

# A new species of *Labidostomma* Kramer, 1879 for the fauna of Hungary (Acari: Trombidiformes: Labidostommatidae) with an overview of the family

W. PFLIEGLER<sup>1</sup> and M. BERTRAND<sup>2</sup>

**Abstract.** We report on two species of the trombidiform mite family Labidostommatidae from the Bükk Mountains, Hungary. One, *Labidostomma (Cornutella) cornuta* (G. Canestrini & Fanzago, 1877) is a new species for the fauna of Hungary, the other, *L. (Nicolettiella) denticulata* (Schrank, 1776) has recently been recorded by Ujvári & Kontschán (2010). A brief description of the family and the species are given, with data on morphology and known occurrences in Europe. The species are illustrated. A key to genera and subgenera of European labidostommatids is presented.

**Keywords.** Acari, Trombidiformes, new record, Hungary.

## INTRODUCTION

The family Labidostommatidae (syn. Labidostomatidae Oudemans, 1906; Labidostommiidae Oudemans, 1906; Nicolettiellidae G. Canestrini, 1891) is the only one assigned to the supercohort Labidostommatides and superfamily Labidostommatoidea (Walter *et. al.*, 2009). The family includes heavily sclerotinised, mostly yellow or orange, medium-sized or large raptorial mites that are mostly found in forest leaf litter, moss and in caves (Grandjean, 1942; Storkán, 1938). Three genera are known from Europe, *Labidostomma* (often written as *Labidostoma*, but in the original description two 'm's were written; see Dunlop & Bertrand, 2011) being the most widespread. The other genera *Akrostomma* Robaux, 1977 and *Eunicolina* Berlese, 1911 are mostly found in Southern Europe.

The family is easily recognised by the general appearance and some specific characters as follows: integument is sculptured, chelicerae are chelate-dentate, first leg-pair is used for sensing. The whole dorsum is covered by a large shield. Two pairs of prodorsal trichobothria are present. The genital and anal openings are cojoined in females, whereas these are apart from, yet close to each other in males. Relatively few information is

available on their biology. Larvae are inactive, non-feeding. Three active nymph-stages are present. Fertilisation occurs via spermatophores. All known species are predators of microarthropods (Walter *et. al.*, 2009).

The occurrence of the family (represented by *L. (Nicolettiella) denticulatum*) in Hungary was first reported in 2010 from Veszprém county, West Hungary (Ujvári and Kontschán, 2010). The members of the family are reportedly sensitive to harmful processes in the soil caused by human activities and are considered to be good indicator organisms (Błoszyk and Czarnota, 1998).

## MATERIALS AND METHODS

Small samples of forest leaf litter were collected in the Bükk mountains, Hungary during autumn, 2010 and kept wet for weeks. These were later manually searched for microarthropods. After killing in alcohol, specimens were left in lactic acid for 24 hours at room temperature then temporarily mounted in glycerol on a microscope slide. The so prepared specimens were examined and photographed with transmitted light. One chelicera of each specimen was removed for further examination. The specimens are in alcohol-filled

<sup>1</sup>Walter Pfliegler, Department of Genetics and Applied Microbiology, University of Debrecen, Egyetem tér 1., H-4010 Debrecen, Hungary. E-mail: walterpfliegler@gmail.com

<sup>2</sup>Dr. Michel Bertrand, UMR5175 CEFE, Université Montpellier 3, Route de Mende, 34199 Montpellier cedex5, France.

vials and deposited in the collection of the first author.

## RESULTS

### *Labidostomma (Cornutella) cornutum* (G. Canestrini & Fanzago, 1878)

(Figures 1a–c and 3a)

*Material examined.* Hungary, Borsod-Abaúj-Zemplén county, Ómassa (cold mountain-side, beech forest), leaf-litter, 500 m a.s.l., 48.107924° N, 20.532074° E. Leg. WP. 15.10.2010, (1 male).

*Diagnosis.* The species is recognizable by its large size (dorsal shield of adults 950–1200µm long), and yellow colour.

*Dorsal shield* anteriorly ended by well visible cornuae, the ornamentation is consisted of imperfect alveoles. Dorsal trichobothria with few branches, lateral gland-like organ rather large and longer than wide. Median eye in subterminal position.

*Chelicerae* with proximal seta inserted on a long cuticular peduncle.

*Digitus fixus* divided distally to proximal and anti-axial teeth, while inferior tooth is modified into a recurrent blade.

*Legs.* The length of the first pair is remarkable with genu as long as tibia. On the tarsus I the two dorsal solenidia are visible and the famulus is of characteristic shape with acute branches (Grandjean, 1941).

*Remark.* The species name often misspelled as *L. cornuta*.

*Distribution.* Central Europe, Southern Europe (Vistorin, 1978).

### *Labidostomma (Nicoletiella) denticulatum* (Schrank, 1776)

(Figures 2a–c and 3b)

*Material examined.* Hungary, Borsod-Abaúj-Zemplén county, Ómassa (cold mountain-side,

beech forest), leaf-litter, 500 m a.s.l., 48.107924° N, 20.532074° E. Leg. WP. 15.10.2010, (1 male and 1 female).

*Remarks.* Yellow-coloured species inhabiting forest litter. Dorsal shield 850–1200µm (adults) anteriorly with prominent cornuae. The mobile digitus of the chelicera is armed with a large proximal tooth and several indentations. The species name often misspelled as *L. denticulata*.

*Distribution.* Central Europe, Balkan, Italy (Vistorin, 1978).

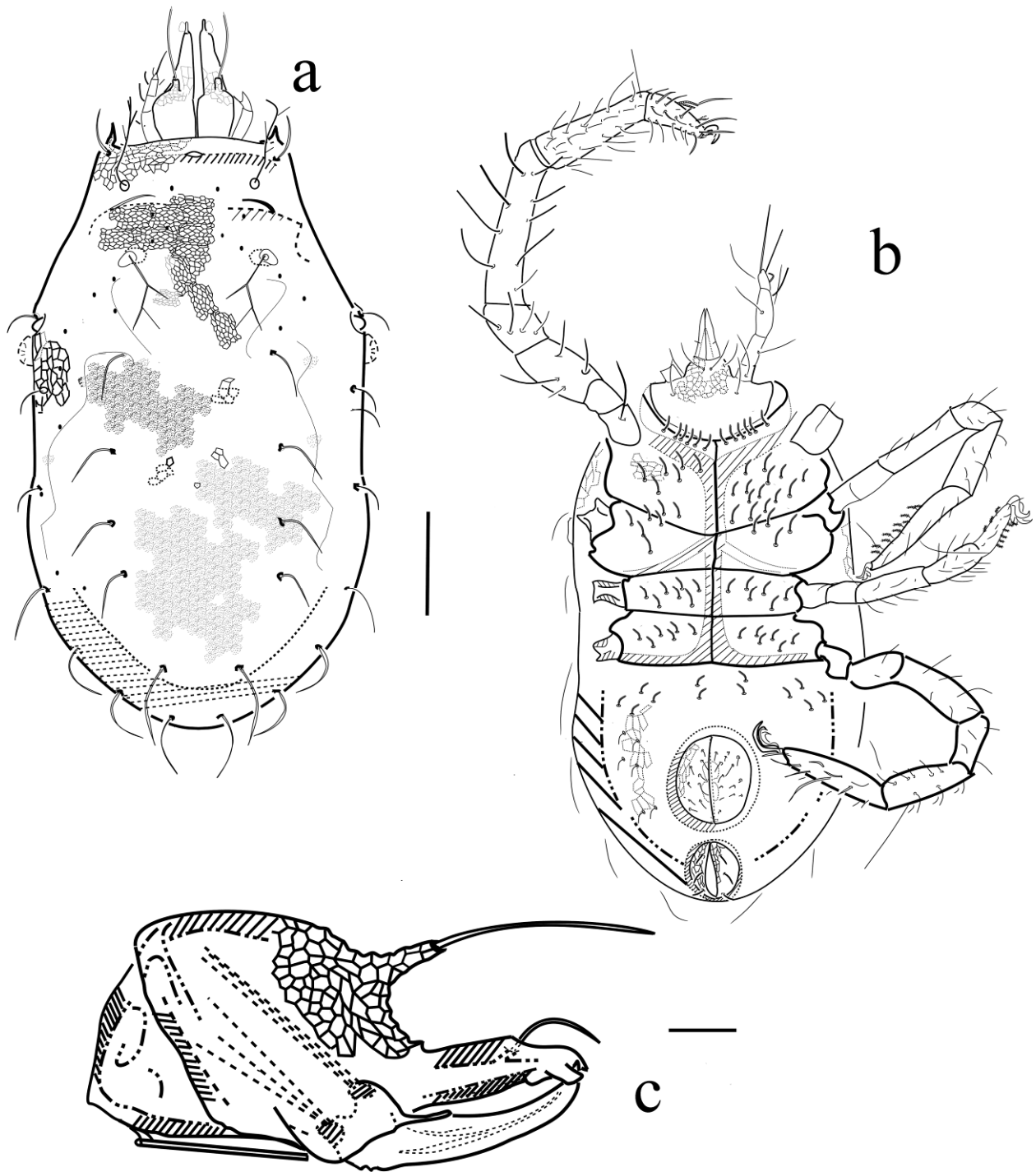
## DISCUSSION

The genus and the family are recorded from the second time in the country. The family is also reported as new to the fauna of the Bükk National Park. The list of Hungarian labidostommatids now includes *Labidostomma (Cornutella) cornutum* and *Labidostomma (Nicoletiella) denticulatum*.

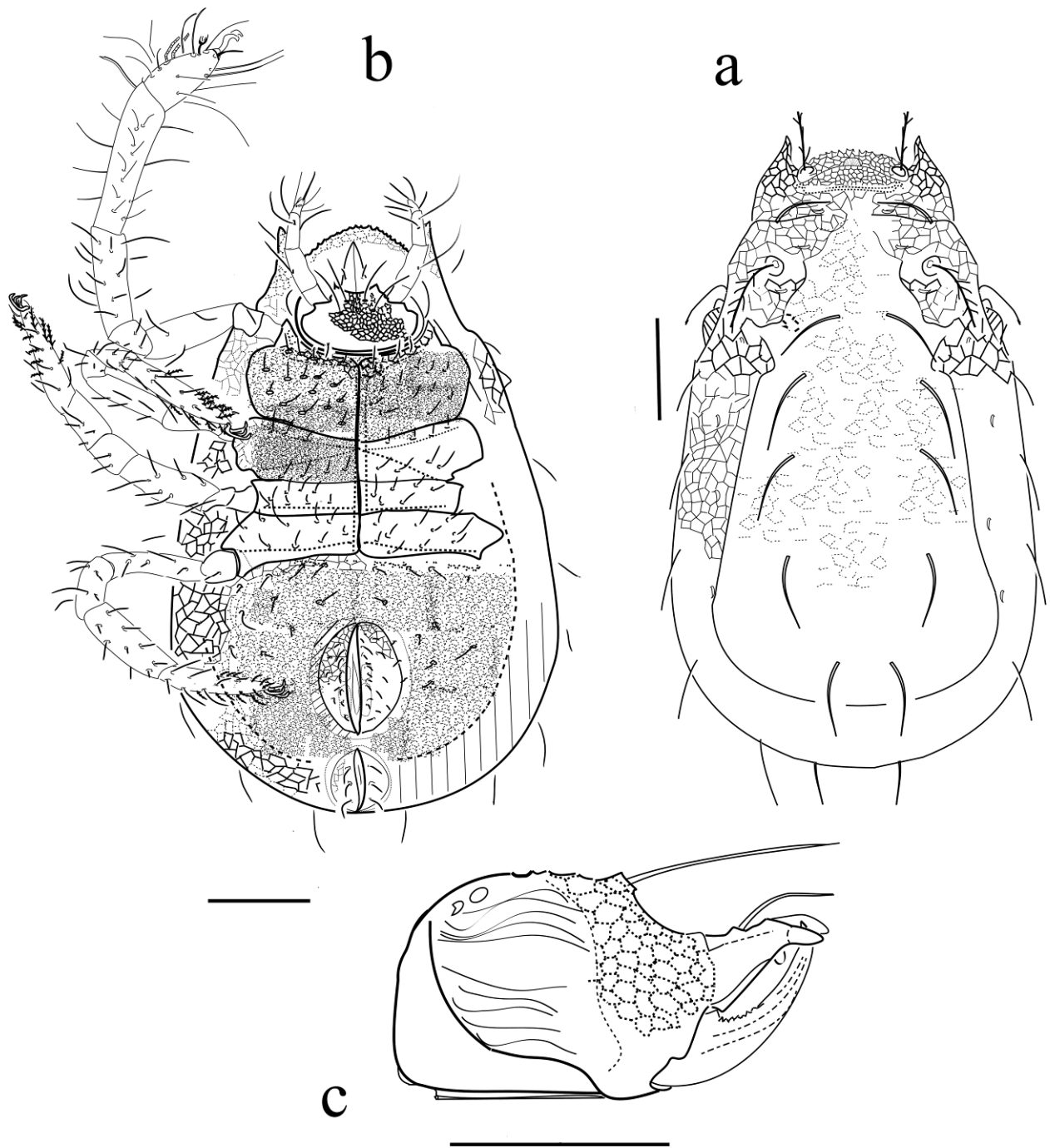
*L. denticulatum* and another species, *L. luteum* Kramer, 1879 were found to be frequently sympatric by Vistorin (1980) (parthogenetic population for the latter). These two species can be confused but the mobile digitus of the chelicerae is armed with a large proximal tooth and several indentations in *denticulatum*, whereas this digitus is only armed with fewer little indentations in *luteum*.

In the original description of another species found in the Carpathian Basin, but not yet reported from Hungary, *Labidostomma (Nicoletiella) romanicum* Feider & Vasiliu (1968) noted that both digits of chelicerae are armed with pronounced denticles (8 on the mobile digit, and a file of more than 12 on the fixed digit). It can easily be distinguished from the two species reported here by the terminal teeth of fixed digits, which are stout and robust in *romanicum*, whereas these are smooth in the other two species herewith reported.

*L. (C.) cornutum* is widely distributed but considered to be typically Mediterranean (Grandjean, 1942), it has been collected in Algeria, France, and all around the Mediterranean basin (Vistorin, 1978; Bertrand, 1989), Romania (Feider & Vasiliu, 1970) with a Northern limit in South Poland.



**Figure 1.** *Labidostomma (Cornutella) cornutum* male: a = dorsal view, b = ventral view (chelicerae removed), c = lateral view of the chelicera. Scale bar: a-b: 200µm. c: 100 µm



**Figure 2.** *Labidostomma (Nicoletiella) denticulatum* male: a = dorsal view, b = ventral view (chelicerae removed), c = lateral view of the chelicera. Scale bars: 100  $\mu$ m



Figure 3a. Photograph of an alive *Labidostomma (Cornutella) cornutum* specimen (male)



Figure 3b. Photograph of an alive *Labidostomma (Nicoletiella) denticulatum* specimen (male)

*Key to the European labidostommatid genera*

- 1 a. Cuticle dense and heavily sclerotized, reticulation with very thick walls, chelicerae strong and stout, with several denticulations (serrate) on the fixed digit, eye reduced or lacking. Body shape fusiform. Holarctic ..... *Akrostomma* Robaux, 1977
- 1 b. Reticulation of the cuticle with fine walls, eye usually present. .... 2
- 2 a. Multiple gland-like organs present on the body, each being uniporous; body heavily sclerotized, the articles of legs with polygons, a hollow with villose ornamentation present posterior to coxae IV; chelicerae often with subterminal tooth

prolonged in a recurrent blade, collected from litter and upper layers of soils. Holarctic. .... *Eunicolina* Berlese, 1911

2 b. Not as above, if multiple gland like organs present, they are not so developed, and are limited in mediolateral position on the dorsal shield close to the lateral lenses, and/or in posterolateral position. Distributed worldwide (Genus *Labidostomma* Kramer, 1879). .... 3

3 a. Famulus: fruit rounded, surrounded by 5–6 branches, or fruit of varied shape. .... 4

3b. Famulus regressive, often hidden by dorsal setae, spine-like. Apical eye in subterminal position, body fusiform and elongated, antero-lateral dorsal projections (cornuae) lacking. .... *Labidostomma (Labidostomma)* Kramer, 1879

(In Europe, the representatives of this subgenus share a dorsolateral line of pores on the dorsal shield that is surrounded by differentiated cuticle, drawing a relief surrounding the dorsal shield, interrupted forward and laterally in the ocular zone [*integrum* species group].)

4 a. One gland-like organ on each side of dorsal shield, rather large and generally multiporous; famulus with spine-like branches. Frontal eye not in terminal position, sometimes lacking (*L. glymma*). Legs: tibia and genua may be ornamented with alveoli similar to those of the dorsum or reticulate. Anterolateral projections (cornuae) more or less developed. Body elongated in shape, chelicerae with proximal seta inserted at the top of a long tube, inferior tooth of fixed digit prolonged in a recurrent blade. .... *Labidostomma (Cornutella)* Feider & Vasiliu, 1969

4 b. Shape of the fruit of famulus regular, rounded; one pair of multiporous gland-like organs present. Sometimes additional pustules present, then uniporous (additional pustules behind the lateral ones or even in lateroposterior position). If frontal eye exists, it is in terminal position above the chelicerae, genua of legs I shorter than tibia, chelicerae with proximal seta inserted on a short tubercle. .... *Labidostomma (Nicoletiella)* R. Canestrini, 1882

**NOTES**

Genus *Akrostomma* Robaux, 1977; three species are described in this euedaphic genus: the American *A. grandjeani* Robaux, 1977, and the European *A. coralloides* Bertrand & Coineau, 1978 and *A. coineaui* Bertrand, 1983. The species *L. zangheri* Lombardini, 1943 which has never been collected after the original description may also belong here.

Genus *Eunicolina* Berlese, 1911 consists of three European species: *E. tuberculata*, *E. travei* and *E. nova*. *E. nova* was assigned to the genus *Grandjeanellina* by Feider and Vasiliu (1969) that cannot be considered sufficiently characterized to be validated.

Genus *Labidostomma* Kramer, 1879; type species *L. luteum*. Cosmopolitan; the genus is the most heterogeneous in the family because many new species of labidostommatids were placed herein.

It is commonly accepted that the most common species in Europe, *L. luteum* is the type species of the genus *Labidostomma*, though the first species described was *L. denticulatum* (syn. *Acarus denticulatus* Schrank, 1776). The species *L. cornutum*, *L. denticulatum* and *L. luteum* were in the past described in the distinct genera *Nicoletiella* R. Canestrini, 1882 (replacing *Nicoletia* G. Canestrini & Fanzago, 1877, a junior homonym of an insect genus) and *Cornutella* Feider & Vasiliu, 1969, which are now considered to be subgenera. The more recent acarologists progressively gave up these genera, and the family name Nicoletiellidae (Walter *et al.*, 2009). However the division of *Labidostomma* into three subgenera is informative and supported by morphology as well (Feider & Vasiliu, 1969; Bertrand, 1990). It must be noted that there is still confusion about the type species of each subgenera.

**Acknowledgements** – We thank Dr. Jenő Kontschán for his remarks on the earlier draft of the article. We also thank the editor, Dr. Csaba Csuzdi for his valuable help concerning nomenclature, editing and for allowing the work to be published.

## REFERENCES

- BERTRAND, M. (1989): *La durée de développement, un facteur limitant de l'extension de l'aire de répartition: le cas de trois espèces européennes de Labidostomidae (Acari, Actinedida)*. In: André, H. M. & Lions, J. C. (eds.): *Ontogénèse et le concept de stases chez les arthropodes*, Agar Press, pp. 123–128.
- BERTRAND, M. (1990) *La famille des Labidostomidae Oudemans, 1904 (Acari: Actinedida). Révision des genres et sous-genres et catalogue des espèces décrites. Acarologia*, 31: 31–38.
- BŁOSZYK, J. & CZARNOTA, P. (1998). Wpływ wybranych czynników na liczebność i rozmieszczenie *Nicoletiella denticulata* (Schrank, 1776) (Acari: Actinotrichida, Labidostommatina) w Gorczańskim Parku Narodowym, w porównaniu ze zdegradowanymi środowiskami Karkonoszy i Gór Izerskich [The influence of selected factors on the density and distribution of *Nicoletiella denticulata* (Schrank, 1776) (Acari: Actinotrichida, Labidostommatina) in the Gorce National Park when compared with the degraded habitats in the Karkonosze and Izery Mountains]. *Parki Narodowe i Rezerwaty Przyrody*, 17: 31–49.
- DUNLOP, J. A. & BERTRAND, M. (2011): Fossil Labidostomatid mites (Prostigmata: Labidostommatidae) from baltic amber. *Acarologia*. 51: 191–198.
- FEIDER, Z. & VASILIU, N. (1968): *Nicoletiella romana* n. sp. (Acariformes), une nouvelle espèce d'acararien de litière. *Revue Roumaine de Biologie (Zoologie)*. 13: 31–41.
- FEIDER, Z. & VASILIU, N. (1969) *Révision critique de la famille des Nicoletiellidae*. In: Proceedings of the 2nd International Congress of Acarology, Sutton Bonington (England), 19th–25th July, 1967. Akadémiai Kiadó, Budapest, pp. 202–207.
- FEIDER, Z. & VASILIU, N. (1970): *Espèces de Nicoletiellidae (Acariformes) de Roumanie*. In: Livre du Centenaire Emile G. Racovitza (1868–1968), Editions de l'Académie de la République socialiste de Roumanie, pp. 371–391.
- GRANDJEAN, F. (1941): Observations sur les Acariens, 6ème série. *Bulletin du Muséum National d'Histoire Naturelle Paris Série 2*, XIII. 6: 532–539.
- GRANDJEAN, F. (1942): Observations sur les Labidostommidae (2e série). *Bulletin du Muséum National d'Histoire Naturelle Paris Série 2*, XIV. 3: 185–192.
- ŠTORKÁN, J. (1938): Beiträge zur Kenntniss der Familie Nicoletiellidae. *Mémoires de la Société zoologique Tchécoslovaque de Prague*. 5: 436–453.
- ÚJVÁRI, ZS. & KONTSCHÁN, J. (2010): Adatok Porva és környékének Mesostigmata és Trombidiformes (Acari) faunájához [Data to the Mesostigmata and Trombidiformes (Acari) fauna of Porva and surroundings.]. *Folia Musei historico-naturalis Bakoyniensis*, 27: 33–38.
- VISTORIN, H. E. (1978): Zur Verbreitung europäischer Nicoletielliden-Arten (Acari, Trombidiformes).

*Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark.* 108: 271–280.

VISTORIN, H. E. (1980): Morphologische Untersuchungen an europäischen Nicoletielliden (Acari, Trombidiformes). *Acarologia*, 21: 367–383.

WALTER, D. E., LINDQUIST, L. L., SMITH, I. M., COOK, D. R. & KRANTZ, G. W. (2009) *Order Trombidiformes*. In: KRANTZ, G. W. and WALTER, D. E. (eds.). *A Manual of Acarology*, Third Edition. Texas Tech University Press, pp. 234–236.