Report of *Rhombognathus scutulatus* (Acari: Halacaridae) from Goa, India

**TAPAS CHATTERJEE,**¹ **MANDAR NANAJKAR**²

¹ Crescent International School, Bario, Govindpur, Dhanbad 828109, Jharkhand, India
² CSIR, National Institute of Oceanography, Dona Paula, Goa-403004, India

Corresponding author, e-mails: drtchatterjee@yahoo.co.in, mandar@nio.org

**Keywords**  
*Rhombognathus*, halacarid mite, Goa

**Abstract**  
*Rhombognathus scutulatus* Bartsch is reported here from Goa, India. World distribution of this species is also provided.

**Introduction**

Halacarid mites of west coast of India were studied by the first author from Kerala (Chatterjee, Sarma, 1993; Chatterjee, 1995, 2000; Bartsch, Chatterjee, 2001), Maharastra (Chatterjee, Chang, 2004) and Goa (Sarma, Chatterjee, 1993; Chatterjee, 2015, 2018; Chatterjee, Guru, 2011a, b; Chatterjee, Marshall, Guru, Ingole, Pesic, 2012; Chatterjee, Guru, Sorensen, 2013). In the present communication we report *Rhombognathus scutulatus* Bartsch, 1983 from rocky shore of Goa. *Rhombognathus scutulatus* was first described from Philippines (Bartsch, 1983). In India, this species was recorded earlier from Andhra Pradesh, Kanya Kumari, Kerala and Andaman & Nicobar Islands (Chatterjee, 1995).

**Material and Methods**

The material examined for the present study was collected from sediments of the intertidal seaweeds viz. *Sargassum, Ulva* and *Gracillaria* from Anjuna beach, Goa. After preliminary observation, one specimen was processed for SEM study.
**Study area:** Anjuna beach (Lat. 15° 34' 58'' N; Long. 73° 44' 28.54'' E) is located on the northern stretches of Goa state on the West Coast of India. The coast is mainly sandy and rocky shore. The rocky shore has small intertidal rock pools which are rich with diverse marine flora and fauna. The seaweed cover was seen on rocky shore and was more on seaward side represented by species of *Sargassum*, *Hypnea*, *Spatoglossum*, *Chaetomorpha*, *Sphacealia*, *Cladophora*, *Dictyota*, *Gracillaria*, *Porphyra* and *Amphiroa*. Some of the seaweeds like *Sargassum* sp. were found submerged in the water mainly in the splash zone area. The calcified genera include *Amphiroa* sp. & *Cheliosporum* sp. were found in abundance in the rook pool area. Whereas the rocky areas display large flank of *Sargassum* in rock pools & crevices. Three common seaweeds *Sargassum*, *Ulva* and *Gracillaria* were collected for the study of mites.

The following abbreviations are used in the text, table and figure legends: AE, anterior epimeral plate; PE, posterior epimeral plate; PGS, perigenital setae; SGS, subgenital setae.

**Result and Discussion**

*Rhombognathus scutulatus* Bartsch 1983

*Rhombognathus scutulatus* Bartsch (1983, pp. 413–415, figs. 46–57; 1993, pp. 20–21, figs. 1A–C; 1999, pp. 354–355, figs. 12F–H; 2000, p. 190; 2003, pp. 273–275, figs. 9A–D; 2006, pp. 42–43; 2009, pp. 35–36); Chatterjee (1995, pp. 284–285, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19) Chatterjee and De Troch (2000, pp. 184–185, figs. 15–19)

**Material Examined:** Males and females from Goa – Anjuna beach among rocky algae – *Sargassum*, *Ulva* and *Gracillaria*.

**Brief Description:** All dorsal plates fused in single shield and sculptured with foveae (Figure 1A). Posterodorsal area with a pair of setae. All ventral plates fused to a ventral shield (Figure 1B). AE area with 3 pairs of ventral setae plus one pair of adjunctive marginal setae. Each PE area with 3 ventral, one dorsal plus 1 adjunctive seta. Male with 11–12 pairs plumose PGS and 2 pairs SGS (Figure 1C). Female with 5 pairs PGS and 2 pairs SGS. Gnathostoma small and compact. Palp 4-segmented. Palpal patella (P₂) and trochanter without any setae. Palpal telofemur with 1 seta and tibiotarsus with 3 setae. Telofemora I and II with 6 setae (2 ventral and 4 dorsal); telofemora III and IV devoid of any ventral seta and bearing 3 dorsal setae. Tibia I with 5 setae of which 2 ventral pectinate. Legs with carpite on tarsi and devoid of median claw. Lateral claw endoplantane with broad accessory process bearing about 13–15 teeth (Figure 1D).

**Distribution:** This species is widely distributed in the south-western Pacific Ocean and Indian Ocean: Philippines, Singapore, Australia, Sri Lanka, India, Iran, Kenya, Mauritius and New Guinea. Table 1 and Figure 2 show the distribution of this species.

**Remarks:** There are six species of *Rhombognathus* viz. *R. aspidotus* Bartsch (2006), *R. conjunctus* Bartsch (1986), *R. parvulus* Viets (1939), *R. peltatus* Viets (1939), *R. scutulatus* Bartsch and *R. similis* Bartsch (1977) in which dorsal plates fused in single shield. *R. similis* was reported from Andaman & Nicobar islands (Chatterjee, 1995) as *R. similis* may belong to other species and should be considered at present as *Rhombognathus* sp. Among *Rhombognathus* species in which dorsal plates fused in single shield, *R scutulatus* and *Rhombognathus* sp. have been recorded from Indian Ocean.
Figure 1. *Rhombognathus scutulatus* Bartsch, SEM figs. A. Dorsal view; B. Ventral view; C. Genital area of male showing PGS and SGS; D. Claw of tarsus III

Table 1. *Rhombognathus scutulatus* Bartsch: Localities with habitats

| Locality                                      | Habitat                  | Ocean                       | Reference         |
|-----------------------------------------------|---------------------------|-----------------------------|-------------------|
| Philippines: Negros Island                    | 0–3 m                     | PTW: Pacific Ocean, tropical west | Bartsch (1983)    |
| Australia: Rottnest Is – Bickley point, Nancy cove, Little Armstrong Bay, western Australia | *Amphibolis* sp, *Caulerpa* sp. | ISE: Indian Ocean, south east | Bartsch (1993)    |
| Australia: Rottnest Is – Cape Vlamingh, Fish Hook Bay western Australia | Algae: *Amphiroa* sp. *Cystophora* sp, *Zonaria* sp. | ISE: Indian Ocean, south east | Bartsch (1993)    |
| 1                              | 2                                            | 3                                      | 4                                      |
|--------------------------------|----------------------------------------------|----------------------------------------|----------------------------------------|
| India: Palm beach, Visakhapatnam, Andhra Pradesh | Among rocky algae                             | ITE: Indian Ocean, tropical east        | Chatterjee (1995)                      |
| India: Kanya Kumari (=Cape comorin), Tamil Nadu    | Among rocky algae                             | ITE: Indian Ocean, tropical east        | Chatterjee (1995)                      |
| India: Kovalam, Kerala             | Among rocky algae                             | ITE: Indian Ocean, tropical east        | Chatterjee (1995)                      |
| India: Corvin cove, Andaman & Nicobar Islands    | Among coralline algae                         | ITE: Indian Ocean, tropical east        | Chatterjee (1995)                      |
| Australia: Rottnest Is – Bickley Bay, Bickley point; Nancy cove | Sea grass Amphiibolis and various algae      | ISE: Indian Ocean, south east           | Bartsch (1999)                         |
| Australia: Great Barrier Reef, Cape Fergusen, AIMS beach | Algae at low tide mark                        | PTW: Pacific Ocean, tropical west       | Bartsch (2000)                         |
| Australia: Great Barrier Reef, Magnetic Island, Alma Bay | Rocky littoral algae                          | PTW: Pacific Ocean, tropical west       | Bartsch (2000)                         |
| Kenya: Gazi Bay                    | Among sea grass: Thalassia hemprichii, Halophila ovalis, H. stipulacea, Halodule wrightii, Syringodium isoetifolium | ITW: Indian Ocean, tropical west        | Chatterjee & De Troch (2000)           |
| Australia: Dampier, northwestern Australia  | Padina sp. (Phaeophyta), low water edge      | ITE: Indian Ocean, tropical east        | Bartsch (2003)                         |
| Australia: 40 Mile Beach north of Cape Preston  | brown algae Padina and Sargassum             | ITE: Indian Ocean, tropical east        | Bartsch (2003)                         |
| Australia: East coast of the Burrup Peninsula, Watering Cove | turf of small red algae                      | ITE: Indian Ocean, tropical east        | Bartsch (2003)                         |
| Singapore: Strait of Singapore, Labrador park   | Small brown and green rocky algae            | PTW: Pacific Ocean, tropical west       | Bartsch (2006)                         |
| Sri Lanka: Ahangama                 | Among Halimeda from a moderately exposed fringing reef flat | ITE: Indian Ocean, tropical east        | Bartsch (2006)                         |
| Mauritius: South of Port Louis, Flie en Flac    | Intertidal wave exposed rocky shore           | ITW: Indian Ocean, tropical west        | Bartsch (2009)                         |
| New Guinea: Base G beach, Jayapura     | Marine littoral                               | PTW: Pacific Ocean, tropical west       | Smit (2011)                           |
| Iran: Chahabar Beach, Darya Bozorg, Gulf of Oman | Sargassum sp at 1m depth                     | ITW: Indian Ocean, tropical west        | Abe & Etemadi (2014)                   |
| India: Goa                          | Various rocky algae                           | ITE: Indian Ocean, tropical east        | Present report                         |
Chatterjee (1996) reported ciliate infestation on *R. Scutulatus* from Kovalam beach, Kerala. Bartsch (2009) has given a comparative view on the variation in number of tines on the accessory process of lateral claws and length of idiosoma. This species exhibits wide variation in number of tines on the accessory process of lateral claws ranging from 10 to 28 (Bartsch, 2009; Abé, Etemadi, 2014).

**Acknowledgement**

Thanks are due to Dr. Martin V. Sorensen, Natural History Museum of Denmark, University of Copenhagen, Denmark for making the SEM photographs.

**References**

Abé, H., Etemadi, I. (2014). Two rhombognathine mites (Acari: Halacaridae) from the Gulf of Oman, Iran. *Persian Journal of Acarology*, 3 (2), 107–119.

Bartsch, I. (2006). A new species and new record of *Rhombognathus* from Singapore (Acari: Halacaridae). *Zootaxa*, 1120, 41–49.

Bartsch, I. (1999). Halacaridae (Acari) from Rottnest Island, Western Australia. Mites on fronds of the seagrass *Amphibolis*. In: D.I. Walker, F.E. Wells (eds.), *The Seagrass Flora and Fauna of Rottnest Island, Western Australia* (pp. 333–357). Perth: Western Australian Museum.

Bartsch, I. (2000). Rhombognathinae (Acari: Halacaridae) from the Great Barrier Reef, Australia. *Memoirs of the Queensland Museum*, 45, 165–203.

Bartsch, I. (2003). Rhombognathine mites (Halacaridae: Acari) from Dampier, Western Australia: taxonomy and biogeography. In: F.E. Wells, D.I. Walker, D.S. Jones (eds.), *The Marine Flora and Fauna of Dampier, Western Australia* (pp. 255–280). Perth: Western Australian Museum.

Bartsch, I. (1993). Rhombognathine mites (Halacaridae, Acari) from Rottnest Island, Western Australia. In: F.E. Wells, D.I. Walker, D.S. Jones, H. Kirkman, R. Lethbridge (eds.), *The Marine Flora and Fauna of Rottnest Island, Western Australia* (pp. 19–43). Perth: Western Australian Museum.
Bartsch, I. (2009). *Rhombognathus* (Halacaridae: Rhombognathinae) from Mauritius, new records from the western Indian Ocean. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut, 106*, 27–38.

Bartsch, I. (1983). Zur Halacaridenfauna der Philippinen Beschreibung von fünf Arten der Gattung *Rhombognathus* (Acari, Halacaridae). *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg, 7*, 399–416.

Bartsch, I., Chatterjee, T. (2001). A new species of the *Agauopsis brevipalpus* group from India (Acari, Halacaridae). *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg, 7*, 399–416.

Chatterjee, T. (1996). Ciliate infestation on phytal Halacaridae (Acari) from the Kovalam beach (Kerala coast). *Journal of the Bombay Natural History Society, 93*, 107–108.

Chatterjee, T. (2018). New record of *Copidognathus andhraensis* (Acari, Halacaridae) from the west coast of India, Arabian Sea. *Acta Biologica, 25*, 123–129.

Chatterjee, T. (1995). Record of three species of *Rhombognathus* (Halacaridae: Acari) from Indian Ocean region. *Journal of the Bombay Natural History Society, 92*, 282–286.

Chatterjee, T. (2015). Scanning electron microscopic observations of *Copidognathus balakrishnani* Chatterjee (Acari: Halacaridae) with notes on species of the *Copidognathus balakrishnani* group. *Acta Biologica, 22*, 213–222.

Chatterjee, T. (2000). Two new species of *Copidognathus* (Halacaridae: Acari) from Kerala. *Journal of the Bombay Natural History Society, 97 (2)*, 235–239.

Chatterjee, T., Chang, C.Y. (2004). Two new *Copidognathus* halacarids (Acari: Halacaridae) from Mumbai coast of India (the Arabian Sea). *Italian Journal of Zoology, 71*, 265–269.

Chatterjee, T., De Troch, M. (2000). Halacaridae (Acari) from Gazi Bay (Kenya): description and biogeography of three new and two known species. *Hydrobiologia, 427*, 177–194.

Chatterjee, T., Guru, B.C. (2011a). Scanning electron microscopic observations of *Agauopsis arabia* Bartsch & Chatterjee (Acari, Halacaridae) with notes on the distribution of *Agauopsis* in the Indian Ocean. *Natura Montenegrina, 10* (4), 415–423.

Chatterjee, T., Guru, B.C. (2011b). Scanning electron microscopic observation of *Copidognathus arabicus* Chatterjee & Chang (Acari, Halacaridae) and notes on the distribution of the *Copidognathus bairdi* group sensu lato in the Indian Ocean. *Natura Montenegrina, 10* (4), 425–434.

Chatterjee, T., Sarma, A.L.N. (1993). Occurrence of *Copidognathus sideus* Bartsch 1982 (Halacaridae: Acari) from Indian coast. *Journal of the Bombay Natural History Society, 90* (2), 304–308.

Chatterjee, T., Marshall, D.J., Guru, B.C., Ingole, B, Pesic, V. (2012). A new species of the genus *Acarothrix* (Acari, Halacaridae) from Brunei Darussalam and India. *Cahiers De Biologie Marine, 53* (4), 541–546.

Chatterjee, T., Guru, B.C., Sorensen, M.V. (2013). Report of *Acarothrix palustris* Bartsch (Acari: Halacaridae) from the Indian Ocean, *Acta Biologica, 20*, 17–26.

Sarma, A.L.N., Chatterjee, T. (1993). Occurrence of *Arhodeoporus bonairensis* (Viets, 1936) from Indian Ocean with zoogeographical remarks on genus *Arhodeoporus* Newell. *Journal of the Bombay Natural History Society, 90* (3), 417–422.

Smit, H. (2011). New species of water mites from New Guinea (Acari: Hydrachnidia, Halacaridae). *Acarologia, 51* (3), 321–345.

Cite as: Chatterjee, T., Nanajkar, M. (2019). Report of *Rhombognathus scutulatus* (Acari: Halacaridae) from Goa, India. *Acta Biologica, 26*, 127–132. DOI: 10.18276/ab.2019.26-11.