SHORT COMMUNICATION

TWO NEW SPECIES OF PHYTOSEID MITES *EUSEIUS* (ACARI: PHYTOSEIIDAE) FROM KERALA, INDIA

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New species of predacious mites from Kerala, India

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Phytoseiid mites have received considerable attention in pest management programs with respect to their potential for biological control of various phytophagous mites and agricultural and horticultural pests in greenhouses, on strawberries, and on deciduous fruits (McMurtry 1982; Helle & Sabelis 1985). The genus Euseius was first described by Wainstein (1962) under the subfamily Amblyseiinae based on the possession of an oval body, short, simple setae with Z5 being the longest and well separated from Z4, setae S2 and S4 present on ventrianal shield, setae JV1 on its anterior margin and usually aligned with setae JV2 and ZV2.

The first version of the world phytoseiid catalogue was published by Moraes et al. (1986), which included about 1,500 species under 79 genera. The first version of an electronic database of Phytoseiidae prepared by Demite et al. (2014) included 2,436 valid species under 91 genera, of which the genus Euseius contains 219 valid species. Gupta & Karmakar (2015) prepared an updated checklist of Indian phytoseiid mites, which included 211 species. The present paper deals with the description of two new species under the genus Euseius, inhabiting the medicinal plants growing in northern Kerala, India.

METHODS

The specimens included in the study were collected from mite-infested leaves of two species of medicinal plants namely, Saraca indica L. and Jatropha curcas L. The collected leaves were examined under a stereo zoom microscope (Magnus - MSZ-TR Trinocular Microscope). The mites wandering on the leaf surface were picked up with a camel hair brush and directly mounted on microscopic slides in Hoyer’s medium (Haderon 2001). Systematic position of the species was identified following Gupta (2003) and Chant & McMurtry (2007) and by seeking expert opinion. The setal nomenclature

Abstract: Two new species of phytoseid mites, Euseius pariyarensis sp. nov. and E. curcasae sp. nov., collected from the medicinal plants Saraca indica L. and Jatropha curcas L. respectively, are described from the Kerala State of India. The morphological features of the two species are described with appropriate illustrations.

Keywords: Euseius curcasae, Euseius pariyarensis, Mesostigmata, Phytoseiidae.

Abbreviations: Z- Posterior mediolateral setae; S-Posterior lateral setae; JV-Ventrocentral setae; ZV-Mediolateral ventral setae

All the type specimens are kept in the P.G. & Research Department of Zoology, Malabar Christian College, Calicut and will be deposited in the National Zoological Collections of Zoological Survey of India, Kolkata, India.

**RESULTS**

*Euseius pariyarensis* sp. nov.

(Fig. 1)

urn:lsid:zoobank.org:act:78BDA1C7-0A49-4308-A730-399B248FA595

**Material examined:** Holotype: No. D 75/1, female, 18.xii.2015, India, Kerala, Botanical Garden, Ayurveda College Pariyaram, Kannur District, 12.07°N, 75.29°E, xiile: *Saraca indica* L., coll. P.P. Santhosh.

Paratype: No. D 75/2, 75/3, 75/4, three slides with three females, collection details same as holotype.

**Female:** Dorsum: Dorsal shield 320μm (300–325 μm) long, 202μm (200–208 μm) wide with 17 pairs of setae. Measurements of setae: *j*₁ 37μm (35–42 μm), *j*₂ 20μm (18–22 μm), *j*₃ & *j*₄ 8μm (6–9 μm) each, *j*₅ 9μm (8–10 μm), *z*₁ & *z*₂ 6μm (5–7 μm) each. *z*₃ 4μm (3–5 μm), Z₁ 12μm (10–15 μm), Z₂ 15μm (13–16 μm), Z₃ 50μm (48–52 μm), S₁ 8μm (6–9 μm), S₂ 8μm (6–9 μm), S₃ 9μm (8–10 μm), S₄ 9μm (8–10 μm), R₁ 8μm (6–9 μm), R₂ 15μm (12–17 μm). Peritreme terminates anteriorly between legs I & II (Z₁ & Z₂).

**Venter:** Sternal shield 73μm (70–75 μm) long and 68μm wide with ST₁ 22μm, ST₂ & ST₃ 20μm long, ST₄ on metasternal shield 12μm long. Genital shield 50μm long and 65μm wide with ST₅ 20μm long. Ventrianal shield slightly pentagonal in shape, 88μm long and 53μm wide. ZV₁ 12μm, ZV₂ & ZV₃ 14μm each, JV₁ 15μm, JV₂ 8μm, JV₃ 12μm, JV₄ 30μm long. A thick fold present between genital and ventrianal shields.

**Chelicera:** 24.5μm long, three teeth on fixed digit and none on movable digit.

**Metapodal plate:** Primary 13μm long, 4μm wide, accessory 5μm long.

**Spermatheca:** With tubular cervix 20μm long and with bifid atrium.

**Macroseta on leg IV:** Genu 37μm (34–39 μm) with pointed tips, tibia 30μm (28–32 μm) with broadened tips, basitarsus 48μm (45–52 μm) with broadened tips.

**Leg chaetotaxy:**

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**Male:** Unknown

**Habitat:** *Saraca indica* L.

**Remarks:** This new species closely resembles *E. ovalis* (Evans 1953) in dorsal chaetotaxy but differs in the structure of spermatheca and by the possession of the following features:

1. In the new species, the length of seta *j*₁ is 37μm (35–40 μm) whereas in *E. ovalis*, it is 31μm long.
2. The ventri-anal shield of the new species is slightly pentagonal, measuring 88μm (86–100 μm) in length and 53μm (51–55 μm) in width whereas it is oval and 84–90 μm long and 72–78 μm wide in *E. ovalis*.
3. The chelicera of the new species is with three teeth on the fixed digit and none on the movable digit whereas in *E. ovalis*, the fixed digit has two teeth and the movable digit has a small tooth.
4. In the new species, the spermatheca has a long tubular cervix (20μm) with funnel-shaped atrium whereas in *E. ovalis*, the cervix is funnel-shaped.
5. The new species possesses a thick fold between the genital and ventri-anal shields, which is absent in *E. ovalis*.

The new species also resembles *E. sacchari* (Ghai & Menon 1967) in the structure of chelicerae and spermatheca but differs by the possession of the following features:

1. The dorsal shield is smaller in size (320μm long & 202μm wide) in the new species when compared to that of *E. sacchari* (350μm long & 230μm wide).
2. The number of teeth on the fixed digit is three in the new species instead of two in *E. sacchari*.
3. The ventri-anal shield is 88μm long and 53μm wide in the new species, whereas in *E. sacchari*, it is 90–100 μm long and 70–80 μm wide.
4. In the new species, the macrosetae on leg IV basitarsus have broadened tip, whereas in *E. sacchari*, the tip of all macrosetae are pointed.
5. In the new species, the peritreme terminates between *z*₂ and *z*₄ whereas in *E. sacchari*, peritreme terminates anteriorly between *j*₁ and *z*₂.

**Etymology:** The nomenclature of this new species is based on the place from where the specimens were collected.
New species of predacious mites from Kerala, India

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_Euseius curcasae_ sp. nov.
(Fig. 2)

urn:lsid:zoobank.org:act:E7C5CEEB-496B-4C1D-B56C-DB581390279A

**Material examined:** Holotype: No. C 15/1, female, 15.v.2014, India, Kerala, University of Calicut, Malappuram District, 11.13°N, 75.89°E, _ex_ Jatropha curcas L., coll. P.P. Santhosh.

Paratype - Nos. C 15/2, 15/3, two females from the same habitat as holotype. Nos. C 15/4, 15/5, 20.vi.2015, two females, Chelembra, Malappuram District, 11.16°N, 75.87°E, _ex_ Bauhinia acuminata (L.), coll. P.P. Santhosh.

**Female:** Dorsum: Dorsal shield slightly reticulated along the lateral margin, 368μm (365–380 μm) long, 270μm (260–278 μm) wide with 17 pairs of simple setae. Measurements of setae: \( j_1 30\)μm (29–31 μm), \( i_1 9 \)μm (8–10 μm), \( i_2 & i_3 8 \)μm (7–9 μm) each, \( i_4 11 \)μm (10–12 μm), \( i_5 8 \)μm (7–9 μm), \( j_1 13 \)μm (12–14 μm), \( j_2 11 \)μm (10–12 μm), \( z_1 11 \)μm (10–12 μm), \( z_2 11 \)μm (10–12 μm), \( z_3 12 \)μm (11–13 μm), \( z_4 15 \)μm (14–16 μm), \( s_1 11 \)μm (10–12 μm), \( s_2 15 \)μm (14–16 μm), \( s_3 15 \)μm (14–16 μm), \( s_4 11 \)μm (10–12 μm), \( z_5 44 \)μm (43–45 μm) smooth, \( z_6 8 \)μm (7–9 μm), \( z_7 15 \)μm (14–16 μm), \( r_1 11 \)μm (10–12 μm), \( R_1 8 \)μm (7–9 μm).

Venter: Sternal shield 75μm (73–78 μm) long and 73μm (70–75 μm) wide with three pairs of sternal setae, \( ST_1 & ST_2 22 \)μm each, \( ST_3 18 \)μm (16–20 μm). \( ST_4 \) lies on the metasternal plate, measuring 20μm (19–21 μm). Genital shield 75μm long, 93μm (90–95 μm) wide with \( ST_1 20 \)μm (18–22 μm) long. Ventrianal shield vase-shaped, slightly concave laterally, 124μm (120–126 μm) long and 65μm (63–67 μm) wide with three pairs of preanal setae and four pairs of setae around. Setae \( ZV_1 & ZV_2 15 \)μm (14–16 μm) each, \( ZV_3 12 \)μm (11–13 μm), \( JV_1 & JV_2 15 \)μm (14–16 μm) each, \( JV_3 15 \)μm (11–13 μm), \( JV_4 25 \)μm (23–26 μm) long. Two pairs of metapodal plates present, primary 17μm long and 5μm wide and accessory one 10μm long.

Spermatheca: Long tubular cervix (33μm) bent anteriorly with nodular atrium.

Peritreme: Terminates anteriorly between \( j_j & j_3 \).

Chelicera: Fixed digit 22μm long with two apical teeth and movable digit with no tooth. Macrosetae on leg IV: genu 37μm (34–38 μm), tibia 35μm (36–37 μm), basitarsus 49μm (47–45 μm).

Figure 1. _Euseius pariyarense_ sp. nov. (female). A - dorsal view, B - ventral view, C - chelicerae, D - spermatheca, E - leg IV
Leg chaetotaxy:

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\begin{align*}
genu II & \quad 1 \quad 2 \quad 2 \quad 1 \\
tibia II & \quad 1 \quad \frac{1}{2} \quad \frac{1}{2} \quad 1 \\
genu III & \quad 1 \quad 2 \quad 2 \quad 1 \\
tibia III & \quad 1 \quad \frac{1}{2} \quad \frac{1}{2} \quad 1
\end{align*}
\]

**Male:** Unknown

**Habitat:** *Jatropha curcas* L., *Bauhinia acuminata* L.

**Remarks:** The specimen studied resembles *E. alstoniae* described by Gupta (1975) in dorsal chaetotaxy, structure of spermatheca, and length of macrosetae but differs in the following characters:

1. Dorsal shield longer and wider (368μm, 270μm) than that of *E. alstoniae* (325μm, 204μm).
2. Dorsal shield slightly reticulated on lateral margin of the anterior half, whereas it is smooth anteriorly and rugose posteriorly in *E. alstoniae*.
3. In the new species, seta S₂ shorter than Z₁, while in *E. alstoniae*, S₂ noticeably longer than Z₁.
4. In the new species, j₁ 30μm (29–31 μm) and j₃ 13μm (12–14 μm) long, whereas in *E. alstoniae*, j₁ almost equal (25–28 μm) in length and j₃ double the length than that of the new species (28–34 μm).
5. Seta JV, 25μm long in the new species, whereas in *E. alstoniae*, JV is 44μm.
6. The number of teeth on the fixed digit of chelicerae is three in the new species, whereas it is two in *E. alstoniae*.
7. In the new species, the shape of the ventrianal shield is pentagonal and measures 124μm long and 65μm wide, whereas in *E. alstoniae*, lateral margin of ventrianal shield slightly concave and differs in size (90–100 μm long, 70–80 μm wide).
8. Peritreme terminates anteriorly between j₁ and j₃ in the new species, whereas in *E. alstoniae*, it terminates between j₁ and Z₂.

This new species resembles *E. bambusae* described by Ghai & Menon (1967) also in the dorsal chaetotaxy but differs in the following characters:

1. Dorsal shield slightly reticulated along the lateral margin in the new species, whereas in *E. bambusae*, the entire dorsal shield is gently reticulate.
2. In the new species, seta JV, 22μm long, whereas in *E. bambusae* it is 38μm long.
3. Macrosetae on leg IV genu 37μm (35–39 μm), tibia 35μm (33–37 μm), and tarsus 49μm (47–50 μm) long in the new species, whereas in *E. bambusae*, genu 52–56 μm, tibia 44–45 μm, and basitarsus 68–72 μm long.
4. In the new species, peritreme terminates between j₁ and j₃, whereas in *E. bambusae*, peritreme terminates anteriorly between j₁ and Z₂.
5. Fixed digit of chelicerae with three apical teeth and movable digit with no tooth in the new species, whereas in *E. bambusae*, 3–4 apical teeth and one tooth on movable digit.

**Etymology:** The nomenclature of this new species is...
based on one of the host plants, *Jatropha curcas* L., from which the specimens were collected.

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The pattern of bird distribution along the elevation gradient of the Sutlej River basin, western Himalaya, India
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New distribution records of the leopard plants Amomum luteum DC. and Ligularia sibirica (L.) Cass. (Asteraceae) in the Indian Himalaya
-- Babu, Pp. 12844–12846

Miscellaneous

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