

Redescription of *Cercamia eremia*, (Perciformes: Apogonidae) from Japan, with comments of the osteological characters

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日本で採集されたサクラテンジクダイ, (スズキ目: テンジクダイ科)の
再記載とその骨学的特性について

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日本沿岸に分布するテンジクダイ科 (Apogonidae) 魚類相の調査を進めている中で, *Cercamia eremia* (ALLEN, 1987) が採集され, 静岡県伊東市伊豆海洋公園・徳島県牟岐町大島・鹿児島県奄美大島などの海域に広く分布することが判明した。本種は外部形態と骨格系や体節の形態などが既知属には認められない特徴があることから同科の1未記載種とされた(林・益田, 1985)。その後十分な記載ではないが, ALLEN (1987) が報告した西オーストラリアのムリオン島を模式産地とするスカシテンジクダイ属の1新種 *Rhabdamia eremia* とこの未記載種は類似していることが判った。一方 RANDALL and SMITH (1988) は *eremia* と外観がよく一致する *Cercamia cladala* を新属新種報告すると共に, 特異な腹椎骨と尾椎骨の組合せや前鰓蓋骨上の小棘の存在などを *eremia* にも共有形質として認め, *Cercamia* 属を2種とした。RANDALL and SMITH に従えば, 日本の未記載種は鰓耙数形質によって *Cercamia eremia* と同定される。日本沿岸では沖縄諸島から相模湾にいたる広い海域で採集されているので, 本報では検索情報が不足している *eremia* の再記載を行い, あわせて骨格形質の特徴を明らかにした。日本の *eremia* の骨格系の比較観察では, 脊椎骨の組合わせが9+15で既知のテンジクダイ科18属 (FRASER, 1972) の10+14とは異なる, 尾骨系の上尾骨は2本, 前上顎骨の上方突起は広角で吻後端に突出するなどの特徴が認められる。一方脱鱗しやすい櫛鱗で有孔側線鱗がなく, 体側や頭部に微小な孔器が並び, また感覚管の発達程度などはヌメリテンジクダイ亜科 (Psudaminae) にみられる特徴と類似している。*Cercamia eremia* の和名は藍澤・瀬能 (1981) のサクラテンジクダイに従い, 本属にサクラテンジクダイ属を提唱する。

Introduction

In addition to those reported in papers of RANDALL and HAYASHI (1989) and HAYASHI (1990), one more species of apogonid fish, *Cercamia eremia* (ALLEN), 1987, was collected from coastal waters of Japan. This genus and species are described here as new to Japan. Apogonid fishes of the genus *Cercamia* have been recognized only two species of *eremia* and *cladala* RANDALL and SMITH, 1988. *C. eremia* distri-

butes from the Indo-West Pacific to the southern Red Sea, the western Australia and Queensland, but *cladala* known only the Society Islands and the Austral Islands in the southern Pacific. As defined by FRASER (1972), *Cercamia* is most similar to *Rhabdamia* of apogonine genera, or three pseudamine genera based on skeletal characters and cephalic sensory canal system. The description of *Rhabdamia eremia* ALLEN, 1987 is not sufficiently, therefore redescription and osteological comments of this species are given here with

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some specimens from Japan.

Abbreviation for dipositories of the specimens examined are; Izu Ocean Park (IOP): Institute of Oceanic Research and Development, Tokai University, Shimizu (IORD): Kushimoto Marine Park Center (KMPC): Department of Zoology, National Science Museum, Tokyo (NSMT): Tokushima Prefectural Museum (TKPM): Department of Marine Sciences, University of Ryukyus (URM): Yokosuka City Museum (YCM): Department of Zoology, University Museum, University of Tokyo (ZUMT).

Methods

Counting and measuring procedures followed mainly those used by RANDALL and SMITH (1988). All measurements were made with digital calipers and expressed in millimeters. Length given for specimens are standard length (SL). Lateral scale counts are made the upper end of the gill opening to the base of the caudal fin, but

not include the small scales on the caudal fin. Gill-raker counts are made on the first gill arch and include all rudiments, and the raker at the angle is contained in the lower-limb count (showed upper+lower-limb counts). The last dorsal and anal rays are a composite of two elements divided to the base and counted as one. All pectoral-fin rays, including small rudimentary ones, are counted (showed i+). Stained specimen and soft X-ray photo was used to examine for internal body characters.

Proportional measurements of examined specimens are given in Table 1 as percentages of standard length.

Cercamia eremia (ALLEN), 1987

Japanese name: Sakura-tenjikudai

(Fig. 1a, b; Table 1)

Apogonidae sp.: HAYASHI and MASUDA, 1985: 20, (abstracts; off Izu Penin., Sagami Bay, Japan).

Rhabdamia eremia: ALLEN, 1987: 4, fig. 2 (orig.

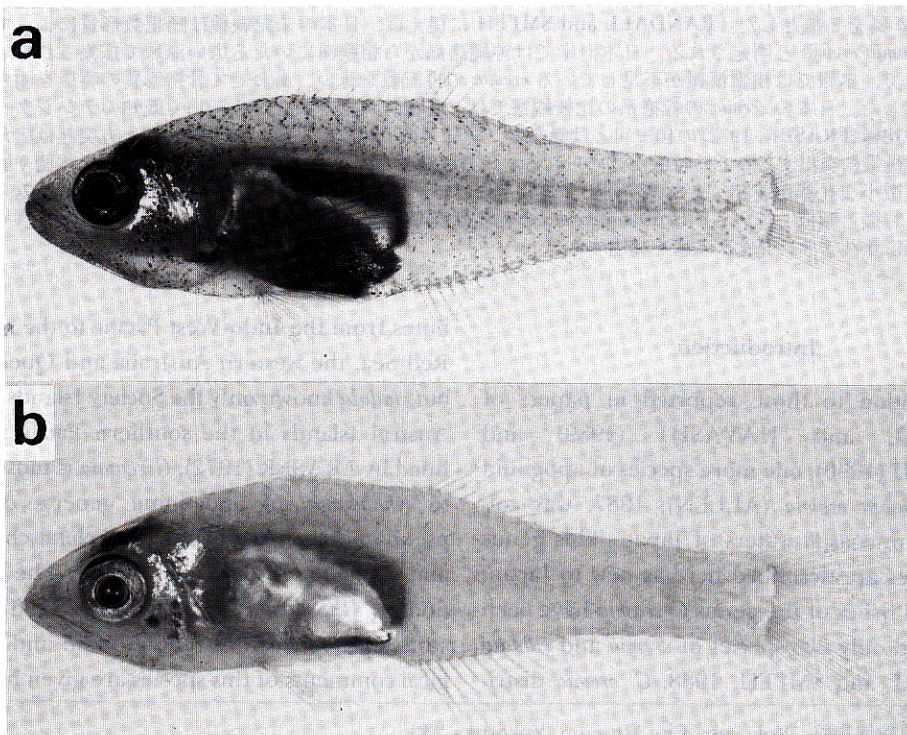


Fig. 1 *Cercamia eremia* ALLEN, 1987. a; YCM-P25558, Female, 45.2 mm SL, Izu Ocean Park, Shizuoka Pref., b; YCM-P26415, Female, 34.0 mm SL, Amami-oshima, Kagoshima Pref..

Table 1 Proportional measurements of *Cercamia eremia* expressed as a percentage of standard length.

Characters	Specimens	YCM-P	YCM-P	IOP-O	YCM-P	KMPC	ZUMT	ZUMT	YCM-P	URM-P	URM-P	IODR
		25556	25557	157-9	25558	80019	58831-1	58832	26415	2595-1	3290	77-401
		Male	Female	Female	Female		Female	Male				
Standard length (mm)		49.2	45.8	47.0	45.2	49.2	49.6	54.2	34.0	34.1	28.6	25.9
Body depth		23.7	23.7	24.2	23.2	25.4	24.7	25.8	22.3	24.3	19.9	22.7
Body width		11.7	11.5	12.7	10.8	9.3	11.0	14.2	8.8	11.1	8.7	11.1
Head length		37.3	37.3	38.5	35.6	41.0	37.2	40.0	37.6	39.2	36.7	37.8
Snout length		9.9	10.2	10.0	10.1	10.3	10.0	9.7	10.0	9.9	9.4	10.4
Orbit diameter		8.9	9.6	9.3	9.7	9.7	9.2	9.2	10.0	10.8	9.7	8.1
Interorbital width		9.5	9.6	9.3	9.7	10.9	8.8	9.7	9.4	9.9	8.3	8.8
Upper jaw length		18.6	18.1	17.4	18.3	17.8	17.3	18.4	18.5	18.1	19.5	17.7
Caudal peduncle depth		10.7	10.9	11.2	10.6	9.9	12.0	11.6	10.5	11.1	10.4	10.4
Caudal peduncle length		32.3	30.3	29.3	32.7	27.8	30.2	29.7	32.0	31.6	31.4	32.4
Predorsal length		39.6	40.3	41.0	39.8	40.6	42.3	41.8	41.1	41.3	40.9	42.0
Preanal length		52.4	52.4	52.7	53.3	57.3	55.2	56.8	52.9	53.3	51.7	54.0
Prepelvic length		33.3	33.1	34.0	33.6	36.5	33.6	35.6	34.1	36.3	33.2	35.5
Length of 1st dorsal spine		11.1	10.6	12.3	9.9	8.7	9.8	9.9	10.2	9.6	9.0	10.4
Length of 2nd dorsal spine		11.9	13.1	14.4	12.3	13.0	9.6	12.9	13.8	11.1	Broken	11.9
Length of 3rd dorsal spine		11.9	13.3	14.0	11.9	11.3	11.4	13.4	14.4	12.0	11.1	12.7
Length of spine of 2nd dorsal fin		10.9	10.0	10.8	9.9	11.1	11.2	9.7	10.2	9.9	10.4	9.6
Length of longest dorsal ray		19.9	19.4	18.7	17.0	20.9	18.3	19.0	20.5	19.3	20.2	18.1
Length of 1st anal spine		2.8	3.0	3.4	2.8	3.0	3.0	2.5	2.6	3.3	Broken	3.0
Length of 2nd anal spine		10.1	10.0	10.4	Broken	8.9	9.2	9.2	9.4	9.0	10.1	7.7
Length of longest anal ray		18.2	17.6	18.9	17.2	19.5	18.1	17.5	20.5	19.9	17.4	18.5
Caudal fin length		26.8	28.3	28.2	27.4	25.2	26.4	28.7	27.6	28.1	29.3	30.1
Caudal concavity		13.0	13.5	14.4	15.2	17.4	12.7	14.3	17.0	11.1	15.7	16.6
Pectoral fin length		24.5	24.4	24.4	21.9	23.9	23.5	22.1	23.5	23.1	23.7	25.0
Pelvic spine length		9.7	11.7	11.4	10.8	10.5	10.4	9.5	10.5	10.2	9.7	11.5
Pelvic fin length		14.8	15.7	15.5	13.9	16.0	15.5	16.2	15.2	16.1	14.3	16.6
Length of caudal spot		8.8	8.7	9.9	10.6	9.8	9.8	10.4	8.8	8.7	9.9	10.6

descr.; type-loc. South Murion IsI., Western Australia).

Cercamia sp.: AIZAWA and SENOU, 1991: 84, pl. 10-B, C (record; Oshima Is., Tokushima Pref., Japan).

Material examined IOP0157-1-9, 9 (42.1–49.2 mm), Izu Ocean Park, Ito, Shizuoka Pref., Sagami Bay, cave in 25 m, A. ONO, 19820714; IORD77–401, 25.9 mm, Amitori Bay, Iriomote Is., Okinawa Pref., 15 m, H. KISHIMOTO, 19770518; KMPC80017-80020, 4 (34.3–49.2 mm), Kushimoto Marine Park, Kushimoto, Wakayama Pref., washing ashore at cold wave, H.

MISAKI, 19800301; TKPM-P1140, 6 (48.3–52.0 mm), Oshima Is., Tokushima Pref., cave in 8–15m, H. AIZAWA and H. SENOU, 19890722. URM-P2595, 13 (29.8–35.2 mm), Sesoko Is., Okinawa Pref., 18 m, H. SENOU, 19770912, URM-P2596, 34.8 mm, same locality, patch-reef, H. SENOU, 19800305, URM-P3290, 28.6 mm, Unarizaki, Iriomote Is., Okinawa Pref., H. SENOU, 19820608; YCM-P25555, 48.5 mm (stained and cleared specimen), YCM-P25556, 49.2 mm, YCM-P25557, 45.8 mm, YCM-P25558, 45.2 mm, same data as IOP0157, YCM-P26415, 34.0 mm, Sakinome, Amami-oshima, Kagoshima

Pref., cave in 29 m, M. HAYASHI and H. HAYASHI, 19910829; ZUMT 58831, 3 (49.2–50.4 mm), same data as TKPM-P1140.

Comparative material. *Cercamia cladala*: NSMT-P44801 (Paratype), 30.5 mm, Rapa, reef at entrance to Haurei Bay, 15–18 m, J.E. RANDALL and D.B. CANNOY, 19710210.

Diagnosis Dorsal rays VI-I, 9; anal rays II, 12; pectoral rays 10; scales 25, weakly ctenoid; predorsal scales 5; gill rakers 1+12; a sharp spine on the posttemporal; 3 spines on the preopercle; color transparent, redish pigmentation on snout, cheek, all fins base and on some scale edge; a few small black melanophores behind the eye.

Description Dorsal rays VI-I, 9 or rarely 10, first and second rays rather long, all rays branched, the last to base; anal rays II, 12 or rarely 11 and 13, first and second rays rather long; pectoral rays $i+8+i=10$, rudimentary upper and lower two unbranched; pelvic rays I, 5, all rays branched; principal caudal rays $9+8=17$, the upper and lower rays unbranched; upper and lower procurrent caudal rays 7–8, the most posterior unsegmented; scales on body mostly missing, no lateral-line scales, scales along a lateral series 23, plus 7–8 small scales posterior to hypural plate; longitudinal scale rows from the dorsal origin to ventral profile, probably 9; median predorsal scales about 5–6; gill rakers (1–3) $1+12=13$ (generally 1 or 2 rudimentary, 1 upper and 11 or 12 lower rakers well developed); branchiostegal rays 7; no predorsal bones; vertebrae $9+15$.

Body elongate, depth 3.9–5.0 in SL; body width 1.8–2.3 in body depth; head length 2.4–2.8 in SL; head and body moderately compressed; front of snout rounded, snout length 3.5–3.9 in HL; orbit diameter 3.6–4.7 in HL; interorbital space flat, the least width 5.8 (4.9–6.4) in HL, its width mostly equal to the orbit diameter; caudal peduncle depth 3.1–4.1 in HL; caudal peduncle length 1.1–1.5 in HL.

Mouth straight or slightly oblique, forming an angle of about 30° to the horizontal; mouth terminal or with the lower jaw rather projecting; upper portion of anterior nostril pointed, form-

ing an angle of ascending process of premaxillary; the maxilla reaching to or slightly beyond a vertical at rear margin of pupil; the upper jaw length 1.9–2.2 in HL; the gape forming of maxilla slightly arched, posterior edge of maxilla truncate to slightly concave, its corners rather angulated; supramaxilla absent; lower jaw tip protruding, the tip thickened; upper jaw teeth in a narrow row and villiform, slightly larger posteriorly, tiny anteriorly; teeth on dentary in one to two rows and in narrow band posteriorly; posterior teeth minute than those anteriorly and laterally, a few large conical teeth in laterally; two embedded canine teeth on vomer, posterior one slightly enlarged and incurved; palatines toothless.

Anterior nostril circular, no tubelike but with membranous short rim on its only posterior edge, directly in front of center of eye about two-thirds distance from edge of eye to front of upper lip; posterior nostril ovate without a rim, more than twice as large as anterior nostril, lying in front of eye by a distance about three-fourths from tip of lower jaw. Pores of lateralis system on head as follows: one dorsally at edge of eye, one below nostrils, one in front of anterior nostril, two at lower edge of preorbital, and one at tip of mandible.

A single and weakly opercular spine slightly pointed; margin of opercle membranous with dorsoposterior flap; anterior edge of preopercle with a sharp pointed at angle; posterior edge with two strong and short spines, rarely three or four, its length same. A small and sharp spine on posttemporal.

Origin of first dorsal fin above posterior tip of opercular flap, and or slightly behind the pectoral base; the fifth interspace between dorsal spines clearly longer than first four interspaces; first dorsal spine, 1.0–1.5 in length of second spine, second and third spines subequal, 2.7–3.9 in HL; spine of second dorsal fin 1.7–1.9 in first longest dorsal ray; all dorsal soft rays branched, first dorsal soft ray longest, 1.9–2.1 in SL; origin of anal fin below base of second dorsal soft ray; first

anal spine shortest, 11.3–15.5 in HL; second anal spine 3.7–4.9 in HL; all anal rays branched; first and second anal rays subequal, first anal soft ray longest, 1.8–2.1 in HL; second dorsal fin and anal fin symmetrically in shape; caudal fin deeply forked, 3.3–4.0 in SL; caudal concavity 7.4–7.7 in SL; pectoral base very narrow; pectoral rays longest (generally the second and third rays), and reaching to base of second or third anal rays; origin of pelvic fins slightly anterior to pectoral fin base; first pelvic soft ray longest, reaching

slightly beyond anus, its length 2.3–2.6 in HL.

Osteology Caudal skeleton (Fig. 2): three hypurals (1 and 2, 3 and 4 are fused), hypural 5 separate; two epurals; a parhypural; no uroneurals and autogenous haemal spines. Vertebrae: 9+15 (rarely 10+14); epipleural ribs only on the

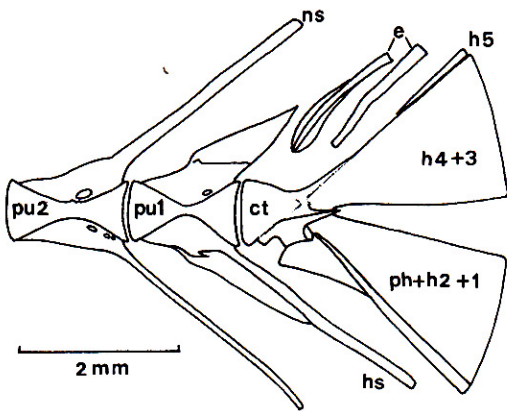


Fig. 2 The caudal skeleton of *Cercamia eremia*. ct; terminal centrum (first ural centrum), e; epurals, h; hypurals, hs; haemal spine, ns; neural spine, ph; parhypural, pu; pre-ural centrum, u; uroneural.

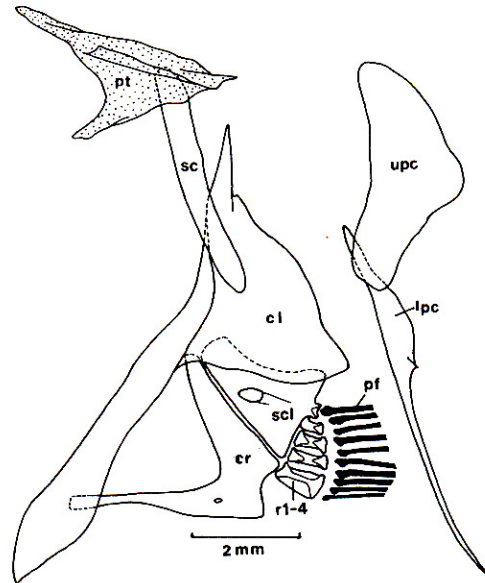


Fig. 4 The Pectoral girdle of *Cercamia eremia*. cl; cleithrum, cr; coracoid, pt; posttemporal, r; radials of pectoral fin, sc; scapula, scl; supracleithrum, upc; upper postcleithrum, lpc; lower postcleithrum, pf; pectoral rays.

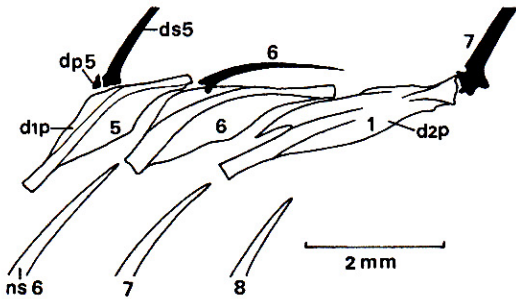


Fig. 3 Dorsal spines and its associated elements of *Cercamia eremia*. dp; distal pterygiophore, ds; dorsal spines, dr; dorsal soft rays, dlp; first dorsal proximal pterygiophores, d2p; second dorsal proximal pterygiophores, ns; neural spines.

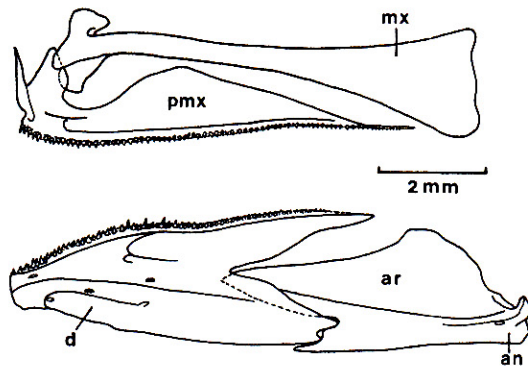


Fig. 5 Upper and lower jaws of *Cercamia eremia*. upper jaw: mx; maxillary, pmx; pre-maxillary. lower jaw: an; angular, d; dentary, ar; articular.

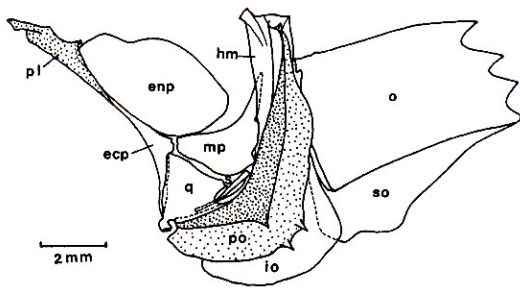


Fig. 6 The suspensorium and opercular bones of *Cercamia eremia*.

ecp; ectopterygoid, end; endopterygoid, hm; hyomandibular, io; interopercle, mp; metapterygoid, o; opercle, pl; palatine, po; preopercle, q; quadrate, s; symplectic, so; subopercle.

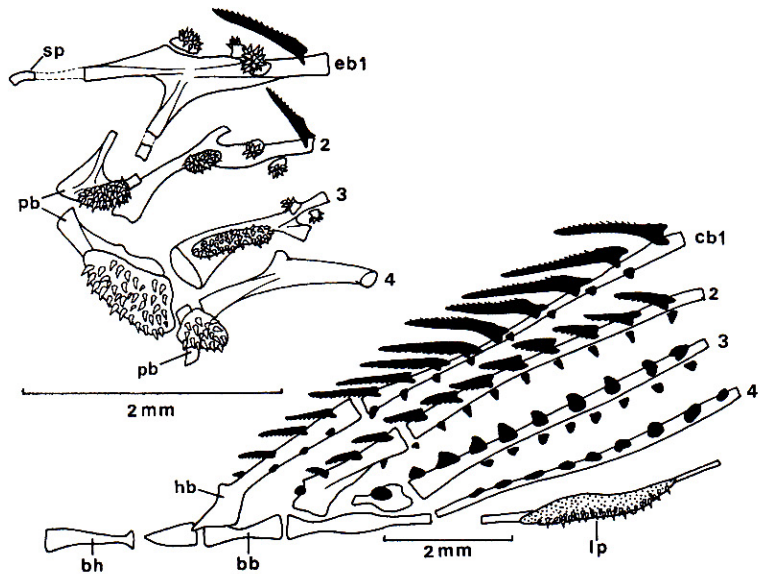


Fig. 7 The upper bones of the branchial basket of *Cercamia eremia*.

eb; epibranchial, pb; pharyngobranchial, sp; suspensory pharyngeal. The lower bones of the branchial arch of *Cercamia eremia*.

bb; basibranchial, bh; basihyal, cb; ceratobranchial, ep; epibranchial, hb; hypobranchial, lp; lower pharyngeal.

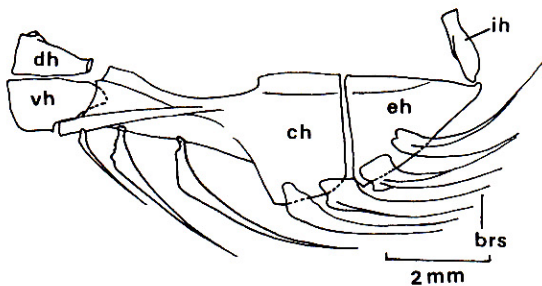


Fig. 8 The hyal apparatus of *Cercamia eremia*.

dh; dorsal hypohyal, vh; ventral hypohyal, ch; ceratohyal, eh; epihyal, ih; interhyal, brs; branchiostegals.

first two pairs of pleural ribs. Anal fin: two spines, first pterygiophore with only one spine; soft rays 11 to 13, mostly 12. Dorsal fin (Fig. 3): six spines in the first dorsal; the first pterygiophore with only one spine; second dorsal with one spine and 9 to 10 (rarely) soft rays; the sixth dorsal spine slightly associated with its corresponding pterygiophore, and locking the sixth distal pterygiophore. Predorsals: none. Pectoral girdle (Fig. 4): a lateral extrascapular generally flattened, no free medial extrascapular; two postcleithrum, lower postcleithrum long and with a short process on its center; a single spine on the posttemporal, short and robust. Jaws (Fig. 5): supramaxilla absent; teeth on both jaws villiform; a single row

of teeth on the dentary, and one to two rows of teeth on the premaxilla; some teeth at anterior portion in both jaws enlarged; ascending process of premaxilla slightly long, inclined anteriorly. Suspensorium and opercles (Fig. 6): teeth on the palatine and ectopterygoid absent; preopercle smooth on the ridge, and with a single spine at the coner; preopercle entire on the ventral and posterior edge, the coner rounded, and with 2 to 3 short spine (mostly 2). Branchial apparatus (Figs. 7, 8, 9): suspensory pharyngeal present; 12 to 14 (11 to 12 well developed) gillrakers, one to 3

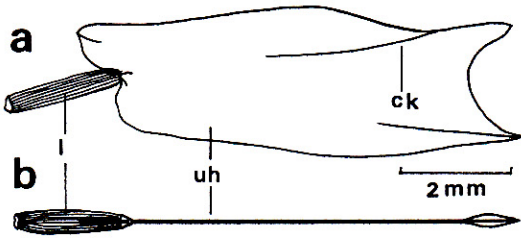


Fig. 9 Lateral view (a) and dorsal view (b) of the urohyal of *Cercamia eremia*.
ck; center keel, uh; urohyal, l; ligament.

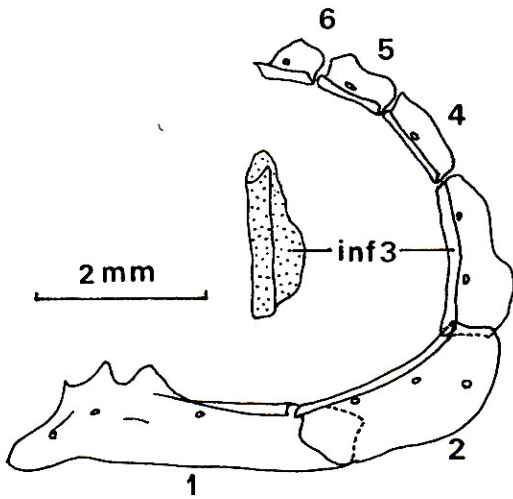


Fig. 10 Infraorbital bones of *Cercamia eremia*.
inf; infraorbital 1–6, 1; first infraorbital or lachrymal, 6; sixth infraorbital or dermosphenotic, s; shelf.

rudiments on the first epibranchial; short and trigonal teeth on lower pharyngeal; basihyal slightly long, posterior edge truncate; seven branchiostegal rays; ceratohyal clearly concave; a suture with ceratohyal and epihyal absent; urohyal without an anterodorsal process, center-keel only developed about one-sixth posteriorly. Infraorbitals (Fig. 10): six, a developed shelf on all infraorbitals, but the first bone not complete. Neurocranium (Fig. 11): no basisphenoid; vomer with two enlarged canine; ethmoid smooth, not expanded or dented; no crests on the frontals; lateral ethmoids process protruding anterior; no acclivity of parasphenoid, rather horizontal.

Scales, pit line and cephalic sensory canal

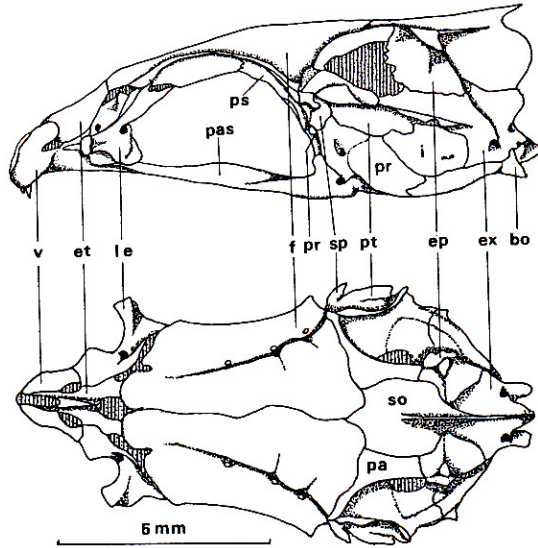


Fig. 11 The neurocranium of the skull of *Cercamia eremia*.

v; vomer, et; ethmoid, le; lateral ethmoids, f; frontals, sp; sphenotics, pa; parietals, pt; pterotics, so; supraoccipital, ep; epiotics, i; intercalars, ex; exoccipitals, pas; parasphenoids, pr; prootics, bo; basioccipital, ps; pterosphenoids.

system (Figs. 12, 13) Scales ctenoid, deciduous, portion of basal groove weakly; spines on network ridge of central lateralside scales undeveloped; scales on back, ventral and portion of caudal peduncle mistaken cycloid for ctenoid. No lateral-line scales. No scales on dorsal and anal fins and a low sheath at base of second dorsal and anal fins. Head naked except for nape. Snout (about 4 rows), lower side at the dorsal fin base (about 10–11 rows), ventral side near the ventral and anal fin base (about 15–17 rows), and near the caudal fin base with transverse rows of sensory papillae (Fig. 12d). Four transverse rows on interorbital region, but extremely indistinct (Fig. 13a). Head sensory canal systems well developed, ramus of canals no break into parts; anterior oculoscapular canal join to posterior oculoscapular canal, lachrymal canal and preopercular canal; mandibular canal join to

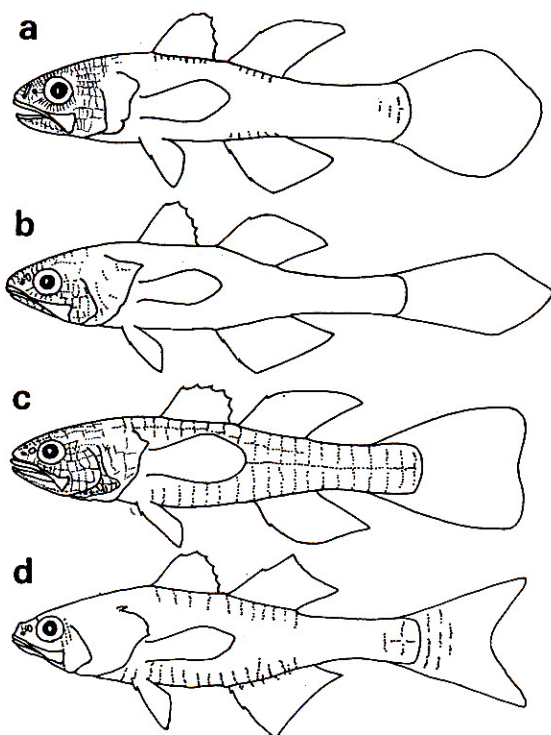


Fig. 12 Series of sensory papillae on head and body of *Pseudamia gelatinosa* (a), *Pseudamiops gracilicauda* (b), *Gymnapogon japonicus* (c) and *Cercamia eremia* (d).

preopercular canal (Fig. 13b).

Color in alcohol Body and fins uniform pale yellowish white; head translucent and brownish, a few scattered melanophores on the membranes of the brain; some stellate melanophores (about 3 to 15, some in large) on the cheek. Some male specimen have many scattered melanophores on back, head, snout and chest. Peritoneum and stomach dusky. All fins pale.

Color in life Body translucent and pale pinkish, particularly on abdomen and operculum where silver hues predominate; tiny redish dots scattered over body, especially deep in snout. Some specimens have a few scattered melanophores on head and posterior body. Opercles translucent, gills see through. Some small melanophores behind the eye. Eyes golden, black in the pupil. All fins clear, redish pigmentation on all fins base (especially on caudal) and rays.

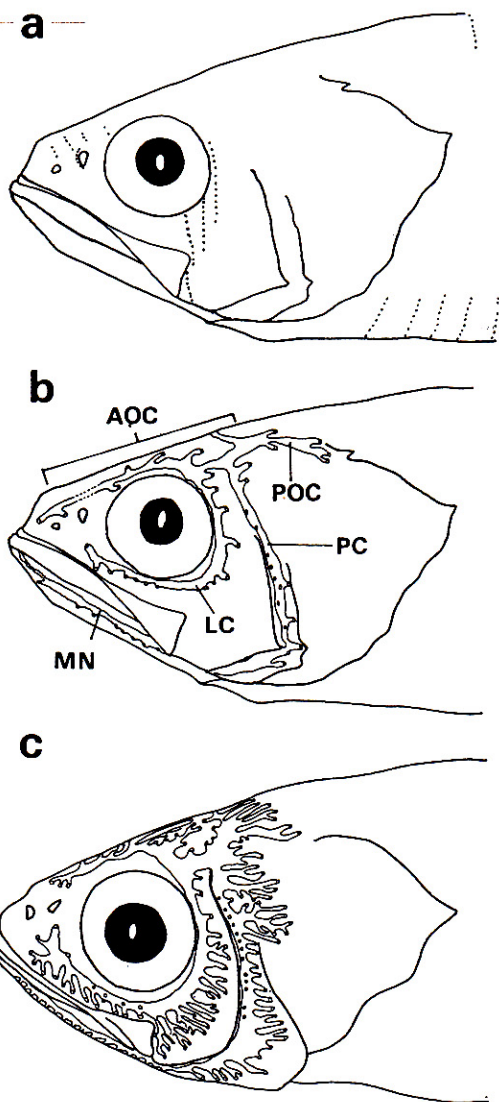


Fig. 13 Pit lines and cephalic sensory canal system of *Cercamia eremia* (a, b) and *Rhabdamia cyrtosetus* (c).

aoc; anterior oculoscapular canal, pc; preopercular canal, poc; posterior oculoscapular canal, mn; madibular canal, lc; lachrymal canal.

Distribution and habitat This species is known in the southern Red Sea, Christmas Island, Western Australia and Queensland, apparently widespread in the Indo-West Pacific including coastal waters of Japan. Most specimens of Japan have been collected from small caves or beneath

ledges in rocky or coral reefs from the depth range of 15–29 m. Some specimens from Japan have been taken from the shore line by the cold wave in winter.

Comparison According to RANDALL and SMITH (1988), *Cercamia eremia* (*Rhabdamia eremia* in original description by ALLEN, 1987) is most closely related to this *C. cladala*, differing chiefly in gill rakers (1+11–12=12–13 vs. 3–4+14–16=17–20 in *cladala*), caudal fin length (23.2–28.4 vs. 28.7–31.3% SL in *cladala*), caudal convexity (11.1–13.8 vs. 13.1–17.5% SL in *cladala*), and pectoral fin length (19.8–23.4 vs. 21.6–25.8% SL in *cladala*). *C. eremia* from coastal waters of Japan, was given mostly same counts and measurements (see descriptions and Table 1). Counts of gill rakers (1+13=14 in 47.0–55.4 mm SL) of *Cercamia* sp. by AIZAWA and SENOU (1991) were included into the meristic range of variation of *C. eremia*, probably considering to adult (1+12–13=13–14 in 45.2–54.2 mm SL) or young (1+11–12=12–13 in 25.9–34.0 mm SL). Moreover *C. eremia* is distinguishable from *C. cladala* in having the following characters: slightly long snout 9.4–10.4% vs. 7.5–8.9% SL; orbital length 8.1–10.8 vs. 9.8–11.9% SL; predorsal length 39.6–42.3 vs. 34.9–38.4% SL; short spines on posterior edge of preopercle 2 (rarely 3) vs. 5; transverse rows of papillae on interorbital region 4 (indistinct) vs. 6 (no counts in paratype NSMT-P44801 of *C. cladala*). RANDALL and SMITH (1988) proposed having 3 epurals as the generic character in the description of *C. cladala*. Fifty-three specimens of *C. eremia* and a paratype specimen (NSMT-P44801) of *C. cladala* were examined about epurals. As the result of epural counts, there are 2 epurals in all specimens. About transversal rows of sensory papillae on interorbital region, there are 6 rows in *cladala* but 4 rows in *eremia*.

Remarks Some osteological characters and the combination of external characters of the genus *Cercamia* occurs in no other genera of the family Apogonidae. RANDALL and SMITH (1988) refer to the generic relationship that *Cercamia*

appears to be related to *Rhabdamia* (Apogoninae) or *Pseudamiops* (Pseudaminae), as defined by FRASER (1972). In addition to their comments, this research was shown following differences. *Cercamia* differs from *Rhabdamia* in having weakly ctenoid scales (spines on network ridge of scales well developed in *Rhabdamia*). The cephalic sensory canal system at the head developed, and ramus are moderately (ramus of canals well break in *Rhabdamia*, see Fig. 13c). About the stage of development of sensory papillae on head, *Cercamia* is most inferior compared with three genera (*Pseudamia*, *Pseudamiops* and *Gymnapogon*) of Pseudaminae (Fig. 12a–d). The postcleithrum of *Cercamia* is similar to its of *Pseudamiops*.

On the new genus *Lachneratus* in FRASER and STRUSAKER (1991), they regarded characteristic similarities of *Cercamia* and *Lachneratus*. But the vertebral count of *Lachneratus* shows 10+14 as compared with 9+15 in *Cercamia*. Further *Lachneratus* has all cycloid scales on body, but ctenoid scales in *Cercamia*.

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