, is not unexpected. The same may not be said for *A. chaplini*, a species previously thought to be restricted to Florida and the Bahamas. This species has not been collected from the Greater and Lesser Antilles, or the coasts of central America north of Panama,

despite extensive sampling of reef fishes within these regions. This large gap in the known distribution of this species is difficult to explain, but it may be partly related to its habitat.

The study site at Bahía Azul is primarily volcanic sedimentary outcropping. Significantly all four of the distributional records, including *A. chaplini*, are species recorded from limestone or other rock outcroppings at other sites in the Caribbean. Two of these (*C. cardonae* and *A. maria*) are species characteristically found in areas of strong surge. More extensive sampling of these habitats in other areas of the Caribbean may reveal other distributional records for these chaenopsids.



Figs 14-17. - Underwater photographs of *Ekemblemaria nigra* at Bahia Azul.

17

Acknowledgments

We thank Dr. **Anthony Coates** for arranging and leading our excursion to Bocas del Toro and **Arturo Acero** for reviewing the manuscript. This research was supported by the National Science Foundation (grant IBN-9407993) to PAH, and support from the Siedell Fund (Smithsonian Institution) to DRR.

References

- Acero (A. P.)**, 1984a. - The chaenopsine blennies of the northwestern Caribbean (Pisces: Clinidae: Chaenopsinae). II. The genera *Acanthemblemaria*, *Ekemblemaria*, and *Lucayablennius*. *Rev. Biol. Trop.* 32:35-44.
- Acero (A. P.)**, 1984b. - The chaenopsine blennies of the southwestern Caribbean (Pisces: Clinidae: Chaenopsinae). I. Systematic analysis and zoogeography. *An. Inst. Inv. Mar. Punta de Betín* 14:29-46.
- Acero (A. P.)**, 1987. - The chaenopsine blennies of the northwestern Caribbean (Pisces: Clinidae: Chaenopsinae). III. The genera *Chaenopsis* and *Coralliozetus*. *Bol. Ecológica: Ecosistemas Trop.* 16:1-21.

- Böhlke (J. E.) & C. C. G. Chaplin.** 1968. - Fishes of the Bahamas. Livingston Publ. Co., Wynnewood, Pa. 771 pp.
- Clarke (R. D.)**, 1994. - Habitat partitioning by chaenopsid blennies in Belize and the Virgin Islands. *Copeia* 1994:398-405.
- Greenfield (D. W.) & R. K. Johnson.** 1981. - The blennioid fishes from Belize and Honduras, Central America, with comments on their systematics, ecology and distributions (Blenniidae, Chaenopsidae, Labrisomidae, Tripterygiidae). *Fieldiana, Zool. N.S.* 8:1-106.
- Greenfield (D. W.) & R. K. Johnson.** 1990. - Community structure of western Caribbean blennioid fishes. *Copeia* 1990:433-448.
- Hastings (P. A.)**, 1997. - Phylogenetic relationships of the species of *Coralliozetus* clade of chaenopsid blennies, with description of a new genus. *Bull. Mar. Sci.* In press.
- Hastings (P. A.) & V. G. Springer.** 1994. - Review of *Stathmonotus*, with redefinition and phylogenetic analysis of the Chaenopsidae (Teleostei: Blennioidei). *Smithsonian Contr. Zool.* 558:1-48.
- Ross (J. F.)**, 1996. - A few miles of land arose from the sea—and the world changed. *Smithsonian* 27 (9):112-121.
- Smith (C. L.) & J. C. Tyler**, 1975. - Succession and stability in fish communities of dome-shaped patch reefs in the West Indies. *Am. Mus. Novitates* 2572:1-18.
- Smith-Vaniz (W. F.) & F. J. Palacio.** 1974. - Atlantic fishes of the genus *Acanthemblemaria*, with description of three new species and comments on Pacific species (Clinidae: Chaenopsinae). *Proc. Acad. Nat. Sci.* 125 (11):197-224.

RÉSUMÉ

Notes sur une collection de Blennies Chénopsidés de Bahia Azul, Province de Bocas del Toro, Caraïbes, Panama.

Les sept espèces représentées ici (photographies sous-marines de **D. Ross Robertson**) ont été récoltées sur le site, relativement à l'écart, de Bahia Azul, dans les Bocas del Toro, sur la côte atlantique du Panama, au voisinage de petites îles d'origine volcanique.

Ces données constituent une zone d'expansion significative pour *A. chaplini*, limitée jusqu'ici à la Floride et aux Bahamas, et plus restreinte pour *Acanthemblemaria maria*, *Coralliozetus cardonae* et *Ekemblemaria nigra*, signalés auparavant d'autres sites des Caraïbes méridionales. *C. cardonae* est la seule espèce du genre présente dans les Caraïbes où elle est très largement répandue, tandis que 5 autres espèces sont connues du Pacifique oriental tropical.