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Investigational Report No. 60

The Penaeoidea of southeast Africa. V – The Family Sicyoniidae.

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A.J. de Freitas

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Published by
THE OCEANOGRAPHIC RESEARCH INSTITUTE
P.O. BOX 10712, MARINE PARADE
DURBAN, 4056
SOUTH AFRICA
March 1984

ISBN 0 86989 036 0

THE PENAEOIDEA OF SOUTHEAST AFRICA
V. The Family SICYONIIDAE

by
ANTÓNIO J. DE FREITAS

ABSTRACT

This is the fifth and final monograph of this series on the Penaeoidea of southeast Africa and deals with a single family, the Sicyoniidae. Only two species have so far been found in the study area, namely *Sicyonia lancifera* and *S. longicauda*. Both these species are fully described and illustrated.

INTRODUCTION

The family Sicyoniidae is a penaeoid family composed only of the genus *Sicyonia*. Milne-Edwards and Bouvier (1909) considered this family to be more closely related to the Aristeidae than to the Penaeidae. However, Burkenroad (1934a) stated that the Sicyoniidae were "... very closely related to the Penaeinae (sic), with which they form a group, set off, especially by the developmental history, from Aristeinae and Solenocerinae (sic)".

This monograph constitutes the fifth and final part of a series on the penaeoids of southeast Africa and the material formed part of a thesis presented to the University of the Witwatersrand for the degree of Doctor of Philosophy.

FAMILY SICYONIIDAE ORTMAN, 1890

The characteristics of this family are those of the single genus *Sicyonia*.

During larval development, pleurobranchs are normally the last to appear (Burkenroad 1934a). In both the Penaeidae and Sicyoniidae, postmysis larvae do not posses pleurobranchs and the larvae of these two families are indistinguishable. During the course of subsequent development, the penaeids add pleurobranchs to the second and third maxilliped somites (somites VIII and IX) as well as to, at least, the somites of the first three pereiopods (somite X to XIII). On the other hand, the Sicyoniidae do not develop pleurobranchs on any of the somites behind that of the third maxilliped (somite IX).

This is but one of the developmental characteristics which indicate that the Sicyoniidae are the most evolutionary advanced of the Penaeoidea.

Genus *Sicyonia* Milne-Edwards, 1837

Sicyonia Milne Edwards, 1937: 405; Bate, 1888: 292; Milne Edwards & Bouvier, 1909: 243; De Man, 1911: 111; Holthuis, 1952: 339: Hall, 1956: 70.

Eusicyonia Stebbing, 1914: 25; Burkenroad, 1934a: 70; Burkenroad, 1934b: 116; Kubo, 1949: 437; Barnard, 1950: 635.

The genus *Sicyonia* was established by Milne-Edwards in 1830 to accommodate three species, namely *S. carinata, S. sculpta* and *S. lancifera.* Stebbing (1914) considered the generic name *Sicyonia* as being preoccupied and renamed it *Eusicyonia.* However, the name *Sicyonia* was finally revalidated through a proposal by Holthuis (1952).

The genus comprises small animals with stongly sclerotinized integument; rostrum always short with one or two ventral teeth; dorsal teeth often extend to posterior margin of carapace; carapace and all abdominal segments dorsally carinated; well developed hepatic spine always present; telson bears pair of fixed subterminal lateral spines; prosartema rudimentary and pleurobranchiae present only on second and third maxillipeds; podobranchs only on second maxilliped; expopodites absent from second maxilliped to fifth pereiopods inclusive; pleopods without endopodites, except first two pleopods of male.

There are about 26 species in this genus of which 16 have been found in the Indo-west Pacific region. So far only two species, *S. lancifera* and *S. longicauda* have been recorded from south-east African waters. Although Kensley (1980) states that a third species *S. truncata* is found in Natal waters, I can find no record of this species within the study area. It has, however, been collected from south of the Kei River (Barnard 1950).

Sicyonia lancifera (Olivier, 1811)

(Fig. V-1)

Palaemon lancifer Olivier, 1811: 664.
Sicyonia lancifer Milne-Edwards, 1837: 410; Bate, 1881: 172; Bate, 1888: 297; Lanchester, 1901: 573; Borradaile, 1910: 259; De Man, 1911: 123; Hall, 1962: 37; Kenlsey, 1972: 24 (in key); Starobogatov, 1972: 377, 404.
Eusicyonia lancifer Burkenroad, 1934b: 71; Barnard, 1950: 821.
Eusicyonia lancifer japonica Kubo, 1949: 440.

Material examined

Mozambique: Sofala Bank (50 m), 3♂♂, 17.6-19.6 mm; Bazaruto (25m), 1♀, 16.8 mm.

Description

Rostrum: Straight to slightly upward curved, reaching distal end of second antennular article, although in some specimens may reach only as far as proximal end of this article; rostral formula 10/1; six teeth on postrostral carina behind orbital margin; adrostral sulcus absent; postrostral carina forms high crest with six widely based teeth; no median sulcus.

Carapace: Uniformly pubescent; postocular sulcus limited to somewhat indistinct pit; none of the usual sulci nor carinae present, although surface very uneven with several shallow depressions especially on gastric and cardiac regions; antennal margin broadly rounded; no antennal spine; hepatic spine long and sharp; region behind hepatic spine distinctly swollen; no branchiostegal nor orbital spines; pterygostomian angle broadly rounded bearing no spine but possessing, subterminally, tuft of long hairs; submarginal carina well developed, following ventral margin for about two-third its length.

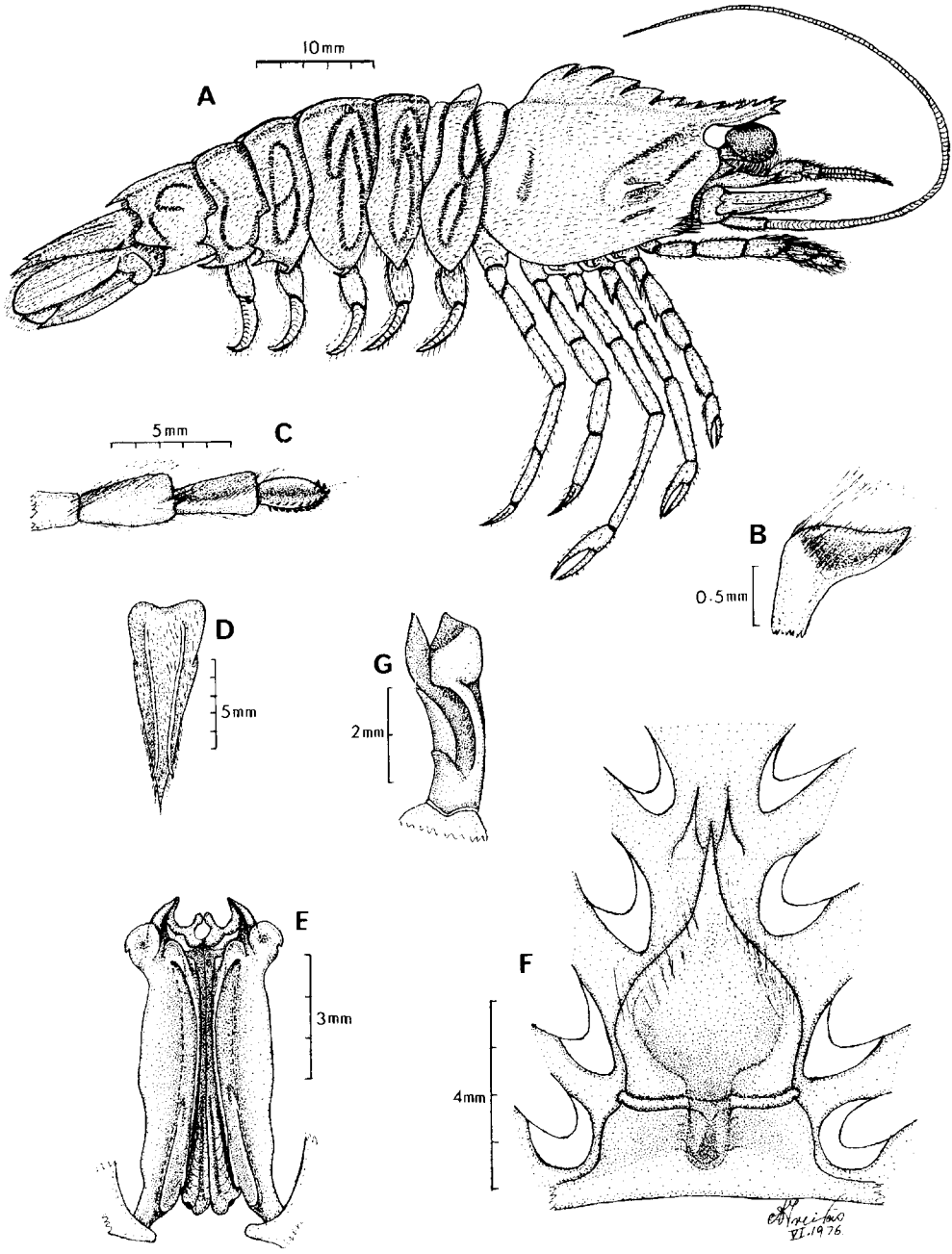

Fig. V-1: *Sicyonia lancifera* Milne-Edwards: A. Whole animal: B. Prosartema; C. Maxilliped III; D. Telson; E. Petasma; F. Thelycum; G. Appendix masculina.

Antennules: Lateral flagella slightly broader distally than proximally; slightly longer than mesial flagella; mesial flagella taper off to fine filament distally; lateral flagella slightly shorter than first antennular article; prosartema extremely small and scale-like; outer face convex, apex pointed; upper surface and apex possess long thin setae; stylocerite long and broad ending in sharp upwardly directed spine, reaching base of distolateral spine of basal antennular article; distolateral spine sharp, extends to about middle of second antennular article; no parapenaeid spine.

Scaphocerite: Distolateral spine reaching distal end of third antennular article; lamella apex not extended beyond distolateral spine; basicerite bispinose; lower spine being longer of two.

Madibular palp: Reaching about half into carpocerite, proximal article subquadrate; as long as wide; concave area in centre of ventral surface; inner half and margin setose; distal article 1.5 times length of proximal article; as long as wide; apex broadly rounded; outer half of ventral surface concave; surface setose; row of long setae down centre projecting forward in thin tuft.

Maxilliped III: Endopodite reaching beyond antennular peduncle by dactylus; no sexual dimorphism; last three articles significantly dorsoventrally depressed; endopodite generally much thicker than any pereiopod; no expopodites; no epipodites.

Pereiopods: Exopodites absent from all pereiopods; epipodites present on first three pairs; basipodites of first three pairs and ischiopodite of first pair, bear well developed spines; pair of ventrally directed long spines arising from sternite between first and second pairs; male possesses structure similar to female genitalia, between fourth and fifth pereiopods; sternal spine of fourth thoracic segment much longer and narrower than in female, extends forward into third segment almost obscuring third sternal spine. Pereiopod V reaching distal end of second antennular article. Pereiopod IV reaching end of first antennular article. Extended laterally, lengths of pereipods in ascending order are: first, fourth, second, fifth and third.

Abdomen: Uniformly pubescent; dorsally carinated on all segments; dorsal carina of first segment projected forward as tooth-like process; carinae clefted posteriorly; all carinae with deep median sulcus; carina of sixth segment terminates in long and sharp spine; first four segments with vertical sulci; these form "arrow" patterns on second and third segments; ventral margin of pleuron of first segment has blunt spine; pleura of second and third segments have sharp upwardly recurved terminal spine; three spines on fourth, two on fifth and one on sixth pleura; pleopods without endopodites, except frist two pleopods of male, modified to form petasma and appendix masculina; sternite of first four abdominal segments are anteroventrally directed; those of third and fourth segments ventrally directed and that of fifth segment posteroventrally directed.

Telson: Telson just about as long as last two abdominal segments taken together: as long as mesial ramus of uropods; median sulcus well defined but shallow; terminal spine short but sharp; distinct dorsolateral carina on each side which runs for posterior two-thirds of telson, terminating in short fixed lateral spines; no movable lateral spines.

Thelycum: Simple open structure. Anterior portion consists of concave central sternal plate with very long slender apical spine which extends to well between third pair of pereiopods; lateral margins of anterior portion notched, into which fit coxae of fourth pereiopods. Posterior portion consists of sternal plate situated between fifth pereiopods; this plate very much wider than long with concave pit in centre.

Petasma: An involuted pod-like structure; subrectangular in outline. Dorsomedian lobules joined along their midline. Ventromedian lobule not distinct from dorsomedian lobule; median lobule as a whole shorter than lateral lobe distally but subequal to it proximally. Each dorsolateral lobule bears pair of spines distally; inner spines anteromedially projected and actually touch medially; distolateral spine somewhat twisted dorsally and bear deep furrow; from dorsal

view dorsolateral lobule has medially directed process proximally. Ventrolateral lobules thickly sclerotinized; distally terminates in lateral rounded lobe possessing very small spine.

Appendix masculina: Swollen and horse-hoof shaped; does not extend beyond short endopodite; inner margin of distal surface forms ridge with row of short setae; from outer margin of distal surface there is a clear, well defined papilla. No appendix interna. Basal segment of endopodite of pleopod II slender and curved outwardly.

Colour in life: It is not possible to describe the colouration of this species as only preserved material has been examined.

Taxonomic status and comments

Three female specimens submitted by the Lourenço Marques Museum were tentatively identified as *S. lancifera* by Barnard (1950). He felt that it was not possible to make a definitive identification until the male was examined. One male was found and examined by myself and it and the females all agree with the descriptions given by other authors.

Distribution (Fig. V-2)

Sicyonia lancifera is an Indo-west Pacific species recorded from Japan – Kagoshima, Misaki, Fukuuru, Ito (Ortman, Kubo); Vietnam – Gulf of Tonkin (Starobogatov); Indonesia – Arafura Sea, Pidjot Bay, Lombok (Bate, De Man); Malaysia – Pulau Bidan, Penang (Lanchester); Sri Lanka – Gulf of Manaar (Pearson); Maldives (Hall, Starobogatov); Mozambique – off Delagoa Bay, Bazaruto, Sofala Bank (Barnard, de Freitas).

Nothing is known about the biology of this species and no information exists with regard to the distribution of juvenile forms and nursery areas. Adults have been recorded from medium depths on the continental shelf. The depth range seems to be from 25-200 metres. The shallowest record is off Bazaruto Island in Mozambique where one male was caught close inshore in 25 metres of water. The deepest record is from Misaki in Japan.

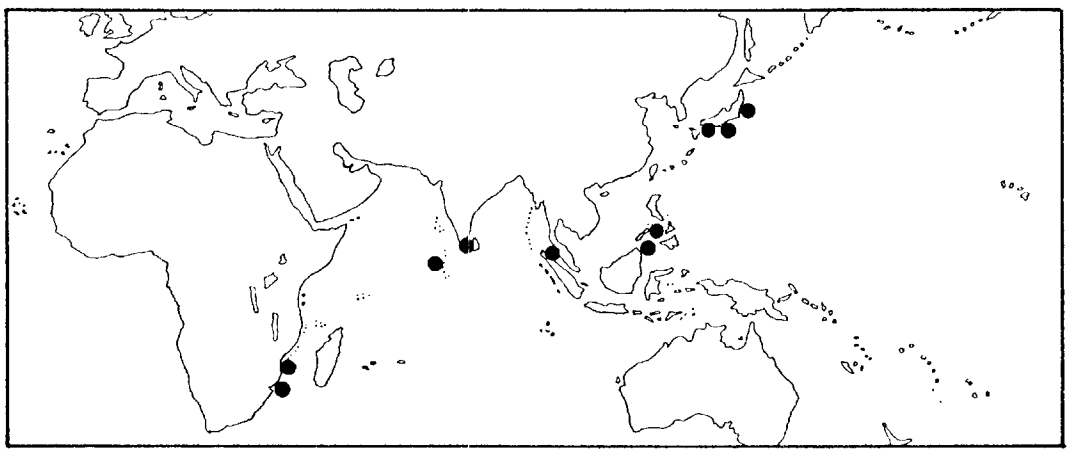

Fig. V-2. Geographical distribution of *Sicyonia lancifera*.

Sicyonia longicauda Rathbun, 1906

(Fig. V-3)

Sicyonia longicauda Rathbun, 1906: 908; De Man, 1911: 115; Kensley, 1972: 24 (in key); Starobogatov, 1972: 406.
Eusicyonia longicauda Stebbing, 1914a: 16; Barnard, 1950: 635.

Material examined

Mozambique: Inhaca (480 m), 1♂, 18.1 mm.
South Africa: Buffalo River (560 m), 6♂♂, 9.5-16.2 mm; 2♀♀, 8.4 mm and 10.3 mm; off Durban (366 m), 1♂, 11.5 mm.

Description

Rostrum: Distinctly upward curved; reaching distal end of antennular peduncle; rostral formula 5/1; two teeth behind orbital margin; adrostral carina distinct, extending from just behind last rostral tooth to orbital margin; postrostral carina very pronounced reaching to posterior margin of carapace; no median sulcus.

Carapace: Uniformly pubescent; gastrofrontal and longitudinal sulci absent; postocular sulcus absent possibly replaced by round depression; orbital spine absent; no cervical sulcus or carina; hepatic spine long and sharp, preceded by prominent swelling; gastro-orbital and antennal carina and orbito-antennal sulcus absent; antennal margin broadly rounded; antennal spine absent; no branchiocardiac carina; hepatic sulcus deep and wide, extending from about midway along carapace to below hepatic spine; branchiostegal spine absent; pterygostomian angle rounded and bears no spine.

Antennule: Lateral flagella cylindrical and about as long as second antennular article; mesial flagella slightly shorter than lateral flagella; prosartema very small and scale-like; apex pointed and upper edge serrated or toothed; stylocerite narrow, about half length of basal article; terminal spine long and sharp, extending beyond eye; distolateral spine very prominent and sharp; extends to middle of second article; no parapenaeid spine.

Scaphocerite: Distolateral spine broad and sharp, reaching distal end of antennular peduncle; basicerite unispinose.

Madibular palp: Reaching to base of carpocerite; proximal article about 1.1 times as long as wide; ventral surface with central depression; mesial and distal margins of article with long setae. Distal article 1.6 times longer than proximal article; apex truncate; apex half width of article; ventral surface with longitudinal sulcus; surface sparsely setose; longer setae on apical margin and along mesial border of longitudinal sulcus.

Maxilliped III: Endopodites reaching to distal end of second antennular article; no sexual dimorphism; last three articles significantly dorsoventrally depressed; on the whole endopodite much thicker than pereiopods; exopodites and epipodites absent.

Pereiopods: Exopodites absent from all pereiopods; epipodites present on first three pairs; basipodite of first two pereiopods with spine; largest on first pair; ischial spine present on first pair only; pair of small ventrally directed triangular spines present on sternite between first and second pairs of pereiopods; smaller and indistinct in males; males possess structure similar to female thelycum between fourth and fifth pereiopods; lanceolate sternal plate of fourth segment more slender than in female; plate on sternite between fifth pereiopods broadly concave; third pereiopods extending forward to beyond antennular peduncle by chela.

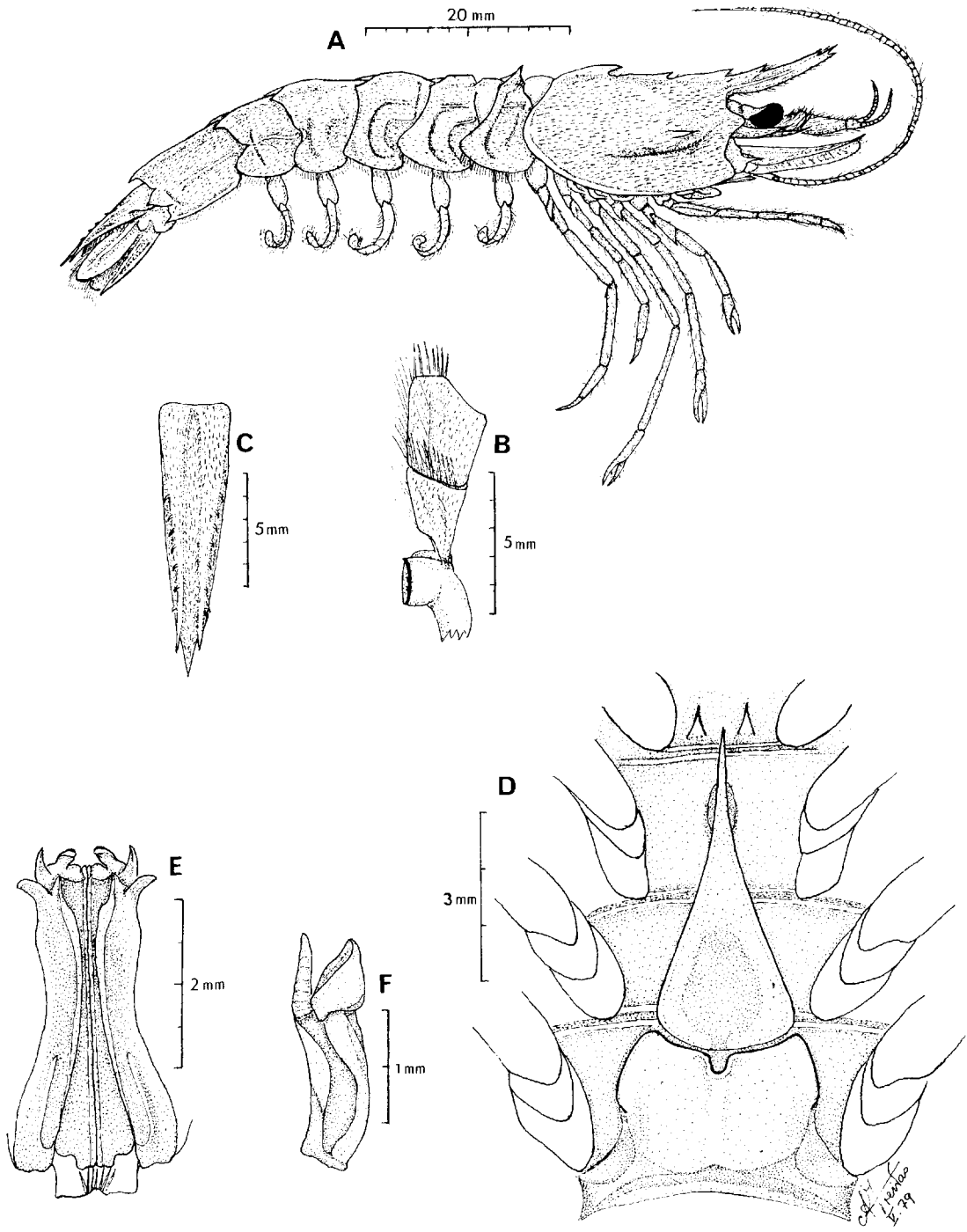

Fig. V-3: *Sicyonia longicauda* Rathbun: A. Whole animal; B. Mandibular palp; C. Telson; D. Thelycum; E. Petasma; F. Appendix masculina.

Abdomen: Uniformly pubescent; dorsally carinated on all segments; carina of first segment projected forward as tooth-like process which has deep median sulcus; second segment has smaller crest; carinae of all segments except sixth with median sulcus and cleft posteriorly; carina of sixth segment terminates in sharp spine; segments one to five have vertical sulci; lateral carina present on segments five and six; ventral margins of pleura free of spine; pleopods with no endopodites.

Telson: Telson as long as sixth and half of fifth abdominal segments; equal in length to uropodal rami which are subequal in length; median sulcus well defined and very broad; terminal spine short but sharp; distinct dorsolateral carina on each side of median sulcus; this carina ends in short fixed lateral spine.

Thelycum: Simple open structure. Anterior portion consists of concave sternal plate with extremely long slender apical spine extending to well between third pair of pereiopods; basal section of plate deeply concave. Posterior portion formed of sternal plate between fifth pereiopods; about twice as wide as long; prominent narrow pit anteromedially.

Petasma: An involuted pod-like structure; subrectangular in outline. Dorsomedian lobules united along entire midline; ventromedian lobules not distinct from dorsomedian lobules; median lobe as a whole somewhat membranous and shorter than lateral lobe distally but subequal to it proximally. Dorsolateral lobule with two horn-like spines distally; inner spine anteromedially directed and dorsally with deep "V" furrow; lateral spines pointed and inwardly curved; rounded tubercle present on dorsal surface just below notch between distal spines; lobule terminates proximally in medially directed bi-lobed process. Ventrolateral lobules thickly sclerotinized; ventral surface concave; distal half of lobules almost touch along ventral midline; distolateral angle bears laterally directed process; inner margins strongly curved terminating distally in pronounced ridge.

Appendix masculina: Roughly horse-hoof shaped; about as long as wide; distal surface irregular; margin smoothly rounded; anterior surface smooth; posterior surface with few indistinct setae; posterior margin with swollen section bearing very small indistinct papilla. No appendix interna. Basal segment of endopodite of pleopod II outwardly curved, slender, about 3.5 times maximum width.

Colour in life: Body and carapace generally mottled in red and white. Mottling less distinct on carapace. Anterior tip of rostrum and preceding three dorsal teeth are white. Posterolateral margin of carapace and margin of pleuron of first abdominal segment, white. Uropods and telson predominantly white with a few orange blotches. Distal four articles of maxilliped III deeper red than proximal articles. Pereiopods III to V banded in red and white while the bands on pereiopod II less distinct. Basal articles of pleopods cream and exopodites of pleopods have distal half cream in colour and proximal half pink. Marginal setae cream to white. Antennular flagella banded in red and white.

Taxonomic status and comments

There is little doubt that the female specimen collected off Inhaca Island is in fact the same species as that described by Barnard (1950) as *S. longicauda.* Barnard's claim that "...until the males of *S. longicauda* and *S. fallax* are discovered in their type localities, Stebbing's identification of the South African specimens may be allowed to stand" is understandable as there seems clearly to be a great similarity between these two species. *S. fallax* differs from *S. longicauda* by having a shorter and more slender rostrum, a more pronounced posterior rostral tooth and by the slightly shorter sixth abdominal segment in relation to the fifth segment (de Man 1911; Starobogatov 1972).

However, both the Mozambique specimen and those found off East London have characteristics which satisfy both the above species. For example, the rostrum is certainly longer and broader than that described by De Man (1911) while the sixth segment of the southeast African specimens are about 1.5 times length of fifth segment. Further the local specimens seem to have a very prominent posterior rostral tooth. These last two characteristics are more like *S. fallax* than *S. longicauda*.

It seems possible that the anomalies found by De Man could be intraspecific rather than interspecific. For this reason I agree with Stebbing's identification of these specimens as *Sicyonia longicauda* Rathbun.

Distribution (Fig. V–4)

Sicyonia longicauda has been found only in the type locality Hawaii (Rathbun) and off the southeast African coast off Inhaca Island in 480 metres, Buffalo River (East London) in 560 metres and between 450 and 580 metres off Cape Morgan just south of the Kei River mouth (Stebbing, Barnard, de Freitas). Should *S. fallax* prove to be a synonym the distribution then extends to the Sulu Sea (6°8′N, 121°19′E) south of the Philippines in 275 metres of water (de Man).

S. longicauda is a deep-water species having been found on the continental slope between 366 and 580 metres in southeast African waters while in Hawaii they were found between 95 and 630 metres of water.

No information exists on the distribution of juvenile or larval forms.

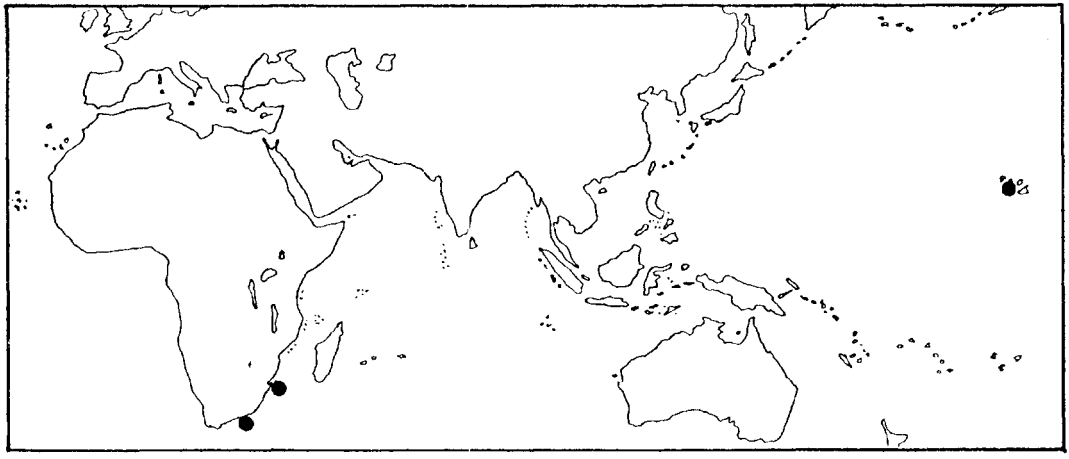

Fig. V-4. Geographical distribution of *Sicyonia longicauda*.

Acknowledgements

It is extremely difficult, if not impossible, to enumerate all the people who have assisted and advised me during the course of this study. As a fairly complete list appears in the original thesis I would like to mention only some key persons and organisations.

My sincerest thanks, therefore, are extended to:

– The Junta de Investigações do Ultramar of Portugal, the Fisheries Development Corporation of South Africa and the South African Association for Marine Biological Research, all of which contributed financially and materially to the successful outcome of the study;

– To the late Prof. W. Macnae, my first supervisor, for his friendship and encouragement and to his wife Meisie for making Bill's microscope available to me, a precious tool without which this work would not have been completed.

– My supervisors, Prof. H. Paterson, Dr A. Heydorn, my past director, Dr V. Valdez and the many friends and colleagues who aided me in many ways.

– Dr I. Pérez-Farfante and Dr W. Dall whose careful criticisms were invaluable.

– Dr K. Tinley for his advice and criticism of the final text.

– To Lorna Cameron for her patience in typing and re-typing the manuscripts.

– and last, but not least, my wife Cathy, my daughter Sandra and my sons Miguel and João Paulo for their love and understanding.

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