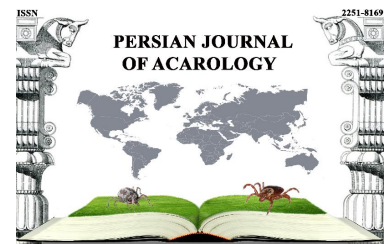




Persian J. Acarol., 2017, Vol. 6, No. 1, pp. 67–70.
<http://dx.doi.org/10.22073/pja.v6i1.27559>
Journal homepage: <http://www.biotaxa.org/pja>



Correspondence

Discovery of the predatory mite *Neoseiulus californicus* (Acari: Phytoseiidae) in some rose greenhouses in Iran and describing variation in spermathecal calyx shape

Soghra Seyedizadeh¹, Mojtaba Ghane-Jahromi¹, Amin Sedaratian-Jahromi¹ and Farid Faraji^{2*}

1. Department of Plant Protection, Faculty of Agriculture, Yasouj University, Yasouj, Iran; E-mails: seyedizade70@gmail.com, mojtaba_ghane23@yahoo.com, sedaratian@yu.ac.ir

2. MITOX Consultants/Eurofins, Science Park 408, 1098 XH Amsterdam, The Netherlands; E-mail: faridfaraji@eurofins-mitox.com

* Corresponding author

PAPER INFO.: Received: 14 December 2016, Accepted: 19 December 2016, Published: 15 January 2017

Neoseiulus californicus (McGregor, 1954) is a predatory mite in temperate and subtropical regions around the world (Fraulo *et al.* 2008; Demite *et al.* 2016) and is commercially reared to control spider mites (Jolly 2000; Easterbrook *et al.* 2001). The outdoor populations of this predatory mite has been reported from many countries with warm temperature (Demitte *et al.* 2016). Close to Iran, in neighbouring Turkey, it was found in an area close to the Aegean Sea with mild winter temperature (Çakmak and Çobanoğlu 2006) and Syria at Latakia, close to the Mediterranean Sea (Barbar 2014). Although different biological attributes of this predatory mite were evaluated under laboratory conditions in Iran (e.g. Rahmani *et al.* 2009; Rezaie 2015; Rezaie & Montazerie 2015; Khanamani *et al.* 2016), its occurrence was not reported from greenhouses or open fields. In the present study, for the first time, we document discovery of the predatory mite *N. californicus* in some rose greenhouses in Yasouj, Iran. Furthermore, variation in spermathecal calyx shape is also discussed.

Mite specimens were collected from some rose greenhouses in Yasouj, Iran. Rose leaves were detached and placed in plastic bags. In the laboratory of the Department of Plant Protection, Faculty of Agriculture, Yasouj University, predatory mites were collected using a camel hairbrush under a dissecting microscope and preserved in 70% ethanol. The specimens were cleared in lactophenol and mounted in Hoyer's medium on microscope slides, individually. Photos were taken with the aid of a digital camera attached to an Olympus phase contrast microscope.

Mite material examined: Two females and one male, 12 April 2016, col.: S. Seyedizadeh, Chenarestan village, Yasouj, Iran.

Neoseiulus californicus was introduced to Iran just for academic research (e.g. Khanamani *et al.* 2016; Maroufpoor *et al.* 2016) and not for use in pest management programs. The rearing cultures were initiated by purchasing *N. californicus* from Koppert Biological System, The Netherlands in 2009 and 2012. It is more likely that the populations of this predatory mite establishing themselves in some Iranian greenhouses originated from any of the university laboratory cultures. Since the average low temperature of Yasouj is about -2°C , this predatory mite can survive the mild freezing wintertime and establish its population outdoor. The same climate condition or even milder winter exists in many other parts of Iran and we expect to face a widespread distribution of *N. californicus*

in Iran in near future. Unlike introduction of an unwanted pest, we consider the occurrence of this precious predatory mite in the Iranian greenhouses and in the fields a benefit for the biological control programs against spider mites. Based on our finding, we add this record to the mite fauna of Iran and recommend the authorities to lift any restrictions for shipment or augmentation of *N. californicus* in Iran.

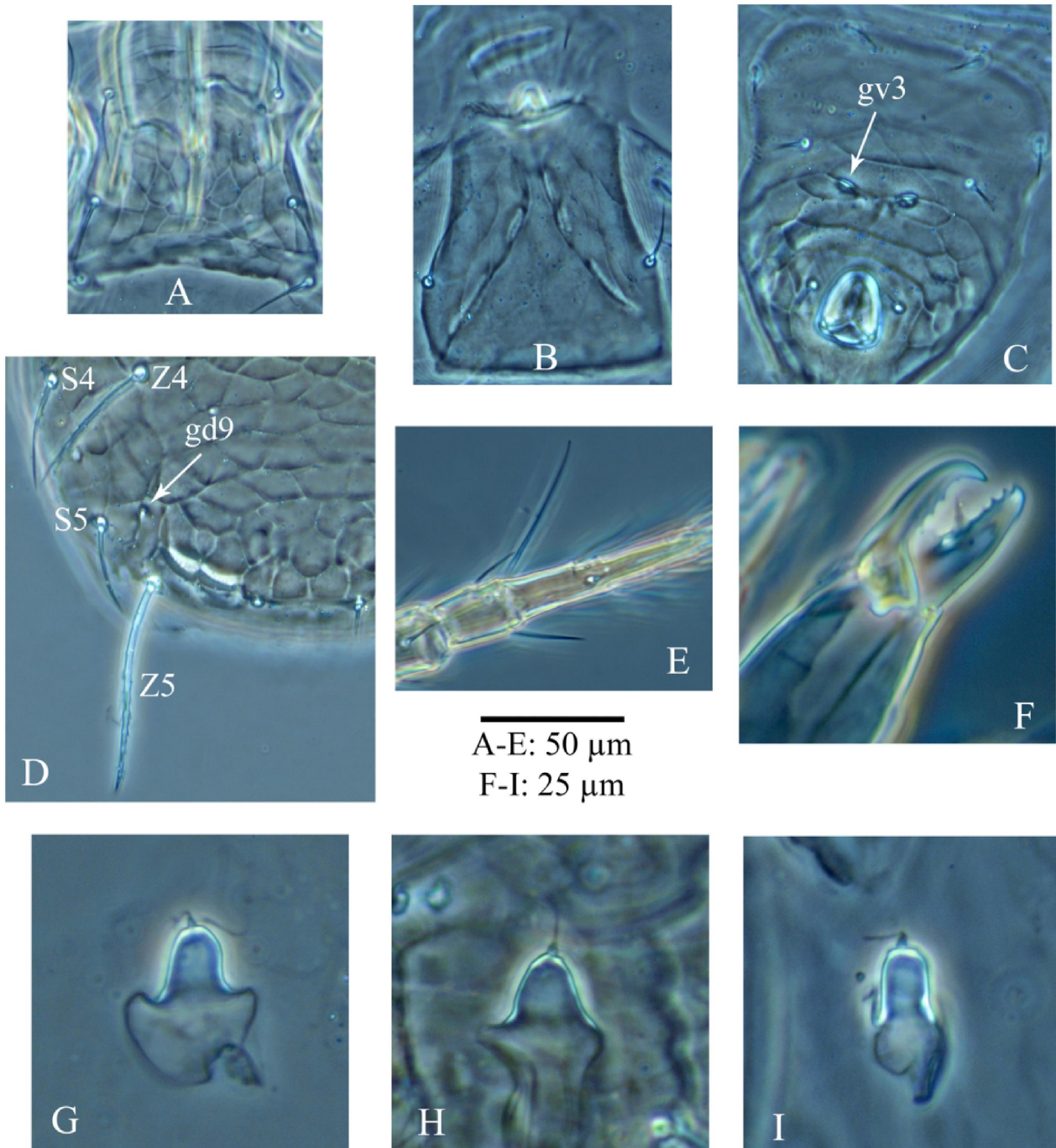


Figure 1. Some features of *Neoseiulus californicus* (female): A. Sternal shield; B. Genital shield; C. Ventrianal shield; D. Posterior part of dorsal shield; E. Basitarsus leg IV; F. Chelicera; G, H & I. Variation in spermathecal calyx shape.

In this paper, we follow Athias-Henriot (1977) for the identification of *N. californicus sensu lato*. Xu *et al.* (2013) has recently reviewed the taxonomical status of *N. californicus*, re-described it

and clarified some mistakes in the literature. The features of the collected mites (Fig. 1: A–I) in Iran fit well with those of the re-described species. Xu *et al.* (2013) documented the shape of spermathecal calyx for some strains of *N. californicus* and emphasized the Chinese strain having calyx slightly longer (L) than wide (W) (2:1.7). The specimens that we have collected in Iran do show a variation of calyx length from unusually longer (L:W, 2:1.3) (Fig. 1I) to equal in length (Fig. 1H).

ACKNOWLEDGEMENTS


The financial support of this study by Department of Plant Protection of Yasouj University is greatly appreciated. Furthermore, we express our particular appreciations to Mostafa Zamanpour for his assistance in sampling the mites.

REFERENCES

- Athias-Henriot, C. (1977) Nouvelles notes sur les Amblyseini. III. Sur le genre *Cydnodromus*: Redéfinition, composition (Parasitiformes, Phytoseiidae). *Entomophaga*, 22: 61–73.
<http://dx.doi.org/10.1007/bf02372991>
- Barbar, Z. (2014) Occurrence, population dynamics and winter phenology of spider mites and their phytoseiid predators in a citrus orchard in Syria. *Acarologia*, 54: 409–423.
<http://dx.doi.org/10.1051/acarologia/20142143>
- Çakmak, I. & Çobanoğlu, S. (2006) *Amblyseius californicus* (McGregor, 1954) (Acari: Phytoseiidae), a new record for the Turkish fauna. *Turkish Journal of Zoology*, 30: 55–58.
- Demite, P.R., Moraes, G.J. de, McMurtry, J.A., Denmark, H.A. & Castilho, R.C. (2016) Phytoseiidae Database. Available from: www.lea.esalq.usp.br/phytoseiidae (accessed on 19/10/2016).
- Easterbrook, M.A., Fitzgerald, J.D. & Solomon, M.G. (2001) Biological control of strawberry tarsonemid mite *Phytonemus pallidus* and two-spotted spider mite *Tetranychus urticae* on strawberry in the UK using species of *Neoseiulus* (*Amblyseius*) (Acari: Phytoseiidae). *Experimental and Applied Acarology*, 25: 25–36.
- Fraulo, A.B., McSorley, R. & Liburd, O.E. (2008) Effect of the biological control agent *Neoseiulus californicus* (Acari: Phytoseiidae) on arthropod community structure in north Florida strawberry fields. *Florida Entomologist*, 91: 436–445.
- Jolly, R.L. (2000) The predatory mite *Neoseiulus californicus*: its potential as a biological control agent for the fruit tree spider mite, *Panonychus ulmi*. *The BCPC Conference, Brighton, Pest and Diseases*, 1: 487–490.
- Khanamani, M., Fathipour, Y., Talebi, A.A. & Mehrabadi, M. (2016) Linking pollen quality and performance of *Neoseiulus californicus* (Acari: Phytoseiidae) in two-spotted spider mite management programmes. *Pest Management Science*, DOI: 10.1002/ps.4305.
- Maroufpoor, M., Ghoosta, Y., Pourmirza, A.A. & Lotfalizadeh, H. (2016) The effects of selected acaricides on life table parameters of the predatory mite, *Neoseiulus californicus* fed on European red mite. *North-Western Journal of Zoology*, 12 (1): 1–6.
- McGregor, E.A. (1954) Two new mites in the genus *Typhlodromus* (Acarina: Phytoseiidae). *Southern California Academy of Science Bulletin*, 53: 89–92.
- Rahmani, H., Fathipour, Y. & Kamali, K. (2009) Life history and population growth parameters of *Neoseiulus californicus* (Acari: Phytoseiidae) fed on *Thrips tabaci* (Thysanoptera: Thripidae) in laboratory conditions. *Systematic & Applied Acarology*, 14: 91–100.
- Rezaie, M. (2015) Comparison of life table parameters of the predatory mite, *Neoseiulus californicus* (McGregor) fed on two-spotted spider mite and western flower thrips. *1st Iranian International Congress of Entomology, 29–31 August 2015, Tehran, Iran*, p. 349.

- Rezaie, M. & Montazerie, F. (2015) Effect of feeding with different plant pollens on predation rate of *Neoseiulus californicus* (McGregor). *1st Iranian International Congress of Entomology, 29–31 August 2015, Tehran, Iran*, p. 351.
- Xu, X., Wang, B., Wang, E., & Zhang, Z.-Q. (2013) Comments on the identity of *Neoseiulus californicus* sensu lato (Acari: Phytoseiidae) with a redescription of this species from southern China. *Systematic & Applied Acarology*, 18 (4): 329–344.

COPYRIGHT

 Seyedizadeh *et al.* Persian Journal of Acarology is under free license. This open-access article is distributed under the terms of the Creative Commons-BY-NC-ND which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author and source are credited.
