RAFFLES BULLETIN OF ZOOLOGY 1990 38(1): 77-82

THE DISTRIBUTION OF THE PARASITIC GASTROPOD *CALEDONIELLA MONTROUZIERI* SOUVERBIE, 1869 (CALEDONIELLIDAE), ON GONODACTYLID STOMATOPOD CRUSTACEANS

Raymond B. Manning and Marjorie L. Reaka-Kudla

ABSTRACT. - The gastropod mollusc *Caledoniella montrouzieri* Souverbie, 1869, an obligate ectoparasite of gonodactylid stomatopods, is now known from localities across the Indo-West Pacific region, from the Persian Gulf and Madagascar to American Samoa and Japan. Host records for *Caledoniella montrouzieri* are summarised, and the sizes of the known hosts are documented. *Caledoniella* is associated with seven species of *Gonodactylus*, including members of all three of the species groups known from the Indo-West Pacific, the *chiragra*-group, the *demanii*-group, and the *falcatus*-group. It also lives on the diminutive *Gonodactylolus paulus* Manning, 1970, the only stomatopod other than a species of *Gonodactylus* known to serve as host.

INTRODUCTION

Until recently, the snail *Caledoniella montrouzieri* Souverbie (1869: 421), a parasite of Indo-West Pacific gonodactylid stomatopods (Reaka, 1978; Rosewater, 1969, 1975), had not been reported as an associate of any of the smallest species of *Gonodactylus*. Budiman & Moosa (1983) studied *C. montrouzieri* from Indonesian stomatopods, and reported its occurrence on five species, members of three different species groups: *G. mutatus* Lanchester, 1903 and *G. glabrous* Brooks, 1886 (*falcatus*-group), *G. smithii* Pocock, 1890 (*chiragra*-group), and *G. incipiens* Lanchester, 1903 and *G. viridis* Serène, 1954 (*demanii*-group).

Through the kindness of A. J. Bruce, Northern Territory Museum of Arts and Sciences, Darwin, Australia, and Jens Hoeg, University of Copenhagen, we received and examined a small stomatopod from American Samoa infected with *Caledoniella montrouzieri*.

The stomatopod, a female 19 mm long (total length), collected by M. Richmond at Tutuila, American Samoa [Leone Estuary, SW; 24 July 1986; M. Richmond sta. SP/39/d; "Pred. (? = pretty) pinky purple a. o. (= all over) white eggs or parasites], is a member of *Gonodactylus incipiens* Lanchester, 1903. It carried two snails on its abdomen, the larger, 2.0 mm in diameter, posteriorly between the last two pleopods; the smaller, 1.1 mm in diameter, anteriorly between the last pereiopods. Numerous ovate egg masses were attached to the pleopods between the snails. The specimen has been deposited in the Northern Territory Museum of Arts and Sciences.

Raymond B. Manning – Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington D.C. 20560, U. S. A. **Marjorie L. Reaka-Kudla** – Department of Zoology, University of Maryland, College Park, MD 20742, U. S. A.

A survey of the literature revealed that there was an earlier record for the association of *Caledoniella* with a *Gonodactylus* from Samoa (Holthuis, 1951: 69). Thanks to C. H. J. M. Fransen, Nationaal Natuurhistorisch Museum (formerly Rijksmuseum van Natuurlijke Historie), Leiden, The Netherlands, we were able to borrow and examine that specimen, a female 17 mm long, which, as reported by Holthuis, also carried numerous egg masses. It, too, proved to be a member of *Gonodactylus incipiens*. Both of these specimens are considerably smaller than the specimen of G. incipiens studied by Budiman & Moosa (1983), a female 29 mm long.

We decided that a re-examination of known stomatopod hosts of *Caledoniella* was needed for several reasons. The occurence of *Caledoniella* on stomatopods from American Samoa, the records of the snail on five different species of *Gonodactylus* from Indonesia (Budiman & Moosa, 1983), and the report of the snail on a *Gonodactylus* from Japan, probably *G. platysoma* Wood-Mason, 1895 (Ishikawa, 1989), all indicated that the snail could use a variety of hosts. Also, recent studies have clarified the status of several species, e.g. *G. botti* Manning, 1975 rather than *G. chiragra* (Fabricius, 1798) and both *G. smithii* Pocock, 1890 and *G. acutirostris* De Man, 1898 are found in the Red Sea and Persian Gulf (Manning & Lewinsohn, 1986; Manning, in press). Here we present the results of this survey and summarise the disparate size ranges of the hosts.

We use USNM for the collections of the National Museum of Natural History, Smithsonian Institution, Washington D.C., TL for total length; mm for millimetres.

LIST OF STOMATOPODS INFESTED WITH *CALEDONIELLA* AND THE LOCALITIES WHERE THEY WERE COLLECTED

The following stomatopods are known to serve as hosts of *Caledoniella*. Their occurrence is shown in Fig. 1.

1. Unidentified *Gonodactylus*.

   "Gonodactyle", New Caledonia (Souverbie, 1869: 421; Souverbie & Montrouzier, 1870: 72). Size of stomatopod not stated.
   Gonodactylus, Cape York, Queensland (Allan, 1936: 392). Size of stomatopod not stated.

   Neither of these records can be identified to species with certainty.

2. *Gonodactylus acutirostris* De Man, 1898.

   Trincomalee, Sri Lanka. We have examined a female, TL 52 mm, with egg sacs but no gastropods from Trincomalee, in the collection of the Naturhistorisch Museum, Basel.

3. *Gonodactylus chiragra* (Fabricius, 1781).

   Persian Gulf (Preston, 1912: 126). Sex and size not stated.

   Andaman Islands (Preston, 1912: 126). Size and sex not stated.

   Ambon, Moluccas, Indonesia (Holthuis, 1941: 280). Two females, size not stated.

The host stomatopod cannot be identified with certainty for any of these records. They could be referable to *G. chiragra* or to any of several species recognised since 1941. There are no substantiated records of the snail occuring on *G. chiragra* s. str.

4. *Gonodactylus glabrous* Brooks, 1886

   Untung Jawa Island, Thousand Islands, off Jakarta, Java, Indonesia (Budiman & Moosa, 1983: 399). Female, TL 37 mm.

5. *Gonodactylus incipiens* Lanchester, 1903.

   Matapao, Samoa (Holthuis, 1951: 69, as *G. chiragra*). Female, TL 17 mm, in Nationaal Natuurhistorisch Museum, Leiden.

   Tutuila, American Samoa. Female, TL 19 mm, in Northern Territory Museum of Arts and Sciences, Darwin, Australia.

   Said, Ambon Island, Moluccas, Indonesia (Budiman & Moosa, 1983: 399). Female, TL 29 mm.

6. *Gonodactylus mutatus* Lanchester, 1903.

   Ifaty, Madagascar (Manning, 1970: 1431, 1440, as G. *falcatus*). Male, TL 30 mm (USNM).

   Tuléar, Madagascar. Female, TL 34 mm, in USNM Division of Mollusks (USNM 796524).

   Ayer Island, Thousand Islands, off Jakarta, Java, Indonesia (Budiman & Moosa, 1983: 399). Female, TL 38 mm.

7. *Gonodactylus platysoma* Wood-Mason, 1895.

   Comoro Islands, western Indian Ocean (Manning, 1968: 44; Rosewater, 1969: 347). Male, TL 60 mm, in USNM Division of Mollusks (USNM 679176).

   Sarodrano, Madagascar (Manning, 1970: 1431, 1440). Female, TL 71 mm, in Collection of Muséum National d'Histoire Naturelle, Paris.

   Bungo Channel, Okino-shima Island, Kochi Prefecture, Japan (Ishikawa, 1989: 24-25). Male, TL 85 mm (based on colour pattern, we believe this record is based on *G. platysoma* rather than *G. chiragra*, as reported).

   Note that snails have been recorded on this species from localities in the western Indian Ocean and Japan, but not from intermediate localities, probably an artifact of collecting.

8. *Gonodactylus smithii* Pocock, 1890.

   Tuléar, Madagascar (Manning, 1968: 46; Rosewater, 1969: 347). Male, TL 35 mm, in collection of Zoological Survey of India, Calcutta; male, TL 19 mm, 3 females TL 24, 46 and 50 mm (all in USNM).

   Sarodrano, Madagascar (Manning, 1970: 1431, 1440). Female, TL 45 mm, in collection of USNM Division of Mollusks (USNM 679541); male, TL 37 mm, and female, TL 47 mm (USNM); 2 females, TL 44 and 46 mm, in Muséum National d'Histoire Naturelle, Paris.

Grand Crique, Madagascar. Male, TL 16 mm (USNM).

Tuhaha Bay, Saparua Island, Moluccas, Indonesia (Budiman & Moosa, 1983: 399). Male and female, each TL 56 mm.

Marsegu Island, north of Ceram Islands, Moluccas, Indonesia (Budiman & Moosa, 1983: 399). Sex not reported, TL 31 mm.

9. *Gonodactylus viridis* Serène, 1954.

Phuket Island, Thailand (Bay of Bengal coast) (Rosewater, 1975: 86). Three males, TL 14, 26 and 33 mm, six females, TL 29, 30, 31, 34, 37 and 37 mm in USNM Division of Mollusks (USNM 710491); same locality (Reaka, 1978: 251), 56 specimens, TL 14 to 45 mm.

Silot Bay, close to Cebu City, Philippines (Moosa, 1986: 381). Male, TL 36 mm.

10. *Gonodactylolus paulus* Manning, 1970.

Reunion Island, western Indian Ocean (Reaka, 1978: 251). Two females in USNM Division of Mollusks, TL 8.5 and 9 mm (USNM 796521, 796523).

DISCUSSION

Caledoniella is now known to be associated with seven shore species of *Gonodactylus* from localities across the Indo-West Pacific region, from the Persian Gulf to Japan (Fig. 1). It has been found with three species of the *chiragra*-group (*G. acutirostris, G. platysoma, G. smithii*), two species of the *falcatus* – group (*G. glabrous, G. mutatus*), and two species of the demanii-group (*G. incipiens, G. viridis*). It is also known to live on *Gonodactylolus paulus*, one of the smallest known gonodactylids.

SUMMARY OF SIZE RECORDS FOR HOSTS OF *CALEDONIELLA*

Species	Host TL
chiragra-group of *Gonodactylus*	
Gonodactylus acutirostris (1)	52 mm
Gonodactylus platysoma (3)	60-85 mm
Gonodactylus smithii (12)	16-55 mm
demanii-group of *Gonodactylus*	
Gonodactylus incipiens (3)	17-29 mm
Gonodactylus viridis (66)	14-37 mm
falcatus-group of *Gonodactylus*	
Gonodactylus glabrous (1)	37 mm
Gonodactylus mutatus (3)	30-38 mm
Gonodactylolus paulus (2)	8.5-9 mm

(Numbers of known specimens in parentheses)

Acknowledgements. - This study was supported by the Smithsonian Institution through its Scholarly Studies Program.

LITERATURE CITED

Allan, J., 1936. *Mysticoncha,* a new generic name for *Caledoniella* Basedow, non Souverbie. *Rec. Aust. Mus.,* **19**: 391-396, Pl. 26.

Budiman, A. & M. K. Moosa, 1983. Notes on *Caledoniella montrouzieri* Souverbie, 1869 from Indonesia (Gastropoda: Caledoniellidae). *The Veliger,* **25**(4): 399-400.

Holthuis, L. B., 1941. The Stomatopoda of the Snellius Expedition. Biological Results of the Snellius Expedition, XII. *Temminckia,* **6**: 241-294.

Holthuis, L. B., 1951. Notes on *Caledoniella montrouzieri* Souverbie, a gastropod mollusc living commensally on stomatopod crustacea. *Basteria,* **15**: 69-71.

Ishikawa, H., 1989. *Caledoniella montrouzieri* collected from Okinoshima, Bungo Channel. *The Chiribotan,* **20**(2): 24-25.

Manning, R. B., 1968. Stomatopod Crustacea from Madagascar. *Proc. U. S. Nat. Mus.,* **24**: 1-61.

Manning, R. B., 1970. Some stomatopod crustaceans from Tuléar, Madagascar. *Bull. Mus. nat. Hist. nat., Paris,* (2)**41**: 1429-1441.

Manning, R. B., in press. Stomatopod crustacea from the Persian Gulf, with the description of a new *Manningia. Steenstrupia,* Copenhagen.

Manning, R.B. & C. Lewinsohn, 1986. Notes on some stomatopod Crustacea from the Sinai Peninsula, Red Sea. *Smithsonian Contrib. Zool.,* **433**:1-19.

Moosa, M. K., 1986. Stomatopod crustacea. Resultats du Campagnes MUSORSTOM I et II Philippines, 2. *Mém. Mus. nat. Hist. nat., Paris,* ser. A (Zool.), **133**: 367-414, Pl. 1.

Preston, H. B., 1912. On a new genus and species of marine parasitic Gastropoda from the Indian region. In: N. Annandale, Fauna Symbiotica India No. 2. *Rec. Indian Mus.,* **7**: 126-127.

Reaka, M. L., 1978. The effects of an ectoparasitic gastropd *Caledoniella montrouzieri* upon moulting and reproduction of a stomatopod crustacean, *Gonodactylus viridis. The Veliger,* **21**: 251-254.

Rosewater, J., 1969. Gross anatomy and classification of the commensal gastropod *Caledoniella montrouzieri* Souverbie, 1869, *The Veliger,* **1**: 345-350.

Rosewater, J., 1975. The marine commensal gastropod, *Caledoniella montrouzieri* (Prosobranchia, Hipponacea) in Thailand. *The Nautilus,* **89**: 86.

Souverbie, S. M., 1869. Diagnoses de mollusques inédits provenant de la Nouvelle-Calédonie. *Journ. Conchyl.,* **17**: 416-421.

Souverbie, S. M. & R. P. Montrouzier, 1871. Descriptions d'espécies nouvelle de l'archipel calédonien. *Journ. Conchyl.,* **18**: 71-83, Pl. 9.

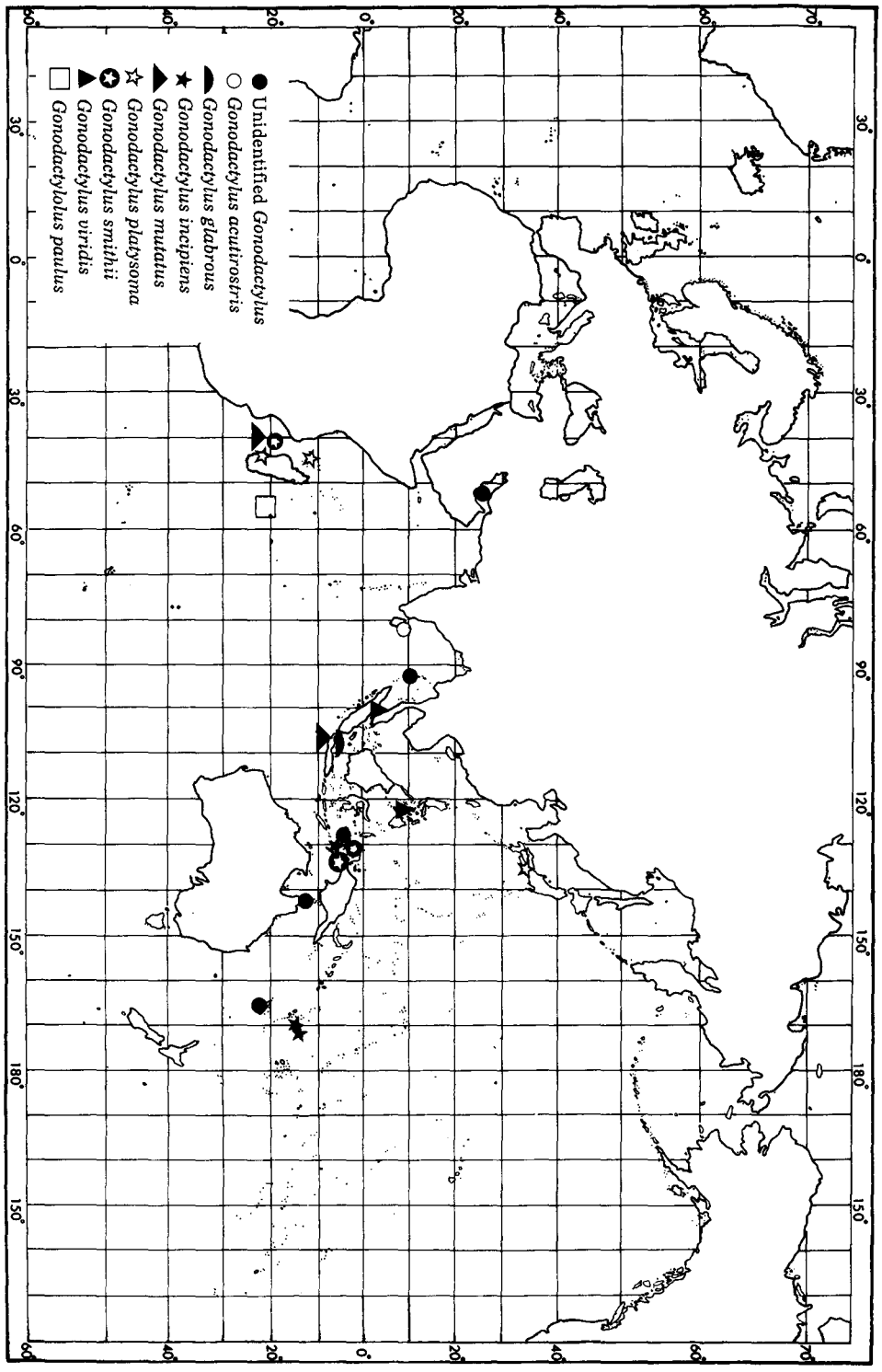

Fig. 1. Distribution of *Caledoniella* and its gonodactylid hosts in the Indo-West Pacific Region.