

First record of three mite species (Acari) in Greece collected on commercial bumblebee (Hymenoptera: Apidae: *Bombus terrestris* Linnaeus, 1758)

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Received 13 March 2015 | Accepted 2 April 2015 | Published online 3 April 2015.

The bumblebees (Insecta: Apidae: *Bombus* spp.) are important pollinators in the natural and the agricultural ecosystems (Morandin *et al.* 2001). The most common and widely distributed species (*Bombus terrestris* Linnaeus, 1758) occurs in Western Palearctic and has role in the pollination of hundreds plant species (Rasmont *et al.* 2008, Teper 2005).

The association between the mites and the Apidae is a well-known phenomenon in the field of acarology, but the mites living together with the bumblebees are scarcely investigated. Only few papers are presented about bumblebee associated mites from Europe, like five mite species are recorded on *Bombus lapidarius* (Linnaeus, 1758) from Switzerland (Schwatz & Huck 1997) and seven species were found on nest of the commercial bumblebee (*Bombus terrestris* Linnaeus, 1758) (Rozej *et al.* 2012). We have very few information about the bumblebee associated mites in different parts of Europe, therefore I would like to present three bumblebee associated mites which were collected in Northern-Greece.

Two specimens of commercial bumblebee species (*Bombus terrestris* Linnaeus, 1758) were collected in Mountain Epirus, Greece (locality: Greece, Epirus region, Ioannina peripheral unit, Lakmos Mts, Tampouria, rocky meadow, macchia and open woodland N of the village, 04.V.2011, (2011/2), N39°43.695' E21°05.034', 1010 m; leg. J. Kontschán, D. Murányi, T. Szederjesi & Zs. Ujvári). The bumblebee specimens were collected by butterfly net and after were placed into 75% alcohol with together the mites. The mites were separated from the body of bumblebee under microscope with aid of brush. Specimens of the found species were cleared in lactic acid and after were preserved in Hoyer media. The collected mites are deposited in the Hungarian Natural History Museum.

One female *Hypoaspis (Pneumolaelaps) marginopilosa* Sellnick, 1938 (Fig. 1) was found on the body of bumblebee. This species is easy to recognize on the basis of the following characters: dorsal shield has some supplementary setae; all dorsal setae are needle-like. Seven pairs of setae situated between genital and anal shields on membranous cuticle. Numerous needle-like setae are placed on membranous cuticle of marginal area of ventral idiosoma. Sternal setae are long, reaching to basis of next setae. Sternal and genital shields are covered by reticulate sculptural pattern. The association of this mite species with the commercial bumblebee is mentioned by Karg (1993) from Central and Northern Europe and by Rozej *et al.* (2012) from Poland. This association earlier was not mentioned neither from the Balkan Peninsula and nor from South Europe. This is the first record of *Hypoaspis (Pneumolaelaps) marginopilosa* from Greece.

Four deutonymphs of *Parasitellus fucorum* (DeGeer, 1778) (Figs 2-4) were collected on the body of the bumblebee. The most important characters of this species are the followings: podonotal and opisthonotal shields are covered by reticulate sculptural pattern, setae r5 and z2 are longer than others and their margins are finely pilose. Epistome is apically rounded, laterally bears two small spines. Surface of

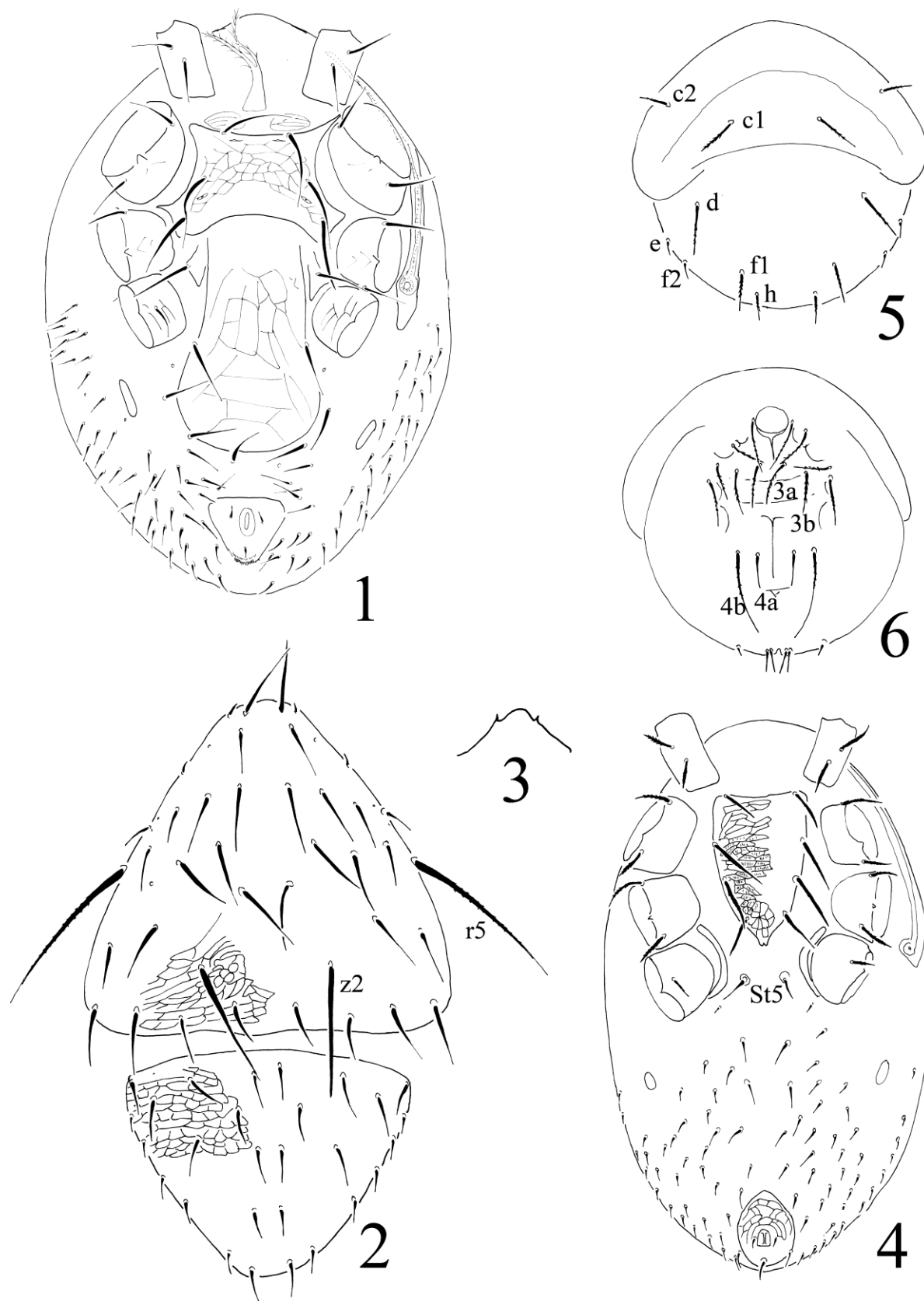


Figure 1. Bumblebee associated mites from Greece: 1: ventral view of *Hypoaspis (Pneumolaelaps) marginepilosa* Sellnick, 1938 (female); 2: dorsal view-, 3: epistome, 4: ventral view of *Parasitellus fucorum* (DeGeer, 1778) (deutonymph), 5: dorsal view-, 6: ventral vies of *Scutacarus acarorum* (Goeze, 1780) (female).

sternal and anal shields are reticulated, four pairs of finely pilose sternal setae situated on sternal shield. Setae St5 situated on small platelets between coxae IV. Ventral setae are short and needle-like. This species is presented in some cases from *Bombus* species (Karg 1993, Fain & Hosseinian 2000, Rozej *et al.* 2012) from Europe. Fain & Hosseinian (2000) mentioned this species from hives of honeybee (*Apis mellifera carnica* Pollman, 1879) as well. This occurrence together with this mite species with bumblebee was not mentioned earlier from the Balkan Peninsula. This is the first record of this mite from Greece.

Two females of *Scutacarus acarorum* (Goeze, 1780) (Figs 5-6) were found on body of a bumblebee specimens. The distinguishing characters are the followings: dorsal setae (c1, c2, d, f1, h) are longer and marginally pilose, but not reaching to basis of next setae, setae e and f2 which are very short and needle-like. Setae 3a is little shorter than 3b, setae 4a is twice shorter than 4b. This species occurs in the nest of bumblebee in Europe, North-America and Mongolia and it was collected from the body of the bumblebees as well (Mahunka 1972). Nor the association neither this mite species do not presented from Greece and from Balkan Peninsula.

However the association of the mites with the Hymenopterans is a well-known phenomenon in the field of acarology, we have little knowledge about the role of the mites found on body of the bumblebee, but we suppose that the scutacarids are parasites and suck the blood of the insects. Mesostigmatans can be used the bumblebees only for the transporting from the flowers to the bumblebee nest, where they can feed the eggs and larvae or other inhabitants of the nest. *Hypoaspis (Pneumolaelaps) marginepilosa* can be profited from living in bumblebee nests as well, feeding on honey and surface lipids of pollen (Royce & Krantz 1989). Deutonymphs of *Parasitellus fucorum* often can be found on the body of bumblebee queens as well (Schwartz *et al.* 1996). Adult females and deutonymphs can be feed on pollen, wax, and nectars (Richards & Richards 1976).

Acknowledgements

The present study was supported by the Hungarian Scientific Research Fund (OTKA 100369 and 108663).

References

- Fain, A. & Hosseinian, S. H. (2000) Observations sur des acariens (Acari) infestant les ruches de *Apis mellifera* race *carnica* (Insecta Apidae) de Belgique. *Bulletin S.R.B.E.I.K.B. V.E.*, 136 (2000), 32–33.
- Karg, W. (1993) *Raubmilben. Acari (Acarina), Milben, Parasitiformes (Anactinochaeta) Cohors Gamasina Leach. Die Tierwelt Deutschlands. 59.* Gustav Fischer Verlag, Jena, 523 pp.
- Mahunka, S. (1972) *Tetűatkák-Tarsonemina. Arachnoidea. Fauna Hungariae 18*, Akadémiai Kiadó, Budapest, 215 pp. (in Hungarian).
- Morandin, L. A., Laverty, T. M., & Kevan, P. G. (2001) Bumble bee (Hymenoptera: Apidae) activity and pollination levels in commercial tomato greenhouses. *Journal of Economic Entomology*, 94, 462–467.
- Rasmont, P., Coppée, A., Michez, D. & De Meulemeester, T. (2008) An overview of the *Bombus terrestris* (L. 1758) subspecies (Hymenoptera: Apidae). *Annales de la Société Entomologique de France (n.s.)*, 44 (1), 243–250.
- Richards, L. A. & Richards, K. W. (1976) Parasitid mites associated with bumblebees in Alberta, Canada (Acarina: Parasitidae; Hymenoptera: Apidae). II. Biology. *University of Kansas Science Bulletin*, 51, 1–18.
- Royce, L. A. & Krantz, G. W. (1989) Observations on pollen processing by *Pneumolaelaps longanalis* (Acari: Laelapidae), a mite associate of bumble bees. *Experimental and Applied Acarology*, 7, 161–165.
- Rozej, E., Witaliński, W., Szentgyörgyi, H., Wantuch, M., Moroń, D. & Woyciechowski, M. (2012) Mite species inhabiting commercial bumblebee (*Bombus terrestris*) nests in Polish greenhouses. *Experimental and Applied Acarology*, 56(3), 271–82.
- Schwartz, H. H. & Huck, K. (1997) Phoretic mites use flowers to transfer between foraging bumblebees. *Insect Sociaux*, 44, 303–310.

- Schwartz, H. H., Huck, K. & Schmid-Hempel, P. (1996) Prevalence and host preferences of Mesostigmatic mites (Acari: Anactinochaeta) phoretic on swiss bumble bees (Hymenoptera: Apidae). *Journal of the Kansas Entomological Society*, 69(4), 35–42.
- Teper, D. (2005) Comparison of food plants of *Bombus terrestris* L. and *Bombus lapidarius* L. based on pollen analysis of their pollen loads. *Journal of Apicultural Science*, 49(2), 43–50.