Persian J. Acarol., 15(2): 150208.

https://www.persianacarology.org

Research Article https://biotaxa.org/pja https://doi.org/10.22073/pja.150208

Description of *Paraphytoptus cichorintybus* Yousefnezhad & Lotfollahi sp. nov. (Acari: Eriophyidae) from Iran

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Received:
18 February, 2026
Accepted:
19 March, 2026
Published:
15 April, 2026
Subject Editor:
A. Saboori

http://zoobank.org/urn:lsid:zoobank.org:pub:E7DED13C-9F37-4892-B84E-310CB2FAE2FC

ABSTRACT

During a survey of eriophyoid mites conducted in Heris village, Maragheh County, East Azerbaijan Province, Iran, in the summer of 2024, a new species, *Paraphytoptus cichorintybus* Yousefnezhad & Lotfollahi **sp. nov.**, was discovered on common chicory, *Cichorium intybus* L. (Asteraceae). The new species is described and illustrated herein. No visible symptoms were observed on the host plants.

KEYWORDS

Aceria, East Azerbaijan, Eriophyinae, Iran, Maragheh, *Paraphytoptus*

CITE: Yousefnezhad, N., Honarmand, A., Pazhouhandeh, M. & Lotfollahi, P. (2026) Description of *Paraphytoptus cichorintybus* Yousefnezhad & Lotfollahi sp. nov. (Acari: Eriophyidae) from Iran. *Persian Journal of Acarology*, 15(2): 150208.
https://doi.org/10.22073/pja.150208

INTRODUCTION

The family Asteraceae is one of the largest flowering plant families with approximately 25,000 species. They are distributed worldwide except in Antarctica. The genus *Cichorium* L., which includes seven accepted species, is native to Macaronesia, northern and northeastern tropical Africa, the Arabian Peninsula, Europe, Central Asia, and the western Himalayas. Among them, *Cichorium intybus* L. and *C. pumilum* Jacq. have been reported from Iran (Plants of the World Online- POWO, 2025). *Cichorium intybus* L. (common chicory) is a perennial herbaceous plant that grows in meadows, saline habitats, areas by the road, the edges of forests, and across the territories in many regions of the world (Zlatic and Stankovic 2017).

Two eriophyoid mite species, *Aceria cichorii* Petanovic, Boczek & Shi, 2000 and *Paraphytoptus intybi* Denizhan, Monfreda, de Lillo & Çobanoğlu, 2015, have been recorded on *Cichorium* plant species worldwide.

In this study, as part of the first author's master thesis research, an attempt was made to expand more knowledge of the eriophyoid mite fauna in Iran.

MATERIAL AND METHODS

The leaves of plants were collected from Maragheh (East Azarbaijan province) during the summer of 2024. Specimens were recovered from the leaves of the plants following a modified washing method (Lotfollahi and Masoudi-Rad 2024). Eriophyoid mites were transferred from obtained sediments partly to 70% ethanol (Walter and Krantz 2009) and partly to 99% ethanol (kept at −20 °C) as preservative

media for morphological and molecular studies respectively. The mites were cleared and mounted according to Lotfollahi and Masoudi-Rad (2024). Morphological measurements were taken based on Amrine and Manson (1996) as modified by de Lillo *et al.* (2010) with an Olympus BX53 phase contrast microscope. In the female description, the holotype measurements are followed by range values of the studied population (i.e. holotype and paratypes) given between parentheses; only the range values are given for males. 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 second author using a camera Lucida, following the method of de Lillo *et al.* (2010), and edited with Adobe Photoshop® CC 2017 software. Amrine *et al.* (2003) were followed for abbreviations labelling schematic drawings in figures. Host plants names and their synonymies are in accordance with "Plants of the World Online" (2025). All paratypes and holotypes 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 of each species which are deposited in the Acarological Collection, Jalal Afshar Zoological Museum (JAZM), Faculty of Agriculture, University of Tehran, Karaj, Iran.

RESULTS

TAXONOMY

Family Eriophyidae Nalepa

Subfamily Eriophyinae Nalepa

Tribe Aceriini Amrine & Stasny

Genus *Paraphytoptus* Nalepa

Type species: *Paraphytoptus paradoxus* Nalepa, 1896

Paraphytoptus cichorintybus Yousefnezhad & Lotfollahi sp. nov. (Fig. 1)

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Description

FEMALE (measured specimens= 5) – Body vermiform, 190 (185–200, including gnathosoma), 40 (40–42) wide, 43* (43–50) thick. **Gnathosoma** 19 (17–23) projecting obliquely downwards, pedipalp coxal setae *ep* 2 (no range), dorsal pedipalp genual setae *d* 5 (4–7), unbranched, subapical pedipalp tarsal setae *v* (not detectable), cheliceral stylets 20 (19–21). Suboral plate rounded anteriorly, with sparse dashes. **Prodorsal shield** subtriangular 25 (23–27), including frontal lobe, 30 (29–30) wide; frontal lobe 3 (3–4) over gnathosomal base. Prodorsal shield pattern composed of median and admedian lines present on 5/6 posterior of the shield with some irregular lines in submedian area. One pit located between scapular tubercles under the first dorsal semiannuli and few lines and microtubercles on lateral sides between shield and coxal region. Tubercles of scapular setae *sc* on ahead of rear shield margin, 19 (19–22) apart, scapular setae *sc* 36 (34–40), directed backward divergently. **Leg I** 29 (26–31), trochanter 3 (no range), femur 10 (8–10), genu 4 (4–5), tibia 6 (4–7), tarsus 8 (6–8), tarsal solenidion *ω* 8 (no range), curved down, distally rounded, empodium 6 (5–6), simple, 6-rayed; basiventral femoral setae *bv* 5 (5–10), antaxial genual setae *l″* 22 (22–26), paraxial tibial setae *l′* 7 (4–7), paraxial fastigial tarsal setae *ft′* 12 (8–12), antaxial fastigial tarsal setae *ft″* 20 (16–22), paraxial unguinal tarsal setae *u′* 3 (2–3). **Leg II** 24 (23–28), trochanter 3 (2–4), femur 8 (8–10), genu 3 (3–5), tibia 3 (3–5), tarsus 5 (5–7), solenidion *ω* 7 (7–9), curved down, distally rounded, empodium 5 (no range), simple, 6–rayed; femoral setae *bv* 5* (5–10), genual setae *l″* 10 (8–12), tarsal setae *ft′* 6 (5–7), setae *ft″* 25 (23–26), setae *u′* 2 (no range). **Coxae** I ornamented with some lines and granules and II with some granules, anterolateral setae on coxisternum I (*1b*) 4 (no range), tubercles *1b* 8 (no range) apart, proximal setae on coxisternum I (*1a*) 30 (29–31), tubercles *1a* 7 (7–9) apart, proximal setae on coxisternum II (*2a*) 49 (45–49), tubercles *2a* 19 (19–22) apart, prosternal apodeme 6 (6–7). **Opisthosoma** dorsally arched with 56 (50–57) dorsal semiannuli ornamented with elliptical microtubercles close to their rear margin, and 63 (63–64) ventral semiannuli ornamented with rounded

microtubercles; 6 (5–6) microtuberculated semiannuli between coxae and genital coverflap; last 2 (2–3) dorsal semmianuli with spines and last 11 (9–14) ventral semiannuli with elongated microtubercles. Setae *c2* 25 (19–25) on ventral semiannulus 10 (10–11); setae *d* 60 (45–60) on ventral semiannulus 22 (21–25); setae *e* 12 (9–17) on ventral semiannulus 38 (38–40); setae *f* 19 (19–24) on ventral semiannulus 57 (57–59), 6 (5–6) annuli after setae *f*. Setae *h2* 65 (50–65), setae *h1* 4 (4–5). **External genitalia** 14 (14–16), 21 (21–24) wide, coverflap with one rank of 14 (12–14) longitudinal striae, proximal setae on coxisternum III (*3a*) 35 (28–35), 12 (12–16) apart; with 1 (1–2) transversal rows of complete granulated lines at the genital coverflap base. **Internal genitalia:** spermathecae ovoid, oriented posterolaterad; transverse genital apodeme subtrapezoidal, distally folded.

MALE (measured specimen= 1) – Body vermiform, 144 (including gnathosoma), 40 wide. Palp genual setae *d* 6, unbranched, palp tarsal setae *v* not detectable. **Prodorsal shield** 25, including frontal lobe, frontal lobe 4. Shield pattern similar to that of female. Tubercles of scapular setae *sc* on rear shield margin, setae *sc* 31. Empodium in both legs 6–rayed. **Coxae** similar to those of female; setae *2a* 30. **Opisthosoma** dorsally arched with 55 dorsal and 61 ventral semiannuli; 5 semiannuli between coxae and genital region. Setae *c2* 12 on ventral semiannulus 10, setae *d* 37 on ventral semiannulus 21; setae *e* 10 on ventral semiannulus 36; setae *f* 17 on ventral semiannulus 56, 5 annuli after setae *f*. Setae *h2* broken; setae *h1* 4; genitalia 12 wide, setae *3a* 22, 8 apart.

Type host plant

Cichorium intybus L. (Asteraceae), Common Cichory.

Relation to the host plant

Vagrant; no apparent symptom was observed.

Type locality

Heris village, Maragheh city, East Azerbaijan province, Iran, (37° 35' 04.45" N, 46° 20' 54.06" E), 1992 m above sea level, coll. N. Yousefnezhad, 2 September 2024.

Type material

Holotype: single female mounted on a microscope slide (CI-IWA-HS-N106-1); **paratypes:** four females mounted on separated microscope slides (CI-IWA-HS-N106-2–5) and one male mounted on a microscope slide (CI-IWA-HS-N106-6).

Other material

Mites extracted from the same sample as the type specimens were preserved in the tubes (CI-IWA-HS-N-1–2).

Etymology

The specific epithet, *cichorintybus* is the nominative case of the word coming from the combination of six first letters of the genus name *Cichor-* and the species designation *–intybus* of the type host plant.

Differential diagnosis

The new species closely resembles *Paraphytoptus intybi*, which was described on *Cichorium intybus* L. in Ankara, Türkiye, without any apparent symptoms. The median and admedian lines are wave-like and broken in *P. intybi*, whereas they are straight and complete in the new species. Additionally, there is a pit on the prodorsal shield base of the new species, whereas it is absent in *P. intybi*. There are some sporadic lines in the submedian area of the shield in both species; however, *P. intybi* has both inner and outer submedian lines, which are absent in the new species. They also exhibited some similarities including length of setae *sc* (34–40 in new species and 37–40 in *P. intybi*), setae *c2* (19–25 in new species and 19–26 in *P. intybi*), setae *e* (9–17 in new species and 12–18 in *P. intybi*), longitudinal striae of coverflap (12–14 in new species and 12–13 in *P. intybi*) and number of semiannuli between coxae and genital coverflap (5–6 in both species). Along with the previously mentioned difference in the prodorsal pattern, the most important differences includes seta *3a* length (28–35 in new species *versus* 14–18 in *P. intybi*), empodial rays number (6 in new species *versus* 7 in *P. intybi*), and dorsal semiannuli number (50–57 in new species *versus* 61–69 in *P. intybi*).

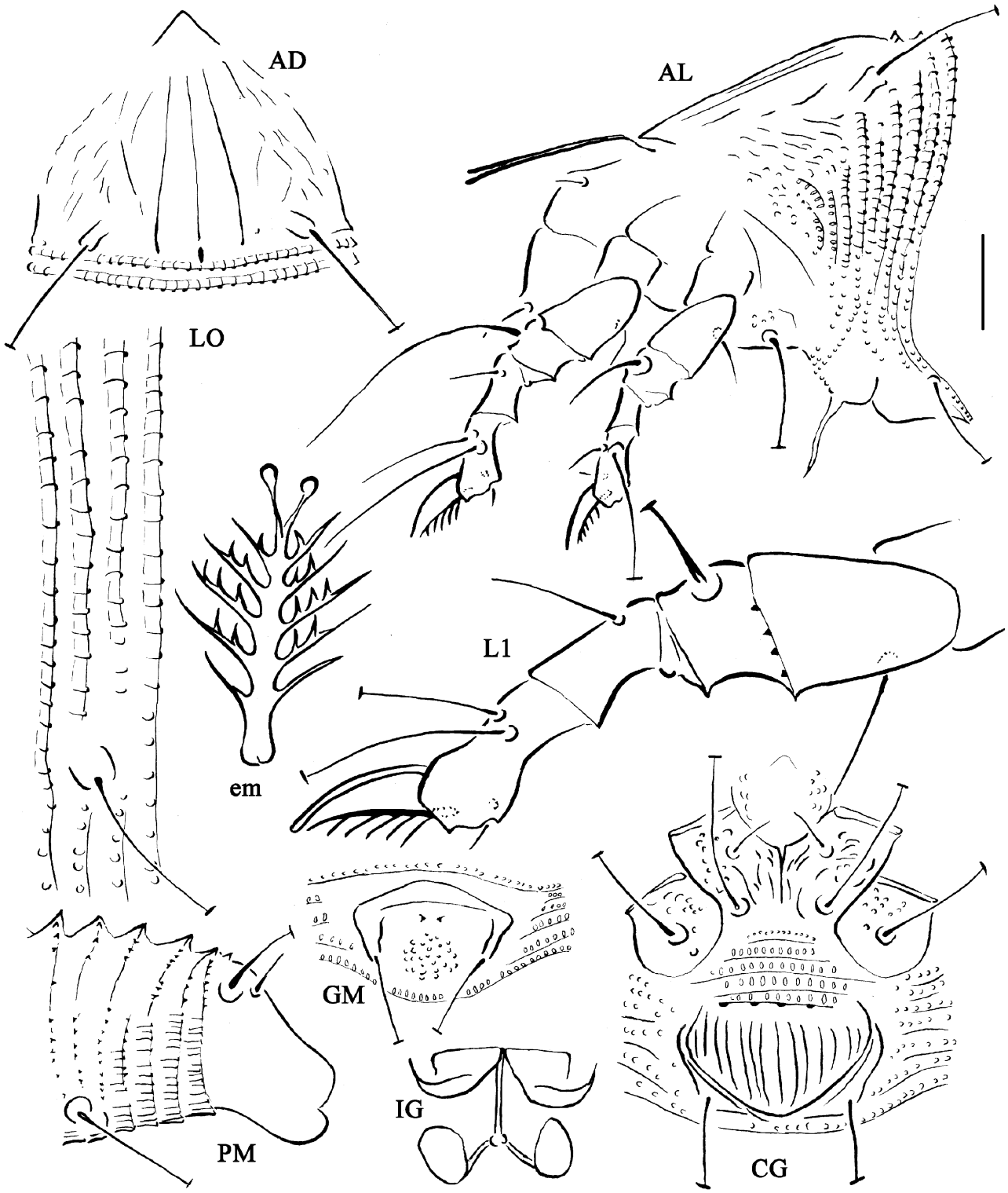

Figure 1. Schematic drawings of *Paraphytoptus cichorintybus* Yousefnezhad & Lotfollahi **sp. nov.** – **AD.** Prodorsal shield; **AL.** Dorso-lateral view of female anterior body region; **CG.** Female coxigenital region; **em.** Empodium; **GM.** Male genital region; **IG.** Internal female genitalia; **LO.** Lateral view of annuli; **L1.** Leg I; **PM.** Lateral view of posterior opisthosoma. **Scale bar:** 10 µm for AD, AL, CG, IG, PM, GM; 5 µm for L1, LO; 2.5 µm for em.

ACKNOWLEDGEMENTS

This research was supported by Azarbaijan Shahid Madani University which is greatly appreciated.

Author contributions: Methodology: A.H. and P.L.; Sampling, collection and preparation of specimens: N.Y.; Analyses and data curation: M.P. and P.L.; Illustration and photography: N.Y. and A.H.; writing – original draft preparation: N.Y. and A.H.; writing – revisions and editing: M.P. and P.L.; supervision: P.L.; funding acquisition: P.L. All authors have read and agreed to the published version of the manuscript.

Funding: The research was funded by Azarbaijan Shahid Madani University.

Availability of data and materials: Data are available upon request from the authors.

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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توصیف گونه جدید *Paraphytoptus cichorintybus* Yousefnezhad & Lotfollahi sp. nov. (Acari: Eriophyidae) از ایران

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چکیده

طی مطالعه کنه‌های اریوفیوئید روستای هریس، شهرستان مراغه، استان آذربایجان شرقی، ایران، طی تابستان ۱۴۰۳، گونهٔ جدید *Paraphytoptus cichorintybus* Yousefnezhad & Lotfollahi **sp. nov.** روی کاسنی معمولی، *Cichorium intybus* L. (Asteraceae) کشف شد. گونهٔ جدید در این مقاله توصیف و ترسیم می‌شود. هیچ علامت قابل مشاهده‌ای در گیاهان میزبان از حضور این گونه مشاهده نشد.

واژگان کلیدی: *Aceria*، آذربایجان شرقی، Eriophyinae، ایران، مراغه، *Paraphytoptus*

CITE: Yousefnezhad, N., Honarmand, A., Pazhouhandeh, M. & Lotfollahi, P. (2026) Description of *Paraphytoptus cichorintybus* Yousefnezhad & Lotfollahi sp. nov. (Acari: Eriophyidae) from Iran. *Persian Journal of Acarology*, 15(2): 150208.
https://doi.org/10.22073/pja.150208

دریافت
۲۹ بهمن ۱۴۰۴

پذیرش
۲۸ اسفند ۱۴۰۴

انتشار
۲۶ فروردین ۱۴۰۵

دبیر تخصصی
ع. صبوری