

*CALIGUS CRUSMAE* NEW SPECIES (COPEPODA,  
SIPHONOSTOMATOIDA) PARASITIC ON AN INSHORE FISH  
FROM CHILE

BY

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Parasitic copepods of the genus *Caligus* Müller, 1785 from Chile are poorly known. So far only 5 species have been described from the Chilean coast, among which are *Caligus gayi* Nicolet, 1849, *Caligus cheilodactyle* Kröyer, 1863, *Caligus teres* Wilson, 1921, and *Caligus debueni* Stuardo & Fagetti, 1961.

Recently, Baeza & Castro (in litt., Not. mens. Mus. nac. Hist. nat. (Chile)) added to this list new records of *Caligus lalandei* Barnard, 1948 and *Caligus quadratus* Shiino, 1954.

In the present paper, the authors add a new species, which was recently discovered in the course of an investigation on parasitic copepods, from Antofagasta (Chile).

***Caligus crusmae* new species (figs. 1-25)**

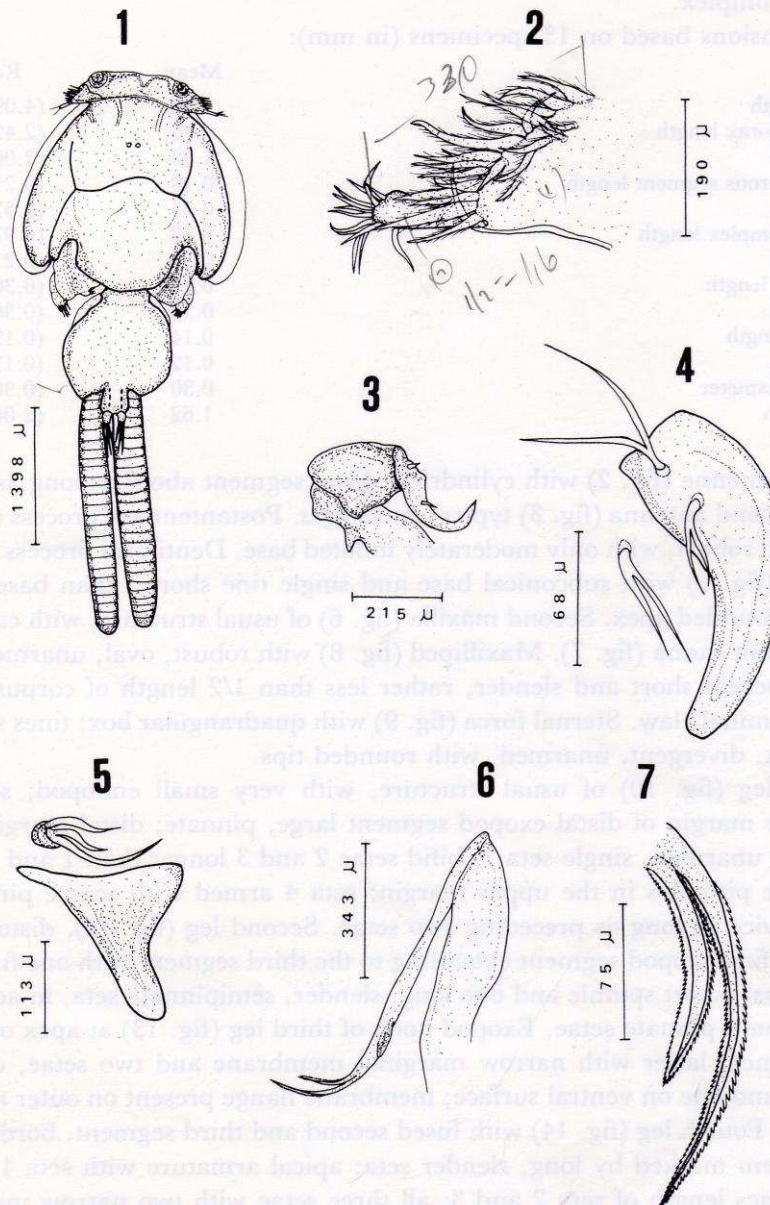
Record of specimens. — Fourteen females and three males were taken from Isla Santa María (Antofagasta, Chile), 23°39' S 70°25' W, on 18 August, 1976. Type specimens are deposited in the Museo Nacional de Historia Natural de Chile: a holotype female (MNHN 15044) and a paratype female (MNHN 15046).

Host. — *Chromis crusma* (Valenciennes).

Habitat. — Skin.

Method. — The specimens were fixed and preserved in neutralized formalin (8%). The appendages were removed, cleared, and studied as whole mounts in glycerin. Figures were drawn with the aid of a camera lucida. The terminology adopted in the description is based on Kabata (1979).

Description. — Female (fig. 1). Dorsal shield subcircular, width 90%, or equal to length, with broad frontal plates; width of lunules slightly more than 1/2 that of plates; posterior sinuses moderately shallow; posterior margin of thoracic zone protruding beyond tips of lateral zones. Length of dorsal shield 55-62% of total length (without caudal setae). Fourth pedigerous segment very short and poorly delimited from genital complex. Latter slightly shorter than thoracic zone of dorsal shield, suborbicular, with indented posterior margin.



Figs. 1-7. *Caligus crusmae* new species, female. 1, habitus, dorsal; 2, first antenna; 3, second antenna; 4, postantennary process; 5, first maxilla; 6, second maxilla; 7, second maxilla, detail of calamus and canna.



Abdomen one-segmented, subquadrangular, its length about 1/3 that of genital complex.

Dimensions based on 13 specimens (in mm):

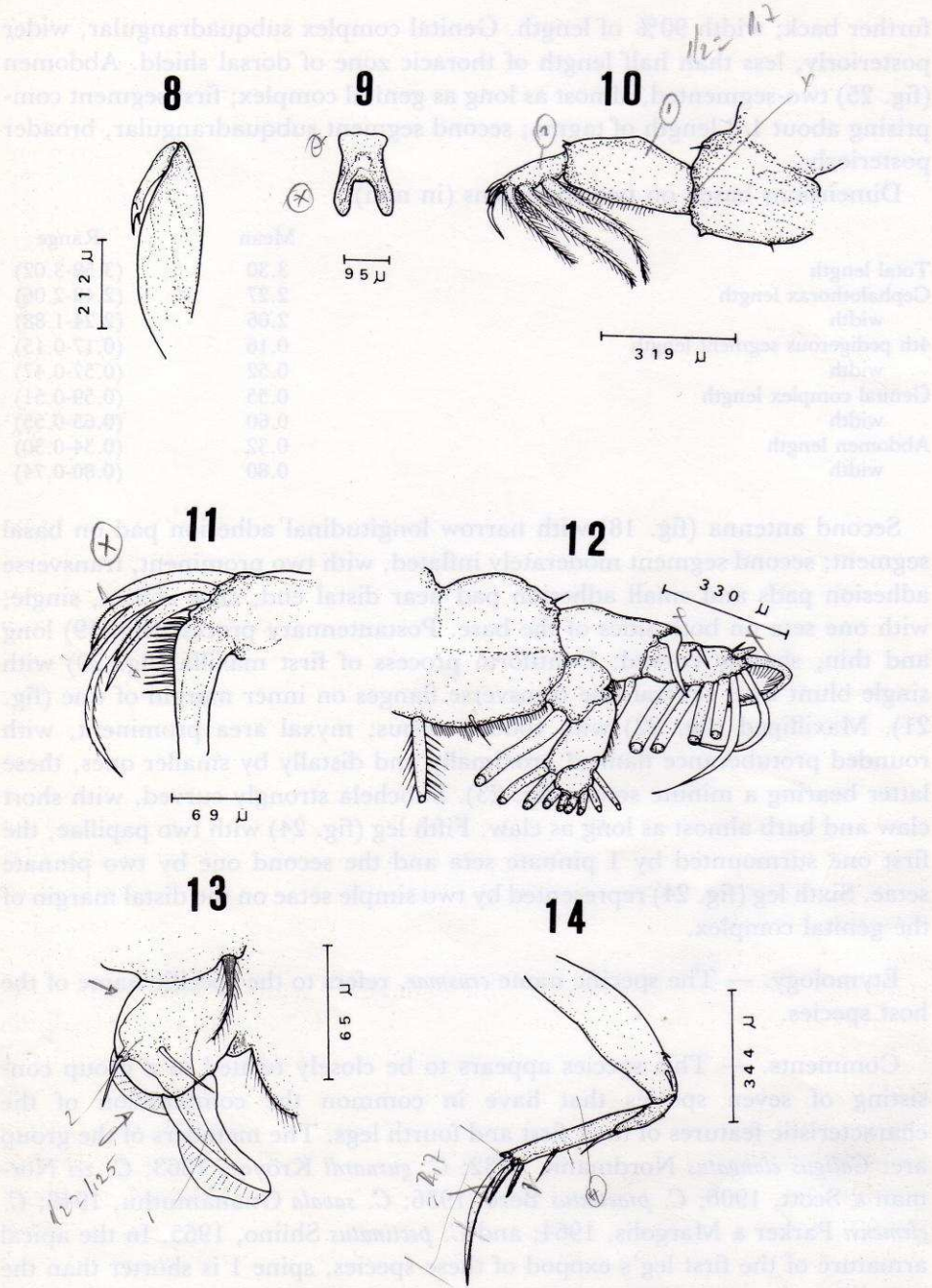
	Mean	Range
Total length	3.36	(4.09-2.92)
Cephalothorax length	1.98	(2.42-1.82)
width	1.88	(2.00-1.76)
4th pedigerous segment length	0.18	(0.21-0.15)
width	0.53	(0.57-0.42)
Genital complex length	0.82	(0.97-0.61)
width	0.92	(0.21-0.77)
Abdomen length	0.24	(0.30-0.21)
width	0.32	(0.36-0.28)
Uropod length	0.14	(0.19-0.13)
width	0.12	(0.13-0.11)
Egg-sac diameter	0.30	(0.30-0.30)
length	1.62	(2.06-1.03)

First antenna (fig. 2) with cylindrical distal segment about as long as proximal. Second antenna (fig. 3) typical for *Caligus*. Postantennary process (fig. 4) short and robust, with only moderately inflated base. Dentiform process of first maxilla (fig. 5) with subconical base and single tine shorter than base, with bluntly rounded apex. Second maxilla (fig. 6) of usual structure, with calamus longer than canna (fig. 7). Maxilliped (fig. 8) with robust, oval, unarmed corpus; subchela short and slender, rather less than 1/2 length of corpus, with short terminal claw. Sternal furca (fig. 9) with quadrangular box; tines shorter than box, divergent, unarmed, with rounded tips.

First leg (fig. 10) of usual structure, with very small endopod; seta on posterior margin of distal exopod segment large, pinnate; distal margin (fig. 11) with unarmed, single seta 1, bifid setae 2 and 3 longer than 1 and armed with fine pinnules in the upper margin; seta 4 armed with scarce pinnules, about twice as long as preceding two setae. Second leg (fig. 12), distolateral spine of first exopod segment extending to the third segment with one fine and one robust, short spinule and one long, slender, semipinnate seta, in addition to five long, pinnate setae. Exopod hook of third leg (fig. 13) at apex of basal prominence; latter with narrow marginal membrane and two setae, one on margin and one on ventral surface; membrane flange present on outer margin of hook. Fourth leg (fig. 14) with fused second and third segment, border between them marked by long, slender seta; apical armature with seta 1 about three times length of seta 2 and 3; all three setae with two narrow marginal strips of serrated membrane; pectines present at bases of seta 1 and 2, but not 3 (fig. 15). Fifth leg (fig. 16) consisting of two small papillae, one with two and one with a single pinnate setule. Uropods (fig. 1) subquadrangular, less than half length of abdomen.

Male (fig. 17). — Dorsal shield similar to that of female, but posterior sinuses relatively deeper and posterior margin of thoracic zone protruding





Figs. 8-14. *Caligus crusmae* new species, female. 8, maxilliped; 9, sternal furca; 10, first leg; 11, first leg, tip of exopod; 12, second leg; 13, third leg, exopod hook; 14, fourth leg.



further back; width 90% of length. Genital complex subquadrangular, wider posteriorly, less than half length of thoracic zone of dorsal shield. Abdomen (fig. 25) two-segmented, almost as long as genital complex; first segment comprising about 1/2 length of tagma; second segment subquadrangular, broader posteriorly.

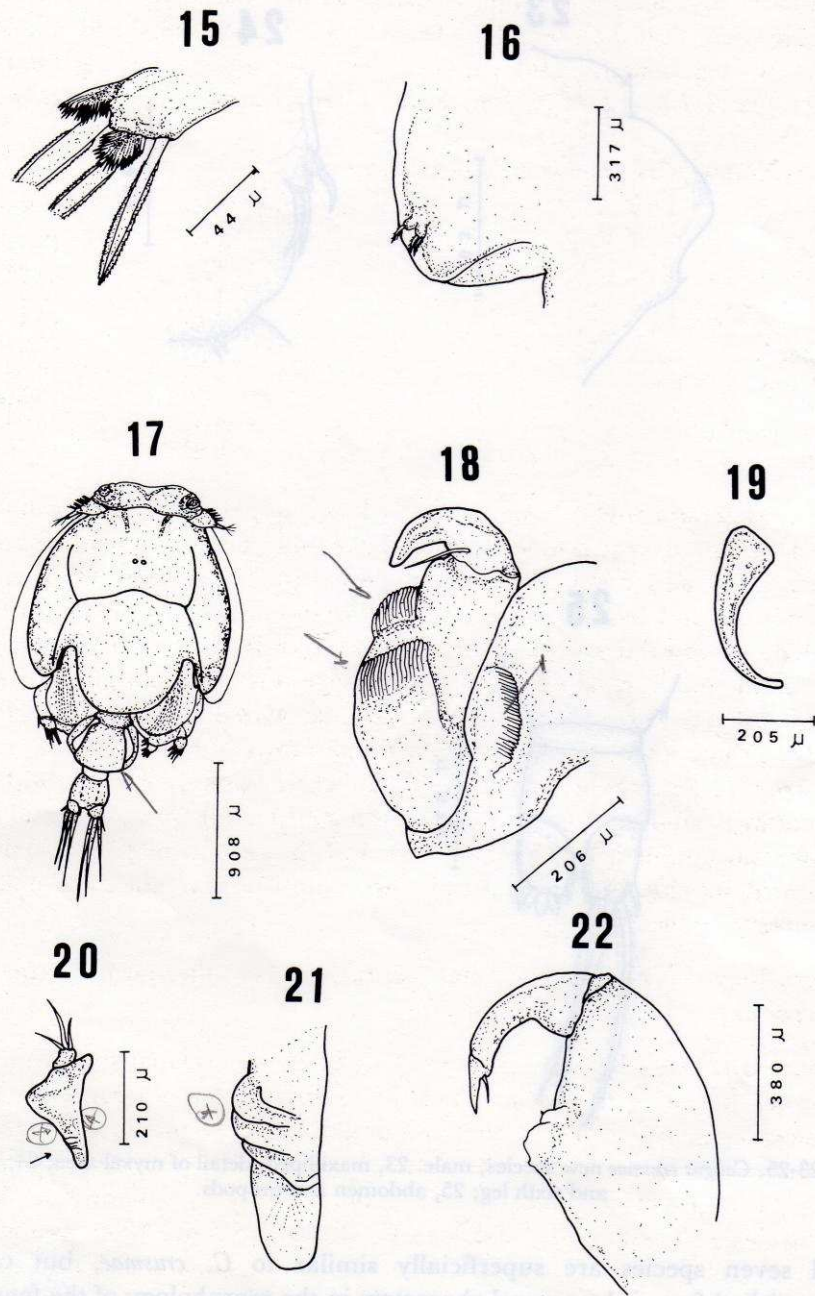
Dimensions based on two specimens (in mm):

	Mean	Range
Total length	3.30	(3.58-3.02)
Cephalothorax length	2.27	(2.48-2.06)
width	2.06	(2.24-1.88)
4th pedigerous segment length	0.16	(0.17-0.15)
width	0.52	(0.57-0.47)
Genital complex length	0.55	(0.59-0.51)
width	0.60	(0.65-0.55)
Abdomen length	0.32	(0.34-0.30)
width	0.80	(0.80-0.74)

Second antenna (fig. 18) with narrow longitudinal adhesion pad on basal segment; second segment moderately inflated, with two prominent, transverse adhesion pads and small adhesion pad near distal end; claw robust, single, with one seta on both sides of the base. Postantennary process (fig. 19) long and thin, sharply curved. Dentiform process of first maxilla (fig. 20) with single blunt tine; several fine transverse flanges on inner margin of tine (fig. 21). Maxilliped (fig. 22) with robust corpus; myxal area prominent, with rounded protuberance flanked proximally and distally by smaller ones, these latter bearing a minute setule (fig. 23). Subchela strongly curved, with short claw and barb almost as long as claw. Fifth leg (fig. 24) with two papillae, the first one surmounted by 1 pinnate seta and the second one by two pinnate setae. Sixth leg (fig. 24) represented by two simple setae on the distal margin of the genital complex.

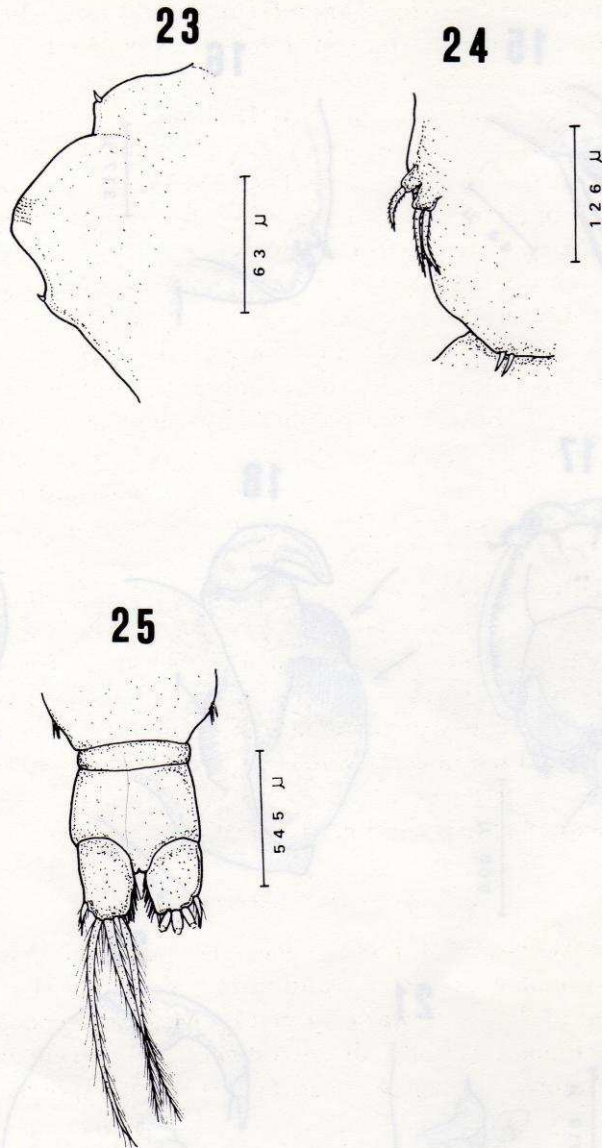
Etymology. — The specific name *crusmae*, refers to the specific name of the host species.

Comments. — This species appears to be closely related to a group consisting of seven species that have in common the combination of the characteristic features of their first and fourth legs. The members of the group are: *Caligus elongatus* Nordmann, 1832; *C. gurnardi* Kröyer, 1863; *C. zeii* Norman & Scott, 1906; *C. praetextus* Bere, 1936; *C. savala* Gnanamuthu, 1948; *C. clemensi* Parker & Margolis, 1964; and *C. pectinatus* Shiino, 1965. In the apical armature of the first leg's exopod of these species, spine 1 is shorter than the remaining three structures, spines 2 and 3 are bifid, and seta 4 is much longer than any of the three spines. The exopod of the fourth leg is two-segmented, its first and second segment being fused, but the original distal spine of the first segment is still in position.



Figs. 15-22. *Caligus crusmae* new species, 15-16, female. 15, fourth leg, detail of pecten on base of distal armature; 16, fifth leg; 17-22, male. 17, habitus, dorsal; 18, second antenna; 19, postantennary process; 20, first maxilla; 21, first maxilla, detail of distal surface of tine; 22, maxilliped.





Figs. 23-25. *Caligus crusmae* new species, male. 23, maxilliped, detail of myxal area; 24, fifth leg and sixth leg; 25, abdomen and uropods.

All seven species are superficially similar to *C. crusmae*, but can be distinguished from it by several characters in the morphology of the female. It differs from all of them in having only two pectines on the exopod of the fourth leg's distal segment. *C. gurnardi* and *C. zeii* differ from *C. crusmae* in having all three terminal spines of the fourth leg of about equal length, moreover, the first terminal spine of the exopod of leg 1 in *C. zeii* is relatively much shorter; in *C.*

*gurnardi* spines 2 and 3 of this exopod are bifid only at the tips, whereas those of the present species are divided for about a half of their length. *C. pectinatus* is difficult to distinguish from the present species; it has a relatively larger abdomen and larger uropods, and its fourth leg has pectines at the bases of all three spines (only two in *C. crusmae*). Only a combination of small morphological details distinguishes *C. crusmae* from *C. clemensi*. The tine of the first maxilla of the male of the *C. crusmae* has a band of transverse striation and the maxilliped of *C. clemensi* carries a different myxal area, with a short seta; these structures permit to differentiate both species. The hook of the third exopod has a marginal membrane in *C. crusmae*, none in *C. clemensi*. The abdomen and uropods of *C. clemensi* are relatively much larger and its fourth leg has three pectines; terminal spine 2 is also relatively longer. *C. savala* is distinguishable from the present species by a relatively much larger abdomen, a different type of bifurcation in spines 2 and 3 of the first leg's exopod, and by proportions of the terminal spines of the fourth leg (second and third are comparatively longer). The armature of the first leg's exopod provides also distinguishing features between *C. praetextus* and the present species. *C. elongatus* is also very similar but can be distinguished from *C. crusmae* by a relatively larger abdomen and smaller uropods. With the exception of *C. pectinatus*, all these species clearly differ from *C. crusmae* in the second antennae of their males (though the male of *C. pectinatus* has not been described). Only *C. savala* has the claw of the male second antenna of a similar structure, but that claw is proportionately much smaller than the one of the male *C. crusmae*.

Taking all these differences into account, the authors feel justified in creating a new taxon for their specimens from *Chromis crusma*.

#### ACKNOWLEDGEMENTS

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#### RÉSUMÉ

Description et figuration de *Caligus crusmae*, parasite sur *Chromis crusma* (Val.), d'Antofagasta, Chili.

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## RESUME

Descriptores: *Caligus clemensi*, género sin género conocido (Caligidae), Chile.

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