Persian J. Acarol., 2023, Vol. 12, No. 1, pp. 1–19.
https://doi.org/10.22073/pja.v12i1.76823
Journal homepage: http://www.biotaxa.org/pja

Article

Halacaridae (Acari) from Tenerife (Canary Islands)

Furkan Durucan[1], Juan Carlos De La Paz[2] and David Hernández-Teixidor[2,3]

1. *Department of Aquaculture, Isparta University of Applied Sciences, 32260 Isparta, Türkiye; E-mail: f_durucan@hotmail.com*
2. *Grupo de Investigaciones Entomológicas de Tenerife, 38206 La Laguna, Tenerife, Canary Islands, Spain; E-mail: juancarlos@nuryana.com*
3. *Island Ecology and Evolution Research Group, Instituto de Productos Naturales y Agrobiología (IPNA-CSIC), 38206 La Laguna, Tenerife, Canary Islands, Spain; E-mail: davidhdez@ipna.csic.es*

ABSTRACT
In the present study, halacarid mites inhabiting various macroalgae, barnacles and sand sediments from Tenerife (Canary Islands) were examined and identified for the first time. Among 114 individuals, 11 halacarid species belonging to six genera were detected: *Agaue adriatica*, *Agauopsis brevipalpus*, *Agauopsis microrhyncha*, *Agauopsis tricuspis*, *Copidognathus lamelloides*, *C. magnipalpus*, *C. remipes*, *Halacarus subtilis*, *H. actenos*, *Halacaropsis hirsuta* and *Rhombognathus procerus*. Presence of the epibiont suctorian ciliate species "*Praethecacineta halacari*" on *C. magnipalpus* is reported for the first time from the Canary Islands.

KEYWORDS: Atlantic ocean, biodiversity, Macaronesia, new records, Prostigmata.

PAPER INFO.: Received: 27 August 2022, Accepted: 25 September 2022, Published: 15 January 2023

INTRODUCTION

The mite family Halacaridae Murray, 1877 comprises about 1150 species, which are found from tropical to polar regions, and from upper altitude areas to abyssal depths (Bartsch 2021; Chatterjee and Durucan 2022; WoRMS 2022). Halacarids generally live in submerged habitats in a variety of substrata (e.g. bryozoans, sponges, macroalgae, large seagrass fronds, polychaetes, hydrozoans, barnacles, mussels, flocculent ooze, amongst surface structures, crustaceans and between spines and in the gut of echinoderms) (Bartsch 2006). Some species are also associated with mangroves (Chatterjee *et al*. 2018) and seagrasses (Chatterjee and Durucan 2022), and others with decapods (Chatterjee 2020). A list of the few parasitic or suspected parasitic forms has recently been provided by Chatterjee (2021). Tenerife is the largest of the Canary Islands, covering a land area of 2,034 km^2. It is situated in the Atlantic Ocean, off the north western coast of Africa. So far, only two *Agauopsis* species [*Agauopsis brevipalpus* (Trouessart, 1889) in Bartsch (2015) and *Agauopsis pteropes* Bartsch, 1986 in Bartsch (2009)] have been reported from Tenerife, so this paper aims to provide new halacarid mite records from Tenerife.

MATERIALS AND METHODS

Samples were collected by the second author (JCP) from 2018 to 2020, either by snorkelling or by

How to cite: Durucan, F., De La Paz, J.C. & Hernández-Teixidor, D. (2023) Halacaridae (Acari) from Tenerife (Canary Islands). *Persian Journal of Acarology*, 12(1): 1–19.

hand at intertidal and subtidal habitats (0–8 m) at two sites (El Pris: 28,50943226, -16,42206246; La Barranquera: 28,53818534, -16,39664927) at Tenerife, Canary Islands (Figs. 1–2). Immediately after collection, sand, various macroalgae (*Amphiora* sp.; *Jania* sp.; *Laurencia* sp.; *Corallina ferreyrae* E.Y. Dawson, Acleto & Foldvik; *Gelidium pusillum* (Stackhouse) Le Jolis; *Hypnea spinella* (C. Agardh) Kützing; *Palisada perforata* (Bory) K.W. Nam) and barnacles "*Chthamalus stellatus* (Poli, 1791)" retained in the set of sieves (63 µm, 500 µm, 1 mm) were sorted under binocular microscope (Leica ES2). Mites were conserved in glycerine with ethanol, cleared in lactic acid and mounted in Hoyer's medium. Drawings were made using two different microscopes (Nikon Eclipse E400 and Olympus BX-51) with camera lucida. These drawings were first scanned, then processed and digitized with the free open-source vector graphics editor Inkscape (https://inkscape.org). All measurements are given in micrometers (µm). The mite specimens are deposited at Eğirdir Fisheries Faculty, Isparta University of Applied Sciences, Isparta, Türkiye. Terminology and abbreviations follow Bartsch (2006).

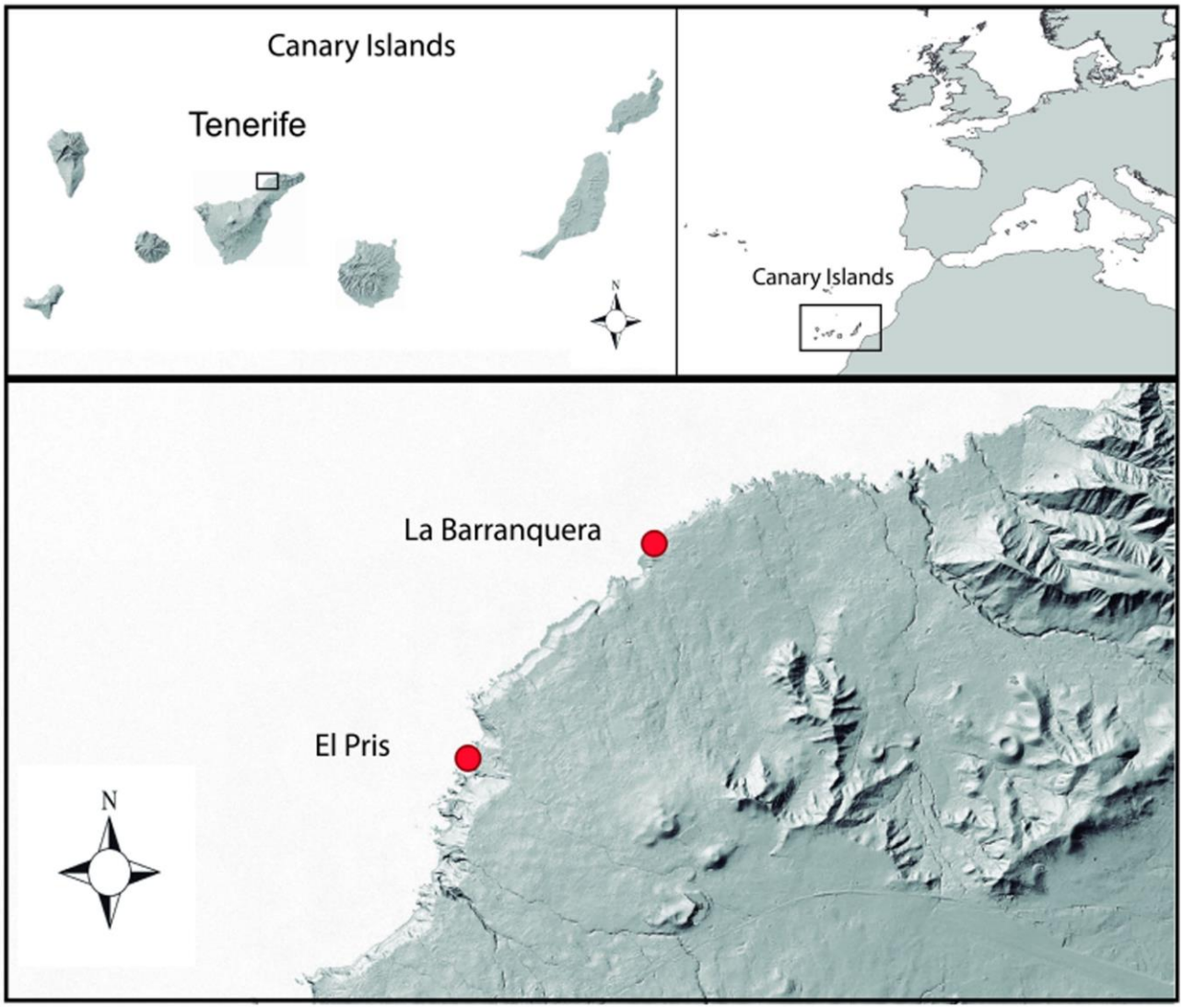

Figure 1. Map showing collecting localities for halacarid mite species in Tenerife.

Abbreviations used in the text – **AD,** anterior dorsal plate; **AE,** anterior epimeral plate; **agsp,** apical genital spine; **ap,** accessory process; **apo,** apodemes; **ce,** cerotegument; **cf,** claw fossa; **che,** chelicerae; **co,** corneae; **DN,** deutonymph; **ds-1 to ds-6,** dorsal setae, from anterior to posterior; **ep,**

epimeral pore; **eu,** eupathidia; **gac,** genital acetabula; **GA,** genitoanal plate; **glp-1 to glp-5,** gland pore/s, from anterior to posterior; **gs,** genital sclerite; **L,** larva; **lc,** lateral claw; **mc,** middle claw; **OC,** ocular plate(s); **ovo,** ovipositor; **p,** pigment; **pc,** pore canaliculus; **P-1 to P-4,** first to fourth segments of palp; **PD,** posterior dorsal plate; **PE,** posterior epimeral plate(s); **pgs,** perigenital seta; **ph-pl,** pharyngeal plate; **PN,** protonymph; **sc,** sclerite; **sgs,** subgenital seta; **spr,** spermatopositor; **T,** tectum; **tf,** telofemur.

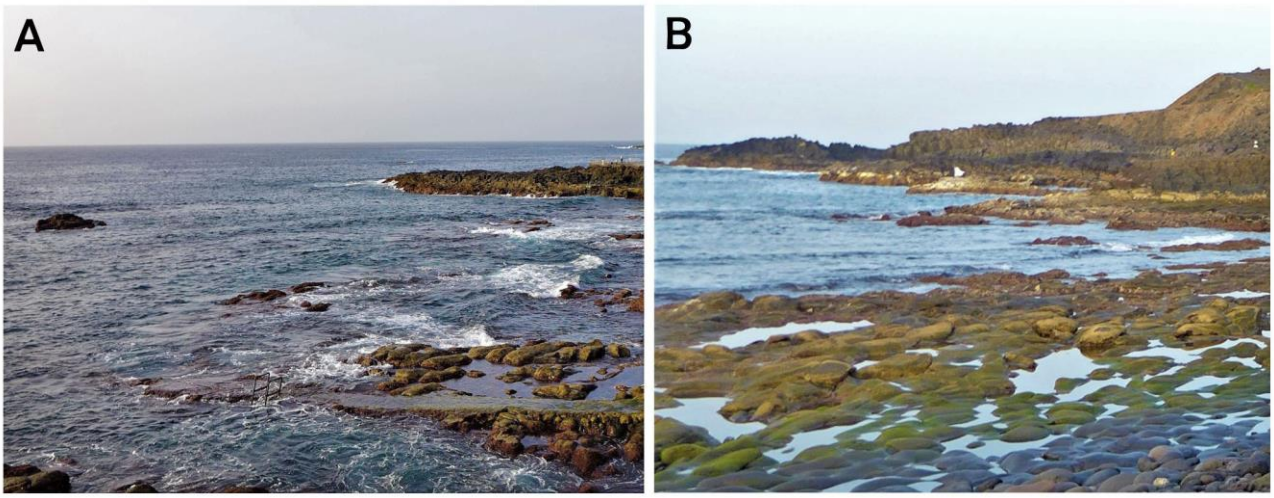

Figure 2. Sampling locations in Tenerife – **A.** El Pris; **B.** La Barranquera.

RESULTS

Eleven halacarid species (Table 1) and 114 individuals belonging to six genera were identified in the present study. The diagnoses of the species will be presented alphabetically.

Table 1. List of recorded halacarid species in this study.

No.	Species	Locations	
		El Pris	La Barranquera
1	*Agaue adriatica* Viets, 1940	-	2♀♀
2	*Agauopsis brevipalpus* (Trouessart, 1889)	1♀; 3 ♂♂	1♀;1♂
3	*Agauopsis microrhyncha* (Trouessart, 1889)	5♂♂; 1DN	3♀♀; 6♂♂
4	*Agauopsis tricuspis* Benard, 1962	1♀; 1♂	1♂
5	*Copidognathus lamelloides* Bartsch, 2000	1♂	-
6	*Copidognathus magnipalpus* (Police, 1909)	1♀; 1♂; 1DN	1♂
7	*Copidognathus remipes* (Trouessart, 1894)	1♂	-
8	*Halacaropsis hirsuta* (Trouessart, 1889)	35♀♀; 7♂♂; 8DN; 4PN	14♀♀; 5♂♂; 1L
9	*Halacarus actenos* Trouessart, 1889	-	1♂
10	*Halacarus subtilis* Viets, 1940	-	1♀
11	*Rhombognathus procerus* Bartsch, 1975	1♀; 2♂♂; 1TN	-

Family Halacaridae Murray, 1877
Genus *Agaue* Lohmann, 1889

Agaue adriatica Viets, 1940

Material examined

Two females (FDHAL-21/1), La Barranquera (*Corallina ferreyrae*, mediolittoral zone).

Diagnosis

The lengths of females' idiosoma were between 470 and 500 µm. Dorsal and ventral plates large. Dorsal plates and margins of idiosoma with cerotegumental lamellae. Known length range of female idiosoma is 440–539 µm long (Bartsch 2016). All dorsal plates bear longitudinal cerotegumental costae. Both margins of AD rounded. Wide cerotegumental lamellae on idiosoma and legs with honey comb-like ornamentation, which is the most distinctive characteristic among other very close *Agaue* species (*A. chevreuxi* and *A. panopae*). OC with two corneae and eye pigment. The ovipositor extends to the anterior margin of GA. Rostrum slender, slightly longer than gnathosomal basis. Both pairs of maxillary setae long. Telofemora with prominent cerotegumental cover. Claws slender, accessory processes minute, 5–9 tines can be seen in the basal part of the concave flank (Figs. 3A, 5A, B, 7A–D).

Remarks

This species was described by Viets (1940) for the first time for the Mediterranean Sea (Adriatic Sea, Croatia) from a variety of habitats and depths. Afterwards the species was recorded in Italy (Mari and Morselli 1990), Cadiz (Spain) and France (Bartsch 2016). The morphological characteristics of the female specimens and idiosoma sizes from Tenerife accord with previous reports of the species from Croatia and Italy (Viets 1940; Mari and Morselli 1990).

Genus *Agauopsis* Viets, 1927

Agauopsis brevipalpus (Trouessart, 1889)

Material examined

One female (FDHAL-21/2) and three males, El Pris (*Gelidium* sp., upper mid-littoral zone); one female and one male, La Barranquera (*Gelidium pusillum*, upper mid-littoral zone).

Diagnosis

The length of females was between 400 and 460 µm, and for males, 450 µm. Idiosoma wide and heavily armed. Integument of plates brownish. Raised porose areolae of dorsal plates with canaliculi. Ostia lacking. AD with small frontal process and the plate clearly raised H-like costa. OC with two corneae, porose areola triangular in outline and rounded angles. Eye spots present beneath AD and OC. PD with pair of medial and lateral costae and the plate anteriorly rounded. Ventral plates porose and faintly reticulate. AE wide, posterior margin of AE and anterior margin of GA truncate. Gnathosoma and palps are slender. Rostrum about as long as gnathosomal base (Bartsch 1996) (Fig. 3B).

Remarks

This is one of the species most encountered within a genus widely distributed and reported in the Black Sea, Mediterranean Sea and eastern Atlantic (Bartsch 2004; Durucan and Boyaci 2018; Durucan 2020, 2021). In the Atlantic Ocean, *A. brevipalpus* has been reported from the Azores, Canary Islands, British Isles and continental Spain (Bartsch 2015).

Agauopsis microrhyncha (Trouessart, 1889)

Material examined

Five males (FDHAL-21/3), one deutonymph, El Pris (*Gelidium* sp., upper-mid littoral zone); three females, six males, La Barranquera (*Corallina ferreyrae*, mediolittoral zone).

Diagnosis

Idiosoma length in females was 420–430 µm, in males, 360–430 µm and in deutonymph 350 µm. Idiosoma wide, flattened and heavily armed. AD and PD slightly raised longitudinal costae. AD areola M-shaped and the plate slightly longer than wide. OC with two corneae. The species can easily be recognized by having a ventral and two anterior spines on telofemur I, a ventral and three anterior spines on tibia I, two of which are adjacent (Fig. 3C) (Pepato and Tiago 2003; Mytilineou *et. al.* 2016; Durucan 2021).

Remarks

This species is present, at least, in the Mediterranean Sea and eastern Atlantic Ocean (Viets 1940; Bartsch 2009). The morphological characteristics of the specimens reported here accord with records previously given by Mytilineou *et al.* (2016) and Durucan (2021).

***Agauopsis tricuspis* Benard, 1962**

Material examined

One female and one male (FDHAL-21/4), El Pris (*Gelidium pusillum*, mediolittoral zone); one male, La Barranquera.

Diagnosis

Length of the female was 440 µm, and 380 µm for male. *Agauopsis tricuspis* is characterized by having five spines on telofemur I and being spread along the eastern North Atlantic and Mediterranean Sea (Bartsch 2015) (Figs. 3D, 5C, D, 8A–E) . The morphological characteristics of the specimens from Tenerife agree well with the previous reports of the species from France (Roscoff) (Benard 1962) and (Bay of Arcachon) (Bartsch 1976), and Italy (Krantz 1970).

Remarks

It was originally described by Benard (1962) from France Atlantic (Roscoff, Bloscon) among barnacles (*Chthamalus stellatus*). Later, the species was reported from the Mediterranean Sea (Adriatic Sea, Venice) amongst mussel beds, by Krantz (1970), and Atlantic France (Bay of Arcachon), again by Bartsch (1976). After that, it was reported from Ireland, United Kingdom, France and Spain, according to Bartsch (1976, 2015).

Genus *Copidognathus* Trouessart, 1888

***Copidognathus lamelloides* Bartsch, 2000**

Material examined

One male (FDHAL-21/5), El Pris (*Corallina ferreyrae*, 1–2 m).

Diagnosis

Idiosoma of only one male was 262 µm long and 187 µm wide. AD with 3 round raised areolae with rosette pores. OC almost as long as AD. Glp-1 is in margins of porose areolae. Telofemora I and II with small ventral lamellae. Tibia IV has bipectinate setae (Fig. 3E). According to Bartsch (2001), *C. lamelloides* resembles to *C. brevipes*. Distinguishing characters are: position of glp-1 (in margins of porose areolae vs near lateral margin of AD), ds-2 (within striated integument vs on OC), length:height ratio of telofemur I (1.7–2.1 vs 1.5–1.6) and shape of ventromedial seta on tibia IV (bipectinate vs smooth).

Remarks

This species was originally described by Bartsch (2000) from Atlantic France (Baie de Morlaix). It is present in the north eastern Atlantic, Mediterranean Sea and Black Sea (Bartsch 2009). The morphological characteristics of the specimen from Tenerife agree with the previous reports of the species from Crimea (Black Sea) (Bartsch 2001) and Türkiye (Levantine Sea) (Durucan 2019b).

***Copidognathus magnipalpus* (Police, 1909)**

Material examined

One male (FDHAL-21/6), one female and one deutonymph, El Pris (sand, 8 m); one male, La Barranquera (sand, mediolittoral zone).

Diagnosis

Lengths of males were 325 and 365 µm, of a female 297 µm and 325 µm in a deutonymph (Fig. 3F). Porose areolae of all dorsal plates with canaliculi arranged within polygons. Setae ds-1 on AD, ds-2 within striated integument between AD and OC, ds-3 to ds-5 on PD. *Copidognathus magnipalpus* is close to *C. loricifer*. Both species have "Y" shaped areolae on AD. They can be easily distinguished by the type of areolae on AD (ovate porose polygonal areolae in *C. magnipalpus*, in *C. loricifer* with rosetta pores) (Bartsch 1979; 2001).

Remarks

Copidognathus magnipalpus was described from the Mediterranean Sea (Tyrrhenian Sea, Italy) by Police (1909). Afterwards the species was reported several times from the Black Sea (Viets 1928; Konnerth-Ionescu 1971; Bartsch 2001, 2004) and Mediterranean Sea (Bartsch 1975; Mari and Morselli 1990; Morselli and Mari 1993; Durucan 2019b). The morphological characteristics and habitat preferences of the specimens from Tenerife are in accordance with previous reports of the species from Türkiye (Bartsch 2001; Durucan 2019b). The female specimen with ciliated by "*Praethecacineta halacari* (Schulz, 1933)" (Figs. 4H, I), which has been recorded from various halacarid mite species and different areas worldwide (Bartsch 2001; Chatterjee *et al*. 2018; Durucan and Boyaci 2019; Durucan and Dovgal 2022). The record of ciliate species "*P. halacari*" is also the first one from the Canaries.

***Copidognathus remipes* (Trouessart, 1894)**

Material examined

One male (FDHAL-21/7), El Pris (*Amphiora* sp., 2 m).

Diagnosis

The male specimen was 310 µm in length and 160 µm width (Fig. 3G). *Copidognathus remipes* is very similar to *C. gibbus*. The most marked differences between these two species are as follows: *C. remipes* is smaller than *C. gibbus*; the idiosoma color of *C. remipes* darker than *C. gibbus*; and *C. remipes* has a pair of short, weak and narrow costae on the PD (Durucan 2019b). Anterior dorsal plate "A" shaped costae, OC longer than wide (80 µm/20 µm), telofemura I wide ventrolateral lamella.

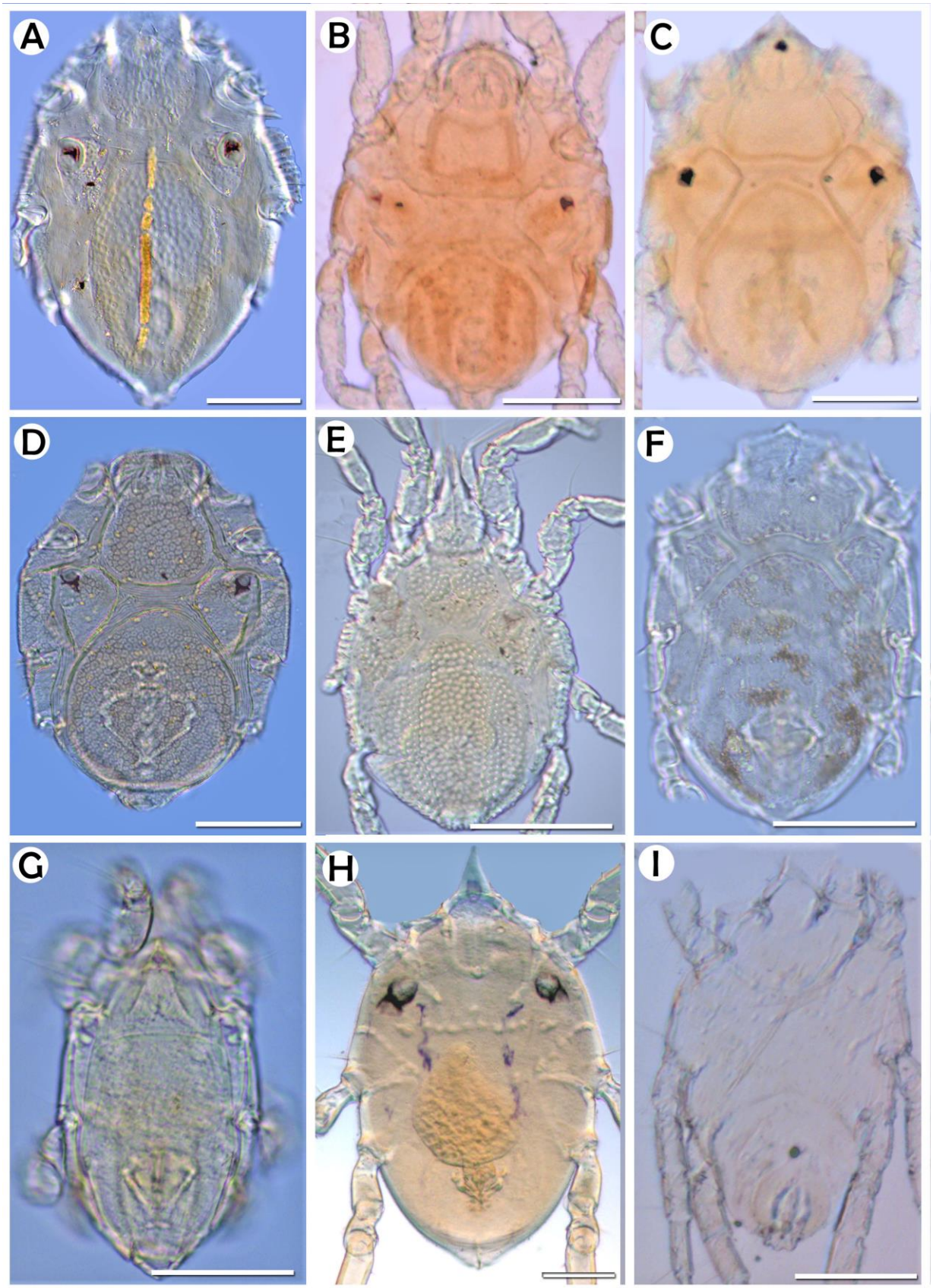

Figure 3. Light-microscope images of halacarid species from Tenerife – **A.** *Agaue adriatica* (female); **B.** *Agauopsis brevipalpus* (female); **C.** *Agauopsis microhyncha* (male); **D.** *Agauopsis tricuspis* (male); **E.** *Copidognathus lamelloides* (male); **F.** *Copidognathus magnipalpus* (male); **G.** *Copidognathus remipes* (male); **H.** *Halacarus actenos* (male); **I.** *Halacarus subtilis* (female) (Scale bars: 100 µm).

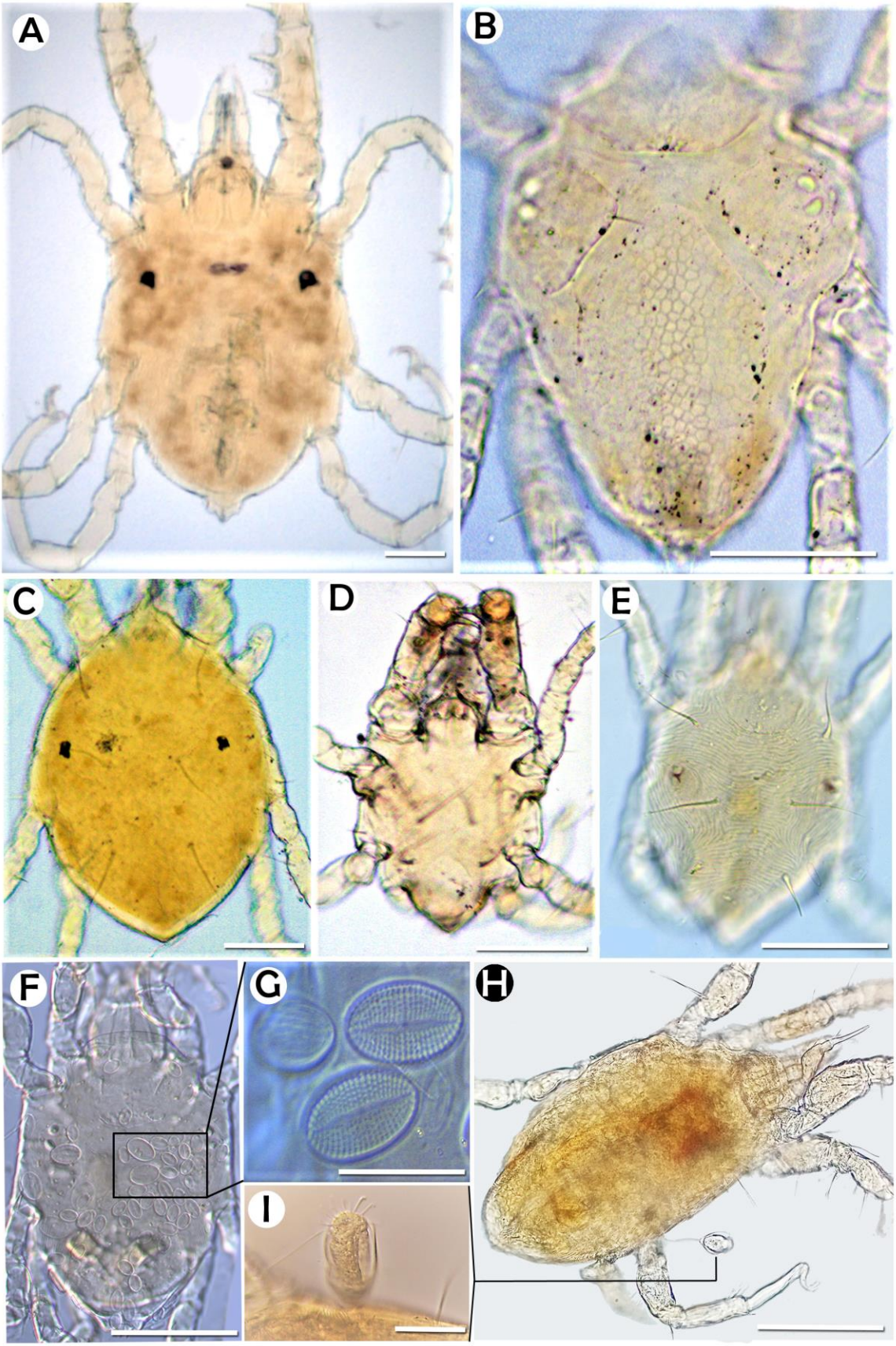

Figure 4. Light-microscope images of halacarid species from Tenerife – **A.** *Halacaropsis hirsuta* (male), **B.** *Rhombognathus procerus* (female); **C.** *H. hirsuta* (DN); **D.** *H. hirsuta* (PN); **E.** *H. hirsuta* (L); **F.** *Rhombognathus* sp. with diatom colonies; **G.** Magnified view of *Cocconeis placentula*; **H.** Ciliate on *Copidognathus magnipalpus* indicated with black bar; **I.** Magnified view of *Praethecacineta halacari* (Scale bars: 100 µm).

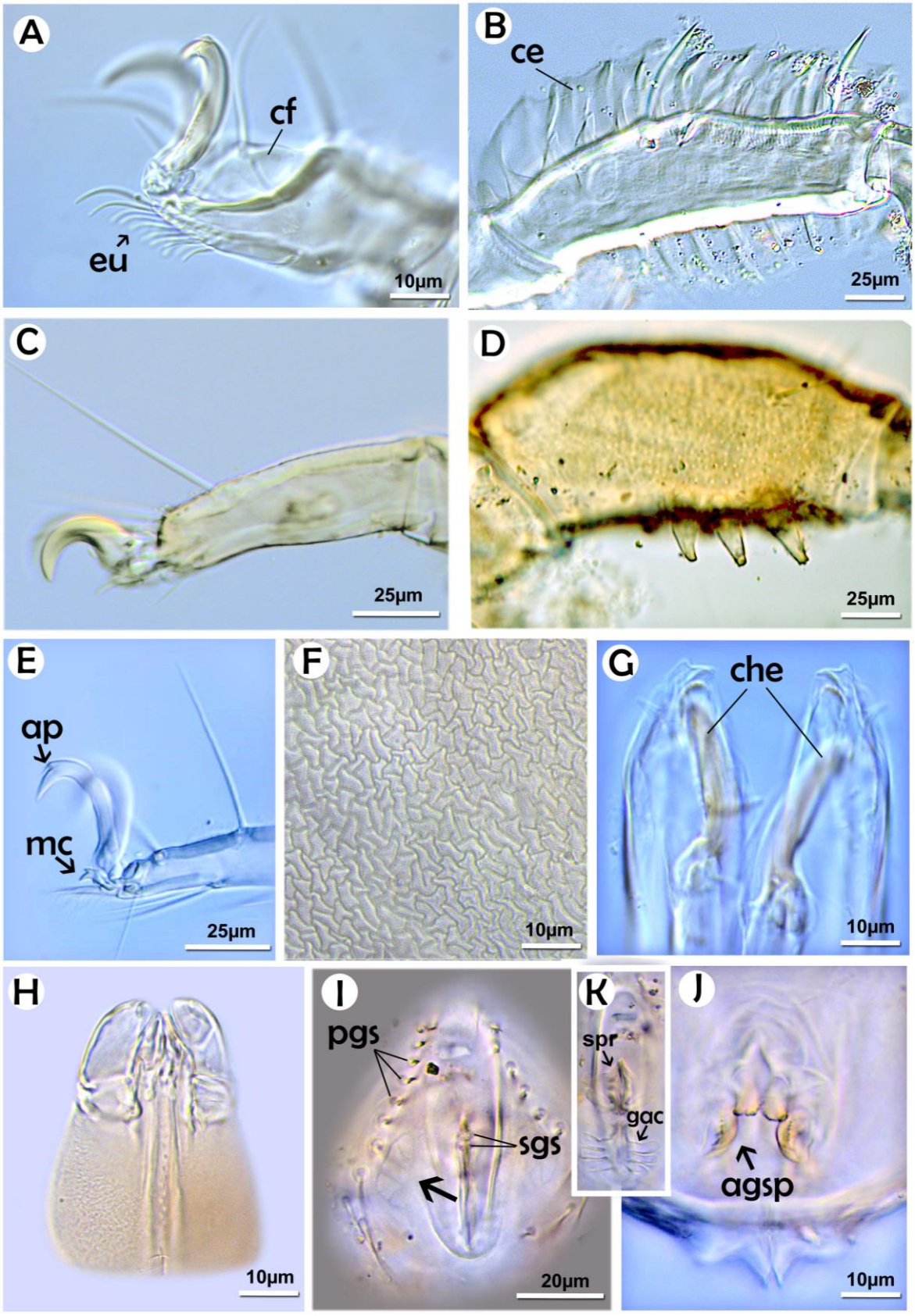

Figure 5. Light-microscope images of halacarid species from Tenerife – **A & B.** *Agaue adriatica* (female) – Medial view of: tarsus I (A), telofemur I (B); **C & D.** *Agauopsis tricuspis* (male) – Medial view of: tarsus I (C), telofemur I (D); **E–G.** *Halacarus actenos* (male) – tarsus IV (E), integument (F), tip of gnathosoma (G); *Rhombognathus procerus*: H & J – female, I & K – male, ventral view of gnathosoma (H), genital openings (I, J, K).

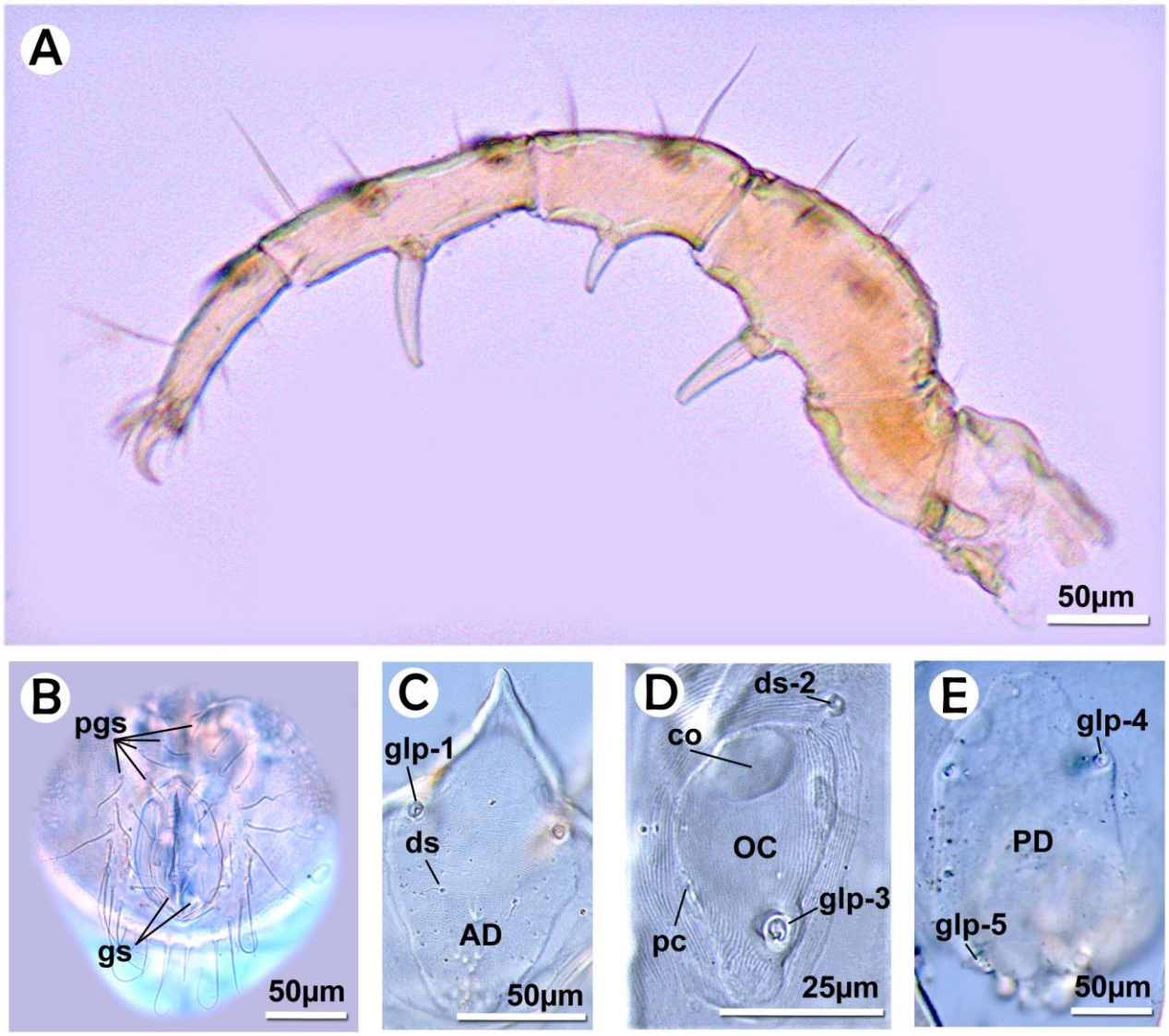

Figure 6. Light-microscope images of halacarid species from Tenerife – **A.** Medial view of leg I (*Halacaropsis hirsuta*- male), **B.** genital opening (*H. hirsuta*- male); **C–E.** *Halacarus subtilis*, anterior dorsal plate (C), ocular plate (D), posterior dorsal plate (E).

Genus *Halacaropsis* Bartsch, 1996

Halacaropsis hirsuta (Trouessart, 1889)

Material examined

35 females, 7 males (FDHAL-21/8), 8 deutonymphs (FDHAL-21/9), 4 protonymphs (FDHAL-21/10), El Pris (*Jania* sp. and *Amphiora* sp., 2 m); 14 females, 5 males, one larva (FDHAL-21/11), La Barranquera (*Corallina ferreyrae*, *Palisada perforata*, mediolittoral zone).

Diagnosis

The length of females was 650–740 µm, for males 620–660 µm, for deutonymphs 560–580 µm, for protonymphs 410–470 µm and for the larva 300–310 µm long. Dorsal and ventral plates large. AD and OC with pair of gland pores. AD has a frontal spine anteriorly. Idiosoma have 5 pairs of idiosomatic setae on adult females and males. This species has the ds-1 on AD. Enlarged setae from ds-2, ds-3 and ds-4 situated in striated integument. It has ds-5 on PD. Adanal setae on anal plate. PE

with one dorsal and three ventral setae. Leg I thickened and armoured with heavy spiniform setae and wider than the following legs in all stages (Figs. 4A, C–E). GA with 21 pairs of pgs and 5 pairs of sgs. Spermatopositor large, extending to anterior margin of GA (Fig. 10D).

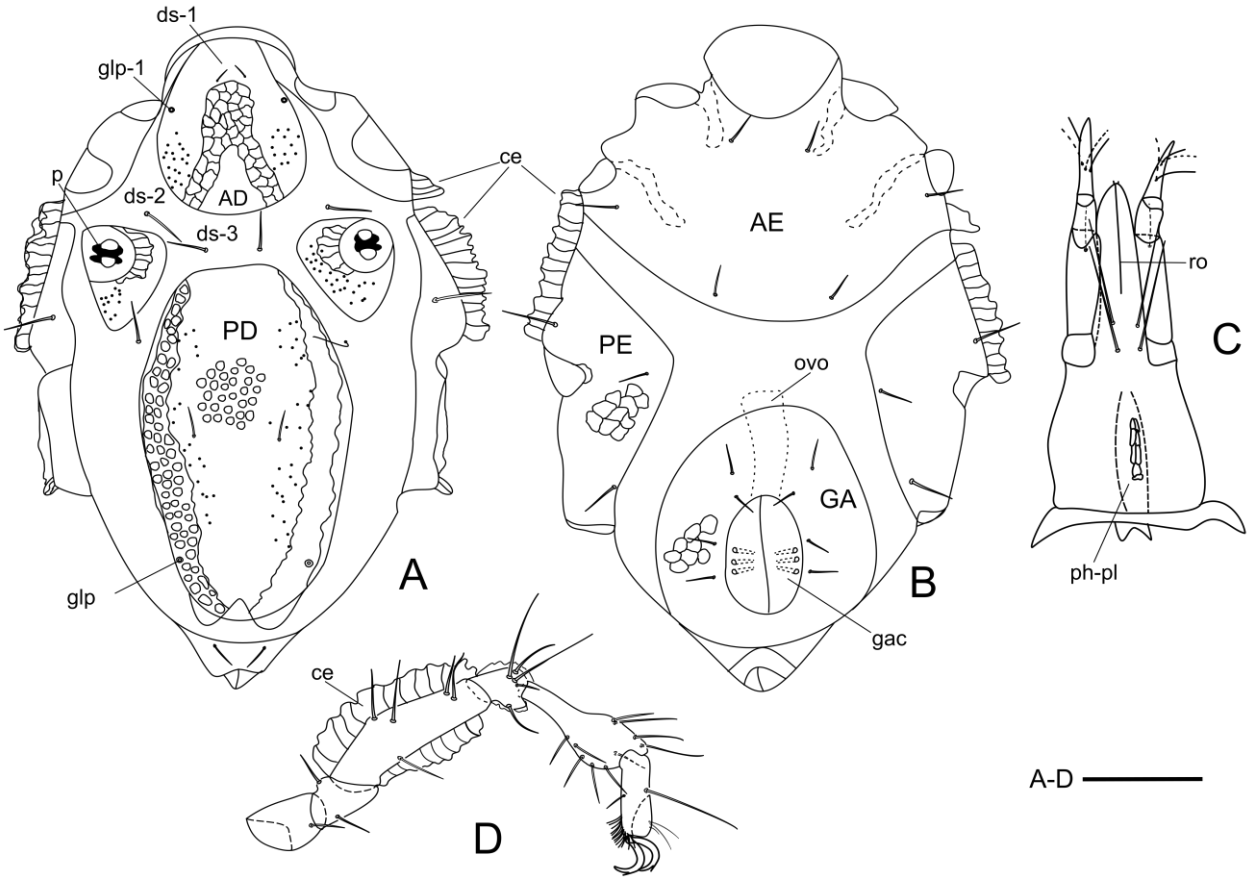

Figure 7. *Agaue adriatica* Viets, 1940 (female) – **A.** Dorsal view of idiosoma; **B.** Ventral view of idiosoma; **C.** Ventral view of gnathosoma; **D.** Medial view of leg I (Scale bar: 100 µm).

Remarks

This species is very common in the Mediterranean Sea (Croatia, Egypt, France, Italy, Spain, Strait of Gibraltar and Türkiye) (Durucan 2020, 2021) and North Atlantic waters (Bartsch 2009). Specimens were found among macroalgae and sand habitats. At the two Tenerife localities, we found more than 70 individuals including all life-stages. The morphological characteristics, habitat preferences and body sizes of the specimens reported here fit with previous records by Viets (1940) and Durucan (2019a).

Genus *Halacarus* Gosse, 1855

Halacarus actenos Trouessart, 1889

Material examined

One male (FDHAL-21/12), La Barranquera (*Hypnea spinella*, upper mid-littoral zone).

Diagnosis

The male specimen measured 592 µm long to the tip of the frontal spine and 350 µm wide. General characters of this species are as follows. Frontal spine medium-sized; posterior part of AD slender; ds-1 on AD; ds-2 to ds-6 striated integument. Eye pigment arranged in a ring around cornea; pair of canaliculi in striated integument posterior to cornea; dorsum with pair of large corneae; PD completely absent. Apodemes between epimera I and II long. Epicuticula on plates and legs exquisitely reticulate. Male GA wide and rounded, covered by more than 60 setae (Figs. 3H, 5E–G, 9A–E).

Remarks

Halacarus actenos was reported from United Kingdom, Ireland, The Netherlands, French Atlantic coasts (Bay of Morlaix, Le Croisic, Baie de Port-lin, Arcachon, Saint Jean-de-Luz) and Spain (Galicia, Praia de Vidrieiro) (Bartsch 2009). This species was also reported by the first author (FD) from Praia da Falésia (Albufeira, Portugal) (Durucan *et al*. 2018). The morphological characteristics, habitat preferences and body sizes of the specimens reported here fit the previous records by Bartsch (2011) and Durucan *et al.* (2018).

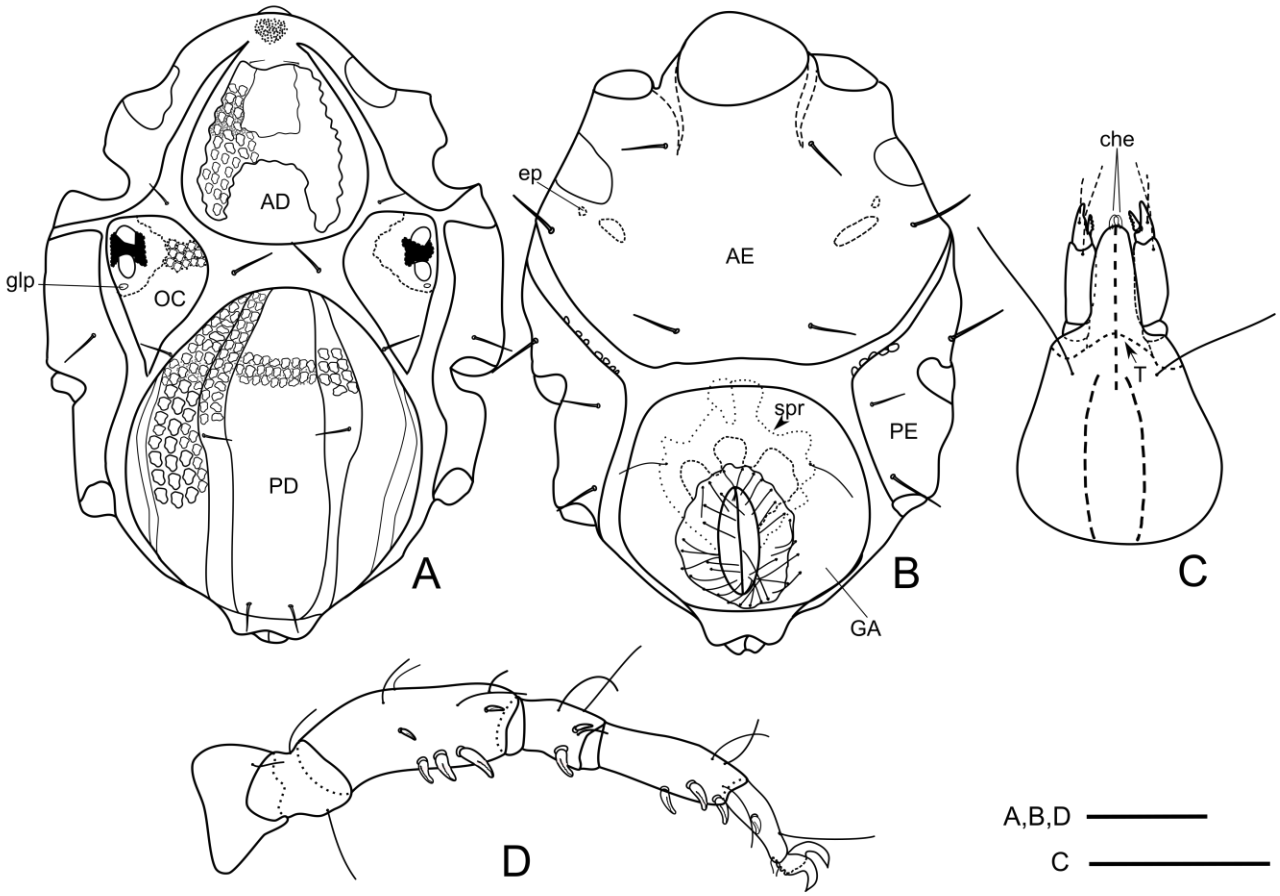

Figure 8. *Agauopsis tricuspis* Benard, 1962 (male) – **A.** Dorsal view of idiosoma; **B.** Ventral view of idiosoma; **C.** Ventral view of gnathosoma; **D.** Medial view of leg I (Scale bars: A, B & D: 50 µm, C: 100 µm).

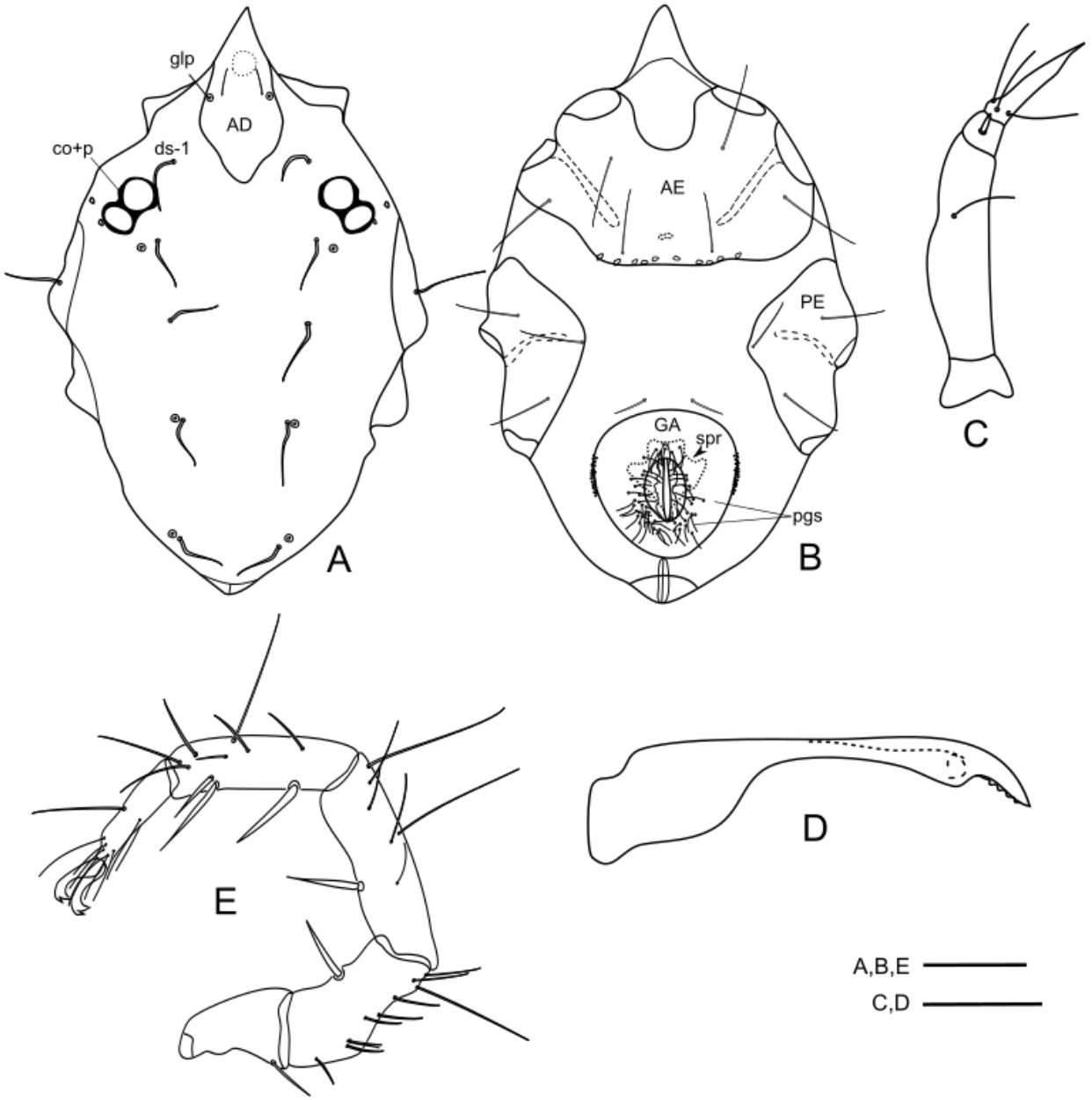

Figure 9. *Halacarus actenos* Trouessart, 1889 (male) – **A.** Dorsal view of idiosoma; **B.** Ventral view of idiosoma; **C.** Lateral view of palp; **D.** Chelicera; **E.** Medial view of leg I (Scale bars: A, B, E: 100 µm, C, D: 50 µm).

***Halacarus subtilis* Viets, 1940**

Material examined

One female (FDHAL-21/13), La Barranquera (*Gelidium pusillum*, upper mid-littoral zone).

Diagnosis

The idiosoma length of the only female specimen was 395 µm long and it was 230 µm wide. Epicuticula on plates, gnathosoma and legs with striae in parallel and fingerprint-like arrangement. Pair of first dorsal setae (ds-1) posterior to first gland pore. OC with cornea, pair of gland pores 2 on OC and gland pore 4 striated integument, gland pore 5 on posterior dorsal plate. PD with

reticulate ornamentation. Tarsi III and IV each with four ventral setae. All paired claws with accessory processes (Figs. 3I, 6C–E, 10A–D).

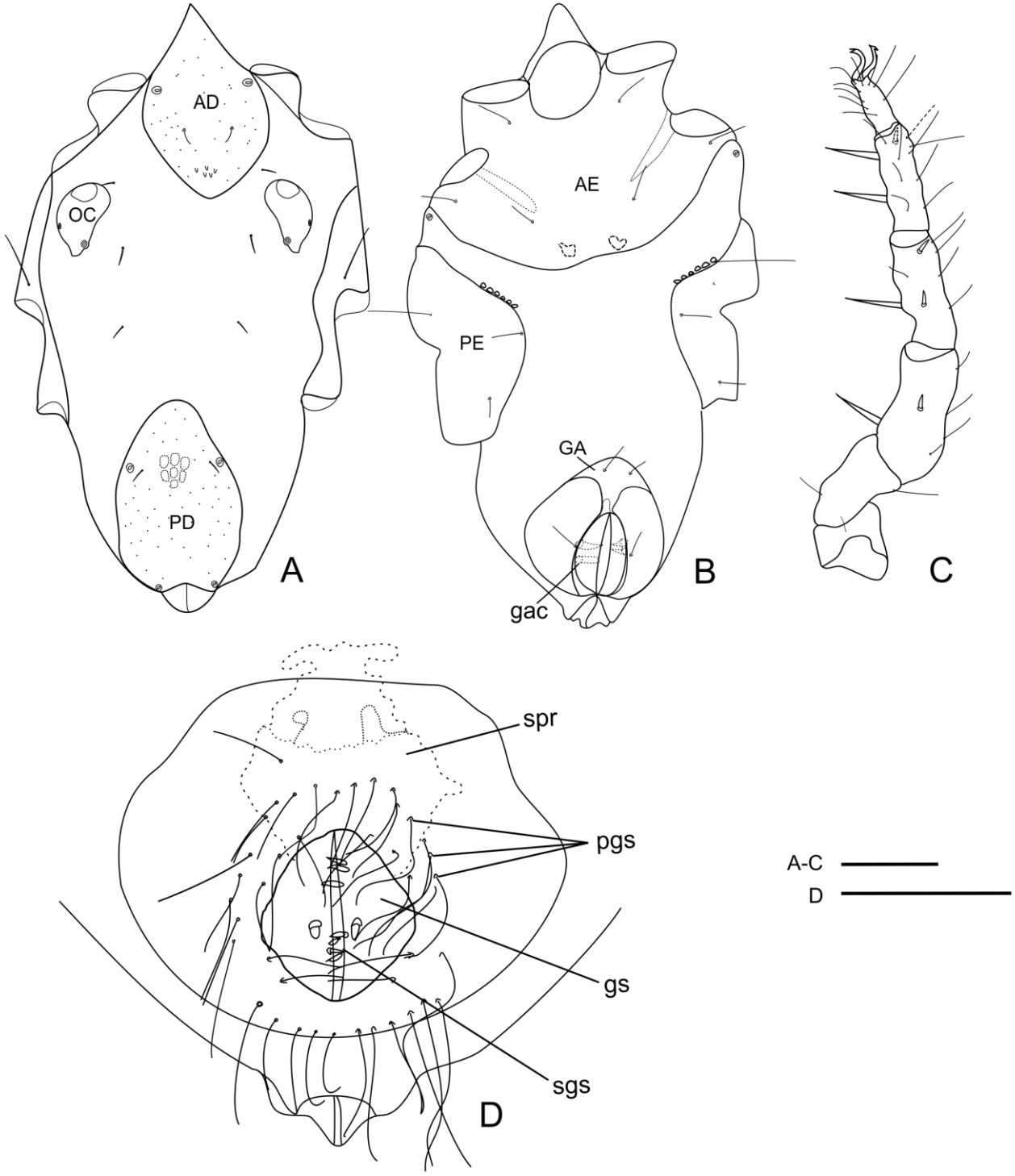

Figure 10. A–C. *Halacarus subtilis* Viets, 1940 (female) – **A.** Dorsal view of idiosoma; **B.** Ventral view of idiosoma; **C.** Medial view of leg I, **D.** *Halacaropsis hirsuta* (Trouessart, 1889), detailed male genitoanal plate; (Scale bars: A–C: 50 µm, D: 100 µm).

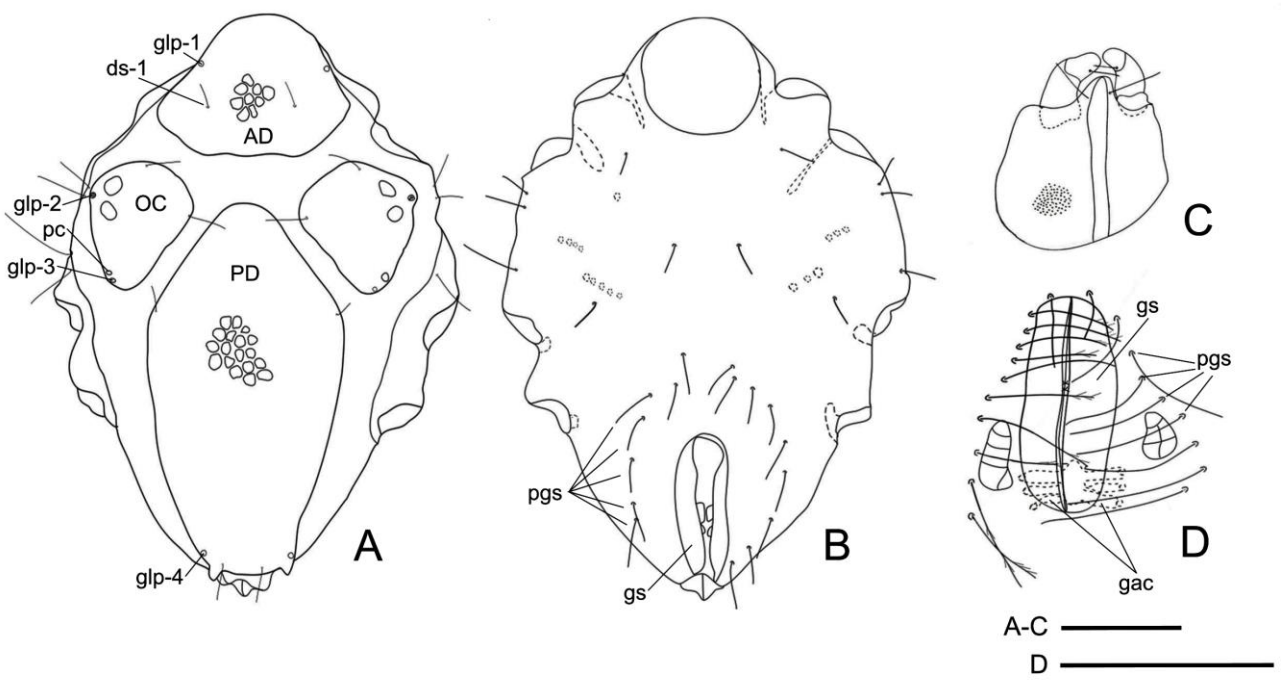

Figure 11. *Rhombognathus procerus* Bartsch, 1975 – **A.** Dorsal view of idiosoma (female); **B.** Ventral view of idiosoma (female); **C.** Ventral view of gnathosoma (female); **D.** Detailed genital opening (male) (Scale bars: A–C: 100 µm, D: 50 µm).

Remarks

Halacarus subtilis was originally described by Viets (1940) from the Mediterranean Sea (Croatia, Rovinj and Split). This is the first report in the Atlantic Ocean. The morphological characteristics of the specimen from Tenerife matches description by Viets (1940) and Bartsch (2007).

Genus *Rhombognathus* Trouessart, 1888

Rhombognathus procerus Bartsch, 1975

Material examined

One female (FDHAL-21/14), two males and one tritonymph, El Pris (*Gelidium pusillum*, intertidal zone).

Diagnosis

The length of female was 313 µm, 224 µm in males and 200 µm in tritonymph. Length of AD is wider than longer. Ds-1 on AD. OC with two corneas and ds-2 and ds-3 on it. PD long. Ds-4 as same as level with OC. Female GA with 8 pairs of perigenital setae. Male GA surrounded by 11 plumose pairs of perigenital setae with trapezoidal arrangement and with two pairs of subgenital setae (Figs. 4B, 11A–D).

Remarks

This species was originally described by Bartsch (1975) from near Roscoff, France. Afterwards, the species was found associated with seagrass *Posidonia oceanica* from Santa Pola (Alicante), south-eastern Spain (Mediterranean Sea) (Martínez *et* al. 2021). The specimens from

Roscoff are larger than our species; otherwise the morphological characteristics agree well with those known for *R. procerus* by Bartsch (1975).

DISCUSSION

This is the first study on halacarid mites from Tenerife. Of the 11 species and 6 genera found, 10 species and 5 genera constitute new records for the Canary Islands. In total, there are 12 halacarid species recorded for the archipelago. These records constitute the southernmost known records for most of these species. In addition, *Halacarus subtilis* is recorded for the first time for the Atlantic Ocean. All species were associated with macroalgae, except one which was found in a sandy habitat (*Copidognathus magnipalpus*). In order to better understand the distributional and ecological features of the halacarid species inhabiting the coasts of Tenerife, additional field and taxonomic work is needed, including samples from different habitats and depths.

ACKNOWLEDGEMENTS

The first author (FD) would like to thank Isparta University of Applied Sciences, Fisheries Faculty, Biology, Ecology and Limnology laboratory (Isparta, Türkiye), Ondokuz Mayis University, Faculty of Agriculture, Department of Plant Protection, (Samsun, Türkiye) and Mediterranean Fisheries Research, Production and Education Institute (Antalya, Türkiye) for providing laboratory facilities. The Cabildo de Tenerife (Island Council) granted the collecting permit. The third author (DHT) is currently funded by the Cabildo de Tenerife, under the TFinnova Programme supported by MEDI and FDCAN funds. The manuscript was edited by Guido Jones, also funded by the Cabildo de Tenerife under the same programme.

REFERENCES

Bartsch, I. (1975) Ein Beitrag zur Rhombognathinen-Fauna (Halacaridae, Acari) der Bretagne-Küste. *Acarologia*, 17: 53–80.

Bartsch, I. (1976) Ergänzung zur Halacariden-Fauna (Halacaridae, Acari) im Becken von Arcachon. *Vie et Milieu, Série A*, 26: 31–46.

Bartsch, I. (1979) Ergänzungen zur *Copidognathus*-Fauna (Halacaridae, Acari) der Bretagne-Küste. *Acarologia*, 20: 217–234.

Bartsch, I. (1996) *Agauopsis* (Acari, Halacaridae) of the Sevastopol area; supplementary notes on taxonomy and ecology. *Revue suisse de Zoologie*, 103(3): 697–712.

Bartsch, I. (2000) *Copidognathus lamelloides* sp. n. (Copidognathinae, Halacaridae, Acari), a new species from European waters. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 13: 219–228.

Bartsch, I. (2001) Black Sea Copidognathinae (Arachnida, Acari, Halacaridae): A review. *Mitteilungen aus dem Museum für Naturkunde in Berlin, Zoologische Reihe*, 77: 247–275.

Bartsch, I. (2004) The Black Sea halacarid fauna (Halacaridae, Acari): faunal comparison with the Mediterranean, eastern North Atlantic, North Sea, and Baltic and reflection on its origin. *Mitteilungen aus dem Museum für Naturkunde in Berlin, Zoologische Reihe*, 80: 143–158.

Bartsch, I. (2006) Halacaroidea (Acari): A guide to marine genera. *Organisms, Diversity and Evolution*, 6 (Electronic Supplement): 1–104.

Bartsch, I. (2007) *Halacarus longiunguis* Police, 1909 (Acari: Halacaridae), a new record a century later, re-description and notes on Mediterranean *Halacarus* species. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 14(176): 393–403.

Bartsch, I. (2009) Checklist of marine and freshwater halacarid mite genera and species (Halacaridae: Acari) with notes on synonyms, habitats, distribution, and descriptions of the taxa. *Zootaxa*, 1998: 1–170.

Bartsch, I. (2011) *Halacarus socius* (Acari: Halacaridae), description of the male and diagnoses of species of the *Halacarus actenos* group. *Zootaxa*, 2800: 18–40.

Bartsch, I. (2015) The *Agauopsis brevipalpus* group (Acari: Halacaridae), descriptions of tropical Indo-West Pacific species, a key to all species, their geographical distribution and reflections on dispersal routes. *Acarologia*, 55(2): 147–169.

Bartsch, I. (2016) Commented and illustrated key for identification of *Agaue chevreuxi* (Trouessart, 1889) and *A. panopae* (Lohmann, 1893) (Acari, Halacaridae). *Ecologica Montenegrina*, 8: 45–54.

Bartsch, I. (2021) The genus *Halacarellus* (Halacaridae, Acari), analysis of distribution, ecology, systematics, and description of *H. balticus*. *Marine Biodiversity*, 51: 24. DOI: 10.1007/s12526-020-01143-y

Benard, F. (1962) Sur une nouvelle espèce d'Acariens marin, *Agauopsis tricuspis* (superfamille des Prostigmata, famille des Halacaridae). *Acarologia*, 4: 215–229.

Chatterjee, T. (2020) Parasitic halacarid mites (Acari, Halacaridae): Survey on literature. *Acta Biologica*, 27: 5–10. DOI: 10.18276/ab.2020.27-01

Chatterjee, T. (2021) A checklist of halacarid mites (Acari: Halacaridae) associated with decapods crustaceans (Arthropoda, Crustacea, Decapoda). *Persian Journal of Acarology*, 10(2): 155–166. DOI: 10.22073/pja.v10i2.65624

Chatterjee, T., Pfingstl, T. & Pešić, V. (2018) A checklist of marine littoral mites (Acari) associated with mangroves. *Zootaxa*, 4442(2): 221–240. DOI: 10.11646/zootaxa.4442.2.2

Chatterjee, T. & Durucan, F. (2022) A checklist of halacarid and pontarachnid mites (Acari: Halacaridae and Pontarachnidae) found in seagrass habitats. *Persian Journal of Acarology*, 11(2): 187–223. DOI: 10.22073/pja.v11i2.70790

Durucan, F. (2019a) New halacarid records from Antalya, Turkey (Acari, Halacaridae). *Munis Entomology and Zoology*, 14(1): 270–282.

Durucan, F. (2019b) New records of *Copidognathus* (Acari: Halacaridae) from Antalya, Turkey. *Persian Journal of Acarology*, 8(3): 189–210. DOI: 10.22073/pja.v8i3.49588

Durucan, F. (2020) Mediterranean and Black Sea marine halacarids (Halacaridae: Acari): A review. *Journal of Black Sea/Mediterranean Environment*, 26(3): 352–373.

Durucan, F. (2021) Halacaridae (Acari: Prostigmata) of the Aegean Sea of Turkey (Çanakkale and Izmir). *Persian Journal of Acarology*, 10(3): 341–346. DOI: 10.22073/pja.v10i3.67699

Durucan, F. & Boyaci, Y.Ö. (2016) *Halacaropsis hirsuta* (Acari: Halacaridae)'nın Türkiye Faunası İçin İlk Kaydı. *Süleyman Demirel Üniversitesi Eğirdir Su Ürünleri Fakültesi Dergisi*, 12(1): 37–40. DOI: 10.22392/egirdir.246316

Durucan, F. & Boyaci, Y.Ö. (2018) Halacarid mites of the genus *Agauopsis* (Acari: Halacaridae) from Antalya (Turkey). *Ege Journal of Fisheries and Aquatic Sciences*, 35(1): 49–53. DOI: 10.12714/egejfas.2018.35.1.09

Durucan, F. & Boyaci, Y.Ö. (2019) First Record of *Praethecacineta halacari* (Suctorea: Ciliophora) from Antalya, Turkey. *Acta Aquatica Turcica*, 15(2): 135–138.

Durucan, F. & Dovgal, I. (2022) New reports of suctorian ciliates (Ciliophora, Suctorea) epibiont on halacarid mites and a harpacticoid copepod from Türkiye. *Marine Biological Journal*, 7(3): 28–33.

Durucan, F., Range, P. & Boyaci, Y.Ö. (2018) First record of *Halacarus actenos* Trouessart, 1889 (Halacaridae, Acari) from Portugal. *Süleyman Demirel Üniversitesi Eğirdir Su Ürünleri Fakültesi Dergisi*, 14(2): 84–88. DOI: 10.22392/egirdir.346221

Konnerth-Ionescu, A. (1971) Les Halacaridae (Acari) du substrat pétricole (littoral roumain de la Mer Noire). *Travaux du Muséum d'Histoire Naturelle Grigore Antipa*, 11: 91–97.

Krantz, G.W. (1970) *Agauopsis vidae*, a new species of Halacaridae (Acari: Prostigmata) from the Northern Adriatic Sea, with notes on its behavior. *Archivio di Oceanografia e Limnologia*, 16: 247–262.

Mari, M. & Morselli, I. (1990) Idracnelle Ed Alacaridi (Acari) di una Prateria Di *Posidonia oceanica* (L.) Delile Dell'Isola D'Ischia. *Atti della Societa Toscana di Scienze Naturali Memorie Serie B*, 96: 243–256.

Martínez, A., García-Gómez, G. & García-Herrero, Á. (2021) Habitat differences filter functional diversity of low dispersive microscopic animals (Acari, Halacaridae). *Hydrobiologia*, 848: 2681–2698. DOI: 10.1007/s10750-021-04586-x

Morselli, I. & Mari, M. (1993) Alacaridi (Acari, Actinedida) di formazioni coralligene dell'infra-litorale laziale (Italia centrale). *Atti della Societa Toscana di Scienze Naturali, Memorie, Serie B*, 99: 115–123.

Mytilineou, Ch., Akel, N., Babali, N., Balistreri, P., Bariche, M., Boyaci, Y.Ö., Cilenti, C., Constantinou, C., Crocetta, F., Çelik, M., Dereli, H., Dounas, F., Durucan, F., Garrido, A., Gerovaslileiou, V., Kapiris, K., Kebapçıoğlu, T., Kleitou, A., Krystalas, L., Lipej, L., Maina, P., Marakis, B., Mavric, B., Moussa, R., PeñaRivas, L., Poursanidis, D., Renda, W., Rizkalla, S.I., Rosso, A., Scirocco, T., Sciuto, F., Servello, G., Tiralongo, F., Yapici, S. & Zenetos, A. (2016) New Mediterranean biodiversity records. *Mediterranean Marine Science*, 17(3): 794–821. DOI: 10.12681/mms.1976

Pepato, A.R. & Tiago, C.G. (2003). A new species of *Agauopsis* (Halacaridae, Acari) from Brazil. *Cahiers de Biologie Marine*, 44: 369–373.

Police, G. (1909) Alcune nuove specie di Halacaridae del Golfe di Napoli. *Archivio Zoologico Napoli*, 3: 409–443.

Viets, K. (1928) Die Halacariden des Schärgaards bei Bergen (Norwegen). *Bergens Museum Aarbok 1927, Naturvidenskapelig rekke*, 6: 1–14.

Viets, K. (1940) Meeresmilben aus der Adria (Halacaridae und Hydrachnellae, Acari). *Archiv für Naturgeschichte (Neue Folge)*, 9: 1–135.

WoRMS Editorial Board (2022) World Register of Marine Species. Available from https://www.marinespecies.org at VLIZ (Accessed on 24.01.2022). DOI: 10.14284/170

کنه‌های دریازی (Acari: Halacaridae) تنریف (جزایر قناری)

فورکان دروجان[1]، خوآن کارلوس د لا پاز و دیوید هرناندز-تیکسیدر[2،3]

۱. گروه آبزی‌پروری، دانشگاه علوم کاربردی ایسپارتا، ۳۲۲۶۰ ایسپارتا، ترکیه؛ رایانامه: f_durucan@hotmail.com

۲. گروه پژوهش‌های حشره‌شناسی تنریف، ۳۸۲۰۶ لاگونا، تنریف، جزایر قناری، اسپانیا؛ رایانامه: juancarlos@nuryana.com

۳. گروه پژوهشی اکولوژی و تکامل جزیره، مؤسسه تولید محصولات طبیعی و زیستی کشاورزی، ۳۸۲۰۶ لاگونا، تنریف، جزایر قناری، اسپانیا؛ رایانامه: davidhdez@ipna.csic.es

*نویسندهٔ مسئول

چکیده

در مطالعهٔ حاضر، کنه‌های هالاکارید ساکن در جلبک‌های مختلف، کشتی‌چسب‌ها و رسوبات شنی از تنریف (جزایر قناری) برای نخستین بار مورد بررسی و شناسایی قرار گرفتند. در بین ۱۱٤ فرد، ۱۱ گونه هالاکارید متعلق به شش جنس شناسایی شدند: *Agaue adriatica*، *Agauopsis brevipalpus*، *Agauopsis microrhyncha*، *Agauopsis tricuspis*، *Copidognathus lamelloides*، *C. magnipalpus*، *C. remipes*، *Halacarus subtilis*، *H. actenos*، *Halacaropsis hirsuta* و *Rhombognathus procerus*. حضور گونهٔ مژک‌دار چسبندهٔ انگل از زیردهٔ Suctoria به نام *Praethecacineta halacari* روی *C. magnipalpus* برای نخستین بار از جزایر قناری گزارش می‌شود.

واژگان کلیدی: اقیانوس اطلس، تنوع زیستی، ماکارونزی، گزارش‌های جدید، پیش‌استیگمایان.

اطلاعات مقاله: تاریخ دریافت: ۱٤۰۱/٦/۵، تاریخ پذیرش: ۱٤۰۱/۷/۳، تاریخ چاپ: ۱٤۰۱/۱۰/۲۵