A new species of *Chonopeltis* (Crustacea: Branchiura) from the Kruger National Park, Southern Africa

Annemarie AVENANT-OLDEWAGE

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A new species of *Chonopeltis*, parasitic on *Barbus marequensis, Labeo rosae, L. rubropunctatus* and *L. ruddi*, is described from the Olifants River in the Kruger National Park. A table with relative measurements of all described species of the genus *Chonopeltis* is included as an aid in species identification.

Une nouvelle espèce de Chonopeltis *(Crustacea : Branchiura) du Parc National Kruger, Afrique du sud.* - Une nouvelle espèce de *Chonopeltis*, parasite sur *Barbus marequensis, Labeo rosae, L. rubropunctatus* et *L. ruddi*, est décrite de la rivière "Olifants" dans le parc national Kruger. Un tableau reprenant les mensurations relative de toutes les espèces décrites dans le genre *Chonopeltis* est inclu comme aide à l'identification des espèces.

Key words: *Chonopeltis*, Branchiura, Crustacea, fish parasite, systematics.

Annemarie Avenant-Oldewage, Research Unit for Terrestrial and Freshwater Ecology, Department of Zoology, Rand Afrikaans University, P.O. Box 524, Johannesburg, 2000, South Africa.

INTRODUCTION

Eleven species of *Chonopeltis* Thiele, 1900 are known from Africa, five of which have thus far been recorded from Southern Africa (Fig. 1). Three species have been collected from fishes of the Limpopo River system, *C. meridionalis* Fryer, from the Nuanetzi River in Zimbabwe (Fryer, 1964), *C. australis* Boxshall, from Boskop Dam in the Mooi River and from the Vaal River (Boxshall, 1976; Van Niekerk, 1984; Van As & Basson, 1984) as well as in the Doorndraai Dam in the Mogalakwin River (Van As & Basson, 1984). *Chonopeltis fryeri* Van As, was described from the Mogalakwin River as well as Loskop Dam in the Olifants River (Van As, 1986). The other two Southern African species i.e. *C. minutus* Fryer, *C. australissimus* Fryer, were collected in the Tra-Tra River and the Groot Berg River in the Southwest Cape, respectively (Fryer, 1977).

METHODS

During fish parasitological surveys of rivers in the Kruger National Park, *Chonopeltis* specimens were collected from the tail and anal fins of *Labeo rosae* Steindachner, 1894 and *Barbus marequensis* Smith, 1841. Initially, specimens were collected from sample site 3 (Fig. 1) in the Olifants River, but in subsequent surveys were collected at all three sample sites (Fig. 1), and also from *Labeo rubropunctatus* Gilchrist and Thompson, 1913 and *L. ruddi* Boulenger, 1907.

Sample sites were selected in accordance with accessibility and to represent different ecological niches. Site 1 is located just inside the border of the park and close to asbestos and phosphate mines. Site 2 is further downstream where the embankments are covered by dense reeds while site 3 lies downstream of the reed vegetation, just prior to the confluence of the Olifants River with the Letaba River.

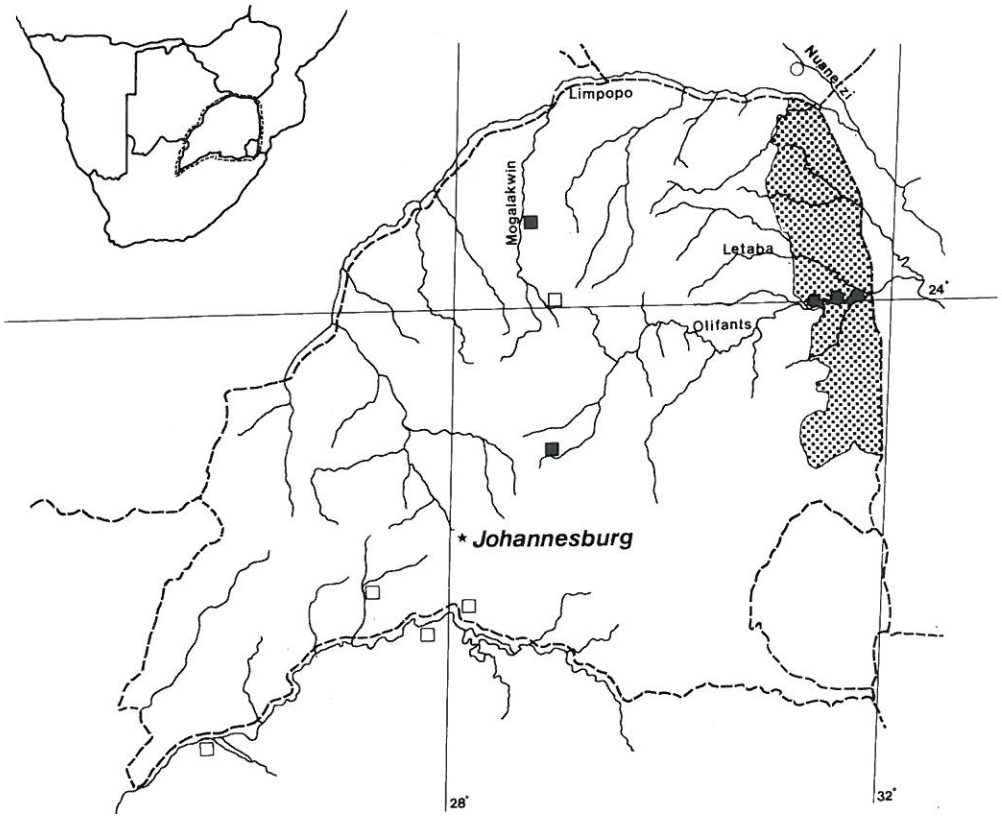

Fig. 1.- The Transvaal (with smaller map of southern Africa for orientation) to show localities of *Chonopeltis* species found. Shaded area indicates Kruger National Park.
❐ *C. australis* in Transvaal (Boxshall, 1976, Van As & Basson, 1984, Van Niekerk, 1984 and previously unpublished records of the present author)
■ *C. fryeri* Van As (1986)
○ *C. meridionalis* Fryer (1964)
● *C. victori* sp. n.

Chonopeltis specimens were cleared in 90% Lactic acid and drawn with the aid of a drawing tube attachment.

CHONOPELTIS VICTORI SP. N.

Types

Type host and locality

Labeo rosae Steindachner, 1894 Olifants River just prior to its confluence with Letaba River, (31°45'E/24°59'S) North Eastern Transvaal Province, South Africa.

Location on host

Anal and tail fins

Type specimens

Holotype RAU 1A and paratypes RAU 1B (four specimens) are deposited in the invertebrate collection of the Albany Museum, Somerset Street, Grahamstown, South Africa.

Description

Adult female (Fig. 2a-e)

Measurements given below are the arithmetic means of measurements obtained from three adult females.

Total length 4,8 mm (max. 5,46 mm). General shape as in figs. 2a & 2b. Carapace trifoliate, reaching back to cover base of second pair of legs. Length of carapace 2,82mm, (58 % of total length (Table 1). Width of carapace 2,91 mm. Ratio of carapace width to carapace length 1,03 giving carapace a circular appearance. Anterior margin of cephalic lobe with central identation and bearing four chitinous supporting rods. Cephalic carapace lobe 1,54 mm wide (52 % of carapace width). Eyes large, 0,16 mm in diameter and 0,68 mm apart with pigment "tearmarks" running towards ocellus. Ocellus same size as eyes, forming an equilateral triangle with the eyes. Segmentation of thorax visible but not distinct. Thorax with two bands of minute pigmented spots (Fig. 2b). Thorax and basal podomeres ventrally covered by minute scales. Respiratory areas typical for the genus. Enteral diverticula visible in carapace lobes.

Abdominal lobes slender, sharply pointed, and with tips directed outwards. Abdomen more or less as wide as thorax. Abdominal length 1,29 mm (27 % of total length), width 0,64 mm (50 % of abdominal length), length of abdominal split 0,68 mm (52 % of abdominal length). Spermathecae oval, situated in middle of fused part of abdomen, posterior to natatory lobes. Spermathecae 0,39 mm long (30 % of abdominal length). Furcal rami minute, situated near base of abdominal split; bearing two setae on each ramus.

Antennae of four segments; distal segment with two terminal setae (Fig. 2c). Suckers in fixed material with rim folded back over stalk (Fig. 1b). In living specimens rim not folded over stalk but forming cup-shaped sucker. Sucker diameter 0,68mm (23 % of carapace width). Mandibles housed in buccal cavity; not clearly visible. Maxillae prehensile, with scabrous areas bearing large round scales on basal, second and third podomeres. Fourth podomere with two terminal chitinous claws. Third podomere with finger-like protrusion on posterior margin (Fig. 2d).

Legs 1-3 evenly spaced, fourth leg further apart from third. Legs decrease in size posteriorly, with legs 3 & 4 considerably shorter than first two pairs. Exopodite of first leg lacks setae and consists of three segments. Second pair of legs of two podomeres and setose endo- and exopodites. Third pair of legs of one podomere and setose endo- and exopodites. Fourth pair of legs each with large posteriorly directed protrusion on basal podomere. A rounded natatory lobe with marginal setae covers the protrusion ventrally. Endo- and exopodite much shorter than in third leg.

Colour of live specimens transparent with eyes and tearmarks red brown. Formalin fixed specimens milky white.

Adult male (Fig. 3a-f)

Total length 3,1 mm. General shape similar to that of female but carapace reaches back to base of third pair of legs. Length of carapace 2,25 mm (59 % of total length). Width of carapace 2,29 mm. Ratio of carapace width to carapace length 1,01 mm. Cephalic carapace lobe 1,25 mm (54 % of carapace width).

Abdomen wider than thorax. Lobes with sharply-pointed tips directed outwards. Abdominal length 1,28 mm (34 % of total length), abdominal width 0,74 mm (58 % of abdominal length), abdominal split length 0,68 mm (53 % of abdomen length). Testis large, length 0,80 mm and extending beyond abdominal split, with serrate lateral margins and enclosed in thick-walled sac. (Fig. 3a). Furcal rami near base of abdominal split. Cephalic appendages as in female.

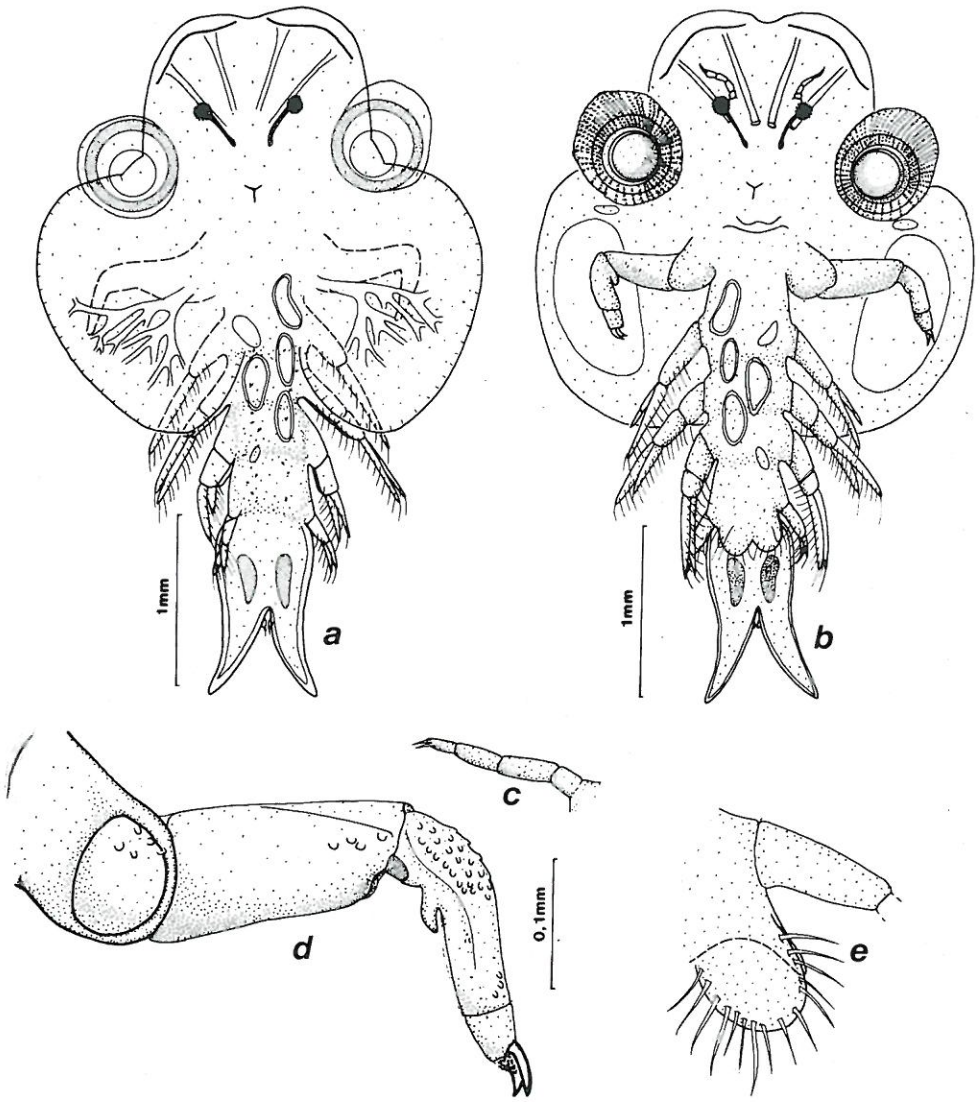

Fig 2.- *Chonopeltis victori* sp.n. (a) Female, dorsal ; (b) Female, ventral; (c) Antenna; (d) Maxilla; (e) Natatory lobe of fourth leg and posteriorly directed protrusion in female.

First pair of legs as in female. Second pair of legs with three protrusions posteriorly on basal podomere and one on second podomere. Protrusions covered by scales. Distal protrusions of basal podomere flattened, connected at their bases (Fig. 3d). Third pair of legs with posterior marginal flap ventrally, extending back to cover basal part of leg four. Two smaller protrusions present on ventral side of flap and one on dorsal side. A fourth protrusion present on exopododite of leg 3 (Fig. 3c,d). Exopodite of fourth pair of legs simple, endopodite with antero-lateral directed process basally and club-shaped process medially (Fig. 3 e,f).

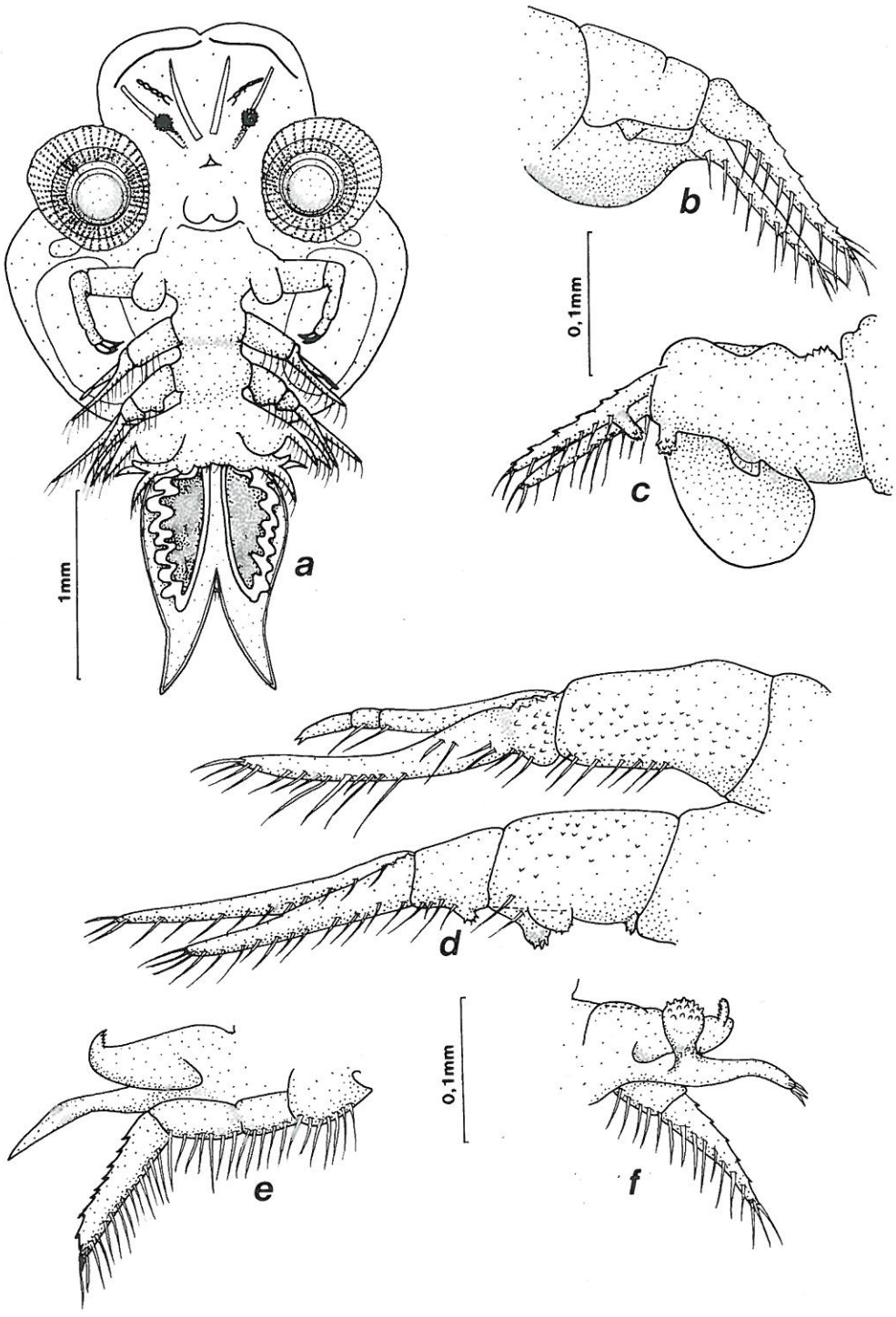

Fig. 3.- *Chonopeltis victori* sp. n. (a) Male, ventral; (b) Male third leg, dorsal; (c) Male third leg, ventral; (d) First and second leg male, ventral (e) Male fourth leg, ventral; (f) Male fourth leg, dorsal.

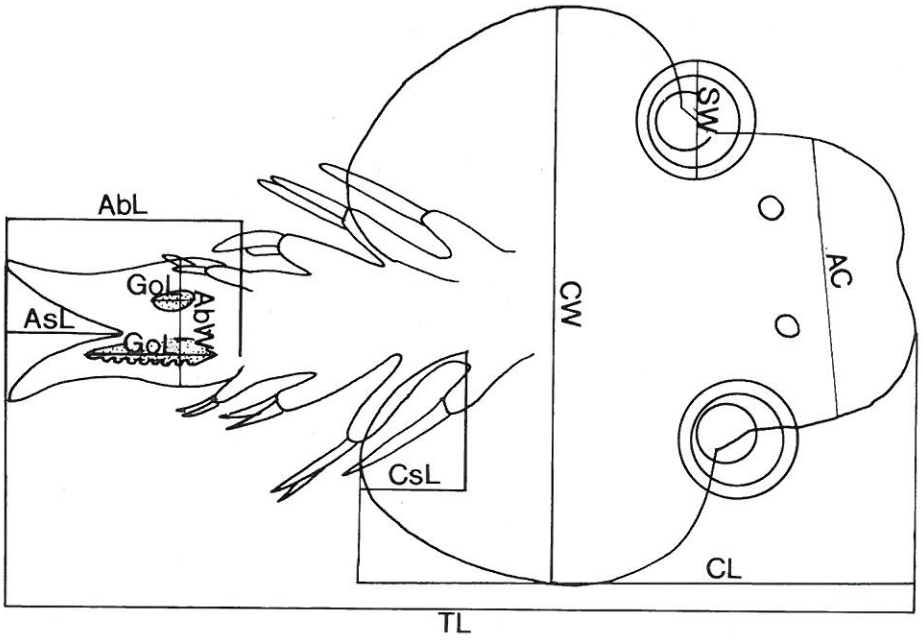

Fig. 4.- Schematic drawing of *Chonopeltis* to indicate the position where measurements were taken. AbL - Abdominal length; AbW - Abdominal width; Ac - Cephalic carapace lobe width; AsL - Abdominal split length; CL - Carapace length; CW - Carapace width; GoL - Testis or spermatheca length; SW - Sucking disc width; TL - Total length.

Remarks

Although *C. victori* resembles *C. fryeri* and *C. meridionalis* it is clearly distinguishable from these latter two species. *C. victori* differs from *C. meridionalis* in the following unique features:- the compound eyes are larger and tearmarks are present; the configuration of the posterior protrusions on the second leg of the males differ and the endo- and exopodites are not flexed backwards; an additional protrusion is present on the third pair of legs of the male and the testis and spermathecae are relatively longer (Table 1). It differs from *C. fryeri* in that the abdominal tips are directed outwards, chitinous rods are present in the cephalon, and in having relatively smaller sucking discs (Table 1). The position and size of spermathecae (Table 1) as well as the copulatory structures on the second, third and fourth pair of legs of the males differ considerably.

Since branchiurans reach sexual maturity before attaining their maximum length, total lengths can be misleading when making comparisons. The present author, demonstrated that on the related genus *Dolops*, relative length is a more reliable taxonomic criterion (Avenant & Van As, 1989).

Relative measurements obtained for all known *Chonopeltis* species are summarised in Table 1. In cases where authors did not give measurements of species in their texts, they were taken from figures accompanying the description. Figure 4 illustrates the position where measurements were taken. The *Chonopeltis* species *C. inermis, C. meridionalis, C. brevis, C. schoutedeni, C. congicus* and *C. flaccifrons* are regarded by Fryer (1961, 1968) as closely related species replacing each other from north to south in distribution. These species are grouped together on the

Table 1.- Relative measurements from all known species of Chonopeltis.

Measurements were taken from figures accompanying species descriptions were the information was not available in the text. A line indicates that the information was not available.

Abbreviations : CL/TL = Carapace length/Total length; CW/CL = Carapace width/Carapace length; CSL/CL = Carapace split length/Carapace length; AbL/TL = Abdominal length/Total length; AbW/AbL = Abdominal width/Abdominal length
GoL/AbL = Testis or spermatheca length/Abdominal length; AsL/AbL = Abdominal split length/Abdominal length; AC/CW = Cephalic carapace lobe width/ Carapace width; SW/CW = Sucking disc width/Carapace width.

	CL/TL	CW/CL	CsL/CL	AbL/TL	AbW/AbL	GoL/AbL	AsL/AbL	AL/CW	SW/CW	Author
Adult females										
C. inermis	45 %	115 %	26 %	31 %	36 %	39 %	65 %	44 %	31 %	Thiele (1900) & Fryer (1956)
C. schoutedeni	36 %	127 %	22 %	42 %	24 %	13 %	85 %	38 %	-	Brian (1940)
C. congicus	47 %	118 %	15 %	24 %	38 %	22 %	60 %	51 %	-	Fryer (1959)
C. brevis	57 %	111 %	29 %	27 %	54 %	46 %	50 %	49 %	28 %	Fryer (1961)
C. meridionalis	56 %	108 %	16 %	28 %	52 %	41 %	44 %	61 %	29 %	Fryer (1964)
C. elongatus	39 %	94 %	21 %	33 %	30 %	33 %	63 %	49 %	36 %	Fryer (1974)
C. victori	58 %	103 %	27 %	27 %	50 %	30 %	52 %	52 %	26 %	Own records
C. flaccifrons	44-47 %	116 %	23 %	22 %	50 %	36 %	46 %	55 %	35 %	Fryer (1960)
C. fryeri	45 %	110 %	31 %	22-24 %	43 %	25 %	52 %	53 %	31 %	Van As (1986)
C. australis	54 %	113 %	31 %	25 %	58 %	39 %	46 %	40 %	25 %	Boxshall (1976)
C. minutus	60 %	107 %	20 %	25 %	65 %	23 %	39 %	54 %	39 %	Fryer (1977)
C. australissimus	56 %	116 %	14 %	27 %	50 %	42 %	27 %	62 %	-	Fryer (1977)
Adult males										
C. inermis	59 %	98 %	28 %	39 %	41 %	67 %	65 %	50 %	19 %	Thiele (1904) & Fryer (1956)
C. schoutedeni	-	-	-	-	-	-	-	-	-	Brian (1940)
C. congicus	-	-	-	26-29 %	-	-	60 %	-	-	Fryer (1959)
C. brevis	55 %	111%	26%	38 %	62 %	70 %	46 %	48 %	-	Fryer (1961)
C. meridionalis	53 %	118 %	16 %	37 %	42 %	46 %	49 %	51 %	-	Fryer (1964)
C. elongatus	44 %	100 %	18 %	39 %	30 %	61 %	49 %	53 %	-	Fryer (1974)
C. fryeri	52 %	120 %	14 %	42 %	47 %	70 %	42 %	55 %	34 %	Own records
C. flaccifrons	52-55 %	131 %	16 %	27-30 %	86 %	-	50 %	53 %	-	Fryer (1960)
C. victori	59 %	101 %	25 %	34 %	58 %	61 %	53 %	54 %	30 %	Van As (1986)
C. australis	57 %	110 %	24 %	34 %	57 %	66 %	34 %	39 %	-	Boxshall (1976)
C. minutus	58 %	113 %	13 %	31 %	57 %	47 %	33 %	57 %	-	Fryer (1977)
C. australissimus	55 %	-	-	31 %	-	-	25 %	-	-	Fryer (1977)

grounds of males possessing projections on the posterior face of leg 2. As Fryer (1968) does not mention *C. elongatus* - a species which was described only in 1974 - the latter should be included in the northern section of the species as projections are present on the posterior face of the second leg (*cf* Fryer, 1974). The presence of projections on this appendage in *C. fryeri* and *C. victori* indicates that they should also be included in the group. Furthermore, since *C. fryeri* and *C. flaccifrons* are the only two species lacking chitinous supporting rods in the cephalic lobe of their carapace, it is reasonable to assume that both are derived from a common ancestor within the larger northern section of the genus. Fryer (1977) on the other hand groups the three southernmost species together on the grounds that males of all three lack projections on the posterior face of leg 2.

From the data in Table 1, it appears that these species groupings of Fryer (1961, 1974, 1977), based on comparative morphological features, are valid when relative measurements of species within or between sections are compared.

In order to put the data in Table 1 to use in species identification, the relative measurements of an unknown specimen should be determined as shown in Fig. 4. With these data, is then possible to place the unknown specimen in a CL/TL smaller or larger than 50 % group (See Table 1). If a CL/TL ratio is, for instance, smaller than 50% the unknown specimen may be placed in a further group by comparing CW/CL length. If CW/CL is smaller than 115 %, the specimen can further be identified by comparing AbW/AbL and GoL/AbL with that of the two known species.

Species identification can eventually be confirmed by comparing characteristics of the unknown specimen with the description of the species indicated in the table.

Etymology

This species is named after Mr Victor Wepener, a post-graduate student from our department who noticed the first specimen.

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