

Orijinal araştırma (Original article)

First report of *Neoseiulus roumelioticus* (Acari: Phytoseiidae) in Turkey

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Türkiye’de *Neoseiulus roumelioticus* (Acari: Phytoseiidae)’un ilk kaydı

Öz: Daha önce sadece Yunanistan’dan yapılan orijinal tanımı üzerinden bilinen avcı akar, *Neoseiulus roumelioticus* Papadoulis, Emmanouel & Kapaxidi (Acari: Phytoseiidae) Türkiye’de ilk kez kayıt edilmektedir. Avcı akar türü, İstanbul ili Çilingöz Tabiat Parkı’ndan Asteraceae familyasına ait bir bitkiden toplanmış bireyler üzerinden yeniden tanımlanmıştır.

Anahtar kelimeler: Biyolojik mücadele, avcı akar, fauna, morfoloji, yeniden tanımlama

Abstract: *Neoseiulus roumelioticus* Papadoulis, Emmanouel & Kapaxidi (Acari: Phytoseiidae), a predatory mite previously known only from its original description from Greece, is reported for the first time in Turkey. The species is re-described and illustrated, based on specimens collected from an unknown species of plant in the family Asteraceae in Çilingöz Nature Park in Istanbul Province, Turkey.

Keywords: Biological control, predatory mite, fauna, morphology, re-description

Introduction

The phytoseiid mites (Acari: Mesostigmata: Phytoseiidae) are one of the most utilized groups of predators for the biological control of plant-feeding mites and some small soft-bodied insects that include thrips and whiteflies (Papadoulis et al. 2009). The genus *Neoseiulus* Hughes includes several important species, such as *N. californicus* (McGregor), *N. fallacis* (Garman), *N. longispinosus* (Evans) and *N. womersleyi* (Schicha), which are Type II selective predators of tetranychid mites, but also Type III generalist predators, such as *N. barkeri* Hughes and *N. cucumeris* (Oudemans), found in soil/litter habitats (McMurtry et al. 2013). All of them have been widely used commercially for the biological control of the pest groups mentioned earlier.

Neoseiulus roumelioticus Papadoulis, Emmanouel & Kapaxidi was described by Papadoulis et al. (2009), based on material collected from moss and low herbaceous plants, in Greece. Later studies showed no indication of the presence of *N. roumelioticus*, not only in Turkey, but also in other Mediterranean countries (Kasap & Cobanoğlu 2009; Faraji et al. 2011; Kasap et al. 2013; Döker et al. 2020; Tsolakis & Ragusa 2016; Cakar et al. 2020; Kreiter et al. 2020; Bas et al. 2022).

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Alınış (Received): 24 Ekim 2022

Kabul edilmiş (Accepted): 5 Aralık 2022

In this study, *N. roumelioticus* is re-described and illustrated, based on material specimens collected from Çilingöz Nature Park in Istanbul Province, Turkey.

Materials and Methods

Plant samples collected from Çilingöz Nature Park in Istanbul Province, Turkey were transferred to the laboratory in an icebox. Phytoseiid mites were extracted by using Berlese-Tullgren funnels and stored in 75% alcohol. Before slide preparation, they were kept in 60% lactic acid for 24 hours at 50 °C. Microscope slides were prepared using Hoyer's medium. Further examinations were conducted using an Olympus® CX-41 microscope. Drawings were prepared with a pencil while using a camera lucida attached to the microscope. The lines were further corrected using tracing paper and a rapidograph pen. Final corrections were made using a computer program (Adobe Photoshop version CS6), whenever required. Measurements are given in micrometers. The taxonomic system used follows that of Chant and McMurtry (2007). The setal nomenclature used follows Lindquist and Evans (1965), as adapted by Rowell et al. (1978). The dorsal and ventral setal pattern utilized is that of Chant and Yoshida-Shaul (1989; 1991). The examined specimens are deposited in the mite collection of the Acarology Laboratory, Cukurova University, Adana, Turkey.

Results

Systematics

Neoseiulus roumelioticus Papadoulis, Emmanouel & Kapaxidi (Figure 1–5)

Neoseiulus roumelioticus Papadoulis, Emmanouel & Kapaxidi, 2009: 87.

Female (n=5).

Dorsum (Figure 1). Dorsal setal pattern 10A:9B (*r3* and *R1* off shield). Dorsal shield, sclerotized, oval with slight waist at level of *Z1*, smooth except some patches of lateral striations or reticulations. Bearing five pairs of solenostomes (*gd1*, *gd2*, *gd4*, *gd6*, and *gd9*). Muscle-marks (sigilla) visible mostly on podosoma, length of dorsal shield 328 (320–335), width 163 (155–165) at level of *s4*, width 183 (170–190) at level of *S2*. All dorsal setae smooth, except *Z4* and *Z5* slightly serrated. Measurements of dorsal setae as follows: *j1* 14 (13–15), *j3* 19 (18–20), *j4* 15 (13–18), *j5* 17 (15–18), *j6* 17 (15–18), *J2* 24 (23–25), *J5* 11 (10–13), *z2* 19 (18–20), *z4* 19 (18–20), *z5* 16 (15–18), *Z1* 24 (23–25), *Z4* 47 (45–50), *Z5* 63 (60–65), *s4* 28 (25–30), *S2* 26 (25–28), *S4* 28 (25–30), *S5* 14 (13–15), *r3* 18 (17–19), and *R1* 17 (16–18). Peritreme extending seta level of *j3*.

Venter (Figure 2). Ventral setal pattern 14:JV–3:ZV. Sternal shield smooth, slightly sclerotized with three pairs of setae (*ST1*, *ST2*, *ST3*), two pairs of poroids (*pst1* and *pst2*). Distance between *ST1*–*ST3* 66 (65–68), distance between *ST2*–*ST2* 56 (55–58). Metasternal setae *ST4* and a pair of pores (*pst3*) on metasternal shields. Genital shield smooth; width at level of genital setae (*ST5*) 61 (60–63). Ventrianal shield reticulated posteriorly and striated anteriorly, bearing three pairs of pre-anal setae (*JV1*, *JV2*, and *ZV2*), a pair of para-anal (*Pa*) and a post-anal setae (*Pst*). Preanal solenostomes (*gv3*) small rounded and located posteromedian to *JV2*.

Length of ventrianal shield 118 (118–120), width at level of ZV2 102 (100–105). Setae JV4, JV5, ZV1, ZV3, and six pairs of poroids on integument surrounding ventrianal shield. Setae JV5 smooth, much longer than other ventral setae, 53 (50–55) in length.

Chelicera (Figure 3). Fixed digit 27 (25–28) long with three teeth clustered apically and a pilus dentilis; movable digit 27 (25–28) long with three teeth.

Spermatheca (Figure 4). Calyx of spermathecal bell-shaped flaring distally, 11 (10–13) in length; atrium nodular and narrower than base of calyx, with major duct thick-walled, fusiform, vacuolated area where it joins atrium; without neck between atrium and calyx; major duct long; minor duct visible.

Legs (Figure 5). Length of legs (base of coxae to base of claws) as follows: leg I 318 (310–325), leg II 233 (225–245), leg III 228 (220–235), leg IV 315 (310–320). Genua II, III, and IV each with seven setae. Leg IV with one sharp pointed macrosetae, StIV 59 (55–63) in length.

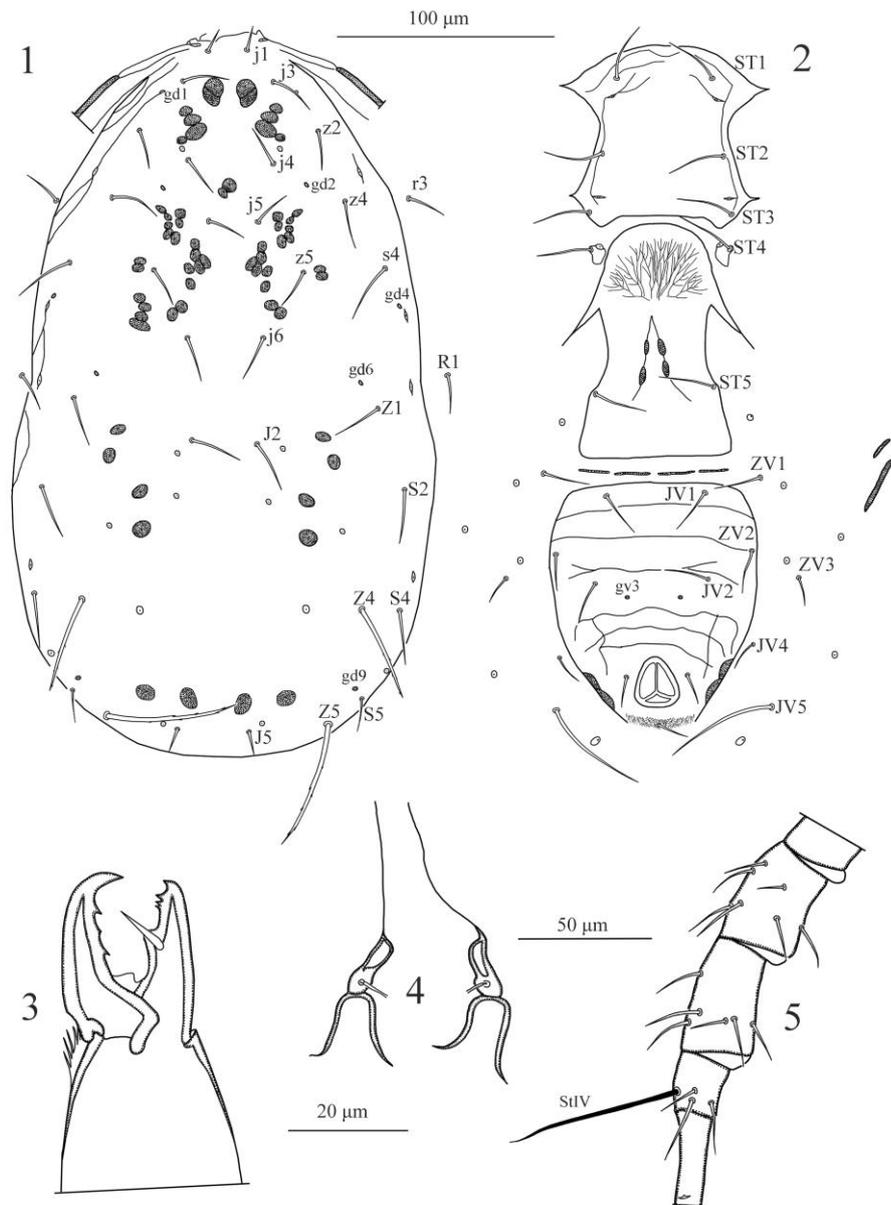
Male. Not collected in this study.

Material examined. Five females collected from an unknown species of plant in the family Asteraceae, in association with thrips, Çilingöz Nature Park, Istanbul Province, May 1, 2017, coll. İ. Döker.

World Distribution. Greece (Papadoulis et al. 2009) and Turkey (this study).

Remarks

Neoseiulus roumelioticus was described by Papadoulis et al. (2009), based on the specimens collected from moss and low herbaceous plants in various locations in Northern (Macedonia) and Central Greece. The species is only known to date from Greece, based on its original description.



Figures 1–5. *Neoseiulus roumelioticus* Papadoulis, Emmanouel & Kapaxidi, female: 1. Dorsal shield; 2. Ventral idiosoma; 3. Chelicera; 4. Spermatheca; 5. Leg IV (Genu, tibia and basitarsus). Scale bars = 100 µm for 1, 2; 20 µm for 3, 4; 50 µm for 5.

Therefore, the finding of the current study represents a new record for the Turkish fauna, as well as the first discovery of the species after its original description. Morphological characters and measurements of the Turkish specimens are almost identical to the original description, except for the length of the calyx of spermatheca. Papadoulis et al. (2009) also reported a bell-shaped calyx of

spermatheca but its length was 24 in the original description as opposed to 11 (10–13) in the current materials. Upon a request by the present authors, Dr. Theodoros I. Stathakis (Agricultural University of Athens, Greece) kindly examined and confirmed that the length of the calyx of spermatheca in the holotype and a paratype specimen were 12 in length.

Neoseiulus roumelioticus is similar to *N. alustoni* which was reported by Döker et al. (2016) for the Turkish fauna. This species can be separated from *N. alustoni* by having an almost smooth dorsal shield (reticulated in *N. alustoni*), three teeth on the movable digit of the chelicera (two in *N. alustoni*), five pairs of dorsal solenostomes (four in *N. alustoni*, gd2 absent), and generally shorter dorsal setae which do not reach the base of subsequent setae (longer and reaching the base of subsequent setae in *N. alustoni*).

Nothing is known of the biology and feeding habits of *N. roumelioticus* as it has been reported only from Greece and Turkey, based on taxonomical descriptions. However, the finding of this predator in association with unknown thrips suggests that studies should be conducted under laboratory and field conditions to determine its potential as a biological control agent of this group of pests.

Acknowledgements

The authors are grateful to Dr. Theodoros I. Stathakis (Agricultural University of Athens, Greece) for his careful examination of the type materials of *Neoseiulus roumelioticus*. This study was supported by the Cukurova University Scientific Projects Foundation Units under grant number, FAY-2022-14495.

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