



Rhyncaphytoptus hanzanensis sp. nov. (Acari: Diptilomiopidae) from Kerman Province, Iran

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ABSTRACT

A new Rhyncaphytoptinae mite, *Rhyncaphytoptus hanzanensis* sp. nov., was discovered and described on *Cotoneaster kotschy* (C.K. Schneid.) G. Klotz (Rosaceae) as a vagrant mite in the Bondare Hanza Village, Hanza area, Rabor County, Kerman Province, Iran. This new species was discovered concurrently with *Eriophyes cotosarica* Lotfollahi, Honarmand, Hashemi & Xue, 2023, which induced circular galls on the same host.

KEYWORDS

Cotoneaster, Rabor County, Rhyncaphytoptinae, Rosaceae, vagrant mite.

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INTRODUCTION

The family Rosaceae Juss. consisting of annual or perennial herbs, shrubs, or trees, is among the 10 richest families of Iran in terms of endemism (Noroozi *et al.* 2019). It comprises 116 genera worldwide, of which 25 genera and 290 taxa occur in Iran, including 85 taxa that are endemic to the country (Hamzehee *et al.* 2022; WFO 2025). *Cotoneaster* Medik. comprises shrubs (rarely small trees) that may be erect, decumbent, or prostrate, and deciduous, semi-evergreen, or evergreen, with a native range in subalpine and temperate Eurasia, encompassing 269 accepted species worldwide (POWO 2024). These plants are commonly known as “Shirkhest” in Persian. In Iran, 28 *Cotoneaster* species have been reported, among them five species (*C. assadii* Khat., *C. esfandiarrii* Khat., *C. persicus* Pojark., *C. nima-yushijii* Niaki & Attar, and *C. mazandaranicus* Niaki & Attar) are endemic to the country; a few species such as *C. kotschy* (C.K. Schneid.) G. Klotz and *C. nummularioides* Pojark. are distributed in all phytogeographical regions of Iran (Raei Niaki *et al.* 2022).

Up to now, approximately 18 eriophyoid mite species (Acari: Eriophyoidea) have been reported on *Cotoneaster* plants around the world (Amrine and de Lillo unpublished databases), among them five species belong to the genus *Rhyncaphytoptus* Keifer: *R. pauciannulatus* Liro, 1943 on *C. laxiflorus* J. Jacq. & Lindl., *R. cotoneasteri* Xue, Song & Hong, 2006 on *Cotoneaster* sp., *R. acutifoliae* Song, Xue & Hong, 2009 on *C. acutifolius* Turcz., *R. buxifoliae* Song, Xue & Hong, 2009 on *C. buxifolius* Wall. & Lindl. and *R. fuyuniensis* Li, Wang, Xu & Zhang, 2015 on *C. ignavus* E.L. Wolf.

To enhance our understanding of Iran's eriophyoid fauna in previously unexplored regions, a survey of eriophyoid mites was conducted during the 2023–2024 growing season in Kerman and Razavi Khorasan Provinces.



MATERIAL AND METHODS

The plant materials were collected from Kerman and Razavi Khorasan Provinces of Iran during the 2023–2024 growing season. Eriophyoid mites were extracted from plant foliage using a modified washing method (Lotfollahi and Masoudi-Rad 2024) and preserved in 70% ethanol (Walter and Krantz 2009). Mites were cleared and slide-mounted following the protocol of Lotfollahi and Masoudi-Rad (2024). Morphological measurements were obtained in accordance with Amrine and Manson (1996), as modified by de Lillo *et al.* (2010), using an Olympus BX53 phase-contrast microscope (Japan). All measurements are given in micrometers; measurements are rounded off to the nearest integer and regard the length of the morphological traits unless otherwise specified. In the female description, the holotype measurements are followed by range values of the studied population (i.e. holotype and paratypes) set between parentheses; only the range values are given for nymph. The mean values of the paratypes are reported in a few cases when measurements of the holotype could not be taken, due to the slide mounting position of the specimens; these are marked by an asterisk (*). The line drawings were made by the first author using a camera Lucida, following de Lillo *et al.* (2010), and edited with Adobe Photoshop® CC 2017 software. The male specimen was not in a condition suitable for the drawing. Amrine *et al.* (2003) was followed for abbreviations labelling schematic drawings in Figure 1. Host plants were identified by Mohammad Reza Joharchi, botanist at the Plant Science Research Institute, Ferdowsi University of Mashhad, Iran; names are in accordance with "Plants of the World Online" (2025). All paratypes and holotype of the new species are deposited at the Acarology Laboratory, Department of Plant Protection, Faculty of Agriculture, Azarbaijan Shahid Madani University (Iran) except one paratype which is deposited in the Acarological Collection, Jalal Afshar Zoological Museum (JAZM), Faculty of Agriculture, University of Tehran, Karaj, Iran.

RESULTS

TAXONOMY

Family Diptilomiopidae Keifer

Subfamily Rhyncaphytoptinae Roivainen

Genus *Rhyncaphytoptus* Keifer

Type species: *Rhyncaphytoptus ficifoliae* Keifer, 1939

Rhyncaphytoptus hanzanensis sp. nov. (Figs 1–3)

<http://zoobank.org/urn:lsid:zoobank.org:act:351435AB-69E5-42D1-94F7-30E9992D1728>

Description

FEMALE (measured specimens = 8) – Body spindle-form, 245 (210–255, including gnathosoma), 60 (57–65) wide, 65* (60–70) thick. **Gnathosoma** projecting obliquely downwards, cheliceral stylets 76 (73–78), palp 50 (44–60), palp coxal setae *cp* 3 (no range), dorsal palp genual setae *d* 9 (9–10), unbranched, subapical palp tarsal setae *v* 1 (1–2). Suboral plate not observed. **Prodorsal shield** subtriangular 37 (35–37), including frontal lobe, 43 (38–44) wide; with a slender acuminate frontal lobe 19 (17–19), over gnathosomal base. Prodorsal shield pattern composed by complete admedian lines bifurcated basally and extended also on the frontal lobe, faint short inner submedian lines and complete outer submedian lines distally connected to admedian lines; median line absent; lateral sides between shield and coxal region smooth. Tubercles of scapular setae *sc* 3 (3–4) ahead of rear shield margin, 16 (16–18) apart, scapular setae *sc* 36 (36–39), directed forward. **Leg I** 40 (38–40), trochanter 4 (3–4), femur 12 (10–12), genu 7 (6–7), tibia 10 (7–10), tarsus 9 (8–9), tarsal solenidion *ω* 8 (7–9), curved down, distally rounded, empodium 7 (6–7), simple, 8-rayed; basiventral femoral setae *bv* 15 (15–17), antaxial genual setae *l''* 29 (27–33), paraxial tibial setae *l'* 14 (12–14), paraxial fastigial tarsal setae *ft'* 23 (21–24), antaxial fastigial tarsal setae *ft''* 29 (29–34), paraxial unguinal tarsal setae *u'* 5 (4–6). **Leg II** 36 (35–37), trochanter 3 (3–4), femur 10 (9–11), genu 5 (5–6), tibia 6 (6–7), tarsus 9 (8–9), tarsal solenidion *ω* 9 (9–11), curved down, distally rounded, empodium 6 (6–7), simple, 8-rayed; femoral setae *bv* 16 (16–19), genual setae *l''*

18 (17–20), tarsal setae *ft'* 10 (9–12), setae *ft''* 32 (30–34), setae *u'* 5 (5–6). **Coxae** smooth; anterolateral setae on coxisternum I (*1b*) 14 (14–15), tubercles *1b* 9 (7–9), proximal setae on coxisternum I (*1a*) 40 (35–43), tubercles *1a* 7 (6–7) apart, proximal setae on coxisternum II (*2a*) 55 (55–60), tubercles *2a* 22 (21–23) apart, prosternal apodeme 5 (5–7). **Opisthosoma** dorsally arched with 40 (39–42) dorsal semiannuli ornamented with rounded microtubercles, and 69 (69–76) ventral semiannuli ornamented with small and rounded microtubercles; 11 (9–12) semiannuli with fine microtubercles between coxae and genital coverflap; last 3 (3–4) dorsal semiannuli with spines and last 9 (9–13) ventral semiannuli with elongated microtubercles. Setae *c2* 28 (25–30), on ventral semiannulus 8 (6–8); setae *d* 67 (67–74), on ventral semiannulus 24 (22–26); setae *e* 17 (17–20), on ventral semiannulus 38 (38–44); setae *f* 22 (22–24), on ventral semiannulus 62 (62–71), 7 (5–7) annuli after setae *f*. Setae *b2* 100 (100–115), setae *b1* 5 (4–6). **External genitalia** 14 (14–16), 27 (24–27) wide, coverflap with one transversal arcuateline, proximal setae on coxisternum III (*3a*) 17 (16–19), 13 (12–14) apart. **Internal genitalia**: spermathecae ovoid, oriented posterolaterad; spermathecal tubes short; transverse genital apodeme trapezoidal, distally folded.

MALE (measured specimen= 1) – Body spindle-form, 210 (including gnathosoma), 50 wide. Palp genual setae *d* 4. **Prodorsal shield** 30, including frontal lobe, 39 wide, frontal lobe 13. Shield pattern similar to that of female. Tubercles of scapular setae *sc* on rear shield margin, 14 apart, setae *sc* 32, empodium 7. **Coxae** similar to those of female; setae *1b* 14, tubercles *1b* 8 apart, setae *1a* 28, tubercles *1a* 5 apart, setae *2a* 35, tubercles *2a* 20 apart. **Opisthosoma** similar to those of female with 38 dorsal semiannuli; 70 ventral semiannuli; 12 semiannuli between coxae and setae *3a*. Setae *c2* 24 on ventral semiannulus 7, setae *d* 58 on ventral semiannulus 24; setae *e* 16 on ventral semiannulus 40; setae *f* 20 on ventral semiannulus 66, 6 annuli after setae *f*. Setae *b2* 80; setae *b1* 4; setae *3a* 16, 16 apart, genitalia wide 21.

Type host plant

Cotoneaster kotschyi (C.K.Schneid.) G.Klotz (Rosaceae) (Fig. 4); Shirkest in Persian.

Relation to the host plant

Mites were vagrant on the leaves of the host plant that damaged by *Eriophyes cotosarica* Lotfollahi, Honarmand, Hashemi-Khabir & Xue, 2023 (Fig. 5).

Type locality

Bondare Hanza Village, Hanza City, Rabor County, Kerman Province, Iran, (29° 19' 43.1" N, 57° 12' 28.5" E), 3029 m above sea level, coll. A. Honarmand, 3 June 2024.

Type material

Holotype: single female on a microscope slide (CK-IK-HA-BA-BJ27-1); paratypes: seven females (CK-IK-HA-BA-BJ27-2–8), and one male (CK-IK-HA-BA-BJ27-9) mounted on separate microscope slides.

Other material

Mites preserved in a vial (CK-IK-HA-BA-BJ27) of 96% ethanol as extracted from the same sample as the type specimens; 5 females mounted singly on separate microscope slides (CN-IRK-KN-SN-H8-1–5), collected on *Cotoneaster nummularius* Fisch. & C.A. Mey. (Fig. 6) as vagrant mite in Sepidar mountain, Kadkan city, Torbat-e Heydarieh County, Razavi Khorasan Province, Iran (35° 34' 25.6" N, 58° 52' 31.0" E), 2018 m above sea level, coll. A. Honarmand, 6 June 2023.

Etymology

The specific epithet, *hanzanensis* refers to the type locality, Hanza area.

Differential diagnosis

The new species, *Rhyncaphytoptus hanzanensis* sp. nov. is morphologically similar to *R. buxifoliae* Song, Xue & Hong 2009, which was originally described from *Cotoneaster buxifolius* Wall. ex Lindl. (Rosaceae) in Tibet Autonomous Region, P. R. China as a vagrant mite. The admedian lines are similar in both species, while the median line is present in *R. buxifoliae* but absent in the new species. They exhibited other similarities, including smooth coxae and coverflap (except for a transverse line on the coverflap of the new species), number of dorsal semiannuli (39–42 in new species and 34–40 in *R. buxifoliae*) and ventral

semiannuli (69–76 in new species and 66–76 in *R. buxifoliae*), length of setae *f* (22–24 in new species *versus* 22–25 in *R. buxifoliae*), and *3a* (16–19 in new species *versus* 14–16 in *R. buxifoliae*). The new species is distinguishable by length of scapular setae *sc* (36–39 in new species *versus* 30–32 in *R. buxifoliae*), *c2* (25–30 in new species *versus* 15–20 in *R. buxifoliae*), *d* (67–74 in new species *versus* 40–45 in *R. buxifoliae*), *e* (17–20 in new species *versus* 22–25 in *R. buxifoliae*), number of empodial rays (8 in new species *versus* 9 in *R. buxifoliae*) and dorsal microtubercles (rounded microtubercles in new species *versus* smooth dorsal semiannuli in *R. buxifoliae*).

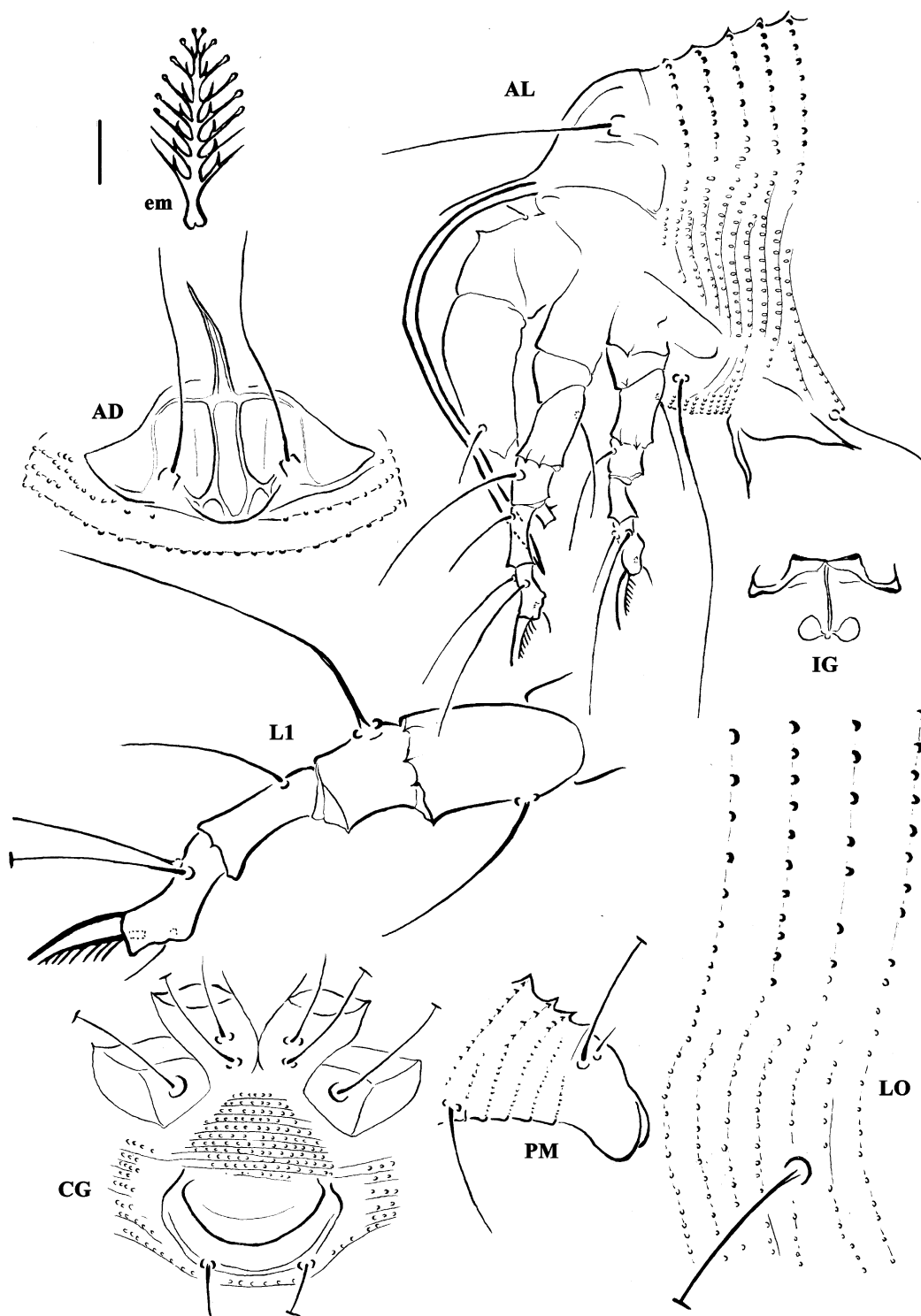


Figure 1. Line drawings of *Rhyncaphytoptus banzanensis* sp. nov. – AD. Prodorsal shield of female; AL. Lateral view of female anterior body region; CG. Female coxigenital region; em. Female empodium; IG. Female internal genitalia; LO. Lateral view of female annuli; L1. Female leg I; PM. Lateral view of posterior opisthosoma of female; **Scale bar:** 10 μ m for AD, AL, CG, IG, PM; 5 μ m for LO, L1; 2.5 μ m for em.

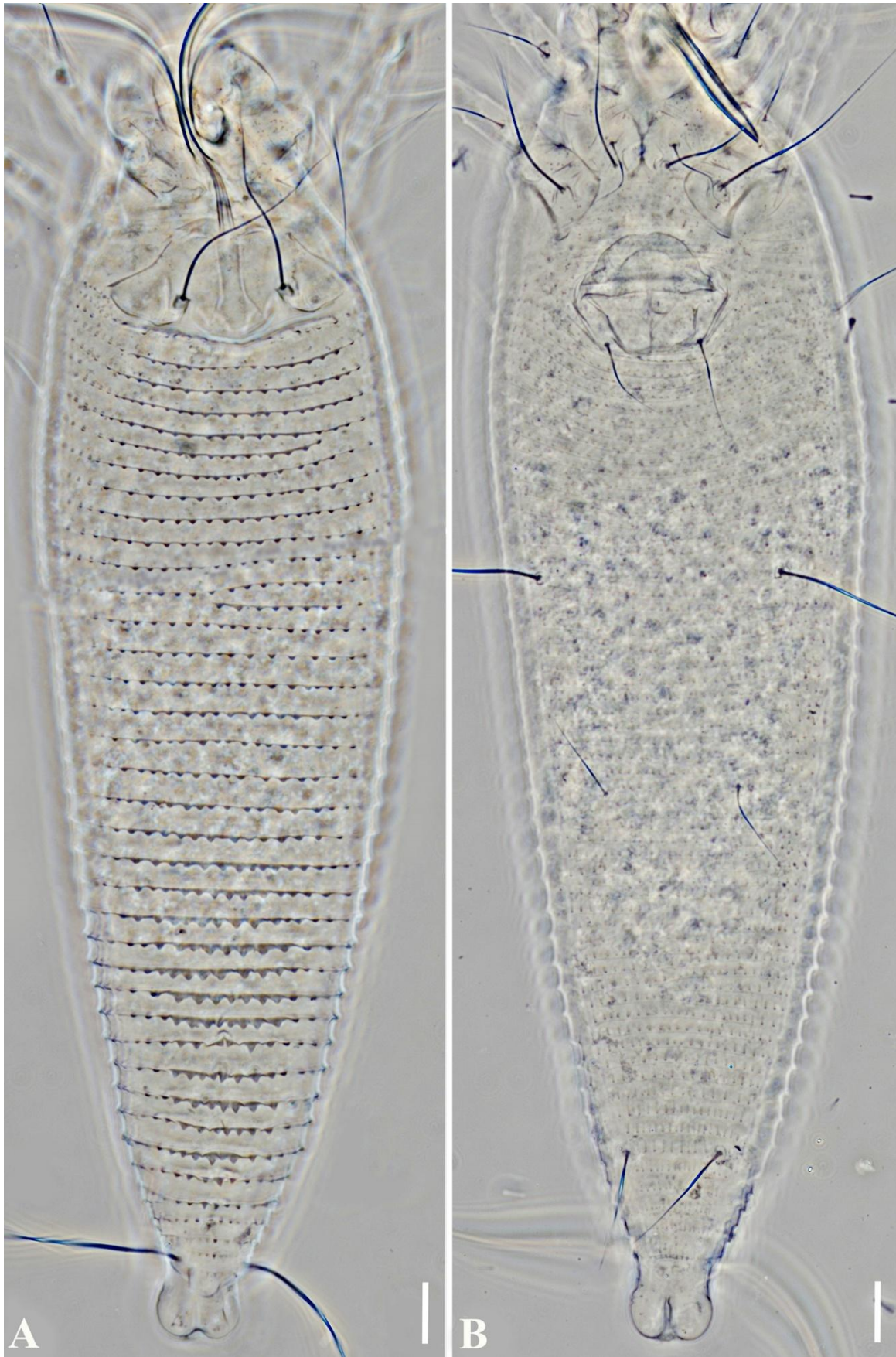


Figure 2. Phase contrast light microscopy images of *Rhyncaphytoptus banzanensis* sp. nov. – **A.** Female dorsal view; **B.** Female ventral view; Scale bar: 10 μ m.

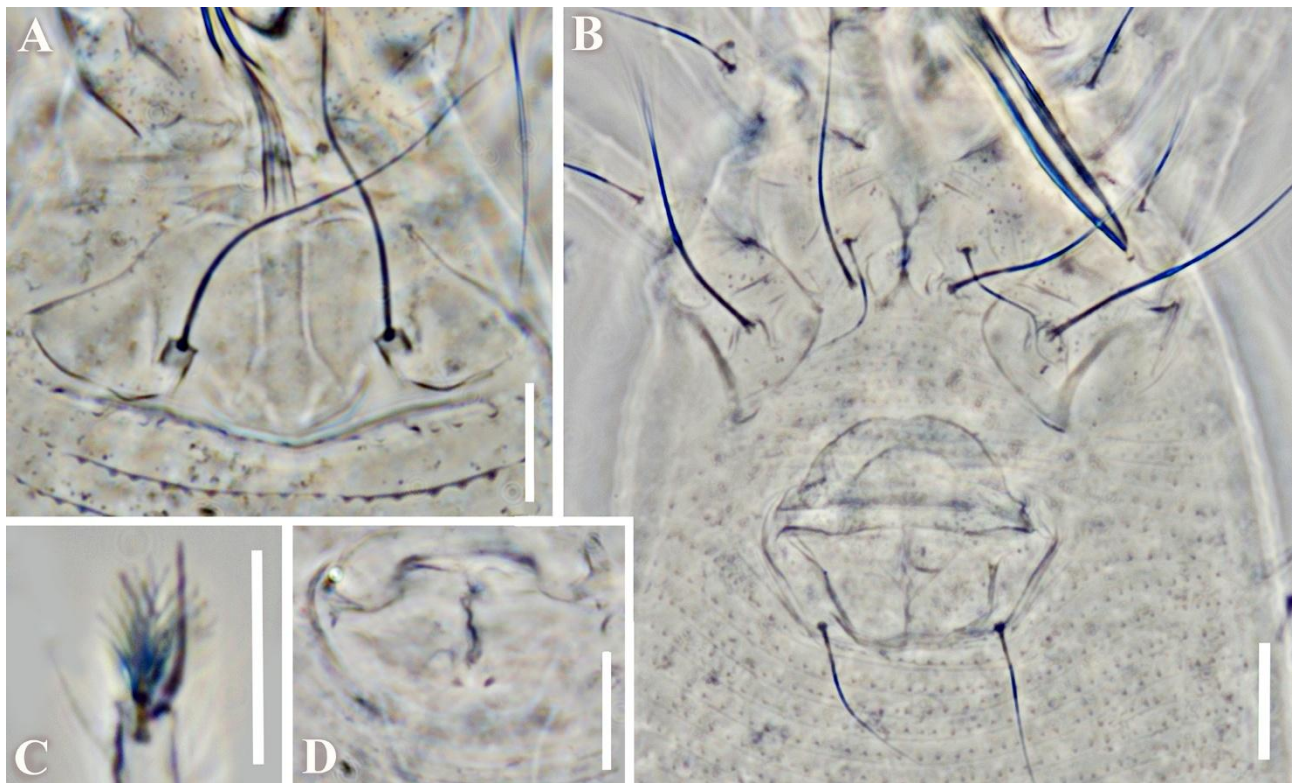


Figure 3. Phase contrast light microscopy images of *Rhyncaphytoptus hanzanensis* sp. nov. – A. Female prodorsal shield; B. Female coxigenital region; C. Female empodium; D. Female internal genitalia; Scale bar: 10 µm.



Figure 4. *Cotoneaster kotschy* (C.K. Schneid.) G. Klotz (Rosaceae) from Kerman Province, Iran, as type host of *Rhyncaphytoptus hanzanensis* sp. nov.



Figure 5. Symptoms observed on the leaves of *Cotoneaster kotschyi* (C.K. Schneid.) G. Klotz (Rosaceae), caused by *Eriophyes cotosarica* Lotfollahi, Honarmand, Hashemi & Xue, 2023 in Kerman province, Iran; **Scale bar:** 15 mm.



Figure 6. *Cotoneaster nummularius* Fisch. & C.A.Mey. (Rosaceae) as the second host plant of *Rhyncaphytoptus hanzanensis* **sp. nov.** in Sepidar Mountain, Kadkan City, Razavi Khorasan Province, Iran; **Scale bar:** 15 mm.

Note on *Eriophyes cotosarica* Lotfollahi, Honarmand, Hashemi & Xue, 2023

Eriophyes cotosarica Lotfollahi *et al.*, 2023 was originally described from *Cotoneaster hissaricus* Pojark. (Rosaceae) in Marmisho, West Azerbaijan Province, Iran. This mite induces relatively large circular galls dispersed on underside surface of leaves, which are covered with longer hairs than the rest of the leaf. This is the second record of this mite species and also first record of *C. kotschyi* as host plant of *E. cotosarica*. The Kerman population exhibits no morphological differences from the original description, apart from setae *d*, which are longer than originally described. This minor variation may reflect differences in host plant or geographical origin.

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Ethics approval and consent to participate: This study only included arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

Consent for publication: All study participants provided informed written consent prior to study enrollment.

Competing interests: The authors declare no conflict of interest.

Generative AI statement: The authors declare no use of Gen AI in the creation of this manuscript.

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گونه جدید *Rhyncaphytoptus hanzanensis* sp. nov. (Acari: Diptilomiopidae) از استان کرمان، ایران

آرش هنرمند | پریسا لطف‌اللهی*

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چکیده

گونه‌ای جدید از زیرخانواده *Rhyncaphytoptinae*، *Rhyncaphytoptus hanzanensis* sp. nov. به عنوان هرئای برگ‌گرد روی *Cotoneaster kotschy* (C.K.Schneid.) G.Klotz (Rosaceae) در روستای بندر هنزا، ناحیه هنزا، شهرستان رابر، استان کرمان، ایران کشف و توصیف شد. این گونه جدید هم‌زمان با *Eriophyes cotasarica* Lotfollahi, Honarmand, Hashemi & Xue, 2023 کشف شد که باعث ایجاد گال‌های گرد روی همان میزبان شده بود.

واژگان کلیدی: *Cotoneaster*، شهرستان رابر، *Rhyncaphytoptinae*، گل سرخیان، هرئای برگ‌گرد.

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دریافت

۱۹ آبان ۱۴۰۴

پذیرش

۱۴ آذر ۱۴۰۴

انتشار

۲۵ دی ۱۴۰۴

دبیر تخصصی

ع. صبوری

