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First Record of the Chaetodontid Genus *Prognathodes* from the Hawaiian Islands[1]

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ABSTRACT: A total of 32 individuals of a chaetodontid fish resembling *Prognathodes guezei* (Maugé & Bauchot) were recorded on photographs and videotape taken from the Hawaii Undersea Research Laboratory's deep-sea submersibles *Makali'i* and *Pisces-V* between 1982 and 1990. These sightings represent the first record of the genus *Prognathodes* from the Hawaiian Islands. The fish were observed at depths of 106–187 m off Hawai'i, at Penguin Bank, and at French Frigate Shoals (Northwestern Hawaiian Islands). Most sightings were made on the western side of Hawai'i, particularly near Kealakekua Bay.

THE CHAETODONTID GENUS *Prognathodes* Gill includes at least seven species: *P. marcelle* (Poll) from the eastern Atlantic; *P. dichrous* (Günther) and *P. obliquus* (Lubbock & Edwards) from the central Atlantic; *P. aculeatus* (Poey), *P. aya* (Jordan) and *P. guyanensis* (Durand) from the western Atlantic; *P. falcifer* (Hubbs & Rechnitzer) from the eastern Pacific; and *P. guezei* (Maugé & Bauchot) from the western Indian Ocean. *P. guezei* is known only from the two type specimens, which were collected at a depth of 80 m off Réunion.

Although Burgess (1978) and Allen (1985) regarded *Prognathodes* as a subgenus of *Chaetodon* Linnaeus, most other recent authors have chosen to consider it a valid genus (e.g., Maugé and Bauchot 1984, Nalbant 1984, 1986, 1991, Blum 1988, Randall and De Bruin 1988). Randall and De Bruin (1988) and Blum (1988) also included *Chaetodon guyotensis* Yamamoto & Tameka from the Kyushu-Palau Ridge and Maldive Islands in *Prognathodes*, but Nalbant (1991) designated it the type species of his proposed new genus *Peterscottia*. Randall and De Bruin (1988) noted the tentative conclusion of S. D. Blum that the chaetodontid genus *Roa* Jordan should be regarded as synonymous with (or perhaps a subgenus of) *Prognathodes*; however, Blum (1988, 1989) and Nalbant (1991) maintained them as separate genera. In their description of *P. guezei*, Maugé and Bauchot (1976) provisionally assigned it to the genus *Chaetodon*, but later placed it in *Prognathodes* (Maugé and Bauchot 1984). Subsequent authors also included *guezei* within *Prognathodes* (e.g., Nalbant 1986, 1991, Randall and De Bruin 1988).

Our observations represent the first record of the genus *Prognathodes* from the Pacific Plate.

METERIALS AND METHODS

We reviewed photographs and videotapes taken from 104 dives of the Hawaii Undersea Research Laboratory (HURL) research submersible *Makali'i* and from five dives of the HURL research submersible *Pisces-V* looking specifically for sightings of chaetodontids (butteflyfishes) and pomacanthids (angelfishes). The tapes we reviewed represent all records of deep-water chaetodontid and pomacanthid sightings from the HURL deep-sea submersible video library, which includes ca. 1300 hr of underwater video recordings taken from a total of 589 submersible dives. For each sighting of any species of chaetodontid or pomacanthid, we noted the location, depth, substratum composition, number

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of individuals in a group, and other species within a 10-m radius.

RESULTS AND DISCUSSION

The videotapes and photographs revealed the presence of an unidentified species of the genus *Prognathodes* around the Hawaiian Archipelago at depths below 100 m. This fish superficially resembles *Roa excelsa* (Jordan) (regarded as *Chaetodon modestus* Temminck & Schlegel by some authors), the predominant chaetodontid species observed below 100 m in the Hawaiian Islands, with a deep body and two broad dark bars against a pale background. The *Prognathodes* differs from *R. excelsa* in having a more strongly produced snout and black bar coloration (bars yellowish orange in *R. excelsa*), and the two species are easily distinguishable in the photographs and videotapes (Figure 1). The unidentified *Prognathodes* is identical in color and general morphology to *P. guezei* and differs substantially from all other known chaetodontid species. Positive identification of this species requires detailed examination of a collected specimen; however, we are confident after viewing the submersible records that this fish is either *Prognathodes guezei* or a closely allied undescribed species. Several of the videotape recordings provide sufficient detail of color and general morphology to show that the Hawaiian fish shares with *P. guezei* a similar body and fin profile; strongly produced snout (snout length about 16% of standard length); relatively long dorsal-fin spines (the fourth or fifth the longest) with deeply incised interspinous membranes; white ground color with two broad black bars on the side of the body, the anterior bar originating at the third to sixth dorsal-fin spine and tapering ventrally at a slight posterior angle to a point midway between the base of the pelvic fin and the anus, the posterior bar originating at the eighth to last dorsal-fin spine and tapering ventrally to the third anal-fin spine; black ocular band originating at the base of the first dorsal-fin spine, extending ventroanteriorly to the eye, and tapering onto the snout; thin black bar along the midline of the snout and interorbital; black posterior margins on the dorsal and anal fins; and a thin black bar at the base of the caudal peduncle. The Hawaiian *Prognathodes* seems to differ slightly from the description of *P. guezei* in the color of the pelvic fin. Maugé and Bauchot (1976) described the pelvic fin color of *P. guezei* as white proximally and black distally. The pelvic fins of the *Prognathodes* from Hawai'i appear to be orangish distally. Because the original color description of *P. guezei* may be based on nonfresh material, we cannot be certain that this represents a real difference between the two populations. Except for pelvic-fin color, we are unable to identify any other characters of the Hawaiian *Prognathodes* that distinguish it from *P. guezei*.

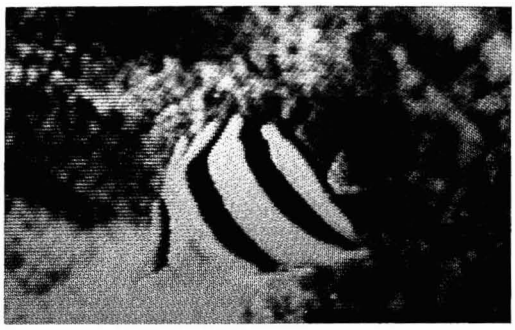

FIGURE 1. *Prognathodes guezei*, photographed at a depth of 187 m off Kona, Hawai'i (HURL photo 174-41, J. E. Randall).

Thirty-two individuals of *Prognathodes* cf. *guezei* were recorded on videotape taken at depths between 106 and 187 m. Half of the fish were between 120 and 140 m, and all but two of the remaining individuals were at greater depths (Figure 2). Twenty-nine individuals were videotaped during 44 dives around Hawai'i: seven fish in 13 dives on the eastern side of the island between Cape Kumukahi and South Point and 22 in 28 dives on the western side between South Point and Kailua-Kona (there were no sightings on three dives at South Point). The greatest concentration of sightings was off Kealakekua Bay, where 13 fish were seen in 10 dives. Only two fish were seen in 25 dives at Penguin Bank, and one fish in four dives at French Frigate Shoals. We saw

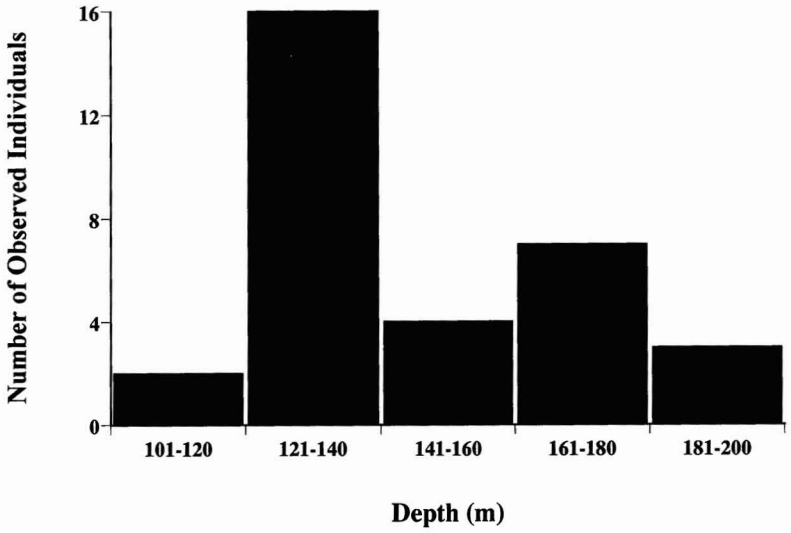

FIGURE 2. Depth distribution of observed *P.* cf. *guezei* in the Hawaiian Islands.

no *P.* cf. *guezei* in seven dives around O'ahu or in 26 dives around Johnston Atoll.

Eighteen (56%) of the observed *P.* cf. *guezei* were in areas of basalt substrata (e.g., basalt talus, blocky lava, lava tubes and pillows, basalt boulders), 13 (41%) were in limestone habitats (primarily limestone holes and ledges), and one fish was sighted on a large (2-m diam.) water pipe. Four of the fish were in the vicinity of an unidentified antipatharian coral, three near *Cirrhipathes spiralis* (Linnaeus), and one near *Antipathes dichotoma* Pallas. Ten *P.* cf. *guezei* were observed in pairs, and the remaining 22 fish appeared to be solitary individuals. Twenty-one of the observed fish (all five pairs plus 12 individuals) were in close proximity to other fish species. Of these, 14 were in the vicinity of *Roa excelsa*, and seven were in the vicinity of *Holacanthus arcuatus* Gray (five were with both *R. excelsa* and *H. arcuatus*). On several occasions, the *P.* cf. *guezei* were observed picking at the substratum, apparently foraging for benthic food items. We saw no instances of apparent feeding on items above the bottom. As a noteworthy comparison, none of the 370 observed *Roa excelsa* exhibited any apparent foraging behavior.

If the Hawaiian *Prognathodes* is indeed *guezei*, it is the most widely distributed species of the genus. A disjunct distribution pattern of only two populations on nearly opposite sides of the globe is unlikely; the lack of reported observations of *P. guezei* from areas between Réunion and Hawai'i may reflect insufficient collecting and observation below 40–60 m, although species of the genus *Roa*, which inhabit a similar depth range, are well represented in collections from throughout the Indo-West Pacific. Such a broadly disjunct distribution is not unprecedented: the cirrhitid *Cirrhitops fasciatus* (Bennett) is known only from Hawai'i, Japan, Mauritius, and Madagascar (Randall 1981); and the pomacanthid *Centropyge debelius* Pyle, known only from Mauritius and Réunion, appears to be most closely related to *C. nahackyi* Kosaki, known only from Johnston Atoll and the Hawaiian Islands (Pyle 1990). It is also noteworthy that no *P.* cf. *guezei* were observed in 26 submersible dives to comparable depths at Johnston Atoll.

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LITERATURE CITED

ALLEN, G. R. 1985. Butterfly and angelfishes of the World, Vol. 2. Mergus Publishers Hans A. Baensch, Melle, W. Germany.

BLUM, S. D. 1988. Osteology and phylogeny of the Chaetodontidae (Pisces: Perciformes). Ph.D. diss., University of Hawaii at Mānoa, Honolulu.

———. 1989. Biogeography of the Chaetodontidae: An analysis of allopatry among closely related species. Environ. Biol. Fishes 25(1–3): 9–31.

BURGESS, W. E. 1978. Butterflyfishes of the World. T. F. H. Publications, Neptune City, New Jersey.

MAUGÉ, L. A., and R. BAUCHOT. 1976. Une nouvelle espèce de Chétodon de l'Océan Indien occidental: *Chaetodon guezei* (Pisces, Chaetodontidae). Bull. Mus. Natl. Hist. Nat. (355): 89–101.

———. 1984. Les genres et sous-genres de Chaetodontidés étudiés par une méthode d'analyse numérique. Bull. Mus. Natl. Hist. Nat. 6, section A (2): 453–485.

NALBANT, T. T. 1984. Studies on chaetodont fishes. II. *Heminigellus*, a new genus of butterflyfishes (Pisces, Chaetodontidae). Trav. Mus. Hist. Nat. 'Grigore Antipa' 26:239–240.

———. 1986. Studies on chaetodont fishes. III. Redescription of the genus *Roaops* Maugé and Bauchot, 1984, and some problems on the phylogeny and evolution of butterflyfishes (Pisces, Chaetodontidae). Trav. Mus. Hist. Nat. 'Grigore Antipa' 28:163–176.

———. 1991. Studies on chaetodont fishes. IV. A new deepwater butterflyfish genus from the Indo-West-Pacific (Pisces, Perciformes, Chaetodontidae). Trav. Mus. Hist. Nat. 'Grigore Antipa' 31:421–426.

PYLE, R. L. 1990. *Centropyge debelius*, a new species of angelfish (Teleostei: Pomacanthidae) from Mauritius and Réunion. Rev. Fr. Aquariol. 17(2): 47–51.

RANDALL, J. E. 1981. Examples of antitropical and antiequatorial distribution of Indo-West-Pacific fishes. Pac. Sci. 35(3): 197–209.

RANDALL, J. E., and G. H. P. DE BRUIN. 1988. The butterflyfish *Prognathodes guyotensis* from the Maldive Islands, a first record for the Indian Ocean. Cybium 12(2): 145–149.