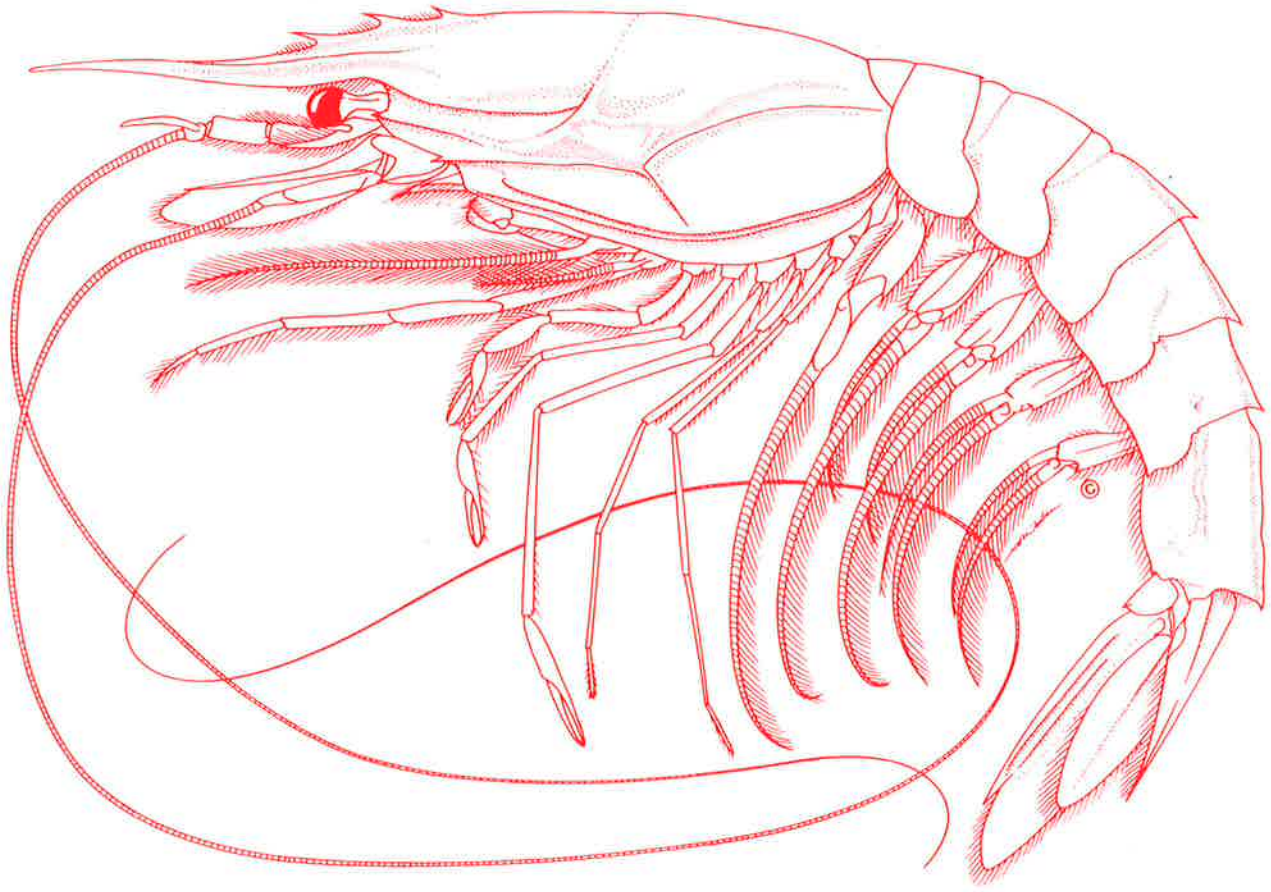
A guide to some common offshore shrimp and prawn species of New Zealand



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Cathy M. Fenaughty
and
Malcolm R. Clark

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MINISTRY OF AGRICULTURE AND FISHERIES
TE MANATU AHUWHENUA AHUMOANA

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Cover: *Plesiopenaeus edwardsianus*.

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CONTENTS

INTRODUCTION

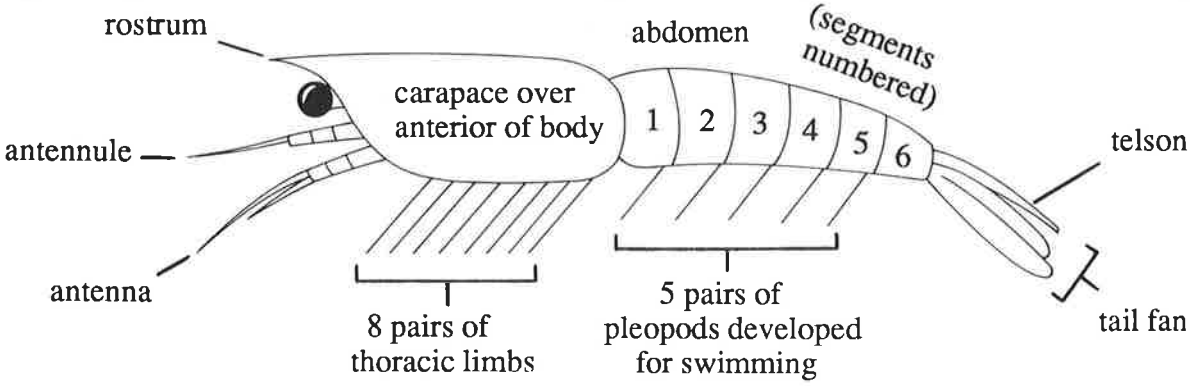
The purpose of this guide is to help identify some of the more common shrimps and prawns caught offshore around New Zealand during commercial fishing or research sampling. It is important to note that **only some of the more common** shrimps and prawns caught in our waters are identified. Because of this detailed keys are not used. Instead the guide relies on a drawing of each species accompanied by a list of its key features (which are as far as possible visible to the unaided eye). A separate box contains the names of similar species and the features that separate them from the one illustrated. It is also important to note that several species included in this guide are similar, (and sometimes species not included will be caught) and, therefore, any shrimp or prawn identified should have the KEY FEATURES listed and should not have the features that distinguish SIMILAR SPECIES.

Notes on colour, size, habitat and distribution accompany the drawings and on each following page, New Zealand catch records of each species are mapped. Most records are from bottom and mid-water trawling carried out over much of the EEZ, but further sampling, especially with fine mesh nets, will certainly extend these distributions.

In the case of ***Funchalia*** species (page 14), ***Sergestes*** species (page 18), and ***Nematocarcinus*** species (page 38) only the generic name is given because there are several very similar species in each genus and more research is needed to sort them out properly.

There is no zoological division between shrimps and prawns - prawns are simply large shrimps. They belong to one systematic group, the order Decapoda (10 legged Crustacea) along with lobsters and crabs. Shrimps and prawns are natants, meaning they are able to swim and are often called natant decapods (crabs and lobsters are "crawlers" and often called reptants). Note that New Zealand "scampi" are not prawns but clawed lobsters.

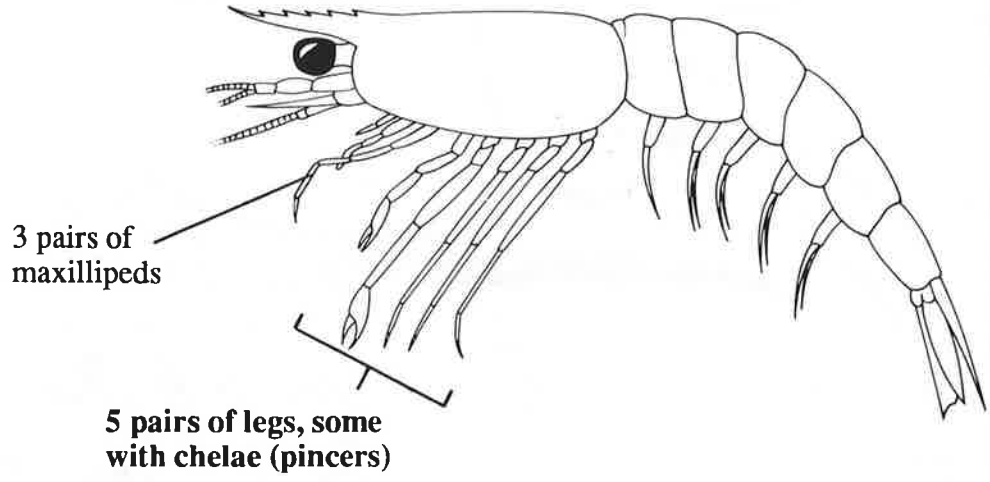
Natant decapods are similar in appearance to crustaceans in two other orders; the Euphausiacea (euphausids) and Mysidacea (mysids). Major morphological components common to the natant decapods, euphausids and mysids are shown in this simplified drawing.



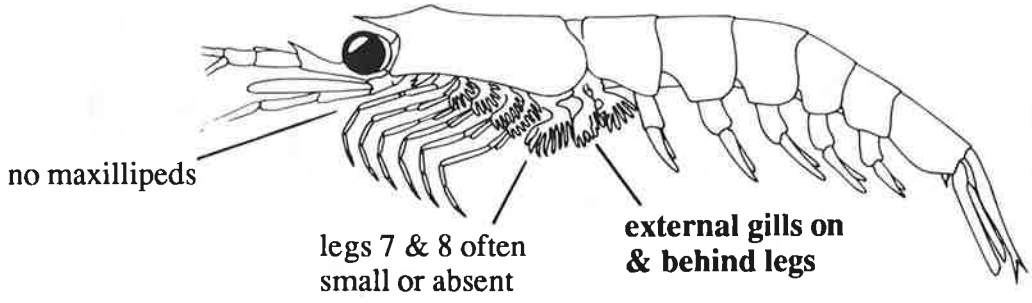
These morphological components are also present in the reptants except that they are generally more heavily built than natants and the pleopods are not developed for swimming - females have long or broad pleopods with hairs for egg attachment.

In the following illustrations the most obvious characters unique to natant decapods, to mysids or to euphausids are labelled - **bold** labels indicate the most distinctive character of each.

Decapoda
natant decapods
natants
shrimps
prawns

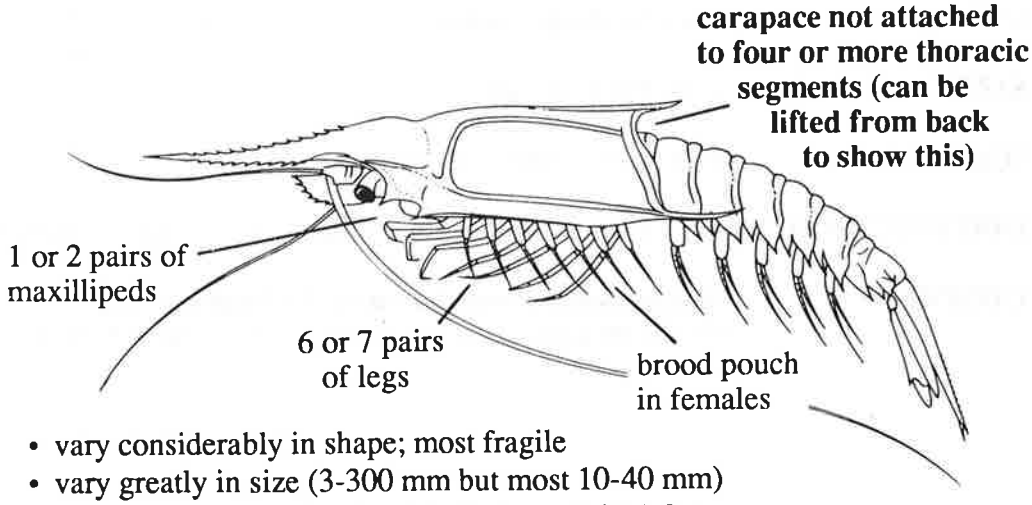


Euphausiacea
euphausids
krill - but not
'lobster krill'



- all fairly similar looking (none uniform scarlet)
- mostly 10-25 mm (largest 50 mm, smallest 8 mm)
- typically pelagic (swimming) in surface to deep water
- often in very large numbers

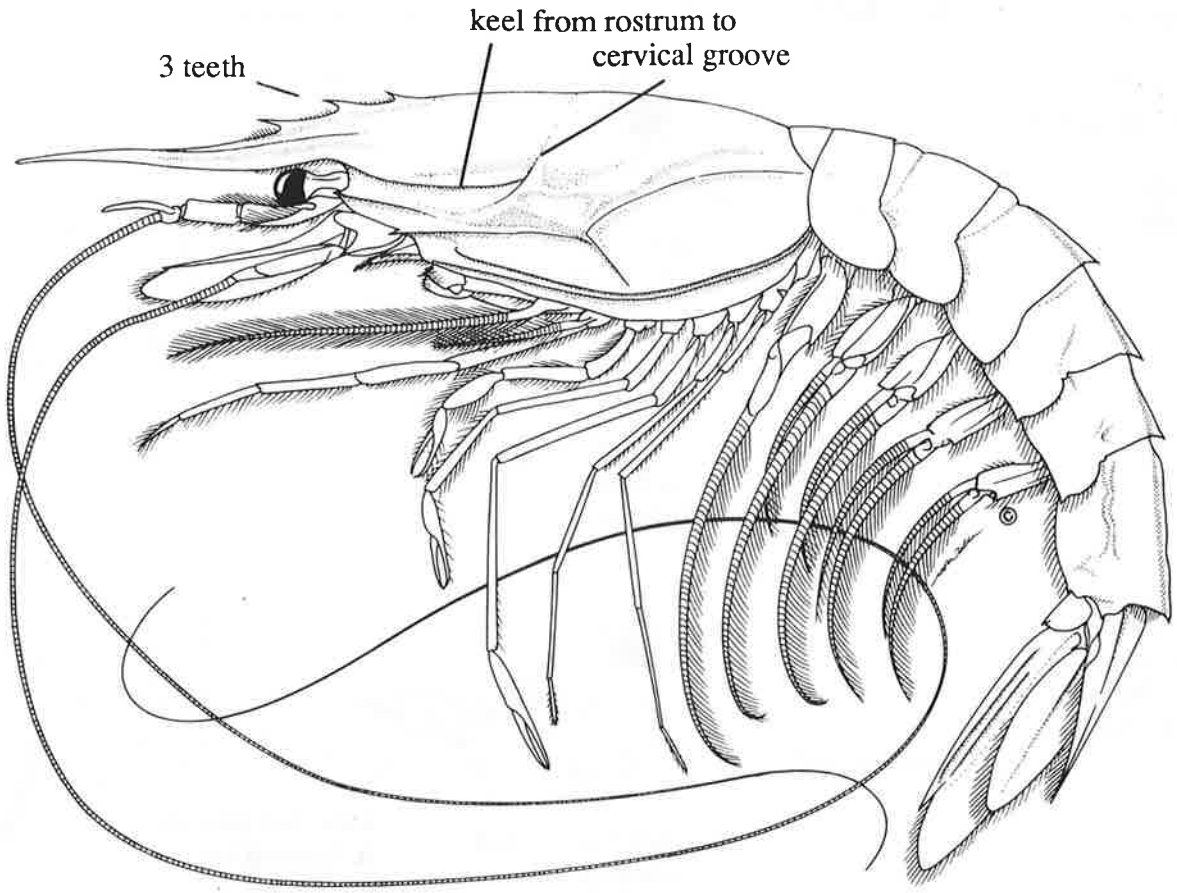
Mysidacea
mysids
opossum shrimps



- vary considerably in shape; most fragile
- vary greatly in size (3-300 mm but most 10-40 mm)
- pelagic (swimming) or benthic (bottom living) from river mouths to very deep water
- occasionally in large numbers

NB:The mysid illustrated is ***Gnathophausia ingens*** which is quite common around New Zealand and often thought to be a prawn. It is bright scarlet and ranges from small to very large (it may reach 300 mm in length)

Scarlet prawn — *Plesiopenaeus edwardsianus*



KEY FEATURES

- Rostrum base has 3 teeth on top, above eye
- Sides of carapace with 'keels'; one keel runs from rostrum to cervical groove
- Hepatic spine absent

COLOUR Scarlet to deep crimson

SIZE Up to 350 mm long

HABITAT Over mud bottom, 200-1800 m.

DISTRIBUTION Many parts of Atlantic; Indo-Pacific including Australia and New Zealand

COMMENTS ***Plesiopenaeus edwardsianus*** is the largest natant decapod in New Zealand. It is fished commercially off Africa (Senegal to Cameroon)

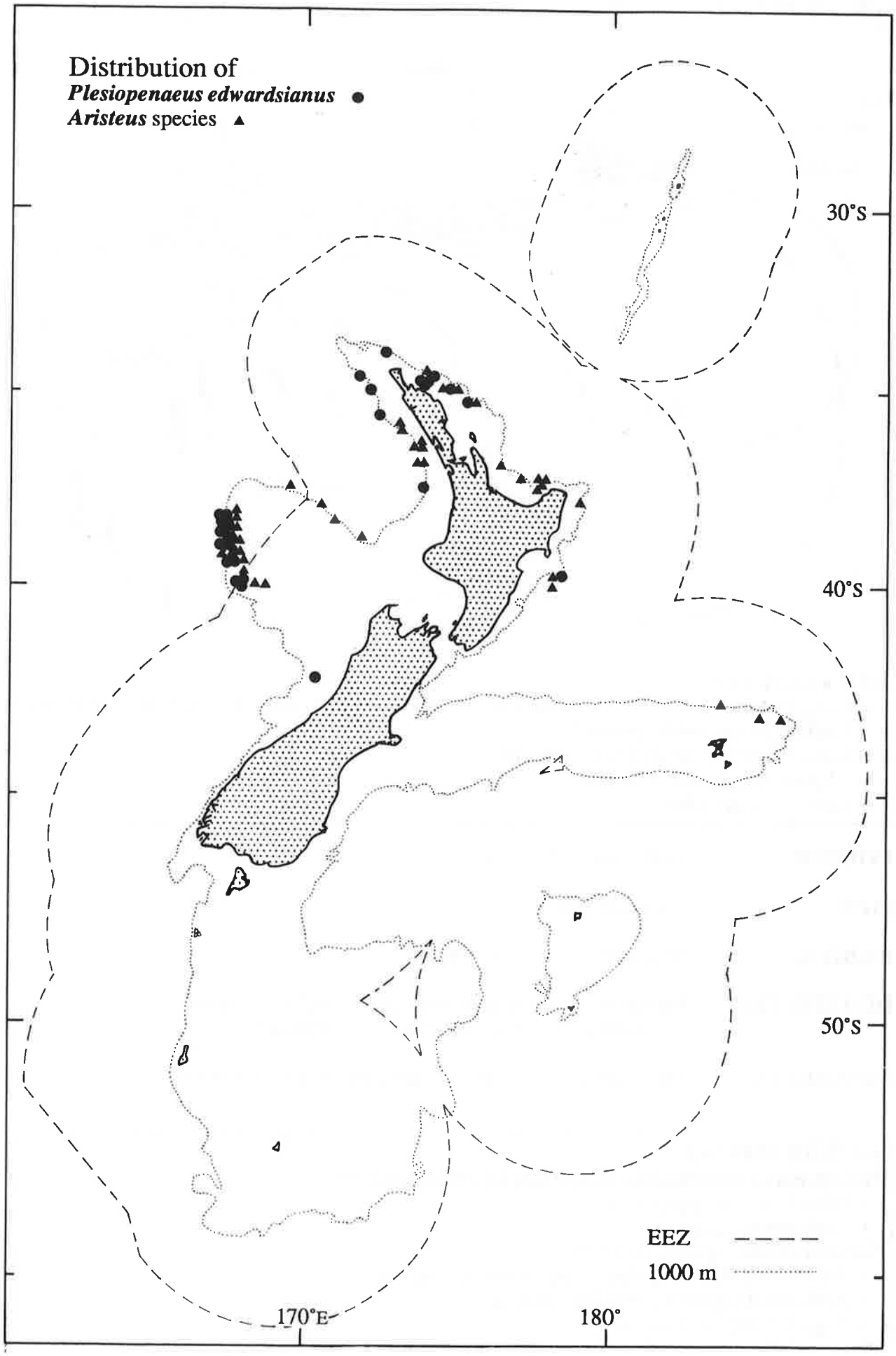
SIMILAR SPECIES

Aristeus species - **very** similar, usually smaller

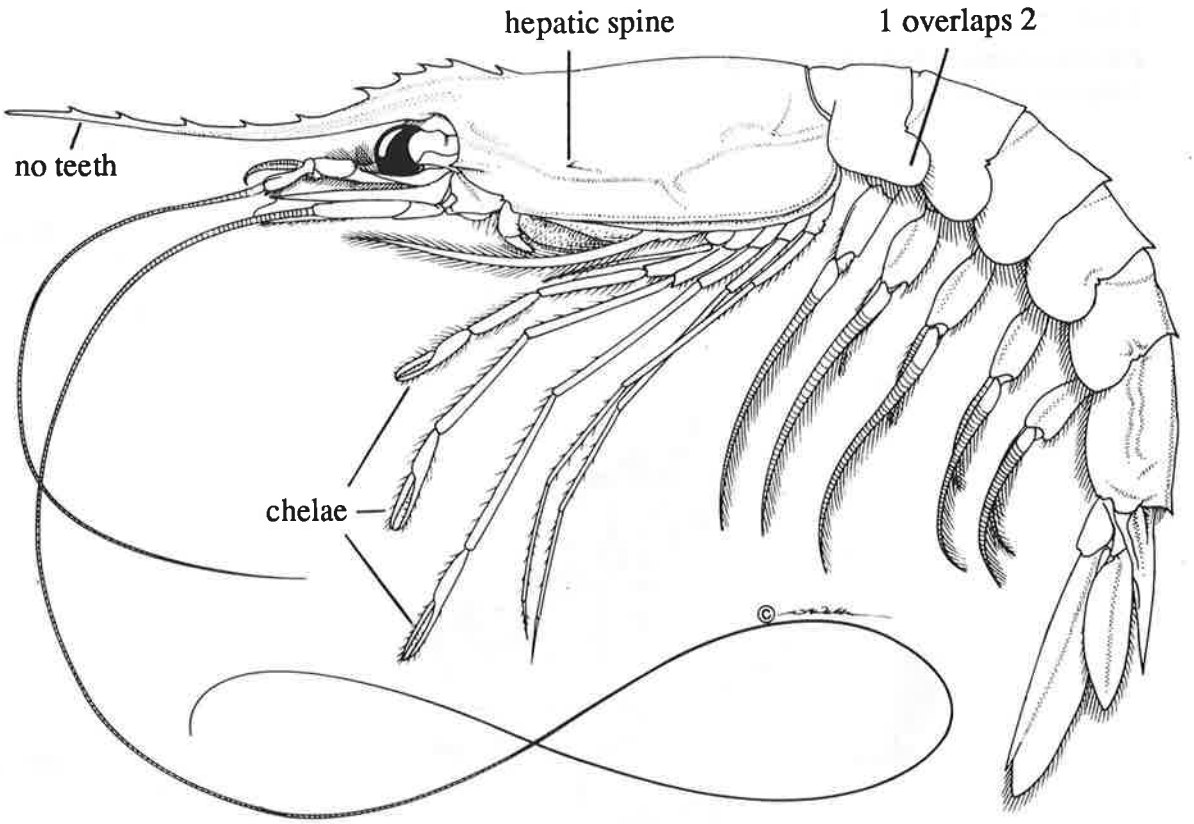
- Has no keel running from rostrum to cervical groove (keel only very short or absent)

Aristaeomorpha foliacea (page 8)

- Has more than 3 teeth on top of rostrum
- Hepatic spine present


Distribution of
Plesiopenaeus edwardsianus
Aristeus species
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Royal red prawn — *Aristaeomorpha foliacea*



KEY FEATURES

- Long rostrum with more than 3 teeth on top (rostrum length may vary, short in large males) Lacks teeth on bottom of rostrum
- Small hepatic spine on side of carapace
- Abdominal segment 1 overlaps segment 2
- Legs 1-3 with chelae

COLOUR Uniformly pink to red

SIZE Up to 225 mm long

HABITAT Over mud bottom, 250-1300 m

DISTRIBUTION Mediterranean, temperate Atlantic, east Africa to Japan, Fiji, northwest and east Australia, New Zealand.

COMMENTS Fished commercially in Mediterranean and New Zealand.

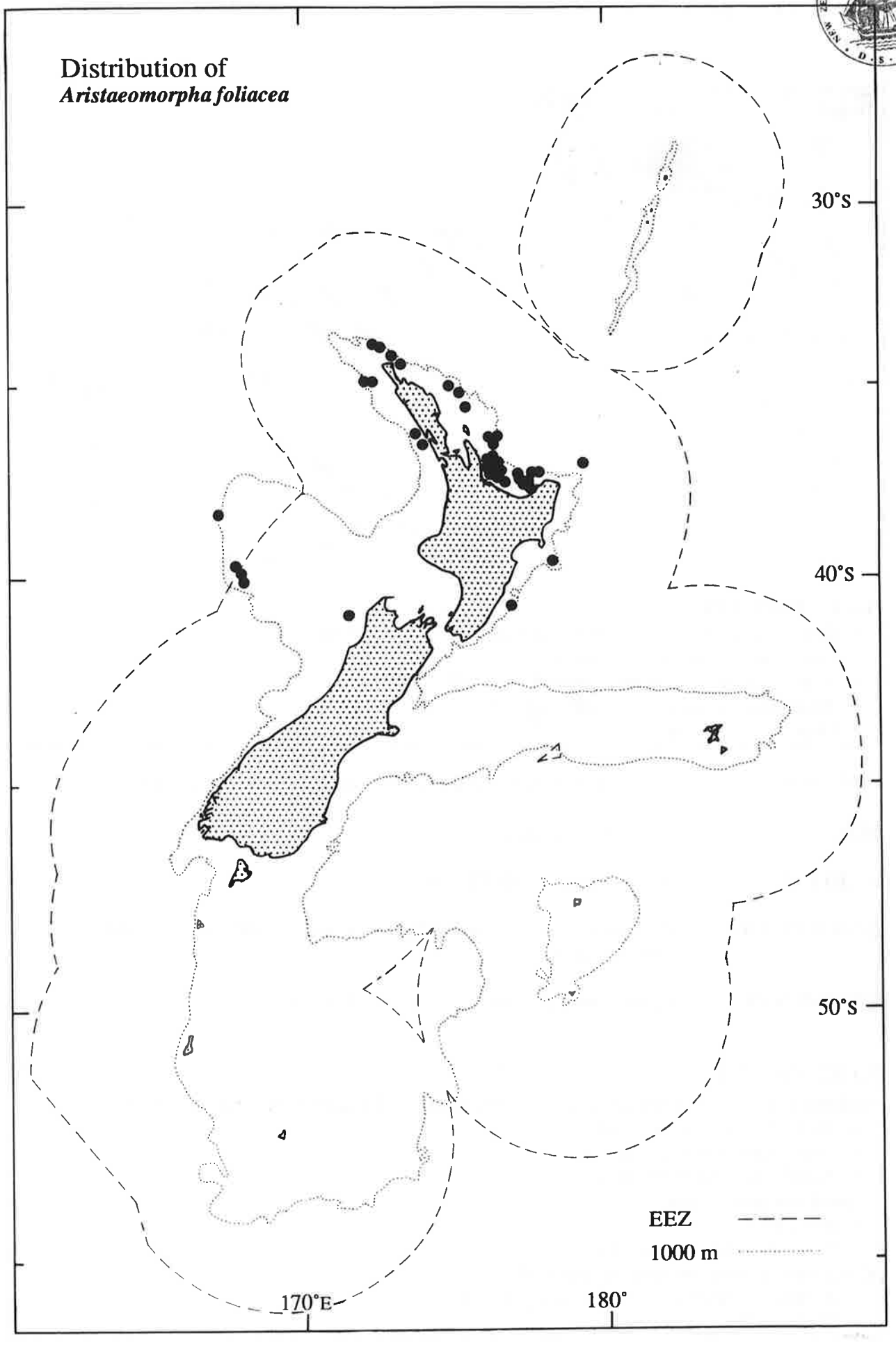
SIMILAR SPECIES

Plesiopenaeus edwardsianus (and ***Aristeus*** species) (page 6)

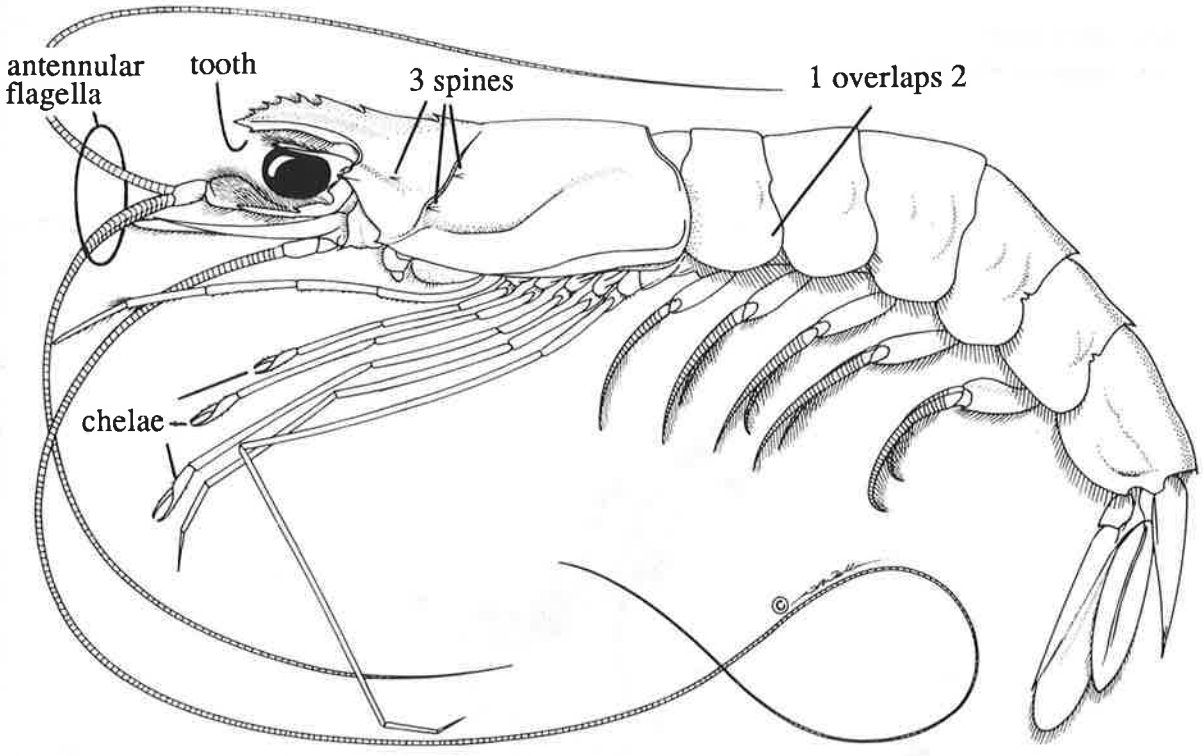
- Only 3 teeth on top of rostrum
- Lack hepatic spine

Nematocarcinus species (page 38)

- About 3 small teeth spread along bottom of rostrum
- Abdominal segment 2 overlaps segment 1
- Legs 1-2 only with chelae


Distribution of
Aristaeomorpha foliacea
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Jack-knife prawn — *Haliporoides sibogae*



KEY FEATURES

- One small tooth below rostrum tip (rostrum longer than eye)
- 3 small spines on side of carapace
- Antennular flagella normal (round, not flat)
- Abdominal segment 1 overlaps segment 2
- Legs 1-3 with chelae

COLOUR	Red-pink with colourless to yellow-orange areas on abdomen
SIZE	Up to 200 mm long
HABITAT	Over soft mud, 100-1500 m
DISTRIBUTION	Madagascar, Japan, South China Sea, Malay Archipelago, Australia, New Zealand.
COMMENTS	Caught commercially in Japan and Australia

SIMILAR SPECIES

Solenocera novaezealandiae (page 12) similar to small ***Haliporoides sibogae*** but has:

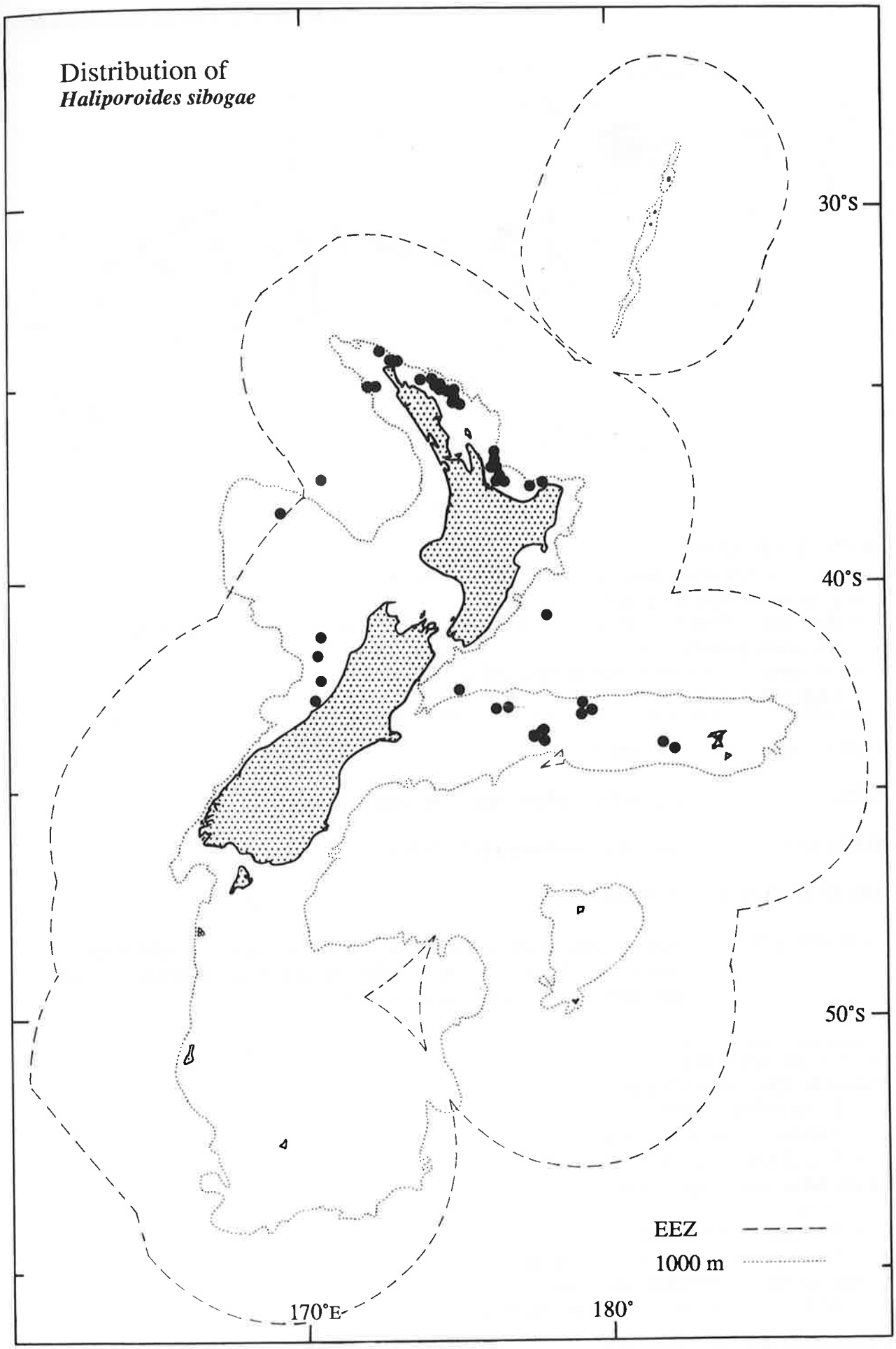
- No teeth below rostrum tip
- 2 spines on side of carapace
- Antennular flagella flattened

Funchalia species (page 14)

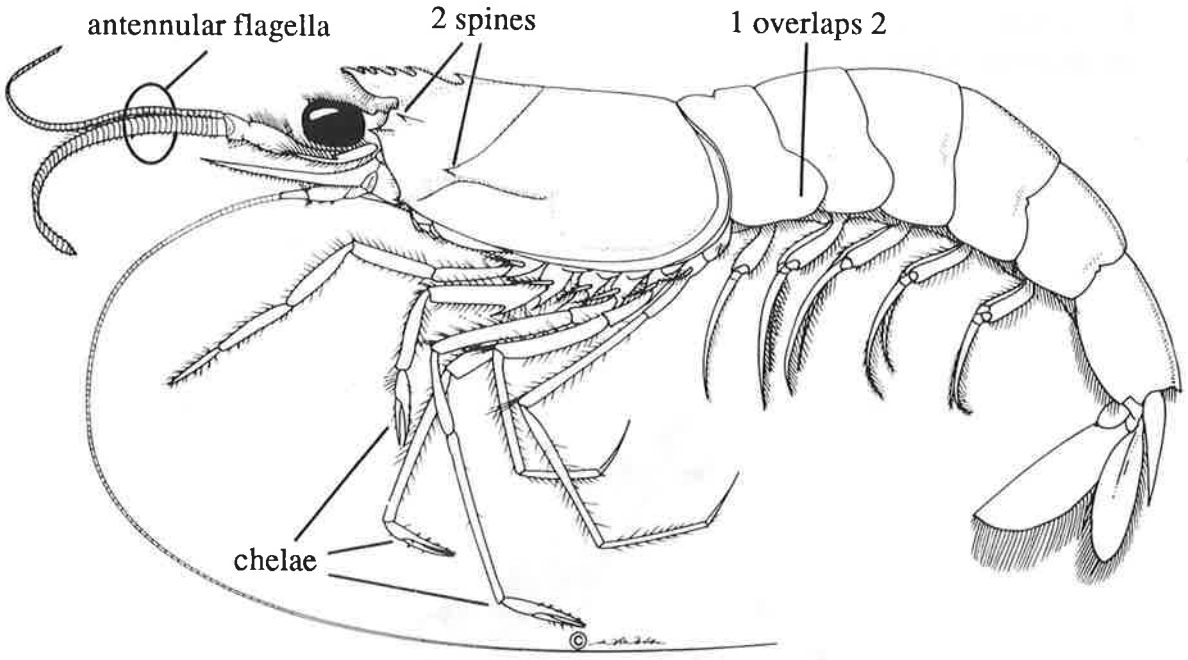
- Body hairy
- No teeth below rostrum tip

Chlorotocus novaezealandiae (page 30)

- Abdominal segment 2 overlaps segment 1
- Chela on leg 2 only


Distribution of
Haliporoides sibogae
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Solenocera novaezealandiae



KEY FEATURES

- No teeth below rostrum tip (rostrum shorter than eye)
- 2 spines on side of carapace
- Antennular flagella flattened (lower flagella with channels forming a tube when pressed together), short
- Abdominal segment 1 overlaps segment 2
- Legs 1-3 with chelae

COLOUR Unknown

SIZE Up to 75 mm long (see comments below)

HABITAT Buried in mud bottom, 50-550 m

DISTRIBUTION New Zealand

COMMENTS Few specimens are held in collections but this species could be quite common and larger. About 10 other species of ***Solenocera*** are caught commercially elsewhere in the world.

SIMILAR SPECIES

Small ***Haliporoides sibogae*** (page 10)

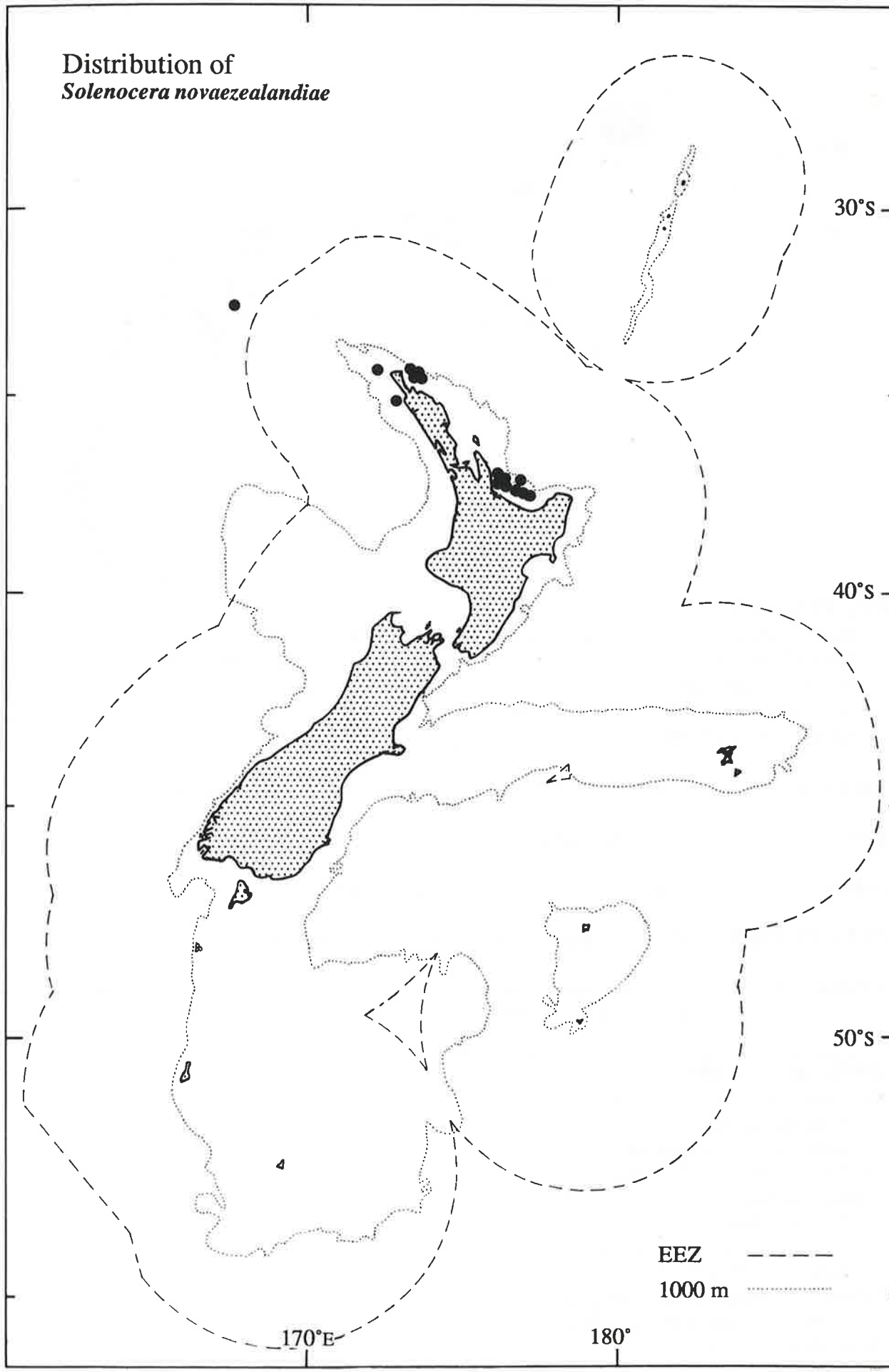
- Tooth below rostrum tip
- 3 spines on side of carapace
- Round antennular flagella

Funchalia species (page 14)

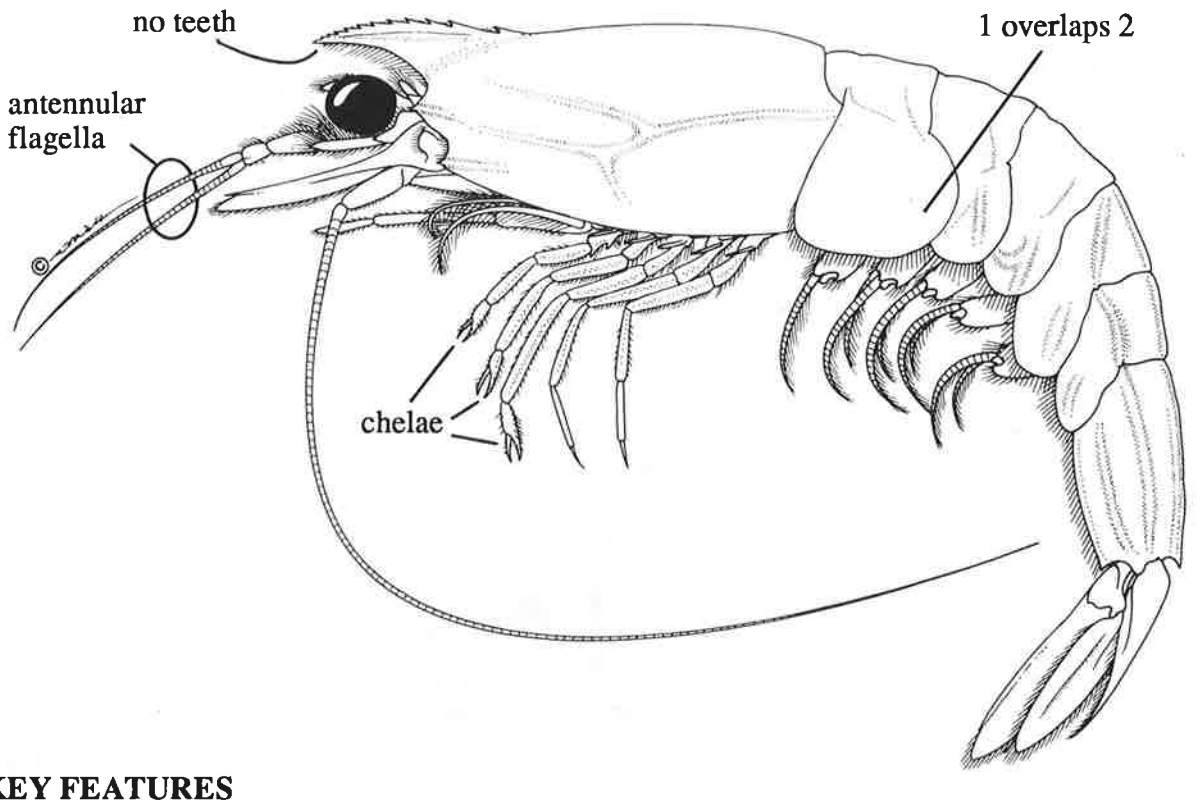
- Body hairy
- Rostrum longer than eye
- Normal (round) antennular flagella

Chlorotocus novaezealandiae (page 30)

- Abdominal segment 2 overlaps segment 1
- Chela on leg 2 only


Distribution of
Solenocera novaezealandiae
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Funchalia species



KEY FEATURES

- Body hairy (i.e. many small hairs lying flat on surface)
- No teeth on bottom of rostrum, 5-12 teeth on top (rostrum longer than eye)
- Normal (round) antennular flagella
- Abdominal segment 1 overlaps segment 2
- Legs 1-3 with chelae

COLOUR	Transparent, with areas of pink-orange-yellow colouring
SIZE	Up to 160 mm long
HABITAT	Surface (at night) - deeper than 500 m
DISTRIBUTION	Meditteranean, Atlantic, Indian Ocean, Pacific
COMMENTS	In smaller specimens rostrum tends to be longer and more slender, with more dorsal teeth

SIMILAR SPECIES

Haliporoides sibogae (page 10)

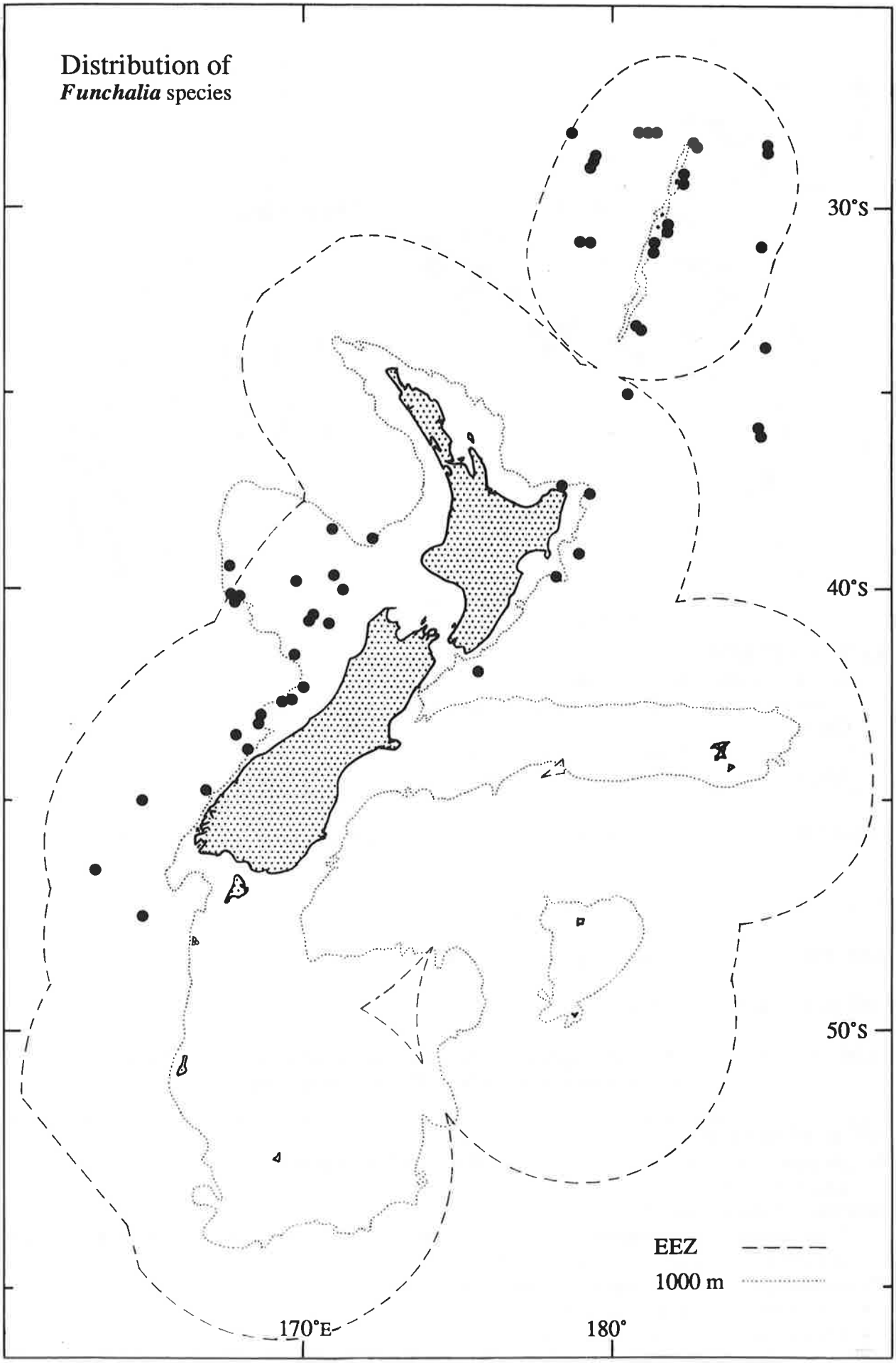
- Body not hairy
- Tooth below rostrum tip
- 3 spines on side of carapace

Solenocera novaezealandiae (page 12)

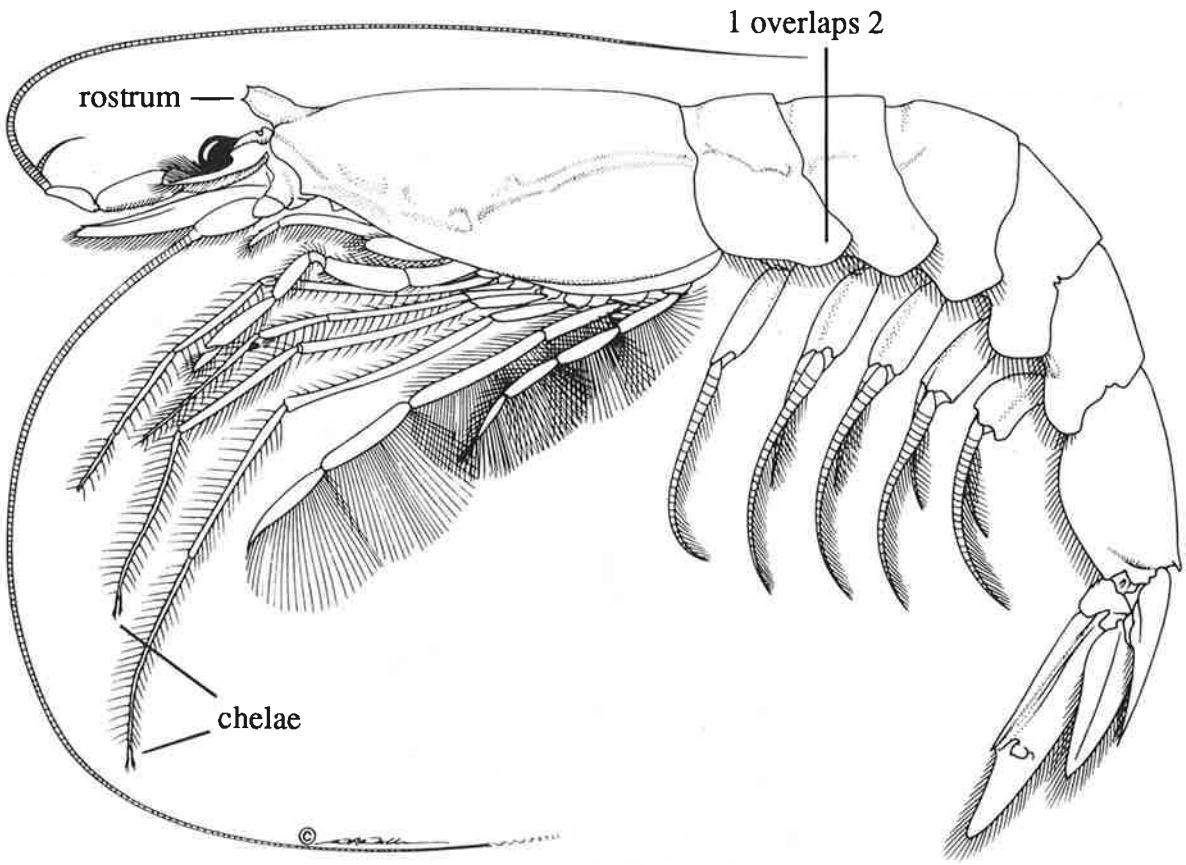
- Body not hairy
- 2 spines on side of carapace
- Antennular flagella flattened

Chlorotocus novaezealandiae (page 30)

- Abdominal segment 2 overlaps segment 1
- Chela on leg 2 only


Distribution of
Funchalia species
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Sergia potens



KEY FEATURES

- Shape of rostrum (has 2 points)
- Eyestalks not particularly long and usually not projecting laterally
- Colour
- Chelae (legs 2 & 3) microscopically small
- Abdominal segment 1 overlaps segment 2

COLOUR	Scarlet to deep crimson all over, deep purple photophores mainly on underside
SIZE	Up to 115 mm long
HABITAT	Surface - deeper than 1100 m
DISTRIBUTION	New Zealand
COMMENTS	The largest species of the family Sergestidae in New Zealand. Animal characteristically 'softer' than most other prawns

SIMILAR SPECIES

Sergia japonicus - similar colour to but smaller than ***Sergia potens***

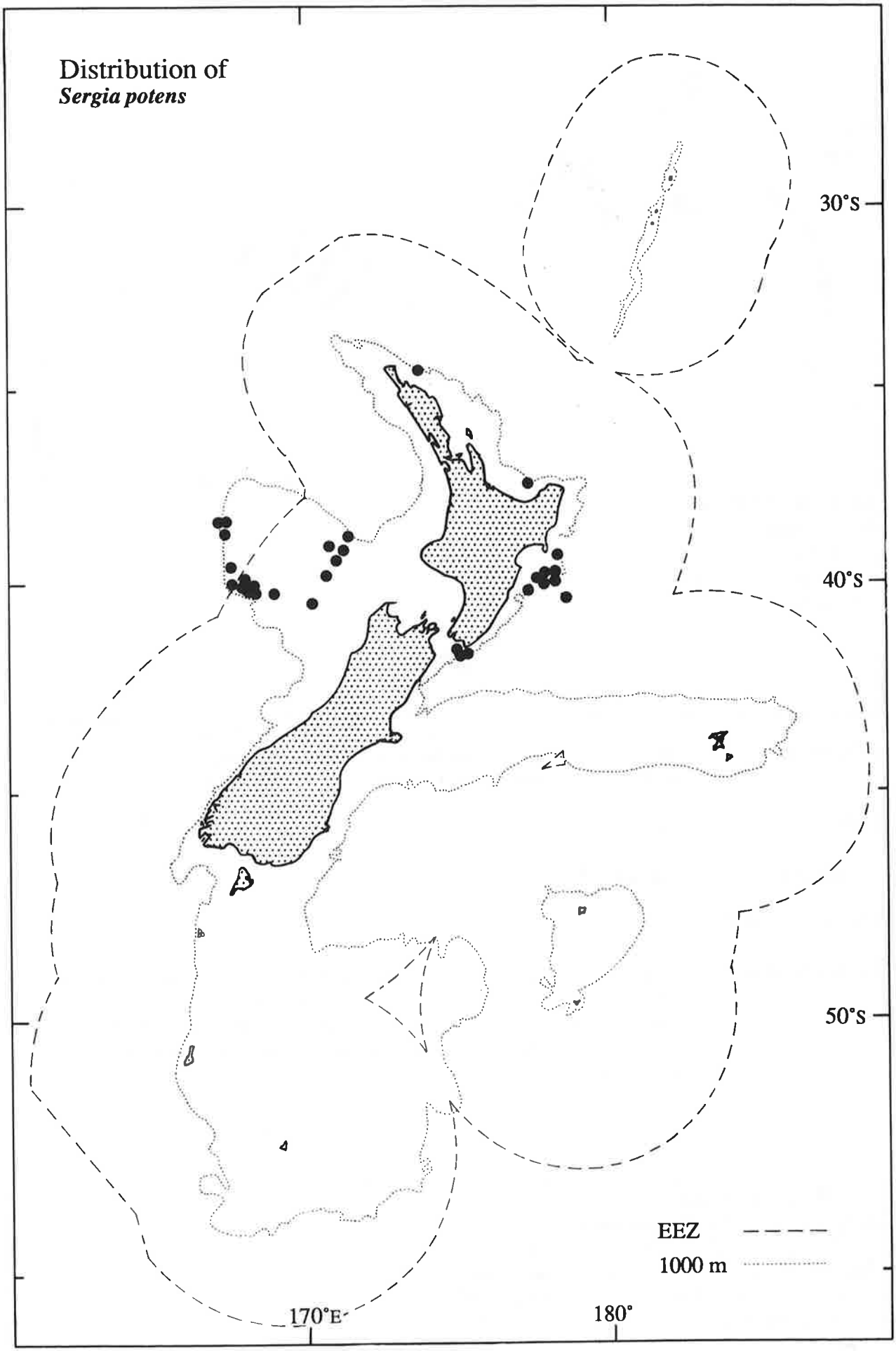
- Lacks points on rostrum

Sergestes species (page 18)

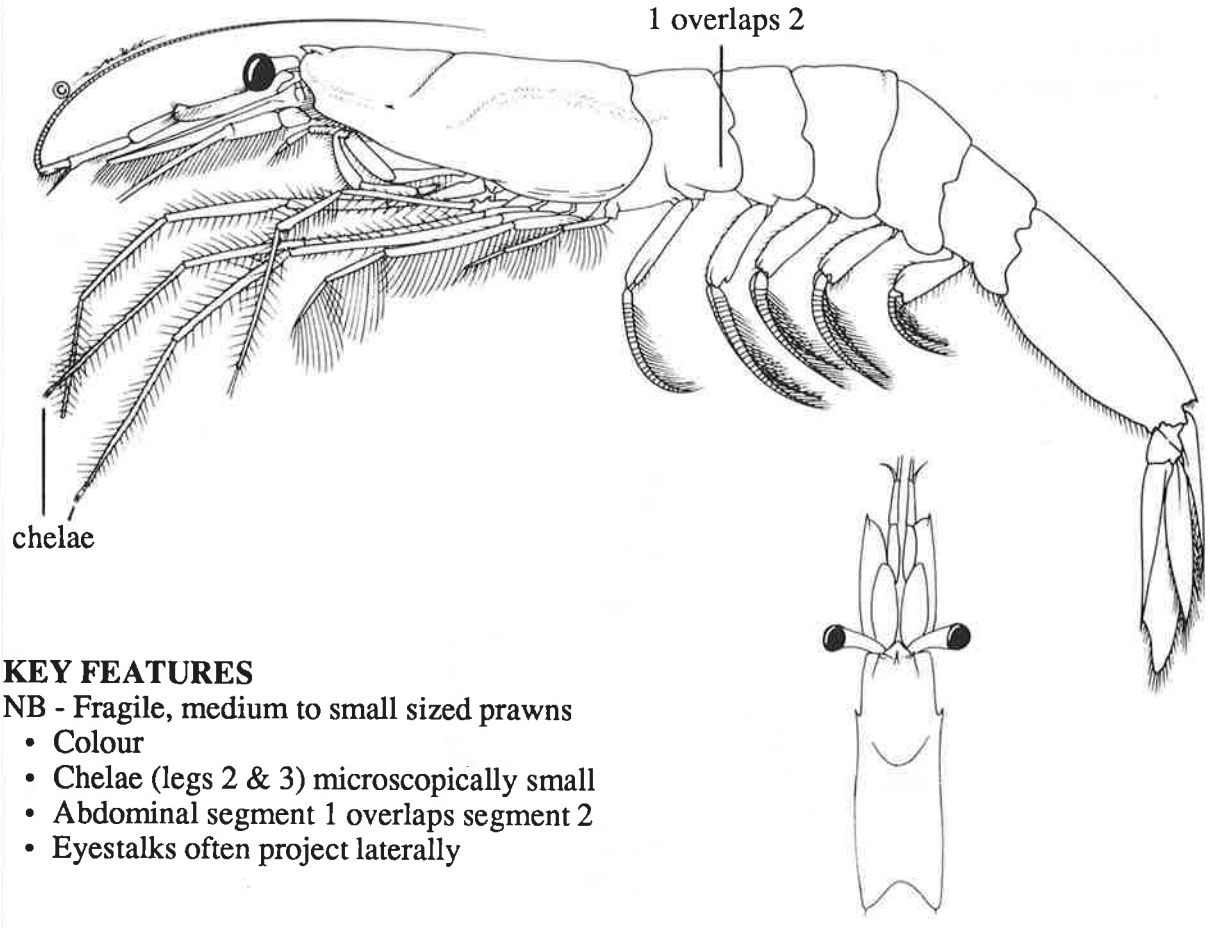
- Transparent with varying numbers of red chromatophores (spots) and with blackish stomach and other organs visible through carapace

Pasiphaea species (e.g. ***Pasiphaea barnardi***, page 20)

- Chelae on legs 1 & 2 (cutting edges comb-like)
- Abdominal segment 2 overlaps segment 1


Distribution of
Sergia potens
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Sergestes species



KEY FEATURES

NB - Fragile, medium to small sized prawns

- Colour
- Chelae (legs 2 & 3) microscopically small
- Abdominal segment 1 overlaps segment 2
- Eyestalks often project laterally

COLOUR Transparent with varying numbers of red chromatophores (spots) and with blackish stomach and other organs visible through carapace

SIZE Less than 70 mm long

HABITAT Surface - 2000 m

DISTRIBUTION Worldwide

COMMENTS Common. A single species of ***Sergestes (Sergestes lucens)*** is caught commercially in Japan. The specimen illustrated is ***Sergestes arcticus*** which is very common but difficult to distinguish from several other species. ***Sergestes*** and ***Sergia*** species are not well known but currently under study

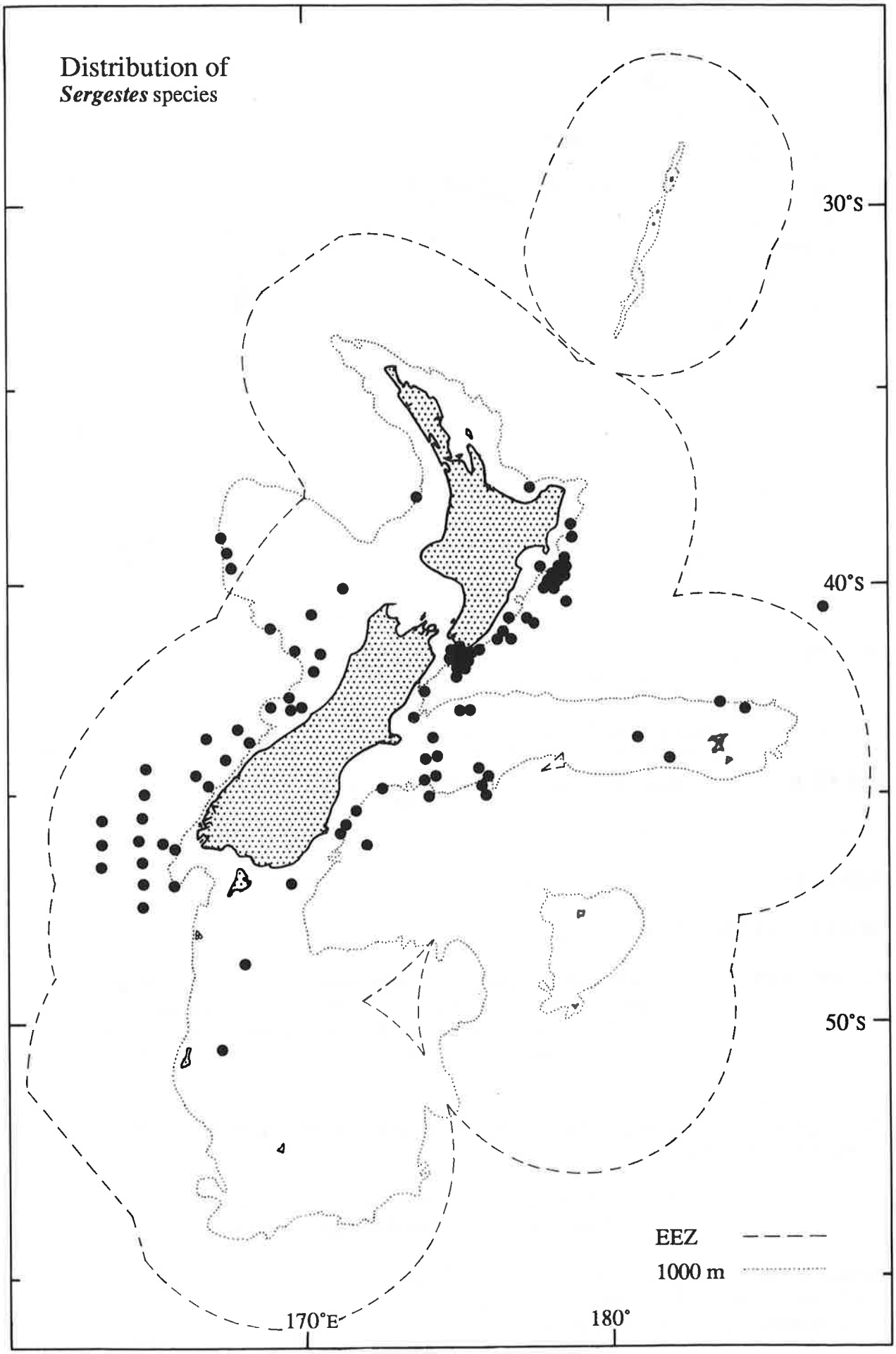
SIMILAR SPECIES

Sergia species (e.g. ***Sergia potens***, page 16)

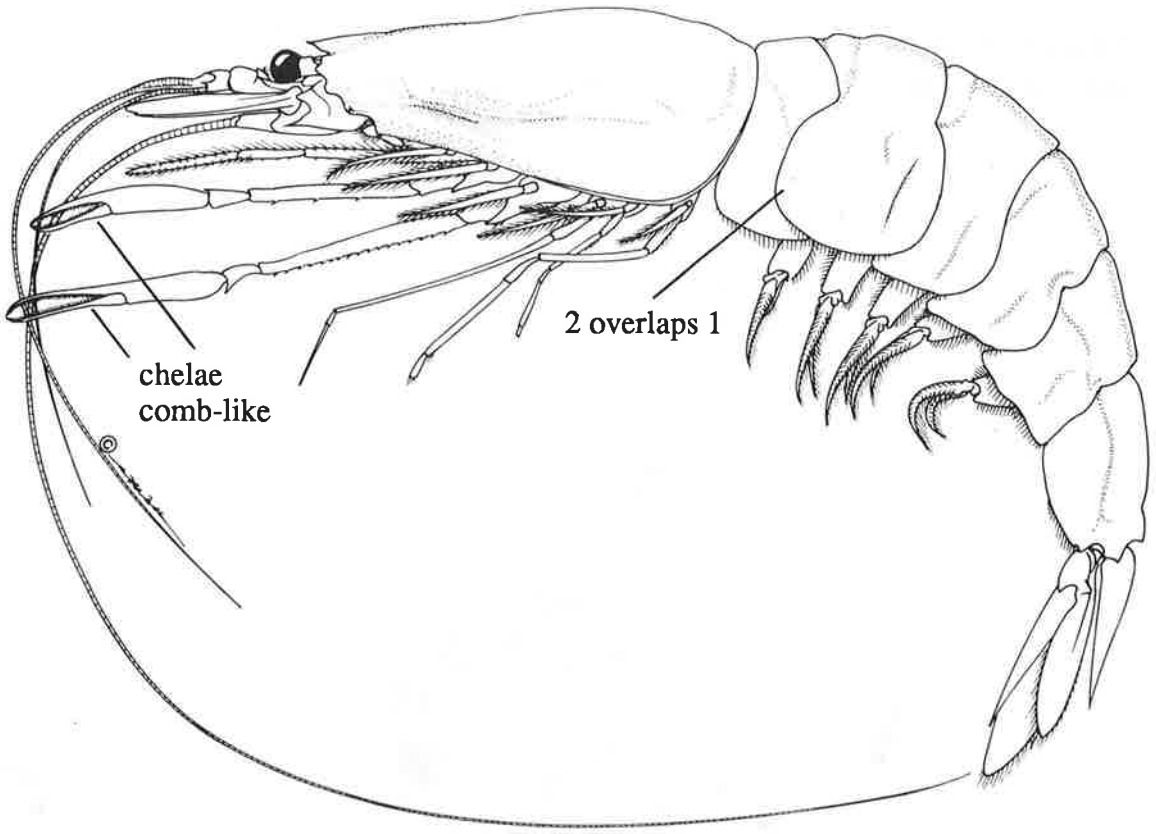
- Typically scarlet to crimson all over

Pasiphaea species (e.g. ***Pasiphaea barnardi***, page 20)

- Chelae on legs 1 & 2 (with comb-like cutting edges)
- Abdominal segment 2 overlaps segment 1


Distribution of
Sergestes species
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Pasiphaea barnardi



KEY FEATURES

- Chelae on legs 1 & 2 (cutting edges comb-like)
- Size
- Abdominal segment 2 overlaps segment 1

COLOUR Red, with pink to colourless abdominal segments

SIZE Up to 160 mm long

HABITAT Trawled 800-1200 m but probably less than 800 m also

DISTRIBUTION New Zealand

COMMENTS Some ***Pasiphaea*** species are called glass shrimps being thin and almost completely transparent (but often with red or orange chromatophores - spots). A few ***Pasiphaea*** species are of minor to moderate commercial importance elsewhere in the world

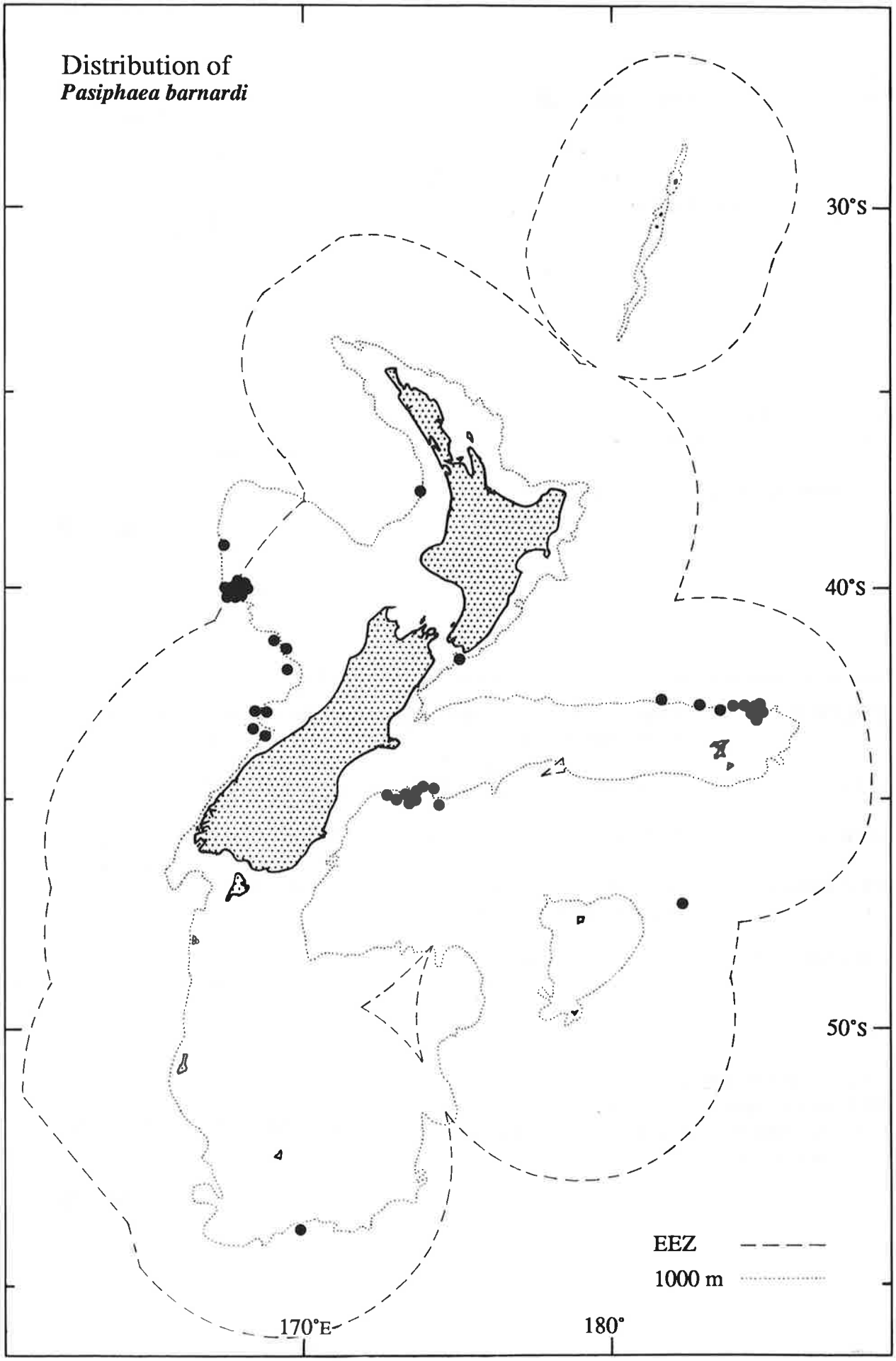
SIMILAR SPECIES

Small specimens of ***Pasiphaea barnardi*** are not distinguishable by eye from some other species of the genus ***Pasiphaea***

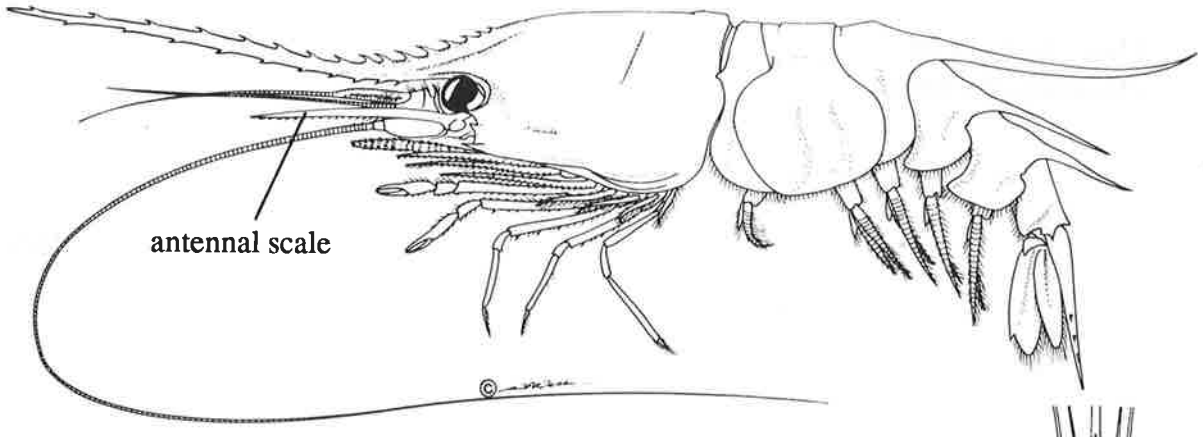
NB: Only specimens approaching the size of the one illustrated should be named ***Pasiphaea barnardi***

Sergia potens (page 16) and ***Sergestes*** species (page 18)

- Chelae (legs 2 & 3) microscopically small
- Abdominal segment 1 overlaps segment 2

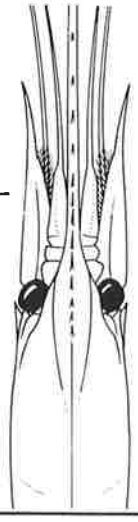

Distribution of
Pasiphaea barnardi
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Oplophorus novaezeelandiae



KEY FEATURES

- Prominent spines on abdominal segments 3-5
- Antennal scale with smooth outer edge (hold prawn up to light).



COLOUR Anterior half of body red, abdomen red striped, rostrum and large spines transparent

SIZE Up to 100 mm long (includes rostrum)

HABITAT Surface - deeper than 730 m

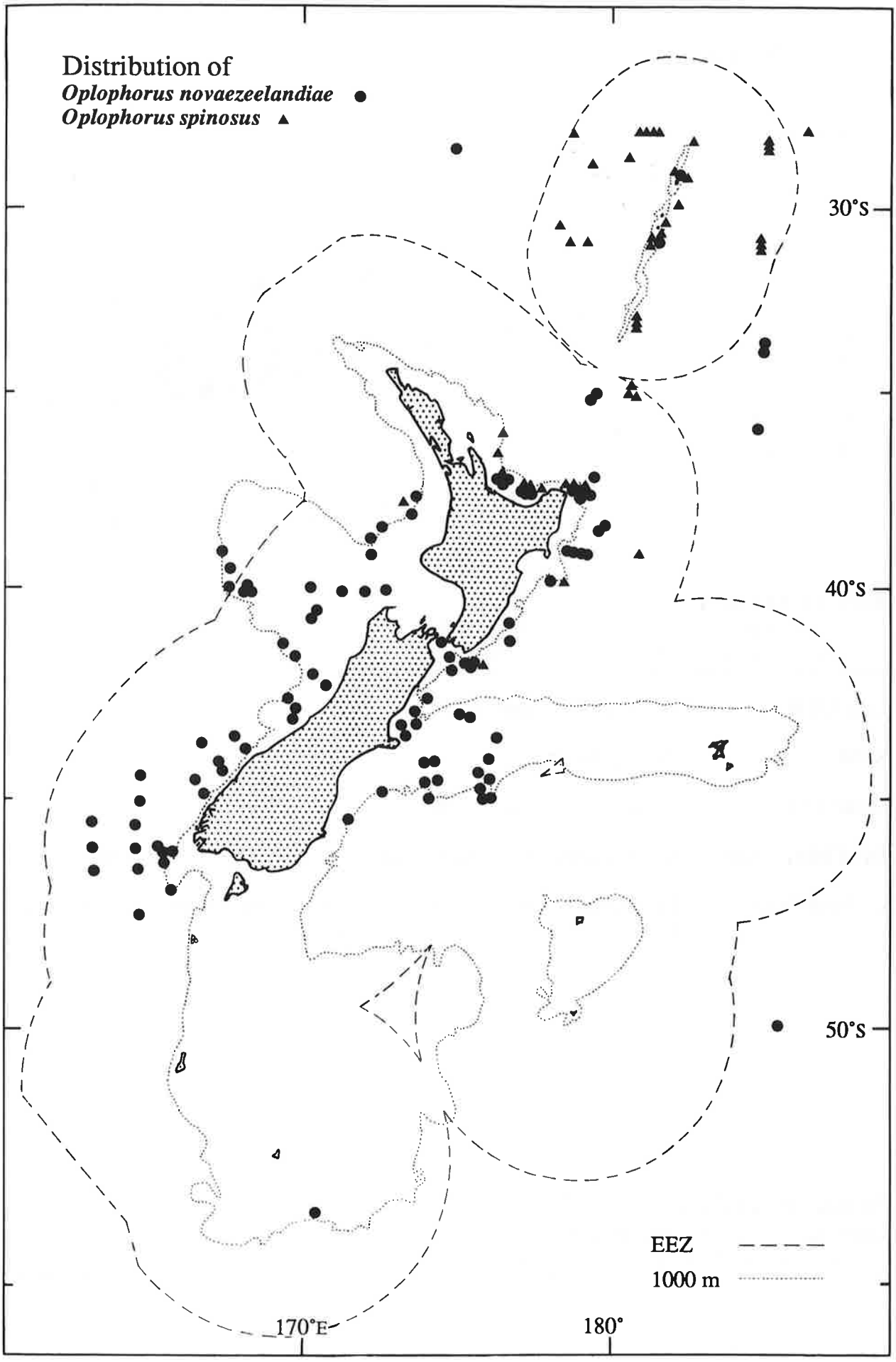
DISTRIBUTION South Atlantic, South Pacific from Chile to Australia, West Australia, New Zealand

COMMENTS Emits clouds of light producing material

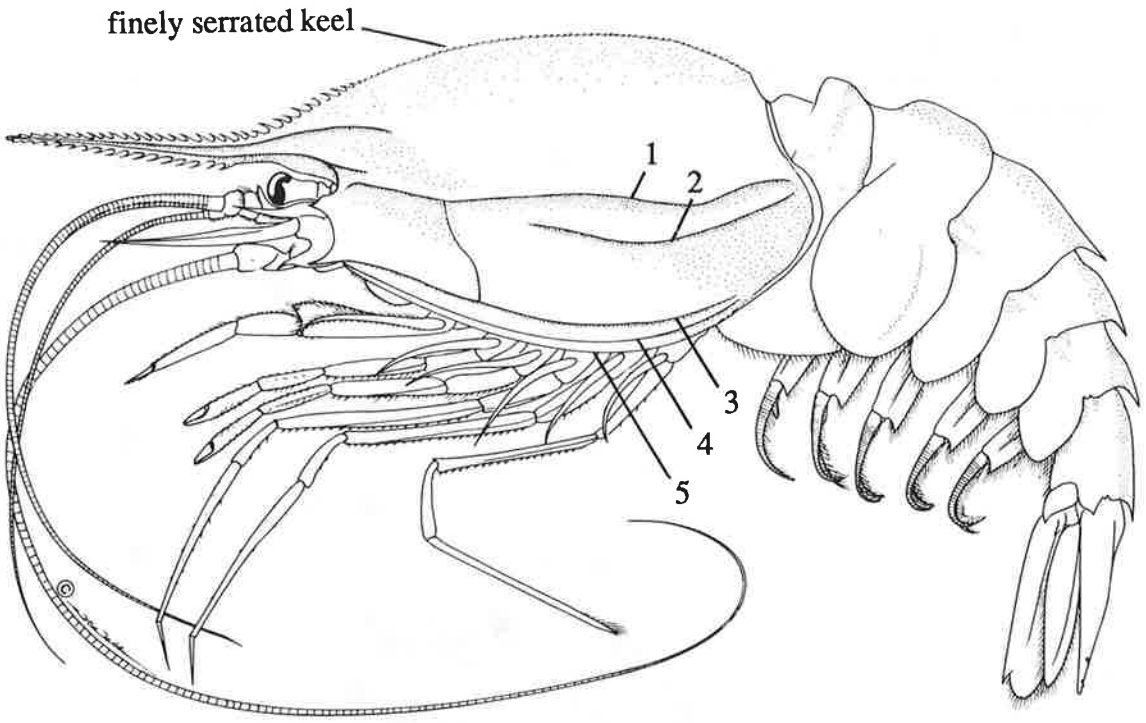
SIMILAR SPECIES

Oplophorus spinosus - very similar

- Small spines on outer edge of antennal scale (one on inner edge)


Distribution of
Oplophorus novaezeelandiae
Oplophorus spinosus
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Notostomus auriculatus



KEY FEATURES
- 5 keels on each side of carapace (numbered)
- Top of carapace a strong keel, finely serrated

COLOUR Scarlet to deep crimson all over

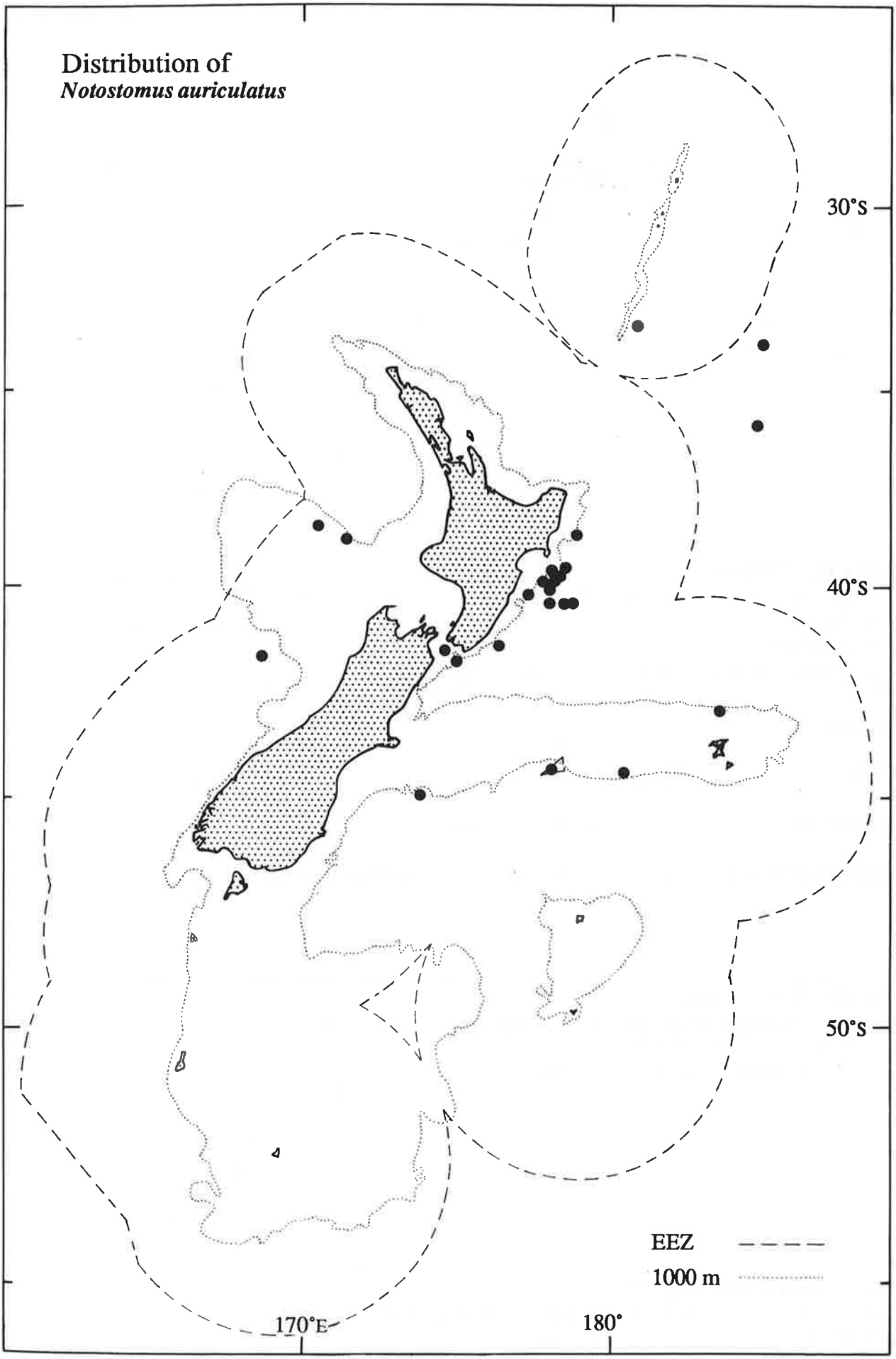
SIZE Up to 150 mm long

HABITAT Surface - deeper than 1200 m

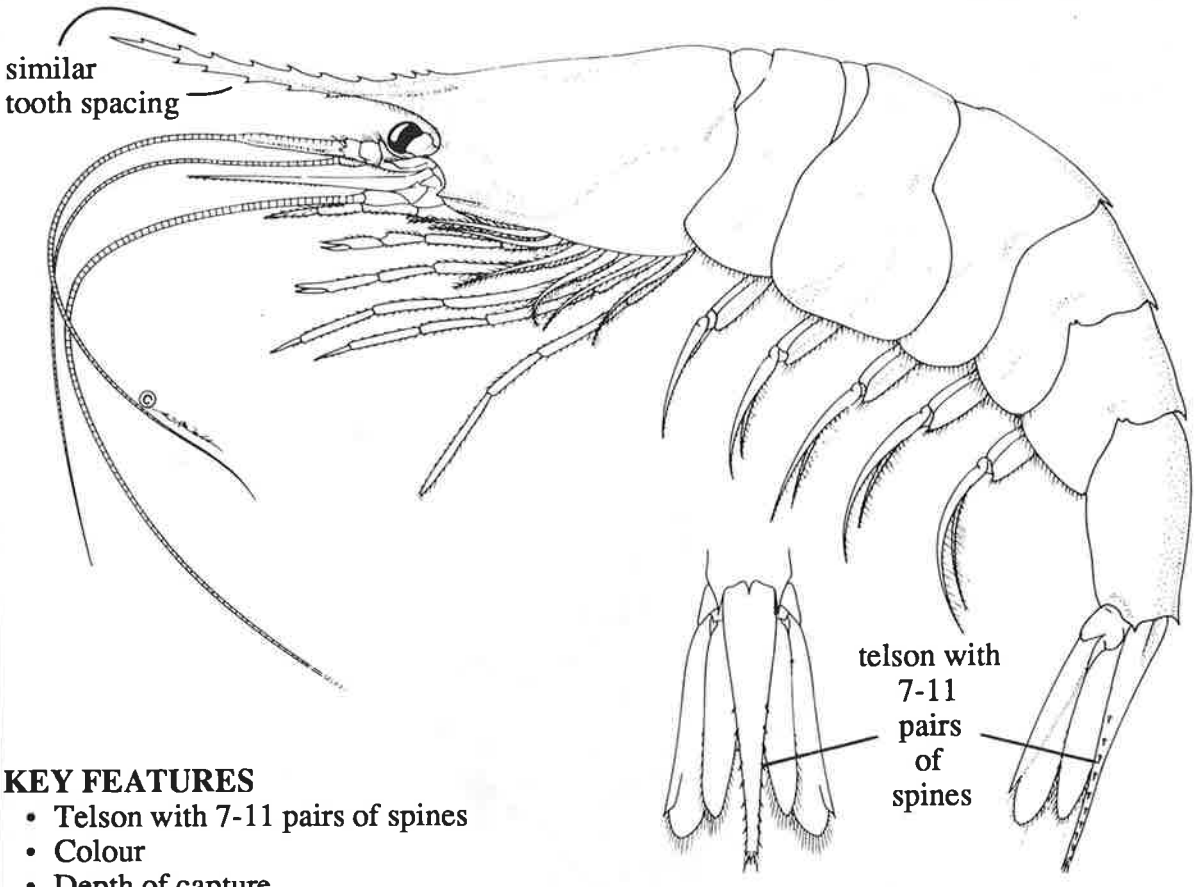
DISTRIBUTION South Atlantic, South Africa, Southern Indian Ocean, New Zealand

COMMENTS The species name of this prawn is not settled and another name may need to be used when its true identity is known

SIMILAR SPECIES
Notostomus species - uncommon
- keels 1, 2 & 3 present, 4 & 5 absent


Distribution of
Notostomus auriculatus
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Acanthephyra pelagica



KEY FEATURES

- Telson with 7-11 pairs of spines
- Colour
- Depth of capture
- Spacing of teeth similar on top and bottom of rostrum

COLOUR Uniformly bright red to scarlet

SIZE Up to 140 mm long

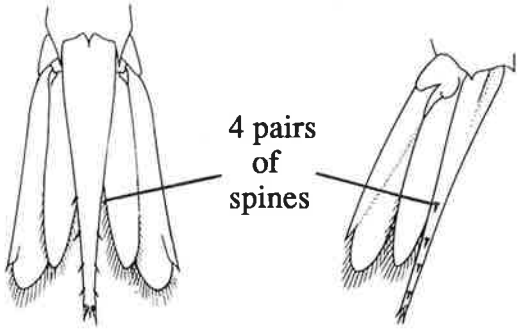
HABITAT 400 - deeper than 2000 m

DISTRIBUTION Very wide - Atlantic, Indian and Pacific Oceans

SIMILAR SPECIES

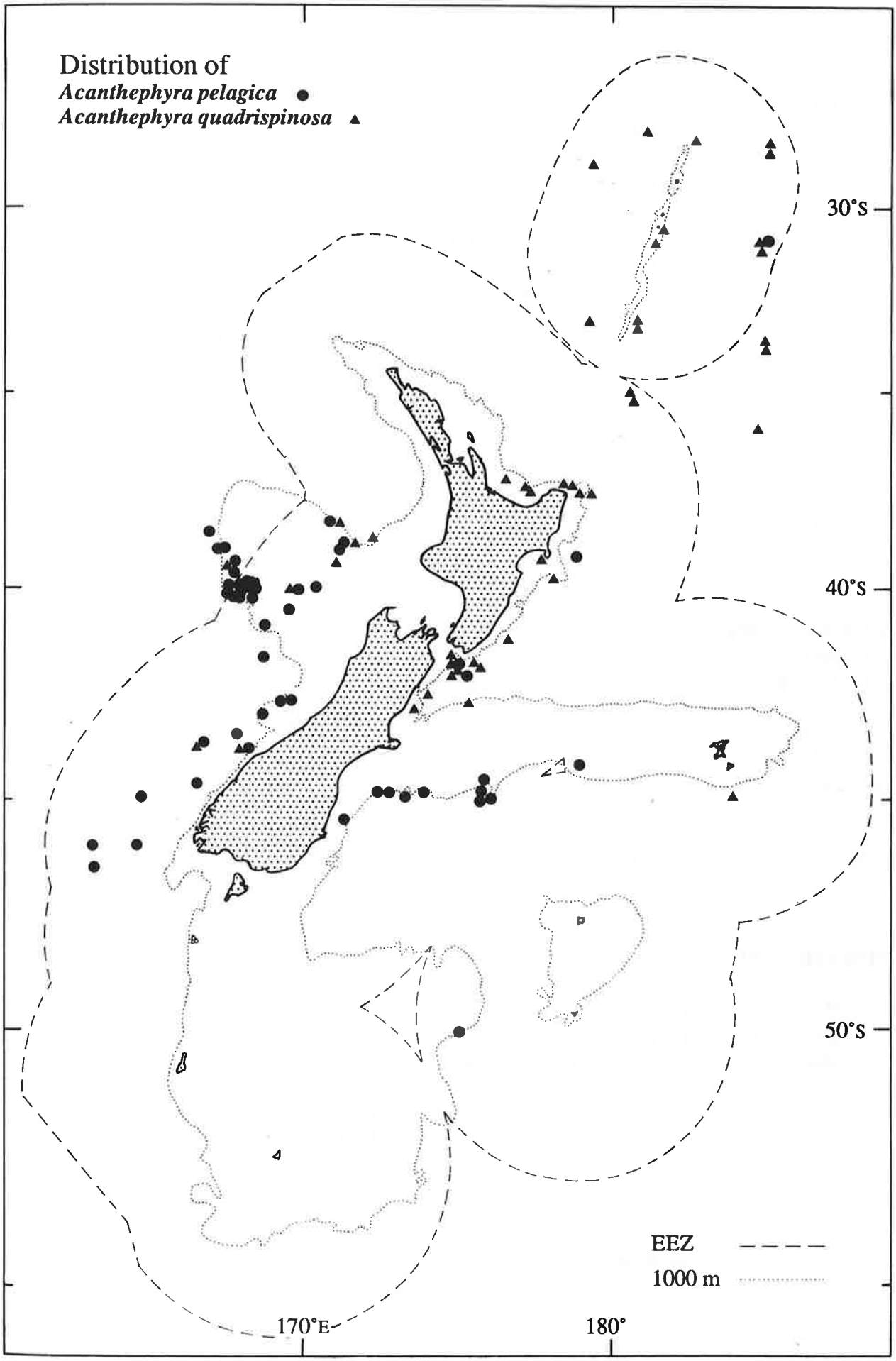
Acanthephyra quadrispinosa - very similar, generally smaller

- Telson with 4 pairs of spines
- Caught between surface and 1100 m

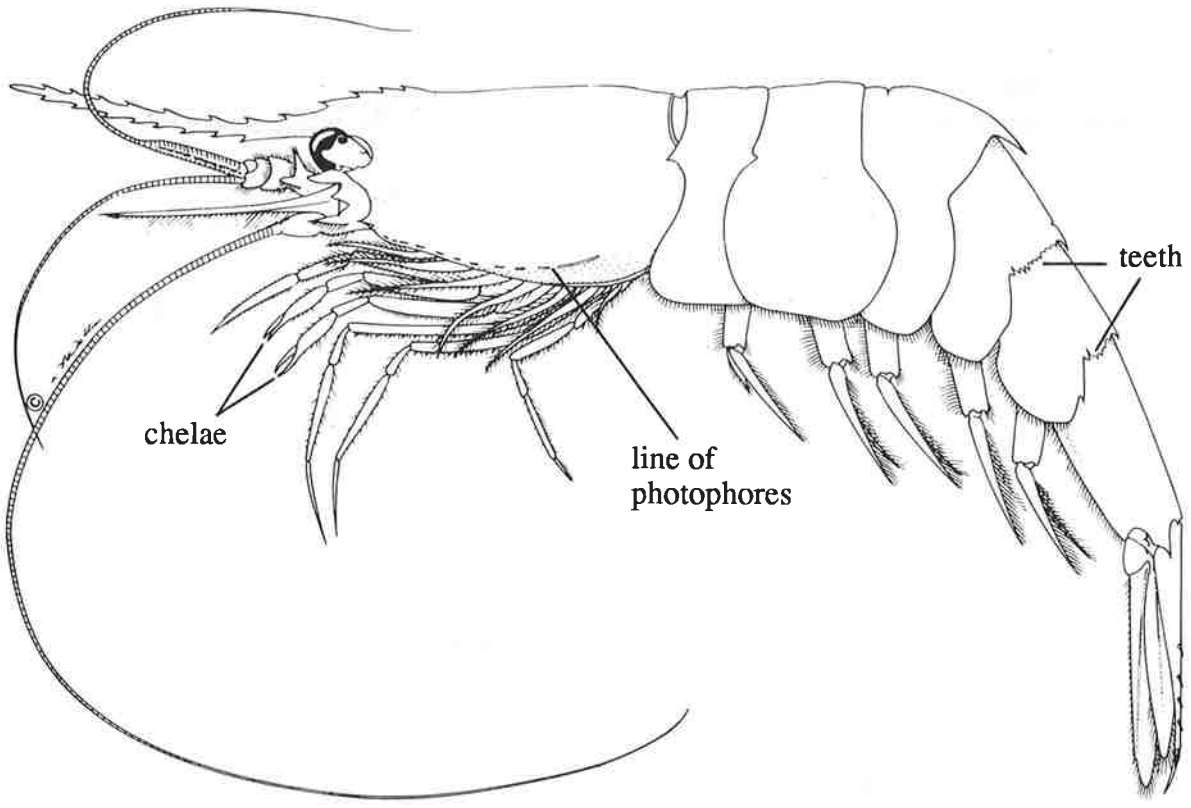


Systellaspis debilis (page 28)

- Lower parts of carapace with a line of photophores
- Partly red partly translucent or colourless


Distribution of
Acanthephyra pelagica
Acanthephyra quadrispinosa
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Systellaspis debilis



KEY FEATURES

- Abdominal segments 4 and 5 with several irregular teeth on each side
- Lower part of carapace with line of photophores
- Rostrum about the same length as carapace (7 or more teeth along bottom of rostrum)
- Chelae on legs 1 & 2

COLOUR Partly red, partly translucent or colourless, with other photophores besides line on carapace

SIZE Up to 75 mm long

HABITAT 50 - 1500 m

DISTRIBUTION Atlantic and Indo-Pacific

SIMILAR SPECIES

Systellaspis pellucida - very similar

- Abdominal segments 4 & 5 with one small tooth on each side

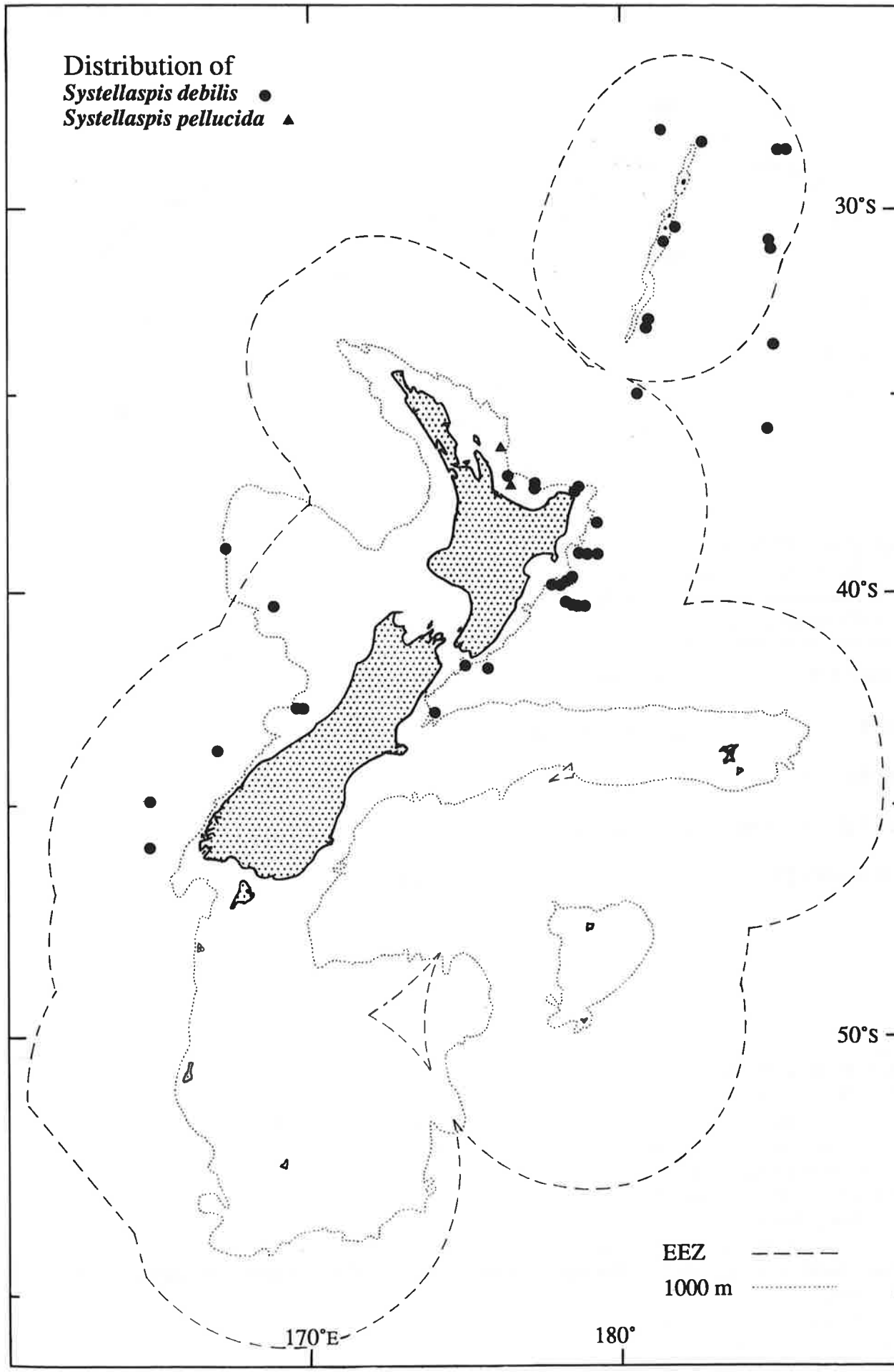
NB: If teeth on abdominal segments can't be seen call the specimen ***Systellaspis*** species

Acanthephyra pelagica (page 26)

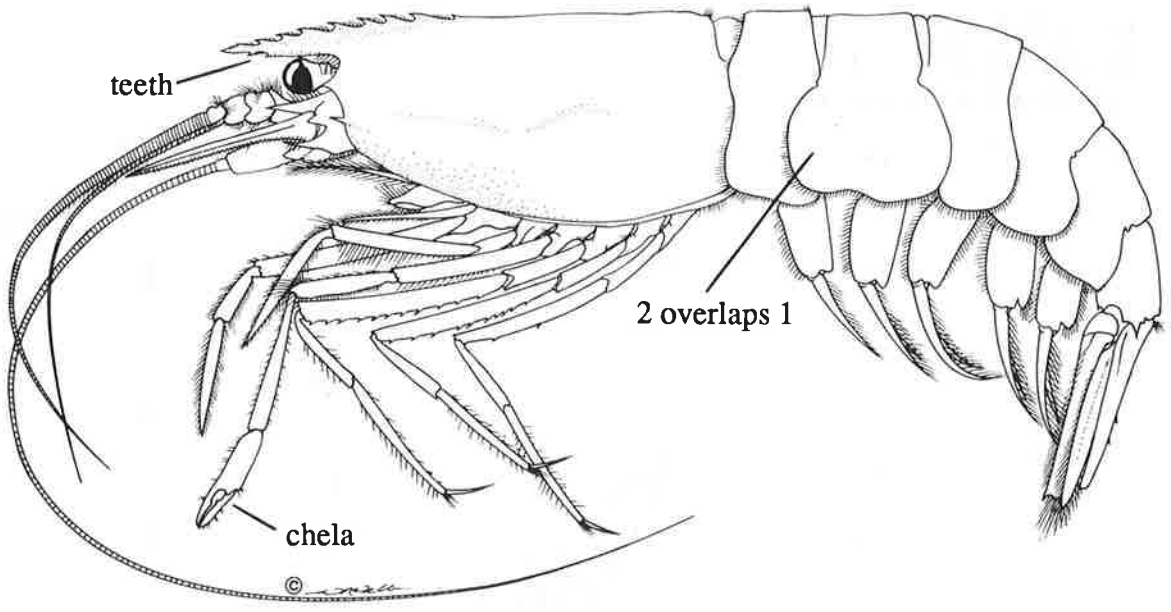
- Uniformly scarlet
- Lacks line of photophores on carapace

Chlorotocus novaezealandiae (page 30)

- Rostrum about length of carapace (5 or less teeth along bottom of rostrum)
- Lacks line of photophores on carapace
- Chela on leg 2 only


Distribution of
Systellaspis debilis
Systellaspis pellucida
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Chlorotocus novaezealandiae



KEY FEATURES

- Rostrum less than length of carapace (5 or less teeth beneath rostrum, usually 2 or 3)
- Abdominal segment 2 overlaps segment 1
- Chela on leg 2 only

COLOUR Transparent with red/pink to yellow/orange markings

SIZE Up to 65 mm long

HABITAT Surface - about 200 m

DISTRIBUTION New Zealand

COMMENTS Occasionally caught in large numbers

SIMILAR SPECIES

Systellaspis debilis (page 28)

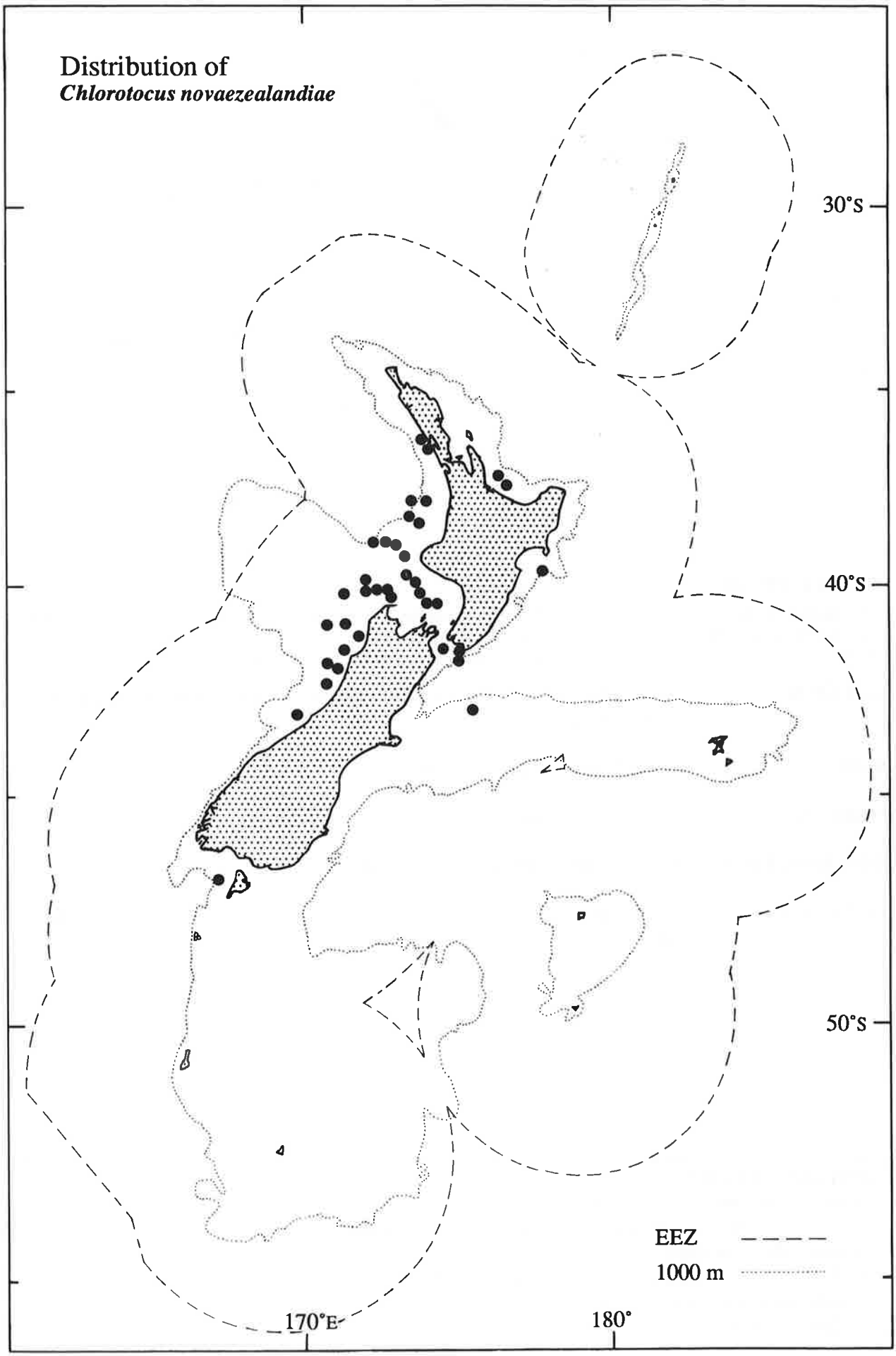
- Rostrum about same length as carapace (7 or more teeth beneath)
- Lower parts of carapace with line of photophores
- Chelae on legs 1 & 2

Funchalia species (page 14)

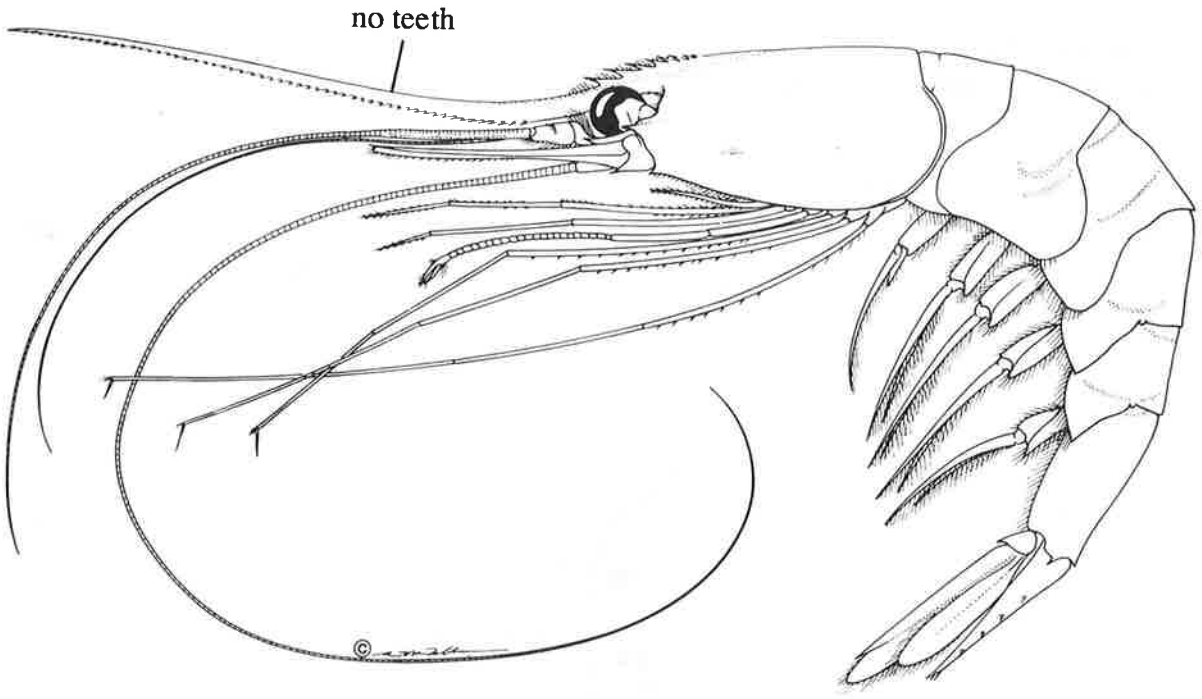
- Body 'hairy'
- No teeth on bottom of rostrum

Funchalia species(page 14), ***Haliporoides sibogae*** (page 10), ***Solenocera novaezealandiae*** (page 12)

- Abdominal segment 1 overlaps segment 2
- Chelae on legs 1-3


Distribution of
Chlorotocus novaezealandiae
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Golden prawn — *Plesionika martia*



KEY FEATURES

- Many small teeth along bottom of rostrum; close-set out to rostrum tip (i.e. not spaced out)
- Teeth absent from top of rostrum except above eye.

COLOUR	Overall translucent to light pink, tip of rostrum red, small red areas on abdomen, telson
SIZE	Up to 170 mm long (includes rostrum)
HABITAT	Over mud bottom 180-2100 m
DISTRIBUTION	Widespread in Atlantic and Indo-Pacific
COMMENTS	Of commercial importance in places, mostly a by-catch of other prawn species

SIMILAR SPECIES

Notopandalus magnoculus (page 34)

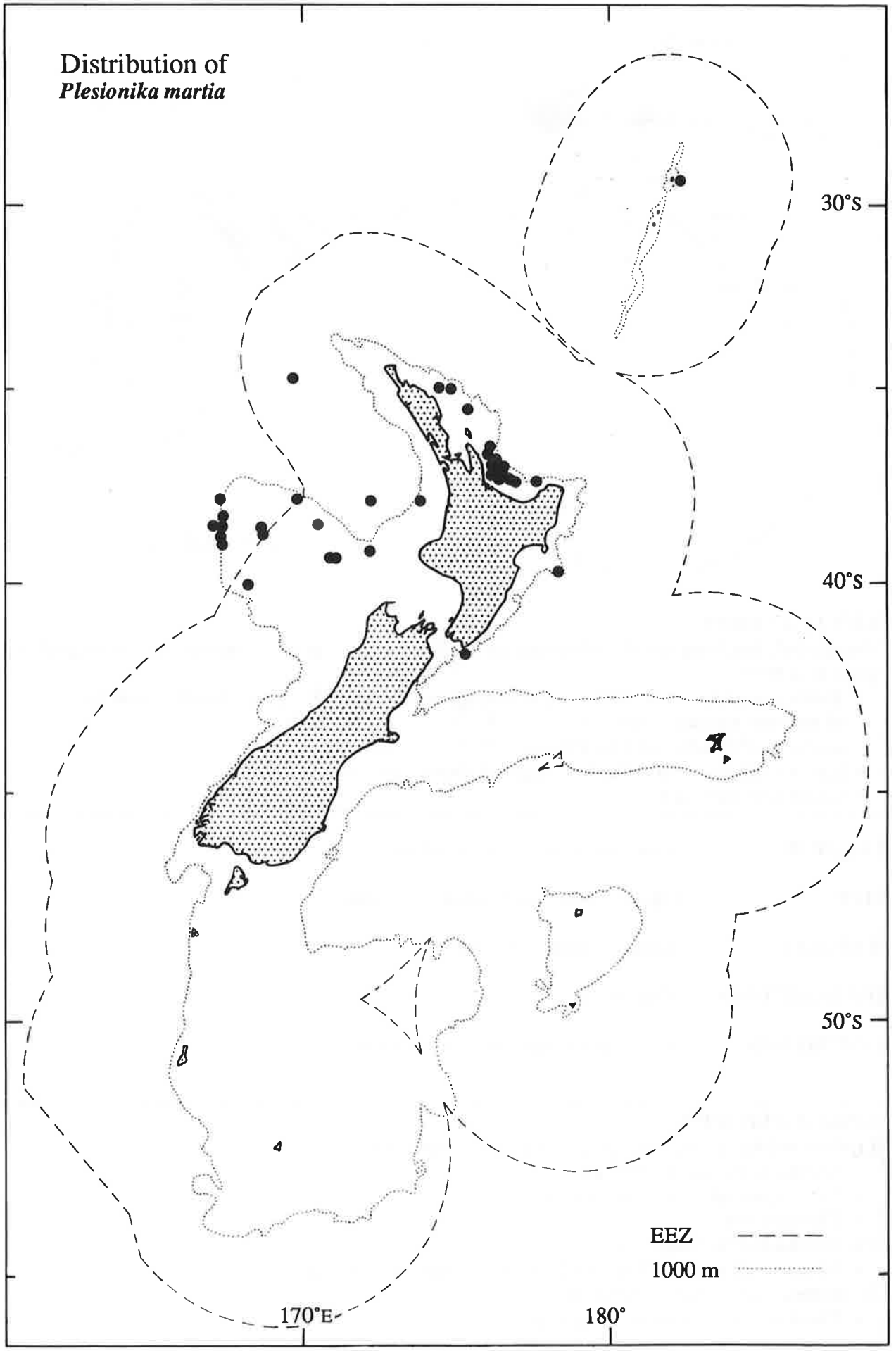
- Teeth on bottom of rostrum spaced out towards rostrum tip

Lipkius holthuisi (page 36)

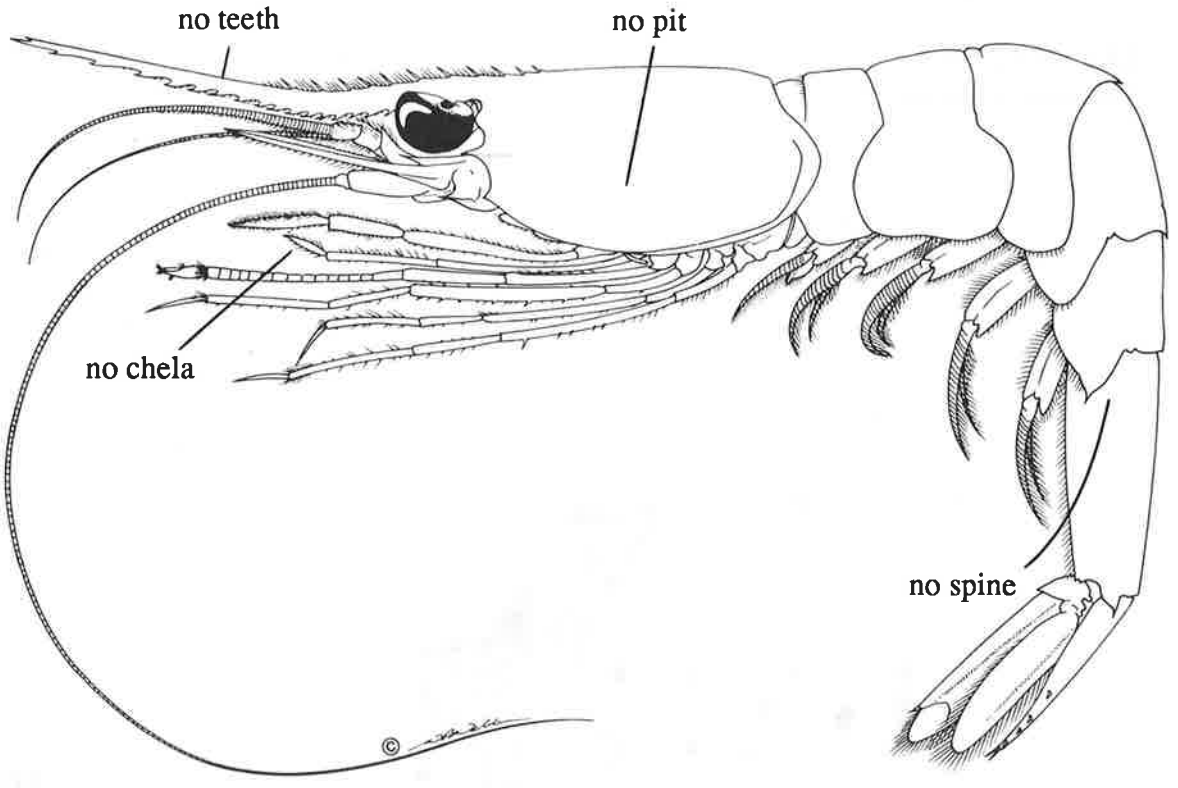
- Teeth on bottom of rostrum spaced out towards rostrum tip

Nematocarcinus species (page 38)

- Teeth on top of rostrum, out to tip


Distribution of
Plesionika martia
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Notopandalus magnoculus



KEY FEATURES

The second, third and fourth differences are difficult to see without a microscope. A magnifying glass may help

- Teeth along bottom of rostrum spaced out towards tip (more than 10 teeth), front part of rostrum top lacks teeth
- Lacks small pit on side of carapace
- Lacks extra spine on posterior border of abdominal segment 5
- Lacks chela on leg 1

COLOUR Transparent with pink to red areas

SIZE Up to 90 mm long (includes rostrum)

HABITAT Surface - deeper than 600 m

DISTRIBUTION New Zealand

COMMENTS Sometimes caught in large numbers

SIMILAR SPECIES

Lipkius holthuisi (page 36) generally larger; deeper water

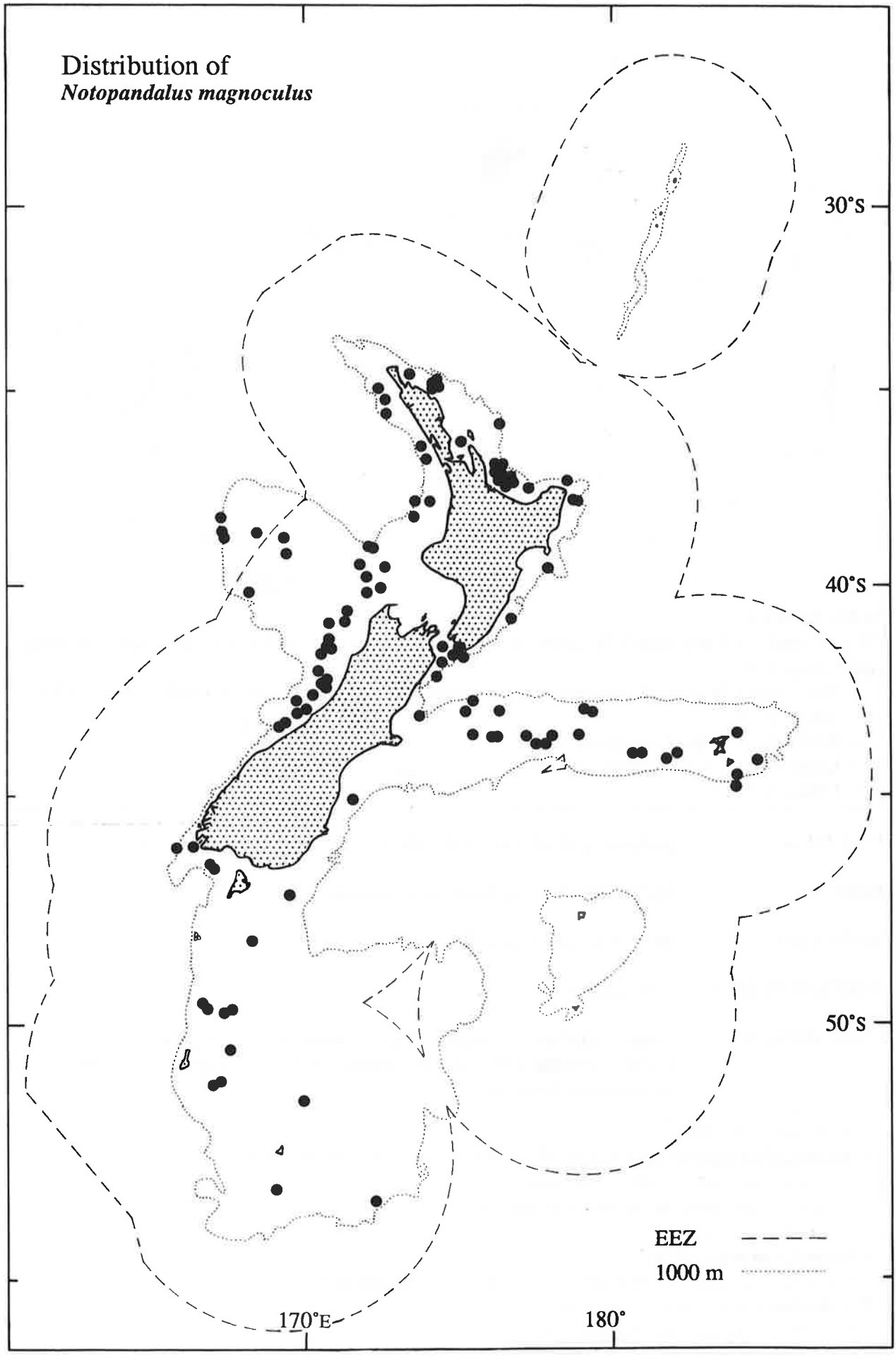
- Small pit on side of carapace
- Extra spine on abdominal segment 5
- Chela on leg 1

Plesionika martia (page 32)

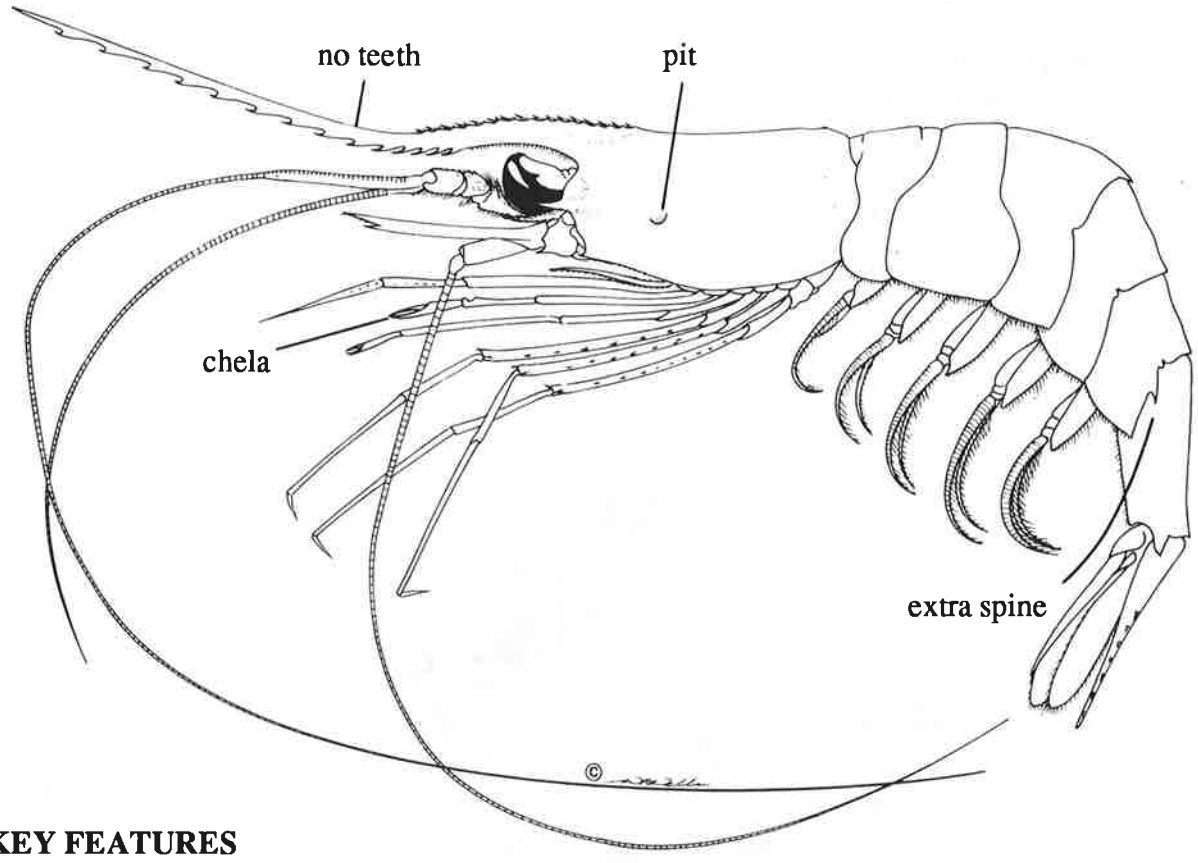
- Many small teeth on bottom of rostrum, close-set out to tip

Nematocarcinus species (page 38)

- Teeth on top of rostrum, out to tip


Distribution of
Notopandalus magnoculus
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Omega prawn — *Lipkius holthuisi*



KEY FEATURES

The second, third and fourth features are difficult to see without a microscope. A magnifying glass may help

- Teeth along bottom of rostrum spread out towards tip (more than 10 teeth), lacks teeth on most of top
- Small pit on side of carapace
- Extra spine on abdominal segment 5
- Chela on leg 1

COLOUR	Anterior half of body red, abdomen partly red, partly colourless
SIZE	Up to 200 mm long (includes rostrum)
HABITAT	600 - 1000 m (mainly 800-1000m)
DISTRIBUTION	New Zealand
COMMENTS	Commercial interest has been taken in this species recently. ***Lipkius holthuisi*** is frequently caught in orange roughy trawls, often with ***Nematocarcinus*** species

SIMILAR SPECIES

Notopandalus magnoculus (page 34) generally smaller; shallower water

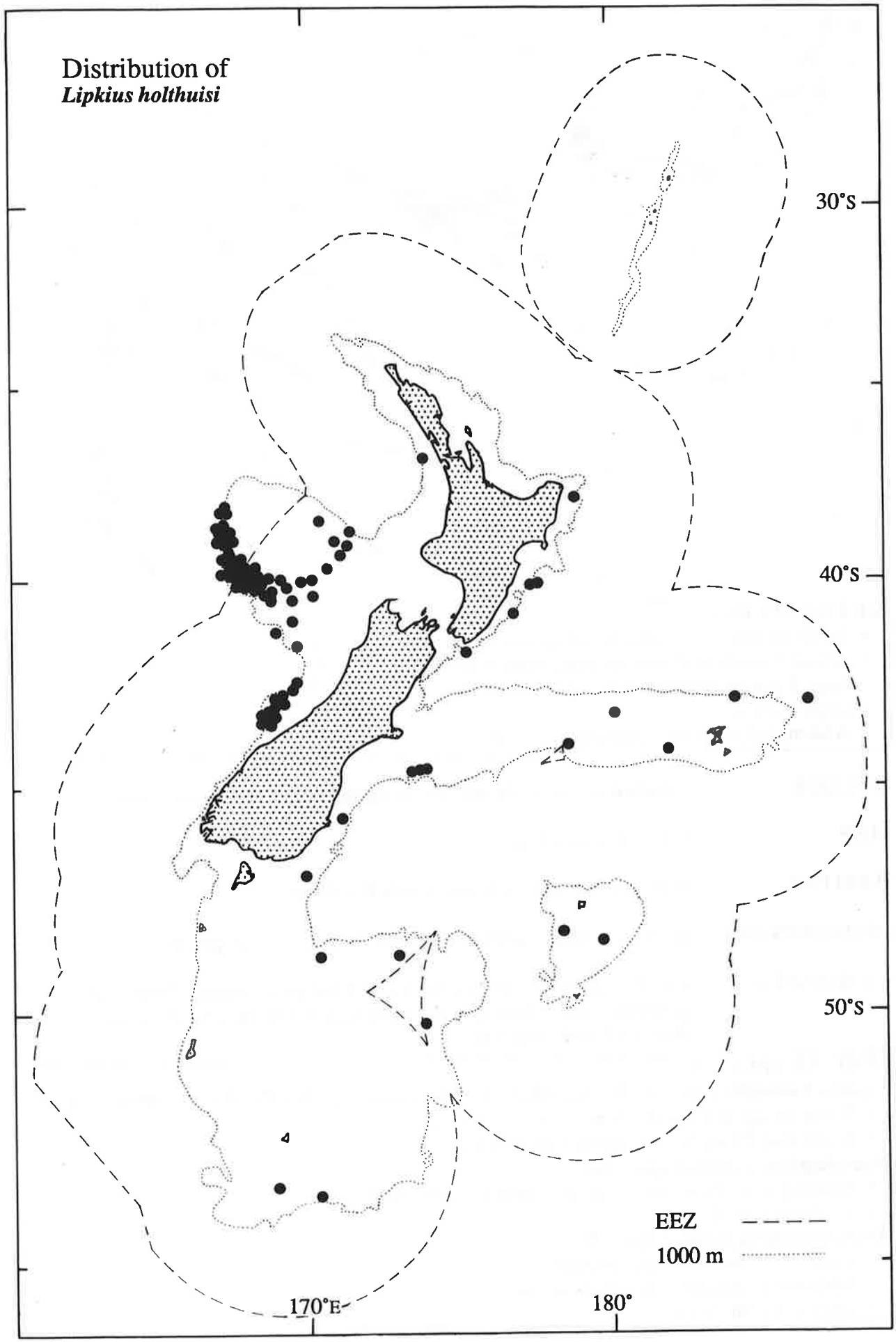
- Lacks small pit on side of carapace
- Lacks extra spine on abdominal segment 5
- Lacks chela on leg 1

Plesionika martia (page 32)

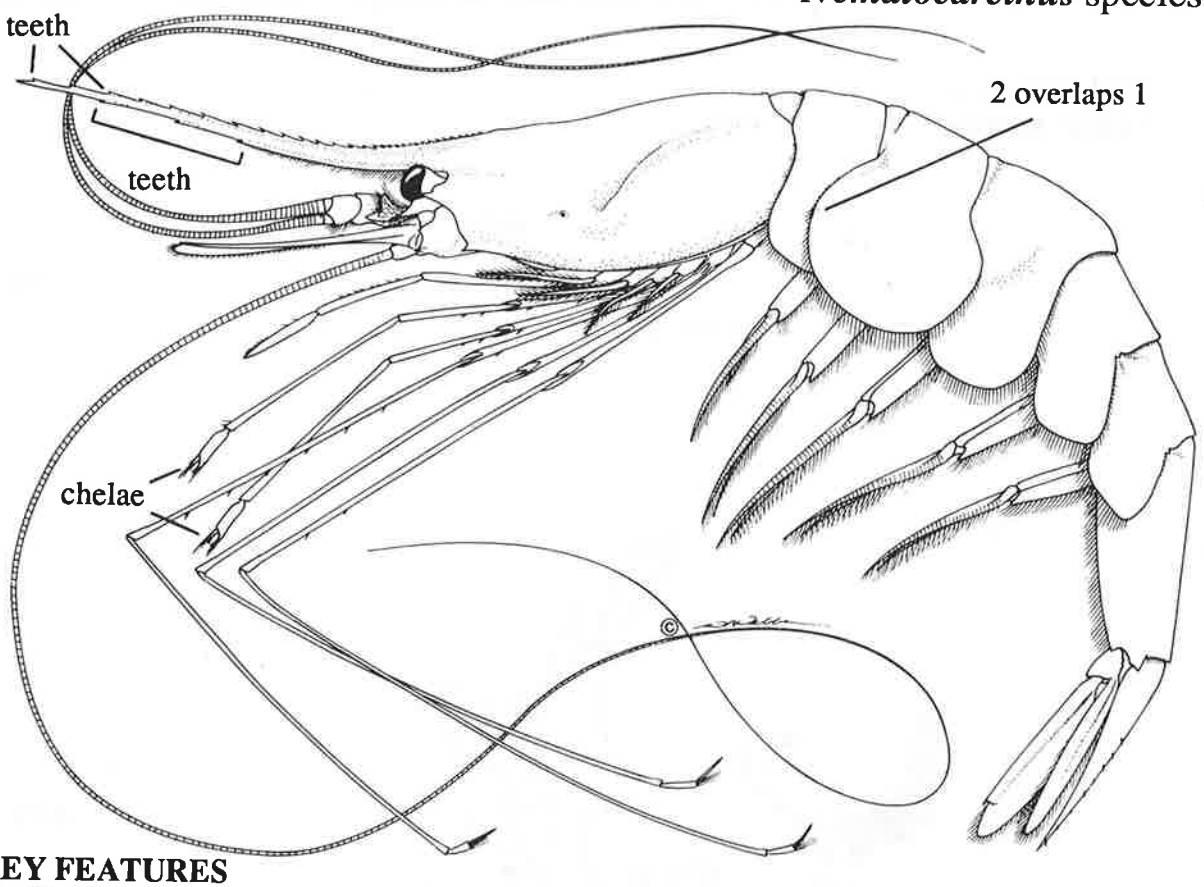
- Many small teeth on bottom of rostrum, close-set out to tip

Nematocarcinus species (page 38)

- Teeth on top of rostrum, out to tip


Distribution of
Lipkius holthuisi
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Nematocarcinus species



KEY FEATURES

- Teeth on top of rostrum extending out to tip
- About 3 small teeth spaced along bottom of rostrum
- Legs 3-5 very long (but usually broken off)
- Legs 1-2 with chelae
- Abdominal segment 2 overlaps segment 1

COLOUR Anterior half of body red, abdomen partly red, partly colourless

SIZE Up to 170 mm long

HABITAT 800 - deeper than 1200 m (most 900-1100 m)

DISTRIBUTION Atlantic & Indo-Pacific, deepwater tropical and temperate

COMMENTS Usually caught in New Zealand with ***Lipkius holthuisi.*** There are probably two or more species in our waters but they have not been identified with certainty

SIMILAR SPECIES

Lipkius holthuisi (page 36), ***Notopandalus magnoculus*** (page 34), ***Plesionika martia*** (page 32)

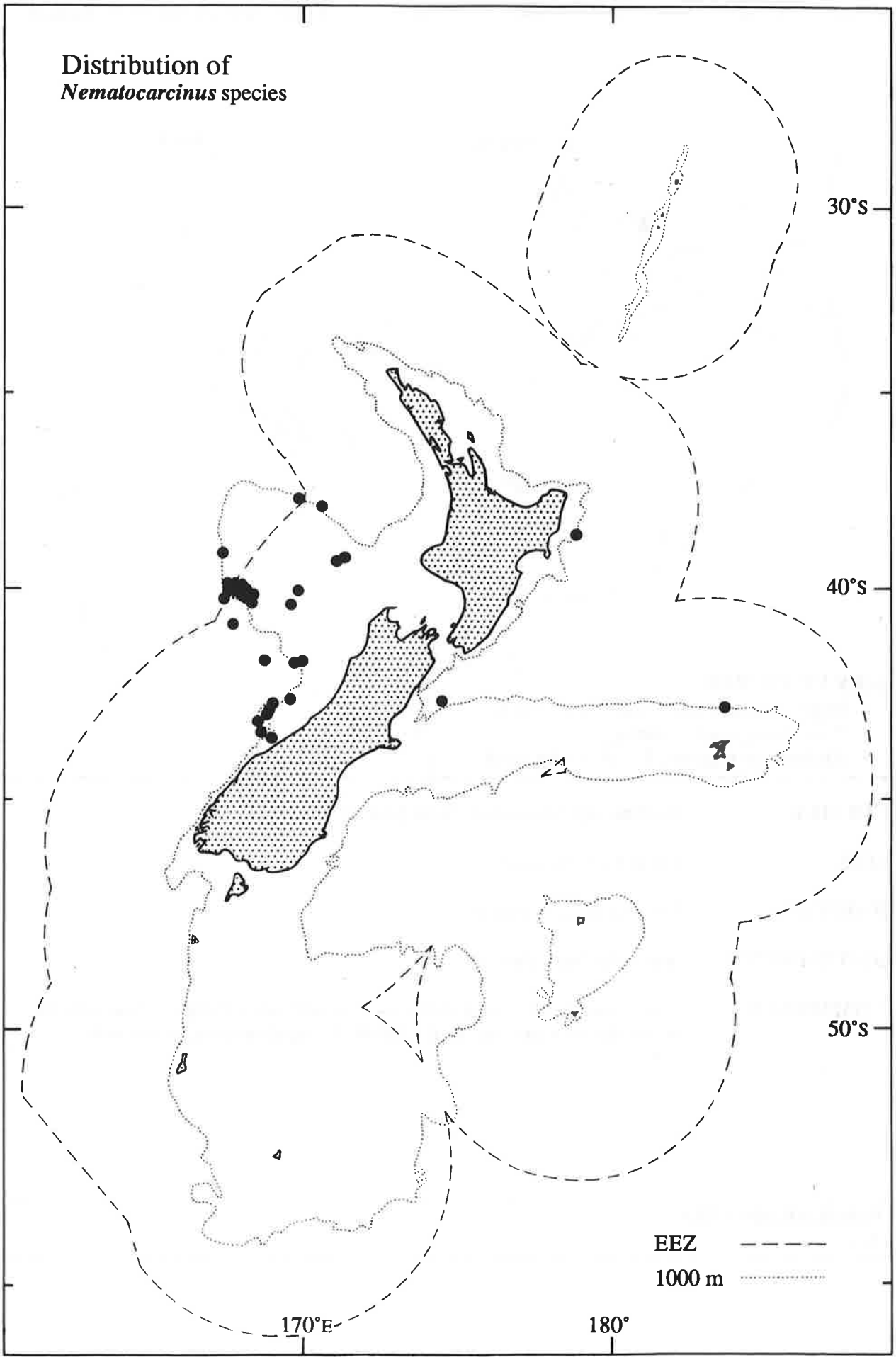
- Teeth on top of rostrum do not extend out to tip
- More than 10 teeth along bottom of rostrum

Acanthephyra pelagica (page 26)

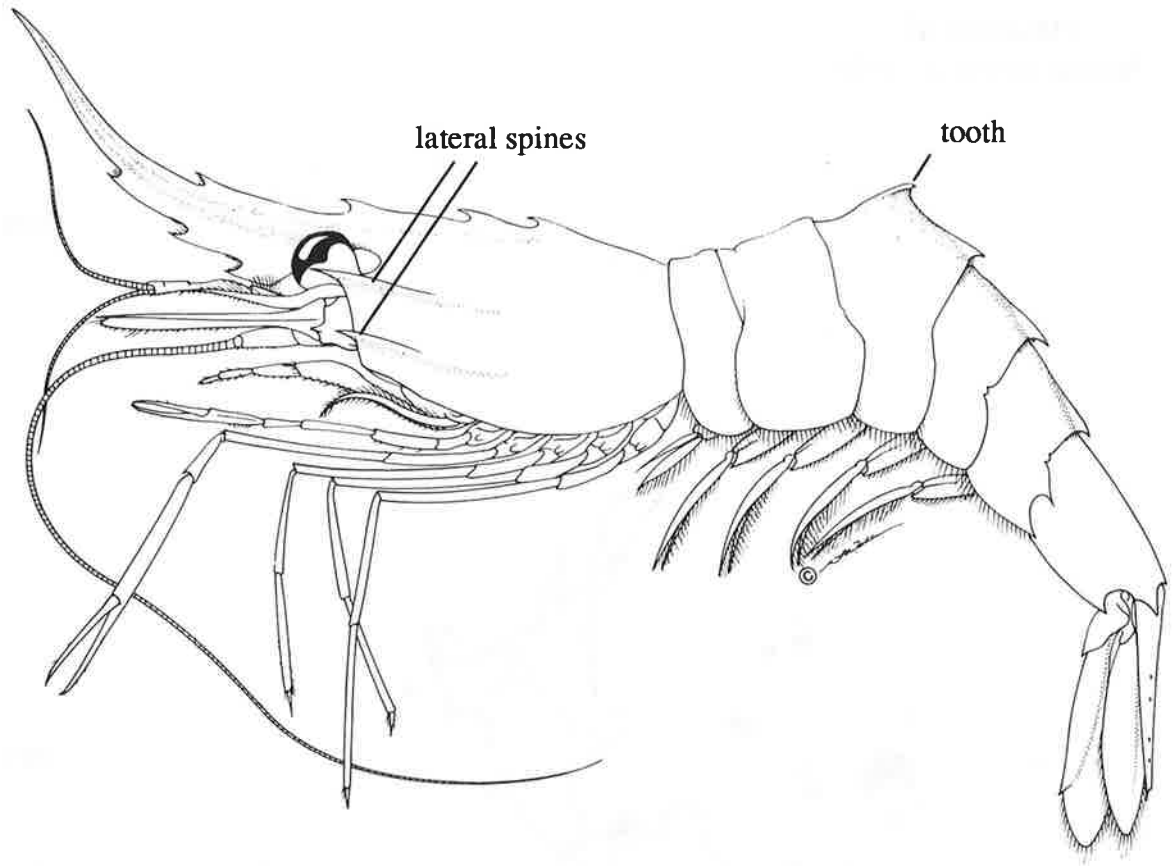
- Spacing of teeth similar on top and bottom of rostrum
- Uniformly scarlet

Aristaeomorpha foliacea (page 8)

- Lacks teeth on bottom of rostrum
- Abdominal segment 1 overlaps segment 2
- Legs 1-3 with chelae


Distribution of
Nematocarcinus species
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

Sabre prawn — *Campylonotus rathbunae*



KEY FEATURES

- Rigid carapace and blade-like rostrum
- Two strong lateral spines
- Abdominal segment 3 with strong tooth

COLOUR Rostrum tip orange/red, body pink to yellow/orange

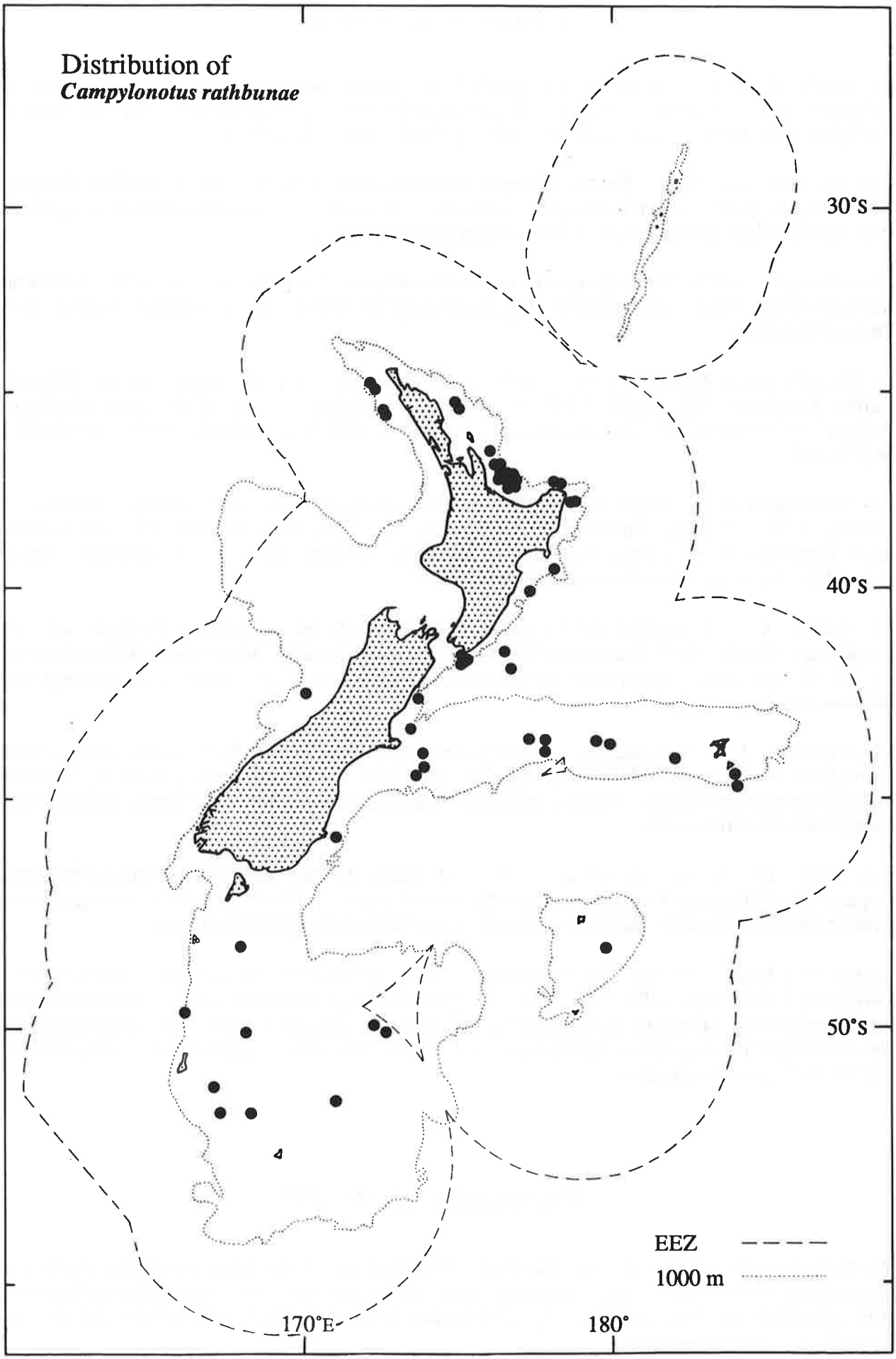
SIZE Up to 150 mm long

HABITAT On bottom, 270-650 m

DISTRIBUTION Australia, New Zealand

COMMENTS This prawn is obviously different from any other New Zealand species being the only member of the family Campylonotidae in our waters

SIMILAR SPECIES
None


Distribution of
Campylonotus rathbunae
30°S
40°S
50°S
170°E
180°
EEZ
1000 m

FURTHER READING

To compile this guide it has been necessary to refer to a number of publications. For those interested in finding out more about New Zealand shrimps and prawns and their relationships to those in foreign waters, an annotated list of the more important of these papers follows:

R.N. Burukovskii, (1983). **Key to Shrimps and Lobsters.** A.A. Balkema/Rotterdam. Russian Translation Series 5. (An up to date and comprehensive work on the classification of decapods in general with illustrated keys to families, genera and some species)

Brian Kensley, (1972). **Shrimps and Prawns of Southern Africa.** Trustees of the South African Museum, Cape Town. (An illustrated key identifying 223 species, some of which occur in New Zealand waters)

A. Crosnier and J. Forest, (1973). Les Crevettes Profundes de l'Atlantique Oriental Tropical. **Faune Tropicale** XIX ORSTOM Paris. (Review of offshore shrimps and prawns of eastern Atlantic, in French but with keys and good illustrations and widely applicable to shrimps and prawns in general)

L.R. Richardson & J.C. Yaldwyn, (1958). A guide to the natant decapod Crustacea (shrimps and prawns) of New Zealand. **Tuatara** 7(1): 17-41. 50 figs. (The most comprehensive and authoritative guide to date, gives keys to all species known to that time and illustrates carapace of most. A number of new species have been recorded since)

J.C. Yaldwyn, (1957). Deep-water Crustacea of the Genus ***Sergestes*** (Decapoda, Natantia) from Cook Strait, New Zealand. **Zoological Publications from Victoria University of Wellington** No. 22: 22-27. (Describes two species of ***Sergestes*** and two species of ***Sergia*** including ***Sergestes arcticus*** and ***Sergia potens***)

J.C. Yaldwyn, (1960). Crustacea Decapoda Natantia from the Chatham Rise: a deep water bottom fauna from New Zealand. **NZDSIR Bulletin** 139: 13-53, 10 figs. (Seven species described or redescribed with detailed illustrations, including ***Notopandalus magnoculus, Lipkius holthuisi*** and ***Campylonotus rathbunae***)

D.L. Grey, W. Dall and A. Baker, (1983). **A Guide to the Australian Penaeid Prawns.** Department of Primary Production of the Northern Territory. (Includes colour photographs of ***Aristaeomorpha foliacea, Plesiopenaeus edwardsianus*** and ***Haliporoides sibogae***)

Fenner A. Chace Jr, (1986). The Carridean Shrimps (Crustacea: Decapoda) of the Albatross Phillipine Expedition, 1907-1910, Part 4: Families Oplophoridae and Nematocarcinidae. **Smithsonian Contributions to Zoology** No 432. (Reviews and gives keys to the genera and some species of these two families which include the species in this guide on pages 22-29 (Oplophoridae) and 36-39 (Nematocarcinidae))

ACKNOWLEDGMENTS

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