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Recent data on the knowledge of Tarsonemidae (Acarina: Heterostigmata) in Turkey

Sultan ÇOBANOĞLU*

Summary

Five species of tarsonemid mites: ***Tarsonemus hermes*** Suski, ***Tarsonemus karli*** Sharanov and Mitrofanov, ***Tarsonemus lobosus*** Suski, ***Dendroptus buxi*** (Canestrini et Berlese) and ***Dentroptus willmanni*** (Schaarschmidt), are recorded for the first time in Turkey. On the basis of specimens collected during a survey on Tarsonemidae (Acarina, Heterostigmata) between 1990 and 1995, their morphological characters are re-examined with the figures. Their distribution and host plants are also given.

Key words: Acarina, Tarsonemidae, Heterostigmata, ***Tarsonemus***, ***Dendroptus***, Turkey

Anahtar sözcükler: Acarina, Tarsonemidae, Heterostigmata, ***Tarsonemus***, ***Dendroptus***, Türkiye

Introduction

About 31 genera reported in the family of Tarsonemidae (Acarina: Heterostigmata). They are include phytophagous, fungivorus, saprophagous and predatory species according to their feeding behaviour (Lindquist, 1986). In Tarsonemidae, beside the phytophagy, parasitism on plant feeding insects especially on scale insects, parasitising or phoretic on bark beetles or microphytophagy can be observed (Smiley and Moser, 1974; Ripka et al., 1997).

The majority of tarsonemid genera do not feed on green plants but the genera ***Phytonemus*** Lindquist, 1986; ***Polyphagotarsonemus*** Beer & Nucifora, 1965; ***Hemitarsonemus*** Ewing, 1939; ***Steneotarsonemus*** Beer, 1954; ***Ogmotarsonemus*** Lindquist, 1986 and ***Suskia*** Lindquist, 1986 are can cause

* University of Ankara, Agricultural Faculty, Plant Protection Dept., 06110 Dışkapı, Ankara
e-mail: sultan.cobanoglu@agri.ankara.edu.tr
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economic damage of the cultivated plants. ***Dendroptus*** Kramer, 1876; species are mainly found on deciduous trees and shrubs frequently in association with eriophid mites (Ripka et al., 1997).

Lindquist (1986) revised systematically and phylogenetically the generic and suprageneric taxa of Tarsonemidae. Gerson (1971), reported the presence of seven tarsonemid species in Israel. Ripka et al., (1997) mentioned 22 tarsonemid species on woody ornamental plants from Poland. ***Tarsonemus destructor*** Smiley & Landwehr predaceous on tetranychid eggs on pine trees (Smiley & Landwehr, 1976). ***Stenotarsonemus konoi*** Smiley & Emmanuel, is causing necrosis of the stems and flowering parts of graminae in Greece (Smiley & Emmanuel, 1980; Papaioannou-Souliotis et al., 1994).

The present knowledge on Tarsonemidae in Turkey is very poor. ***Tarsonemus hominis*** Bahl and ***Tarsonemus granarius*** Lindquist were observed in flour and cheese and on stored rice respectively (Merdivenci, 1972; Özkan et al., 1988, 1994; Öksüz & Özman, 1999). Three tarsonemid species ***T. waitei*** Banks, ***T. confusus*** Ewing and ***Polyphagotar sonemus latus*** (Banks) were reported from vegetables (Çobanoğlu, 1995). At that time some of the species were not identified with certanity. After that, the species were identified by Dr. Magowski (A. Mickiewicz University, Department of Animal Taxonomy & Ecology. Poznan - Poland).

Material and Method

Terminology is based on Lindquist (1986). The plant samples were taken from various parts of cultivated areas. The mites samples were kept into lactic acid and mounted in Hoyer's medium. All measurements are in micrometers (µm). The drawings were made with the aid of phase contrast microscope.

The specimens are kept in the authors's collection of University of Ankara, Plant Protection department.

Results

Family Tarsonemidae

Genus *Tarsonemus* Canestrini & Fanzago, 1876

Type species: ***Chironemus minusculus*** Canestrini and Fanzago, 1876

In adult female and male: sejugal apodeme fully developed or reduced only medially, tarsus II usually retaining spine like seta dorsoproximally near solenidion, or if this seta not present, leg I usually lacking 1 of 2 tibial solenidia.

Tarsonemus hermes Suski, 1966 (Figure 1-3)

Female

Dorsum: Slightly globular shape, the body length (from the palpi to the end of cauda of opisthosoma) 170 and width 112.5 (n=2). Dorsal structure almost smooth. Gnathosoma long and conical shaped, palpi free. Idiosoma broadly oval

and the largest part is in the middle. Propodosomal shield truncate anteriorly and covered most of the gnathosoma. Pseudostigmatic organs large and oval in shape, located just above of trochanters II. The apex of the pseudostigmatic organ about twice as long as the pedicel. On tergites II, III, and IV stout and blunted (Fig. 1).

Venter: Apodemes I and II very weak and not join the transverse apodeme. Apodeme III very strong and extend in anteromedial and posterolateral directions. Apodeme IV weak, straight. The both apodeme has two knot like thickening. Legs are moderately long and robust. On femur II, they have flange like projection (Fig.2). Leg IV has whip like terminal seta and nearly as long as the length of leg IV (Fig. 3).

Male: Not found.

Material examined: Mushroom, 11.5. 1993, Ankara (5 ♀♀).

This species was found on apple trees in Poland (Suski, 1966). Later it was recorded from Hungary and it was reported that this species was associated with ***Tetranchus viennensis*** (Zacher) (Prostigmata: Tetranychidae) (Ripka et al., 1997).

T. hermes is a new record for the fauna of Turkey.

Tarsonemus karli Sharonov & Mitrofanov, 1986 (Figure 4-6)

Female

Dorsum: Body 173.75±6.1 long, 117±4.13 wide (n=4).

Gnathosoma broadly oval, pseudostigmatic organ globular shape and pedicel long. Propodosomal plate doesn't have any extension over the gnathosoma. Dorsal tergites obscure (Fig. 4).

Venter: Apodeme I joined with epimeron. The second apodeme is not joined with epimeron. Apodeme III strong thickening at the coxal apex. Leg IV have whip like seta (Fig. 5).

Male: The body length 150±3.96 and width 90.5±2.43 (n=5).

Ventral apodemes very strong around coxae III and IV.

Legs IV have prominent and hook shaped claw and two setae on femur (Fig. 6).

Material examined: ***Citrus*** sp., 19.6.1993; 18.10.1993, Izmir (4 ♀♀, 5 ♂♂, 1 Larva).

T. karli was described from Crimea, Sukhumi, Abkhazia in 1986 (Sharonov et Mitrofanov, 1986). Later it was recorded on ornamental trees and shrubs from different parts of Hungary (Ripka et al., 1977). ***T. karli*** and ***T. waitei*** were found together with ***Pseudolacaspis pentagona*** (Targ.-Tozz.) (Homoptera: Diaspididae). It was also reported on ***Salix*** sp., ***Fraxinus*** sp., ***Malus*** sp. and ***Quercus*** sp. with ***Aculus schlechtendali*** (Nal.), ***Aceria fraxinivorus*** Nal. and ***Cecidiophyes tristernalis*** (Nal.) (Prostigmata: Eriophyidae) (Ripka et al., 1997).

T. karli is a new record for the fauna of Turkey.

Tarsonemus lobosus Suski, 1965 (Figure 7-8)

Female

Dorsum: Broadly oval shaped. Body length 175±3.6 and with 112.5±0.0 (n=4). Dorsal tergits are strong. Idiosoma oval. Propodosomal shield broad. Pseudostigmatic organ oval in shape; anterior part of this organ is longer. Dorsal integument almost smooth (Fig.7).

Venter: Propodosomal shield has an apodeme at the posterior of the shield and it has sircular lobus covering the most part of gnathosoma. Ventral apodemes distinct. Apodeme I joined anteriomedian epimeron but the second apodeme does not join in the middle. Apodeme III curved and extend the anterior apodeme by the trochanters. Apodeme IV very weak and straight and joined posteromedian apodeme. All the apodemes have knot like thickenings but the thickening in the middle of the apodeme IV is distinct than the others. This species has small lobus between trochanters IV (Fig. 8).

The legs are moderately longer and robust. There is a whip like seta on Leg IV.

Male: Not found.

Material examined: ***Citrus*** sp., 17.10.1993, Izmir (4 ♀♀).

This species was collected for the first time on apple orchards in Poland (Suski, 1965). Later, it was recorded on woody ornamental plants in Hungary (Ripka, et al., 1997). This species was found with ***P. pentagona*** and ***Aulacaspis rosae*** (Bouche). ***T. lobosus*** was also found associated with ***T. vienennsis*** (Ripka et al., 1997).

T. lobosus is a new record for the fauna of Turkey.

Genus *Dendroptus* Kramer, 1876

Type species: ***Dendroptus kirchneri*** Kramer, 1876

This genus is distinguished by a round shape flange on the femorogenu IV on male. In larva and adult, femora I and II each with three setae. The species of the genus ***Dendroptus*** Kramer are considered in close association with eriophyoid mites. Also mentioned that this group may be interacted with fungus which lives in the surface of the leaves (Ripka et al., 1997).

Dendroptus buxi (Canestrini & Berlese, 1884) (Figure 9-11)

Tarsonemus buxi Canestrini & Berlese, 1884

Female

Dorsum: Body length 237.5 and width 117.5 (n=2). Female longer and thin look like ***Stenotarsonemus*** spp. Gnathosoma longer and the palpus prominent. Pseudostigmatic organ small, globular in the apex, sphere shaped (Fig. 9).

Venter: Apodeme I and II joined with anteromedian apodeme and strong. Epimeron III and IV weak almost unconspicious. Leg IV has whip like seta (Fig. 10).

Male: Body length 200 and width 112.5 (n=1).

In general, male robust, stout and large. The palpus is very long comparing the other tarsonemid species. Apodeme III and IV joined with epimerite and make different segmentation on this part. Copulation apparatus is very distinct in the ventral region.

Leg IV stout, but it is not very large. Trochanter longer than wide. Femur IV very large at the distal this part and larger than tibia. Femur divided in two part and has a round shape flange. It is also exist prominent claw at the apex of leg IV (Fig.11).

Material examined: On ***Buxus bacorica*** and ***B. sempervirens*** L., 17.9.1995, Ankara (2 ♀♀, 1 ♂).

This species was reported on ***B. sempervirens*** from Middle of Europe (Stammer, 1959). In Hungary eight species of ***Dendroptus*** were recorded. Out of 21 samples were observed with ***Dendroptus*** sp., 16 samples supplies with eriophyoid mites. It means that almost 76% samples were infected with eriophyoids. It seems that there is a close biological relationship between the species of ***Dendroptus*** and eriophyoid mites (Ripka et al., 1997). A sort of facultative parasitism may be a life habit of some ***Dendroptus*** mites (Lindquist, 1986). ***Dendroptus*** species were found to feed on erineum of eriophyoids. In earlier works many ***Dendroptus*** species were identified as ***Tarsonemus*** sp. Their identifications are very difficult and sometimes it is only possible with certainty with their males. It is always necessary to be careful about identification of this group.

Dendroptus willmanni (Schaarschmidt, 1959) (Figure 12-14)

Tarsonemus willmanni Schaarschmidt, 1959

Female

Dorsum: Elongate shaped. Body length 210.0 and width 127.5 (n=2). Gnathosoma longer than wide, rostral setae robust. Pseudostigmatic organ small globular in shape (Fig. 12).

Venter: Epimera I and II not joined together. They are free. Legs IV have whip like seta at the apex (Fig.13).

Male: Body length 152.5±0 and width 85.0±0 (n= 1). Idiosoma flat and large in dorsal. Coxae I and II far from each other. Epimera III and IV joined together as like caudal segment. Copulation apparatus very large and seems divided in two segments (Fig. 14).

In male, Legs IV stout and robust. Femora IV have very characteristic, small but fairly distinct rounded inner flange and the fourth leg has exceptionally a prominent terminal claw (Fig. 14).

Material examined: ***Ulmus campestris*** 14.5.1989. Ihlara valley (2 ♀♀, 1 ♂).

This species was reported on ***Crataegus leaves*** with ***Eriophyes goniothorax*** Nal., and on ***Acer campestris*** L. with ***Eriophyes macrorhynchus*** Nal. from Bremen (Schaarschmidt, 1959). Later it was recorded from Hungary on ***A. campestris***, ***Alnus*** sp., ***Fraxinus*** sp., ***Prunus*** sp., and ***Populus*** sp. with ***Aceria***, ***Acalitus***, ***Aculus, Diptacus*** sp. (Eriophyoidae). ***D. willmanni*** was also reported with ***Pseudochermes*** sp. and ***Phenococcus aceris*** (Signoret) (Insecta: Coccoidea). The same species were often collected from the leaves infested with ***Eotetranychus tiliarum*** (Hermann) (Acari: Tetranychidae) (Ripka et al., 1997).

D. willmanni is a new record for the fauna of Turkey.

Özet

Türkiye Tarsonemidae (Acari: Heterostigmata) faunası ile ilgili son veriler

Tarsonemidae familyasından beş tür, ***Tarsonemus hermes*** Suski, ***Tarsonemus karli*** Sharanov and Mitrofanov, ***Tarsonemus lobosus*** Suski, ***Dendroptus buxi*** (Canestrini et Berlese) ve ***Dentroptus willmanni*** (Schaarschmidt) Türkiye akar faunası için yeni kayıt olarak belirtilmiştir. Örnekler 1990 ve 1995 yıllarında yapılan surveyler sonucu elde edilmiş, türlerin tanınmasında yardımcı olacak morfolojik karakterler şekillerle açıklanmıştır. Ayrıca türlere ait konukçular ve yayılış alanları da verilmiştir.

Acknowledgements

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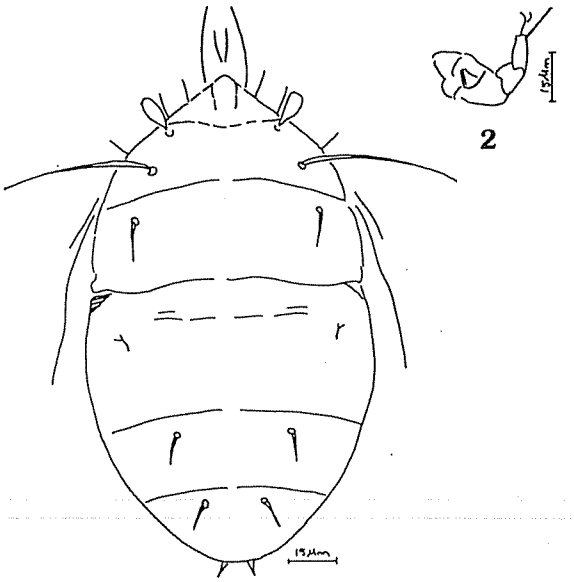

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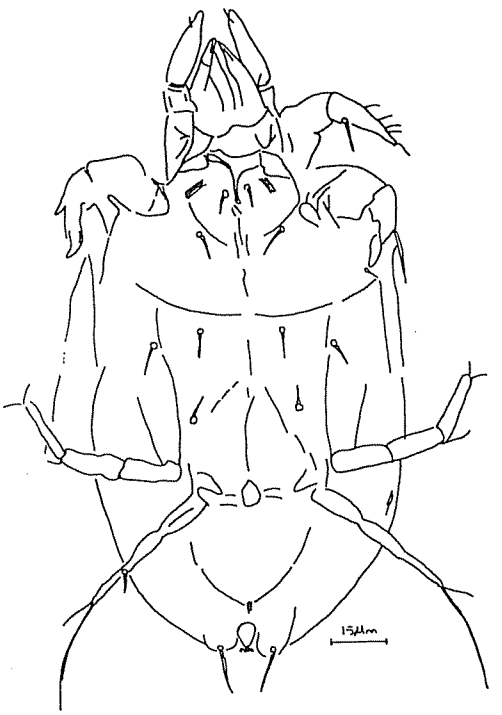

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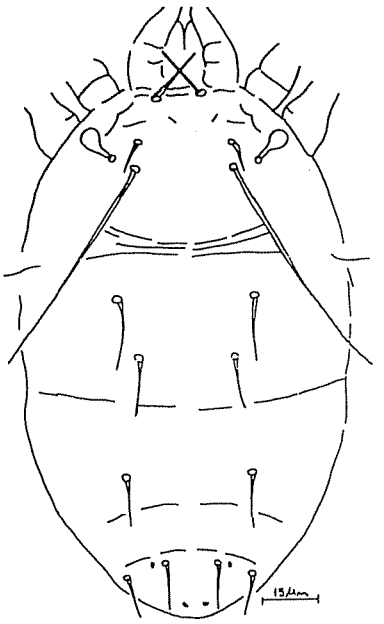
Figures 1-3. ***Tarsonemus hermes*** Suski, 1966: Female; 1. Dorsum, 2. Femur II., 3. Venter, Scale bar = 15 µm.



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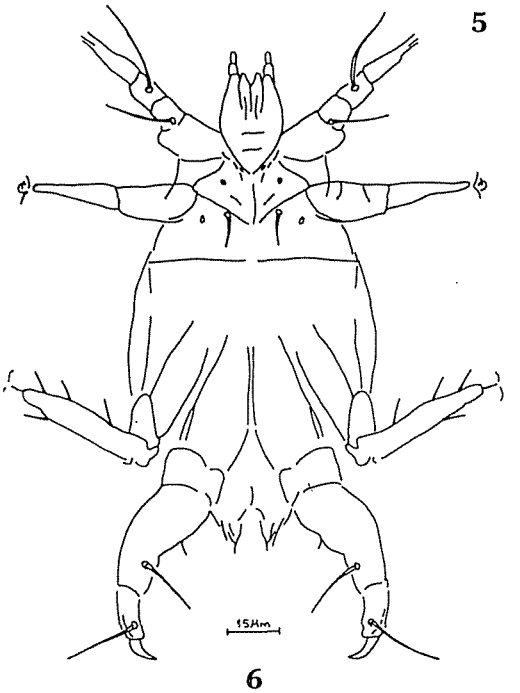

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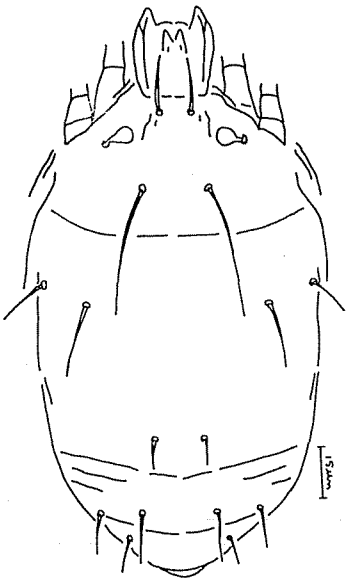
Figures 4-6. ***Tarsonemus karli*** Sharonov & Mitrofanov, 1986: Female; 4. Dorsum, 5. Venter, 6. Venter, Male; Scale bar = 15 µm.



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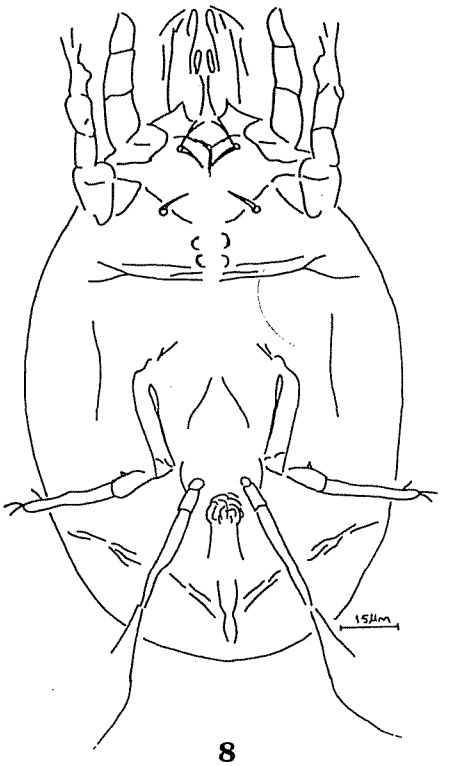

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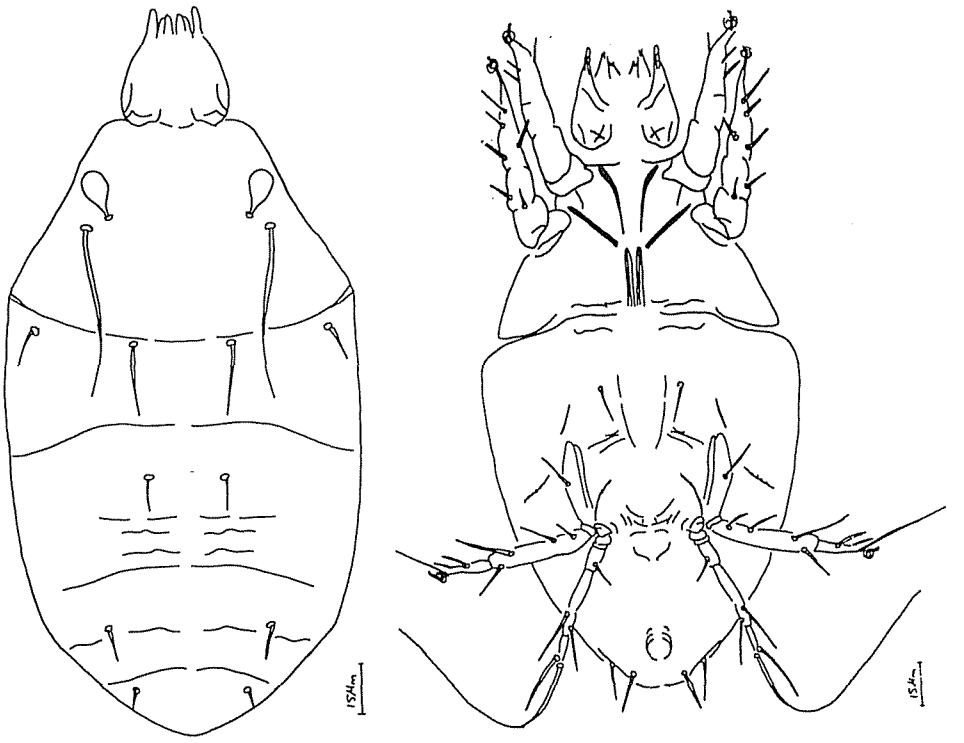
Figures 7-8. ***Tarsonemus lobosus*** Suski, 1965: Female; 7. Dorsum, 8. Venter, Scale bar = 15 µm.



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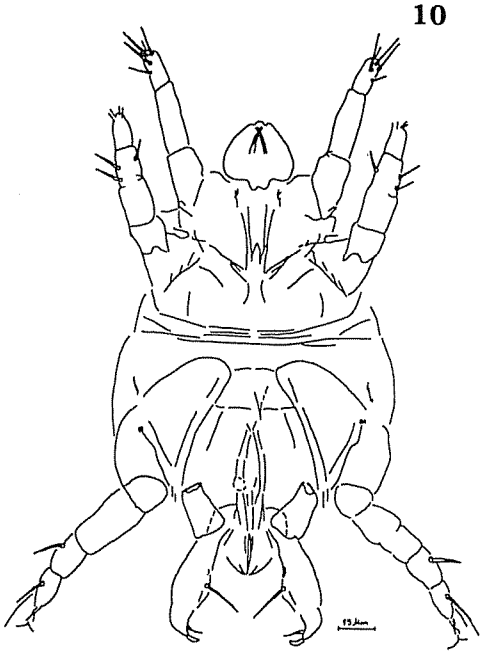

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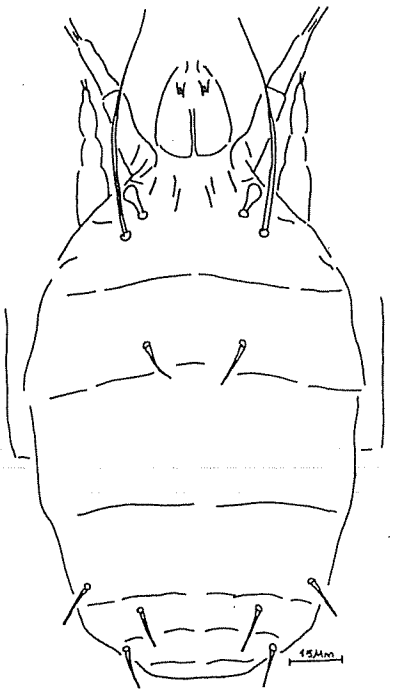
Figures 9-11. ***Dendroptus buxi*** (Canestrini & Berlese, 1884): Female; 9. Dorsum, 10. Venter, 11. Venter, Male; Scale bar = 15 µm.



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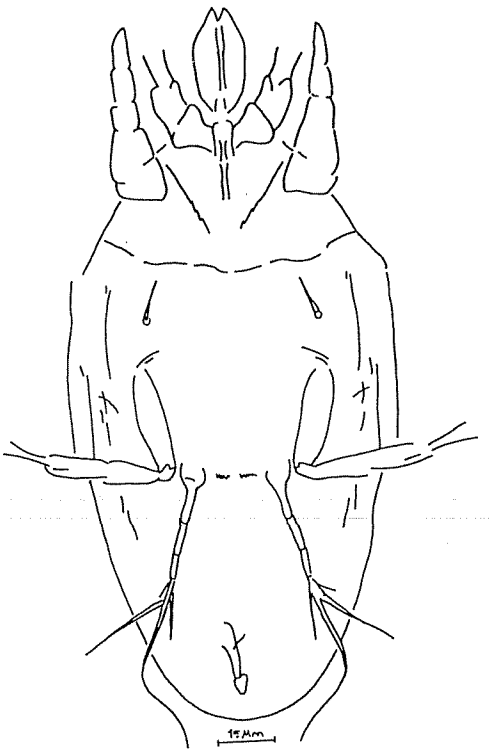

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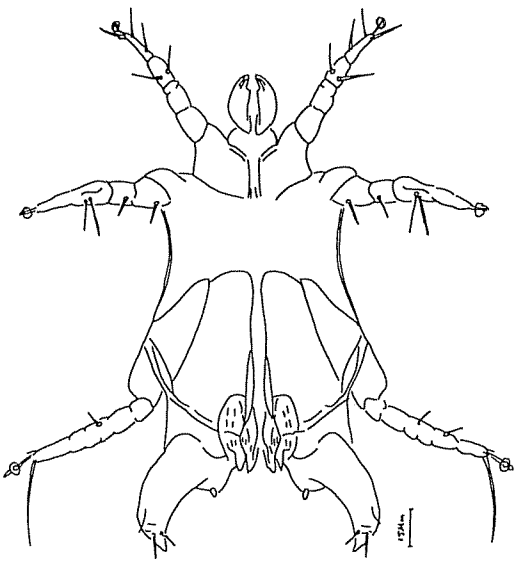

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Figures 12-14. ***Dendroptus willmanni*** (Schaarschmidt, 1959): Female; 12. Dorsum, 13. Venter, 14. Venter, Male; Scale bar = 15 µm.