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Article

A checklist of halacarid mites (Acari, Halacaridae) found among ascidians (Tunicata, Ascidiacea)

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ABSTRACT

A compilation of marine halacarid mites (Halacaridae) found with ascidians (sea squirts) has been carried out based on published records. In this paper, we listed 19 species found with ascidians, altogether. These 19 species belong to 7 genera, viz. *Agaua* (3 species), *Arhodeoporus* (1 species), *Copidognathus* (8 species), *Halacarus* (1 species), *Lohmannella* (2 species), *Rhombognathides* (1 species), and *Thalassarachna* (3 species). Most of these reports are from mixed habitats and all these species which were found among ascidians were reported also from other habitats. Most of the cases of halacarids on acidians may be occasional invaders.

KEY WORDS: Ascidian; Association; Halacaroidea; sea squirts; Trombidiformes.

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INTRODUCTION

The family Halacaridae includes more than 1000 marine and about 60 freshwater species all over the world (Bartsch 2009). These mites are found among various substrata e.g., fronds, holdfasts, tufts of macroalgae, in and on colonies of sponges, hydrozoans, bryozoans, barnacles, mussels, polychaetes, sediments, flocculent ooze, coarse and fine sands (Chatterjee and Sarma 1991; Bartsch 2009). Recently, checklists of halacarid mites found in association with decapod crustaceans, echinoderms, and sponges were given in Chatterjee (2021a, b, c). Some species are associated with mangroves (Chatterjee 2015; Chatterjee *et al.* 2018) and some are also reported from seagrass habitats (Chatterjee and Durucan 2022). There are a few parasitic forms or suspected to be parasitic species (Chatterjee 2020). Halacarid mites are found from upper altitude to deep-sea level (Chatterjee 2021d; Chatterjee and Durucan 2021).

In marine environment, many invertebrates, like sponges, cnidarians (anthozoans, hydrozoans), bryozoans, polychaetes, gastropods, arthropods (e.g., tanaidaceans, amphipods, isopods, cumaceans) have been found among ascidians (Sepúlveda *et al.* 2003, 2014; Voultziadou *et al.* 2007, 2010; Rimondino *et al.* 2015).

It has been reported that in some ascidians, particular chemical characteristics (e.g., vanadium concentration), production of secondary metabolites, acidic pH etc. may help to prevent epibiosis (Stoecker 1978, 1980; McClintock *et al.* 2004; Odate and Pawlik 2007; Koplovitz *et al.* 2009).

Acidians are also known as “ecosystem engineers” i.e. organisms that directly or indirectly

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control the availability of resources to associated life forms by causing physical state changes in biotic or abiotic materials (Jones *et al.* 1994; Castilla *et al.* 2004; Wright and Jones 2006; Voultziadou *et al.* 2010).

Information on the halacarid fauna found among ascidians is rare, scarce and scattered in the literature. The present article compiled a checklist of halacarid mites found among ascidians based on published data in the literature.

METHOD

The present checklist is prepared based on published literatures on halacarid mites by the end of September 2021. The genera, and species within genera, are arranged in an alphabetical sequence.

RESULTS

Family Halacaridae Murray, 1877

Genus *Agauae* Lohmann, 1889

Agauae hispida (Lohmann, 1893)

Report found among ascidians – This species was reported among ascidians, bryozoans and alcyoniids from Sydney, southeastern Australia (Lohmann 1893).

Agauae reichelti Otto, 1999

Report found among ascidians – This was reported among coralline algae with ascidians from Lizard Island, Australia (Otto 1999).

Remarks – This species was reported on coral algae, coral rubble, coral sand (Otto 1999).

Agauae sp.

Report found among ascidians – This species was reported among algae, ascidians, bryozoans and alcyoniids from Sydney, southeastern Australia, as *Agauae panopae* (syn.: *Halacarus panopae*) by Lohmann (1893).

Remarks – Bartsch (2016a) commented that the record of *Agauae panopae* from Australia by Lohmann (1893) should be excluded due to its unproven identity.

Genus *Arhodeoporus* Newell, 1947

Arhodeoporus arenarius Newell, 1947

Report found among ascidians – This species was reported among ascidians, mixed hydroids and ascidians in subtidal area of Beaufort, North Carolina, Eastern North America (Newell 1947).

Remarks – This was also reported in various substrata: among sponges and broken shells perforated by sponges *Cliona* sp., algae, hydroids, crustaceans, intertidal and subtidal sediments from North America (Newell 1947; Bartsch 1979).

Genus *Copidognathus* Trouessart, 1888

***Copidognathus acutus* Newell, 1947**

Report found among ascidians – This species was reported among ascidians, mixed hydroids and ascidians in subtidal area of Beaufort, North Carolina, Eastern North America (Newell 1947).

Remarks – This species was also reported in various substrata: among sponges and broken shells perforated by sponges *Cliona* sp., algae, hydroids from Eastern North America (Newell 1947).

***Copidognathus aurorae* Newell, 1951**

Report found among ascidians – This species has been found from Bering Sea, near Cape Prince of Wales, Alaska in muddy sand and gravel with ascidians (Newell 1951a).

Remarks – This species was also reported among algae, sponges, sand and gravel from Alaska, Bering Sea, Arctic Ocean (Newell 1951a, b).

***Copidognathus bavayi* (Trouessart, 1896)**

Report found among ascidians – This species has been found from Babi Besar Island, Malaysia among dead corals overgrown by algae and colonies of sponges, hydroids and ascidians (Bartsch 1993).

Remarks – This species was reported among algae from Vietnam (Trouessart 1896; André 1937).

***Copidognathus dentatus* Viets, 1940**

Report found among ascidians – This species has been found among *Ascidiella aspersa* (O.F. Müller, 1776) from Netherland (Bartsch and Smit 2006).

Remarks – This species was found in intertidal and subtidal zone on stone, algae, and seagrasses (Viets 1940; Green and MacQuitty 1987; Durucan 2019).

***Copidognathus fabricii* (Lohmann, 1889)**

Report found among ascidians – This species has been found among ascidians *Ascidiella aspersa* (O.F. Müller, 1776) and *Ciona intestinalis* (Linnaeus, 1758) from Netherland (Bartsch and Smit 2006).

Remarks – This species is inhabitant of lower tidal and subtidal substrata - sandy deposits, algae and colonial organisms (Bartsch 2020).

***Copidognathus punctatissimus* (Gimbel, 1919)**

Report found with ascidians – This species was reported among ascidians, mixed hydroids and ascidians in subtidal area of Beaufort, North Carolina, Eastern North America (Newell 1947).

Remarks – This species was reported in various tidal and subtidal substrata in brackish to marine waters from United States (Gimbel 1919; Newell 1947).

***Copidognathus vanhoeffeni* (Lohmann, 1907)**

Report found among ascidians – *Copidognathus liouvillei* Trouessart, 1914 is a synonym of *C. vanhoeffeni* (Lohmann, 1907) (see Bartsch 2009). *Copidognathus liouvillei* was reported found on ascidians (Trouessart 1914, Newell 1984).

Remarks – This species is expected to live on and amongst various substrata from Antarctic Peninsula (Bartsch 2016b).

***Copidognathus* sp.**

Report found among ascidians – This was reported among algae, ascidians, bryozoans and alcyoniids from Sydney, southeastern Australia cited as *Copidognathus lamellosus* by Lohmann (1893).

Remarks – Bartsch (2009) commented that the record of *Copidognathus lamellosus* from Sydney, Australia by Lohmann (1893) is most likely erroneous.

Genus *Halacarus* Gosse, 1855

***Halacarus oblongus* Lohmann, 1893**

Report found among ascidians – This species was reported among ascidians, bryozoans and alcyoniids from Sydney, southeastern Australia (Lohmann 1893).

Genus *Lohmannella* Trouessart, 1901

***Lohmannella falcata* (Hodge, 1863)**

Report found among ascidians – This species was reported on ascidian *Ciona* sp. from Bergen, Norway (Viets 1928). This species has been found also among ascidian *Ascidiella aspersa* (O.F. Müller, 1776) from Netherland (Bartsch and Smit 2006).

Remarks – This species was reported in various substrata (Chartosia *et al.* 2018; Abé 2021).

***Lohmannella norvegica* Viets, 1927**

Report found among ascidians – This species was reported in sediments with corals, and occasionally mussels and ascidians at 150 m depth from Bergen, Norway (Viets 1928).

Remarks – This species was also reported in subtidal algae, barnacles, and sediments (Viets 1927; Bartsch 2020; Abé 2021).

Genus *Rhombognathides* Viets, 1927

***Rhombognathides pascens* (Lohmann, 1889)**

Report found among ascidians – This species was reported among ascidians *Ciona* sp. and *Ascidiella* sp. from Bergen; in sediments with corals, and occasionally mussels and ascidians at 150 m depth from Bergen, Norway (Viets 1928).

This was also found among ascidian *Botryllus* sp. in the tidal regions (Green and MacQuitty 1987).

Remarks – This species was found in eastern and western North Atlantic Ocean, Baltic Sea, Black Sea at various substrata (Lohmann 1889; Viets 1927; Newell 1947; Bartsch 1972, 2009; Green and MacQuitty 1987; Abé 1998).

Genus *Thalassarachna* Packard, 1871

***Thalassarachna basteri* (Johnston, 1836)**

Report found among ascidians – This species was reported among ascidians *Ciona* sp. and *Ascidiella* sp. from Bergen; in sediments with corals, and occasionally mussels and ascidians at 150 m depth from Bergen, Norway (Viets 1928).

Remarks – This species has been reported in various substrata (among sand, hydroids, bryozoans, bivalves, tubes of serpulid polychaetes, algae, etc.) from western, eastern North Atlantic Ocean, Baltic Sea and Mediterranean Sea (Newell 1947; Green and MacQuitty 1987; Bartsch 2009).

Thalassarachna hexacantha (Viets, 1927)

Report found among ascidians – This species was reported in sediments with corals, and occasionally mussels and ascidians at 150 m depth from Bergen, Norway (Viets 1928).

Remarks – This species was found amongst shallow water substrata like algae, shell fragments etc. (Bartsch 2020).

Thalassarachna longipes (Trouessart, 1888)

Report found among ascidians – This species was reported among ascidian *Ciona* sp. from Bergen, Norway (Viets 1928).

Remarks – This species was recorded on various substrata: sediments, algae, sponges, and bryozoans from eastern and western North Atlantic Ocean (Newell 1947; Bartsch 1998, 2009). This species was also found amongst spider crab *Libinia emarginata* from Rhode Island, USA (Bartsch 1979; Chatterjee 2021a).

DISCUSSION

In this paper, we listed 19 species found among ascidians, altogether. These 19 species belong to 7 genera, viz. *Agaua* (3 species), *Arhodeoporus* (1 species), *Copidognathus* (8 species), *Halacarus* (1 species), *Lohmannella* (2 species), *Rhombognathides* (1 species), and *Thalassarachna* (3 species). Most of these reports are from mixed habitats. All these species which were found among ascidians were also reported from other habitats. Information on the halacarid fauna found among ascidians is very scarce in the literature and samples obtained were insufficient to determine the nature of the relationship between mites and ascidians. Most of the cases of halacarids on ascidians may be occasional invaders.

Proper collection of more ascidian specimens for halacarid mites from different areas may result in uncovering many more species and give a better idea about the nature of the association between halacarid mites and ascidians.

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REFERENCES

Abé, H. (1998) *Rhombognathine mites. Taxonomy, phylogeny, and biogeography*. Hokkaido Unive-

rsity Press, Sapporo, 219 pp.

- Abé, H. (2021) Taxonomic review of the subfamily Lohmannellinae (Acari: Trombidiformes: Halacaridae) with morphological comparisons among genera. *Zootaxa*, 4980(2): 201–255. DOI: [10.11646/zootaxa.4980.2.1](https://doi.org/10.11646/zootaxa.4980.2.1)
- André, M. (1937) Description de trois Halacariens de Conchinchie. *Bulletin du Muséum National d'Histoire Naturelle*, 2(9): 206–211.
- Bartsch, I. (1972) Ein Beitrag zur Systematik, Biologie und Ökologie der Halacaridae (Acari) aus dem Litoral der Nordund Ostsee. I. Systematik und Biologie. *Abhandlungen und Verhandlungen des Naturwissenschaftlichen Vereins zu Hamburg, Neue Folge*, 16: 155–230.
- Bartsch, I. (1979) Halacaridae (Acari) von der Atlantikküste Nordamerikas. Beschreibung der Arten. *Mikrofauna des Meeresbodens*, 79: 1–62.
- Bartsch, I. (1993) Halacaridae (Acari) von Malaysia. Beschreibung von drei Arten der Gattung *Copidognathus*. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 11: 45–58.
- Bartsch, I. (1998) Halacarinae (Acari, Halacaroida) from the northwestern Black Sea: A review. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 95: 143–178.
- 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. DOI: [10.11646/zootaxa.1998.1.1](https://doi.org/10.11646/zootaxa.1998.1.1)
- Bartsch, I. (2016a) Commented and illustrated key for identification of *Agaua chevreuxi* (Trouessart, 1889) and *A. panopae* (Lohmann, 1893) (Acari, Halacaridae). *Ecologica Montenegrina*, 8: 45–54. DOI: [10.37828/em.2016.8.6](https://doi.org/10.37828/em.2016.8.6)
- Bartsch, I. (2016b) Antarctic Halacaridae (Acari), new records, these species characteristics and an updated list of species. *Polish Polar Research*, 37(1): 131–154. DOI: [10.1515/popore-2016-0007](https://doi.org/10.1515/popore-2016-0007)
- Bartsch, I. (2020) *Lohmannella* (Acari, Halacaridae) from a cold-water coral reef off Norway, description of two new and a list of North Atlantic species. *Zootaxa*, 4722: 277–286.
- Bartsch, I. & Smit, H. (2006) Een checklist van de Nederlandse zeemijten (Acari: Halacaroida). *Nederlandse Faunistische Mededelingen*, 25: 25–32.
- Castilla, J.C., Lagos, N.A. & Cerda, M. (2004) Marine ecosystem engineering by the alien ascidian *Pyura praeputialis* on a mid-intertidal rocky shore. *Marine Ecology Progress Series*, 268: 119–130.
- Chartosia, N., Anastasiadis, D., Bazairi, H., Crocetta, F., Deidun, A., Despalatović, M., Di Martino, V., Dimitriou, N., Dragičević, B., Dulčić, J., Durucan, F., Hasbek, D., Ketsilis-Rinis, V., Kleitou, P., Lipej, L., Macali, A., Marchini, A., Ousselam, M., Piraino, S., Stancanelli, B., Theodosiou, M., Tiralongo, F., Todorova, V., Trkov, D. & Yapici, S. (2018) New Mediterranean biodiversity records (July 2018) *Mediterranean Marine Science*, 19: 398–415. DOI: [10.12681/mms.18099](https://doi.org/10.12681/mms.18099)
- Chatterjee, T. (2015) A checklist of halacarid and pontarachnid mites (Acari: Halacaridae and Pontarachnidae) found with mangroves. *Ecologica Montenegrina*, 4: 334–341. DOI: [10.37828/em.2015.2.40](https://doi.org/10.37828/em.2015.2.40)
- Chatterjee, T. (2020) Parasitic halacarid mites (Acari, Halacaridae): Survey on literature. *Acta Biologica*, 27: 5–10. DOI: [10.18276/ab.2020.27-01](https://doi.org/10.18276/ab.2020.27-01)
- Chatterjee, T. (2021a) A checklist of halacarid mites (Acari: Halacaridae) found with decapods crustaceans (Arthropoda, Crustacea, Decapoda). *Persian Journal of Acarology*, 10(2): 155–166. DOI: [10.22073/pja.v10i2.65624](https://doi.org/10.22073/pja.v10i2.65624)

- Chatterjee, T. (2021b) A checklist of halacarid mites (Acari, Halacaridae) found with echinoderms (Echinodermata). *Persian Journal of Acarology*, 10(4): 359–369. DOI: [10.22073/pja.v10i4.68340](https://doi.org/10.22073/pja.v10i4.68340)
- Chatterjee, T. (2021c) A checklist of halacarid and hydrachnid mites (Acari, Halacaridae & Hydrachnidia) associated with sponges (Porifera). *Zootaxa*, 5072(2): 101–129. DOI: [10.11646/zootaxa.5072.2.1](https://doi.org/10.11646/zootaxa.5072.2.1)
- Chatterjee, T. (2021d) A checklist of deep-sea halacarid mites (Acari, Halacaridae) found from more than 1000 m depth. *Persian Journal of Acarology*, 10(3): 249–268. DOI: [10.22073/pja.v10i3.67563](https://doi.org/10.22073/pja.v10i3.67563)
- Chatterjee, T. & Durucan, F. (2021) A checklist of halacarid mites (Acari, Halacaridae) found from more than 900 m a.s.l altitudes. *Persian Journal of Acarology*, 10(1): 21–40. DOI: [10.22073/pja.v10i1.63954](https://doi.org/10.22073/pja.v10i1.63954)
- Chatterjee, T. & Durucan, F. (2022) A checklist of halacarid and pontarachnid mites (Acari, Halacaridae & Pontarachnidae) found in seagrass habitats. *Persian Journal of Acarology*, 11(2): 187–223 .
- Chatterjee, T., Pflingstl, T. & Pešić, V. (2018) A checklist of marine littoral mites (Acari) found with mangroves. *Zootaxa*, 4442(2): 221–240. DOI: [10.11646/zootaxa.4442.2.2](https://doi.org/10.11646/zootaxa.4442.2.2)
- Chatterjee, T. & Sarma, A.L.N. (1991) Review of Indian Ocean Halacaridae and perspectives of future research. In: Gopal, V. & Asthana, V. (Eds.), *Aqatic Sciences in India*. Indian Association of Limnology and Oceanography, pp. 189–198.
- Durucan, F. (2019) New records of *Copidognathus* (Acari: Halacaridae) from Antalya, Turkey. *Persian Journal of Acarology*, 8(3): 189–210. DOI: [10.22073/pja.v8i3.49588](https://doi.org/10.22073/pja.v8i3.49588)
- Gimbel, O. (1919) Über einige neue Halacariden. *Mitteilungen aus dem Zoologischen Museum Hamburg*, 36: 105–130.
- Green, J. & MacQuitty, M. (1987) Halacarid mites. *Synopses of the British Fauna, New Series*, 36: 178 pp.
- Jones, C.G., Lawton, J.H. & Shachak, M. (1994) Organisms as ecosystem engineers. *Oikos*, 69: 373–386.
- Koplovitz, G., McClintock, J.B., Amsler, C.D. & Baker, B.J. (2009) Palatability and chemical anti-predatory defenses in common ascidians from the Antarctic Peninsula. *Aquatic Biology*, 7: 81–92.
- Lohmann, H. (1889) Die Unterfamilie der Halacaridae Murr. und die Meeresmilben der Ostsee. *Zoologische Jahrbücher, Abteilung für Systematik, Ökologie und Geographie der Tiere*, 4: 269–408.
- Lohmann, H. (1893) Die Halacarinen der Plankton-Expedition. *Ergebnisse der Plankton-Expedition der Humboldt Stiftung*, 2. G. a: 11–95.
- McClintock, J.B., Amsler, M.O., Amsler, C.D., Southworth, K.J., Petrie, C. & Baker, B.J. (2004) Biochemical composition, energy content and chemical antifeedant and antifoulant defenses of the colonial Antarctic ascidian *Distaplia cylindrica*. *Marine Biology*, 145: 885–894.
- Newell, I.M. (1947) A systematic and ecological study of the Halacaridae of eastern North America. *Bulletin of the Bingham Oceanographic Collection*, 10: 1–232.
- Newell, I.M. (1951a) New species of *Agaua* and *Thalassarachna* from the Aleutians (Acari, Halacaridae). *American Museum Novitates*, 1489: 1–19.
- Newell, I.M. (1951b) Further studies on Alaskan Halacaridae (Acari). *American Museum Novitates*, 1536: 1–56.

- Newell, I.M. (1984) Antarctic Halacaroida. *Antarctic Research Series*, 40: 1–284.
- Odate, S. & Pawlik, J.R. (2007) The role of vanadium in the chemical defense of the solitary tunicate, *Phallusia nigra*. *Journal of Chemical Ecology*, 33: 643–654.
- Otto, J.C. (1999) Four new species of *Agaue* (Acarina: Halacaridae) from the Great Barrier Reef Marine Park. *Cahiers de Biologie Marine*, 40: 273–281.
- Rimondino, C., Torre, L., Sahade, R. & Tatián, M. (2015) Sessile macro-epibiotic community of solitary ascidians, ecosystem engineers in soft substrates of Potter Cove, Antarctica. *Polar Research*, 34: 24338. DOI: [10.3402/polar.v34.24338](https://doi.org/10.3402/polar.v34.24338)
- Sepúlveda, R., Cancino, J.M. & Thiel, M. (2003) The peracarid epifauna found with the ascidian *Pyura chilensis* (Molina, 1782) (Ascidiacea: Pyuridae). *Journal of Natural History*, 37: 1555–1569.
- Sepúlveda, R.D., Rozbaczylo, N., Ibáñez, C.M., Flores, M. & Cancino, J.M. (2014) Ascidian-associated polychaetes: ecological implications of aggregation size and tube-building chaetopterids on assemblage structure in the Southeastern Pacific Ocean. *Marine Biodiversity*, DOI: [10.1007/s12526-014-0283-7](https://doi.org/10.1007/s12526-014-0283-7)
- Stoecker, D. (1978) Resistance of a tunicate to fouling. *The Biological Bulletin*, 155: 615–626.
- Stoecker, D. (1980) Relationships between chemical defense and ecology in benthic ascidians. *Marine Ecology Progress Series*, 3: 257–265.
- Trouessart, E. (1896) Description d'espèces nouvelles d'acariens marins. *Bulletin de la Société Entomologique de France*, 1896: 250–253.
- Trouessart, E. (1914) Acariens. In: *Deuxième Expédition Antarctique Française (1908-1910), commandée par le Dr. Jean Charcot. Sciences naturelles, Documents Scientifiques*. Masson, Paris, pp. 1–16.
- Viets, K. (1927) Die Halacaridae der Nordsee. *Zeitschrift für Wissenschaftliche Zoologie*, 130: 83–173.
- Viets, K. (1928) Die Halacariden des Schärngaards bei Bergen (Norwegen). *Bergens Museums Årbok 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.
- Voultsiadou, E., Pyrounaki, M.M. & Chintiroglou, C. (2007) The habitat engineering tunicate *Microcosmus sabatieri* Roule, 1885 and its associated peracarid epifauna. *Estuarine, Coastal and Shelf Science*, 74: 197–204. DOI: [10.1016/j.ecss.2007.04.003](https://doi.org/10.1016/j.ecss.2007.04.003)
- Voultsiadou, E., Kyrodinou, M., Chryssanthi, A. & Vafidis, D. (2010) Sponge epibionts on ecosystem-engineering ascidians: The case of *Microcosmus sabatieri*. *Estuarine Coastal and Shelf Science*, 86(4): 598–606. DOI: [10.1016/j.ecss.2009.11.035](https://doi.org/10.1016/j.ecss.2009.11.035)
- Wright, J.P. & Jones, C.G. (2006) The concept of organisms as ecosystem engineers ten years on: progress, limitations and challenges. *BioScience*, 56: 203–209. DOI: [10.1641/0006-3568\(2006\)056\[0203:TCOOAE\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2006)056[0203:TCOOAE]2.0.CO;2)

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فهرست کنه‌های دریازی (Acari, Halacaridae) یافت شده در میان کوزه‌داران (Tunicata, Ascidiacea)

تا پاس چاترجی

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چکیده

مجموعه‌ای از کنه‌های دریازی (Halacaridae) که با کوزه‌داران یافت شده‌اند، بر اساس گزارش‌های منتشر شده تهیه شده است. در این مقاله، ۱۹ گونه یافت شده با کوزه‌داران فهرست شده‌اند. این ۱۹ گونه به ۷ جنس تعلق دارند یعنی *Arhodeoporus* (۱ گونه)، *Agauae* (۳ گونه)، *Copidognathus* (۸ گونه)، *Halacarus* (۱ گونه)، *Lohmannella* (۲ گونه)، *Rhombognathides* (۱ گونه) و *Thalassarachna* (۳ گونه). بیشتر این گزارش‌ها مربوط به زیستگاه‌های مختلط است و تمامی این گونه‌هایی که در میان کوزه‌داران یافت می‌شوند از رویشگاه‌های دیگر نیز گزارش شده‌اند. بیشتر موارد کنه‌های دریازی که در زیستگاه‌های کوزه‌داران دیده شده‌اند ممکن است مهاجمان اتفاقی باشند.

واژگان کلیدی: Ascidian؛ ارتباط؛ Halacaroida؛ کوزه‌داران؛ Trombidiformes.

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