# A new species of the Agauopsis brevipalpus-group from India (Acari: Halacaridae) 

Ilse Bartsch and Tapas Chatterjee

(With 12 figures)


#### Abstract

Agauopsis arabia sp. n. is described from the Indian coast of the Arabian Sea. The species is a member of the brevipalpus-group. With the four denticulate ventral spines on telofemur I, A. arabia sp. n. resembles A. brevipalpus (Trouessart, 1889) and related species.


## Introduction

The genus Agauopsis Viets, 1927 is cosmopolitan, with records from littoral to bathyal zones. The majority of the 72 species described can be attributed to natural species groups (Bartsch 1986, 1996, 1999, Otto 1999), one of these groups is the brevipalpus-group, named after Agauopsis brevipalpus (Trouessart, 1889). The brevipalpus-group is characterized by: anterior dorsal plate with H-shaped costae; posterior dorsal plate with pair of porose costae; ventral plates uniformly porose; third palpal segment with blunt, denticulate spur; fourth palpal segment with two setae; tarsi II to IV with three dorsal but no ventral setae; on tarsus II medial parambulacral seta spur-like, lateral parambulacral seta setiform; tarsi III and IV each with spur-like lateral but no medial parambulacral seta; telofemur I with one to three ventral and none, one or two ventromedial spines; tibia I with one ventral and two ventromedial spines.

Agauopsis brevipalpus, described on the base of a specimen from Le Croisic, French Atlantic coast (Trouessart 1889; Trouessart \& Neumann 1901), is characterized by its four spines on telofemur I. A similar number and arrangement of spines is present in many of the species of the brevipalpus-group. A. brevipalpus is presently known from the eastern Atlantic, Mediterranean and Black Sea. Records from other oceans are in need of verification (Bartsch 1996), e.g. those by Rao \& Ganapati (1968) and Chatterjee (1995). Examination of individuals collected on the coast of southwestern India proved these to be similar but not conspecific with $A$. brevipalpus.

## Material and methods

The halacarids were collected by the junior author (T.C.) in the Arabian Sea, southwestern coast of India, on a shore with boulders, rocky platforms, and rock pools. The mites are mounted in glycerine jelly. The holotype is deposited in the Zoological Museum Hamburg (ZMH), paratypes in the ZMH and the Senckenberg Museum Frankfurt (SMF).

Abbreviations used in the description are: $A D$, anterior dorsal plate; $A E$, anterior epimeral plate; $d s-1$ to $d s-5$, first to fifth pair of dorsal setae on idiosoma; GA, genitoanal plate; GO, genital opening; OC, ocular plate(s); $P D$, posterior dorsal plate(s); $P E$, posterior epimeral plate; pgs, perigenital setae. Legs numbered I to IV.

The position of a seta is given in a decimal system, with reference to the length of a plate, from the anterior to the posterior margin.

## Systematics

Agauopsis arabia sp. n.
Figs 1-12
MATERIAL: H o I ot y p e. Male, ZMH, Acc. No A46/01. India, west coast, Kerala, Kovalam beach, $8^{\circ} 23^{\prime} \mathrm{N}, 76^{\circ} 57^{\prime} \mathrm{E}$, amongst intertidal algae, November 1992; coll. T. Chatterjee.

Paratypes. One female, ZMH, Acc. No A47/01. Collecting data as in holotype. Male, female, SMF; collecting data as in holotype.

ETYMOLOGY: The name is derived from the locality, the Arabian Sea.
DIAGNOSIS: A species of the Agauopsis brevipalpus-group with 4 ventral apically denticulate spines. Medial costae of PD 2-3 porose panels wide; lateral costae delicate. Rostrum slightly longer than gnathosomal base. Tibia II to IV with 3, 2, 2 pectinate and spiniform ventral setae. Claw pectines on tarsi III and IV rudimentary.

DESCRIPTION: M a l e. Idiosoma of holotype $416 \mu \mathrm{~m}$ long, $270 \mu \mathrm{~m}$ wide; paratype $422 \mu \mathrm{~m}$ long. Costae of dorsal plates pierced by canaliculi which are arranged in panels. Each panel with 4-9 such canaliculi. Integument outside costae with epicuticular droplets fused to reticulate ornamentation (Fig. 3); each polygon of reticulum with 5-8 very delicate pores. Idiosoma with minute frontal spinelet (Fig. 1). $A D 152 \mu \mathrm{~m}$ long, $122 \mu \mathrm{~m}$ wide; with H-shaped costae. Pair of small gland pores in anterior portion of ' H '; $d s-1$ medial to gland pores. Setae $d s-2, d s-3$ and $d s-4$ within striated integument. OC $92 \mu \mathrm{~m}$ long, $67 \mu \mathrm{~m}$ wide. Each plate with oblique porose costa extending to medial margin of the plate, 2 corneae, a gland pore and a pore canaliculus. Interval between posterior cornea and gland pore, and between gland pore and pore canaliculus, equalling width of posterior cornea. PD $204 \mu \mathrm{~m}$ long, 169 $\mu \mathrm{m}$ wide; anterior margin rounded. Medial pair of longitudinal costae almost V shaped; costae 2, rarely 3 porose panels wide (Fig. 3). Porose areola in posteromedian edge of PD somewhat delimited from longitudinal costae. Lateral costae weakly developed, hardly raised but with canaliculi. Setae ds-5 at 0.40 relative to length of $P D$, and midway between medial and lateral costae. Adanal setae delicate.

Ventral plates panelled, each panel with 6-18 canaliculi. AE $147 \mu \mathrm{~m}$ long, $257 \mu \mathrm{~m}$ wide; with 3 pairs of ventral setae and pair of epimeral pores. The latter with internal cup-shaped structure opening to exterior with minute slit. PE $177 \mu \mathrm{~m}$ long; with 1 dorsal and 3 ventral setae. GA $147 \mu \mathrm{~m}$ long, $160 \mu \mathrm{~m}$ wide. Anterior margin in holotype slightly concave (Fig. 2), in paratype truncate. GA $60 \mu \mathrm{~m}$ long, $45 \mu \mathrm{~m}$ wide. Distance from GA to GO equalling length of GO. Spermatopositor large (Fig. 4); from anterior truncate portion to base of furca $107 \mu \mathrm{~m}$ long. Pair of outlying setae almost at the same level as anterior setae of ring of pgs. Holotype with 5 and 6 pgs on either side immediately lateral to GO, and 28 pgs in a ring around GO. Paratype on either side with 4 and 5 inner pgs and 13 and 14 outer setae. Genital sclerites with 5 pairs of spur-like subgenital setae.

Gnathosoma $155 \mu \mathrm{~m}$ long. Gnathosomal base porose. Tectum scaliform (Fig. 5). Rostrum, as in female (Fig. 11) slender, parallel-sided, slightly longer than gnathosomal base. Basal pair of maxillary setae long, situated on gnathosomal base; the other pair in apical fourth of rostrum. Tip of rostrum with 2 pairs of slender rostral setae. Palps slender; extending to end of rostrum. Spine on third palpal segment long, bluntly ending and pectinate (Fig. 6).

First pair of legs larger than succeeding pairs. Integument of all telofemora and lateral flank of trochanters and basifemora III and IV pierced by canaliculi. Telofemora II to IV 2.0-2.2 times longer than high. Leg chaetotaxy, from trochanter to tarsus (solenidia omitted): leg I, 1, 2, 9, 5, 9, 10; leg II, 1, 2, 6, 5, 7, 5; leg III, 1, 2, 3, 3, 5, 4; leg IV, 0, 2, 3, 3, 5, 4. Telofemur I with 2 ventral and 2 ventromedial spines; genu I with pair of spines; tibia I with 1 ventral spine and 2 ventromedial ones (Fig. 7); tarsus I with 1 ventromedial spine. Spines short, with denticulate tip. Tibia II with 3 ventral setae, ventromedial seta slightly flattened, short and bipectinate; 2 ventral setae spiniform and pectinate (Fig. 8). Tibiae III and IV each with pair of pectinate, spiniform ventral setae (Figs 9, 10); ventromedial seta slightly smaller than ventrolateral one. Tarsi II to IV with short membranes of claw fossa. Tip of tarsus I with 2 small ventral setae and pair of doubled parambulacral setae.

Claws on tarsus I much shorter than those on succeeding tarsi; claws smooth, without accessory process and pecten. Claws on tarsi II to IV slender, each with delicate accessory process and remnants of pectines. Tines of pectines visible only under oil immersion. On tarsus II short pectines present both in convex and concave portion of claws; the former pecten with about 7 tines, the latter with 12 tines. Pectines of claws III and IV present only in concave portion of claws, its 5-6 tines rudimentary. Central sclerite on tarsus I with large, bidentate median claw; upper tooth much smaller than ventral one. Central sclerite on tarsi II to IV small, without claw-like process.

Female. Idiosoma $490 \mu \mathrm{~m}$ long, $319 \mu \mathrm{~m}$ wide. Dorsal aspect as in male. PD 1.3 times longer than wide. GA $169 \mu \mathrm{~m}$ long, $159 \mu \mathrm{~m}$ wide. Anterior margin truncate (Fig. 12). GO $93 \mu \mathrm{~m}$ long, $62 \mu \mathrm{~m}$ wide. Distance between anterior margin of GA to GO about half length of GO. Ovipositor not extending beyond GA. The three pairs of pgs close to $G O$. Subgenital setae lacking.


Figs 1-8. Agauopsis arabia sp. n. (o ${ }^{7}$ ): 1 -idiosoma, dorsal; 2 - idiosoma, ventral; 3 portion of right $P D$ at the level of $d s-5 ; 4$ - anterior portion of $G A$ with spermatopositor; 5 - gnathosoma, lateral; 6 - palp, medial; 7 - leg I, ventromedial; 8 - basifemur to tarsus II, medial ( $p$, porose panels; sp, spermatopositor. Scale $=50 \mu \mathrm{~m}$ ).


Figs 9-12. Agauopsis arabia sp. n.: 9 - leg III, medial ( $\sigma^{\top}$ ); 10 - leg IV, medial ( $\sigma^{\star}$ ); 11 gnathosoma, ventral (ㅇ); 12 - idiosoma, ventral (ㅇ) .( Scale $=50 \mu \mathrm{~m})$.

Gnathosoma 172-180 $\mu \mathrm{m}$ long, 85-92 $\mu \mathrm{m}$ wide; length almost twice the width. Rostrum slightly longer than gnathosomal base. Chaetotaxy as in male. Legs as in male.

## Remarks

The brevipalpus-group includes species with one to three denticulate ventral spines or none, one or two similar shaped ventromedial spines on telofemur I. Adults of Agauopsis arabia sp. n. have four such spines. The same number of spines are present in the eight species A. atacamae Newell, 1984, A. borealis Newell, 1947, A. brevipalpus (Trouessart, 1889), A. ibssi Bartsch, 1996, A. littoralis Bartsch \& lliffe, 1985, A. moorea Bartsch 1992, A. ripa Otto, 1999, and A. sordida Bartsch, 1992. A. atacamae and $A$. littoralis can be separated from the others on the base of the
numbers of setae on tibiae III and IV, four setae on each in A. atacamae, six setae in A. littoralis, but five setae in the other species. A. ibssi is characterized by the uniformly ornamented $P D$ and very slender telofemora, with the telofemora III and IV having a length:height ratio of 2.8-2.9, whereas the PD of the other species have distinct costae and telofemora III and IV a length:height ratio of less than 2.5. A. sordida has a short rostrum, its length is 0.7 of that of the gnathosomal base, in contrast, the rostra of A. arabia, A. borealis, A. brevipalpus, A. moorea, and A. ripa are longer; the rostra of A. arabia, A. borealis, A. brevipalpus, and A. moorea are almost as long as or longer than the gnathosomal bases. On the OC of A. moorea, the gland pore is in the posterior half of the plate and is separated from the posterior cornea by more than the latter's diameter, in A. arabia sp. n. the pore is in the anterior half of the OC and close to the posterior cornea. The PD of A. borealis, A. brevipalpus and $A$. ripa each have a pair of elongate medial and lateral costae, the medial costae are about four porose panels wide; in $A$. arabia sp . n . the medial costae are two to three porose panels wide, the lateral costae are weakly developed.

Agauopsis borealis and A. brevipalpus are spread in the boreal North Atlantic, A. borealis on the American Atlantic coast, from Rhode Island to North Carolina (Newell 1947, Bartsch 1979), A. brevipalpus on the European Atlantic coast, in the Mediterranean and Black Sea (Bartsch 1996b). Records of A. littoralis are from the Bermuda Islands and Florida (Newell 1947, Bartsch and lliffe 1985) and those of $A$. ibssi from the Black Sea (Bartsch 1996b). A. atacamae, A. moorea and A. ripa are species of the Pacific Ocean, A. atacamae was taken on the shores of Chile (Newell 1984), A. moorea from the Society Islands (Bartsch 1992a), and A. ripa proved to be abundant in shallow water habitats in eastern Australia (Otto 1999). Records of $A$. sordida are from Southern China (Bartsch 1992b). A. arabia sp. n. is from the southern edge of India; the species is supposed to be widely spread in the Indian Ocean. In respect of the Agauopsis brevipalpus-group, obviously each biogeographic region or subregion - as outlined by Ekman (1953) and Vermeij (1978) - harbours species of its own.

## Zusammenfassung

Die im Arabischen Meer, an der Südküste Indiens, gesammelte Agauopsis arabia sp. n. wird beschrieben. Die Art gehört zur brevipalpus-Gruppe. Sie trägt, wie A. brevipalpus Trouessart, 1889, vier fein-gezähnte Ventraldornen an den Telofemora des ersten Beins.

## References

Bartsch, I., 1979: Halacaridae (Acari) von der Atlantikküste Nordamerikas. Beschreibung der Arten. - Mikrofauna Meeresboden, 79: 1-62. Mainz.

Bartsch, I., 1986: Zur Gattung Agauopsis (Acari, Halacaridae), Beschreibung zweier neuer Arten und Übersicht über Verwandtschaftsgruppen. - Zool. Scr., 15: 165-174. Stockholm.

Bartsch, I., 1992a: Halacariden von den Inseln Moorea und Bora Bora, Gesellschaftsinseln, Polynesien (Arachnida: Acari). - Senckenberg. biol., 72: 465-488. Frankfurt a.M.

Bartsch, I., 1992b: Two new species of littoral Agauopsis (Acari: Halacaridae) from Hong Kong. - In: Morton, B. [ed.]: Proceedings of the Fourth International Marine Biological Workshop. The Marine Flora and Fauna of Hong Kong and Southern China, 1: 243-250. Hong Kong University Press, Hong Kong.

Bartsch, I., 1996. Agauopsis (Acari, Halacaridae) of the Sevastopol area: supplementary notes on taxonomy and ecology. - Rev. suisse Zool., 103: 697-712. Genf.

Bartsch, I. 1999. Wiederbeschreibung zweier Arten der Agauopsis ornata-Gruppe (Acari, Halacaridae). - Entomol. Mitt. zool. Mus., Hamburg, 13: 37-48. Hamburg.

Bartsch, I. \& lliffe, T.M., 1985: The halacarid fauna (Halacaridae, Acari) of Bermuda's Caves. - Stygologia, 1: 300-321. Leiden.

Chatterjee, T., 1995: Occurence of Agauopsis brevipalpus brevipalpus Trouessart (Halacaridae: Acari) from west coast of India. - J. Bombay nat. Hist. Soc., 92: 431-434. Bombay.

Ekman, S., 1953: Zoogeography of the Sea. - Sidgwick and Jackson Limited, 417 pp. London.

Newell, I.M., 1947: A systematic and ecological study of the Halacaridae of eastern North America. - Bull. Bingham oceanogr. Coll., 10: 1-232. New Haven, Conn.

Newell, I.M., 1984: Antarctic Halacaroidea. - Antarct. Res. Ser., 40: 1-284. Washington, D.C.
Otto, J.C., 1999: Halacarid fauna of the Great Barrier Reef and Coral Sea: The genera Agauopsis and Halacaropsis (Acarina: Halacaridae). - Mem. Qd. Mus., 43: 797-817. Brisbane.

Rao, G. C. \& Ganapati, P. N., 1968: The interstitial fauna inhabiting the beach sands of Waltair coast. - Proc. natn. Inst. Sci. India, B, 34: 82-125. Calcutta, New Delhi.

Trouessart, E., 1889: Sur les acariens marins des côtes de France. - C. r. hebd. Séanc. Acad. Sci., 108: 1178-1181. Paris.

Trouessart, E. \& Neumann, G., 1901: Note sur les acariens marins (Halacaridae) récoltés par M. Henri Gadeau de Kerville dans la région d'Omonville-la-Rouge (Manche) et dans la fosse de la Hague. - Bull. Soc. amis Sci. nat., Rouen, sér 4, 14: 247-266, pI. IV, V. Rouen.

Vermeij, G.J., 1978: Biogeography and adaptation: patterns of marine Life. - Harvard University Press, 332 pp. Cambridge, Massachusetts.

Authors' addresses:

Dr. I. Bartsch, Forschungsinstitut und Naturmuseum Senckenberg, Notkestr. 31, 22607 Hamburg, Germany; --- Dr. T. Chatterjee, Bihar, Indian School of Learning, ISM Annexe, Dhanbad 826004, Bihar, India.

## ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database
Digitale Literatur/Digital Literature
Zeitschrift/Journal: Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg

Jahr/Year: 1999
Band/Volume: 13
Autor(en)/Author(s): Bartsch Ilse, Chatterjee Tapas
Artikel/Article: A new species of the Agauopsis brevipalpus-group from India (Acari: Halacaridae) 321-327

