Kensley, 1969

ANNALS OF THE SOUTH AFRICAN MUSEUM
ANNALE VAN DIE SUID-AFRIKAANSE MUSEUM

Volume 52 Band
April 1969 April
Part 7 Deel

DECAPOD CRUSTACEA FROM THE SOUTH-WEST INDIAN OCEAN

By

B. F. KENSLEY

Cape Town Kaapstad

The ANNALS OF THE SOUTH AFRICAN MUSEUM

are issued in parts at irregular intervals as material becomes available

Obtainable from the South African Museum, P.O. Box 61, Cape Town

Die ANNALE VAN DIE SUID-AFRIKAANSE MUSEUM

word uitgegee in dele op ongereelde tye na beskikbaarheid van stof

Verkrygbaar van die Suid-Afrikaanse Museum, Posbus 61, Kaapstad

OUT OF PRINT/UIT DRUK

1, 2(1, 3, 5, 7–8), 3(1–2, 5, t.-p.i.), 5(2, 5, 7–9), 6(1, t.-p.i.), 7(1, 3), 8, 9(1–2), 10(1–3), 11(1–2, 7, t.-p.i.), 21, 24(2), 27, 31(1–3), 38, 44(4).

Price of this part/Prys van hierdie deel

R2.10

Printed in South Africa by
The Rustica Press, Pty., Ltd.
Court Road, Wynberg, Cape

In Suid-Afrika gedruk deur
Die Rustica-pers, Edms., Bpk.
Courtweg, Wynberg, Kaap

DECAPOD CRUSTACEA FROM THE SOUTH-WEST INDIAN OCEAN

By

B. F. KENSLEY

South African Museum, Cape Town

(With 16 figures)

[*MS. received* 30 *July* 1968]

CONTENTS

INTRODUCTION

The material dealt with in this paper comes from several sources. The greatest proportion was collected on the seventh cruise of the R/V *Anton Bruun*, in 1964, as part of the International Indian Ocean Expedition. The station numbers of the *Anton Bruun* are designated by the letters BRU, while catalogue numbers of the Zoology Department, University of Cape Town, are designated either as NAD (off the Natal coast) PED (off Moçambique coast), MDD (off the south-western coast of Malagasy Republic), or WBS (Walter's Shoal). This latter is a shallow area about 400 nautical miles south of the Malagasy Republic, and about 600 miles off the coast of South Africa. A final report of the expedition was published by the U.S. Program in Biology, I.I.O.E., in 1965, to which body I am indebted for the opportunity of examining the material.

Other sources of material include the collections made by the R/V *Vema* (station Vema 6) off the Natal coast, the *John D. Gilchrist* (station GIL 56–58) off Natal, and the S.A.S. *Natal* (station NGY) off Natal.

Type material is housed at the South African Museum, and catalogued with South African Museum (S.A.M.) numbers. All other material is in the Zoology Department of the University of Cape Town.

Ann. S. Afr. Mus. 52 (7), 1969, 149–181, 16 figs.

Abbreviations

Sampling gear:

AD—Agassiz Dredge
CG—Campbell Grab 0.6 m²
MT—Menzies Trawl
RD—Rock Dredge

Substrata:

c—coarse
Calc. Alg.—Calcareous Algae
Crl—coral
d—dark
f—fine
G—gravel
gn—green
G.O.—Globigerina Ooze
gy—grey
M—mud
R—rock
S—sand
Sh—shell
St—stone

Station List

Station Number	*Date*	*Position*	*Depth (m)*	*Bottom*	*Gear*
GIL 56	13.7.59	29°53′S/31°06′E	20	SM	RD
GIL 58	13.7.59	29°53′S/31°04′E	71	M	RD
NGY 21	17.5.58	30°47′S/30°29′E	44	St	
NGY 17	16.8.58	29°53′S/31°04′E	38	Cl	D
NGY 59	12.8.58	29°58′S/31°27′E	49		
NGY 63	13.8.58	30°47′S/30°27′E	36		
Vema 6	23.4.58	29°46′S/31°17′E	110–130		
BRU 356 B	29.7.64	29°11′S/31°37′E	18	R	RD
BRU 356 J	29.7.64	29°10′S/31°51′E	43	S	MT
BRU 357 B	30.7.64	29°11′S/32°02′E	70	R Sh	RD
BRU 358 C	30.7.64	29°21′S/31°58′E	370	gn S M	MT
BRU 363 P	5.8.64	23°17′S/43°33′E	12–25	gn M	AD
BRU 363 W	12.8.64	23°19′S/43°36′E	82		AD
BRU 370 G	18.8.64	24°40′S/35°28′E	347	Sh	AD
BRU 371 E	18.8.64	24°46′S/35°20′E	132	R Sh S	RD
BRU 371 F	18.8.64	24°46′S/35°18′E	110	c S R	RD
BRU 371 G	19.8.64	24°53′S/34°56′E	55	f gy S R	RD
BRU 372 C	19.8.64	24°46′S/24°50′E	22	Sh S R	RD
BRU 372 G	19.8.64	24°53′S/34°56′E	55	f gy S R	RD
BRU 372 L	19.8.64	25°07′S/34°34′E	112	d S M	AD
BRU 372 Q	22.8.64	25°57′S/33°02′E	42	Sh R	D
BRU 373 B	22.8.64	26°00′S/33°05′E	135	R Sh	RD
BRU 381 A–C	30.8.64	33°13′S/43°51′E	38–46	Calc. Alg.	RD
BRU 389 G	8.9.64	29°57′S/31°31′E	700	G O	AD
BRU 390 C	8.9.64	29°45′S/31°40′E	440	S	AD
BRU 390 E	8.9.64	29°42′S/31°38′E	350	S M	AD
BRU 390 G	8.9.64	29°38′S/31°36′E	200	S M	CG
BRU 390 H	8.9.64	29°37′S/31°33′E	175–200	S M	D
BRU 390 L	9.9.64	29°35′S/31°38′E	150	S M	AD
BRU 390 N	9.9.64	29°34′S/31°39′E	115	S M	CG
BRU 390 P	9.9.64	29°34′S/31°39′E	118	S M	AD
BRU 390 R	9.9.64	29°35′S/31°42′E	138	Gr Crl	CG
BRU 390 S	9.9.64	29°35′S/31°42′E	138	c S Crl	AD
BRU 391 B	9.9.64	29°29′S/31°45′E	86	M	CG
BRU 391 C	9.9.64	29°29′S/31°45′E	86	M	AD
BRU 391 F	9.9.64	29°26′S/31°46′E	77	gn M	AD
BRU 391 H	9.9.64	29°21′S/31°35′E	57	c M S Sh	AD
BRU 391 J	9.9.64	29°31′S/31°35′E	57	M S Sh	AD
BRU 392 F	10.9.64	29°16′S/31°32′E	35	d M	CG
BRU 392 G	10.9.64	29°14′S/31°31′E	18	f gy S	CG
BRU 392 H	10.9.64	29°13′S/31°31′E	18	gy f S	AD
BRU 392 K	10.9.64	29°19′S/31°26′E	38	c S	AD

Species List

* — new record for the southern African region
ovig — ovigerous
juv — juveniles

Species	♂	♀	*Juv*	*Station*	*Catalogue number*
BRACHYURA					
Achaeopsis spinulosus Stimpson	1	3 ovig	—	Vema 6	NAD 11 B
Achaeopsis thomsoni (Norman)	2	1 ovig	—	372 Q	PED 20 Y-Z
	1	—	—	371 F	PED 7 B
Achaeus lacertosus (Stimpson)	7	2 ovig	—	372 G	PED 16 N
Achaeus cf. *affinis* Miers	—	1		372 G	PED 16 N
	—	3 ovig	—	NGY 21	NAD 3 Z
Actaea rueppellii (Krauss)	1	—	—	NGY 21	NAD 3 X
Calappa lophos (Herbst)	1	—	—	363 W	MDD 1 D
Carcinoplax longimanus (de Haan)	—	1	15	390 H	NAD 31 C
	3	—	—	371 G	PED 8 Y
Charybdis cf. *annulata* (Fabricius)	—	1 ovig	—	NGY 17	NAD 8 L
Conchoecetes artificiosus (Fabricius)	8	6	—	391 J	NAD 62 L
Dorippe lanata (Linnaeus)	1	3 ovig	1	391 C	NAD 51 E
	—	—	2	390 L	NAD 35 E
	1	4 ovig	—	GIL 58	NAD 26 R
Ebalia (*Lithadia*) *barnardi* Stebbing	1	—	—	391 B	NAD 55 N-Q
Ebalia (*Ebalia*) *tuberculata* Miers	4	2 ovig	—	Vema 6	NAD 11 E
	1	—	—	390 S	NAD 45 N
	2	1	—	390 S	NAD 45 L
	—	—	1	358 C	ABD 1 C
Ebalia (*Ebalia*) *tuberculosa* f. *postulans* (Stebbing)	1	—	—	371 G	PED 8 V
Ebalia (*Ebalia*) *tuberculosa* f. *scandens* Stebbing	3	2	—	NGY 63	NAD 14 M
	1	1	—	390 E	ABD 15 K
	5	1 ovig	—	370 G	ABD 8 Z
	4	—	—	358 C	ABD 1 B
Ebalia sp.	1	—	—	390 E	ABD 15 L
**Ethusa sinespina* n.sp.	—	1 ovig	—	390 E	S.A.M. A12648
	—	1	—	358 C	S.A.M. A12649
	1	—	—	390 S	NAD 45 K
Eumedonus granulosus MacGilchrist	1	—	—	372 G	PED 16 Z
Eurynome aspera (Pennant)	3	1 ovig	—	NGY 21	NAD 3 S
Goneplax angulata (Pennant)	5	3	—	390 H	NAD 31 E
Gonioneptunus africanus (Shen)	10	17+2 ovig	—	390 L	NAD 35 D
	2	1 ovig	—	372 L	PED 19 N
Homola barbata (Fabricius)	—	1	—	381 A-C	WSS 3 D
Hyastenus spinosus Milne-Edwards	4	1 ovig	—	391 J	NAD 62 B
	2	—	—	372 G	PED 7 C
Inachus cf. *dorsettensis* (Pennant)	1	—	—	370 G	ABD 9 A
Inachus guentheri (Miers)	2	1 ovig	—	371 F	PED 7 C
	1	3 ovig	—	Vema 6	NAD 11 B
Inachus sp.	—	—	3	370 G	ABD 9 A
Leucosia marmorea Bell	—	1 ovig	—	391 J	NAD 62 K

	♂	♀	*Juv*	*Station*	*Catalogue Number*
Lophozozymus dodone (Herbst)	1	—	—	NGY 21	NAD 3 W
Lupocyclus tugelae Barnard	—	1 ovig	—	372 G	PED 16 K
Macropodia formosa Rathbun	4	—	—	NGY 59	NAD 18 T
	2	1 ovig	—	372	PED 19 T
	1	—	—	381 A-C	WSS 3E
**Nursilia dentata* Bell	1	—	—	371 F	PED 6 Z
**Palicus sexlobatus* n.sp.	1	—	—	371 F	S.A.M. A12642
**Paratergatis longimanus* Sakai	—	1	—	372 L	PED 19 M
	2	—	—	391 C	NAD 51 C
	2	—	—	390 P	NAD 40 K
Philyra globosa (Fabricius)	2	—	—	392 H	NAD 73 B
Philyra globulosa Milne-Edwards	13	8 ovig	—	391 C	NAD 51 A
	—	1 ovig	2	356 J	NAD 86 D
	2	2 ovig	—	392 K	NAD 75 E
Pilumnus hirsutus Stimpson	1	3	—	372 C	PED 12 Q-R
	2	1	—	372 G	PED 16 F-G
Pilumnus longicornis Hilgendorf	1	—	—	371 G	PED 8 X
	—	1	—	356 B	NAD 80 X-Y
	2	4	—	NGY 21	NAD 3 Y
Pinnotherids (Unidentified)	1	—	—	363 W	MDD 1 C
	1	—	—	372 L	PED 19 K
	1	—	—	390 S	NAD 45 J
	1	—	—	372 G	PED 16 H
Platylambrus quemvis Stebbing	5	7+2 ovig	—	391 J	NAD 62 A
				NGY 59	NAD 18 R
Platypodia cf. *granulosa* (Rüppell)	—	1	—	381 A-C	WSS 3 C
Portumnus mcleayi Barnard	1	1 ovig	—	372 C	PED 12 N
	1	—	—	391 J	NAD 64 W
Ranina ranina (Linnaeus)	1	—	—	372 G	PED 16 E
**Retropluma planiforma* n.sp.	2	4	—	390 H	NAD 31 D
					S.A.M. A12643 -5
Thalamita woodmasoni Alcock	—	1 ovig	—	NGY 21	NAD 3 R
Thalamita sp.	—	1 ovig	—	NGY 21	NAD 3 R
Thalamita sp.	2	—	—	Vema 6	NAD 11 C
Xanthias tuberculidens Rathbun	1	—	—	390 S	NAD 45 G
	—	1	—	390 R	NAD 49 R
	—	1	—	371 E	PED 2 D
	1	—	—	356 B	NAD 80 X-Y
	2	—	—	NGY 21	NAD 3 V
? *Xanthias* sp. (Immature)	—	—	2	372 G	PED 16 L
Xanthids (Unidentified)	—	—	5	381 A-C	WSS 3 B
ANOMURA					
PAGURIDEA					
Anapagurus hendersoni Barnard	1	—	—	390 L	NAD 35 G
	1	1	—	390 S	NAD 45 R
	1	—	—	390 C	ABD 14 L
Dardanus arrosor (Herbst)	1	—	—	391 J	NAD 62 T
	—	1+1 ovig	—	GIL 58	NAD 26 S
Dardanus euopsis (Dana)	1	—	—	372 G	PED 16 R-T
Dardanus setifer (Milne-Edwards)	1	—	—	NGY 59	NAD 20 V
	1	—	—	NGY 21	NAD 3 N

	♂	♀	Juv	Station	Catalogue Number
Diogenes brevirostris Stimpson	1	1	—	372 C	PED 12 S
Diogenes costatus Henderson	2	—	—	NGY 59	NAD 18 Y
				356 J	NAD 86 A
				392 H	NAD 73 K
				392 K	NAD 75 H
		many		391 J	NAD 62 S
				391 F	NAD 58 J
				391 C	NAD 51 N
				391 H	NAD 67 C
Diogenes custos (Fabricius)	5	2	—	392 H	NAD 73 J
**Nematopagurus gardineri* Alcock	1	—	—	390 S	NAD 45 P
**Nematopagurus squamichelis* Alcock	2	1	—	370 G	ABD 8 V
Pagurus spinulentus (Henderson)	5	3	—	392 K	NAD 75 J
				GIL 56	NAD 24 D
				NGY 59	NAD 18 V
	1	—	—	356 J	NAD 87 W
	13	7 ovig	—	391 J	NAD 62 N
Pagurus sp.	1	—	—	372 C	PED 12 V
	1	—	—	390 S	NAD 45 Q
	—	—	1	370 G	ABD 8 W
	—	2 ovig	—	372 G	PED 16 R-T
Between *Pagurus & Pylopagurus*	1	—	—	372 G	PED 16 R-T
Parapagurus pilosimanus Smith	2	1	—	358 C	ABD 1 E
? *Pylopagurus* sp.	1	—	—	371 E	PED 2 G
GALATHEIDEA					
Galathea dispersa Bate	2	1	—	357 B	NAD 20 S
	—	1 ovig	—	371 G	PED 8 U
	2	1 ovig	—	372 L	PED 19 L
	—	—	1	371 F	PED 23 D
Galathea intermedia Liljeborg	5	5	—	NGY 59	NAD 20 S
	—	—	2	390 G	NAD 33 N
	—	1	—	NGY 21	NAD 3 Q
	1	4	—	372 G	PED 17 W
Munida sanctipauli Henderson	—	1 ovig	—	373 B	PED 23 Z
	—	1	—	389 G	ABD 13 L
Munida semoni Ortmann	1	1+1 ovig	1	372 L	PED 19 Q
	—	1 ovig	—	373 B	PED 23 C
	—	1+2 ovig	—	371 F	PED 6 X
	2	1	—	372 G	PED 16 C
	10	12	—	390 P	NAD 40 L
	—	2	—	391 C	NAD 51 G
	7	2	—	390 S	NAD 45 B
	11	6	—	390 H	NAD 31 A
Munida cf. *semoni* Ortmann	—	1 ovig	—	371 F	PED 6 X
**Petrolisthes militaris* (Heller)	5	3	—	372 G	PED 16 A
	1	—	—		ABD 82 M
Porcellana dehaanii Krauss	—	—	2	356 B	NAD 80 Z
Porcellana streptocheles Stimpson	2	2	—	357 B	NAD 91 J
	—	1	—	356 B	NAD 82 M
	3	—	—	NGY 21	NAD 3 P
	—	—	1	372 C	PED 12 T
	4	6	—	372 G	PED 16 A
THALASSINIDEA					
**Axius* (*Neaxius*) sp.	1	—	—	357 B	NAD 91 N
	—	1	—	356 B	NAD 81 A

	♂	♀	Juv	Station	Catalogue Number
Callianassa sp.	1	—	—	390 H	NAD 31 B
Callianassa sp.	—	1	—	390 H	NAD 31 B
MACRURA					
PENAEIDEA					
Acetes erythraeus Nobili	5	3	2	NGY 21	NAD F
	2	13	—	392 H	NAD 73 F-H
	—	1	—	392 K	NAD 75 N
**Gennadas propinquus* Rathbun	1	—	—	363 P	ABD 5 A
Macropetasma africana (Balss)	1	10	—	392 H	NAD 73 E
Metapenaeopsis adamanensis (Wood-Mason)	—	1	—	390 S	NAD 45 T
Metapenaeopsis cf. *stebbingi* Nobili	—	—	1	392 H	NAD 73 F-H
Parapenaeus fissurus (Bate)	1	—	—	390 P	NAD 40 R
	—	1	—	391 C	NAD 51 M
	—	—	1	390 L	NAD 35 N
Penaeopsis rectacuta (Bate)	—	1	—	370 G	ABD 8 T
Penaeus japonicus Bate	1	—	—	392 H	NAD 73 D
Sergestes prehensilis Bate	1	—	—	390 C	ABD 14 R
Solenocera africanum Stebbing	1	—	—	390 P	NAD 40 S
	—	1	—	390 H	NAD 31 G
Solenocera ? *pectinata* (Bate)	1	—	—	390 P	NAD 40 R
Solenocera sp.	?1	—	—	390 L	NAD 35 Q
CARIDEA					
Alpheus frontalis Milne-Edwards				390 G	NAD 33 K
**Alpheus nonalter* n.sp.	sev.	sev.	—	390 H	NAD 31 H, S.A.M. A12650–1
	sev.	sev.	—	390 P	NAD 40 M
				391 C	NAD 51 H-J
	1	—	—	372 L	PED 19 P
**Alpheus waltervadi* n.sp.	4	2 ovig	6	381 A-C	WSS 2 Y, S.A.M. A12646–7
Alpheus sp. (damaged)	1	—	—	391 J	NAD 62 V
	1	—	—	NGY 59	NAD 20 Q
				390 P	NAD 40 N
				392 K	NAD 75 P
				390 N	NAD 43 B-C
Chlorotocus crassicornis (Costa)	—	1	3	390 L	NAD 35 M
	—	1	—	390 C	ABD 14 T
	1	1 ovig	—	390 P	NAD 40 U
	—	1	—	372 L	PED 19 Y-Z
Eualus ctenifera (Barnard)	?4	2 ovig	—	381 A-C	WSS 2 Z
**Heterocarpus woodmasoni* Alcock	—	1	—	370 G	ABD 8 U
Hippolysmata vittata Stimpson	—	1	—	356 B	NAD 81 B-E
Latreutes mucronatus (Stimpson)	5	3 ovig	sev.	356 B	NAD 81 B-E
	?1	—	—	372 C	PED 12 U
	?1	—	—	372 G	PED 16 X-Y
Leptochela pugnax de Man	—	1	—	392 F	NAD 72 P
Leptochela robusta Stimpson	—	1 ovig	—	371 E	PED 2 C
Nikoides cf. *danae* Paulson	1	1	—	356 J	NAD 86 F
**Oplophorus spinicauda* Milne-Edwards	—	?1	—	363 P	ABD 5 C
Periclimenes (*Periclimenes*) sp.	?3	—	—	356 B	NAD 81 B-E
Periclimenes sp.	?1	—	—	373 B	PED 22 U

	♂	♀	*Juv*	*Station*	*Catalogue Number*
**Plesionika* cf. *acanthonotus* (Smith)	2	—	—	390 P	NAD 40 T
	1	1	—	390 H	NAD 31 F
Plesionika martia (Milne-Edwards)	—	?1	—	392 H	NAD 73 F-H
	2	—	—	358 C	ABD 1 D
Pontocaris cataphracta (Olivi)	—	1 ovig	—	372 L	PED 19 W
	1	1 ovig	—	372 G	PED 16 U
	1	—	—	391 F	NAD 58 H
	1	1 ovig	—	391 J	NAD 62 W
	1	—	—	390 P	NAD 40 Q
	3	—	—	391 C	NAD 51 S
Pontocaris lacazei (Gourret)	2	—	—	390 C	ABD 14 P
	—	1	—	390 L	NAD 35 P
Processa austroafricana Barnard	2	4+5 ovig	1	390 L	NAD 35 L
	—	1 ovig	—	390 P	NAD 40 V
	—	—	1	356 B	NAD 81 B-E
Processa sp.	—	1 ovig	—	372 G	PED 16 X-Y
Stylodactylus bimaxillaris Bate	—	1 ovig	—	372 L	PED 19 Y-Z
	—	—	1	390 P	NAD 40 W
Synalpheus anisocheir Stebbing	—	3+3 ovig	4	NGY 21	NAD 4 B
	?1	—	—	NGY 59	NAD 20 Q
Synalpheus jedanensis de Man	—	1+2 ovig	—	372 G	PED 16 V-W
Synalpheus cf. *jedanensis* de Man	—	1	—	357 B	NAD 91 M
Tozeuma armata (Paulson)	?1	—	—	371 G	PED 8 Z

Systematic Discussion

BRACHYURA

Family **Parthenopidae**

Eumedonus granulosus MacGilchrist, 1905

Fig. 1 a–b

Eumedonus granulosus MacGilchrist, 1905: 253. Rathbun, 1911: 259. Flipse, 1930: 90. Barnard, 1954: 96.

Previous records: Amirante, Persian Gulf, Zanzibar, Delagoa Bay.

Material: 1 ♂, carapace length (including rostrum) 4 mm, carapace breadth (including lateral spines) 3·8 mm. Station BRU 372 G. Depth, 55 metres.

Remarks: The present specimen appears to differ from the original description of *E. granulosus* only in the degree of granulation of the carapace. From MacGilchrist's description and figures (latter in *Illustrations of the zoology of the R.I.M.S. 'Investigator'*, 1907, plate 77, figs 2, 2a), it would seem that the whole integument is granulated, whereas in the present specimen it is granulated only in the antero-lateral region. The specimen recorded by Barnard (1954) has the carapace granulated in the mid-region only. The carapace grooves of the type are more distinct than in this specimen. Body proportions are similar. Unfortunately, all the pereiopods and chelipeds are missing. The differences mentioned may be due to the immaturity of the specimen, as the type measures 11·5 × 11·5 mm.

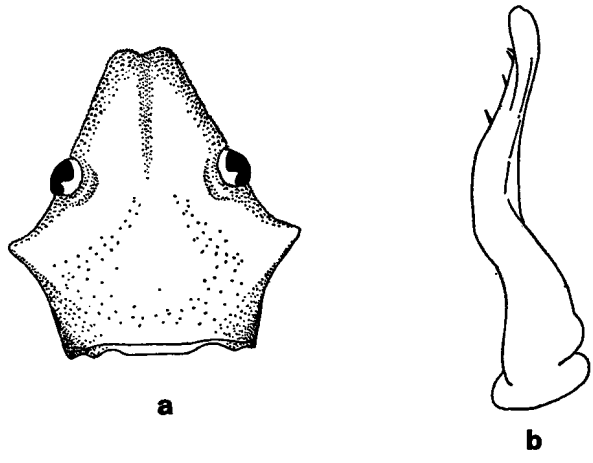

Fig. 1. *Eumedonus granulatus* MacGilchrist
a. Carapace. *b*. First pleopod, male.

Family **Xanthidae**

Paratergatis longimanus Sakai, 1965

Paratergatis longimanus Sakai, 1965*a*: 98, fig. 1; 1965*b*: 128, fig. 16.

Previous records: Sagami Bay and near-by Japanese islands.

Material: 1 ♀, carapace length 12·0 mm, carapace breadth 19·0 mm. Station BRU 372 L. Depth, 112 metres. 2 ♂♂, carapace lengths 10·6 mm, 6·0 mm, carapace breadths 17·0 mm, 7·0 mm. Station BRU 390 P. Depth 118 metres. 2 ♂♂, carapace lengths 12·0 mm, 5·0 mm, carapace breadths 19·0, 8·0 mm. Station BRU 391 C. Depth 86 metres.

Remarks: There can be no doubt that this is the same species as that recorded by Sakai (1965*a*, *b*). This would appear to be the first record of this monotypic genus outside Japanese waters.

Family **Palicidae**

Cympolidae: Rathbun, 1918: 182. Sakai, 1939: 607.
Palicidae: Holthuis & Gottlieb, 1958: 104.

Palicus sexlobatus n.sp.

Fig. 2 a–e

Description: Carapace wider than long, dorsally convex, granular, with larger scattered tubercles, margins crenulate. Fronto-orbital margin with 2 pairs of spines, inner 2 more slender, longer than outer spines, set slightly lower than latter. 3 supra-orbital teeth, innermost broadest, outer 2 acutely triangular. External orbital tooth largest of 6 antero-lateral teeth, latter decreasing in size posteriorly. Postero-lateral margin of carapace concave at origin of 5th pereio-

pod. (Latter dorsal in position.) Posterior margin with 6 separated flattened lobes. Gastric region tuberculate, with anterior row of 4 larger transverse tubercles, 2 posterior transverse tubercles. Gastric region separated from cardiac and branchial regions by well-defined grooves. Cardiac region with row of 4 transverse flattened tubercles, inner 2 larger. Branchial regions with scattered tubercles. Lower orbital margin formed by 2 broad rounded crenulated lobes.

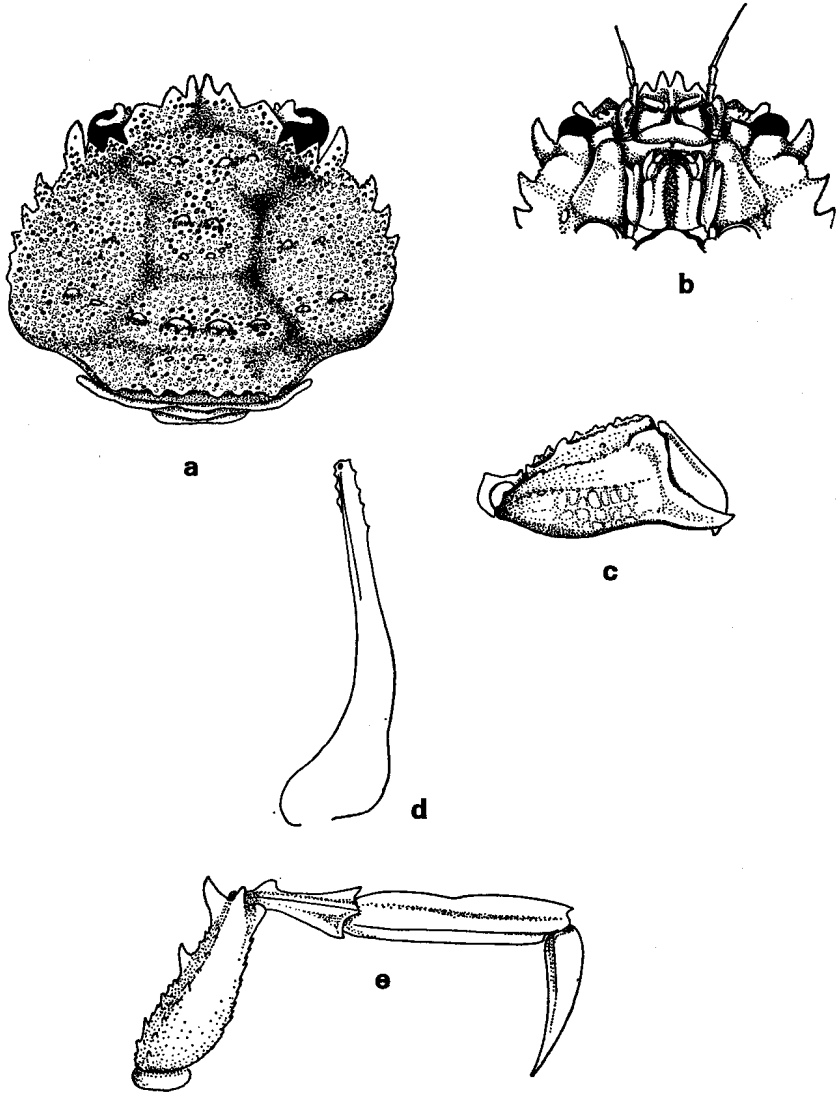

Fig. 2. *Palicus sexlobata* n.sp.
a. carapace, dorsal view. *b*. Antero-ventral region of carapace. *c*. Right cheliped. *d*. First pleopod, male. *e*. Second pereiopod.

Distal portion of basal joint of antenna wider than proximal part, with 3 small ventral tubercles. 2nd and 3rd joints of peduncle slender, equal in length. Eye wider than stalk, latter with 3 dorsally visible lobes. 4th joint of endopod of maxilliped 3 with external curved flattened portion. Right cheliped stout, (left missing), upper surfaces of propodus, carpus, merus tuberculate. Finger and thumb flattened, tips overlapping, cutting edge entire. Pereiopods stout, meri granulate, upper surface with 2 large spines, more anterior of which largest, plus several smaller flattened spines. Lower surface with many small spines. Carpus half length of merus, slightly flattened, proximally with a flattened rounded lobe on upper edge, distally with an acute flattened spine. Propodus and dactylus flattened, lower edge of latter entire. Abdomen with 7 segments, first 2 very short, with prominent transverse raised ridge. 3rd segment twice length of 2nd, also with raised ridge, all 3 ridges dorsally visible.

Material: 1 ♂, holotype, S.A.M. A12642, carapace length (including rostral spines) 8·6 mm, carapace breadth 10 mm. Station BRU 371 F. Depth 110 metres.

Remarks: This species would seem to be most closely related to *P. investigatoris* (Alcock), but differs in the arrangement of the larger tubercles of the carapace, also in the posterior carapace ridge. The latter has 6 flattened lobes in *P. sexlobatus*, 8 in *P. investigatoris*. The ambulatory pereiopods differ in that the propodi and dactyli of *P. investigatoris* are denticulate on their lower edges, entire in *P. sexlobatus*. This appears to be the first record of this cosmopolitan genus from the Moçambique Channel.

Family **Retroplumidae**

Alcock & Anderson, 1894: 180. Gill, 1894: 1044. Doflein, 1904: 29. MacGilchrist, 1905: 266. Tesch, 1918: 29. Rathbun, 1932: 33. Sakai, 1948: 606.

Retropluma planiforma n.sp.

Fig. 3 a–g

Description: Carapace more or less flattened, almost naked, slightly granular. Carapace divided into 3 parts by 2 transverse carinae. Entire carapace margin crenulated. Anterior portion sloping forward to slender apically rounded rostrum. Latter slightly shorter than basal antennular peduncle joint. Supra-orbital border smoothly contoured, unarmed. External orbital angle a rounded forwardly projecting lobe. Antero-lateral border sloping obliquely outward from external orbital lobe to more anterior lateral carapace lobe. Latter is extension of anterior transverse carina. Lateral margin of middle carapace portion with a convex rounded lobe. Second carapace carina slightly curved. Carapace wider than long (excluding rostrum). Postero-lateral angles rounded. Eyestalks free, directed laterally, upper surface granular. Base of eyestalks wider than cornea. Infra-orbital spine prominent, forwardly directed, margins crenulated, reaching to middle of second joint of antennal peduncle. Latter

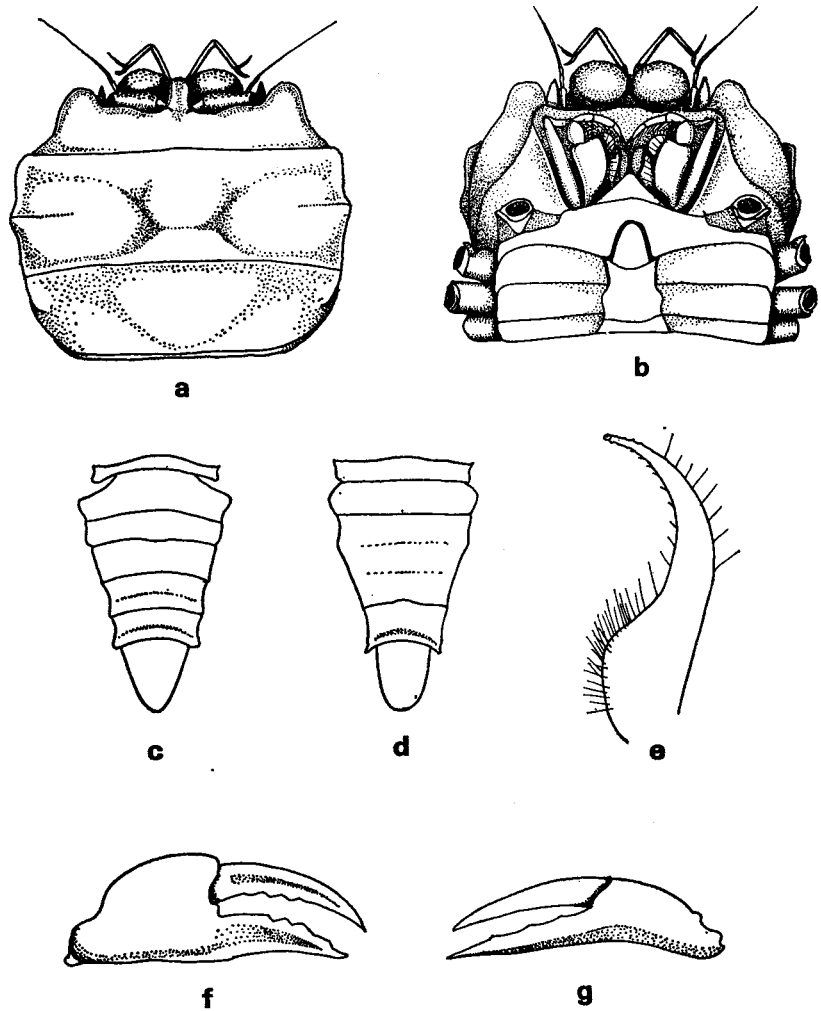

Fig. 3. *Retropluma planiforma* n.sp.
a. Carapace, dorsal view. *b*. Carapace, ventral view. *c*. Abdomen, female. *d*. Abdomen, male. *e*. First pleopod, male. *f*. Right chela. *g*. Left chela.

half length of basal joint. Flagellum of antenna with 19 or 20 joints. Basal antennular joint globular, inflated, granular. 2nd joint arising at antero-mesial corner of basal joint. Bases of antennae, antennules and infra-orbital spines in a line. Chelipeds equal in length, right stouter than left, palm higher, equal in length to finger. Palm of left chela shorter than finger, upper borders of both chelae smooth. Fingers wide at base, compressed. A gap between fingers of right chela. Fingers of latter with 3 (possibly 4) teeth, on sharp cutting edge

Cutting edge of left chela only slightly denticulate. All pereiopods fringed with feathered hairs. Ambulatory pereiopods (i.e. 2, 3, 4) long and slender, 2nd pair longest. Dactyli slender, slightly curved, equal in length to outer margin of propodus of same pereiopod. Anterior margins of propodi and carpi, anterior and posterior margins of meri finely denticulate. Distal denticles of carpi and proximal denticles of propodi particularly well developed. 5th pereiopods reduced, almost dorsal, prominently fringed with feathered hairs. Entire 5th pereiopod equal in length to merus of 4th. Abdomen of male and female triangular. Abdomen of female 7-jointed, 7th longest, apically rounded. 6th segment with lateral notch, distal blunt tooth, a raised ridge between the notches. Abdomen of male 5-jointed, 3rd joint largest (consisting of fused segments 3–5), 6th joint with posteriorly directed lateral tooth, also with raised ridge. 7th segment apically rounded. Pleopods of female sometimes protruding from beneath abdomen.

Material: Holotype, S.A.M. A12644, paratypes, S.A.M. A12643, A12645.

♀ carapace		♂ carapace			
length	breadth	length	breadth	Station	Depth (m)
Holotype 7·0	9·1	Paratype 5·8	7·9	BRU 390 H	200
Paratype 5·4	6·5	5·4	7·0		
6·8	9·0				
4·5	6·0				

Remarks: The genus *Retropluma* is represented by 5 species, viz. *notopus* (Alcock & Anderson, 1894), from the eastern Indian Ocean, *chuni* Doflein, 1904, from the Andaman Islands, *plumosa* Tesch, 1918, from the Kei Islands in the Banda Sea, and *denticulata* Rathbun, 1932, from Japan. *Retropluma eocenica* Via Boada, 1959, has been recorded from the Eocene of Spain. The present species differs from *notopus* and *denticulata* in having rounded lobes on the lateral margins of the carapace and an apically rounded rostrum. *R. notopus* has no lateral extrusions, neither has *denticulata*. The rostrum is apically bifid in *notopus*, a mere point in *denticulata*. *R. planiforma* differs from *chuni* in that while the latter has acute lateral carapace spines and a tapering rostrum, the former has rounded lobes and a rostrum with parallel sides. *R. planiforma* most closely resembles *plumosa* in the rounded carapace lobes, the shape of the male abdomen and the granulate character of the integument, especially that of the appendages. The main differences include the shape of the rostrum (tapering in *plumosa*) the externo-orbital angles (angular in *plumosa*, rounded in *planiforma*), the denticulate nature of the ambulatory pereiopods in *planiforma* (granulate but not noticeably denticulate in *plumosa*). The antennal flagellum has fewer segments (25 in *plumosa*, 19–20 in *planiforma*). A very obvious difference is the lack of specialized hairs found on the appendages in *plumosa*. These hairs are scattered amongst the plumose hairs and are inflated and membranous. *R. planiforma* has only plumose hairs.

Family **Dorippidae**

Ethusa sinespina n.sp.

Fig. 4 a–c

Ethusa spp. Alcock, 1896: 281–286. Doflein, 1904: 27–32.

Description: Carapace slightly longer than broad, finely and evenly granulate, anterior portion with fine scattered hairs. Frontal indentation forming angle of about 60°. Front bilobed, 4-toothed, inner teeth slightly longer than outer, smooth rounded indentation separating the 2 teeth. Supra-orbital angle acute. External orbital spine acute, directed slightly outward, not reaching to tip of outer frontal spine. Carapace regions not very well demarked, cardiac and branchial regions with indistinct delimiting grooves. Branchial regions very slightly convex in dorsal view. Antennal peduncle slightly longer than frontal spines. Eyestalks stout, movable. Efferent branchial canals ending just behind frontal notch. Chelipeds small, finger and thumb equal in length to palm. Finger and thumb separated by gap, each with 4 small teeth on cutting edge. Dactylus of 3rd leg longer than propodus, equal in length to merus. Abdomen 7-jointed, 3rd and 4th joints widest. Distal segment apically rounded.

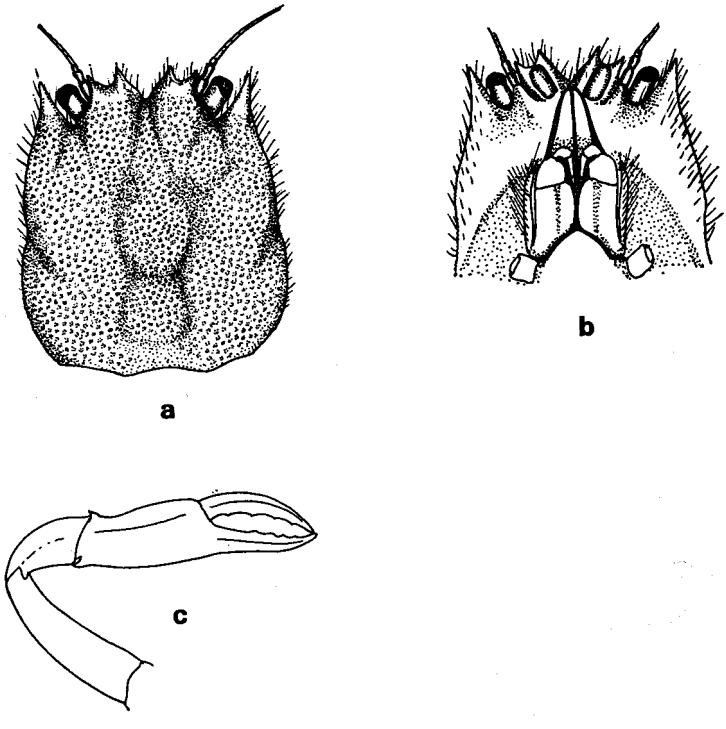

Fig. 4. *Ethusa sinespina* n.sp.
a. Carapace, dorsal view. *b.* Carapace, antero-ventral region. *c.* Right cheliped.

Material: 1 ♀, paratype, S.A.M. A12649 carapace length, 5·8 mm, carapace breadth 5·2 mm. Station BRU 390 S. Depth 138 metres. 1 ♀, ovigerous, Holotype, S.A.M. A12648, carapace length 7·5 mm, carapace breadth 6·8 mm. Station BRU 390 E. Depth 350 metres. 1 ♀, carapace length 4 mm, carapace breadth 3·5 mm. Station BRU 358 C. Depth 370 metres.

Remarks: These specimens are most closely related to *E. zurstrasseni* Doflein, recorded by the *Valdivia* from the East African coast, but differ from this species in that there is no minute spine between the pairs of frontal spines. The external orbital spine is not dorso-ventrally flattened. The grooves defining the carapace regions are not so well defined as in *zurstrasseni.*

Family **Leucosiidae**

Nursilia dentata Bell, 1855

Fig. 5 a–e

Nursilia dentata Bell, 1855: 309. Alcock, 1896: 260. Rathbun, 1911: 203.

Description: Entire carapace finely and evenly granular, roughly hexagonal. Front with large raised supra-orbital lobes, with single smaller ventro-lateral exorbital tooth. Indistinct mid-dorsal carapace carina, stretching from base of supra-orbital lobes to 1st median spine in cardiac region. 4 blunt prominent spines in median cardiac region, most anterior of which largest, flanked by

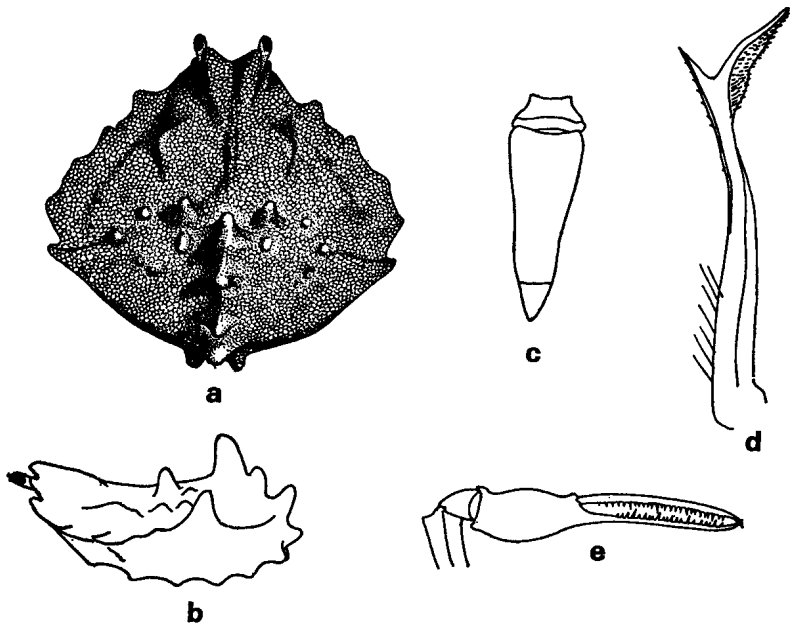

Fig. 5. *Nursilia dentata* Bell.
. Carapace, dorsal view. *b.* Carapace, lateral view. *c.* Abdomen, male. *d.* First pleopod, male. *e.* Right chela.

pair of blunt knobs on posterior gastric region. Lateral carapace margin slightly upturned, with 5 teeth, most posterior of which largest. Between largest lateral tooth and median line, 4 or 5 slight knobs. Abdomen of 4 segments, first 2 narrow, 3rd largest, latter three times longer than broad, with single forwardly directed median spine near distal margin; distal segment triangular, apically rounded. Palm of left chela slightly inflated, two-thirds length of fingers. Latter slender, with about 25 large and small teeth on cutting edge.

Previous records: Andaman Sea, off Ceylon, Madras coast, off Maldives, Seychelles, Malabar coast, Cargados Carajos.

Material: 1 ♂, carapace length 7 mm, carapace breadth 8 mm. Station BRU 371 F. Depth 110 metres.

ANOMURA

Family **Paguridae**

Nematopagurus squamichelis Alcock, 1905

Fig. 6 a–d

Nematopagurus squamichelis Alcock, 1905: 113, pl. 12, fig. 1.

Description: Carapace breadth three-quarters that of length, broadest in branchial region. Latter clearly defined dorsally by 2 ridges. Cervical groove distinct. Rostrum lacking, frontal margin smoothly curved. Eyes much wider than eyestalks, latter stout, one-third of carapace length. Ocular scales tiny. Chelipeds equal in length, right stouter than left. Tips of finger and thumb corneous, entire hand and fingers and carpus of chelae covered with flat imbricating squamae. Vas deferens of male protruding on right side, slender and elongate, ending in coiled filament. Vas deferens of left side protruding as short conical papilla.

Previous records: Andaman Sea.

Material: 2 ♂♂, carapace length 7·5 mm, 8·0 mm, 1 ♀, carapace length 5·5 mm. Station BRU 370 G. Depth 347 metres.

Nematopagurus gardineri Alcock, 1905

Fig. 6 e–h

Nematopagurus gardineri Alcock, 1905: 110, plate 12, fig. 2.

Description: Carapace breadth half length. Cervical groove and ridges defining branchial regions well marked. Rostrum lacking, frontal margin smoothly rounded, tiny supra-antennal spine present. Ocular scale minute. Eyes wider than eyestalks. Chelipeds thickly pilose, especially on outer surface of propodus and carpus. Right chela slightly longer, much stouter than left. Cutting edges and tips of finger and thumb corneous. Upper edge of carpus and propodus spinous, denticulate. Outer surface with median longitudinal row of spines.

Previous records: Maldive Islands.

Material: 1 ♂, carapace length 4·8 mm. Station BRU 390 S. Depth 138 metres.
Remarks: Easily distinguished from the previous species by the pilose and spinous nature of the chelipeds.

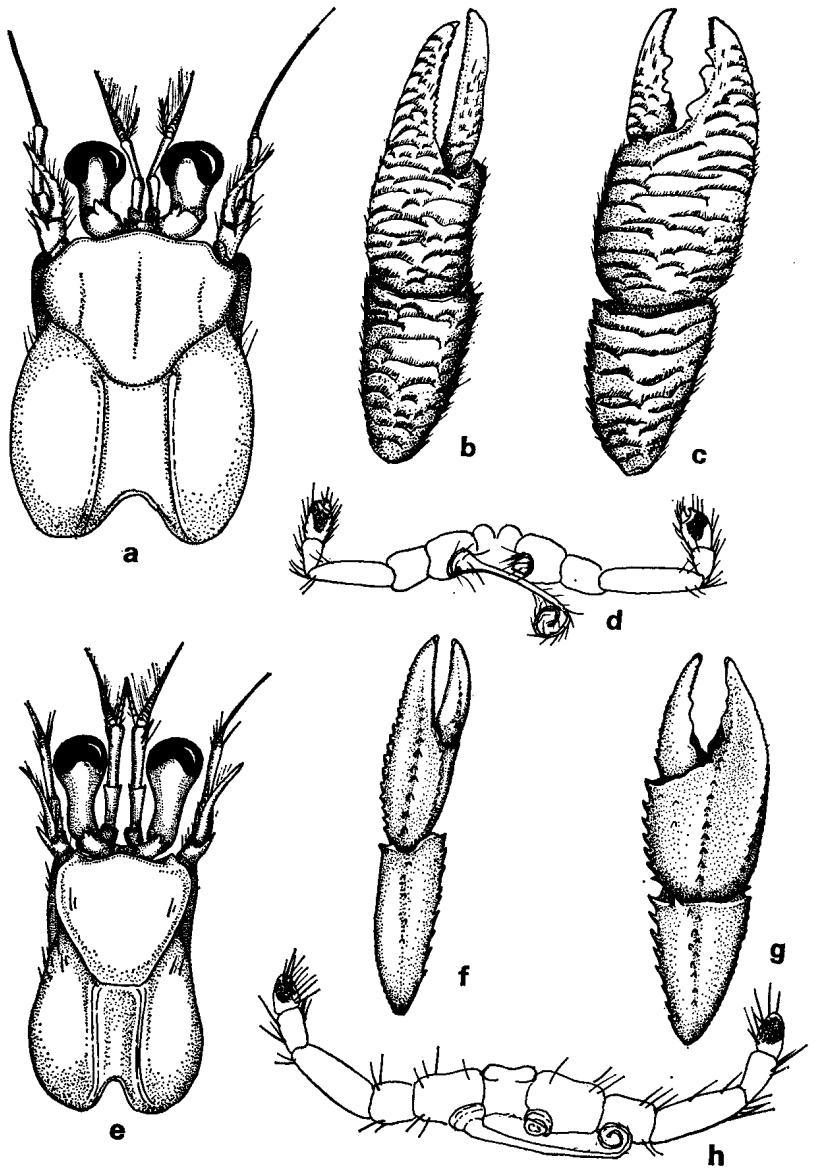

Fig. 6. *Nematopagurus squamichelis* Alcock.
a. Carapace, and anterior appendages. *b.* Left chela and carpus. *c.* Right chela and carpus. *d.* Sternum and 5th pair pereiopods, male.
Nematopagurus gardineri Alcock.
e. Carapace and anterior appendages. *f.* Left chela and carpus. *g.* Right chela and carpus. *h.* Sternum and 5th pair pereiopods, male.

Family **Galatheidae**

Munida semoni Ortmann, 1894

Munida semoni Ortmann, 1894: 24, plate 1, fig. 4. Barnard, 1950: 491, fig. 92c.

Material: see page 153 of species list.

Remarks: The present specimens agree closely with *semoni*, but differ in the following respects: the 2nd abdominal segment has 8 spines on the anterior margin, the posterior portion of segments 2 and 3 with only 1 setose transverse groove (2 in *semoni*), 4th joint of maxilliped 3 with only 2 strong spines (3 in *semoni*). In smaller specimens, there are sometimes 2 spines on the anterior margin of the 3rd abdominal segment.

Petrolisthes militaris (Heller, 1862)

Fig. 7 a–d

Petrolisthes militaris (Heller), Miyake, 1943: 56. Haig, 1964: 357.

Description: Carapace length (including rostrum) equal to breadth. Frontal margin broadly triangular, apically rounded, base (between supra-orbital teeth) just less than twice length, margin finely crenulated. Prominent supra-

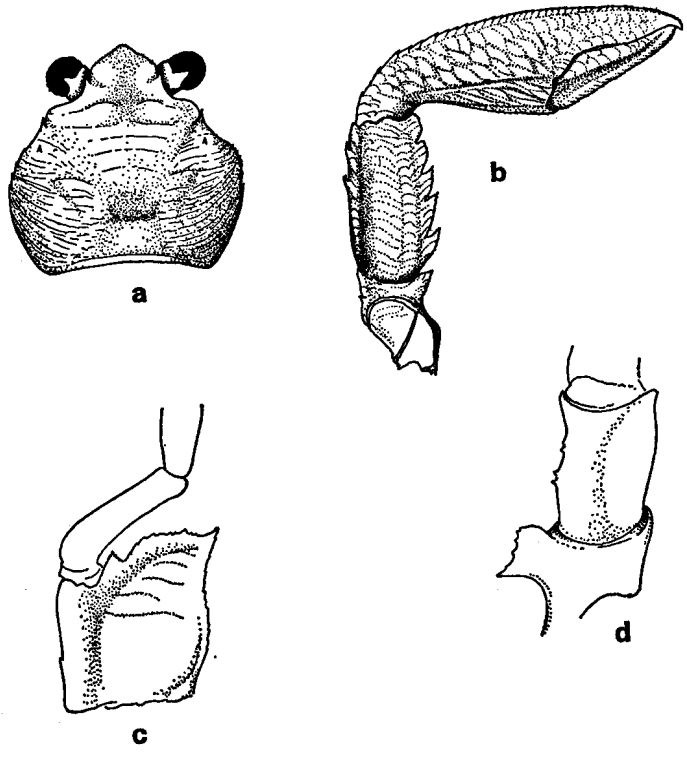

Fig. 7. *Petrolisthes militaris* (Heller).
a. Carapace. *b.* Left cheliped. *c.* Basal joint of antennule. *d.* Basal joints of antenna.

orbital spine present. Epibranchial spine present. Just posterior to latter, small spine in antero-branchial region. Lateral branchial margin with 2 or 3 largish spines, anterior to which, 2 or 3 minute spines. Gastric and branchial regions covered with transverse rugae. Basal joint of antennule with distal toothed keel. 1st free peduncular joint of antenna with distal slightly flattened denticulate lobe. Chela longer than carapace. Merus, carpus, propodus, and dactylus of cheliped covered with flattened rugae. Merus with large crenulated tooth on inner distal angle. Carpus with 5 crenulate flattened teeth on anterior margin, distal 2 apically blunt. Posterior margin of carpus with 3 small distal spines. Proximal posterior margin of chela slightly denticulate, denticles decreasing in size distally. Meri of ambulatory pereiopods with flattened rugae. Propodi cylindrical, about twice length of carpus. Dactylus with 3 sharp spines on lower margin, ending in acute curved talon.

Distribution: Widespread throughout Indo-Pacific region.

Material:

♂ carapace length	♀ carapace length	Station	Depth (m)
4·0	4·5	BRU 372 G	55
4·0	5·0		
4·6	6·0		
5·0			
6·0			
3·5			

Remarks: These specimens would appear to constitute the most south-westerly record for the species.

THALASSINIDEA

Family **Axiidae**

Axius (*Neaxius*) sp.

Fig. 8 a–b

Description: Rostrum triangular, breadth equal to length, apically notched, margin with 4 spines. Prominent exorbital spine, region between latter and base of rostrum smooth. Lateral margin of anterior carapace region with 13 to 14 spines. Very prominent cervical groove. Anterior two-thirds of flattened part of carapace with scattered spines. Telson slightly broader than long, without transverse carinae.

Material: 1 ♂, carapace length 4 mm, overall length 9·5 mm. Station BRU 357 B. Depth 70 metres. 1 ovigerous ♀, dimensions as ♂. Station BRU 256 B. Depth 18 metres.

Remarks: As many of the appendages are missing, it is difficult to be definite

about the specific position of these specimens. *Axius acanthus* var. *mauritianus* Bouvier, 1914, has been recorded from Mauritius. This species has a telson with 2 transverse carinae, poorly developed lateral carapace spines, and no scattered carapace spines. The present specimens lack the telson carinae, while possessing scattered spines on the carapace, and well-developed antero-lateral carapace spines.

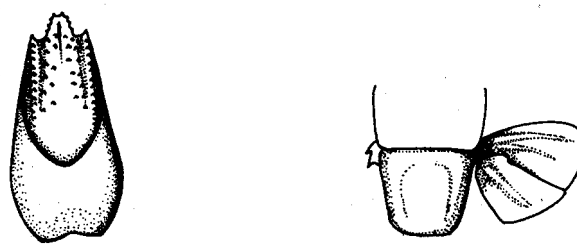

Fig. 8. *Axius* (*Neaxius*) sp.
a. Carapace. *b*. Telson and uropod.

PENAEIDEA

Family **Penaeidae**

Gennadas propinquus Rathbun, 1906

Fig. 9

Gennadas propinquus Rathbun, 1906: 907. Barnard, 1950: 634.
Gennadas scutatus Kemp, 1910: 178, *non* Bouvier, 1908: 42.
Gennadas scutatus indicus Balss, 1927: 259.

Previous records: Indian Ocean, off Hawaii.

Material: 1 ♂, carapace length (including rostrum), 9 mm. Station BRU 363 P. Depth 1225 metres.

Fig. 9. *Gennadas propinquus* Rathbun. Petasma.

CARIDEA

Family **Pasiphaeidae**

Leptochela pugnax de Man, 1920

Fig. 10 a–c

Leptochela pugnax de Man, 1920: 26. Kemp, 1925: 255. Barnard, 1958: 6 (In *L. robusta*).

Description: Rostrum slender, reaching beyond eyes to 2nd antennular peduncle segment. Small antennal spine present. Rostral carina not continued posteriorly along carapace. Dactylus of 2nd pereiopod with about 19 spines, finger of propodus with about 21 spines. 5th abdomimal segment not dorsally carinate, unarmed. Pleurae of 3rd, 4th, 5th abdominal segments ventrally rounded, each with small tooth in anterior region. 6th abdominal segment with long ventro-lateral spine about two-thirds from anterior end, followed by several setae. Posterior margin of 6th segment with prominent lateral spine. Anterior part of telson with 1 pair of dorsal spines, 1 pair of lateral spines at about the mid-point. Telson with 5 pairs of apical spines.

Previous records: Maldives, Andamans, Nicobars, Mergui Archipelago.

Material: 1 ♀, carapace length 4 mm, overall length 13 mm. Station BRU 392 F. Depth 35 metres.

Remarks: The present species closely resembles *L. robusta* Stimpson, which has

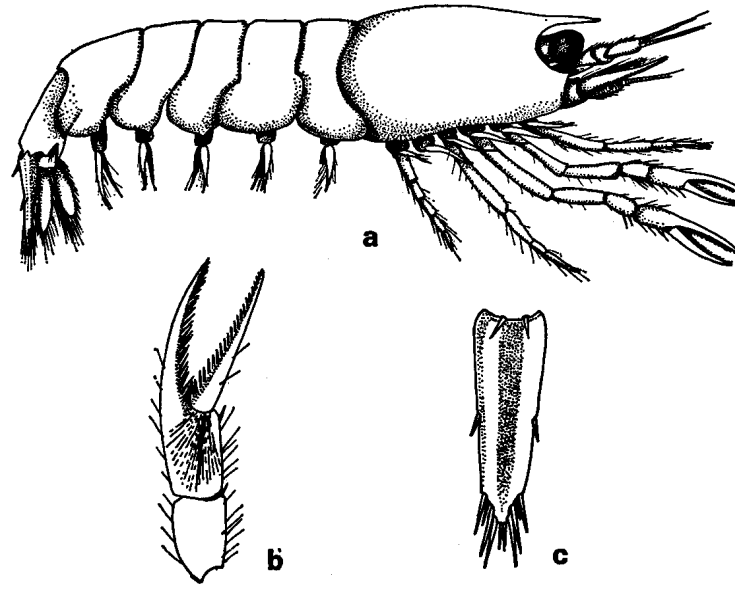

Fig. 10. *Leptochela pugnax* de Man.
a. Lateral view. *b.* First chela. *c.* Telson.

been recorded from Inhambane, but differs in the possession of an antennal spine, and one pair of lateral telson spines and not two as in *robusta*.

Family **Oplophoridae**

Oplophorus spinicauda Milne-Edwards, 1883

Fig. 11

Oplophorus spinicauda Milne-Edwards, 1883: plate 29. de Man, 1920: 48. Chace, 1940: 184.

Description: Postero-lateral angle of carapace lacking tooth. 2nd, 3rd, 4th abdominal segments ending in long spines. Telson terminating in end piece, latter armed laterally with spines.

Previous records: East coast of U.S.A., West Indies, off Morocco, north of Malagasy Republic, off Indian coast, Philippines, Hawaii.

Material: 1 ? ♀, carapace length (excluding rostrum) 5·5 mm. Station BRU 363 P. Depth 1225 metres.

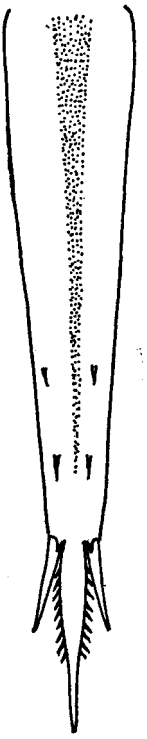

Fig. 11. *Oplophorus spinicauda* M.-Ed.
Telson.

Family **Pandalidae**

Heterocarpus woodmasoni Alcock, 1901

Fig. 12

Heterocarpus woodmasoni Alcock, 1901: 108. de Man, 1920: 156.

Description: Rostrum one and a half times longer than carapace, 10 dorsal, 7 ventral teeth. Rostral carina produced almost to posterior margin of carapace, posterior portion indistinct. Carapace with prominent post-antennular and post-antennal carinae, starting with prominent antennal and branchiostegal spines respectively. Antennal scale two-thirds carapace length. 1st pereiopods equal in length to 3rd maxillipeds, ending in minute dactyl. 2nd pereiopods both chelate, right shorter than left. Right chela slightly larger than left, carpus of former with 12 segments, carpus of latter with about 20 segments. 3rd, 4th, 5th pereiopods similar, with slender dactyls. Abdominal segments 1 and 2 dorsally smooth, 3rd with flattened hook-like tooth, 4th, 5th, 6th dorsally smooth. Telson elongate, tapering, equal in length to outer branch of uropod, apically pointed, with 2 pairs of subapical spines.

Previous records: Bali Sea, Makassar, Kei Islands, Madura Straits, Andaman Sea.

Material: 1 ♀, carapace length (excluding rostrum) 9 mm, overall length 43 mm. Station 370 G. Depth 347 metres.

Remarks: This appears to be the most southerly record of this very distinctive Indian Ocean species.

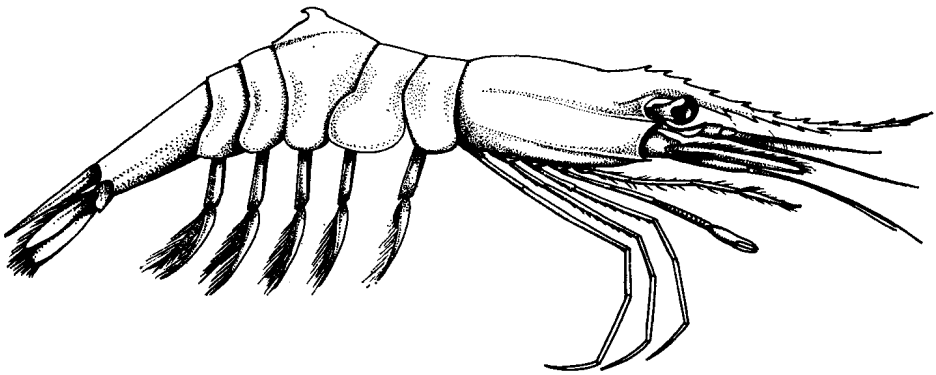

Fig. 12. *Heterocarpus woodmasoni* Alcock.
Lateral view.

Plesionika acanthonotus (Smith, 1882)

Fig. 13 a–b

Pandalus acanthonotus Smith, 1882: 61, plate 13, figs 10, 11.
Plesionika acanthonotus (Smith), de Man, 1920: 105. Holthuis, 1951: 62, fig. 13 b-t.

Description: Rostrum two-thirds carapace length, compressed, spines variable (11/5, 12/4, 12/5). Prominent antennal and branchiostegal spines. Basal joint

of antenna with prominent spine on lower distal angle. Antennal scale seven-eighths carapace length, rostrum two-thirds antennal scale length. Carapace and abdomen with minute scales. 1st pereiopod with microscopic dactyl, very slender, propodus half length of carpus, 2nd pereiopods equal in length, reaching beyond antennal scale. Chela about one-eighth length of carpus. Latter consisting of about 21 jointlets. Merus and ischium equal in length, each slightly more than half length of carpus. Dactyl of 3rd pereiopod one-third length of propodus, merus reaching to end of antennal scale. Posterior margin of merus with 11 spines. 4th pereiopod similar to 3rd. 5th pereiopod longest, midpoint of carpus reaching to end of antennal scale. Merus armed with 8 spines. Pleuron of 5th abdominal segment with tooth on postero-ventral angle. Telson with 3 pairs lateral spines, slightly shorter than inner branch of uropod, latter slightly shorter than outer branch. Outer margin of outer branch with tooth some way behind apex.

Previous records: East coast of U.S.A., off Portugal, Spain, Brazil, Angola.

Material: 1 ♂, carapace length (excluding rostrum) 6 mm, 1 ♀, carapace length 5 mm. Station BRU 390 H. Depth 175–200 metres. 2 ♂♂, carapace lengths 8 mm, 7·5 mm. Station BRU 390 P. Depth 118 metres.

Remarks: From de Man's 1920 key to the genus *Plesionika*, this specimen falls into the group characterised by a rostrum shorter than the carapace, 2nd pereiopods equal in length. The species in this group, viz. *hypanodon* Doflein,

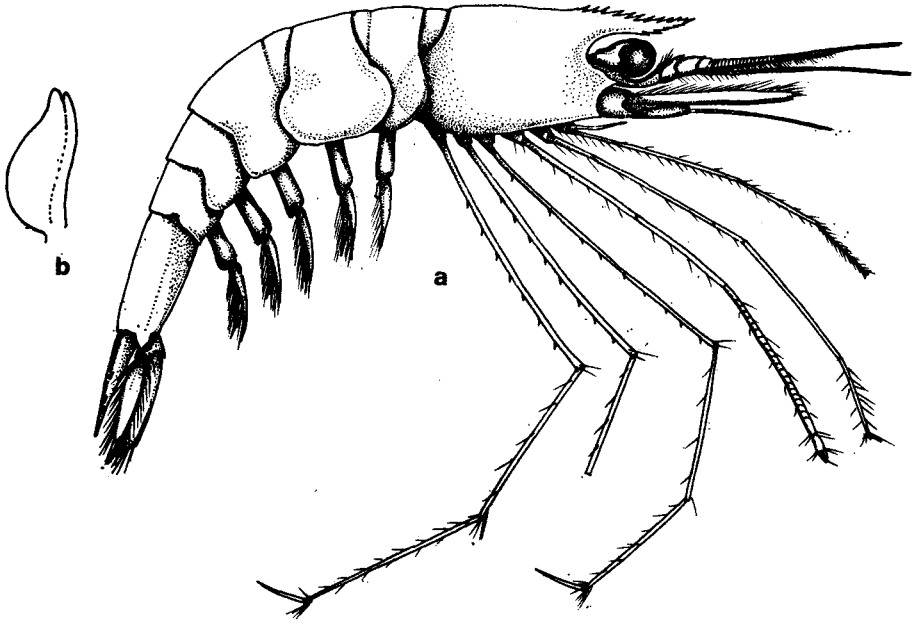

Fig. 13. *Plesionika acanthonotus* (Smith).
a. lateral view. *b.* Endopod of pleopod one.

and *brevis* (Rathbun) bear little resemblance to the present species, which more closely resembles the *ortmanni* Doflein, *longipes* (Milne-Edwards), *sindoi* (Rathbun) group, in spite of the short rostrum. This species most closely resembles *P. acanthonotus* (Smith). The rostra of the 2 species are very similar, being shorter than either the carapace or the antennal scale. The variation in number of the rostral teeth in this species is similar to that of *acanthonotus*. The shape of the telson, abdomen, and antennular peduncle also agree closely. The pereiopods are similar in both species, including the number of jointlets of the carpus of the 2nd pereiopods. The mouthparts are identical. The antennal scale of this species appears proportionally more slender than *acanthonotus*, while the endopod of the 1st pleopod in the male differs in shape. It seems unusual that such a typically Atlantic species should occur in the Indian Ocean. Without further material it is not possible to be more definite regarding the status of this species, but if not *acanthonotus*, it is certainly very closely related.

Family **Processidae**

Processa sp.

Fig. 14

Description: Rostrum apically bidentate, reaching to posterior part of orbit. Lateral process of basal joint of antennule smoothly rounded, with a slightly elongate inner rounded angle. Antennal scale apically rounded, spine on outer margin slightly longer than apex. Palm of chela of right 1st pereiopod almost twice length of finger and thumb. Dactylus of left 1st pereiopod about one-third length of propodus. Postero-inferior angle of pleuron of 5th abdominal segment with a small tooth.

Material: 1 ovigerous ♀, carapace length (including rostrum) 4·5 mm, overall length 16 mm. Station BRU 372 G. Depth 55 metres.

Remarks: This specimen closely resembles *P. australiensis* Baker, 1907, in the shape of the carapace, rostrum, telson and 5th abdominal pleuron, but differs in possessing a smoothly rounded process on the basal antennular joint. *P. australiensis* has this process with a spine on the outer angle. The 2nd–5th pereiopods appear to be more slender than in *australiensis*. Without more material it is difficult to give this specimen definite status.

Family **Alpheidae**

Alpheus nonalter n.sp.

Fig. 15 a–d

Description: No supra-orbital spines. Rostrum reaching about two-thirds along basal antennular peduncle joint. Latter with swollen base, spine on external distal angle reaching just beyond end of joint. 2nd antennal peduncle segment 3 times length of 3rd. Antennal scale reaching beyond antennular peduncle. Larger chela with palm about 4 times longer than broad. No notch at base of

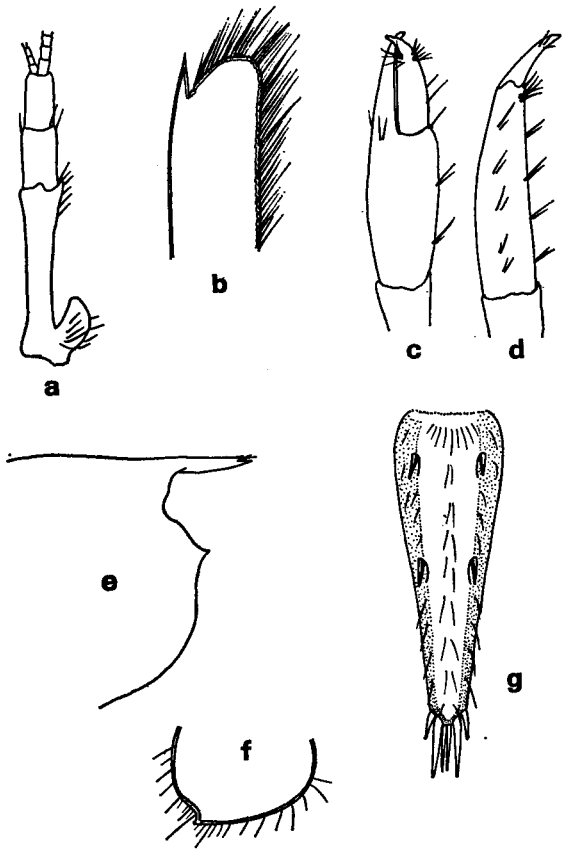

Fig. 14. *Processa* sp.

a. Peduncle of antennule. *b*. Tip of antennal scale. *c*. Chela of first right pereiopod. *d*. Dactyl and propodus of left first pereiopod. *e*. Antero-lateral portion of carapace. *f*. Pleuron, 5th abdominal segment. *g*. Telson.

dactyl, but shallow notch at base of fixed finger. Latter longer than movable finger. Both chelae granulous. Smaller chela with fingers half to two-thirds length of palm. Latter cylindrical, six times longer than wide. Movable finger slightly balaeniceps-like. Meri and ischia of both chelae with inner margin denticulate, former with spine on inner distal angle. Carpus of 2nd pereiopod of 5 jointlets, 2nd joint two-thirds length of 1st, equal in length to jointlets 3, 4, 5 together. Pereiopods 3, 4, 5 with simple flattened dactyls. Propodi, carpi, and meri equal in length. Ischia with single ventral spine. Telson length twice basal width.

Material: 3 ovigerous ♀♀, carapace lengths (including rostrum) 8·0, (holotype, S.A.M. A12650), 8·0, 9·0 mm. 7 ♂♂, carapace lengths, 6·0, 7·0, 7·4, 7·5

(paratype, S.A.M. A12651), 8·0, 8·0, 8·0 mm. 18 damaged specimens. Station BRU 390 P. 118 metres. 1 ♀, carapace length 7·5 mm. 1 damaged. Station BRU 391 C. 86 metres. 4 ♀♀, carapace length 7·5, 8·0, 8·0, 8·0 mm. 4 ♂♂, 6·0, 6·0, 7·0, 8·0, 15 damaged, 4 juveniles. Station BRU 390 H. 175–200 metres.

Remarks: The unarmed meri of the third pereiopods, the balaeniceps-like smaller chela of the male, the simple lanceolate-like dactyls of the last 3 pairs of pereiopods and the lack of supra-orbital spines place this species in the *Brevirostris* group of de Man (1911). This species is most closely related to *A. acutocarinatus* de Man, and *A. macrosceles* Alcock & Anderson. It differs from

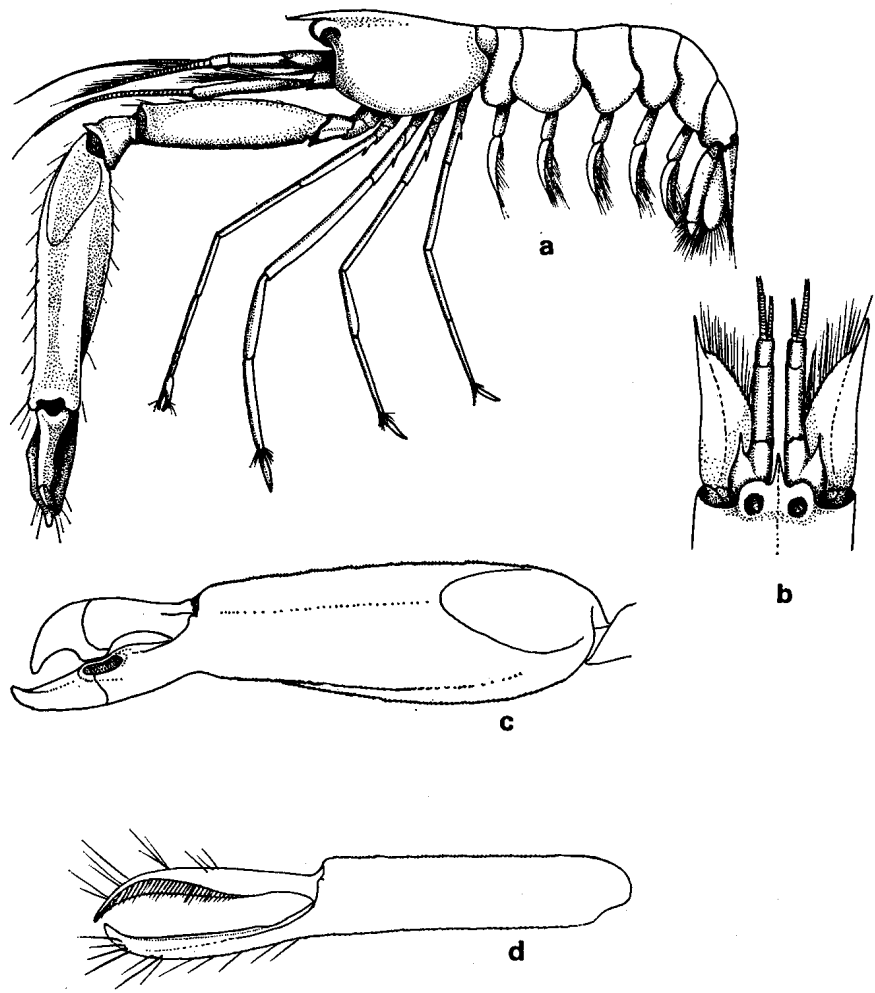

Fig. 15. *Alpheus nonalter* n.sp.
a. Lateral view. *b.* Anterior carapace and appendages, dorsal view. *c.* Large chela. *d.* Small chela.

A. acutocarinatus in that it lacks a prominent post-rostral carina and the tubercle or tooth just behind the orbital hood. It differs from *A. macrosceles* (which has a subcylindrical chela) in having a slightly flattened larger chela. The smaller chela of *A. macrosceles* is not balaeniceps-like, as in this species; both fingers meet when shut.

Alpheus waltervadi n.sp.

Fig. 16 a–c

Description: Rostrum reaching to middle of 1st antennular peduncle segment, supra-orbital spines slightly shorter. 2nd antennular peduncle segment twice length of 1st, $1\frac{1}{3}$ length of 3rd. 1st antennular peduncle segment basally broad, with external spine reaching to end of segment. Apical spine of antennal scale reaching beyond 3rd antennular peduncle segment. Larger chela of 1st pereiopods with distinct deep notch in upper margin of palm behind dactyl. Notch followed distally by raised flattened lobe, distal end of which armed with forwardly directed tooth. Latter overhangs dactyl. Carpus one quarter length of merus, latter triangular in cross section, distally ending in 3 lobes at the angles, margins unarmed. Smaller chela only slightly shorter than other, fingers equal in length to palm. Spine at distal end of palm overhangs dactyl. Latter with concave inner edge. Carpus of 2nd pereiopods consisting of 5 jointlets, 1st largest. Ischium only slightly longer than merus. Dactyls of pereiopods 3, 4, 5, biunguiculate. Carpi two-thirds length of propodi, latter armed ventrally with 8 spines. Carpus with distal lobe overlapping propodus, otherwise unarmed, merus with flattened spine on ventral distal margin. Telson $1\frac{1}{2}$ times longer than basal width, with 2 pairs lateral spines dividing the appendage into thirds.

Material: 2 ovigerous ♀♀, carapace lengths 5·5 (paratype, S.A.M. A12647), 4·1 mm (holotype, S.A.M. A12646). 4 ♂♂, carapace lengths 3·4, 4·0, 4·1, 4·1 mm. 6 juveniles, 5 damaged, station BRU 381 A-C, 38–46 metres (Walter's Shoal).

Remarks: According to de Man's 1911 classification of the genus *Alpheus* (taken from Coutiere, 1899), this species belongs to the *Megacheles* group, characterized by the presence of supra-orbital spines, a grooved and notched first chela, unarmed meri of the 3rd pereiopods and biunguiculate dactyls for the last three pairs of pereiopods. This species is very closely related to the following: *A. hailstonei* Coutiere, and its varieties *assimulans* de Man, *laetabilis* de Man, and to *A. paradentipes* Coutiere. It differs from *hailstonei* in that the larger chela is proportionally more robust and shorter and differently shaped. The supra-orbital spines are not as pronounced as in *hailstonei.*

It differs from *hailstonei* var. *assimulans* in the detailed shape of the larger chela, the stockier meri of the third pereiopods and in the 4th joint of the carpus of the 2nd pereiopods being only half as long as the 2nd. (These are equal in *assimulans.*) It differs from *hailstonei* var. *laetabilis* in lacking the spinous merus

of the larger chela characteristic of this variety. It differs from *paradentipes*, which it most closely resembles, in the shape of the larger chela, in having much less prominent supra-orbital spines, and no spines on the carpi of the last three pairs of pereiopods. Further investigation may well prove this species to be synonymous with an already established one. This is, however, a preferable situation to incorrectly assigning them to an already established species.

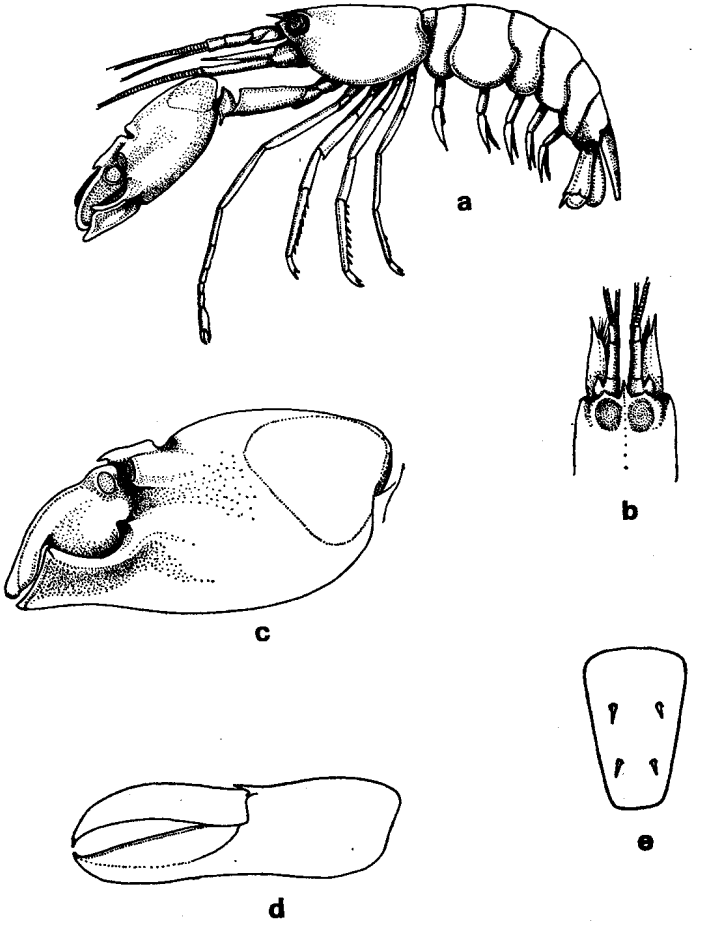

Fig. 16. *Alpheus waltervadi* n.sp.
a. Lateral view. *b*. Anterior carapace and appendages, dorsal view. *c*. Large chela. *d*. Small chela. *e*. Telson.

Distribution

In the following table the geographical distribution of all the species in this collection is given. All are automatically included in the Indo-Pacific region. The South African region includes the area from Cape Point east to

about Durban. The Atlantic region includes the area west from Cape Point. It can be seen from this table that the majority of animals have Indo-Pacific affinities, while only about 21 species occur in all three regions.

Species	Indo-Pacific	South African	Atlantic
BRACHYURA			
Achaeopsis spinulosus	×		
Achaeopsis thomsoni	×	×	×
Achaeus lacertosus	×		
Achaeus cf. *affinis*	×	×	
Actaea rueppellii	×		
Calappa lophos	×		
Carcinoplax longimanus	×	×	
Charybdis cf. *annulata*	×		
Charybdis variegata	×		
Conchoecetes artificiosus	×		
Dorippe lanata	×	×	×
Ebalia barnardi	×	×	
Ebalia tuberculata	×	×	×
Ebalia tuberculosa f. *postulans*	×	×	
Ebalia tuberculosa f. *scandens*	×	×	
Ethusa sinespina	×		
Eumedonus granulosus	×		
Eurynome aspera	×	×	×
Goneplax angulata	×	×	×
Gonioneptunus africanus	×	×	
Homola barbata	×	×	×
Hyastenus spinosus	×		
Inachus cf. *dorsettensis*	×		
Inachus guentheri	×	×	
Leucosia marmorea	×		
Lophozozymus dodone	×	×	
Lupocyclus tugelae	×	×	
Macropodia formosa	×	×	
Nursilia dentata	×		
Palicus sexlobatus	×		
Paratergatis longimanus	×		
Philyra globosa	×	×	
Philyra globulosa	×	×	
Pilumnus hirsutus	×	×	
Pilumnus longicornis	×		
Platylambrus quemvis	×		

Species	Indo-Pacific	South African	Atlantic
Platypodia granulosa	×		
Portumnus mcleayi	×	×	
Ranina ranina	×		
Retropluma planiform	×		
Thalamita woodmasoni	×		
Xanthias tuberculidens	×	×	
ANOMURA			
PAGURIDEA			
Anapagurus hendersoni	×	×	
Dardanus arrosor	×	×	×
Dardanus euopsis	×		
Dardanus setifer	×		
Diogenes brevirostris	×	×	×
Diogenes costatus	×	×	
Nematopagurus gardineri	×		
Nematopagurus squamichelis	×		
Pagurus spinulentus	×	×	
Para-pagurus pilosimanus	×	×	×
GALATHEIDEA			
Galathea dispersa	×	×	×
Galathea intermedia	×	×	×
Munida sanctipauli	×	×	×
Munida semoni	×		
Porcellana dehaanii	×		
Porcellana streptocheles	×	×	
MACRURA			
PENAEIDEA			
Acetes erythraeus	×		
Gennadas propinquus	×		
Macropetasma africana	×	×	×
Metapenaeopsis adamanensis	×		
Metapenaeopsis stebbingi	×		
Parapenaeus fissurus	×		
Penaeopsis rectacuta	×		
Penaeus japonicus	×	×	
Sergestes prehensilis	×	×	
Solenocera africanum	×	×	×
Solenocera pectinata	×		

Species	Indo-Pacific	South African	Atlantic
CARIDEA			
Alpheus nonalter	×		
Alpheus waltervadi	×		
Alpheus frontalis	×		
Chlorotocus crassicornis	×	×	×
Eualus ctenifera	×	×	
Heterocarpus woodmasoni	×		
Hippolysmata vittata	×		
Latreutes mucronatus	×		
Leptochela pugnax	×		
Leptochela robusta	×		
Nikoides cf. *danae*	×		
Oplophorus spinicauda	×		×
Plesionika cf. *acanthonotus*	×		
Plesionika martia	×	×	×
Pontocaris cataphracta	×	×	×
Pontocaris lacazei	×	×	×
Processa austroafricana	×	×	
Stylodactylus bimaxillaris	×	×	×
Synalpheus anisocheir	×	×	×
Synalpheus jedanensis	×		
Tozeuma armata	×		

Summary

A collection of brachyuran, anomuran and macruran decapod Crustacea is described. The material is from the south-west Indian Ocean, i.e. off the coasts of Portuguese East Africa, Natal and Malagasy Republic, and includes approximately 110 species, of which 15 are new records, and 5 previously undescribed.

Acknowledgements

Thanks are due to the Zoology Department of the University of Cape Town, and particularly to Mr. J. Field, for making the material available. Thanks are also due to Mr. C. Berrisford and Miss L. Joubert for preliminary identifications of some of the material and to Dr. M.-L. Penrith for helpful comments and criticisms.

The Trustees of the South African Museum are grateful to the Council for Scientific and Industrial Research for a grant towards the publication of this paper.

References

ALCOCK, A. 1896. Materials for a carcinological fauna of India. 2. The Brachyura Oxystoma. *J. Asiat. Soc. Beng.* **65**: 134–296.

ALCOCK, A. 1901. *A descriptive catalogue of the Indian deep-sea Crustacea, Decapoda Macrura and Anomala, in the Indian Museum, being a revised account of the deep-sea species collected by the Royal Indian Marine Survey ship 'Investigator'*. Calcutta: Indian Museum.

ALCOCK, A. 1905. *Catalogue of the Indian decapod Crustacea in the collection of the Indian Museum.* **2.** Anomura. Calcutta: Indian Museum.

ALCOCK, A. & ANDERSON, A. R. 1894. Natural history notes from H.M. Indian Marine Survey steamer 'Investigator', Commander C. F. Oldham, R.N., commanding. Series 2, no. 14. An account of a recent collection of deep-sea Crustacea from the Bay of Bengal and Laccadive Sea. *J. Asiat. Soc. Beng.* **63**: 141–185.

BAKER, W. H. 1907. Notes on South Australian decapod Crustacea. Part 5. *Trans. R. Soc. S. Aust.* **31**: 173–191.

BALSS, G. 1927. Macrura der Deutschen Tiefsee-Expedition. 3. Natantia, Teil B. *Wiss. Ergebn. dt. Tiefsee-Exped. 'Valdivia'* **23**: 245–275.

BARNARD, K. H. 1950. Descriptive catalogue of South African decapod Crustacea. *Ann. S. Afr. Mus.* **38**: 1–824.

BARNARD, K. H. 1954. Notes sur une collection de crustacés décapodes de la région Malgache. *Mém. Inst. scient. Madagascar* (A) **9**: 95–104.

BARNARD, K. H. 1958. Further additions to the crustacean fauna-list of Portuguese East Africa. *Mem. Mus. Dr. Alvaro de Castro* **4**: 3–27.

BELL, T. 1855. Horae carcinologicae, or notices of Crustacea. A monograph of the Leucosiadae, with observations on the relations, structures, habits and distribution of the family; a revision of the generic characters; and descriptions of new genera and species. *Trans. Linn. Soc. Lond.* **21**: 277–314.

BOUVIER, E. L. 1908. Crustacés décapodes, provenant de campagnes de l'"Hirondelle' et de la 'Princesse Alice' 1886–1907. *Résult. Camp. scient. Prince Albert I.* **33**: 1–122.

BOUVIER, E. L. 1914. Sur la faune carcinologique de l'île Maurice. *C. r. hebd. Séanc. Acad. Sci. Paris* **159**: 698–704.

CHACE, F. A. 1940. Plankton of the Bermuda Oceanographic Expeditions. 9. The bathypelagic caridean Crustacea. *Zoologica, N.Y.* **25**: 117–210.

COUTIERE, H. 1899. Les Alpheidae. *Annls Sci. nat.* **9**: 1–560.

DOFLEIN, F. 1904. Brachyura. *Wiss. Ergebn. dt. Tiefsee-Exped. 'Valdivia'* **6**: 1–314.

FLIPSE, H. J. 1930. Oxyrrhyncha. Parthenopidae. *Siboga Exped.* monogr. **39c²**: 1–96.

GILL, T. 1894. A new bassalian type of crab. *Am. Nat.* **28**: 1043–1045.

HAIG, J. 1964. Papers from Dr. Th. Mortensen's Pacific Expedition 1914–16. 81. Porcellanid crabs from the Indo-West Pacific, Part 1. *Vidensk. Meddr dansk naturh. Foren.* **126**: 355–386.

HELLER, C. 1862. Neue Crustaceen, gesammelt während der Weltumseglung der k.k. Fregatte Novara. Zweiter vorläufiger Bericht. *Verh. zool.-bot. Ges. Wien* **12**: 519–528.

HOLTHUIS, L. B. 1951. The caridean Crustacea of tropical west Africa. *Atlantide Rep.* **2**: 7–187.

HOLTHUIS, L. B. & GOTTLIEB, E. 1958. An annotated list of the decapod Crustacea of the Mediterranean coast of Israel, with an appendix listing the Decapoda of the eastern Mediterranean. *Bull. Res. Coun. Israel* **7B**: 1–126.

KEMP, S. 1910. Notes on the Decapoda in the Indian Museum. 1. *Rec. Indian Mus.* **5**: 173–181.

KEMP, S. 1925. On various Caridea. Notes on Crustacea Decapoda in the Indian Museum. 17. *Rec. Indian Mus.* **27**: 249–343.

MACGILCHRIST, A. C. 1905. Natural history notes from the R.I.M.S. 'Investigator' Capt. T. H. Heming, R.N. (retired) commanding. Series 3, no. 6. An account of some of the new and some of the rarer decapod Crustacea obtained during the surveying season 1901–1904. *Ann. Mag. nat. Hist.* (7) **15**: 233–268.

MAN, J. G. de. 1893. Report on the podophthalmous Crustacea collected in the year 1891 by Dr. H. Ten Kate in some islands of the Malay Archipelago. *Notes Leyden Mus.* **15**: 284–311.

MAN, J. G. de. 1911. The Decapoda of the Siboga Expedition. Part 2. Family Alpheidae. *Siboga Exped.* monogr. **39a**[1]: 1–465.

MAN, J. G. de. 1920. The Decapoda of the Siboga Expedition. Part 4. Families Pasiphaeidae, Stylodactylidae, Hoplophoridae, Nematocarcinidae, Thalassocaridae, Pandalidae, Psalidopodidae, Gnathophyllidae, Processidae, Gylphocrangonidae and Crangonidae. *Siboga Exped.* monogr. **39a**[3]: 1–318.

MILNE-EDWARDS, A. 1883. *Recueil de figures de crustacés nouveaux ou peu connus.* Paris.

MIYAKE, S. 1943. Studies on the crab-shaped Anomura of Nippon and adjacent waters. *J. Dep. Agric. Kyushu imp. Univ.* **7**: 49–158.

ORTMANN, A. E. 1894. Crustaceen. *In* Semon, R. *Zoologische Forschungsreise in Australien und den malayischen Archipel.* **5**: 1–80. Jena: Fischer. *Denkschr. med.-naturw. Ges. Jena* **8**: 1–80.

RATHBUN, M. 1906. The Brachyura and Macrura of the Hawaiian Islands. *Bull. U.S. Fish Commn* **23**: 827–930.

RATHBUN, M. 1911. Marine Brachyura. *Trans. Linn. Soc. Lond.* (2, Zool.) **14**: 191–261.

RATHBUN, M. 1918. The grapsoid crabs of America. *Bull. U.S. natn. Mus.* **97**: i–xxii, 1–461.

RATHBUN, M. 1932. Preliminary descriptions of new species of Japanese crabs. *Proc. biol. Soc. Wash.* **45**: 29–38.

SAKAI, T. 1939. *Studies on the crabs of Japan* **4**. Brachygnatha, Brachyrhyncha. Tokyo: Yokendo.

SAKAI, T. 1965*a*. On two new genera and five new species of xanthoid crabs from the collection of His Majesty the Emperor of Japan, made in Sagami Bay. *Crustaceana* **8**: 97–106.

SAKAI, T. 1965*b*. *The crabs of Sagami Bay.* Honolulu: East West Centre Press.

SMITH, S. I. 1882. Reports on the results of dredging . . . on the east coast of the United States . . . by the U.S. Coast Survey Steamer 'Blake' . . . 17. Report on the Crustacea. Part 1. Decapoda. *Bull. Mus. comp. Zool. Harv.* **10**: 1–108.

TESCH, J. J. 1918. The Decapoda Brachyura of the Siboga Expedition. 1. Hymenosomidae, Retroplumidae, Ocypodidae, Grapsidae and Gecarcinidae. *Siboga Exped.* monogr. **39c**[1]: 1–148.

INSTRUCTIONS TO AUTHORS

Based on

CONFERENCE OF BIOLOGICAL EDITORS, COMMITTEE ON FORM AND STYLE. 1960.
Style manual for biological journals. Washington: American Institute of Biological Sciences.

MANUSCRIPT

To be typewritten, double spaced, with good margins, arranged in the following order: (1) Heading, consisting of informative but brief title, name(s) of author(s), address(es) of author(s), number of illustrations (plates, figures, enumerated maps and tables) in the article. (2) Contents. (3) The main text, divided into principal divisions with major headings; subheadings to be used sparingly and enumeration of headings to be avoided. (4) Summary. (5) Acknowledgements. (6) References, as below. (7) Key to lettering of figures. (8) Explanation to plates.

ILLUSTRATIONS

To be reducible to $4\frac{3}{4}$ in. × 7 in. ($7\frac{1}{2}$ in. including caption). A metric scale to appear with all photographs.

REFERENCES

Harvard system (name and year) to be used: author's name and year of publication given in text; full references at the end of the article, arranged alphabetically by names, chronologically within each name, with suffixes *a*, *b*, etc. to the year for more than one paper by the same author in that year.

For books give title in italics, edition, volume number, place of publication, publisher.

For journal articles give title of article, title of journal in italics (abbreviated according to the *World list of scientific periodicals.* 4th ed. London: Butterworths, 1963), series in parentheses, volume number, part number (only if independently paged) in parentheses, pagination.

Examples (note capitalization and punctuation)

BULLOUGH, W. S. 1960. *Practical invertebrate anatomy.* 2nd ed. London: Macmillan.

FISCHER, P.-H. 1948. Données sur la résistance et de le vitalité des mollusques. *J. Conch., Paris* **88**: 100–140.

FISCHER, P.-H., DUVAL, M. & RAFFY, A. 1933. Etudes sur les échanges respiratoires des littorines. *Archs Zool. exp. gén.* **74**: 627–634.

KOHN, A. J. 1960*a*. Ecological notes on *Conus* (Mollusca: Gastropoda) in the Trincomalee region of Ceylon. *Ann. Mag. nat. Hist.* (13) **2**: 309–320.

KOHN, A. J. 1960*b*. Spawning behaviour, egg masses and larval development in *Conus* from the Indian Ocean. *Bull. Bingham oceanogr. Coll.* **17** (4): 1–51.

THIELE, J. 1910. Mollusca: B. Polyphacophora, Gastropoda marina, Bivalvia. *In* Schultze, L. *Zoologische und anthropologische Ergebnisse einer Forschungsreise im westlichen und zentralen Süd-Afrika.* **4**: 269–270. Jena: Fischer. *Denkschr. med.-naturw. Ges. Jena* **16**: 269–270.

ZOOLOGICAL NOMENCLATURE

To be governed by the rulings of the latest *International code of zoological nomenclature* issued by the International Trust for Zoological Nomenclature (particularly articles 22 and 51). The Harvard system of reference to be used in the synonymy lists, with the full references incorporated in the list at the end of the article, and not given in contracted form in the synonymy list.

Example

Scalaria coronata Lamarck, 1816: pl. 451, figs 5 *a*, *b*; Liste: 11. Turton, 1932: 80.