

Halacarids (Acari) from coral reefs off Norway, Northern Atlantic: Description of a new *Agauopsis* species

ILSE BARTSCH

(With 15 figures)

Abstract

A new species, *Agauopsis corallinus* sp. n., is described from a coral reef from the mid-Norwegian shelf, Northern Atlantic. *Agauopsis corallinus* sp. n. is most similar to *A. meteoris* Bartsch, a species recorded from the Josephine Seamount, northeastern Atlantic, off Portugal. The two species differ in the arrangement and size of the porose areolae.

Introduction

The existence of coral reefs in Norwegian waters has been known for centuries to fishermen and scientists, reefs built by cold-water stony corals. On the Sula Ridge, at 64° N, there is such a coral reef in water depth of 270-310 m; the reef is about 15 km in length, up to 300 m in width and 10-35 m in height (Freiwald *et al.* 1999; Fosså *et al.* 2000). The reefs are formed mainly by colonies of the scleractinian coral *Lophelia pertusa* (Linné, 1758); another six species of Scleractinia are reported on (Freiwald & Mortensen 2000).

The reefs provide numerous habitats for a sessile and motile fauna. The associated sponges and hydrozoans on deep-water corals off Norway have been studied in recent years, as well as the macro- and megafauna (Jensen & Frederiksen 1992; Mortensen *et al.* 1995; Freiwald & Mortensen 2000; Thiel *et al.* 2002). The taxon Halacaridae has been recorded from cold water reefs (Jensen & Frederiksen 1992), but the species composition is unknown. The present paper presents a description of a halacarid species new to science.

Material and Methods

In the course of the project BOSMAN (Boreal Sponges-Sources of Marine Natural Products), coral fragments were collected in summer 1999 during dives of the manned submersible 'Jago' which was operated from the R/V Poseidon (POS 254). Collecting area was the Sula Ridge, a coral reef structure on the mid-Norwegian shelf.

Halacarids were extracted by washing coral fragments over a sieve with 100 μm mesh size. The halacarid mite described was cleared in lactic acid and mounted in glycerine jelly. The holotype is deposited in the Zoological Museum, Hamburg (ZMH).

Abbreviations used in the descriptions are: *AD*, anterior dorsal plate; *AE*, anterior epimeral plate; *ds-1* to *ds-6*, first to sixth (pair of) dorsal idiosomatic seta(e); *GA*, genitoanal plate; *GO*, genital opening; *OC*, ocular plate(s); *P-3* and *P-4*, third and fourth palpal segment; *pas*, parambulacral seta(e); *PD*, posterior dorsal plate; *PE*, posterior epimeral plate(s); *pgs*, perigenital setae; *sgs*, subgenital setae. Legs numbered I to IV.

Systematics

Subfamily Halacarinae Viets, 1927

Genus *Agauopsis* Viets, 1927

Agauopsis corallinus sp. n.

Figs 1-14

MATERIAL EXAMINED: Holotype male, ZMH A17/03, Northeastern Atlantic, Sula-Ridge, 64°04'50" N, 08°01'40" E, depth 285 m, POS 254, Sample 22J1-10, 31 July 1999. Coll. W. Michaelis and T. Pape.

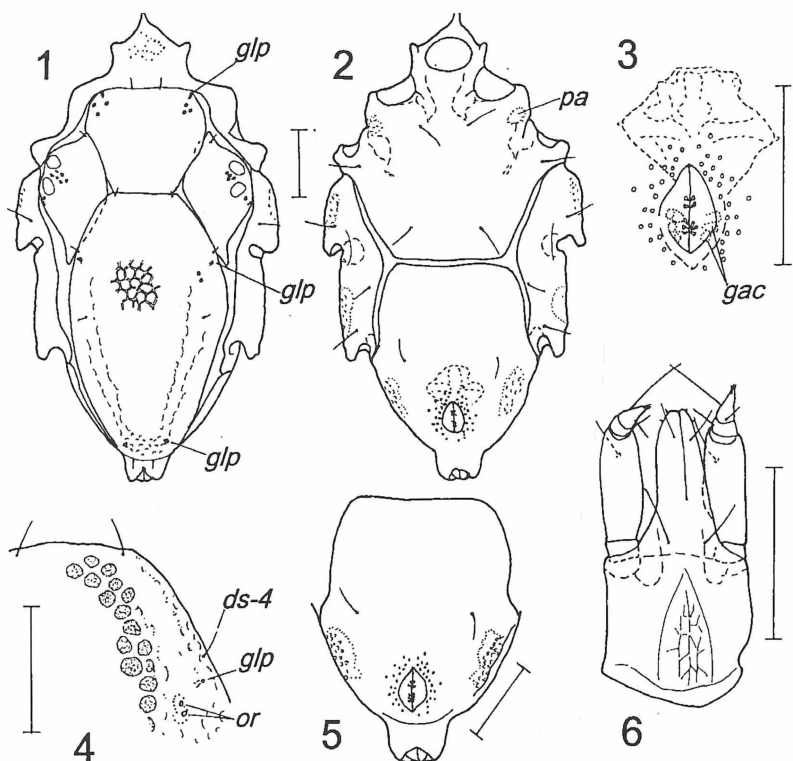
ETYMOLOGY: Derived from the substratum, *corallium* (Latin), coral.

DIAGNOSIS: Length 345 μm . With tricuspid anterior margin. *PD* with V-shaped costae; almost no rosette pores in anterior parts of costae but pores present posteriorly; remainder of plate panelled. Ventral plates with delimited porose areolae; remainder of plates almost smooth. Porose areolae with rosette pores. Male *GA* with pair of rosette pores, 41 perigenital setae close around *GO* and one pair of outlying setae. Integument of gnathosomal base smooth. *P-3* with long, slender seta. *P-4* with two setae in basal whorl. On leg I telofemur with one long ventral spine and three ventromedial spines; genu with short ventral and longer ventromedial spine; tibia with two ventral and three ventromedial spines, the basal ones situated close together but not contiguous. Tibiae II to IV with three ventral bristles. Claws on leg I almost as long as claws on following legs.

DESCRIPTION: Idiosomal length 345 μm , width 205 μm . Dorsal plates separated by narrow striae of membraneous integument. Plates with raised areas with rosette pores; each such pore with ostium and canaliculi. Length of *AD* 132 μm , width 93 μm . Anterior tricuspid margin of idiosoma formed by fusion of anterior dorsal plate and portion of *AE* (Fig. 1). Anteriorly integument with epicuticular droplets arranged in polygons; posterior portion of *AD* panelled. Posterior margin of *AD* truncate. Pair of gland pores and porose areolae close to lateral margin of *AD*; porose areolae with three rosette pores each. Length of *OC* 100 μm , width 55 μm ; anteriorly and posteriorly pointed. Plate with two corneae and eye pigment beneath corneae, raised areola with 4-6 rosette pores. Gland pore posterior to corneae. Length of *PD* 197 μm , width 125 μm . V-shaped, raised costae extending anteriorly to about the level of posterior angle of *OC*. Two rosette pores in anterior end of right costa, no pores within left costa; seven

ral rosette pores in posterior portion of *PD*. Integument between costae panelled. One pair of gland pores near lateral margin (Fig. 4) at the level of posterior corner of *OC*, second pair of gland pores in margin of porose areola. Dorsal setae short, pair of *ds-1* immediately anterior to level of gland pores; *ds-2* in anterior corner of *OC*; *ds-3* to *ds-6* on *PD*, *ds-3*, *ds-4* and *ds-5* almost equidistant. Pair of *ds-6* in posterior margin of *PD*.

Ventral plates large, almost smooth apart from marginal, delimited porose areolae. Such porose areolae posterior to insertion of leg I as well as anterior and posterior to leg III (Fig. 2). Rosette pores of areolae with deep ostia, slit-like or circular at the surface, surrounded by numerous canaliculi. Length of *AE* 139 μ m, width 182 μ m. Camerostome anterior to the level of insertion of leg I. *AE* with three pairs of setae; epimeral pores



Figs 1-6. *Agauopsis corallinus* sp. n., male: 1 - idiosoma, dorsal; 2 - idiosoma, ventral; 3 - genital opening and spermatopositor; 4 - portion of anterior and right *PD* level with *ds-4*; 5 - genitoanal plate, ventral; 6 - gnathosoma, ventral. (*ds-4*, fourth dorsal idiosomatic seta; *gac*, genital acetabula; *glp*, gland pore; *or*, ostia of rosette pore; *pa*, porose areola). Scale = 50 μ m.

not discernible. *PE* with one dorsal seta and three ventral setae. Length of *GA* 157 μm , width 127 μm . Plate with pair of marginal porose areolae. *GO* small, surrounded by 41 *pgs*, in addition one pair of outlying setae anterior to *GO* (Fig. 5). Spermatopositor 42 μm long, 47 μm wide, extending beyond *GO* and beyond ring of *pgs*, almost reaching the level of outlying setae. Genital sclerites with five pairs of *sgs*. *GO* with three pairs of internal genital acetabula (Fig. 3).

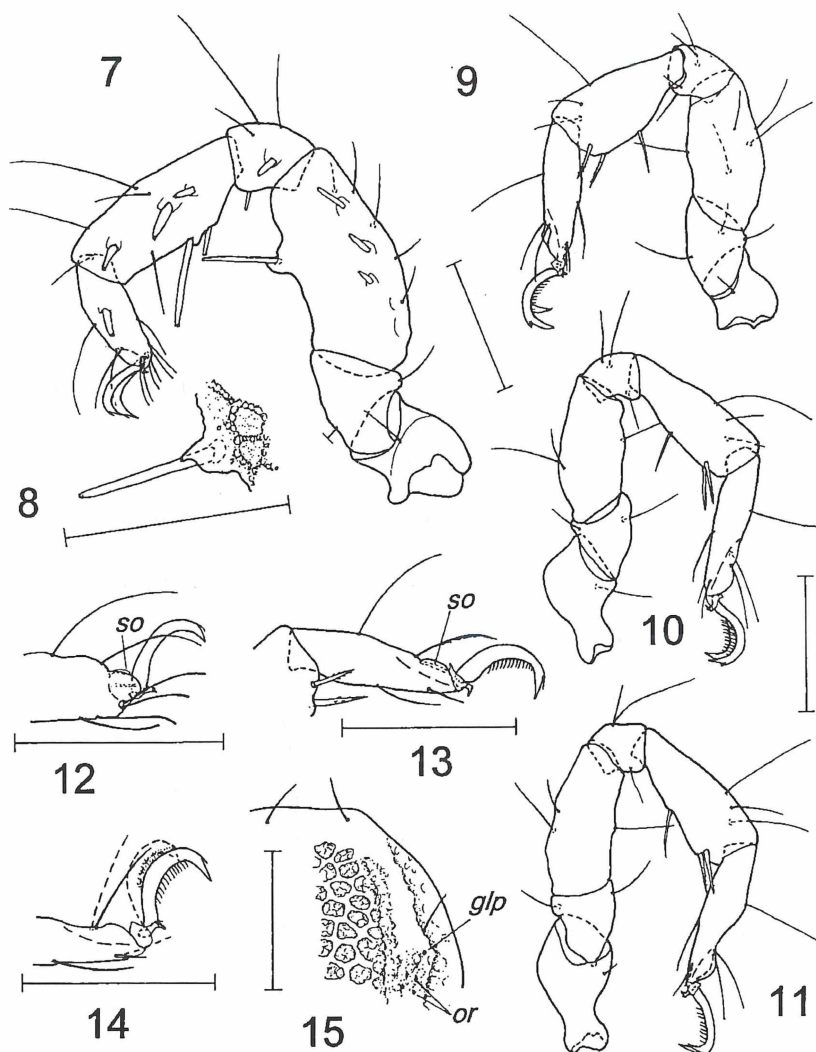
Gnathosomal length 87 μm , width 45 μm . Gnathosomal base without rosette pores. Tectum truncate. Basal pair of maxillary setae long and inserted near base of rostrum, apical pair short and in posterior third of rostrum. Bristle-like seta of *P*-3 as long as that segment. Basal portion of *P*-4 with short ventral and long dorsal seta.

Leg I (Fig. 7) larger than following legs (Figs 9-11). Telofemora I and II with coarse reticulate ornamentation (Fig. 8). Leg chaetotaxy (spines in roman numerals; solenidia, famulus and *pas* excluded): leg I, 1, 2, 5+IV, 3+II, 5+V, 6+I; leg II, 1, 3, 5, 4, 6, 4; legs III and IV, 1, 2, 3, 3, 6, 4. Telofemur I with four spines, ventral spine conspicuously long, longer than three ventromedial spines. Ventromedial spine of genu I large, ventral spine short, one third of the length of the former. Tibia I with three ventromedial and two ventral spines; both basalmost spines short, the others long. All spines on leg I with denticulate tip (Fig. 8). Tarsus I with one ventromedial spine, three eupathid ventral setae, pair of doubled *pas*, three dorsal fossary setae, and a small dorsomedial solenidion adjacent to lateral fossa membrane (Fig. 12). Famulus represented by canal within a membrane. Tarsi II to IV each with three fossary setae, paired setae slightly widened and situated on fossa membranes. Tarsus II with slender medial *pas* and one long and one small lateral *pas*; on tarsi III and IV medial *pas* slender, lateral *pas* half as long but slightly thicker (Fig. 14). Solenidion of tarsus II about 7 μm long, situated on inside of medial fossa membrane (Fig. 13).

Paired claws of tarsus I almost as long as those of other tarsi. Claws with accessory process, claws of tarsi I without pecten, those of tarsi II to IV with numerous tines. Median claw small, with minute dorsal and slightly longer ventral dent.

REMARKS: *A. corallinus* sp. n. is similar to the northern Atlantic species *A. minor* (Trouessart, 1894) and *A. meteoris* Bartsch, 1973. Records of *A. minor* are from the English Channel, off France, a record of *A. meteoris* is from the Josephine Seamount, off Portugal (Trouessart 1894a, b; Bartsch 1973, 2001), the record Great Meteor Seamount in Bartsch (2001) is a lapse. Differences between *A. corallinus* and *A. meteoris* are: (1) areola with rosette pores mainly restricted to posterior margin of *PD* (*A. corallinus*) vs numerous pores within costae (*A. meteoris*), (2) anterior gland pore of *PD* close to lateral margin (*A. corallinus*) vs immediately adjacent to porose costae (Fig. 15, *A. meteoris*), (3) male *GA* with pair of porose areolae with rosette pores (*A. corallinus*) vs without porose areolae (*A. meteoris*). *A. minor* is easily distinguished from *A. corallinus* on the base

of (1) the shape of the anterior margin of the idiosoma with a median spine and truncate lateral processes in *A. minor* but three spiniform processes in *A. corallinus*, (2) the numerous rosette pores on the PD, and (3) the absence of a ventral seta on the tarsi III and IV.



Figs 7-15. *Agauopsis corallinus* sp. n., male (7-14): 7 - leg I, medial; 8 - ventral spine of telofemur I, lateral; 9 - leg II, medial; 10 - leg III, medial; 11 - leg IV, medial; 12 - tip of tarsus I, lateral (medial setae and claw omitted); 13 - tarsus and distal part of tibia II, medial, male (lateral setae and claw omitted); 14 - tip of tarsus III, lateral (medial setae and claw in broken line) (so, solenidion); 15 - *Agauopsis meteoris* Bartsch, male: 15 - portion of anterior and right PD level with *ds-4* (glp, gland pore; or, ostia of rosette pore). Scale = 50 μ m.

The major differences between *A. corallinus* and *A. meteoris* are the arrangement and size of the porose areolae. These differences are distinct and assumedly beyond the range of a possible variability. There are no records of any influence on the development of characters in halacarids by metabolites released from the substratum and/or the associated flora and fauna.

Co-occurring halacarid fauna: Two species of *Lohmannella* and one of *Copidognathus* were present in the same small sample. One of the *Lohmannella* species has a very long rostrum, the other is most similar to *L. falcata* (Hodge, 1863). The single *Copidognathus* species is characterized by a slender idiosoma. The author expects the deep-water coral reefs to contain a halacarid fauna rich in species and numbers.

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Zusammenfassung

Eine neue Art, *Agauopsis corallinus*, wird beschrieben. Die Art stammt von einem Kaltwasser-Korallenriff vom Mittelnorwegischen Schelf. *A. corallinus* ist *A. meteoris* äußerst ähnlich. Die letztgenannte Art, gemeldet von der Josephine Bank, gehört ebenfalls zur Fauna des Nordostatlantiks. Die zwei Arten lassen sich aufgrund der Anordnung und Größe der Porenareale unterscheiden.

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Author's address:

Dr. I. BARTSCH, Deutsches Zentrum für Marine Biodiversitätsforschung, Forschungsinstitut Senckenberg, Notkestr. 85, D 22607 Hamburg, Germany.

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