



Short Communication

Two new species of the genus *Sennertia* (Acari: Chaetodactylidae) phoretic on Carpenter bees from west Bengal, India



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ABSTRACT

Two new species of *Sennertia* Oudemans, 1905, *Sennertia punctatus* sp. nov. and *Sennertia xylocopi* sp. nov. which are phoretic on Carpenter bees collected from West Bengal for the first time are illustrated and described.

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Introduction

Acari is one of the most biologically diverse groups among Arachnids, successfully colonizing aquatic and terrestrial habitats (Evans, 1992). Most of them are free-living organism, while other forms are different types of temporary or permanent association ranging from commensal to parasitic. Astigmatid mites have developed various types of symbiotic relationships including parasitism, phoresy (temporarily use large organisms as a means of transportation) and predation with both vertebrates and invertebrates summarized in OConnor (1982). Most invertebrate associates are basically free-living and facultatively associated with arthropods for phoresy as deutonymphs, while certain groups of astigmatid families like Canestriniidae, Chaetodactylidae, and Winterschmidtiiid spend their entire life cycle with host insects. Host-parasitic relationships can be explained among them by the evolution of twisted claws in deutonymphs of hymenoptera-associated astigmatid mite which help them to hold host body during phoresy.

Among the *Xylocopa* associates, *Sennertia* Oudemans, 1905, of the family chaetodactylidae is the largest group. Most species of the genus have been described as deutonymphs, phoretic on adult bees and rarely feeding stages are found living in insect nests (Eickwort, 1994). Among the ~60 described species in *Sennertia*, sometimes multiple species (deutonymph) have been collected from a single host (Fain, 1981; Baker and Delfinado-Baker, 1983; Ramaraju and Mohanasundaram, 2001; Okabe and Makino, 2002, 2008). This genus is known in India

by 28 species (Putatunda and Kapil, 1990; Putatunda, 1996). Then three new species were added by Ramaraju and Mohanasundaram (2001).

Fain (1981) divided the genus into the following five subgenera based on deutonymphal characteristics: *Sennertia*, *Afrosennertia*, *Asiosennertia*, *Amsennertia* and *Spinosenertia*. Then, Kurosa (2003) added a new subgenus, *Eosennertia*, with a new species, *Sennertia (Eosennertia) bifida*. The subgenus *Sennertia* was divided into three groups, 1.Group 'horrida', 2.Group 'japonicus' and 3.Group 'cerambycina' by Fain (1981). In the present communication, two new species of the genus *Sennertia* collected from two different species of Carpenter bees in West Bengal, India are illustrated and described. This genus is the first report from West Bengal. These new species belong to the group 'japonicus' under subgenus '*Sennertia*'.

Materials and methods

A regular screening of field collected Carpenter bees was done to study the association of mites with these insects. Whenever the mites were found, they were collected, cleared and mounted in lactic acid (50%) on glass slide and then slides were warmed gently over an electric lamp (40 W) for a few seconds until the fumes of lactic acid started emerging. Identification was done using a research microscope and drawings were made using a drawing tube fitted with the microscope. All the measurements were taken in micrometers. Then permanent slides were made using Hoyer's medium. Specimens were identified by comparison with published descriptions and illustrations without recourse to type specimens. The nomenclature for body chaetotaxy has been followed as per Ramaraju and Mohanasundaram (2001).

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Taxonomic accounts

Sennertia (Sennertia) punctatus sp. nov.

Description

Deutonymph (hypopus): Body broadly oval, bulky, 270 long and 247 wide.

Dorsum: Dorsal hysterosomal shield entire, single, large (162×152), punctuate with transversely curved striation pattern, covering 1/3 of the entire dorsum, anterior margin roughly rounded, extend up to the base of leg II, epimera I and II nearer to Sc_i and Sc_e but do not reach the level of legs I. Hysterosomal shield bears setae d_1 – d_4 and d_5 – l_5 being located ventrally. Posterior margin of the shield rounded, wider at a level just near legs III. Dorsal hysterosomal shield extends ventrally like a fold into the suctorial plate (Fig. 1).

Striation of body outside hysterosomal shield well developed more or less concentric on propodosoma. Setae d_1 – d_5 small, less than $3 \mu\text{m}$; Scapular setae, internal (Sc_i) small, 21, lies in the central part; setae Sc_e large, 112 long, posterior to the base of legs I; humeral setae (h , 82) simple, located outside the shield at the lateral margin of body, posterior to legs II; setae L_1 (92) located posterior to the base of legs II; L_2 (100) located at the base of legs III and L_3 (62) long, located on the lateral side of body just above at the base of legs IV (Fig. 2).

Venter: Epimera I fused medially forming 'y' shaped sternum and reach the end of legs II; epimera II–IV free well developed; epimera III very long and ends in blunt condition with one end going down, epimera IV short and 'y' shaped. Setae CX_i and CX_{III} fine, simple, 52 and 37 long, respectively. Setae sh , stout, marginal, 37 long, ga stout, 25 long, gm small, thin, 20 long, gp fairly stiff 30 long and l_5 104 long. Suctorial plate round, big, longer (70) than wide (52), well sclerotized covering almost half of opisthosomal area and do not reach the end of body. Anterior sucker larger, closely placed (12 in diameter) than posterior sucker (7 in diameter); conoids almost equal in size with posterior sucker, arranged in transverse line, both side of anterior and posterior suckers (Fig. 3).

Legs: All legs well developed; Leg I–III end in sharp, strong, large and twisted sickle-shaped claw, with lateral process present in tarsus I, II but that on tarsus III simple, not strong process, leg IV with a long whip-like seta apically, leg I–IV 112, 112, 105 and 575 long, respectively. Tarsi I, II with semi foliate seta, tarsi IV with long apical seta and sub apical seta.

Host: *Xylocopa iridipennis* Lepeletier (Xylocopidae: Hymenoptera).

Type material: Holotype deutonymph (hypopus) marked on the slide and five paratypes. India, West Bengal, Science City, Eastern Bypass, 15.viii.2009. ex Carpenter bee, *Xylocopa modesta* Smith (Xylocopidae: Hymenoptera).

Type depositions: The types of the new species are presently deposited in the collection of the Entomology Laboratory, Dept. of

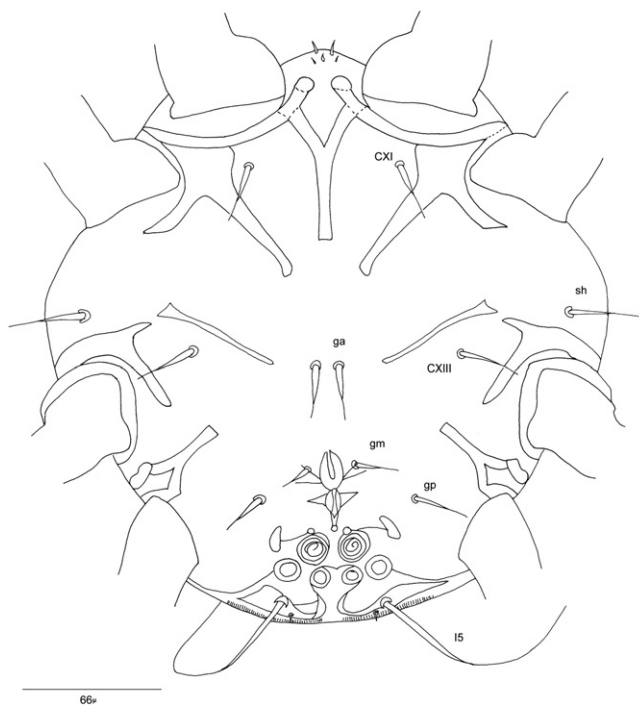


Fig. 2. *Sennertia (Sennertia) punctatus* sp. nov. Ventral view.

Zoology, Calcutta University, which in due course will be deposited to the National Zoological collection of Z.S.I., Kolkata.

Etymology: The species is given basing on punctations on dorsum.

Diagnosis: This new species belongs to *japonicus* group but because of having some strikingly different characters, it does not resemble any of the known species for example (Fain, 1981)

1. Dorsal shield almost as long as wide in the new species but in most of the other species it is longer than wide.
2. Presence of incurved lanceolate setae on pretarsus I, II and absent in pretarsus III, but in others it is present in all pretarsi barring *S. japonicus* and *S. alfkani*.
3. Apicoventral setae on tarsus I and II strong and on tarsus III, it is simple in the new species but in others like, *S. alfkani*, where it is strong and simple, not spine-like and in *S. japonicus*, it is short and spine-like.

Sennertia (Sennertia) xylocopi sp. nov.

Description

Deutonymph (hypopus): Body oval, globose, 230 long and 172 wide.

Dorsum: Hysterosomal shield single, large (182×97), elongate ovate, widest at posterior, gradually narrowed towards the anterior end with fine longitudinal striations and dense minute punctures, cuticular surface not punctuate. Well developed setae Sc_e , h , L_1 , L_2 and minute Sc_i , d_1 – d_5 , L_3 , l_5 and d_5 ventrally. Dorsum well developed striations, more or less concentric anteriorly and longitudinal laterally. Setae Sc_i , minute (7), Sc_e long (60), located at the base of leg I; setae Sc_i small, minute, placed on the epimera I; hysterosomal setae d_1 – d_5 small, less than $5 \mu\text{m}$; setae h (40) marginally located posterior to legs II. Lateral setae L_1 long (67), situated at base of legs II; L_2 long (62), anterior to legs III. Seta d_1 on hysterosoma small, placed at level of h ; d_2 also small, located at some level of L_2 , d_3 small, placed at level of leg IV. Setae d_4 small, located dorsally on the suckers; seta L_3 also small (17), placed in middle in between legs III and IV (Fig. 4).

Venter: Epimera I fused forming 'V' shaped sternum, all coxal fields open; epimera II and IV free; ventral setae thin, simple, and small in length; setae CX_i on epimera II and CX_{III} on coxal fields measuring 12 both. Setae ga , gm and gp small, stiff, inflated at middle, measure 15, 7, and 12 respectively. Setae sh short, simple and 15 long. Suckers are

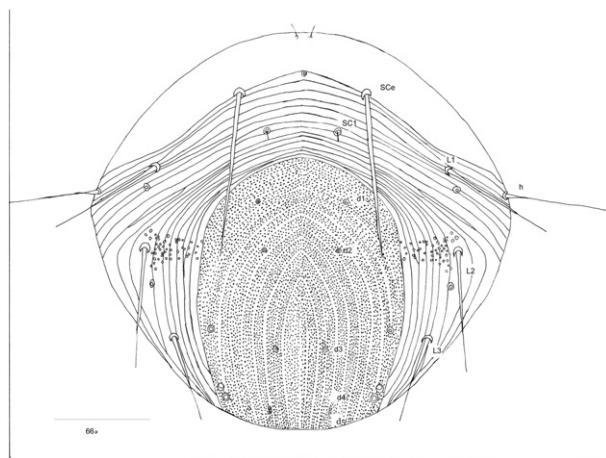


Fig. 1. *Sennertia (Sennertia) punctatus* sp. nov. Dorsal view.

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