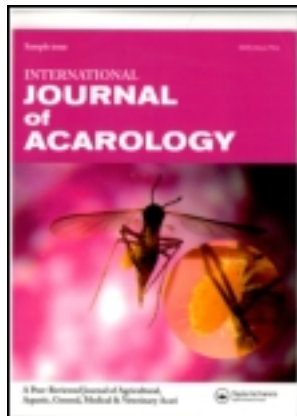


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A new species of Hemisarcoptes lignières, 1893 (Acari: Hemisarcoptidae) from ornamental trees in Hungary

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A NEW SPECIES OF *HEMISARCOPTES* LIGNIÈRES, 1893 (ACARI: HEMISARCOPTIDAE) FROM ORNAMENTAL TREES IN HUNGARY

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SUMMARY - *Hemisarcoptes budensis* sp.n. (Acari: Hemisarcoptidae) is described from adults and immatures, including deutonymphs, from Budapest, Hungary. The adult mites were collected from trees and shrubs infested with six armored scale species. The deutonymphs were found beneath the elytra of ladybirds (Coleoptera: Coccinellidae), especially *Chilocorus renipustulatus*, more rarely *C. bipustulatus*, visiting the infested trees.

Key words -Acari, systematics, *Hemisarcoptes*, Hungary.

INTRODUCTION

The new species described here was discovered during the course of a study on the insects and mites parasitic on ornamental plants in Budapest. This study was initiated by the junior author in 1990 (Ripka *et al.*, 1990 and 1996).

All our observations were made in Budapest, especially in the Botanical Garden of the University of Horticulture and Food Industry, District XI at Buda. Budapest is separated in two parts by the Danube. Buda is a hilly part whereas Pest is a plain.

The adults, tritonymphs, protonymphs and larvae of *H. budensis* were collected from six species of armored scales, attacking 13 species of ornamental trees or shrubs belonging to 10 genera and seven families. We list the scale insects which were infested with this hemisarcoptid mite:

1. *Pseudaulacaspis pentagona* (Targioni-Tozzetti): It was most frequently encountered species. It was found on six plant species, i.e. *Euonymus europaeus* (Fam. Celastraceae), Budapest XI, 27 Jan.1995 and 15 June 1997; *Fraxinus angustifolia* (Oleaceae), Budapest II, 8 February 1991, *F. pennsylvanica*, Budapest II, 8 February 1991; *Phellodendron amurense* (Rutaceae), Budapest XIII, 20 February 1991; *Rhus typhina* (Anacardiaceae), Budapest X, 4 January 1995; *Sophora japonica* (Fabaceae), Budapest II, 11 February 1991.

2. *Unaspis euonymi* (Comstock): Found on *Euonymus europaeus*, Budapest XI, 15 June 1997. This shrub was heavily infested with this scale insect.

3. *Epidiaspis leperii* (Signoret): Found on five species of Rosaceae: *Crataegus laevigata*, Budapest XI; *Malus baccata*, Budapest XI; *Prunus domestica*, Budapest XV; *Pyrus betulifolia*, Budapest XI and *P. pyraster*, Budapest VIII, all collected in January 1991 and 1995.

4. *Chionaspis salicis* (L.): From *Populus canescens* (Salicaceae), Budapest III, April 1991 and *P. simonii*, Budapest XI, February 1991.

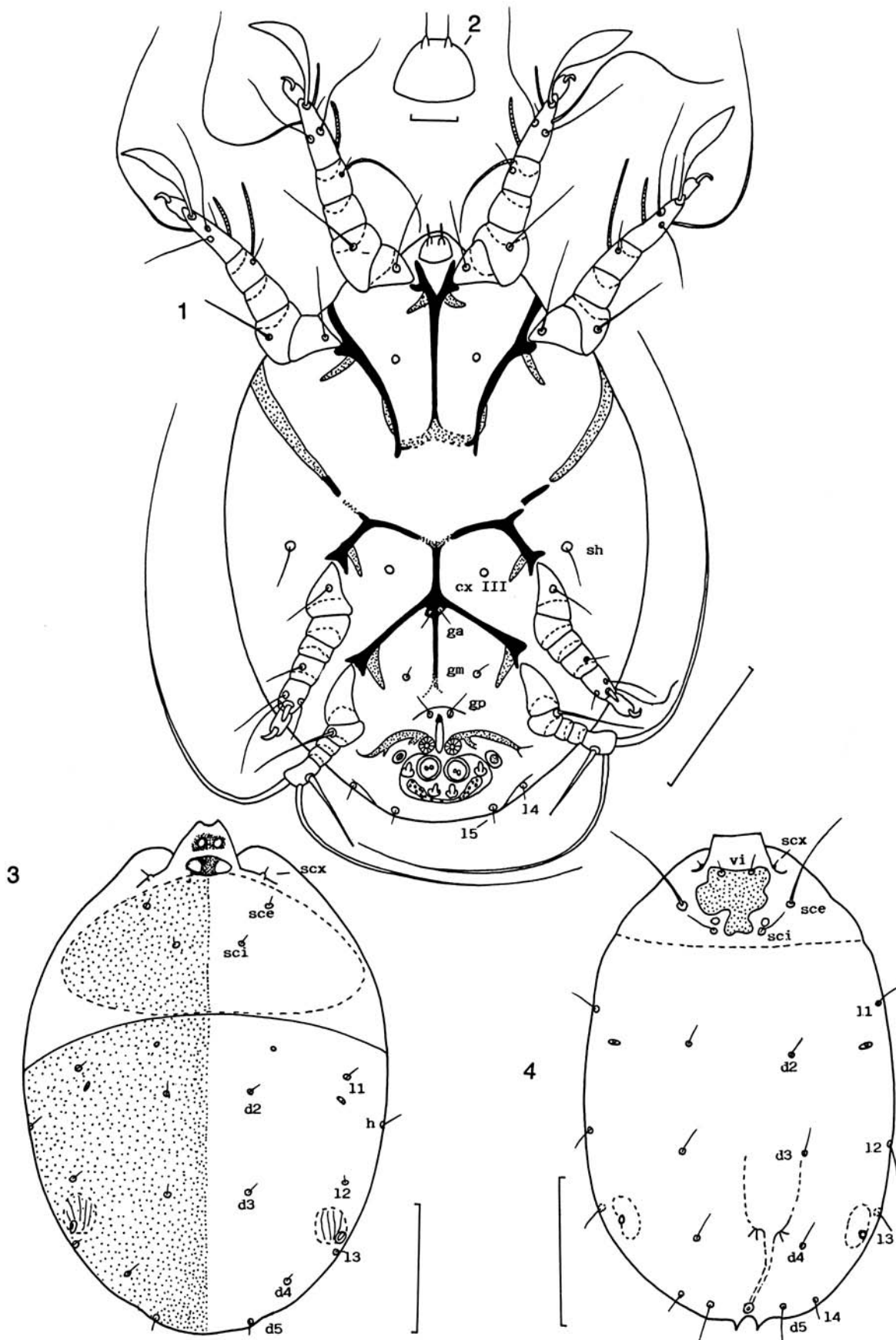
5. *Quadraspidiotus gigas* (Thiem & Gerneck): From *Populus simonii*, Budapest XI, September 1991.

6. *Lepidosaphes ulmi* (L.): From *Fraxinus angustifolia*, Budapest III, September 1991.

Attempts to find hemisarcoptids on fruit trees or shrubs, e.g. pear, peach, cherry and currants, were unsuccessful.

Almost all the deutonymphs of *H. budensis* sp.n. were found beneath the elytra of *Chilocorus renipustulatus* (Scriba) and only a few specimens from the much more scarce *C. bipustulatus* (L.). The infested ladybirds were collected from *Celastrus orbiculatus* and *Euonymus europaeus* (September and November 1997).

All measurements are given in micrometers (μm). Setal nomenclature of idiosoma follows Fain *et al.*(1995).



Figs. 1-4. *Hemisarcoptes budensis* sp. n. -deutonymph in ventral view (1), palposoma (2), deutonymph (3) and female (4) in dorsal view. Scale lines: 5 μ m (2), 50 μ m (1,3) and 100 μ m (4).

Genus *Hemisarcoptes* Lignières, 1893

***Hemisarcoptes budensis* sp. n.**

(Figs 1-22)

Etymology -The name *budensis* refers to the hilly part of Budapest, i.e. Buda, where the new species was discovered.

Larva - Four specimens in rather poor condition and chaetotaxy not observable. Length and width of idiosoma of two specimens: 160×105 and 158×107.

Protonymph (Only one specimen collected) -The protonymph differs from the tritonymph by the following characters: only one pair of *g* setae present, absence of setae $\omega 3$ and *pR*, presence of only one pair of genital suckers, shorter genital slit and shorter chaetotaxy and solenidiotaxy. Measurement: 210 long, 160 wide (idiosoma); scutum 25 long, 32 wide; vulvar slit 9 long, setae *g* 6, *a1* and *a2* 4, 15 110.

Deutonymph (Holotype) (Figs 1-3, 6-11) (Measurements of holotype and, between brackets, of 3 paratypes given) -*Idiosoma*: 190 long, 144 wide (220×150; 219×169; 199×151). *Dorsum*: Both shields finely punctate, without grooves, lines or thick punctations. Sejugal furrow well developed. Anterior margin of dorsum poorly sclerotized, broadly rounded and with small irregular projections. Two pairs of lyrifissures, anterior located behind setae *ll*, posterior at level of leg IV. Oil-gland openings situated slightly in front of *l3*. Eye-lenses conical, oriented transversely. *Venter*: Palposoma consisting of a sclerotized frame, bearing anteriorly two very short "palps" prolonged by short (4) solenidia *alpha*. Sternum 37 long (32 to 39). Epimera III very close to median sclerite. Width of suctorial plate 30; diameter of anterior suckers 6, of oval posterior suckers 9.6×8.4. *Chaetotaxy of idiosoma*: All dorsal setae very short: Setae *vi* replaced by small sclerotized ringlets, *scx* 3, *sci* 3, *sce* 3. Setae *d1* absent; *d2* 2.4 (2.5, 3, 2.5), *d3* 2.2 (1.5, 2.2, 2.5), *d4* 2.5 (3, 2.5, 2.2), *d5* 3 (3, 2.2, 3.2), *ll* 2.5 (3.6, 2, 2), *l2* 3 (3.6, 4.8, 3), *l3* 2.5 (2.5, 2, 2.5), *l4* 3 (3, 2.2, 2), *l5* 6 (6, 6, 5), *h* 2.5 (3.2, 2.5, 3), *sh* 10 (12, 6, 10). Setae *sci* 25 apart, *sce* 43 apart. Setae *ga* 7.7 (9.6, 7, 10), *gm* 3.6 (4, 3.6, 4), *gp* 4 (6, 7, 6). *Legs*: Length of tarsi I-IV: 19.4 (22, 24, 23), 19.2 (22, 23, 22), 13 (12, 15, 13), 11 (10.5, 10.8, 11). Tibia IV not fused with tarsus. Claws I-III 5-5-5.8. Pulvilli of tarsi I-III 11-10-10. *Chaetotaxy of legs*: Tarsi I: *e* 40 (40-44), *d* 5 (5), *la* 30 (33-40), *ra* 50 (60), *wa* 25 (22-24), *f* 3.5 (3-3.6). Tarsi II: *e* 40 (42), *d* 5 7, *la* 29 (32-38), *ra* 52 (50-58), *wa* 25 (22-25). Tarsi III: *w* 14 (15-18), *s* 6 (6), *r* 18 (16-19), *d* 35 (36-45). Tarsi IV: *w* 150 (160-168), *d* 132 (140-160), *r* 30 (28-32). Tibiae I and II: *gT* 8.5 (8-9.6). Tibiae III: *kT* 12 (10-12). Genua I-II: *mG* 4.5-5 (4-6); *cG* 5-6 (4-5). Femora I-II: *vF* 22-25 (24-30). Femora IV:

wF 30 (30-35). *Solenidiotaxy*: Tarsi I: $\omega 1$ 11 (13-14.5), $\omega 3$ 11 (14.4). A very thin and short ϵ observed in some paratypes; $\omega 2$ lacking. Tarsi II: ω 12 (12). Distance between $\omega 1$ of tarsus I and base of this tarsus 5-6, distance between ω of tarsus II and base of this tarsus 7.2. Tibiae I-III: ϕI 40 (41-43); ϕII 30 (28-41), ϕIII 1.2 (1.2-1.3). Genua I: σI (internal) 4 (4.5-4.8), $\sigma 2$ (external) 2.4 (0.5-1.3). Genua II 2 (1.3-2.5).

Tritonymph -Differs from protonymph by general characters mentioned above and smaller size of idiosoma, greater length of most setae, longer genital slit (14 to 18). Spermatheca lacking. Idiosoma in five tritonymphs: 215-240 long and 140-155 wide. In one paratype (idiosoma 230 long, 150 wide) scutum 32 long, 36 wide, genital slit measures 17, *gp* 7, *a1* 7.8, *a2* 6, *l5* 200. Solenidia of legs I-III as in adults, but shorter, $\omega 2$ lacking.

Female (Figs 4-5; 12-19) (Description of one paratype and, between brackets, measurements of 3 paratypes given) - *Idiosoma* 294 long, 190 wide (305×192, 324×228, 340×235). Dorsal shield triangular, with lateral margins very irregular, 60 long, 40 wide (64×46, 63×46, 60×46). Diameter of eyes 5.8 (5, 6, 6). Two pairs of lyrifissures, one latero-dorsal at 25 behind *ll* and one latero-ventral at 12-16 in front of *l3*. Oil-gland openings located posteriorly, at level of *l4* and behind *l3*. Length of sternum 35 (36, 34, 36). Diameter of eyes 5.8 (5, 6, 6). A large cylindrical spermatheca present in posterior part of body. *Chaetotaxy of idiosoma (lengths of setae)*: *vi* 8 (10, 7, 7), *sci* 16 (12, 12, 11), *sce* 72 (74, 68, 66), *scx* 6 (7, 6), *d2* 18 (17, 12, 12), *d3* 16 (18, 12, 15), *d4* 16 (18, 16, 13), *d5* 25 (28, 25, 28), *ll* 20 (20, 22, 24), *l2* 20 (22, 20, 20), *l3* 15 (11, 18, 18), *l4* 13 (19, 11, 11), *l5* 330 (305, 290, 250), *h* 26 (26, 19, 29), *sh* 24 (30, 22, 27), *cx* 25 (30, 28, 30), *cxIII* 24 (25, 26, 25), *ga* 24 (25, 26), *gm* 22 (24, 17, 18), *gp* 22 (21, 18, 20), *a1* 22 (22, 17, 23), *a2* 15 (15, 19, 17). All idiosomal setae filiform except *l5* and *sce* which are thickened at their bases. *Legs*: Lengths of tarsi I: 11 (10, 9, 12), II: 11 (11, 9, 12), III: 12 (12, 12, 13), IV: 13 (13, 13, 15). Pulvilli of tarsi I and II: 20 (20, 21, 22), III: 25 (25, 24, 25), IV: 27 (26, 27, 27). *Chaetotaxy of legs*: tarsi I: ϵ 3.5, *d* 36 (32, 36, 40), *f* 4.2, *p* 6 (6 to 7), *q* 3.6 (3.8 to 4), *la* 25 (26, 32, 25), *ra* 26 (26, 32, 25), *wa* 6. Tarsi II: *d* 36 (35, 40, 45), *p* 6.5, *q* 4; *la* 22 (24, 19, 25), *ra* 24 (26, 20, 25); *wa* 6. Tarsi III: *d* 108 (95, 138, 90), *s* 6 (6 to 7), *p* 6, *q* 4; *w* 33 (27, 32, 36), *r* 36 (30, -, 40). Tarsi IV: *d* 120 (156, 150, 160), *s* 6, *p* 7, *q* 7; *w* 30 (30, 28, 42), *r* 26 (25, 27, 36). Tibiae I-II: *gT* 6 to 7. Tibia III: *kT* 7.2. Genua I-III: *mG* and *cG* 5 to 6. Femora I: *vF* 18 (16, 16, 18), II: *vF* 26 (30, 24, 30), IV: *wF* 20 (18, 18, 24). Trochanters I: 20 (17, 17, 18), II: 22 (16, 22, 18); III: 19 (19, 16, 24). *Solenidiotaxy*: Tarsi I: $\omega 1$ (slightly dilated at apex) 12 (11 to 12), $\omega 3$ 17 (16, 18, 17); $\omega 2$ not observed. Tarsi II: ω 10 (thicker than $\omega 1$ of tarsus I). Tibiae I: ϕ 43

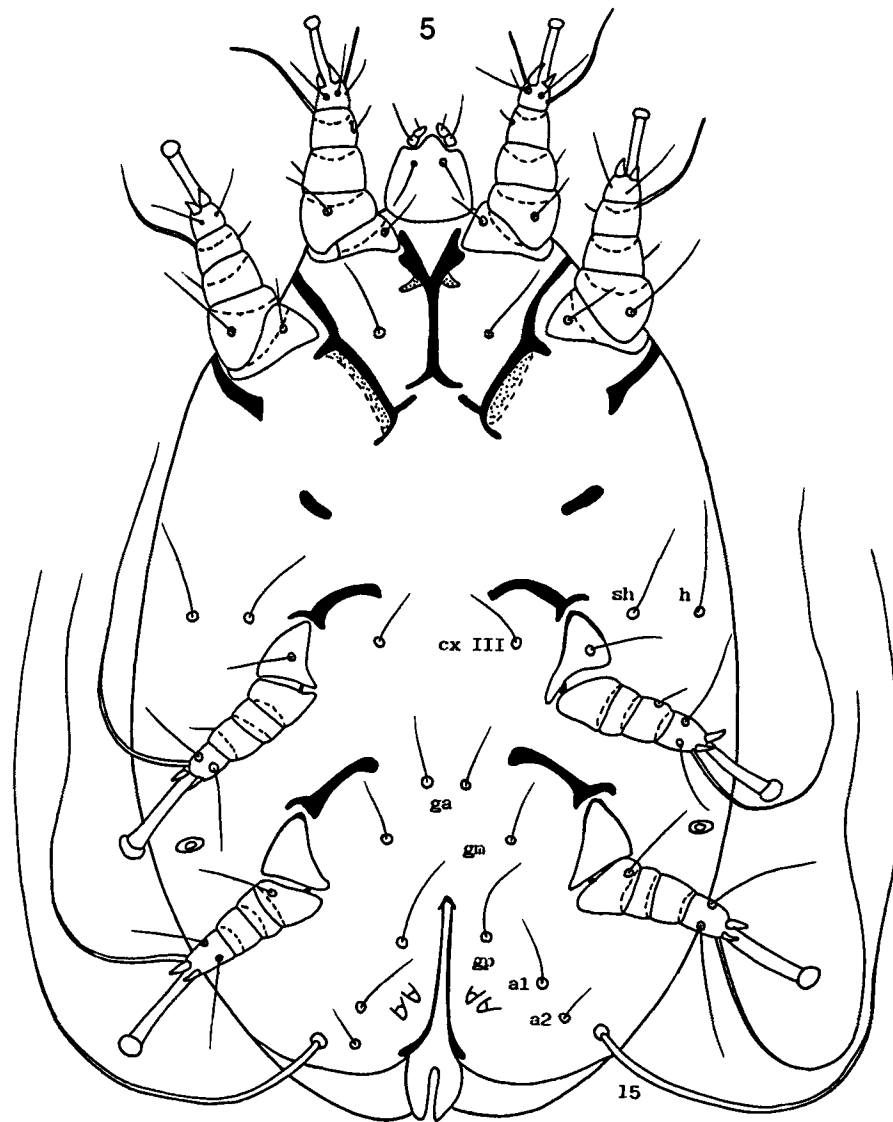


Fig. 5. *Hemisarcoptes budensis* sp. n. - female in ventral view.

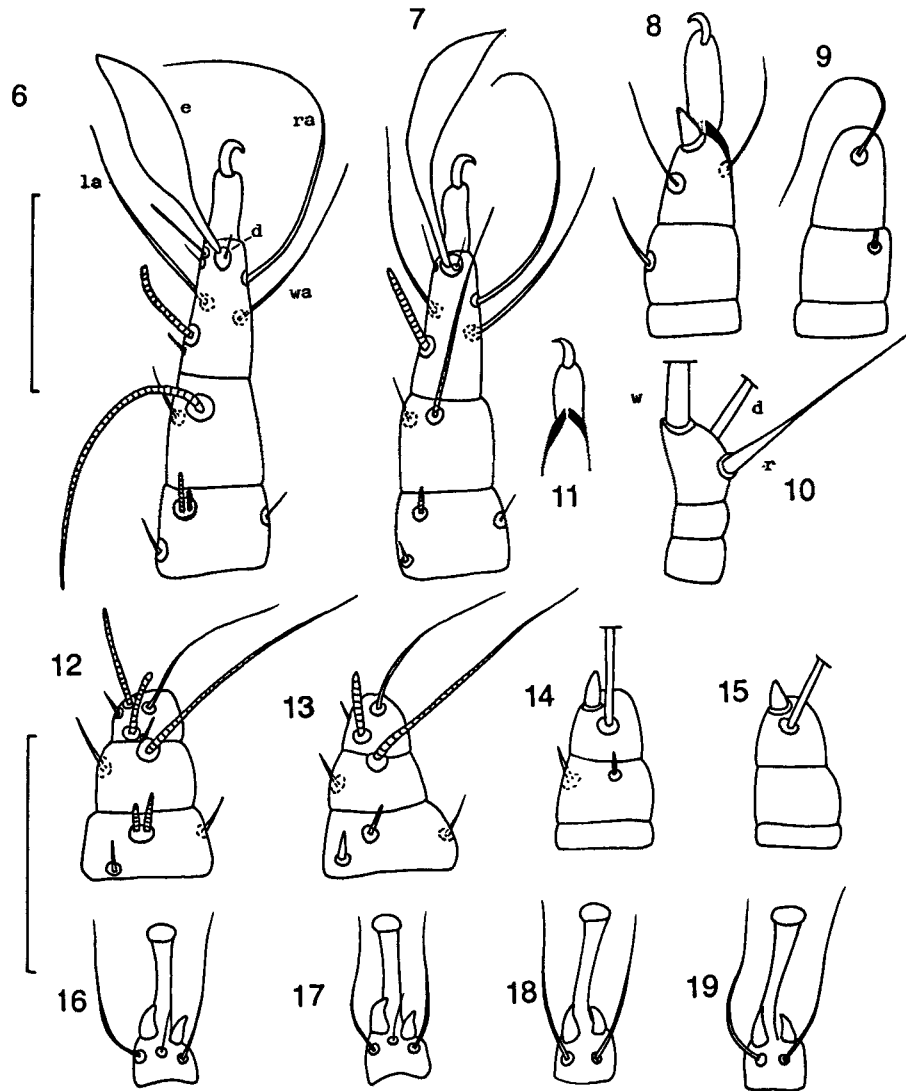
(45, 42, 50); II: ϕ 44 (48, -, 48); III: ϕ 3.6. Genua I: $\sigma 1$ (internal) 4.6 (3.6, 4.8, 3), $\sigma 2$ (external) 8.2 (7.5, 7.9, 8.4). *Gnathosoma*: Dorsally, base of gnathosoma covered by a prolongation of idiosoma. Length (ventrally) 36, width 32 (in another paratype 39x36).

Male (Figs 20-22) (Description of two paratypes): Body ovoid. *Idiosoma* (lengthxwidth): 220x147 and 198 x125. Dorsal scutum irregular as in female but smaller: 50 long, 30 wide (55x31). Diameter of eyes 4.8. Lyrifissures and oil glands as in female. *Chaetotaxy of idiosoma* as in female but generally shorter: *vi* 6, *sci* 11, *sce* 45, *d2* 9, *d3* 7, *d4* 7.5, *d5* 15, *l1* 12, *l2* 12, *l3* 11, *l4* 6, *l5* 170, *h* 13, *sh* 12, *cxI* 14, *cxIII* 10, *ga* replaced by sclerotized rings, *gm* 6, *gp* 10, *a1* 7.5. Anterior lyrifissure situated at 19 behind *l2*, posterior lyrifissure at 12 in front of *l3*, latter slightly in front of oil-gland aperture. *Legs*: Lengths of tarsi I-IV 9-9-11-12; of pulvilli 17-17-20-20.5. *Chaetotaxy of legs*:

tarsi I: ε 2.5, *d* 22, *f* 4, *p* 6, *q* 3.6 *la* 15, *ra* 17. Tarsi II: *d* 27, *p* 6, *q* 4; *la* 17, *ra* 18. Tarsi III: *d* 60, *s* 4.8, *w* 16, *r* 16. Tibiae I-III: *gT* 5, 5, 6; *kT* 6. Genua I-II as in female. Femora I: 10, II: 17, IV: 12. Trochanters I-III: 8-12-12. *Solenidiotaxy*: Tarsi I: $\omega 1$ 10.5, $\omega 3$ 13; $\omega 2$ not observed. Tarsi II: ω 7.5. Tibiae I-II: ϕ 35 and 36. Genua I: $\sigma 1$ 4.8, $\sigma 2$ 6.

Total length of genital organ 23; width of punctate area behind penis 25. Penis S-shaped (visible in lateral view). Gnathosoma 32 long, 30 wide. Pregenital sucker slightly oval (12 long, 9.6 wide).

Hosts and localities - **Holotype** deutonymph collected beneath the elytron of *Chilocorus renipustulatus* from *Celastrus orbiculatus*, the Waxwork or American Bittersweet, in Budapest District XI (Botanical Garden), 9 September 1997. This shrub was heavily infested with *Unaspis euonymi*. **Paratype deutonymphs**: 16 deuto-

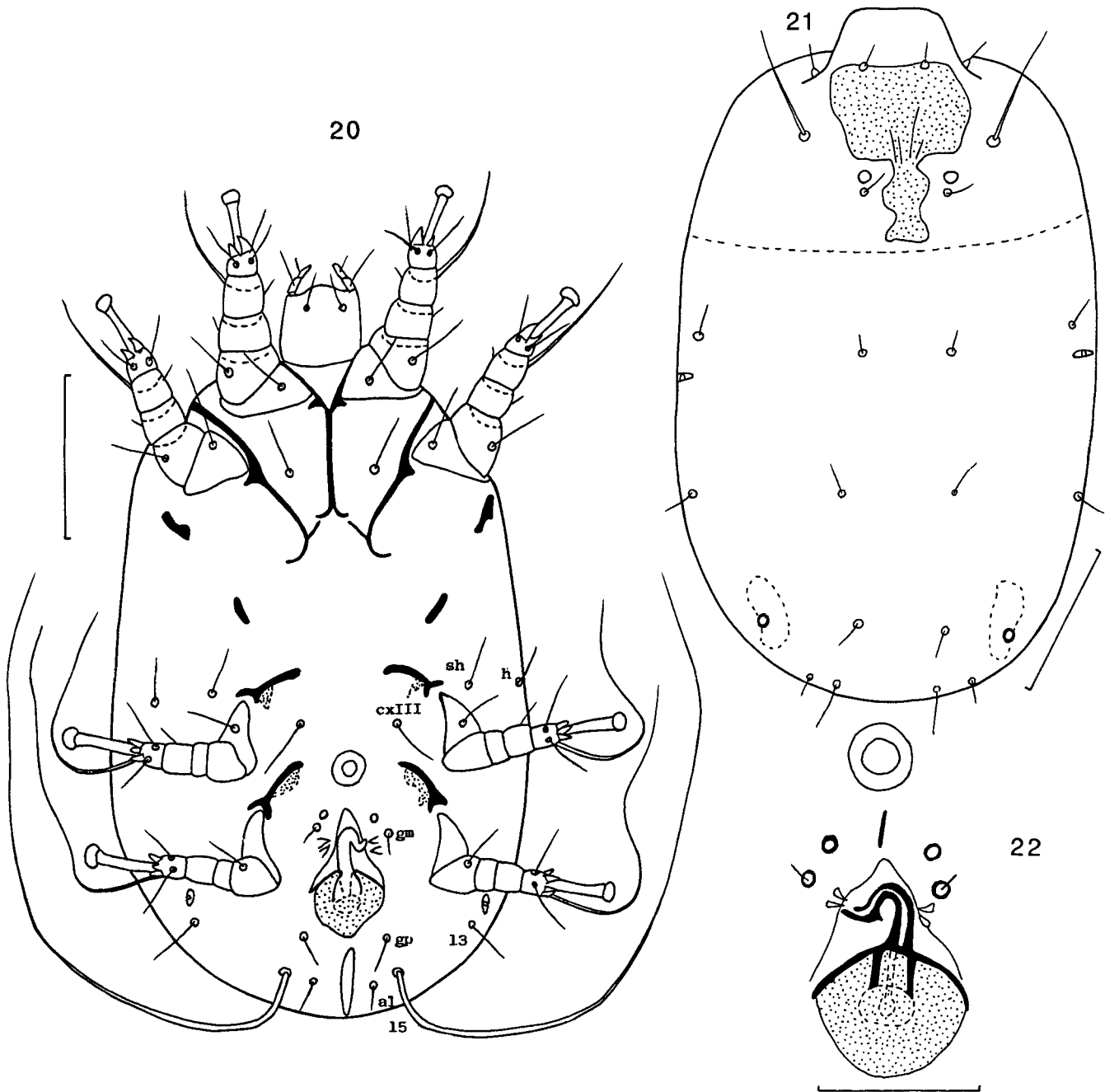


Figs. 6-19. *Hemisarcoptes budensis* sp. n. - deutonymph: leg I (6), leg II (7) in dorso-lateral view, leg III in ventral (8) and dorsal view (9), leg IV in ventral view (10), apico-ventral region of leg I (11), female: legs I (12), II (13), III (14), IV (15) in dorsal view, tarsi I (16), II (17), III (18) and IV (19) in ventral view. Scale lines: 25 μ m (6-11) and 50 μ m (12-19).

nymphs with same data as holotype; 5 deutonymphs from same beetle but collected from *Euonymus europaeus*, the European Spindle tree, infested with the same scale insect, in a park of Budapest, district XVII, 9 November 1997; 1 deutonymph from *Chilocorus bipustulatus*, from Budapest XI, August 1997. **Paratypes of other stages:** 23 females, 6 males, 20 tritonymphs, 1 protonymph and 4 larvae collected from 1991 to 1997 (see Introduction). One male was found attached to *Chilocorus renipustulatus*. Holotype deposited in the Institut royal des Sciences naturelles de Belgique. Paratypes in the same Institute (Belgium); British Museum, London; US National Museum, Washington, D. C, USA and in the collections of the authors.

Systematic position of *H. budensis*

The deutonymph (or hypopus) of this new species differs from those of the three species of *Hemisarcoptes* where this stage is known, i.e. *H. cooremami* (Thomas, 1961), *H. malus* (Shimer, 1868) and *H. coccophagus* Meyer, 1962, by the following important characters: absence of grooves, lines or thick punctations on the two dorsal shields, absence of sclerotized antero-dorsal conical "snout-like" prolongation of the idiosoma, absence of setae *vi*, and conical shape of the eye-lenses. In these three species the dorsal shields bear longitudinal or oblique grooves or lines, a snout and setae *vi* are present. The deutonymph of *H. coccophagus* was described by Gerson and Schneider (1982) from Israel.



Figs. 20-22. *Hemisarcoptes budensis* sp. n. - male in ventral view (20), male in dorsal view (21) and penis enlarged turned laterally (22). Scale lines: 50 μ m (20, 21) and 25 μ m (22).

The female of *H. budensis* is distinguished from that of *H. cooremani* by the shorter length of setae *al* (17 to 23 long, instead of 44.9 to 83.3 in *H. cooremani*). It is distinguished from the female of *H. coccophagus* by the shape and length of setae *gp* and *al* (see fig 5 of this paper), very thin and equal or subequal in length, while in *coccophagus* setae *al* are thick and one-and-a-half times as long as *gp* (see the original figures and description of *H. coccophagus*).

Our females differ from those of *H. dzhashii* Dzhibladze, 1969, very briefly described from Georgia, Russia, by the smaller size of the body, the presence of setae *ga* (absent in this species) and the longer and thinner setae *gp* and *al*.

There is a fifth species in the genus *Hemisarcoptes*, i.e. *H. coccusugus* Lignières, 1893, the type of the genus, described from adults and nymphs (except deutonymphs) collected in south of France and considered by André

(1942) as synonymous with *H. malus*. Recently, the senior author found numerous deutonymphs from *Chilocorus renipustulatus* that had been collected in the same region as the typical series of *H. coccisugus*. In all these deutonymphs the dorsal shields have numerous longitudinal or oblique furrows or lines and the body is dorsally prolonged in a sclerotized conical "snout".

REFERENCES

- André, M. 1942. Sur l'*Hemisarcoptes malus* Shimer (= *coccisugus* Lignières) Acarien. Bull. Museum 2^e s. t. XIV, n°3: 173-180.
- Dzibladze, K.N. 1969. A new species of predatory mite (Hemisarcoptidae) attacking the orange scale *Cor-miaspis*. Entom. Rev. 48: 435-436.
- Fain, A., G.D.D. Hurst, J.C. Tweddle, R.F. Lachlan, M.E.N. Majerus and D.P. Britt. 1995. Description and observations of two new species of Hemisarcoptidae from deutonymphs phoretic on Coccinellidae (Coleoptera) in Britain. Internat. J. Acarol. 21(2): 99-106.
- Gerson, U. and R. Schneider. 1982. The hypopus of *Hemisarcoptes coccophagus* Meyer (Acari: Astigmata: Hemisarcoptidae). Acarologia, 23: 171-176.
- Houck, M.A. and B.M. OConnor. 1990. Ontogeny and life history of *Hemisarcoptes cooremani* (Acari: Hemisarcoptidae). Ann. Entomol. Soc. Am. 83: 869-886.
- Lignières, J. 1893. Etude zoologique et anatomique de l'*Hemisarcoptes coccisugus*. Mém. Soc. Zool. France VI: 16-25.
- Meyer, M.K.P. (Smith) 1962. Two new mite predators of red scale (*Aonidiella auranti*) in South Africa. South African J. Agric. Sci. 5: 411-417.
- Ripka, G. and K. R. Saly. 1990. Az eperfapajzstetu (*Pseudaulacaspis pentagona* Targ.) eltergedése a főváros területén. Növényvédelem 1: 6-11 (in Hungarian).
- Ripka, G., K.R. Saly and F. Kozár. 1996. Recent data to the coccid and aleyrodid fauna (Homoptera: Coccoidea, Aleyrodoidea) on woody ornamentals in the Budapest area. Növényvédelem 32 (1): 7-17 (in Hungarian with English summary).
- Shimer, H. 1868. Notes on the "Apple Bark-Louse" *Lepidosaphes conchiformis* (Gmelin sp.) with a description of a supposed new *Acarus*. Trans. Am. Entomol. Soc. 1: 361-374.
- Thomas, H.A. 1961. *Vidia* (*Coleovidia*) *cooremani*, new subgenus and new species, and notes on the life history (Acarina: Saprogllyphidae). Ann. Entomol. Soc. Am. 54: 461-463.
