

Two Rare Fishes of the Families Carapidae and Chiasmodontidae from the Ryukyu Islands, Japan

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Abstract A rare carapid fish, *Eurypleuron owasianum*, and a rare chiasmodontid fish, *Dysalotus alcocki*, were collected from the Okinawa Trough, East China Sea in 2002 and 2003, respectively. Adult specimens of *E. owasianum* have only been recorded in Japan from its type locality, Owase, Mie Prefecture. No specimens of *D. alcocki* have been reported from Japanese waters, although this species has been included in Japanese checklists. We report morphological characters of both specimens and include color photographs.

Key words: *Eurypleuron owasianum*, *Dysalotus alcocki*, Okinawa Trough, East China Sea.

Introduction

The fish fauna of deep waters around the Ryukyu Islands has been relatively well investigated (e.g., Okamura and Kitajima, 1984; Okamura, 1985; Yamada *et al.*, 1986; Yoda *et al.*, 2002). Shinohara *et al.* (2005) reviewed the literature and counted 643 species of 155 families based on both specimens and literature records.

The National Museum of Nature and Science and the Ocean Research Institute, the University of Tokyo investigated the deep water fauna by beam trawls around the Okinawa Trough in 2002. During this survey, a damaged specimen of a chiasmodontid was collected from 2147–2164 m off Kume-jima Island. In 2003, the Museum and the Seikai National Fisheries Research Institute made otter trawl surveys in the East China Sea and collected a slightly damaged specimen of a carapid from 194–204 m depths. These two specimens were photographed in fresh on the research vessels, but not identified or illustrated in Shinohara *et al.* (2005).

Materials and Methods

Counts and proportional measurements follow Williams (1984) for *Eurypleuron owasianum* and Hubbs and Lagler (1958) with the following two additions for *Dysalotus alcocki*: preanal and prepectoral lengths measured from anterior tip of premaxilla to anteriormost point of each fin, respectively. Gill rakers counted on first arch of right side. D_{30} and A_{30} counted the dorsal-fin and anal-fin ray bases anterior to a vertical between the 30th and 31st centra, respectively. Measurements to nearest 0.1 mm with calipers. Total, standard and head lengths expressed as TL, SL and HL, respectively. The specimens are deposited in the National Museum of Nature and Science, Tokyo (NSMT) and comparative material in the Hokkaido University Museum, Hakodate (HUMZ) was examined. Systematic arrangement of taxa follows Nelson (2006).

Order Ophidiiformes
Suborder Ophioidei
Family Carapidae

Eurypleuron owasianum (Matsubara, 1953)

[Japanese name: Soko-kakureuo]

(Fig. 1A)

Carapus owasianus Matsubara, 1953: 29, fig. 1 (original description).

Echiodon owasianus: Williams, 1984: 417, figs. 1C, 5 (re-description of holotype).

Eurypleuron owasianum: Markle and Olney, 1990: 338, figs. 1A, 22A; Nielsen *et al.*, 1999: 18, figs. 21a, b; Aizawa, 2000: 446, unnumbered fig. (keys); Aizawa, 2002: 446, unnumbered fig. (keys).

Material examined. NSMT-P 67562, 152.7 mm TL, female, Okinawa Trough, East China Sea, 30°32.83'N, 127°48.41'E to 30°31.62'N, 127°47.69'E, 194–204 m, R/V *Yoko-maru*, YK-03-T04-04, 5 November 2003.

Description. Counts and proportional measurements are provided in Table 1.

Body slender and tapering into tail. Dorsal surface of head almost flat. Snout rounded. Mouth oblique, upper jaw slightly beyond lower jaw anteriorly. Posterior margin of upper jaw beyond posterior margin of eye. Villiform teeth band on both upper and lower jaws, two large canines on anterior tip of upper jaw, and one large canine on

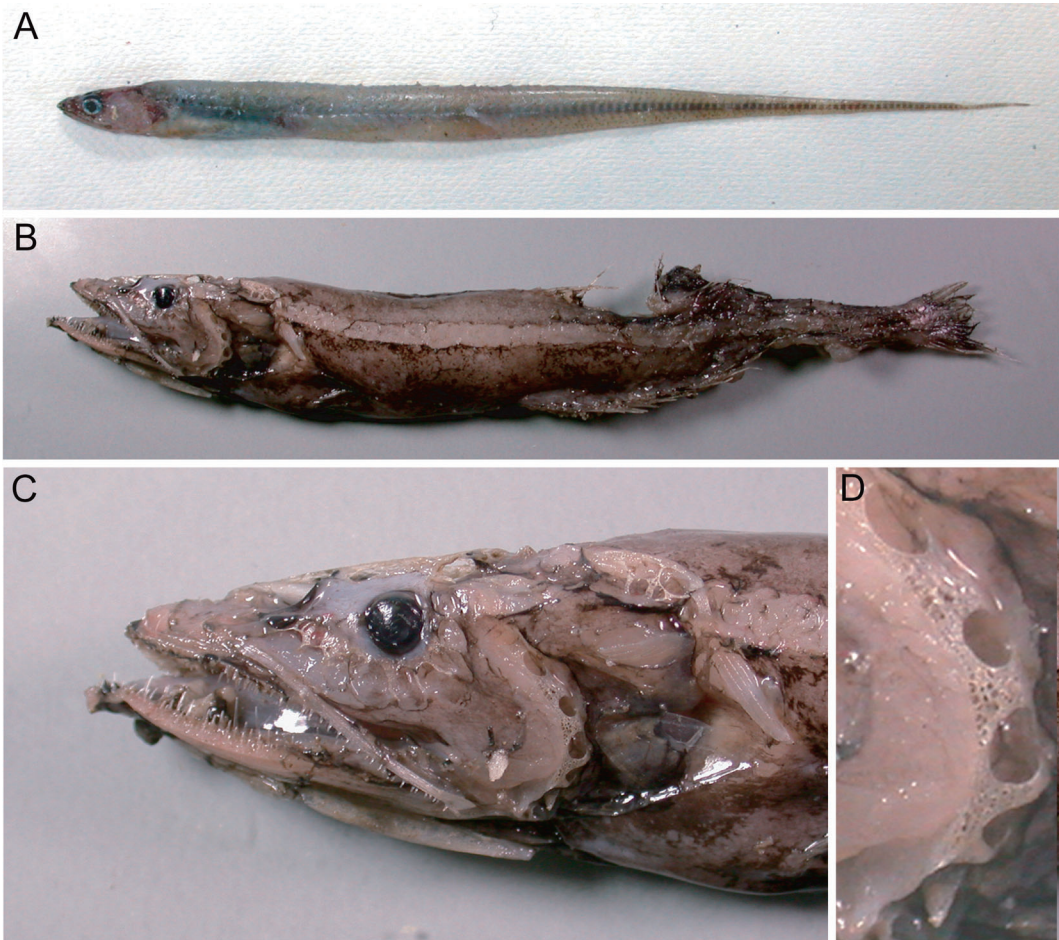


Fig. 1. Fresh specimens of two rare fishes from Ryukyu Islands. A, *Eurypleuron owasianum*, NSMT-P 67562, 152.7 mm TL; B–D, *Dysalotus alcocki*, NSMT-P 67078, 144.0 mm SL. C and D show head and decreased calcification (skeletal reduction of preopercular bone).

Table 1. Counts and morphometric data *Eurypleuron owasianum*.

	NSMT-P 67562	Matsubara (1953)	Williams (1984)	Markle and Olney (1990)
Total length (mm)	152.7	No data	Broken	5.2–236
Counts				
D ₃₀	45	No data	42–47	36–47
A ₃₀	44	No data	40–45	37–44
Precaudal vertebrae	24	No data	24–26	22–27
Pectoral fin	15	16	16–17	15–20
Total nasal lamellae	16	No data	24–25	No data
Preopercular pores	3	No data	3	No Data
Branchiostegal rays	7	7	No data	7
Gill rakers	(2) 0+1+2 (6)	3+8	(4) 0+1+2 (5–7)	No data
Dorsal-fin insertion	7	No data	7	7–8
Anal-fin insertion	5	No data	6	5–7
Predorsal bone	6	No data	6	6–7
Measurements (% TL)				
Head length	11.5	11.8	Broken	No data
Predorsal length	15.9*	14.8	Broken	No data
Preanal length	12.8	13.7	Broken	No data
Preanus length	12.0	12.6	Broken	No data
Measurements (% HL)				
Horizontal diameter of bony orbit	22.2	20.2	18.9–19.8	14–20
Bony interorbit length	11.4	11.3	7.6–10.9	10–14
Snout length	19.9	22.2	20.0–20.7	19–23
Maxillary length	54.0	48.3	49.2–50.2	49–52
Depth at nape	48.3	No data	38.8–42.2	36–45
Depth at 50 mm	42.6	No data	32.9–41.3	No data
Sagitta length	21.0	No data	14.5–15.6	No data

* Approximate value because of buried first dorsal-fin ray.

lower jaw. Vomerine and paratine teeth present. Anterior nostril midway between tip of snout and anterior margin of eye. Posterior nostril just in front of eye. Opercular spine present. Three slender gill rakers on first gill arch, one between upper and lower limbs, others on lower limb. No pseudobranchial filaments. Anus below pectoral-fin base. Head and body scaleless.

First to sixth dorsal-fin rays buried in body. First dorsal-fin ray above anterior part of seventh vertebral centrum. Anal fin originating just behind anus, first anal-fin ray below middle of fifth vertebral centrum. Pectoral fin reaching 12th or 13th anal-fin rays. Pelvic fin absent.

No rockerbones, no ventral tunic ridges on posterior portion of swimbladder, and thoracic plates not formed by expanded parapophyses.

Color when fresh based on color photographs (Fig. 1A). Head reddish brown, vicinity of eye deep red. Body cream with single dark grey hori-

zontal line on lateral line. Belly silver. Head and body with melanophores except for belly.

Color in alcohol. Head and body pale brown with melanophores except for belly, especially densely scattered at nasal and ventral surface of lower jaw, above and below eye, and along bases of dorsal and anal fins. All fins pale brown. Stomach tan.

Distribution. South Africa, Indonesia, Australia, New Zealand, Japan and Chile (Matsubara, 1953; Markle and Olney, 1990; Nielsen *et al.*, 1999; Aizawa, 2002). Depths 1–455 m (Nielsen *et al.*, 1999). Host species unknown.

Remarks. Matsubara (1953) described *Carpus owasianus* from Owase, Mie Prefecture, Japan. Williams (1984) included this species in the genus *Echiodon* because of the presence of two pseudobranchial filaments and an opercular spine. Markle and Olney (1990) established a monotypic genus *Eurypleuron* for *E. owasianum*

on the basis of carapid phylogeny, and this genus was characterized by the following combination of characters in the adult: no pelvic fins, no rockerbones, no cardiform teeth, no ventral tunic ridges on posterior portion of swimbladder, thoracic plates formed by expanded parapophyses on fifth through 18–20th vertebrae (in males only), and dorsal-fin origin over anal-fin origin resulting in equivalent (or nearly so) A_{30} and D_{30} values. Recently, most ichthyologists follow Markle and Olney (1990) (e.g., Nielsen *et al.*, 1999; Aizawa, 2000, 2002). The present specimen has all characters for *Eurypleuron*. All meristics of this specimen range within those of *E. owasianum*, except 16 nasal lamellae (vs. 24–25) (Table 1). This value of nasal lamellae is approximate to those of Williams (1984), and the difference seems to be an intraspecific variation. In addition, measurements of the new specimen are very similar to those of previous studies (Table 1). We also found an intraspecific variation in the position of the anus, i.e., just below pectoral-fin base in Matsubara (1953) and this study, but between level of pectoral-fin base and anal-fin origin in Markle and Olney (1990), Nielsen *et al.* (1999), and Aizawa (2000, 2002).

Around Japanese waters, adult specimens of *Eurypleuron owasianum* have been recorded only from Owase, Mie Prefecture, with its larvae only from the East China Sea near Okinawa-jima Island (e.g., Markle and Olney, 1990; Aizawa, 2002). Fresh color of this species is recorded for the first time in this study.

We could not check most of the cephalic sensory pores and the lateral line tube, because the specimen is in poor condition and most cephalic and body skin is gone.

Order Perciformes
Suborder Trachinoidei
Family Chiasmodontidae

***Dysalotus alcocki* MacGilchrist, 1905**

[Japanese name: Toge-bouzugisu]

(Fig. 1B–D)

Dysalotus alcocki MacGilchrist, 1905: 268; Johnson and

Cohen, 1974: 31; Nakabo, 2002: 1072, unnumbered fig. (keys); Shinohara *et al.*, 2005: 437 (list).

Material examined. NSMT-P 67078, 144.0 mm SL, Okinawa Trough, East China Sea, 26°10.7'N, 125°50.7'E to 26°11.4'N, 125°52.7'E, 2147–2164 m, R/V *Tansei-maru*, KT-02-3-D1(2), 27 April 2002.

Description. Counts and proportional measurements are provided in Table 2. Body elongate and compressed. Head large and its dorsal profile almost straight. Eye small. Snout long, pointed. Mouth large. Lower jaw slightly projecting beyond upper jaw. Posterior end of maxillary beyond posterior margin of eye. Band of canine-like teeth on both jaws. Supramaxilla present. No vomerine teeth. Palatine teeth in single row. Gill rakers on first arch slender and needle-like.

Single broad lateral line originating from upper angle of gill opening, curving slightly downwards and continuing to caudal-fin base. Emergent prickles above and below lateral line on posterior half of body.

Dorsal fins two: first dorsal-fin origin slightly posterior to vertical line through pectoral-fin base, ending above anal-fin origin; second dorsal-fin origin just after first dorsal fin, ending at caudal peduncle. Anal-fin origin slightly posterior to anus, its end at caudal peduncle. Pectoral fin beyond vertical line through sixth dorsal-fin spine. Pelvic fin small.

Body feeble, skin thin and easily removable. Sponge-like structure on accidentally exposed preopercular bone (Fig. 1D).

Color when fresh based on color photographs (Fig. 1B–C). Head, body and all fins apparently uniformly dark brown.

Color in alcohol. Head, body and all fins same as fresh.

Distribution. Tropical to temperate waters of Atlantic and eastern Indian Ocean to central Pacific (MacGilchrist, 1905; Parr, 1933; Johnson and Cohen, 1974; Parin *et al.*, 1977; Johnson and Keene, 1986; Nakabo, 2002; McEachran and Fechtel, 2005). Mesopelagic (e.g., Nakabo, 2002).

Table 2. Counts and measurements of *Dysalotus alcocki*.

	NSMT-P 67078	HUMZ 130474	MacGilchrist (1905)	Johnson and Cohen (1974)
Standard length (mm)	144.0	156.1	ca. 240	50.5–223
Counts				
First dorsal fin	X	XI	VIII	X–XI
Second dorsal fin	ca. 28	25	27	26–28
Anal fin	I, 28	I, 25	27	I, 26–28
Pectoral fin	12 (left)/13 (right)	12 (left)/11 (right)	11	11–13
Pelvic fin	I, 5	I, 5	I, 5	I, 5
Gill rakers (upper+lower)	12+18	13+21	No data	No data
Pored lateral line scales	ca. 40	ca. 40	ca. 41	42–45
Branchiostegal rays	7	7	7	7
Vertebrae	40	39	39	39–40
Measurements (% SL)				
Head length	29.2	27.4	29	26.9–34.5
Body depth	11.3	13.1	13	11.1–17.4
Eye diameter	2.8	3.4	No data	2.6–5.0
Interorbital width	6.5	6.4	No data	6.3–8.3
Postorbital head length	15.2	14.3	No data	14.3–17.4
Snout length	11.5	9.2	No data	10.0–13.9
Predorsal length	33.1	32.5	No data	31.7–39.6
Preanal length	51.7	53.4	No data	49.6–57.2
Prepectoral length	31.2	29.7	No data	28.4–36.4
Upper jaw length	17.9	13.5	No data	16.4–22.0
Lower jaw length	21.9	18.4	No data	19.8–25.9
Pectoral fin length	12.7	15.6	No data	12.6–17.8
Caudal peduncle length	8.3	11.0	No data	7.4–10.7
Caudal peduncle depth	3.1	3.8	No data	3.2–4.8

Remarks. The genus *Dysalotus* was established by MacGilchrist (1905) and characterized as having seven branchiostegals, one pore per section on lateral line, spinules above and below lateral line on body, minute band of teeth on both jaws, and no photophores (Johnson and Cohen, 1974; Nakabo, 2002). *Dysalotus* includes two species, *D. alcocki* and *Dysalotus oligoscolus* Johnson and Cohen, 1974; the former species is separated from the latter in having more than one row of prickles above and below lateral line, and no vomerine teeth (vs. having single row and vomerine teeth, respectively; see Johnson and Cohen, 1974; Johnson and Keene, 1986). Although the present specimen is damaged, all the above features remain. In addition, both proportional measurements and counts are close to those of Hawaiian and previously reported specimens (Table 2).

In Japanese waters, *D. alcocki* had been reported by Parin *et al.* (1977) who listed its name only

based on single specimen from the southeast of the Ryukyu Islands. Japanese taxonomists (e.g., Nakabo, 2002; Shinohara *et al.*, 2005) subsequently followed Parin *et al.* (1977) without any chance to examine specimens.

The caudal peduncle of this specimen was damaged by pumice stones. The surface of the head and lateral line are broken, but the color in fresh specimens is reported for the first time. The skeletal reduction as a sponge-like structure in bones (Fig. 1D) could be a buoyancy adaptation to the mesopelagic environment.

Comparative material examined. *D. alcocki*: HUMZ 130474, 1 specimen, 156.1 mm SL, Hawaii Islands, February 1994.

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