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The genus *Glyptholaspis* Filipponi & Pegazzano (Acari: Macrochelidae) of Kelkit Valley (Turkey), with first description of male of the species *G. saprophila* Mašán

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Abstract: This study was carried out on the genus *Glyptholaspis* in Kelkit Valley, Turkey, during 2007–2012. Three species, *G. americana* (Berlese, 1888), *G. confusa* (Foà, 1900), and *G. saprophila* Mašán, 2003, were recorded from Kelkit Valley. *G. americana* has been previously recorded from Turkey; *G. confusa* and *G. saprophila* are first records for the Turkish fauna. The male of *G. saprophila* is described for the first time in this study. Original drawings for all known species of the genus from Kelkit Valley are included. Additionally, an identification key to the Turkish species of *Glyptholaspis* is given here.

Key words: Macrochelid mites, *Glyptholaspis*, new records, Kelkit Valley, Turkey

1. Introduction

Macrochelid mites live in organic matter, especially in dung, compost, and litter, and feed on other small arthropods, eggs and larvae of flies, and nematodes (Halliday, 2000; Krantz and Walter, 2009). They are well known worldwide, but have been poorly investigated in Turkey, with only 16 species described (Erman et al., 2007; Özbek et al., 2013; Özbek and Bal, 2014).

Glyptholaspis is separated from other genera of family Macrochelidae by the posterior edges of the sternal shield extending posterior to the metasternal shields, and with very distinctive sculpture of the dorsal and ventral shields (Filipponi and Pegazzano, 1960; Krantz, 1962; Hyatt and Emberson, 1988; Mašán, 2003).

The genus *Glyptholaspis* was created by Filipponi and Pegazzano (1960) and includes about 15 species worldwide. Two recorded species of *Glyptholaspis*, *G. fimicola* and *G. americana*, have previously been reported from Denizli, Turkey, by Ekiz and Urhan (2002). *G. confusa* and *G. saprophila* are described based on females and males in this survey. The male of *G. saprophila* is described for the first time.

2. Materials and methods

Mites were collected from the Kelkit Valley and extracted using Berlese funnels. Mites were mounted in Hoyer's medium following the methods of Krantz and Walter (2009). Specimens were examined and illustrated using a Nikon E-600 research microscope and Nikon Y-IDT drawing tube. Measurements were made using a Leica DM 4000 B phase-contrast microscope. All measurements are given as a range in micrometers. Examined specimens were deposited in the Acarology Laboratory of Erzincan University, Turkey. Notation of the dorsal setae follows Halliday (1986, 1987).

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3. Results and discussion

Family Macrochelidae Vitzthum, 1930

Genus *Glyptholaspis* Filipponi & Pegazzano, 1960

Species *Glyptholaspis confusa* (Foà, 1900)

Holostaspis confusa Foà, 1900: 137.

Specimens examined: 12 females, Turkey, Giresun, Çamoluk, 40°08′07″N, 38°48′37″E, alt. 1066 m, 24 November 2007, from litter under *Juniperus* sp.; 10 females, Turkey, Tokat, Erbaa-Taşova, 40°43′51″N, 36°23′37″E, alt. 210 m, 9 November 2008, from decaying grass; 15 females and 3 males, Turkey, Gümüşhane; 40°16′31″N, 39°′37′20″E, alt. 1880 m, 16 November 2008, from litter under *Astragalus* sp.

Diagnosis

Female: Dorsal shield 1170–1290 long, 690–770 wide at the level of setae *r4*, shield having 28 pairs of setae and 1–2 unpaired setae between *j6* and *J2*; dorsal setae *j6*, *z5*, *z6*, *J5*, and *J2* distally denticles, other setae pilose; *z1* shorter than *j1*; posterior margin of dorsal shield between setae *Z5* with 5 distinct outgrowths; setae *Z5* longer than

J5; sternal shield ornamented with symmetrical pattern; all of diagnostic characters as in Figures 1A–1F.

Male: Dorsal shield 820–900 long, 530–590 wide at the level of setae *r4*, and bearing 28 pairs of setae and 1–2 unpaired setae; holoventral shield 670–720 long, 160–180 wide; femora II and IV with spur; other diagnostic characters same as in females (Figures 2A–2D).

Distribution: It is widely distributed in the world (Mašán, 2003). New for Turkey.

Notes: *G. confusa* is easily distinguished from other species of the genus by having 1–2 unpaired setae between *j6* and *J2*. It was found in litter under *Juniperus* sp. and *Astragalus* sp., and in decaying grass at altitudes of 210–1880 m from the valley.

***Glyptholaspis americana* (Berlese, 1888)**

Holostaspis marginatus var. *americanus* Berlese, 1888: 195.

Specimens examined: 1 female and 6 males, Turkey, Tokat, Niksar, 40°31′54″N, 36°54′25″E, alt. 327 m, 14 May 2011, from dung.

Diagnosis

Female: Idiosoma 1490 long, 780 wide at the level of setae *r4*; dorsal shield bearing 28 pairs of setae; *j5*, *j6*, *z5*, *z6*, *J2*, and *J5* needle-like, other setae pilose; *J5* longer than *Z4* and *Z5*; *j5* surpassing base of setae *j6*; between setae *Z5* 2 large outgrowths and numerous microdenticles present; all of diagnostic characters as in Figures 3A–3G.

Male: Dorsal shield 960–1085 long, 580–650 wide and bearing 28 pairs of setae; holoventral shield 735–895 long

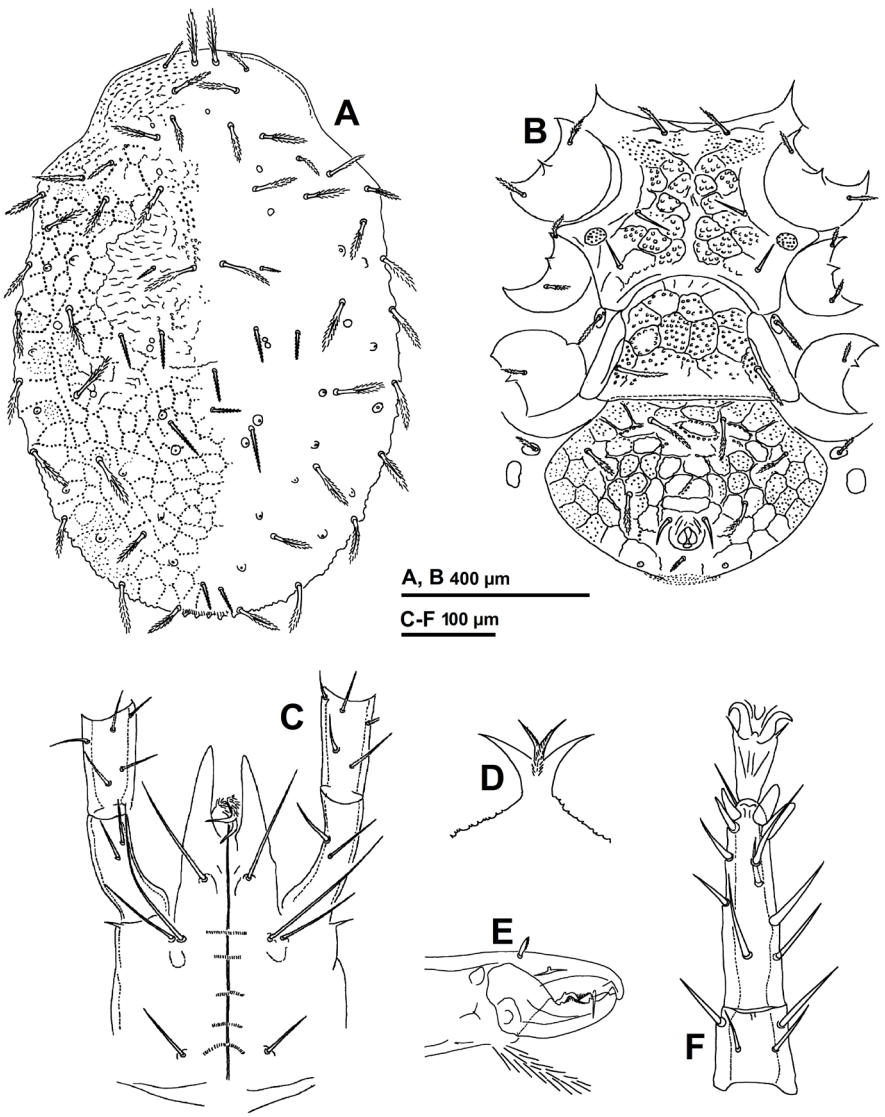


Figure 1. *Glyptholaspis confusa* (female): **A)** dorsal shield, **B)** ventral shields, **C)** gnathosoma, **D)** epistome, **E)** chelicera, **F)** tarsus II.

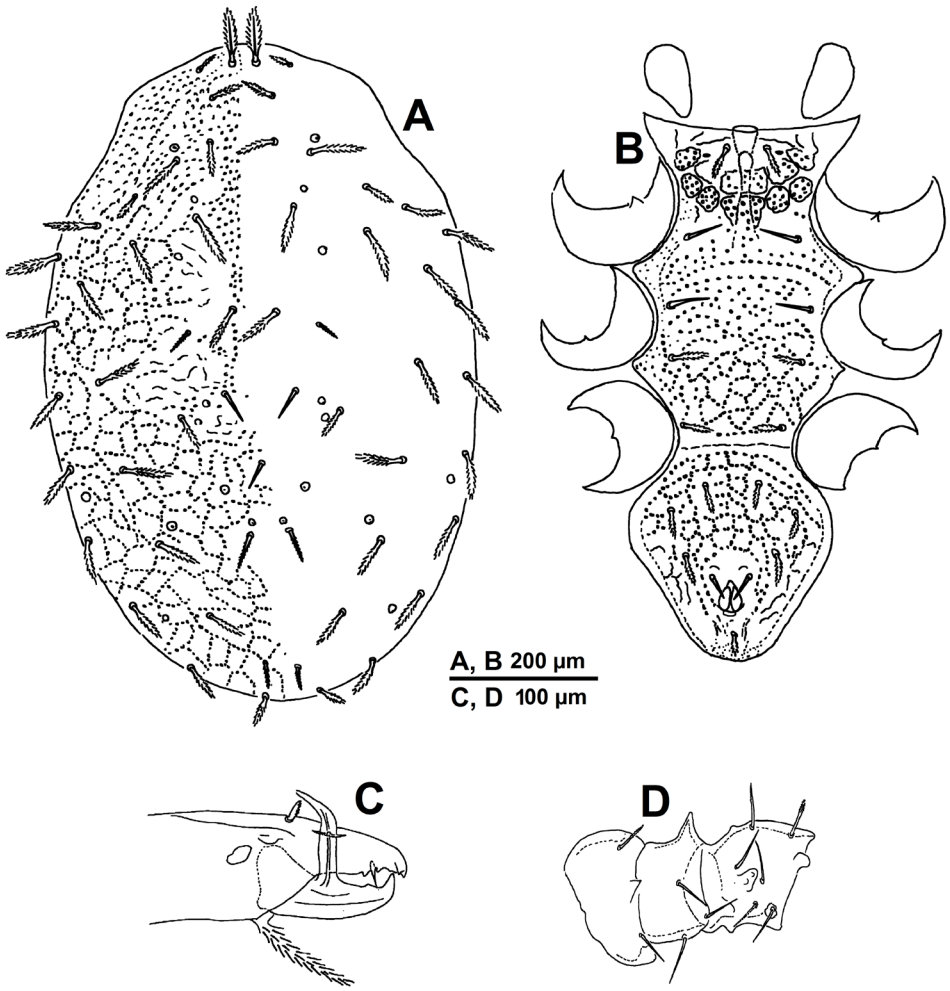


Figure 2. *Glyptholaspis confusa* (male): **A)** dorsal shield, **B)** holoventral shield, **C)** chelicera, **D)** femur II with spur.

and having 5 pairs of sternal setae; *st1* (70–85), *st2* (about 75), *st3* (60–70), *st4* (50–65), and *st5* (70–85); femur II with spur; other diagnostic characters same as in females (Figures 4A–4D).

Distribution: It is widely distributed in the world (Mašán, 2003).

Notes: *G. americana* was previously recorded from Denizli Province by Ekiz and Urhan (2002), based on females. Turkish specimens of the male *G. americana* are presented with this study. It is a very common species in the world (Mašán, 2003). It was found in dung at altitudes of 327 m from the valley.

***Glyptholaspis saprophila* Mašán, 2003**

Glyptholaspis saprophila Mašán, 2003: 125.

Specimens examined: 2 females and 1 male, Turkey, Gümüşhane, Köse, 40°17′37″N, 39°34′03″E, alt. 1927 m, 26 October 2007, from litter under *Juniperus* sp.; 12 females and 5 males, Turkey, Tokat, Erbaa-Taşova, 40°43′51″N, 36°23′37″E, alt. 210 m, 9 November 2008, from decaying grass; 9 females and 3 males, Turkey, Tokat, Erbaa-Niksar, 40°35′53″N, 36°49′36″E, alt. 256 m, 9 November 2008, from stack of grass; 3 females, Turkey, Gümüşhane, Şiran, Çakırkaya village, 40°08′43″N, 39°05′06″E, alt. 1343 m, 29 May 2011, from moss; 5 females and 2 males, Turkey, Gümüşhane, Köse, 40°16′97″N, 39°37′84″E, alt. 1869 m, 26 June 2011, from moss; 3 females, Turkey, Gümüşhane, Köse, 40°16′56″N, 39°37′93″E, alt. 1792 m, 26 June 2011, from debris near stream; 7 females and 1 male, Turkey, Gümüşhane, Şiran, Tomara waterfall, 40°04′75″N, 39°02′65″E, alt. 1375 m, 23 April 2012, from debris under *Pinus* sp.; 2 females, Turkey, Gümüşhane, Şiran, 40°09′97″N, 39°00′17″E, alt. 1309 m, 23 April 2012, from dung and decaying grass; 7 females, Turkey, Gümüşhane, Şiran, 40°15′52″N, 38°57′90″E, alt. 1570 m, 23 April 2012, from dung; 2 females, Turkey, Şiran, Tomara waterfall, 40°04′95″N, 39°02′52″E, alt. 1303 m, 1 May 2012, from moss.

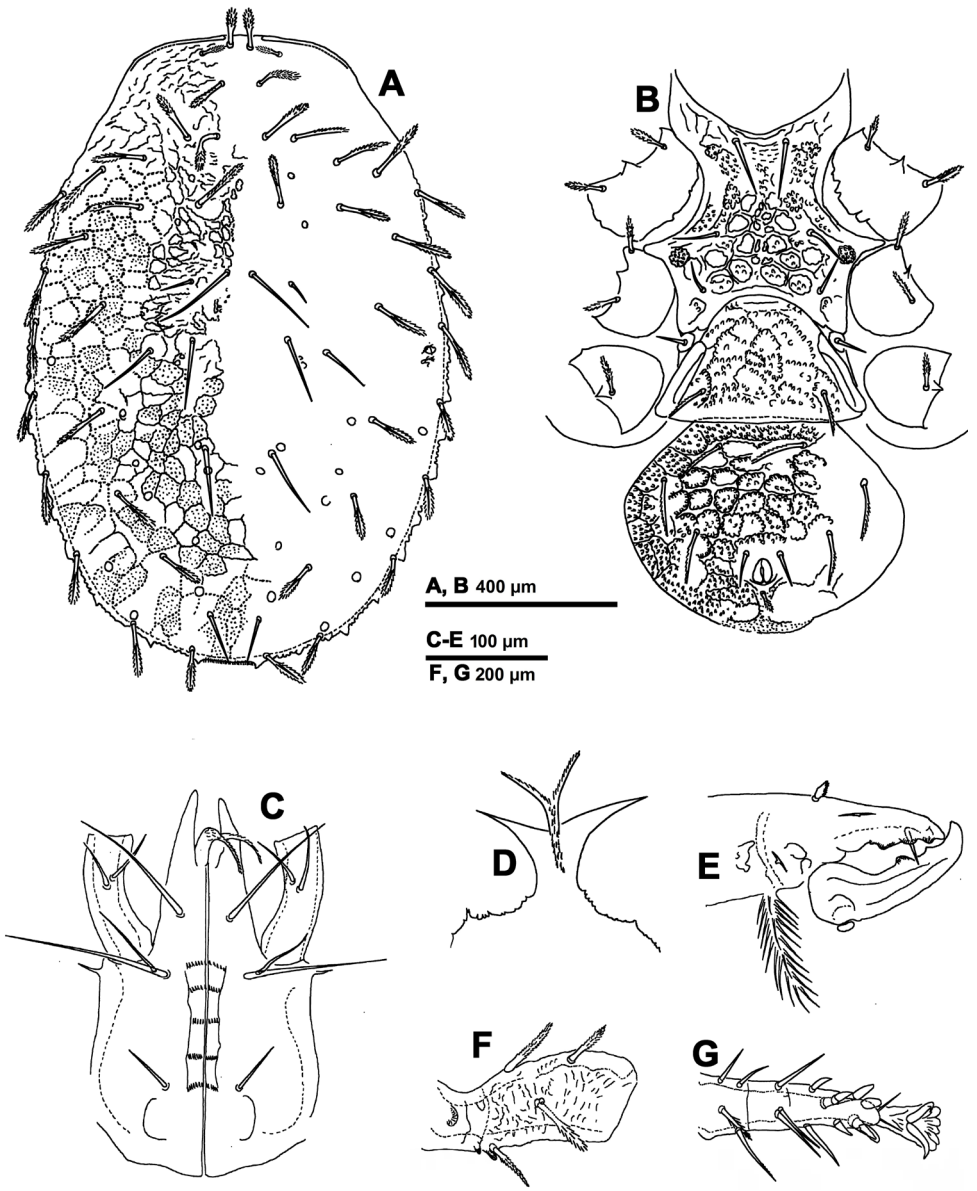


Figure 3. *Glyptholaspis americana* (female): **A)** dorsal shield, **B)** ventral shields, **C)** gnathosoma, **D)** epistome, **E)** chelicera, **F)** femur II, **G)** tarsus II.

Diagnosis

Female: Dorsal shield 1000–1145 long, 640–740 wide; setae *z5* short and needle-like, *j5*, *j6*, *z6* and *J2* distally faintly pilose, *J5* distally denticles, other setae pilose; *j5* not reaching base of *j6*; *J5* shorter than *Z4*, but longer than *Z5*; dorsal shield posteriorly with 2 large outgrowths and a lot of microdenticles between setae *Z5*; all of diagnostic characters as in Figures 5A–5F.

Male: Dorsal shield 680–880 long, 410–460 wide; dorsal setae *j5*, *j6*, *z5*, *z6*, and *J5* terminally small denticles, other setae pilose; holoventral shield 560–640 long, 400–460 wide; *st1* (about 61), *st2* (about 81), and *st3* (45–50) needle-like, *st4* (40–45) and *st5* (40–45) pilose.

Description: Male (n = 12).

Dorsum: Dorsal shield 680–880 long, 410–460 wide at the level of *r4*, oblong, ornamented with web-like patterns and covered with punctuate; dorsal shield bearing 28 pairs of setae; dorsal setae *j5*, *j6*, *z5*, *z6*, *J2* needle-like and *J5* terminally small denticles, other setae pilose; anterior ends of peritremes reaching base of *z*1 the shield posteriorly with 2 large outgrowths between setae *Z5* (Figure 6A).

Venter: Holoventral shield 560–640 long, 400–460 wide at the level coxae II and ornamented sculpture patterns and punctuate; setae *st1* (about 60), *st2* (about 80), and *st3* (40–50) needle-like; *st4* (40–50) and *st5* (40–50) pilose. Coxae II–III carrying a pair of pilose setae, coxa

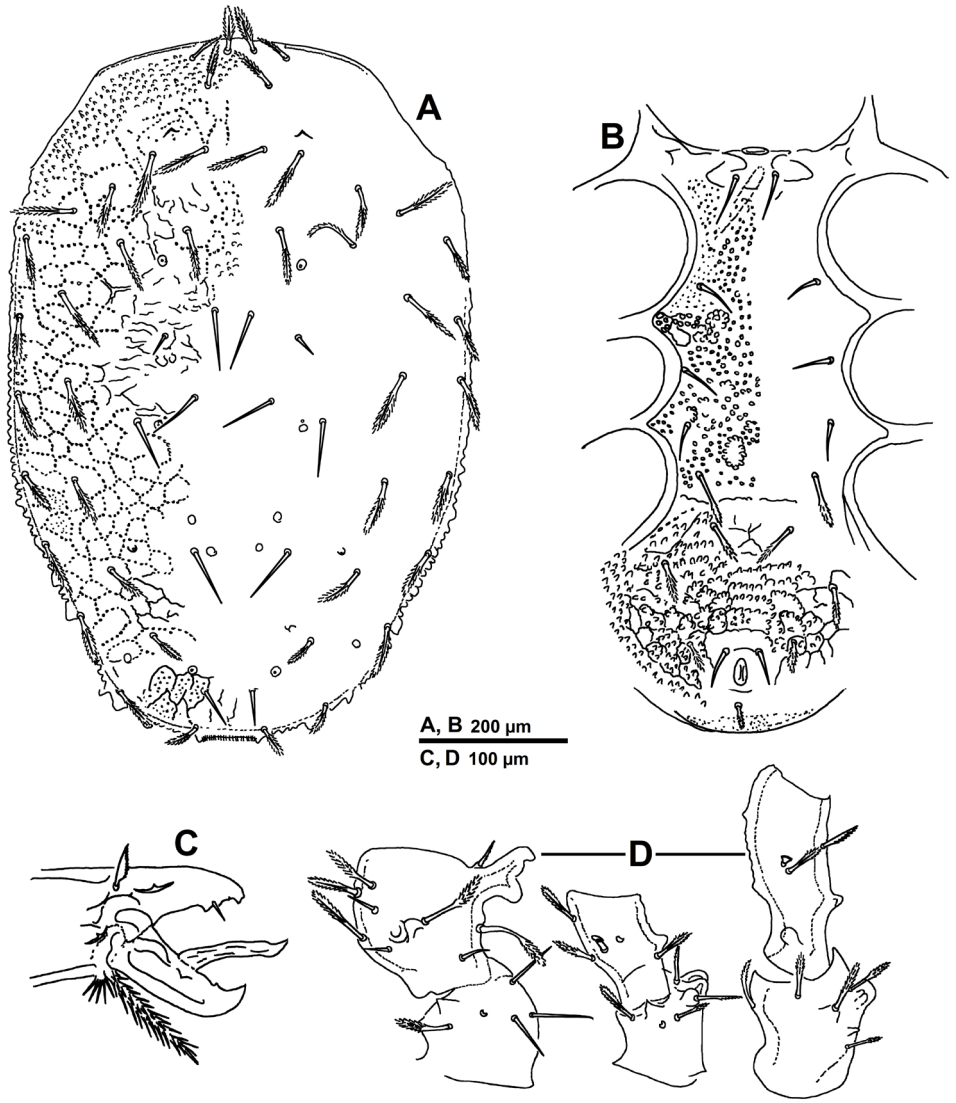


Figure 4. *Glyptholaspis americana* (male): **A)** dorsal shield, **B)** holoventral shield, **C)** chelicera, **D)** trochanters and femora of legs II–IV.

IV carrying 1 pilose seta. Femora II–IV with nodules and spur (Figure 6B).

Gnathosoma: Movable digit of chelicerae 75–85 long, with a short spermatodactyl, 1–2 small teeth and a large subterminal tooth; fixed digit 65–75 long at level of dorsal seta, with 4–5 small teeth and 1 smaller subterminal tooth; dorsal seta comb-like; arthrodial brush long, but not reaching end of movable digit; other features of gnathosoma as for female (Figure 6C).

Distribution: Slovakia (Mašán, 2003). New for Turkey.

Notes: *G. saprophila* was first described from Slovakia by Mašán (2003), with females only. The male is first presented with descriptions and original drawings in this study. Turkish specimens of *G. saprophila* agree with those from Slovakia. It was abundantly collected from the Kelkit Valley, in litter under *Juniperus* sp., *Pinus* sp., decaying grass, stack of grass, and moss at altitudes of 200–2000 m.

Key to the females of the genus *Glyptholaspis* species known from Turkey

1. Dorsal shield bearing 28 pairs of setae 2
- Dorsal shield bearing 28 pairs of setae and 1–2 unpaired setae ..... *G. confusa* (Foà, 1900)

2. Posterior margin of dorsal shield having 2 large outgrowths between setae *z5* 3
- Posterior margin of dorsal shield having 5 large outgrowths between setae *z5* ..... *G. fimicola* (Sellnick, 1931)

3. Idiosoma length more than 1200 and length of setae *j5* surpassing beyond base of *j6* .... *G. americana* (Berlese, 1888)
- Idiosoma length less than 1200 and length of setae *j5* not reaching base of *j6* ..... *G. saprophila* Mašán, 2003

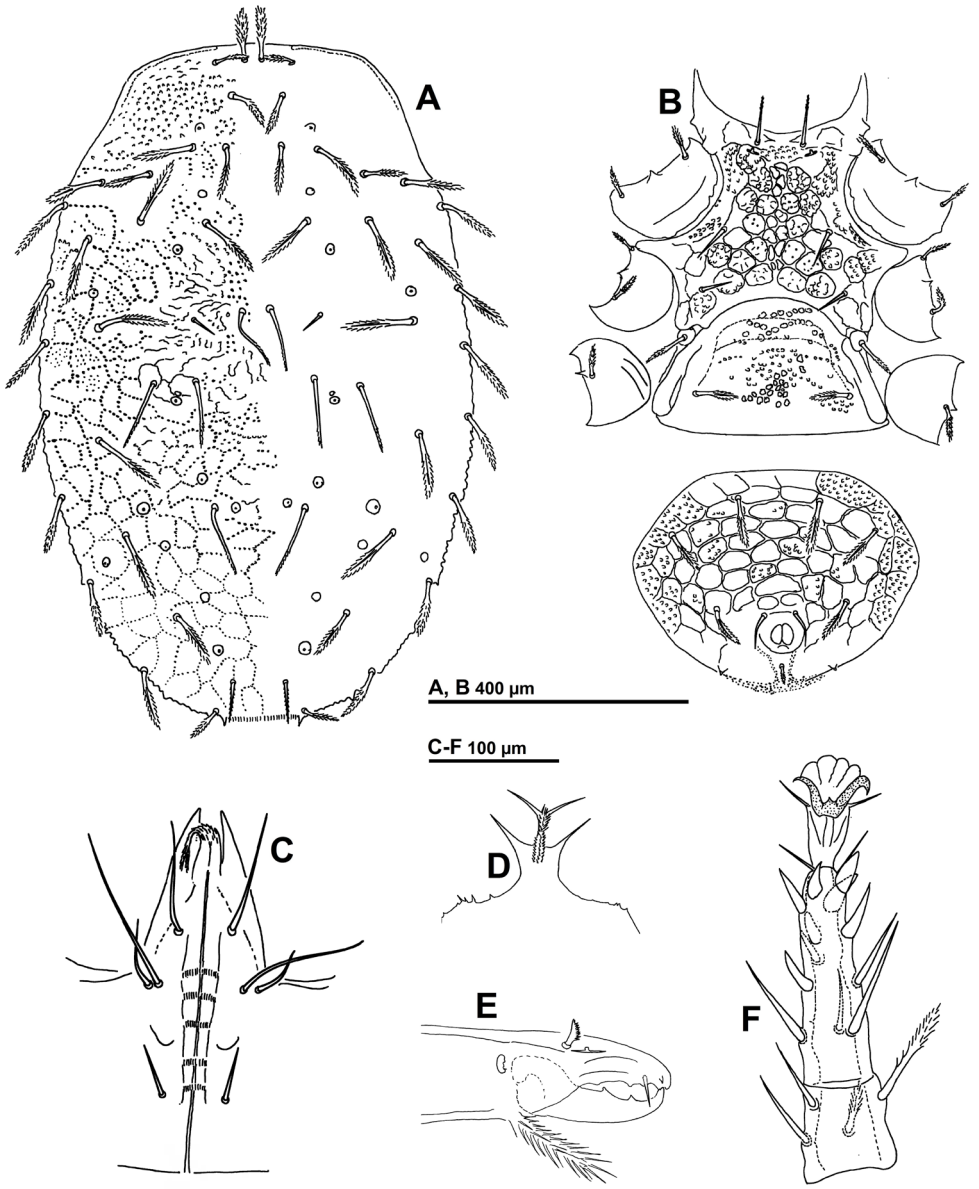


Figure 5. *Glyptholaspis saprophila* (female): **A)** dorsal shield, **B)** ventral shields, **C)** gnathosoma, **D)** epistome, **E)** chelicera, **F)** tarsus II.

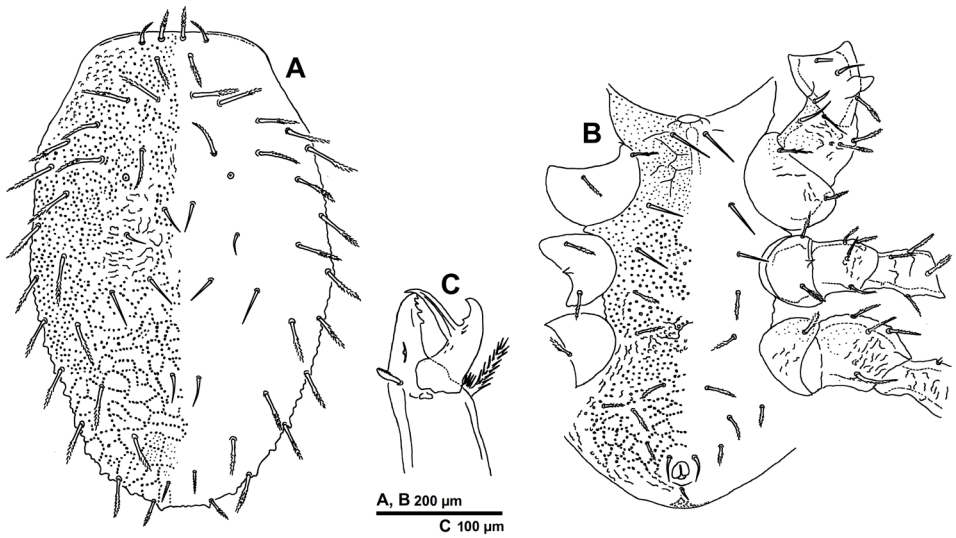


Figure 6. *Glyptholaspis saprophila* (male): **A)** dorsal shield, **B)** holoventral shield, **C)** chelicera.

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