

# Acarologia

A quarterly journal of acarology, since 1959  
Publishing on all aspects of the Acari

All information:

<http://www1.montpellier.inra.fr/CBGP/acarologia/>  
[acarologia-contact@supagro.fr](mailto:acarologia-contact@supagro.fr)



**Acarologia is proudly non-profit,  
with no page charges and free open access**

Please help us maintain this system by  
**encouraging your institutes to subscribe to the print version of the journal**  
and by sending us your high quality research on the Acari.

Subscriptions: Year 2022 (Volume 62): 450 €

<http://www1.montpellier.inra.fr/CBGP/acarologia/subscribe.php>

Previous volumes (2010-2020): 250 € / year (4 issues)

Acarologia, CBGP, CS 30016, 34988 MONTFERRIER-sur-LEZ Cedex, France

ISSN 0044-586X (print), ISSN 2107-7207 (electronic)

The digitalization of Acarologia papers prior to 2000 was supported by Agropolis Fondation under the reference ID 1500-024 through the « Investissements d'avenir » programme (Labex Agro: ANR-10-LABX-0001-01)



**Acarologia is under free license** and distributed under the terms of the Creative Commons-BY

RE-DESCRIPTION OF  
*TYPHLODROMUS (ANTHOSEIUS) KHOSROVENSI*  
ARUTUNJAN,  
FIRST RECORD FOR IRAN  
(ACARI: PHYTOSEIIDAE)

BY E. A. UECKERMANN<sup>1, 2</sup>, M. JALAEIAN<sup>3</sup>,  
A. SABOORI<sup>4</sup> & H. SEYEDOLESLAMI<sup>2</sup>

(Accepted January 2008)

ACARI  
PHYTOSEIIDAE  
*TYPHLODROMUS* IRAN  
RE-DESCRIPTION

SUMMARY: *Typhlodromus (Anthoseius) khosrovensis* Arutunjan is re-described from *Malus domestica*, Alavijeh, Isfahan. Iran. It is a first record for Iran. A key to the Iranian species of *Typhlodromus* is given.

INTRODUCTION

To date 18 Iranian species of *Typhlodromus* (*Anthoseius*) are known from Iran (FARAJI, *et al.*, 2007). KHALIL-MANESH (1973) reported *T. (A.) rhenanus* Oudemans on *Malus* sp. at Tehran. McMURTRY (1977) described *T. (A.) persianus* from citrus at Minab and reported *T. (A.) bagdasarjani* Wainstein & Arutunjani (= *T. (A.) kettanehi* Dosse) from citrus at Kazerun. He also conducted tests to determine the fecundity rates of this species on different foods and found that the highest rate occurred on a combination of *Tetranychus pacificus* McGregor eggs and larvae plus *Malephora crocea* (Jacq.) pollen. DANESHVAR (1980) reported *T. (A.) kazachstanicus* Wainstein from *Malus* sp. at Damavand and Oroomiyeh. DANESHVAR & DENMARK (1982) described

four new species. DANESHVAR (1987) added another new species and recorded *T. (A.) kerkirae* Swirski & Ragusa for the first time from Iran. FARAJI *et al.* (2007) ordered the Iranian phytoseiids with their extensive key to the phytoseiids of Iran. *Typhlodromus (Anthoseius) khosrovensis* is re-described here which bring the total of *T. (Anthoseius)* species known from Iran to 19.

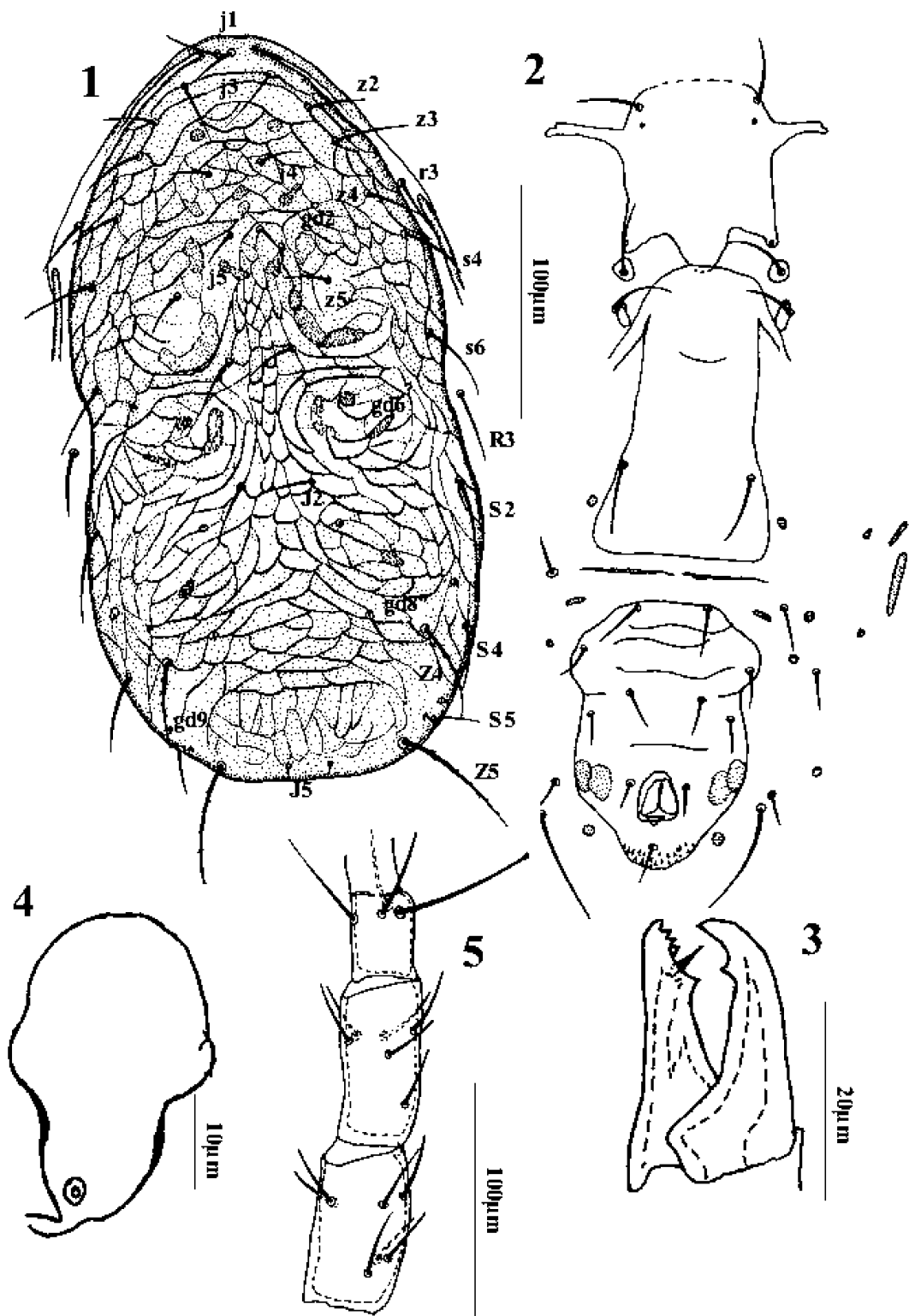
The present study was conducted during 2001 to 2003, by the second author, in the western region of Isfahan Province, to determine the phytoseiid species present in fruit orchards for the purpose of selecting beneficial species that might be included in pest management programs. DANESHVAR (1987) recorded the *Neoseiulus zwoelferi* (Dosse) from a *Prunus* sp from Dorche, Isfahan, apparently the only phytoseiid known from this province to date in spite of many

1. ARC-Plant Protection Research Institute, Private Bag X134, Queenswood, Pretoria, 0121 South Africa. E-mail: [UeckermannE@arc.agric.za](mailto:UeckermannE@arc.agric.za)

2. Dept. of Plant Protection, College of Agriculture, Isfahan University of Technology, Isfahan, Iran. E-mail: [mahdi\\_jalaeian@yahoo.com](mailto:mahdi_jalaeian@yahoo.com)

3. Dept. of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran. E-Mail: [saboori@ut.ac.ir](mailto:saboori@ut.ac.ir)

4. School of Environmental Sciences and Development, North-West University, Potchefstroom 2520, South Africa



FIGS. 1-5. *Typhlodromus (Anthoseius) khosrovensis* Arutunjan. Female. 1.— Dorsum. 2.— Venter. 3.— Chelicera. 4.— Spermatheca. 5.— Leg IV.

surveys conducted all over Iran (Sepasgozarian, 1977, Khalil-Manesh, 1973, DANESHVAR & DENMARK, 1982 and Daneshvar, 1987).

The key of FARAJI et al. (2007) are used here to compare *T. (A.) khosrovensis* with the known Iranian species.

We followed the setal notations of ROWELL et al. (1978) and the classification system of CHANT & McMURTRY (1994) and all measurements are in micrometer ( $\mu\text{m}$ ). First measurement is that of the holotype (ARUTUNJAN, 1971- where available), those in brackets are the range, followed by the mean.

#### MATERIAL AND METHODS

Samples were taken at ten-day intervals during spring to early autumn from soil, leaves, fruit and ground cover (weeds amongst trees) from five orchards. Five trees in each orchard were selected randomly. Mites from the leave, fruit, weed and soil samples were extracted by means of a Berlese funnel and collected in 70% ethanol. Lactophenol and Nesbitt's solution were used to clear the mites and subsequently mounted in Hoyers.

*Typhlodromus (Anthoseius) khosrovensis* Arutunjan (FIGS. 1-5)

*Typhlodromus khosrovensis* Arutunjan, 1971: 306

DIAGNOSIS. — The following combination of characters seems to be unique for *T. (A.) khosrovensis*: Dorsal shield ornamented and with four pairs of large pores (*gd2*, *gd6*, *gd8* and *gd9*), all dorsal setae smooth except for setae *Z4* and *Z5* which are serrated; peritremes extend to level of setae *z4*; sternal shield smooth with two pairs of setae, with *ST 3-4* on small platelets; ventrianal shield is slightly creased with four pairs of pre-anal setae but lacks pre-anal pores; fixed cheliceral digit with four teeth and movable digit with one tooth; calyx of spermatheca cup-shaped with atrium incorporated in calyx; genu I with eight setae and leg IV with one knobbed macroseta.

*Female* (Specimens measures: five) :

*Dorsum* (FIG. 1) — Dorsal shield 322 (308-340) 325 long and 150 (152-170) 159 wide, elongate-oval and

reticulated. With 18 pairs of smooth setae, except for *Z4* and *Z5* which are serrated and four pairs of large pores (*gd2*, *gd6*, *gd8* and *gd9*) and five pairs of small pores. Female idiosomal setal pattern 12A:8A/JV: ZV.

*Setal lengths*: *j1* 21 (20-25) 23, *j3* 29 (30-36) 32, *j4* 19 (16-20) 18, *j5* 19 (18-19) 18, *j6* 23 (23-26) 25, *J2* 28 (25-29) 27, *J5* 5 (4-5) 4, *z2* 23 (22-26) 23, *z3* 26 (29-32) 31, *z4* 26 (25-28) 28, *z5* 19 (14-22) 19, *Z4* 49 (40-45) 43, *Z5* 63 (55-60) 57, *s4* 31 (34-35) 35, *s6* 36 (35-40) 38, *S2* 37 (35-41) 38, *S4* 35 (33-36) 35, *S5* 17 (18-22) 20, *r3?* (27-30) 29 and *RI?* (31-34) 32.

*Peritreme* — Extending to level of setae *z4*.

*Venter* (FIG. 2) — All ventral setae smooth. Distances between *ST1* – *ST3* (63-67) 65, *ST2* – *ST2* (50-55) 52 and *ST5* – *ST5* (48-52) 50. Two pairs of metapodal shields with primary shield long and slender. Opisthogastric cuticle with four pairs of setae, seven pairs of small platelets and a slender platelet between genital and ventrianal shields. Setae *JV5* long and smooth. Sternal shield with two pairs of setae and two pairs of small pores. Posterior margin of sternal shield with a medial lobe. Setae *ST3* and *ST4* on small platelets. Third pair of sternal pores associated with *ST4*. Sternal and genital shields smooth. Ventrianal shield (103-111) 107 long, (71-77) 75 wide at level of setae *ZV2* and (67-73) 70 at anal level. Ventrianal shield slightly creased. Para-anal setae close to anterior margin of anal opening. Pre-anal pores absent. Setae *Jv1-3* and *Zv2* are on ventrianal shield and setae *Zv1*, *Zv3*, *Jv4* and *JV5* on surrounding membrane.

*Chelicera* (FIG. 3) — Movable digit (25-26) 25 long, with one tooth and fixed digit (22-25) 24 long, with four teeth and a pilus dentilis.

*Spermatheca* (FIG. 4) — Calyx (8-13) 10 long, cup or bell-shaped. Atrium incorporated in calyx.

*Legs* (FIG. 5) — Only one knobbed macroseta on basitarsus IV, 49 (44-47) 45 long. Chaetotaxy of genu II: 2-2/1, 2/0-1 and genu III: 1-2/1, 2/0-1.

REMARKS. — The Iranian specimens correspond with the description of *T. (A.) khosrovensis* in all respects. However, the peritreme of the Iranian specimens extends to the level of *z4* but in the Russian specimens it reaches the level of setae *s4*. The shape

of the ventrianal shield also differs with the anterior margin straight in the Russian specimens but straight only between setae JV1 in the Iranian specimens.

MATERIAL EXAMINED — Six females from *Malus domestica*, Alavijeh (Isfahan), August 2003, M. JALAEIAN. The specimens will be deposited in the museum of the University of Tehran (Karaj), Iran and one female in the National Collection of Arachnida. ARC-Plant Protection Research Institute. Pretoria, South Africa.

KEY TO THE IRANIAN SPECIES  
OF *TYPHLODROMUS* (*ANTHOSEIUS*) SPECIES  
BASED ON THE KEY OF FARAJI ET AL. (2007).

1. Seta S5 present. . . . . subgenus *Anthoseius* De Leon=2
1. Seta S5 absent . . . . . subgenus *Typhlodromus* Scheuten=15
2. Ventrianal shield with three pairs of preanal setae . . . . . 3
2. Ventrianal shield with four pairs of preanal setae . . . . . 4
3. Ventrianal shield with a pair of pores; macroseta on basitarsus IV 35 long; posterior margin of sternal shield convex. . . . . *T. (A.) intercalaris* Livshitz & Kuznetsov
3. Ventrianal shield without any pores; macroseta on basitarsus IV 50 long; posterior margin with a median lobe. . . . . *T. (A.) rodriguizi* (Denmark & Daneshvar)
4. Seta Z5 knobbed apically. . . . . 5
4. Seta Z5 pointed apically. . . . . 6
5. Calyx of spermatheca tubular and narrow; movable digit of chelicera with one tooth; Z5 45 long. . . . . *T. (A.) caudiglans* Schuster
5. Calyx of spermatheca poculiform; movable digit of chelicera with two teeth; Z5 58 long. . . . . *T. (A.) persianus* McMurtry
6. Peritreme reaching seta *j*1 or level between *j*3 and *j*1. . . . . 7
6. Peritreme not reaching seta *z*2 . . . . . 11
7. Dorsal shield heavily sclerotized; distal half of calyx membranous. . . . . *T. (A.) bakeri* (Garman)
7. Dorsal shield not heavily sclerotized; calyx without membranous part . . . . . 8
8. Movable digit of chelicerae with one tooth . . . . . 9
8. Movable digit of chelicerae with more than one tooth. . . . . 10
9. Calyx of spermatheca with length: width 2-2.5: 1 . . . . . *T. (A.) rhenanus* Oudemans)
9. Calyx of spermatheca with length: width 1-1.5: 1 . . . . . *T. (A.) georgicus* Wainstein, *T. (A.) kerkirae* Swirski & Ragusa

10. Z5 66 long; movable digit of chelicerae with 3 teeth; S4 shorter than Z4 (about half) . . . . . *T. (A.) vulgaris* Ehara
10. Z5 55 long; movable digit of chelicerae with 2 teeth; S4 subequal to Z4 . . . . . *T. (A.) dalfardicus* (Daneshvar)
11. Dorsal shield with 5 pairs of large pores; movable digit of chelicerae smooth . . . . . *T. (A.) bagdasarjani* Wainstein & Arutunjan  
. . . . . [= *T. (A.) kettanehi* (Dosse)]
11. Dorsal shield with 3 or 4 pairs of large pores; movable digit of chelicerae with one tooth . . . . . 12
12. Dorsal shield with 3 pairs of large pores; ventrianal shield with or without preanal pores; spermatheca saccular or fundibular; macroseta on basitarsus knobbed or pointed . . . . . 13
13. Dorsal shield with 4 pairs of large pores; ventrianal shield without pre-anal pores; spermatheca pocular; macroseta with small knob . . . . . *T. (A.) khosrovensis* Arutunjan.
14. Ventrianal shield with a pair of pores . . . . . *T. (A.) neyshabouris* (Denmark & Daneshvar)
14. Ventrianal shield without any pores. . . . . 14
15. Macroseta on basitarsus leg IV with pointed tip. . . . . *T. (A.) torbatejamae* (Denmark & Daneshvar)
15. Macroseta on basitarsus leg IV with knobbed tip. . . . . *T. (A.) iraniensis* (Denmark & Daneshvar)  
suspected junior synonym of *T. (A.) kazachstanicus* Wainstein
16. Ventrianal shield with three pairs of preanal setae; setae on dorsal shield short . . . . . *T. (T.) leptodactylus* Wainstein
16. Ventrianal shield with four pairs of preanal setae; setae on dorsal shield longer. . . . . 16
17. Dorsal shield with three pairs of prominent pores 77. . . . . *T. (T.) tubifer* Wainstein
17. Dorsal shield with four pairs of prominent pores. . . . . 17
18. Calyx of spermatheca cup-shaped with neck long; seta JV5 equal to Z4. . . . . *T. (T.) cotoneastri* Wainstein
18. Calyx of spermatheca without neck; seta JV5 longer than Z4 . . . . . 18
19. Calyx of spermatheca longer than 20 I-lm; Z4 38 long. . . . . *T. (T.) athiasae* Porath & Swirski [= *T. (T.) perbibus* Wainstein & Arutunjan
19. Calyx of spermatheca shorter than 20 I-lm; Z4 27 long. . . . . *T. (T.) laurae* Arutunjan

ACKNOWLEDGEMENTS

We thank Mr. Besharatnejad for his support and encouragement and Mr. Sh. Hesami for his useful comments during this study. The authors also wish to

thank Dr Farid FARAJI of MITOX, Amsterdam, The Netherlands for his valuable criticism.

#### REFERENCES

- ARUTUNJAN, (E.S). 1971. — New species of the genus *Typhlodromus* Scheuten, 1857 (Parasitiformes, Phytoseiidae). Dokl.Akad. Nauk Arm. SSR 52(5): 305-308.
- CHANT (D.A.) & McMURTRY, (J.A.), 1994. — A review of the subfamilies Phytoseiinae and Typhlodrominae (Acari: Phytoseiidae). — Internat. J. Acarol. 20 (4): 223-310
- DANESHVAR (H.), 1980. — Some predator mites from Northern and Western Iran. — Ent. Phyto. Appl., 48(1): 87-96.
- DANESHVAR (H.), 1987. — Some predatory mites from Iran, with descriptions of one new genus and six new species (Acari: Phytoseiidae, Ascidae). — Ent. Phyt. Appliq., 54(1-2): 13-37.
- DANESHVAR (H.) & DENMARK (H.A.), (1982). — Phytoseiids of Iran (Acarina: Phytoseiidae). — Internat. J. Acarol., 8(1): 3-14.
- FARAJI (F.), HAJZADEH (J.), UECKERMANN (E.A.), KAMALI (K.) & McMURTRY (J.A.). 2007. — Two new records for Iranian phytoseiid mites with synonymy and keys to the species of *Typhloseius* Chant and McMurry and Phytoseiidae in Iran (Acari: Mesostigmata). — Internat. J. Acarol., 33(3): 231-239.
- KHALIL-MANESH (B.), 1973. — Phytophagous mite fauna of Iran (I). — Ent. Phyto. Appl., 35: 30-38 (In Farsi).
- McMURTRY (J.A.), 1977. — Description and biology of *Typhlodromus persianus*, n.sp., from Iran, with notes on *T. kettanehi* (Acari: Mesostigmata: Phytoseiidae). — Ann. Entomol. Soc. Am, 70(4): 563-568.
- ROWELL (H.J.), CHANT (D.A.) & Hansell (R.I.C.), 1978. — The determination of setal homologies and setal patterns on the dorsal shield of the family Phytoseiidae (Acarina: Mesostigmata). — Can. Entomol., 110: 859-876.
- SEPASGOZARIAN, (H.), 1977. — The 20 years research of Acarology in Iran. — J. Iranian Soc. Eng, 56: 40-50 (In Farsi).