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FULL PAPER

Paraliparis adustus and *Paraliparis bullacephalus*: two new snailfish species (Teleostei: Liparidae) from Alaska

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Abstract *Paraliparis adustus* sp. nov., a snailfish species from the Bering Sea near the Aleutian Island Archipelago, Alaska, is described based on a single mesopelagic specimen. This new species is clearly distinguished by a combination of several morphological features and meristic counts, including long pointed gill rakers with 0–3 spinules at or near the tip, anus positioned forward near the pectoral symphysis, and color uniform brown. *Paraliparis bullacephalus* sp. nov. from Shelikof Strait, Gulf of Alaska, is also described. This new species is very similar in meristic characters and general body shape and size to *P. holomelas* Gilbert, but differs primarily in morphological features of the head, particularly in the shape of the dorsal contour of the head, snout, and opercular flap, mouth size, and eye position.

Keywords *Paraliparis adustus* · *Paraliparis bullacephalus* · New species · Liparidae · Alaska

Introduction

The snailfish genus *Paraliparis* (family Liparidae) is distributed worldwide and is currently represented by about 110 recognized species (Chernova et al. 2004; Chernova 2006). Species of *Paraliparis* are considered deepwater or bathypelagic fishes and have been captured at depths of up to 3,385 m (Stein 1978). Mecklenburg et al. (2002) reported six *Paraliparis* species as occurring in Alaskan waters and included accounts of three additional species from adjacent areas as likely members of the Alaskan marine ichthyofauna. Orr et al. (2005) reported one additional species as a range extension. While examining snailfishes deposited in the University of Washington (UW) Fish Collection and material collected during surveys of the Alaska Fisheries Science Center (AFSC), we discovered one unusual *Paraliparis* specimen from the Bering Sea near the Aleutian Island Archipelago. We also found three other specimens from Shelikof Strait, Alaska, and determined that they and the specimen from the Bering Sea represent two undescribed species. In this study, we describe and name the new species *Paraliparis adustus* sp. nov. and *Paraliparis bullacephalus* sp. nov. and provide comparisons with their most similar congeners, particularly *Paraliparis nassarum* Stein and Fitch 1984 and *Paraliparis holomelas* Gilbert 1896.

Materials and methods

The *Paraliparis adustus* holotype was collected during an Alaska Fisheries Science Center (AFSC) research cruise in 1982 using a Marinovich mid-water trawl (Bakkala et al. 1985). The specimen was collected approximately 200 km north of Adak Island, Alaska (Fig. 1), during the hours 0902–1045, Alaska Daylight Time. Specimens of *P. bullacephalus* were collected in a 60 cm bongo net, epibenthic sled, and bottom trawl in Shelikof Strait, Alaska (Fig. 1). Methods for recording morphometric and meristic data of specimens follow Stein (1978), Stein and Fitch (1984) and Stein et al. (2001) with the following additions:

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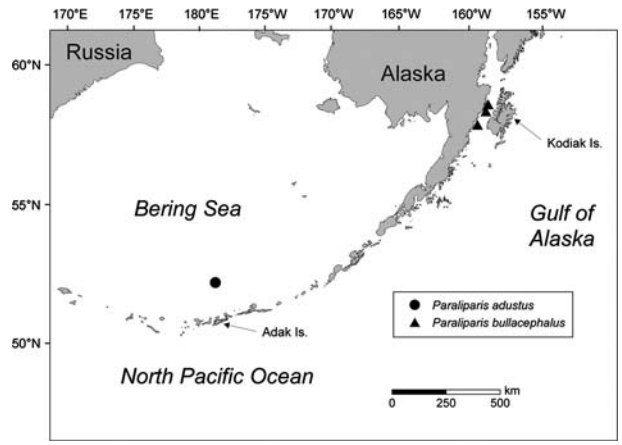

Fig. 1 Collection localities of *Paraliparis adustus* sp. nov. and *Paraliparis bullacephalus* sp. nov.

CL	Caudal fin length
dCL	Dorsal fin overlap of caudal fin length
aCL	Anal fin overlap of caudal fin length
CD	Caudal fin depth

Standard length (SL) is used throughout unless otherwise specified. Pore formula and nomenclature follow Stein et al. (2001).

Counts were taken from radiographs with the exception of gill rakers, pectoral-fin rays, and pyloric caeca. On all specimens with the exception of the *P. bullacephalus* holotype, the right gill opening was enlarged with a scalpel to examine gill rakers. The pectoral girdle was removed from the right side of a paratype of *P. bullacephalus* (UW 047282) and differentially cleared and stained (Potthoff 1984). All illustrations were prepared by the junior author with the exception of Fig. 6, which was prepared by Beverly Vinter (AFSC-retired), and Fig. 4b which was prepared by the senior author. Collection abbreviations follow Leviton et al. (1985).

***Paraliparis adustus* sp. nov.** (English name: Brown snailfish) (Figs. 1–5).

Holotype. UW 028648: male, 150 mm SL (Fig. 2), Bering Sea, Aleutian Island Archipelago, north of Adak Island, Alaska (53°24′36″N, 176°40′12″W), 27 July 1982, collection depth 640 m, bottom depth 3,658 m, coll. G. Smith.

Diagnosis. The following combination of characters distinguishes *Paraliparis adustus* sp. nov. (Fig. 2) from other species of *Paraliparis*: dorsal-fin rays 64; anal-fin rays 56; pectoral-fin rays 24; vertebrae 68 (11 + 57); insertion of dorsalmost pectoral-fin ray level with dorsal margin of eye; ventral pectoral-fin lobe consisting of three short, thick, fleshy, lightly pigmented rays; mouth extending posteriorly beyond anterior margin of eye; gill opening entirely above pectoral fin and surrounded with fleshy tissue; gill rakers long, pointed, with 0–3 spinules at or near tip; anus positioned forward near pectoral symphysis; caudal fin wide with 6 rays; pyloric caeca five; coloration uniform brown on lateral body and median fins.

Description. Measurements and counts are given in Table 1. Head small, 8.7 times in SL, deep and wide; length 1.2 times depth and depth 1.3 times width. Dorsal contour slightly rounded to snout. Snout short, 1.4 times eye diameter, with rounded tip, projecting past upper jaw; appearing wide and blunt from anterior view with a very gelatinous texture. Rostral fold deep, entirely covering upper lip. Nostril large, about 3 times in eye diameter, tube-like with a tall raised rim, tube base level with upper half of eye. Eye large, 4.5 times in head length, upper margin well below dorsal contour of head. Interorbital space 1.9 times eye diameter. Suborbital space (distance from end of mouth cleft to eye) nearly equal to eye diameter. Mouth slightly inferior, horizontal, and large, with cleft reaching to vertical beyond anterior margin of eye. Maxilla reaching beyond anterior margin of eye, mostly covered by skin. Upper and lower lip folds wide and covered almost entirely by gelatinous folds of tissue. Mandible shorter than maxilla and included in upper lip. In ventral view, chin wide, with anterior contour slightly curved, upper lip visible but covered with gelatinous tissue, ventral margin of snout visible (Fig. 3). Teeth simple, very short, blunt, papilla-like, mostly covered with skin (Fig. 4a), oriented in a posteriorly directed uniserial row of 4–5 evenly spaced teeth on maxilla and a posteriorly directed uniserial row of 8–10 teeth on mandible.

Gill opening small, round, about one-half eye diameter, ventral margin level with dorsal edge of eye. Opercular flap small, rounded and fleshy, covering lower half of gill opening. Gill rakers only present on lower arch, unpaired, long, slender, and conical (Fig. 5a), decreasing in length

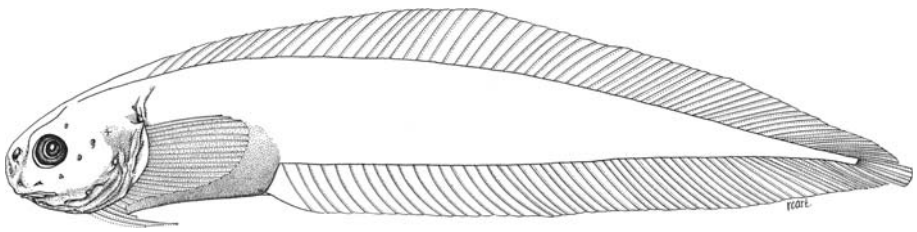

Fig. 2 *Paraliparis adustus* sp. nov., UW 028648, holotype, male, 150 mm SL, lateral view

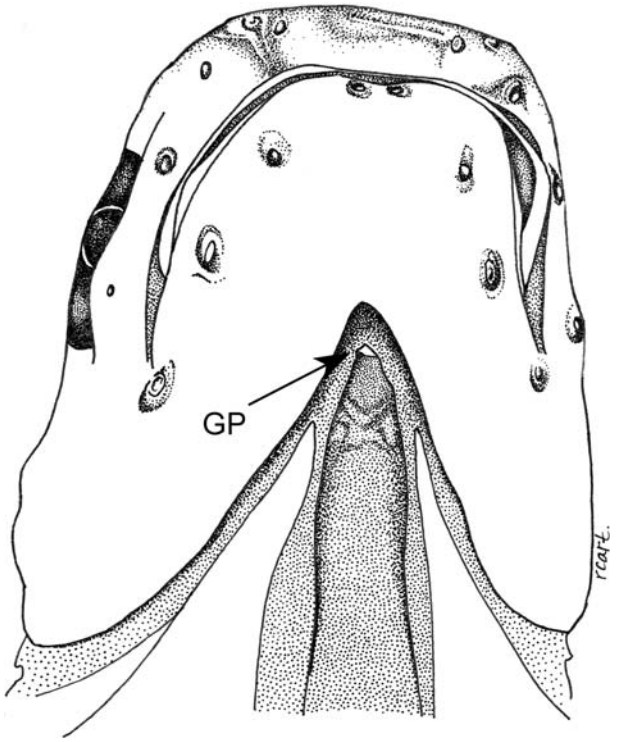

Fig. 3 *Paraliparis adustus* sp. nov., UW 028648, holotype, male, 150 mm SL, ventral view anterior of anal-fin origin showing chin pores and genital papilla. *GP* genital papilla

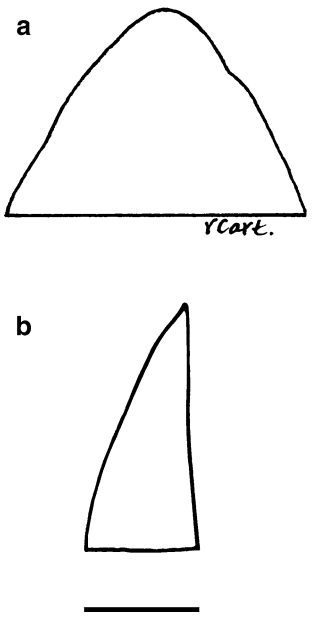

Fig. 4 **a** Tooth of *Paraliparis adustus* sp. nov., UW 028648, holotype (skin removed to expose tooth base). **b** Tooth of *Paraliparis bullacephalus* sp. nov., UW 042325, holotype. *Bar* 0.05 mm

from dorsal to ventral, each raker with 0–3 spinules at or near its tip (Fig. 5b). Ventralmost gill raker nub-like, about one-half length of adjacent raker and not as pointed.

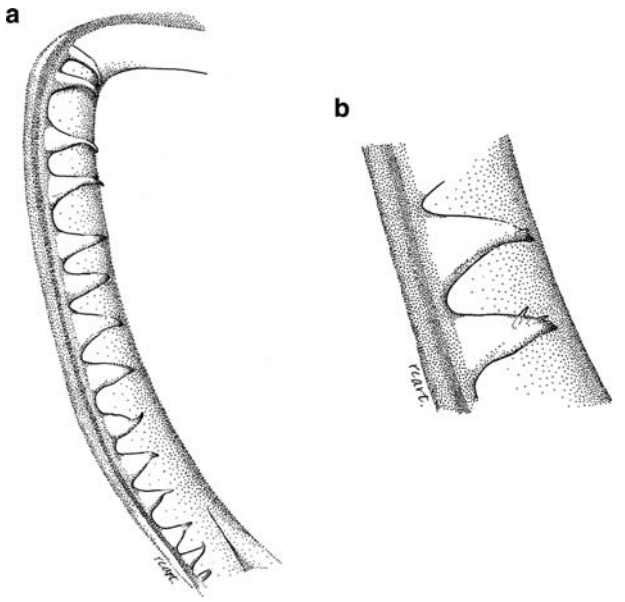

Fig. 5 **a** First right gill arch and rakers of *Paraliparis adustus* sp. nov., holotype UW 028648. **b** Spinules of gill rakers

Cephalic pores large but notably smaller in diameter than nostril. Nasal pore (n) interspace wide, about one-third eye diameter. Nasal pores, second and third infraorbital pores (io), and all preoperculomandibular pores (pm) deeply embedded in gelatinous tissue; fifth and sixth io pores, postorbital (po) and suprabranchial pore (s) embedded to a lesser extent. Suprabranchial pore small, aligned above anterior margin of gill opening. Chin pores closely set, interspace about one-third distance between first and second pm (Fig. 3).

Interneural of first dorsal-fin ray inserted between third and fourth neural spines. Dorsal- and anal-fin rays united by fin membranes at tips. Anterior half of dorsal- and anal-fins submerged in thick gelatinous tissue. Pectoral fin with a deep notch. Uppermost pectoral-fin ray base inserted on vertical through ventral margin of gill opening, nearly level with dorsal margin of eye. Lowermost ray inserted on vertical below posterior margin of eye. Upper lobe not reaching anal-fin origin, lower lobe reaching posterior well beyond anus. Caudal fin depth broad, about 1.5 times in eye diameter, and short with 6 principal rays (3/3) with narrow base, about 4.5 times in eye diameter. Dorsal and anal fins overlap caudal fin for about one-half and two-thirds of its length.

Six pairs of pleural ribs. At least 6 abdominal vertebrae with epipleural ribs seen on radiograph. Skin thick, gelatinous, naked. Pyloric caeca long, white, with blunt tips.

Color in alcohol. Body and median fins uniform light brown. Snout, mouth, lower jaw and edge of operculum dusky brown. Dorsal and outer edge of upper pectoral-fin

Table 1 Morphometric measurements and counts of *Paraliparis adustus* sp. nov. and *P. bullacephalus* sp. nov.

	Paraliparis adustus	*Paraliparis bullacephalus*	*n*
Measurements			
Standard length (mm)	150.0	53.0–94.0 (69.7)	3
Head length	17.3	24.1–25.0 (24.7)	3
Head width	10.9	14.5–19.1 (17.5)	3
Head depth	13.9	19.9–21.1 (20.5)	3
Postorbital head length	8.5	11.1–12.6 (12.0)	3
Suborbital length	3.9	2.6–3.7 (3.3)	3
Snout length	5.5	5.0–6.4 (5.5)	3
Maxilla length	6.4	10.0–11.1 (10.5)	3
Mandible length	5.1	7.6–9.2 (8.4)	3
Interorbital width	7.4	7.3–8.1 (7.6)	3
Eye diameter	3.8	5.6–6.5 (6.1)	3
Gill opening length	2.0	7.9–9.1 (8.5)	3
Predorsal length	19.1	23.7–27.0 (25.7)	3
Preanal length	27.7	31.9–32.5 (32.1)	3
Mandible to anus length	6.6	14.2–18.3 (16.2)	3
Anus to anal-fin origin length	22.1	10.5–13.9 (12.0)	3
Body depth at pectoral fin	15.5	21.1–23.6 (22.0)	3
Body depth at anal-fin origin	17.0	13.2–15.4 (14.1)	3
Upper pectoral-fin length	12.9	16.7–17.7 (17.1)	3
Pectoral-fin notch length	2.0	6.0–6.8 (6.5)	3
Lower pectoral-fin length	12.2	13.1–16.2 (14.2)	3
Caudal-fin length	8.2	10.0–11.5 (10.8)	2
Caudal-fin depth	2.5	0.9–0.9 (0.9)	2
Dorsal fin connection to caudal-fin length	4.1	4.9–5.1 (5.0)	2
Anal fin connection to caudal-fin length	5.1	4.8–5.3 (5.0)	2
Counts			
Dorsal-fin rays[a]	64	60, 60	2
Anal-fin rays[a]	56	53, 55	2
Pectoral-fin rays upper lobe	20	15	3
Pectoral-fin rays notch	1	1	3
Pectoral-fin rays lower lobe	3	4, 5, 4	3
Pectoral-fin rays total	24	20, 21, 20	3
Caudal-fin rays[a]	6	6, 7	2
Abdominal vertebrae	11	10	3
Caudal vertebrae[a]	57	53, 54	2
Total vertebrae[a]	68	63, 64	2
Gill rakers[b]	14	9, 12	2
Branchiostegal rays	6	6	3
Pyloric caeca	5	3, 3	2
Gill opening extending to pectoral-fin ray number	Completely above	11, 11, 13	3
Cephalic sensory pores	2-6-7-1	2-6-7-1	3

Measurements with the exception of standard length are given as percent standard length

Range (mean) and sample size (*n*) given for measurements of *P. bullacephalus*

[a] Entire caudal fin and some dorsal- and anal-fin rays and caudal vertebrae missing on *P. bullacephalus*, UW 110935

[b] Right gill opening not enlarged by dissection to examine gill rakers on the holotype of *P. bullacephalus*, UW 042325

lobe and entire lower lobe dusky brown. Peritoneum black. Stomach, intestine, and pyloric caeca pale.

Maturity and reproduction. Holotype is a male with mature testes. Prominent genital papilla, length nearly one-half eye diameter and directed anteriorly (Fig. 3).

Distribution. Known only from the holotype, collected in the Bering Sea, near the Aleutian Island Archipelago, north of Adak Island, Alaska (Fig. 1). The specimen was collected at 640 m in water 3,658 m deep.

Etymology. The species name "*adustus*" is derived from Latin, meaning "brown of skin," referring to the uniform brown coloration of the body and median fins of the holotype.

Comparisons. The *P. adustus* holotype was initially identified as *Paraliparis rosaceus* Gilbert 1890, but close examination revealed numerous differences between these species. Important characters distinguishing *P. adustus* include 24 total pectoral-fin rays (vs. 18–22); dorsalmost pectoral-fin ray insertion level with dorsal margin of eye (vs. below eye); ventral pectoral-fin lobe consisting of short, thick, fleshy, lightly pigmented, rays (vs. long, thin, darkly pigmented); 11 abdominal vertebrae (vs. 12–13); maxilla extending posteriorly beyond anterior margin of eye (vs. just to anterior margin); fleshy tissue surrounding the gill opening (vs. fleshy tissue absent); 13 long gill rakers pointed with 0–3 spinules at or near tip (vs. 15–16 short, blunt rakers with numerous spinules); forward position of the anus near pectoral symphysis (vs. posterior near mid-gut); a prominent genital papilla (vs. genital papilla not externally visible); wide caudal peduncle and fin (vs. narrow); and uniform brown coloration on lateral body and median fins (vs. rosy to pinkish with black edges on median fins). Teeth of *P. adustus* differ from those of *P. rosaceus* in being simple, short, blunt, papilla-like, mostly covered with skin, and directed posteriorly in a uniserial row of 4–5 teeth on the maxillary symphysis and restricted to a posteriorly-directed uniserial row of 8–10 teeth on mandibular symphysis (vs. a nearly complete uniserial row of longer, thinner, and sharper teeth that are not posteriorly directed or covered with skin). *Paraliparis adustus* is most similar in appearance to *P. nassarum* from off California, but differs in all of the same characters noted for *P. rosaceus* except pectoral-fin ray count and body coloration of which *P. nassarum* is more similar to *P. rosaceus*. *Paraliparis adustus* also differs from *P. nassarum* by having 64 dorsal-fin rays (vs. 56–61); 56 anal-fin rays (vs. 51–55); 68 vertebrae (vs. 64–67); and a broad caudal fin with 6 rays (vs. narrow with 8–9 rays). In addition, neither *P. rosaceus* or *P. nassarum* has been reported from the Bering Sea. *Paraliparis adustus* has some similarities to *Paraliparis paucidens* Stein 1978 from off Oregon and the Bering Sea (Orr et al. 2005), but differs in having more dorsal rays (64 vs. 57–62), vertebrae (68 vs. 66–67), and fewer suprabranchial pores (1 vs. 2). *Paraliparis adustus* is also lighter in coloration and lacks the mandibular rods present in *P. paucidens*. *Paraliparis adustus* is also similar in appearance to *Paraliparis meridionalis* Kido 1985 from the East China Sea, but differs in having more dorsal-fin rays (64 vs. 61–62), fewer caudal-fin rays (6 vs. 8), and a more dorsal insertion of the uppermost pectoral-fin ray (level with dorsal margin of eye vs. below eye). The majority of north Pacific *Paraliparis* are thought to be demersal species. This water column collection of *P. adustus* in the mesopelagic zone is unusual, but not necessarily indicative that this species is unique to that habitat being the only known specimen.

***Paraliparis bullacephalus* sp. nov.** (English name: Bubble-head snailfish) (Figs. 1, 4, 6–8).

Holotype. UW 042325: male, 53.0 mm SL (Fig. 6), Gulf of Alaska (57°59′02″N, 154°22′08″W), R/V *Miller Freeman*, 6 April 1992, depth 279 m.

Paratypes. UW 047282: female, 94.0 mm SL, Gulf of Alaska (58°01′37″N, 154°11′58″W), F/V *Dominator*, 19 June 1999, depth 233 m. UW 110935: male, 62.0 mm SL (length estimated, portion of posterior body missing), Gulf of Alaska (58°36′00″N, 155°22′50″W), R/V *Miller Freeman*, 10 April 1993, depth 322 m.

Diagnosis. The following combination of characters distinguishes *Paraliparis bullacephalus* sp. nov. from other species of *Paraliparis*: dorsal-fin rays 60; anal-fin rays 53–55; pectoral-fin rays 20–21; caudal-fin rays 6; vertebrae 63–64; dorsal contour of head rounded to snout, covered with gelatinous tissue; snout short with rounded tip projecting past upper jaw; mouth small, horizontal, inferior, with cleft

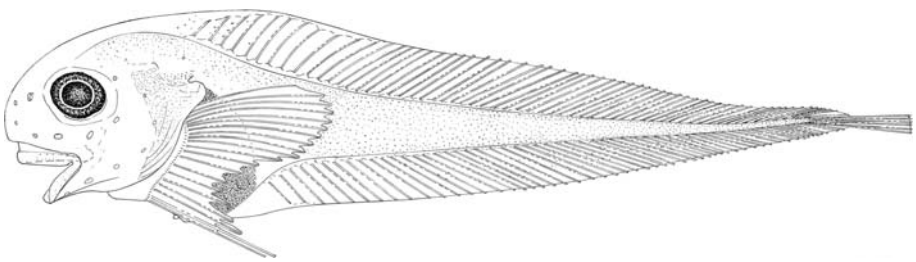

Fig. 6 *Paraliparis bullacephalus* sp. nov., UW 042325, holotype, male, 52.0 mm SL, lateral view

reaching to nearly vertical below center of eye; eye large with dorsal margin level with or slightly above top of gill opening; opercular flap large, rounded, projecting slightly toward dorsal; pectoral fin with 15 rays in upper lobe, one in notch, and 4 or 5 in lower lobe, both lobes extending beyond anal-fin origin; cephalic pores equal to or smaller in diameter than nostril; suprabranchial pore elevated, anterior of gill opening a distance about equal to opercular flap width; pyloric caeca 3.

Description. Measurements and counts are given in Table 1. Head large, 4 times in SL, deep and wide; length 1.1 times depth, depth equal to width. Dorsal contour rounded to snout, covered with gelatinous tissue. Snout short, nearly equal to eye diameter with rounded tip, projecting past upper jaw; appearing wide from anterior view with a very gelatinous texture. Rostral fold deep, but not covering upper lip. Nostril small, about 6 times in eye diameter, tube-like with short raised rim, tube base level with center of eye. Eye large, about 4 times in head length, dorsal margin below dorsal contour of head and level with or slightly above top of gill opening. Interorbital space 1.1–1.2 times eye diameter. Suborbital space 0.5–0.6 of eye diameter. Mouth inferior, horizontal, and small, with cleft reaching to vertical nearly below center of eye. Upper and lower lip folds wide but not covered by gelatinous folds of tissue. Lower jaw shorter than upper jaw, included in upper lip. In ventral view, chin moderately wide, with curved anterior contour, upper lip visible in its entirety, ventral margin of snout also visible (Fig. 7). Teeth simple, long and slender, slightly curved posteriorly (Fig. 4b). About 30 rows of 6–8 teeth on each side of upper and lower jaws.

Gill opening long, about 1.3–1.5 times eye diameter, ventral margin level with ventral edge of eye, extending ventrally in front of 11–13 pectoral-fin rays. Opercular flap large, rounded, oriented dorsally, covering upper two-thirds of gill opening. Gill rakers distally compressed, paired dorsally and ventrally, alternating in center with slightly domed spinule plate and up to 8 irregularly positioned spinules.

Cephalic pores small, equal to or smaller in diameter than nostril. Interspace of nasal pores wide, about equal to eye diameter. All nasal, infraorbital, preoperculomandibular, postorbital, and supraorbital pores partially embedded in gelatinous tissue. Suprabranchial pore small, elevated, and anterior of gill opening a distance about equal to opercular flap width, also partially embedded in gelatinous tissue. Chin pores widely set, interspace slightly greater than distance between first and second pm (Fig. 7).

Dorsal- and anal-fin rays united by fin membranes at tips. Well-developed gelatinous tissue surrounding dorsal and anal fins. Pectoral fin encased in gelatinous tissue with a deep notch. Uppermost pectoral-fin ray base inserted on vertical through center margin of gill opening slightly below center of eye. Lowermost ray inserted on vertical well beyond posterior margin of eye. Upper and lower lobes both reaching beyond anal-fin origin. Radials 4 (4 + 0), very large with large fenestra between second and third (Fig. 8). Scapula with a very strong helve, coracoid rod-shaped. Caudal-fin base very narrow, about 9 times in eye diameter with long caudal-fin rays. Dorsal and anal fins overlap caudal fin nearly one-half of its length.

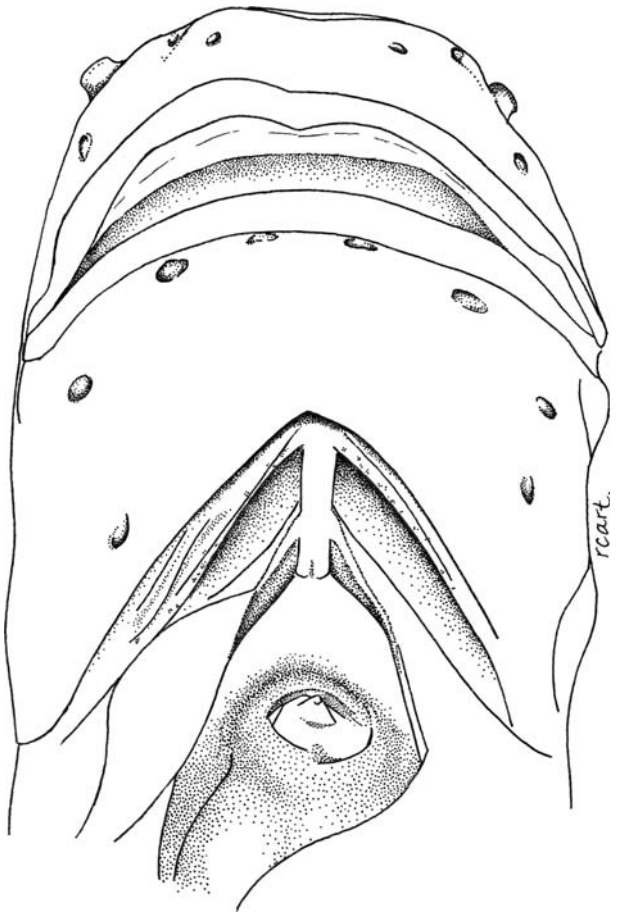

Fig. 7 *Paraliparis bullacephalus* sp. nov., UW 042325, holotype, male, 52.0 mm SL, ventral view anterior of anal-fin origin showing chin pores

Pleural and epipleural ribs not discernable on radiographs. Skin thin, gelatinous, naked. Pyloric caeca long, moderately thick, tips blunt, pigmented at base to about one-half length, tips pale.

Color in alcohol. Light covering of punctate melanophores on head dorsally over the midbrain, hindbrain, posterior region of head, opercular flap, and nape. Additional small melanophores uniformly scattered over lateral body. A few very small, widely-spaced melanophores present on posteriormost one-fourth of the dorsal and anal fins, and anteriormost one-fourth of the caudal fin. Peritoneum and stomach darkly pigmented.

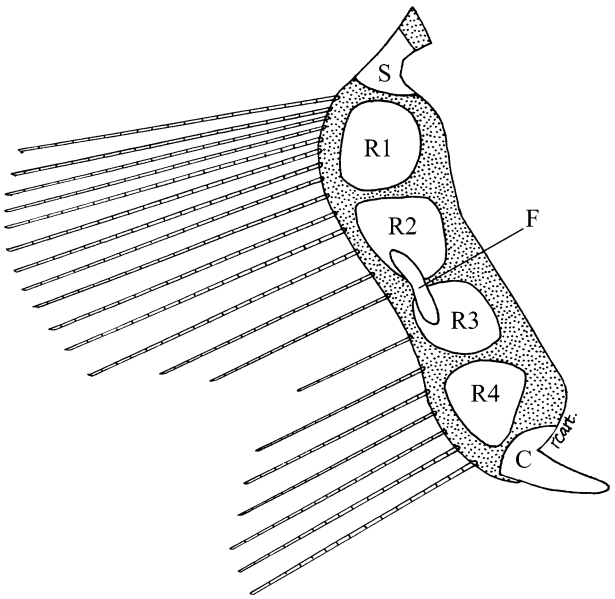

Fig. 8 Cleared and stained right pectoral girdle of *Paraliparis bullacephalus* sp. nov., paratype UW 047282. *S* scapula, *R1* first radial, *R2* second radial, *F* fenestra, *R3* third radial, *R4* fourth radial, *C* coracoid

Maturity and reproduction. The males (53.0, 62.0 mm) appear to be mature. The female (94.0 mm) was mature with the ovaries containing numerous mature and immature, spherical, pale-colored, opaque, yolked oocytes, ranging in diameter from 0.20–2.12 mm. From gross observation, there appear to be fewer than 100 eggs in each ovary.

Distribution. All three specimens were collected in Shelikof Strait, Alaska, at depths ranging from 233 to 322 m (Fig. 2).

Etymology. The specific epithet and common name of this snailfish are derived from the Latin words "*bulla*" for "bubble" and "*cephalus*" for "head" in reference to the large, round head covered with gelatinous tissue.

Comparisons. *Paraliparis bullacephalus* is most similar to *Paraliparis holomelas*, particularly in body and gill raker morphology (Busby and Cartwright 2006; figs. 1, 6A, B), but primarily differs by having the dorsal contour of the head rounded to the snout (vs. slightly concave), a shorter snout, smaller mouth, rounded opercular flap (vs. slightly hook shaped), smaller cephalic sensory pores, suprabranchial pore elevated and forward of gill opening (vs. aligned closely above anterior margin of gill opening), dorsal margin of the eye level or slightly above the top of the gill opening (vs. well below level), more radials in the pectoral girdle (4 vs. 3), and fewer pyloric caeca (3–4 vs. 7–10). *Paraliparis bullacephalus* is also similar to *Paraliparis latifrons* Garman 1899, but differs in having a dark (vs. pale) stomach and usually more dorsal- (57–61 vs. 54–57) and more anal- (52–55 vs. 48–50) fin rays.

Comparative material. All material listed in Busby and Cartwright (2006) and the following: *Paraliparis darwini* (photograph only), one specimen, CAS 86576, holotype, female, 131 mm SL, "Johnson Sea-Link" Dive 3971, NE Pacific, Isla Wolf, Galapagos Islands, Ecuador, 23 November 1995, depth 637 m, coll. J. McCosker et al. *Paraliparis grandis*, one specimen, UW 113730, sex undetermined, 210 mm SL, Bering Sea, USA, 59°21′48″N, 178°27′44″W, 24 June 2002, depth 1,047 m, coll. L. Britt. *Paraliparis nassarum*, four specimens, LACM 37600-1, three paratypes, one female?, 234 mm SL, two sex undetermined, 243 and 248 mm SL, 5.6–14.8 km SE of San Clemente Island, California, USA, 10 July 1978, depth 1,006–1,189 m, coll. A. Rickard. LACM 38507-2, one paratype, male, 294 mm SL, 55.5 km SW of San Nicholas Island, California, USA, 06 June 1979, depth 914 m, coll. S. Schones. *Paraliparis rosaceus,* five specimens, UW 047106, one male, 275 mm, Coast of Washington, USA, 46°48′00″N, 125°16′08″W, 15 October 2000, 1,189 m, coll. R. Lauth. UW 047107, one female, 160 mm SL, Coast of Oregon, USA, 44°26′06″N, 125°16′08″W, 05 November 1999, depth 1,208 m, coll. R. Harrison. UW 04089, one male, 145 mm SL, Coast of N. California, USA, 39°29′07″N, 124°08′53″W, 27 October 2001, depth 921 m, coll. D. King. UW 048100, one female?, 123 mm SL, Coast of Washington, USA, 48°07′29″N, 125°50′31″W, 17 November 1999, depth 1,193 m, coll. J. Orr. UW 048179, one male, 230 mm SL, Coast of Washington, USA, 48°17′17″N, 124°58′00″W, 13 November 1999, depth 1,101 m, coll. J. Orr. *Paraliparis paucidens*, six specimens, UW 111201, four females, one male, one immature, 72–186 mm SL, Bering Sea, USA, 56°00′50″N, 169°05′03″W, 21 May 2000, depth 997 m, coll. E. Sinclair.

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