Stomatopoda (Crustacea) of the KARUBAR Expedition in Indonesia

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ABSTRACT
Stomatopods collected by the KARUBAR Expedition to Indonesia are reported. The six species represented are new records for the Kai, Aru and Tanimbar islands and increase the known fauna to 28 species. The six species are Alainosquilla foresti Moosa, 1991, Odontodactylus latirostris Borradaile, 1907, Lysiosquilla sulcirostris Kemp, 1913, Kasim karubar n. sp., Kaisquilla laevis n. gen., n. sp., Oratosquillina quinquedentata (Brooks, 1886) and Squilloides leptosquilla (Brooks, 1886). Kasim karubar n. sp. closely resembles K. philippinensis (Moosa, 1986) but differs chiefly in having shorter eyestalks, and five teeth instead of seven on the dactylus of the raptorial claw. Kaisquilla laevis n. gen., n. sp. most closely resembles species of Anchisquilloides Manning, 1977 and Anchisquillopsis Moosa, 1986, but most significantly differs in lacking submedian abdominal carinae. The present specimen of Alainosquilla foresti is the largest known specimen of the species and represents the first record of the species since it was first described. Moosa’s (1991) description is erroneous in several important features. Therefore, Alainosquilla Moosa, 1991 is rediagnosed.

KEY WORDS
Crustacea, Stomatopoda, Alainosquilla, Kaisquilla n. gen., Kasim, Indonesia, new genus, new species.
INTRODUCTION

The 1991 French-Indonesian KARUBAR Expedition to the southeastern Indonesian islands of Kai, Aru and Tanimbar resulted in a small, but significant collection of Stomatopoda. Of the six species reported here, two are new to science and one is also referable to a new genus. The collection also includes the first Indonesian record of *Alainosquilla foresti* Moosa, 1991, a species previously only known from New Caledonia.

MATERIALS AND METHODS

Terminology and size descriptors follow Ahyong (2001). All measurements are in millimetres. Total length (tl) is measured along the midline from the tip of the rostrum to the apices of the submedian teeth. Carapace length (cl) is measured along the midline and excludes the rostral plate. Corneal index (CI) is given as 100cl divided by cornea width. Abbreviations used in this account include: antennule (A1); antenna (A2); abdominal somite (AS); thoracic somite (TS); maxilliped (MXP); median (MD); submedian (SM); intermediate (IM); lateral (LT); marginal (MG); pleopod (PLP). Specimens are deposited in the Muséum national d’Histoire naturelle, Paris (MNHN).

SYSTEMATICS

Superfamily GONODACTYLOIDEA Giesbrecht, 1910
Family ALAINOSQUILLIDAE Moosa, 1991
Genus *Alainosquilla* Moosa, 1991

*Alainosquilla foresti* Moosa, 1991
(Fig. 1)

*RÉSUMÉ*
Crustacés stomatopodes de l’Expédition KARUBAR en Indonésie.

MOTS CLÉS
without dorsal carinae; articulation compact. Telson with distinct MD carina, short anterior SM carinae, minute SM and two IM denticles. Uropodal protopod with one primary spine; exopod segments with terminal articulation.

**DISTRIBUTION.** — New Caledonia and now from Indonesia at depths between 110 and 212 m.

**REMARKS**
The specimen agrees well with the holotype (tl 17) but shows several size related differences: the rostral plate is slightly broader, the median carina on the telson is sharper, and four instead of three movable spines are present on the outer margin of the uropodal exopod. The present
specimen is female and the type series is based on subadults (and possibly some postlarvae), so the adult morphology of the endopod of the male first pleopod remains uncertain.

According to Moosa’s (1991) account, *Alainosquilla* resembles eurysquillids in having a depressed, loosely articulated body, and resembles gonodactylids in bearing a fixed dorsal process on the antennal protopod and in having subterminally articulated uropodal exopod segments. Re-examination of the type material along with the present specimen shows that the body is strongly convex with compact articulation, the dorsal process on the antennal protopod is articulated and the uropodal exopod segments are terminally articulated, as in hemisquillids and pseudosquillids. *Alainosquilla foresti* is re-diagnosed above.

Family **Odontodactylidae** Manning, 1980

Genus *Odontodactylus* Bigelow, 1893

**Odontodactylus latirostris** Borradaile, 1907


*Odontodactylus brevirostris* — Moosa 1973: 12, 13 [non *O. brevirostris* (Miers, 1884)].

**Material examined.** — Kai Islands, stn DW01, 05°46'S, 132°10'E, 156-305 m, 22.X.1991, right raptorial claw, propodus length 12 (MNHN).

**Distribution.** — The Seychelles to Australia, southeastern Indonesia and New Caledonia at depths between 20 and 305 m.

**Remarks**

Based on the mottled colour pattern on the merus and presence of seven teeth on the dactylus of the raptorial claw, the specimen is likely referable to *O. latirostris*. *Odontodactylus latirostris* was reported from various localities in Indonesia by Debelius (1999) and from Ceram (03°15'S, 128°08'E) by Moosa (1973) as *O. brevirostris*. Ahyong (2001) recently reported *O. latirostris* from northern Australia.
Kasim karubar n. sp., holotype (MNHN): A, anterior cephalon, dorsal; B, eye, right dorsal; C, raptorial claw, right lateral; D, TSS-8, right dorsal; E, ASS-6, telson and uropod, dorsal; F, telson, ventral; G, uropod, right ventral; H-J, pereiopods 1-3, right posterior; K, PLP1 endopod, right anterior; L, TS8 sternal keel, right lateral. Scale bar: A-J, 1.25 mm; K, L, 0.6 mm.
unarmed; ischium approximately one-third merus length.

Mandibular palp 3-segmented. MXP1-5 each with epipod. MXP5 basal segment lacking ventrally directed spine; merus with broad, evenly convex flange on inner margin.

TS5 lateral process obsolete. TS6-7 lateral processes subtruncate laterally, rounded anterolaterally and posterolaterally; posterolateral margin not produced posteriorly. TS8 lateral process rounded; sternal keel conical, apex blunt.

Pereiopods 1-3 basal segment with posterior, ventrally directed spine. Pereiopods 1-2 with distal segment of endopod subcircular; endopod 3 distal segment slender, elongate.

AS6 smooth medially; lacking submedian and intermediate carinae or spines; lateral spines slender; with one slender spine and one broad triangular projection anterior to uropod articulation; sternum posterior margin unarmed.

Telson broader than long; with three pairs of primary teeth (SM, IM, LT); SM teeth with movable apices; IM teeth with apices extending posteriorly beyond base of SM teeth; with 10 SM denticles either side of midline; with four IM denticles, second and fourth longest; LT denticle spiniform; lateral margins unarmed. Dorsal surface smooth, lacking carinae; with low posteromedian projection terminating in blunt median projection flanked by three slender, well spaced, posteriorly directed spines above marginal armature. Telson ventral surface with postanal spine; lacking carinae lateral to postanal spine.

Uropodal protopod terminating in two slender, flattened spines, dorsally and ventrally carinate, triangular in cross-section, inner longer; unarmed dorsally excepting dorsal spine above proximal exopod articulation; with slender ventral spine anterior to endopod articulation. Uropodal exopod proximal segment unarmed dorsally; inner margin with low, round distal lobe; outer margin with six movable spines, distalmost exceeding midlength but not apex of distal segment; distal margin with slender ventral spine. Exopod distal segment longer than proximal segment. Endopod unarmed dorsally; length 2.57 breadth.

Colour in alcohol
Completely faded.

Measurements of holotype

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<td>3.3</td>
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<tr>
<td>A2 scale</td>
<td>2.6</td>
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<tr>
<td>Propodus length</td>
<td>6.2</td>
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REMARKS

Kasim now includes three species, _K. insuetus_ (Manning, 1970) from southern Australia, _K. philippinensis_ (Moosa, 1986) from the Philippines, and _K. karubar_ n. sp. from Indonesia. _Kasim karubar_ n. sp. most closely resembles _K. philippinensis_ and both differ from _K. insuetus_ in lacking a ventral papilla on the antennal protopod, lacking longitudinal carinae on the telson, and in bearing no more than four intermediate denticles on the telson. _Kasim karubar_ n. sp. differs from _K. philippinensis_ in bearing shorter, but asymmetrically bilobed eyes, fused instead of separate ocular scales, five instead of seven teeth on the dactylus of the raptorial claw, the posterolateral margin of TS6-7 is not posteriorly produced, and the posteromedian process of the telson is a blunt lobe instead of a slender spine. The three species of _Kasim_ can be separated using the key below.

Species of four tetrasquillid genera have a postanal spine on the ventral surface of the telson: _Acaenosquilla_ Manning, 1991, _Heterosquillopsis_ Moosa, 1991, _Kasim_ Manning, 1995, and _Tectasquilla_ Adksion & Hopkins, 1984. Unlike other tetrasquillids, however, in _Acaenosquilla, Heterosquillopsis_ and _Kasim_, the endopods of pereiopods 1-2 are subcircular to ovate as in _Nannosquillidae_, but unlike _nannosquillids_, the endopod is slender on pereiopod 3. _Acaenosquilla, Heterosquillopsis_ and _Kasim_ form a discrete group in the Tetrasquillidae, being united by the postanal spine and morphology of the pereiopodal endopods (Ahyong & Harling 2000).
Superfamily SQUILLOIDEA Latreille, 1802
Family SQUILLIDAE Latreille, 1802

Kaisquilla n. gen.

TYPE SPECIES. — Kaisquilla laevis n. gen., n. sp. by monotypy.

ETYMOLOGY. — Named after the type locality, Kai Islands, in combination with the generic name Squilla. Gender feminine.

DIAGNOSIS. — Eye with bilobed cornea, distinctly broader than and set slightly obliquely on stalk. Ocular scales separate. A1 somite dorsal processes with short slender apices, directed anterolaterally. Carapace with anterolateral spine; with faintly indicated LT and reflected MG carinae indicated posteriorly only. Mandibular palp present. MXP1-2 each with epipod. TS5-7 lateral processes single. TS5 without ventral spine. AS1-5 without MD and SM carinae. Telson broader than long, with three pairs of primary teeth (SM, IM, LT); SM teeth with movable apices; prelateral lobe absent; dorsolateral surface rugose, with short, low, mid-dorsal carina; ventral surface without postanal carina; ventrolateral carina extending posteriorly to base of LT denticle. Uropod protopod with smooth inner margin.

REMARKS
Kaisquilla n. gen. superficially resembles Levisquilla Manning, 1977, and Rissoides Manning & Lewinsohn, 1982, in the rounded lateral process of TS6-7 and reduced dorsal carinae. In other respects, however, such as general habitus, the bilobed cornea, rostral plate shape, absence of a pair of ventral spines on TS5, the blunt hook process on the endopod of PLP1, telson and uropod structure, Kaisquilla n. gen. most closely resembles Anchsiquilloides Manning, 1977 and Anchsiquillopsis Moosa, 1986. A cladistic analysis of the squilloid genera (unpublished data) shows that Kaisquilla n. gen. is most closely related to Anchsiquilloides and Anchsiquillopsis. Unlike most other squilloids that have a single lateral process on TS5, Kaisquilla n. gen., Anchsiquilloides and Anchsiquillopsis share a blunt instead of acute hook process on the endopod of the first male pleopod.

Kaisquilla laevis n. sp.

(Fig. 3)

TYPE MATERIAL. — Kai Islands, stn DW14, 05°18’S, 132°28’E, 245-246 m, 24.X.1991, holotype tI 28 (MNHN).

ETYMOLOGY. — Named laevis, meaning smooth, for the absence of median and submedian carina on the abdomen in Kaisquilla n. gen., that are present in species of Anchsiquilloides and Anchsiquillopsis.

DISTRIBUTION. — Known only from Kai, at 245-246 m depth.

DESCRIPTION
Dorsal integument smooth, polished.
Eye with cornea bilobed, distinctly broader than and set slightly obliquely on stalk, not extending beyond antennular peduncle segment 1; CI 421.
Ophthalmic somite with medially emarginate anterior margin. Ocular scales rounded, separate.
A1 somite dorsal processes with short slender apices, directed anterolaterally; A1 peduncle 1.10cl. A2 scale slender, 0.40cl; entire margin setose.

Rostral plate longer than broad; lateral margins convex; apex blunt; with distinct median carina. Carapace anterior width less than half median length; anterolateral spines not extending anteriorly to base of rostral plate; with faintly indicated lateral and reflected mg carinae indicated posteriorly only.
Raptorial claw unknown. 
Mandibular palp 2-segmented (damaged on left side). MXP1-2 each with epipod. MXP5 basal segment without ventrally directed spine. 
Pereiopods 1-3 basal segment unarmed; endopod 2-segmented, distal segment slender. 
TS5 lateral process a single slender spine directed anterolaterally; ventral spine absent. TS6-7 lateral process broadly rounded. TS6-8 each with distinct IM carinae. TS8 anterolateral margin rounded; sternal keel produced as a posteriorly directed spine. 
AS1-5 each with IM, LT and MG carinae. AS6 with SM, IM and LT carinae; with ventrolateral spine anterior to uropodal articulation; sternum posterior margin unarmed, without transverse carinae. Abdominal carinae spined as follows: SM 6, IM 5-6, LT 5-6, MG 4-5. 
Telson broader than long, with three pairs of primary teeth, each with dorsal carina; SM teeth with movable apices; prelateral lobe absent; MD carina with proximal pit and posterior spine; dorsolateral surface rugose, with short, low, mid-dorsal carina and a few shallow pits; denticles spiniform SM 12-14, IM 9-10, LT 1; ventral surface without postanal carina; ventrolateral carina extending posteriorly to base of LT denticle. 
Uropodal protopod terminating in two slender spines, dorsally and ventrally carinate, inner longer; unarmed dorsally except for dorsal spine above proximal exopod articulation; protopod inner margin smooth, without ventral spine or tubercle anterior to endopod articulation; lobe on outer margin of inner spine rounded and deflected dorsally, broader than adjacent spine, proximal margin faintly concave. 
Uropodal exopod proximal segment unarmed dorsally; distal margin with slender ventral spine; outer margin with six movable spines, distalmost not exceeding midlength of distal segment; exopod distal segment longer than proximal segment; endopod unarmed dorsally, entire margin setose. 

*Colour in alcohol*
Largely faded, but with dark pigment around the posterolateral margins of the carapace, lower and posterior margins of the thoracic and abdominal somites. AS6 with dark submedian patch. Telson dark on posterior half. Uropodal protopod dark proximally, on inner distal margin and apex of outer spine. Uropodal exopod proximal segment with dark pigment distally.

**Measurements of holotype**

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<td>cornea width</td>
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**REMARKS**
Unfortunately, the specimen is badly damaged: both raptorial claws are missing, the right anterior portion of the carapace is fragmented, and the ocular somite fractured and almost fully detached from the cephalon. Therefore, Fig. 3 shows a partial reconstruction. 
The well-developed pene and endopod of PLP1 show that this specimen is sexually mature.

**Genus Oratosquillina Manning, 1995**

*Oratosquillina quinquedentata* (Brooks, 1886)


**Material examined.** — Kai Islands, stn DW01, 05°46’S, 132°10’E, 156-305 m, 22.X.1991, 1 ♀ postlarva tl 22 (MNHN).

**DISTRIBUTION.** — Gulf of Thailand, India, Indonesia, and Australia from the shore to 156-305 m depth.

**REMARKS**
The postlarva lacks raptorial claws, but agrees well with Alikunhi’s (1967) account of postlarval *O. quinquedentata*. The present specimen represents the deepest known record for *O. quinquedentata*. *Oratosquillina quinquedentata* was previously known from the shore to 51 m depth (Dingle *et al.* 1977; Manning 1978; Ahyong 2001).
Genus *Squilloides* Manning, 1968

*Squilloides leptosquilla* (Brooks, 1886)


**Distribution.** — The Philippines, the Andaman Islands, Australia, the Banda Sea, and now from Káí and Tanimbar, Indonesia at depths between 170 and 754 m (Ahyong 2001).

**Remarks**

The specimens in the present series generally agree well with the holotype and published accounts (Brooks 1886; Kemp 1913; Moosa 1986; Ahyong 2001). Variation in the Indonesian specimens resembles that reported by Ahyong (2001) for Australian material. In the smaller specimens, the eye is more triangular, and the median carina on the carapace and rostral plate is less distinct than in the largest specimen. The lateral process of TS5 is directed laterally in the smallest specimen, and anterolaterally in the largest specimen.

**Discussion**

Moosa (1973) reported 22 species of stomatopod from Káí, Aru and Tanimbar, none of which are represented in the present collection. Therefore, the six species of stomatopod reported above are all new records for area increasing the known stomatopod fauna to 28. The material reported by Moosa (1973) was collected from the shoreline to a maximum depth of 90 m (usually less than 50 m) whereas specimens reported above were collected at depths between 156 and 809 m (usually 200-300 m). Not surprisingly then, the species reported here were not represented in Moosa’s (1973) collection. The majority of the stomatopods known from Káí, Aru and Tanimbar occur elsewhere in the Australasian region or are widely distributed in the Indo-West Pacific. Thus, *Alainosquilla foresti* was previously known from New Caledonia. *Odontodactylus latirostris, Oratosquillina quinquedentata* and *Squilloides leptosquilla* are relatively widespread in the Indo-West Pacific region. *Kasim karubar* n. sp. and *Kaisquilla laevis* n. gen. n. sp., however, are presently known only from Tanimbar and Káí respectively.

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**References**


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