A new fish-ectoparasitic ergasilid (Crustacea: Copepoda) from the Pongola River system

Article *in* South African Journal of Zoology · January 1987

DOI: 10.1080/02541858.1987.11448022

2 authors:

Willie Oldewage
University of Johannesburg
38 PUBLICATIONS **257** CITATIONS

SEE PROFILE

Jo G Van As
University of the Free State
109 PUBLICATIONS **2,161** CITATIONS

SEE PROFILE

South African Journal of Zoology

ISSN: 0254-1858 (Print) (Online) Journal homepage: http://www.tandfonline.com/loi/tafz19

A new fish-ectoparasitic ergasilid (Crustacea: Copepoda) from the Pongola River system

W.H. Oldewage & J.G. Van As

To cite this article: W.H. Oldewage & J.G. Van As (1987) A new fish-ectoparasitic ergasilid (Crustacea: Copepoda) from the Pongola River system, South African Journal of Zoology, 22:1, 62-65, DOI: 10.1080/02541858.1987.11448022

To link to this article: http://dx.doi.org/10.1080/02541858.1987.11448022

A new fish-ectoparasitic ergasilid (Crustacea: Copepoda) from the Pongola River system

W.H. Oldewage and J.G. van As*

Research Unit for Fish Biology, Rand Afrikaans University, P.O. Box 524, Johannesburg, 2000 Republic of South Africa

Received 19 May 1986; accepted 24 July 1986

A taxonomic description of *Ergasilus mirabilis* sp. n. (Crustacea: Copepoda), a fish ectoparasite infesting the gill filaments of the leopard squeaker, *Synodontis leopardinus* Pellegrin, 1914 in the Pongola River system, is provided.

'n Taksonomiese beskrywing van *Ergasilus mirabilis* sp. n. (Crustacea: Copepoda), 'n vis-ektoparasiet wat die kieue van die luiperdkolskreeubaber, *Synodontis leopardinus* Pellegrin, 1914 in die Pongolariviersisteem besmet, word verskaf.

*To whom correspondence should be addressed

Introduction

Fourteen species of the genus *Ergasilus* von Nordmann, 1932 have been recorded from the African continent. The majority of species have been described from the great lakes of central Africa (Cunnington 1920; Fryer 1956; Fryer 1961; Thurston 1970), the Congo (Capart 1944; Fryer 1964) and the Volta River systems (Paperna 1969; Cressey & Collette 1971).

The only record of ergasilids from southern Africa was provided by Marques (1978), who collected specimens in a plankton sample in Lake Dilolo, Angola, which were identified as *Ergasilus seiboldi* von Nordmann, 1932 and *Ergasilus brevimanus* (Sars, 1909). The information presented by Marques (1978) is, however, in our opinion, not sufficient for specific identification.

During a fish parasitological survey in the Pongola flood plains on the Makatini Flats, Ngwavuma, specimens of ergasilid gill parasites were collected from the leopard squeaker *Synodontis leopardinus* Pellegrin, 1914. This material proved to be an as yet undescribed species, which is described below.

The parasites were removed from the gills with a sharpened tungsten needle and cleaned in 2,5% sodium hypochlorite and 2% KOH, as described by Johnson (1969). Specimens were cleared in methyl salicylate and studied microscopically. Drawings were made from microscope projections. The description is based on ten specimens of egg-bearing females. Specimens for scanning electron microscopy were dehydrated in a range of alcohols, critical point dried and sputter coated with gold.

Taxonomic description

Host and locality

Synodontis leopardinus Pellegrin, 1914, Pongola River, northern Natal, South Africa.

Position on host

Approximately one quarter of the distance along the gill filament from the tip.

Type material

Holotype No. E 86/2/12-1 and two paratypes No. E 86/2/12-2 and E 86/2/12-3 in the collection of the Department of Zoology, Rand Afrikaans University, Johannesburg.

Female (Figure 1)

Total length 930 µm (average of 10 specimens). Cephalothoracic segment largest, approximately as broad as wide. Ornamentation dorsally consists of two oval sculptures, anterior and posterior to an inverted T pattern (Figure 2a). Eyespot anterior to anterior oval sculpture (Figure 1a). Two sensory pits occur medially between the inverted T and anterior sculptures. First four thoracial segments progressively smaller and wider than long (Figure 1c & d). Paired sensory setae occur dorsally on segments two to four. Single sensory pits are present on second and third segments directly anterior to sensory setae (Figure 1a). A single row of bristles occurs on the posterior, ventral edge of segments two to four (Figure 2b). Fifth thoracic segment compressed bearing a rudimentary edge of segments two to four. Fifth thoracic segment compressed, lacks sensory apparatus and bears a rudimentary fifth leg. Sixth thoracic segment as long as wide with a median patch and posterior row of bristles ventrally. Egg sacs (Figure 1a & 2g) long and slender. Abdominal segments short. First and second abdominal segments bear a posterior row of ventral bristles. Third segment splits dorso-ventrally with two rows of bristles on posterior, ventral surface on either side (Figure 1g). Furcal rami elongated, approximately twice as long as wide with a long, stout, median seta, a single shorter dorsolateral seta and two even shorter ventrolateral setae. Bristles occur on the posterior, ventral edge (Figure 1g & 2c).

Antennules originate on the anterior periphery of the first cephalothoracic segment, directly dorsal to the antennae. Six-segmented, segments bearing 0-7-4-2-2-4 setae respectively. Terminal segment bearing a tuft of short, fine setules (Figure 1d). Antennae slender, smooth and four-segmented, terminal segment short, curved, pointed and scleritonized (Figure 1e).

Table 1 Spine – seta formulae and distribution of bristles and fine setae on the swimming legs of *Ergasilus mirabilis* sp. n.

Leg		Segment[a] 1 Spines – setae	2 Spines – setae	3 Spines – setae	4 Spines – setae
1	Endopodite	0 – 1°	0 – 1ˣ	2 – 4	–
	Exopodite	1 – 0°ˣ	1 – 1ˣ	0 – 6ˣ	–
2	Endopodite	0 – 1ˣ	0 – 1ˣ	0 – 6ˣ	–
	Exopodite	0 – 0°ˣ	0 – 1ˣ	0 – 4ˣ	–
3	Endopodite	0 – 1ˣ	0 – 2ˣ	0 – 5ˣ	–
	Exopodite	1 – 0°ˣ	1 – 1ˣ	0 – 6ˣ	–
4	Endopodite	0 – 0ˣ	0 – 0ˣ	0 – 6ˣ	–
	Expodite	1 – 0	0 – 5ˣ	–	–
5	(Rudimentary)	0 – 2			

[a]Segments numbered from basipodite end of swimming legs; ˣbristles; °fine setae.

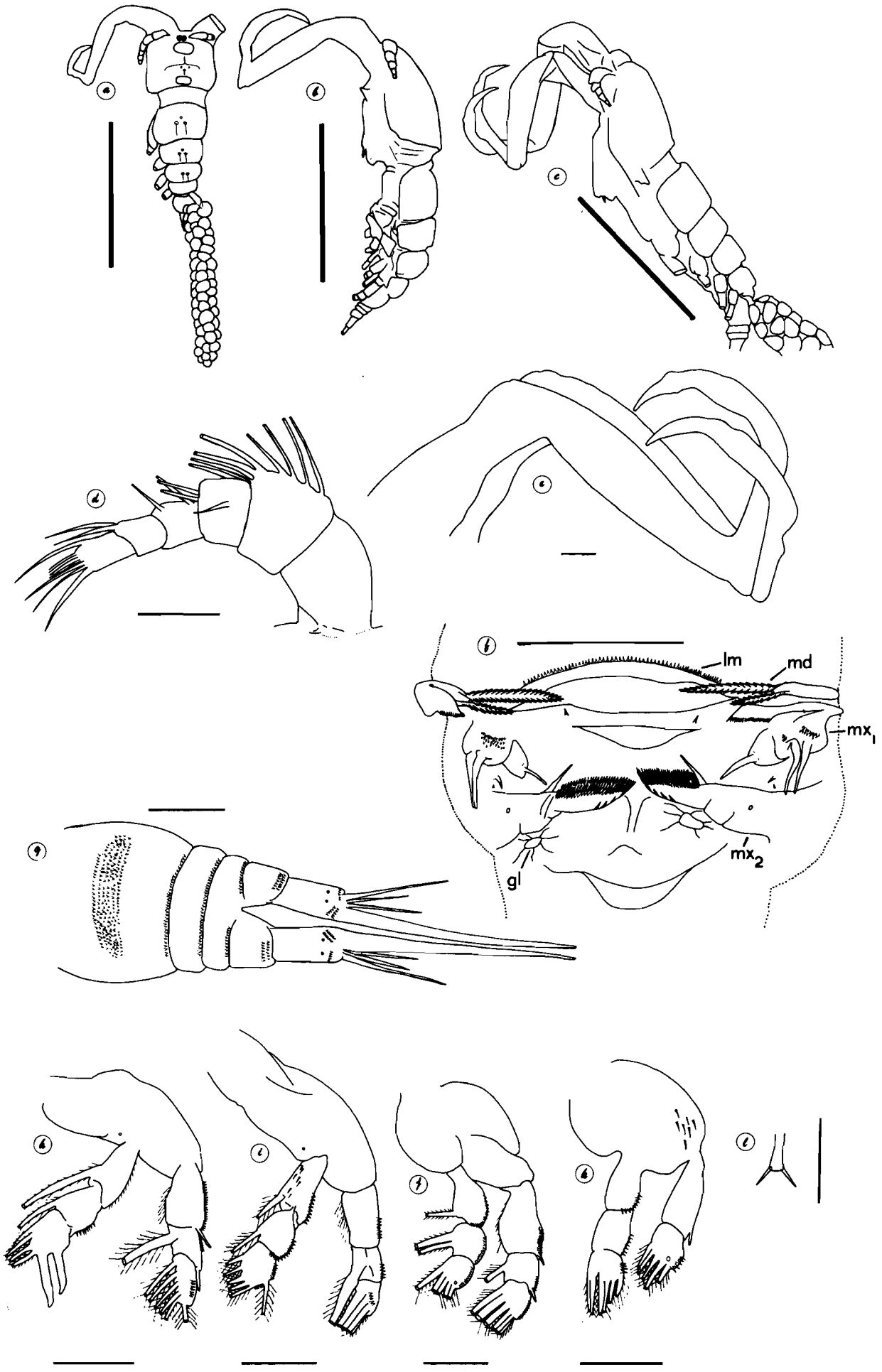

Figure 1 a – c. *Ergasilus mirabilis* sp. n., **d.** antennula, **e.** antennae, **f.** mouthparts (lm — labrum, md — mandible, mx — first maxilla, mx — second maxilla, gl — glandular projections on the labium), **g.** genital segment and abdomen, **h – l.** legs 1 – 5 (Scale —— 500 µm, —— 50 µm).

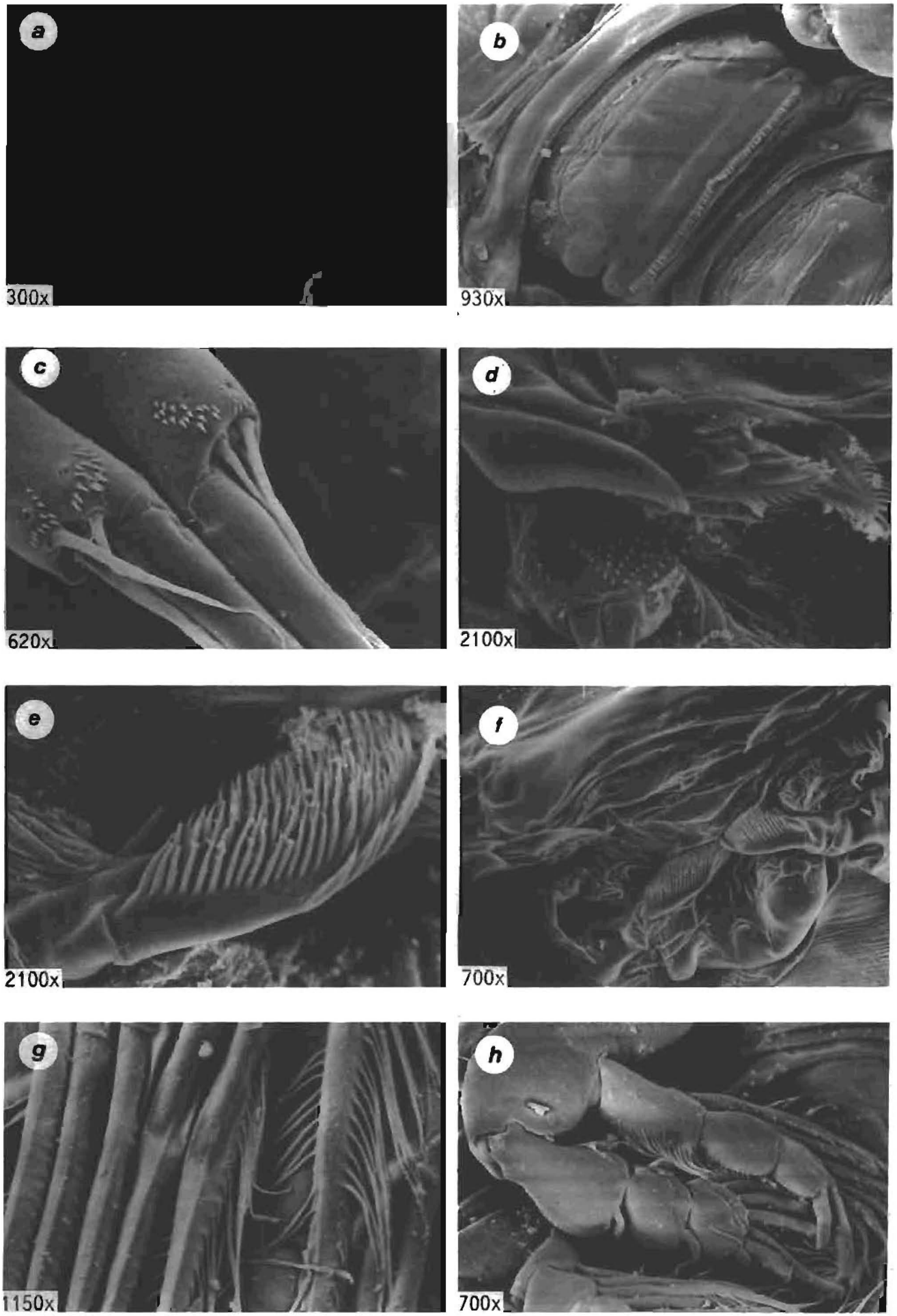

Figure 2 a – h. Scanning electron micrographs of morphological features of *E. mirabilis*: a. sculpturing on the dorsal surface of the cephalothorax, b. bristles occuring on the ventral surface of thoracic segments two to four, c. furcal rami, d. mandible, e. second maxilla, f. view of the mouthparts *in situ*, g. fine setae on the setae of the swimming legs and h. a dorsal view of the first swimming leg showing fine setae and bristles on various segments.

Mouth opens posteriorly under a ventrally projected, denticulate-edged labrum (Figure 1d). Mandible with a stout, 'feathered' terminal spine and a similar, sub-terminal spine about half its length. Endopodite a single palp 'feathered' ventrally (Figure 2d). First maxilla as typical for the genus, the exopodite with two setae and a number of bristles, endopodite bearing a single seta. Second maxilla three-segmented, with a terminal process of spiny bristles, basal bristles and a large, single seta (Figure 1f & 2e). Mouth opens on the horizontal line betwee the first maxillae (Figure 2f). Short, stout spines present directly below the labrum, between the first and second maxilla and on the basal segments of the second maxilla. Mandible and second maxilla oppose each other in the buccal cavity (Figure 2f). Labium with two lateral, glandular projections (Figure 1f).

Legs one – four as typical for this genus. All setae plumose (Figure 2g). Spine-seta formulae, as well as the presence of bristles and fine setae (Figure 2h) as in Table 1. Fifth leg rudimentary with two terminal setae (Figure 1l).

Male

Unknown.

Remarks

This species can be distinguished from the fourteen other species of *Ergasilus* occurring in Africa by its general morphology and unique spine-setae formulae of the swimming legs.

E. mirabilis shows some resemblance to *Ergasilus cunningtoni* Capart, 1944, but differs by a lack of digitiform processes on the antennae and the more quadrangular shape of the cephalothorax. Furthermore, the long seta on the basipodite of the second leg of *E. cunningtoni* is absent in the present species.

References

CAPART, A. 1944. Copepodes parasites des Poissions d'em douche du Congo Belge. *Bull. Mus. Hist. Nat. Belg.* 20: 1 – 24.

CUNNINGTON, W.A. 1920. The fauna of the African Lakes: a study in comparative Limnology with special reference to Tanganyika. *Proc. Zool. Soc. Lond.* 1920: 507 – 623.

CRESSEY, R.F. & COLLETTE, B.B. 1971. Copepods and needlefishes: A study in host-parasite relationships. *Fish. Bull.* 68: 347 – 342.

FRYER, G. 1956. A report on the parasitic Copepoda and Branchiura of the fishes of Lake Nyasa. *Proc. Zool. Soc. Lond.* 127: 293 – 344.

FRYER, G. 1961. The parasitic Copepoda and Branchiura of fishes of Lake Victoria and the Victoria Nile. *Proc. Zool. Soc. Lond.* 137: 41 – 60.

FRYER, G. 1964. Further studies on the parasitic Crustacea of African freshwater fishes. *Proc. Zool. Soc. Lond.* 143: 79 – 102.

JOHNSON, S.K. 1969. Sodium hypochlorite: Use on parasitic copepoda for identification. *Trans. Amer. Microsc. Soc.* 88: 591 – 592.

MARQUES, EMERITA. 1978. Copepodes e branquiuros das aguas do logo Dilolo. *Garcia de Orta, Ser. Zool.* 7: 1 – 6.

PAPERNA, I. 1969. Ectoparasitic infections on fish of Lake Volta, Ghana. *Bull. Wildl. Dis. Assoc.* 4: 135 – 137.

THURSTON, J.P. 1970. The incidence of Monogenea and parasitic Crustacea on the gills of fish in Uganda. *Rev. Zool. Bot. Afr.* LXXXII: 111 – 130.