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## New records of marine water mites (Acari: Hydrachnidia, Pontarachnidae) from the southern Black Sea (Sinop Bay, Turkey)

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### Abstract

New records of marine mites family Pontarachnidae Koenike, 1910 (Acari: Hydrachnidia) from the southern Black Sea (Sinop bay, Turkey) are presented. Two species, i.e., *Pontarachna valkanovi* Petrova, 1978 and *Pontarachna adriatica* Morselli, 1980 are reported for the first time from Turkey. These are the first records of these species after its original description. Our study shows ecological differences between these species: *Pontarachna valkanovi* specimens were collected from 3 m depth, while *P. adriatica* seems to be characteristic of deeper waters (10 m depth).

**Keywords:** marine mites, Pontarachna, Black Sea.

### Introduction

The water mite family Pontarachnidae Koenike, 1910, the only family of Hydrachnidia occurring in the marine environment, represents a diverse and widespread, but still neglected group of marine meiofauna (Pešić *et al.*, 2012a). Following a worldwide survey of the diversity of the family by Pešić *et al.* (2012b), most of the presently known 43 species are known from the tropical Central Indo-Pacific Ocean. Most species live in the marine littoral zone. A few species have been described from freshwater areas, but these species were found to occur in estuaries or locations near the sea (Smit, 2002; Pešić *et al.*, 2013). Almost nothing is known of the life history of members of the family Pontarachnidae. The larva (if it exists as a free living stage) and its host (if any) are unknown and it is possible that the parasitic larval stage is bypassed (Pešić *et al.*, 2011).

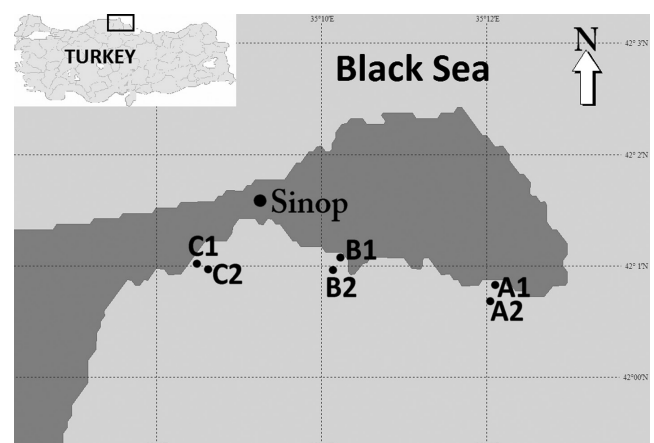
The family is represented by two genera: *Pontarachna* Philippi, 1840 and *Litarachna* Walter, 1925. Of the 43 known species, three species are known from the Black Sea (Pešić *et al.* 2012b): *Pontarachna punctulum* Philippi, 1840, *P. pontica* Viets, 1928 and *P. valkanovi* Petrova, 1978. At present, only two species are known from Turkey, i.e. *Pontarachna episce* Smit 2008, found in the gill of a fish, collected in the Mediterranean Sea (Smit, 2008), and *Litarachna divergens* Walter, 1925, recently recorded from Side (Antalya, Eastern Mediterranean - Thessalou-Legaki *et al.*, 2012).

During 2009–2010, the junior author conducted a bi-

odiversity survey at the three study sites located in Sinop bay (Fig. 1), situated on the most northern edge of the Turkish side of the Black Sea coast. The present samples of water mites were collected during this survey. In this study, two species new for Turkish fauna are identified.

### Materials and Methods

An annual meiobenthic sampling was carried out in August 2009- July 2010 at eight stations with alternating depths of 3 (A1, B1, C1) and 10 (A2, B2, C2) meters in Sinop Bay. In this study, water mites were collected at six sampling sites (Fig 1). Sampling was done using a metal sediment corer, 4 cm in diameter, positioned into a 20x20 quadrat. The sediment at all sites was a mixture of shell



**Fig. 1:** Map of the study area showing the sampling stations.

remains and muddy sand. Fixation was done using 75% ethanol. The material was washed through sieves of 1 mm, 500  $\mu\text{m}$  and 64  $\mu\text{m}$  mesh sizes. Bengal rose solution was added to the samples prior to sorting. Water mites were sorted in the laboratory with the aid of a stereo microscope and preserved in 90% ethanol. The material will be deposited in the collection of the first author.

The composition of the material is: males/females/deutonymphs.

## Results and Discussion

### Systematics

Family Pontarachnidae

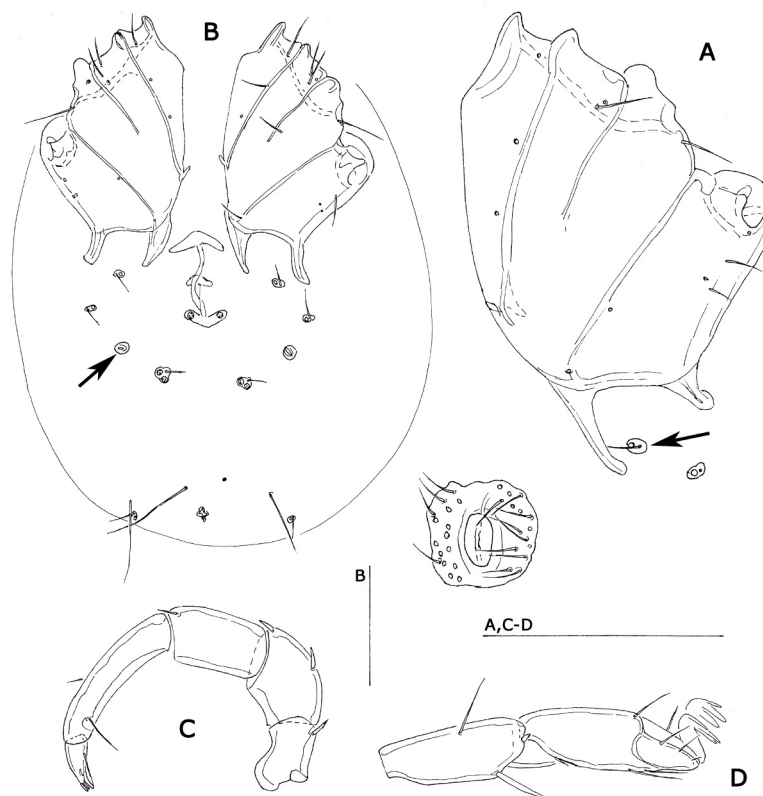
Genus *Pontarachna* Philippi, 1840

***Pontarachna adriatica* Morselli, 1980**

(Fig. 2)

**Material examined.** C2: 28.06.2010 1/1/0 (mounted); C2: 20.10.2009 0/1 (damaged)/1; C2: 29.01.2010 0/1/0; C2: 26.03.2010 0/1/0; C2: 31.05.2010 1/0/0.

**Remarks.** *Pontarachna adriatica*, a species described by Morselli (1980) from northern Adriatic brackish waters most closely resembles *P. punctulum* Philippi, 1840, which can easily be distinguished by the higher number of perigenital setae in males (80-90 [data taken from: K. Viets 1957, Morselli 1980] vs. 28-37 in *P. adriatica* – see Fig. 2A). Figure 2A-D shows some morphological details of the specimen from Sinop Bay.



**Fig. 2:** *Pontarachna adriatica* Morselli, 1980 (A = male, B-D = female): A = coxal and genital field (arrow showing small platelet with coxoglandularia 4 and associated seta); B = idiosoma, ventral view (arrow showing glandularium-like structure); C = palp; D = fifth and sixth segments of leg I. Scale bars = 100  $\mu\text{m}$ .

**Habitat.** The specimens of *P. adriatica* were collected from 10 m depth. The greatest depth at which pontarachnid mites have been recorded was recently reported by Pešić *et al.* (2012a) who described *Litarachna nemethi* from a mesophotic site near Vieques Island, off Puerto Rico, from 52–67 m depth. In the Mediterranean Sea, Mari & Morselli (1983) found *Litarachna communis* Walter occurring to a depth of 25 m, although most specimens were found between 3 and 5 m.

**Distribution.** Adriatic Sea. New for Turkey.

***Pontarachna valkanovi* Petrova, 1978**

(Fig. 3)

**Material examined.** Sinop Bay: A1: 20.10.2009 1/1/0; B1: 19.02.2009 0/0/1 (mounted); B1: 20.10.2009 0/0/1 (mounted); B1: 26.03.2010 0/1/0; B1: 19.11.2009 1/0/0 (mounted).

**Remarks.** *Pontarachna valkanovi* was first described by Petrova (1978) from the interstitial zone of the marine littoral (0.6-1.2 m depth) of the Bulgarian Black Sea coast. This species can easily be distinguished from other *Pontarachna* species in the sclerotized area surrounding the genital field in the male with a reduced number (5-6 pairs) of setae, and the very broad medial posterior apodemes of the fourth coxae (Fig. 3A). Figure 3A-C shows some morphological details of the specimen from Sinop Bay.

**Habitat.** Our study shows ecological differences between two collected pontarachnid species from Si-



**Fig. 3:** *Pontarachna valkanovi* Petrova, 1978, male: A = idiosoma, ventral view; B = palp; C = fourth to sixth segments of leg I. Scale bars = 100 µm.

nop bay: *Pontarachna valkanovi* were collected from 3 m depth, while *P. adriatica* seems to be characteristic of deeper waters (10 m depth).

**Distribution.** Black Sea. New for Turkey.

#### KEY TO SPECIES OF *PONTARACHNA* FROM THE BLACK SEA

1. A pair of small platelets with coxoglandularia 4 and associated setae fused with the fourth coxal plates; 17-21 pairs of perigenital setae in male .....  
*P. pontica* K. Viets, 1928  
 - A pair of small platelets with coxoglandularia 4 and associated setae not fused with the fourth coxal plates; number of perigenital setae in male various.....2
2. medial posterior apodemes of fourth coxae very broad; 5-6 pairs of perigenital setae in male.....  
*P. valkanovi* Petrova, 1978  
 - medial posterior apodemes of fourth coxae narrower; more than 10 pairs of perigenital setae in male.....3
3. 40-45 pairs of perigenital setae in male; postgenital

- sclerite in female straight.....  
 .....*P. punctulum* Philippi, 1840  
 - 16-19 pairs of perigenital setae in male; postgenital sclerite in female bowed.....  
 .....*P. adriatica* Morselli, 1980

#### Acknowledgements

We are indebted to Dr Ilse Bartsch (Hamburg), who separated pontarachnid mites and sent them to the first author. This work was funded by the Scientific and Technological Research Council of Turkey (TUBITAK) and the National Academy of Sciences of Ukraine (NASU), under 108Y340 project number.

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