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FIRST RECORD OF *ROCINELA* AFF. *AUSTRALIS* (ISOPODA, AEGIDAE) IN  
THE PATAGONIAN TOOTHFISH *DISSOSTICHUS ELEGINOIDES* (PISCES,  
NOTHOTENIDAE) FROM SOUTHERN CHILE

BY

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ABSTRACT

An isopod of the family Aegidae, provisionally referred to as *Rocinela* aff. *australis* Schiøedte & Meinert, 1879, is reported from the Patagonian toothfish *Dissostichus eleginoides* Smitt, 1898, from off the Biobío region, Chile. One specimen was collected, its body suboval, symmetrical, the dorsum weakly vaulted, stout, and with a few pits on the body. The specimen collected clearly belongs to the genus *Rocinela* and within that genus would most closely resemble *Rocinela australis*, but its actual specific status, whether an established species of the genus (and if so, which one) or possibly proving to be an as yet undescribed species, will have to await close examination by a specialist in marine isopod taxonomy. For the time being, we refer to the specimen as “*Rocinela* aff. *australis*”, since, compared with existing *Rocinela* spp., it matches best with that species both in general morphology and in geographical occurrence. This species, then, was reported until now only for the Strait of Magellan, Magellan region, and the southern Argentinean Atlantic coast. Thus, if the specimen would prove to really belong to *Rocinela australis*, then this report would constitute the most northern record of that species.

RESUMEN

Un isópodo de la familia Aegidae, denominado provisionalmente *Rocinela* aff. *australis* Schiøedte & Meinert, 1879, se reporta a partir del bacalao de profundidad *Dissostichus eleginoides* Smitt, 1898, de la región del Biobío, Chile. Se recogió un espécimen, su cuerpo suboval, simétrico, el

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dorso débilmente abovedado, robusto y con pocos puntos puntiagudos en el cuerpo. El espécimen recolectado pertenece claramente al género *Rocinela* y dentro de ese género se parecería más a *Rocinela australis*, pero su estado específico real, ya sea una especie establecida del género (y si es así, cuál) o posiblemente demostrando ser una especie aún no descrita. especies, deberán esperar un examen detenido por parte de un especialista en taxonomía de isópodos marinos. Por el momento, nos referimos al espécimen como “*Rocinela* aff. *australis*”, ya que, en comparación con las *Rocinela* spp. existentes, coincide mejor con esa especie tanto en la morfología general como en la presencia geográfica. Esta especie, entonces, fue reportada hasta ahora solo para el Estrecho de Magallanes, región de Magallanes y la costa atlántica sur argentina. Por tanto, si el espécimen resulta pertenecer realmente a *Rocinela australis*, este informe constituiría el registro más septentrional de esa especie.

## INTRODUCTION

In the marine environment, Isopoda are important constituents of the invertebrate fauna. In this ecosystem, the influence of isopods can be substantial at various levels, especially considering their different roles in the marine food webs (Riseman & Brusca, 2002). For example, members of the family Aegidae, *Aega* Leach, 1815 with eight species, *Aegapheles* Bruce, 2009 with seven species, *Aegiochus* Bovallius, 1885 with 16, *Epulaega* Bruce, 2009 with two, *Rocinela* Leach, 1818 with nine, and *Syscenus* Harger, 1880 with five species (cf. Bruce, 2009), are recognized as temporary predators or parasites of fish (Brusca & Iverson, 1985).

Within the Aegidae, the genus *Rocinela* Leach, 1818, comprises species with a cosmopolitan distribution, but that are only scarcely reported. According to Brusca & France (1992), species of *Rocinela* are distinguished from all other aegid genera by the gradually tapering lateral body margins, a 2- or 3-articulate maxillipedal palp, normal (unexpanded) antennal peduncles, a small frontal lamina and broadly expanded clypeus region, a small free labrum and an elongate first article of the mandibular palp. To determine interspecific differences, the most useful characteristics are the shape of the frontal margin and frontal lamina, the pereopodal armature, and the shape and armature of the uropods. However, the same authors (Brusca & France, 1992) point out that the species of *Rocinela* are little known, due to the scarcity of collected specimens and the fact that most of their descriptions date from before 1905.

The Patagonian toothfish *Dissostichus eleginoides* Smitt, 1898, known also as Chilean sea bass, constitutes an important human resource in southern fisheries. This species is distributed along the continental slope up to the Diego Ramirez Islands at depths of 80-2500 m (Rodríguez & George-Nascimento, 1996; Murillo et al., 2008; Oliva et al., 2008; Collins et al., 2010).

With the aim of providing information about the taxonomic composition of the parasites found on and in *D. eleginoides*, the record of an ectoparasitic crustacean of the isopod genus *Rocinela* in *D. eleginoides* captured along the coast of central-south of Chile, was noted and is here reported.

## MATERIAL AND METHODS

During the legally determined fishing period, i.e., between May and September 2018, from a location at 37°10'S 74°15'E (mean depth: 920 m), three *Dissostichus eleginoides* were captured and sent to the Pisciculture and Aquatic Pathology Laboratory (University of Concepcion). A subsequent necropsy of the captured fish revealed the presence of one specimen of ectoparasitic isopod, adhered to the right branchial arch of one of the specimens. The parasite was fixed in absolute ethanol and sent first to the Parasitology Laboratory (University of Concepcion), and next to the Biological and Chemical Sciences Department (Catholic University of Temuco) for identification according to the descriptions given in Richardson (1898), Schiödte & Meinert (1879), Brusca & France (1992), and Bruce (2009). The specimen is now kept in the laboratory of Prof. Patricio De los Ríos-Escalante (Catholic University of Temuco).

As regards the description, we have been able to acquire two general photographs of the specimen's habitus (see fig. 1). However, as we are not taxonomists, we had no facilities to make taxonomically adequate line drawings. Accordingly, our figures had to be restricted to "field sketches" that are sufficient for our ecological purposes, but cannot be used to verify any morphological details in a taxonomic sense (as apparent from fig. 2).



Fig. 1. The specimen of *Rocinela* aff. *australis* Schiödte & Meinert, 1879, collected from *Dissostichus eleginoides* Smitt, 1898, and examined in the present study: left, dorsal view; right, ventral aspect.

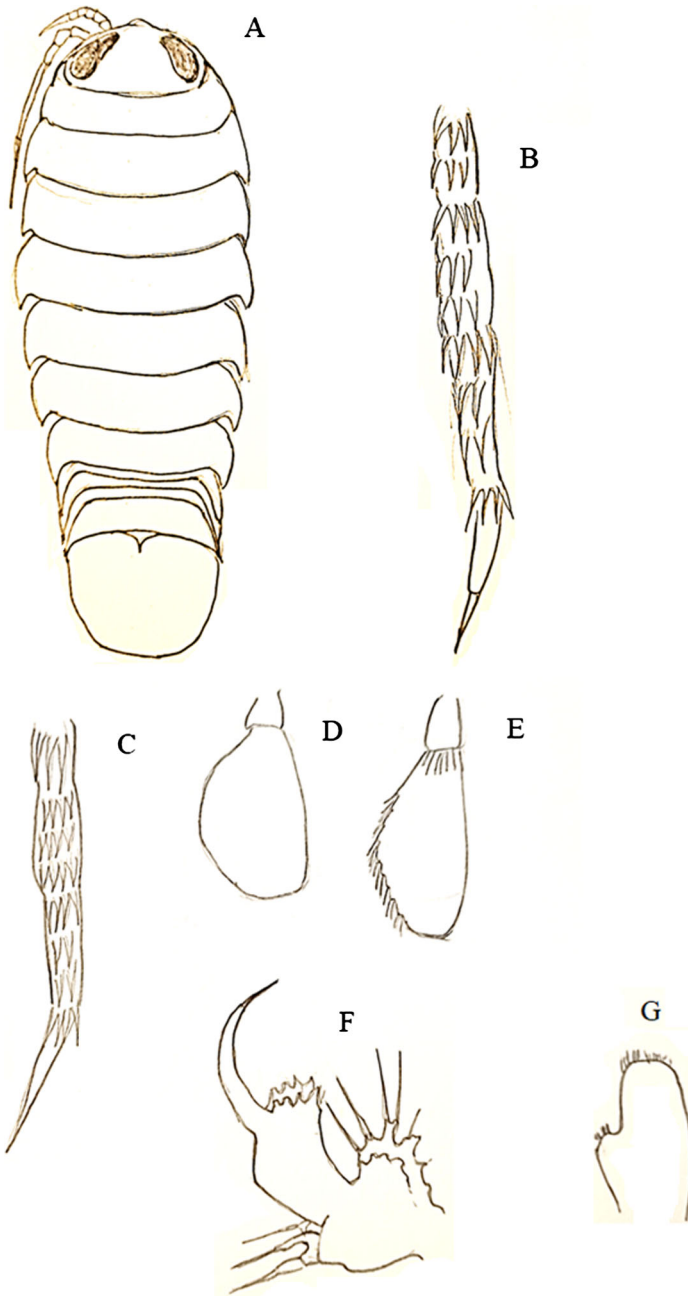


Fig. 2. Crude field sketches of some morphological aspects of the specimen of *Rocinela* aff. *australis* Schiødt & Meinert, 1879 examined in this study: A, dorsal view; B, first pereopod; C, third pereopod; D, pleopod representative of pleopods I-IV; E, pleopod representative of pleopods V-VI; F, maxilliped representative of maxillipeds I-III; G, mandible.

**Rocinela aff. australis** Schiødt & Meinert, 1879

(figs. 1-2)

Material examined.— One specimen, sex not determined, body 45 mm long, 18 mm greatest width; from 37°10'S 74°15'E, off Biobio Region, Chile, average depth ca. 920 m; on right branchial arch of host *Dissostichus eleginoides* Smitt, 1898, caught between May and September 2018.

Provisional, crude description.— Length 45 mm, maximum width 18 mm (figs. 1, left and right, 2A), body 3 times as long as wide, widest at pereonite 4, sub-oval, symmetrical, dorsum weakly vaulted, stout, and with few pits on the body. Cephalon 3 times as wide as long, anteriorly somewhat triangular, slightly constricted margin posterior to eyes, posterior margin smooth, anterior margin rounded. Eyes very large, separated by less than one eye-width. First pair of antennae with six segments (fig. 2A). Mandible lacking lacinia mobilis, molar process reduced (fig. 2G). Terminal articles of maxillipeds with stout, recurved setae, palp of maxillipeds with two articles (fig. 2F).

Pereon broad, convex, individual pereonal somites much wider than long, pereon with seven distinct, separated pereonites. Angles of first pereonite extended forward below eye for less than one eye length. Pereiopods prehensile. Propodi of pereopods I-III large, broad, with four to six acute spines, dactyli of pereopods I-III longer than propodi, meri of pereopods I with three large spines (fig. 2B), meri of pereopods III with four spines in total, 1 spine in sub-basal position (fig. 2C).

Pleon with six fully separated somites including pleotelson counted as one unit. Pleotelson subequal to, or slightly narrower than, width of pleonite 5. Dorsal integument of pleotelson largely depressed except for antero-dorsal rim (fig. 1, left). Pleopods generally similar, fourth and fifth pair not operculiform (figs. 2D, E).

Uropodal rami flattened, fan-like. Uropods in plane of pleotelson. Medial angle of uropodal peduncle extending over less than 50% but more than 40% length of endopod; lateral margins of pleonite 5 ending in acute posterior points.

The described specimen was preserved; its colour was white after two years in ethanol 96 %.

Remarks.— First of all, the above description is not meant to present a set of taxonomically useful characters at species level, but only serves to justify the choice of the genus in which the species represented by our unique specimen is supposed to belong. The description should, however, suffice for a characterization of the isopod in the local, pelagic ecosystem.

Marine parasitic isopods are frequent in warm waters, although relict species such as *Rocinela australis* were reported for cold and temperate waters (Brusca & France, 1992). While within the life cycle of these species there are free-living stages, they can directly contact their eventual hosts to feed, being opportunistic

and apparently not presenting specificity for any species of fish in particular (Wing & Moles, 1995). Brusca & France (1992) point out that isopods of the genus *Rocinela* are temporary ectoparasites that feed on the host's blood and mucus and are later shed off their temporary host. However, the close association of the parasite with the tissue can cause significant damage to the host. In this regard, it has been reported that parasitizations by species of *Rocinela* have caused lesions and predisposition to secondary infections (Wing & Moles, 1995; Cavalcanti et al., 2012). Thus, this type of ectoparasites, being intermittent feeders, will generate such damage to the host that its growth rate, and thus its production, will be affected (Bunkley-Williams & Williams, 1998; Lester, 2005).

The scarce previous reports available about *R. australis* establish its distribution mainly in the Strait of Magellan (Schioedte & Meinert, 1879), which is confirmed by more recent literature (Ortmann, 1911; Menzies, 1962; Brandt, 1991; Espinoza-Pérez & Hendrickx, 2006; Bruce, 2009). Nevertheless, González et al. (2008) do not mention this species, but Muñoz & Olmos (2007) reported the genus *Rocinela* as a parasite of Chilean marine fishes, specifically *Sebastes capensis* (Gmelin, 1789) in the Antofagasta region (Oliva & González, 2004; González & Poulin, 2005).

The literature about the parasitic fauna of *D. eleginoides* at other latitudes (Parukhin & Lyadov, 1982; Gaevskaya et al., 1990; Hamilton, 1995; Brickle, 2003; Brickle et al., 2005, 2006; Brown et al., 2013), and the Chilean seas, allow to denote that the present study is the first report of *R. aff. australis* on *D. eleginoides*. If it is correct that *D. eleginoides* is distributed off the central-south of Chile (Espinoza-Perez et al., 2009), the results would agree with the original descriptions in the literature. Nevertheless, given the fact that only the present specimen has been found, of which the identity still must remain uncertain, and also in view of the few other reports on *R. australis*, we believe that it is not possible to use this species as an eventual biomarker, nor to discuss its possible zoogeographic affinities with the total of the Chilean fauna.

*Dissostichus eleginoides* being an important fishery resource, we intend to continue parasitological studies of this host, which we hope will contribute to clarify the occurrence as well as the ecological role of *Rocinela* spp. in the local ecosystem.

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## REFERENCES

- BRANDT, A., 1991. Zur Besiedlungsgeschichte des antarktischen Schelfes am Beispiel der Isopoda (Crustacea, Malacostraca). Ber. Polarforsch. (Bremerhaven), **98**: 1-240.
- BRICKLE, P., 2003. The parasite ecology of the Patagonian toothfish (*Dissostichus eleginoides* Smitt, 1898): 1-211. (Ph.D. Thesis, Aberdeen University, Aberdeen, Scotland, U.K.).
- BRICKLE, P., K. MACKENZIE & A. PIKE, 2005. Parasites of the Patagonian toothfish, *Dissostichus eleginoides* Smitt, 1898, in different parts of the sub-Antarctic. Pol. Biol., **28**: 663-671.
- BRICKLE, P., K. MACKENZIE & A. PIKE, 2006. Variations in the parasite fauna of the Patagonian toothfish (*Dissostichus eleginoides* Smitt, 1898), with length, season, and depth of habitat around the Falkland Islands. J. Parasitol., **92**: 282-291.
- BROWN, J., P. BRICKLE & B. E. SCOTT, 2013. The parasite fauna of the Patagonian toothfish *Dissostichus eleginoides* off the Falkland Islands. J. Helminthol., **87**: 501-509.
- BRUCE, N. L., 2009. The marine fauna of New Zealand: Isopoda, Aegidae (Crustacea). NIWA Biodiv. Mem., **122**: 1-252.
- BRUSCA, R. D. & S. C. FRANCE, 1992. The genus *Rocinela* (Crustacea: Isopoda: Aegidae) in the tropical Eastern Pacific. Zool. J. Linnean Soc., **106**: 231-275.
- BRUSCA, R. D. & E. W. IVERSON, 1985. A guide to the marine isopod Crustacea of Pacific Costa Rica. Rev. Biol. Trop., **33**: 1-77.
- BUNKLEY-WILLIAMS, L. & E. H. WILLIAMS, 1998. Isopods associated with fishes: a synopsis and corrections. J. Parasitology, **84**(5): 893-896.
- CAVALCANTI, E. T. S., S. K. S. NASCIMENTO, N. H. C. BARROS & S. CHELLAPPA, 2012. Occurrence of the isopod parasite *Rocinela signata* (Isopoda: Aegidae) on marine fish *Sparisoma frondosum* (Osteichthyes: Scaridae). J. Mar. Biol. Assoc. U.K., **5**(1): 1-4.
- COLLINS, M. A., P. BRICKLE, J. BROWN & M. BELCHIER, 2010. The Patagonian toothfish: biology, ecology and fishery. Adv. Mar. Biol., **58**: 227-300.
- ESPINOZA-PÉREZ, M. C. & M. E. HENDRICKX, 2006. A comparative analysis of biodiversity and distribution of shallow-water marine isopods (Crustacea: Isopoda) from Polar and temperate waters in the East Pacific. Belgian J. Zool., **136**: 219-247.
- ESPINOZA-PÉREZ, M. C., M. E. HENDRICKX & J. J. MORRONE, 2009. Identification of generalized tracks for the species of Isopoda (Peracarida) from Eastern Pacific. J. Crust. Biol., **29**: 224-231.
- GAEVSKAYA, A. B., A. A. KOVALJOVA & A. M. PARUKHIN, 1990. Peculiarities and formation of parasitofauna of the Patagonian toothfish *Dissostichus eleginoides*. Biol. Morya, **4**: 23-28.
- GONZÁLEZ, E. R., P. A. HAYE, M. J. BALANDA & M. THIEL, 2008. Lista sistemática de peracáridos de Chile (Crustacea, Eumalacostraca). Gayana, **72**: 157-177.
- GONZÁLEZ, M. T. & R. POULIN, 2005. Nested patterns in parasite component communities of a marine fish along its latitudinal range on the Pacific coast of South America. Parasitology, **131**: 1-9.
- HAMILTON, H. F., 1995. A preliminary parasite survey of the Patagonian toothfish (*Dissostichus eleginoides* Smitt, 1898) from the Falkland Islands with a view to differentiation of stocks in the Antarctic: 1-49. (M.Sc. Thesis, Aberdeen University, Aberdeen, Scotland, U.K.).
- LESTER, R. J. G., 2005. Isopoda (Isopods). In: K. RHODE (ed.), Marine parasitology: 138-144. (CSIRO Publishing, Canberra, ACT, Australia).
- MENZIES, R. J., 1962. The zoogeography, ecology, and systematics of the Chilean marine isopods. Reports of the Lund University Chile Expedition 1948-49, **42**. Lunds Universitets Årsskrifter, (N.F.) (Avd. 2) **57**: 1-162.
- MUÑOZ, G. & V. OLMOS, 2007. Revisión bibliográfica de especies ectoparásitas y hospedadoras de sistemas acuáticos de Chile. Rev. Biol. Mar. Ocean., **42**: 89-148.
- MURILLO, C., C. OYARZÚN & I. FERNÁNDEZ, 2008. Latitudinal and temporal variation in the diet of *Dissostichus eleginoides* Smitt, 1898 (Perciformes: Nototheniidae) deep environments of the south and center coast of Chile. Gayana, **72**: 94-101.



- NELSON, J., T. C. GRANDE & M. V. H. WILSON, 2016. Fishes of the world. (John Wiley & Sons, Inc., Hoboken, New Jersey).
- OLIVA, M. E., I. FERNÁNDEZ, C. OYARZÚN & C. MURILLO, 2008. Metazoan parasites of the stomach of *Dissostichus eleginoides* Smitt, 1898 (Pisces: Nototheniidae) from southern Chile: A tool for stock discrimination? *Fish. Res.*, **91**: 119-122.
- OLIVA, M. E. & M. T. GONZÁLEZ, 2004. Metazoan parasites of *Sebastes capensis* from two localities in northern Chile as tools for stock identification. *J. Fish Biol.*, **64**: 170-175.
- ORTMANN, A. E., 1911. Crustacea of southern Patagonia. Reports of the Princeton University Expeditions to Patagonia, 1896-1899, (Zoology) **3**: 635-667, pl. XLVIII.
- PARUKHIN, A. M. & V. N. LYADOV, 1982. Helminth fauna of food Nototheniidae fishes from Kerguelen region. *Ekol. Morya, Kiev*, **10**: 49-57.
- RICHARDSON, H., 1898. Description of four new species of "*Rocinela*", with a synopsis of the genus. *Proc. American Phil. Soc.*, **37**: 8-17.
- RISEMAN, S. F. & R. C. BRUSCA, 2002. Taxonomy, phylogeny and biogeography of *Politolana* Bruce, 1981 (Crustacea: Isopoda: Cirolanidae). *Zool. J. Linn. Soc.*, **134**: 57-140.
- RODRÍGUEZ, L. & M. GEORGE-NASCIMENTO, 1996. The metazoan parasite fauna of the Patagonian toothfish *Dissostichus eleginoides* Smitt, 1898 (Pisces: Nototheniidae) of central Chile: taxonomic, ecological and zoogeographic aspects. *Rev. Chilena Hist. Nat.*, **69**: 21-33.
- SCHIÖDTE, J. C. & F. MEINERT, 1879. Symbolae ad monographiam Cymathoarum Crustaceorum Isopodum familiae. *Natur. Tidss.*, (Tred: Raekke) **12**: 321-414.
- WING, B. L. & D. A. MOLES, 1995. Behavior of *Rocinela angustata* (Isopoda, Aegidae), an ectoparasite of Alaskan marine fishes. *J. Aquat. Anim. Health*, **7**: 34-37.

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