FIRST RECORD OF THE GENUS *SCHIZACEA* KEIFER (ACARI: ERIOPHYIDAE) FROM EGYPT, WITH DESCRIPTION OF A NEW SPECIES

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Abstract

A new species of eriophyid mites from Egypt is described and illustrated. It is *Schizacea aegyptimperata* **sp. nov.** which has been found on *Imperata cylindrical* (L.) (Poaceae) from Egypt. This species is new to science and the genus is new record for Egyptian mite fauna. It causes rust on inner surface of leaves of the host plant. A key to the species of *Schizacea* of the world is provided.

Key wards: Eriophyidae, *Schizacea, Imperata cylindrical,* Poaceae, new species, Egypt.

INTRODUCTION

The super family Eriophyoidea is one of the major groups of obligatory herbivorous mites. Eriophyoid mites are characterized by considerable host specificity. Their very small dimensions (0.1–0.5 mm body length) and other traits (e.g. elongate flexible opisthosoma, reduced setation and body simplification) facilitate their occupation of shelters and hiding places on their hosts, e.g. buds, inflorescences, leaf grooves and sheaths (Westphal & Manson 1996).

The genus *Schizacea* was established by Keifer, 1977 (Eriophyidae, Phyllocoptinae, Acaricalini), based on *Schizacea gynerii* Keifer 1977, infesting *Gynerium sagittatum* (Poaceae). The genus *Schizacea* characterized by: Body fusiform, empodium divided, gnathosoma curved ventured at an obtuse angle, prodorsal shield setae and tubercles missing; with frontal lobe overhanging gnathosoma. Leg I and II lacking basiventral femoral setae and Leg II lucking antaxial genual seta. Opisthosoma with dorsal annuli broader than ventral annuli and

projecting evenly laterally; centrally, the dorsal annuli with broad furrow or trough. Opisthosoma ventral setae (*d*) and (*e*) missing (Amrine *et al.*, 2003).

Up to now, the genus *Schizacea* holds only three species: *Schizacea gynerii* Keifer, 1977 on *Gynerium sagittatum* (Aubl.) Beauv. (Poaceae) from Colombia; *Schizacea geonomae* Navia & Flechtmann, 2002 on *Geonoma sp.* (Arecaceae) from Brazi and *Schizacea chinenseae* Huang& Wang, 2003 on *Polygonum chinese* L.(= *Persicaria chinensis* (L.)) (Polygonaceae) from china.

So far, two species of eriophyoid mites were recorded on *Imperata cylindrical* from Egypt namely, *Aceria imperata* Zaher & Abou-Awad, 1978 and *Oziella niloticus* (Abou-Awad, 1981). In a survey of the Eriophyidae associated with *Imperata cylindrical* (L.) (Poaceae) in Qalyubia and Sharkia governorates of Egypt, a new species was collected and described herein and a key to species of the world is provided.

MATERIALS AND METHODS

During seasonal growth of 2014-2015, a survey of the eriophyoid fauna was conducted in Qalyubia, and Sharkia governorates Egypt. Mite specimens were collected directly from *Imperata cylindrical* (L.) (Poaceae) and examined using stereo–microscope. And mounted with Keifer's F–medium on glass slides according to protocol reported in (Amrine & Manson, 1996). Specimens were examined under a phase contrast (BX46, Olympus® Germany) microscope. Drawings were made according to de Lillo *et al.* (2010) and abbreviations follow Amrine *et al.* (2003). The morphological terminology used herein follows that of Lindquist (1996) and the generic classification is based on Amrine *et al.* (2003). Specimens were measured following de Lillo *et al.* (2010). For each species, the holotype female measurement precedes the corresponding range for selected paratypes (given in parentheses). All measurements are given in micrometers (µm) and refer to the length of morphological traits unless otherwise specified. The count of ventral opisthosomal semiannuli starts from the first full semiannulus behind coxae II. Dorsal opisthosomal semiannuli are counted from the first full semiannulus behind the rear margin of the prodorsal shield. Host plant names and their synonymies are in accordance with The

Plant List on–line database (2010). Holotype and some paratypes were deposited in the Collection of Department of Fruit Acarology, Plant Protection Research Institute, Agricultural Research Center, Egypt. Two paratypes of the species are deposited at Collection of the Department of Zoology and Nematology, Faculty of Agricultural, Cairo University, Egypt.

RESULTS

Family Eriophyidae Nalepa, 1898.

Subfamily Phyllocoptinae Nalepa, 1892.

Tribe Acaricalini Amrine & Stasny, 1994.

Genus *Schizacea* Keifer, 1977. C13: 1-2, fig. 1.

***Schizacea aegyptimperata* sp. nov.** (Figs 1&2)

Description

Female: (n =10). Body fusiform, 160 (154–165) long, 60 (55–62) wide, 57 (57–62) thick; amber color. **Gnathosoma** 216 (15–17), curved ventrad at an obtuse angle, pedipalp coxal setae (*ep*) 3 (3–4), dorsal pedipalp genual setae (*d*) 2 long, chelicerae 11 (10–11).

Prodorsal shield 50 (48–53) long including frontal lobe, 50 (50–55) wide; sub-semicircular in anterior out line, with rounded and broad based frontal lobe 7 (7–9) over gnathosomal base; prodorsal shield unornamented, with transverse curved line at base of prodorsal shield. Scapular tubercles and scapular setae missing. Coxal plates with granules; setae (*1b*) 8 (7–8), 12 (11–13) apart; setae (*1a*) 15 (14–16), 5 (5–6) apart; setae (*2a*) 23 (22–25), 22 (21–23) apart. Prosternal apodeme 5 (5–6) forked anterior.

Leg I 26 (25–27); femur 8 (7–8), basiventral femoral setae (*bv*) absent; genu 4 (3–4), antaxial genual setae (*l''*) 26 (22–26); tibia 4 (3–4), paraxial tibial setae (*l'*) 8 (7–8), located 3/4 from dorsal base, tarsus 6 (5–6), paraxial, fastigial, tarsal setae (*ft'*) 10 (8–11), antaxial, fastigial, tarsal setae (*ft''*) 22 (20–23), setae (*u'*) 4 (3–4); tarsal empodium (*em*) 5 (5–6), divided, 4–rayed in each branch, tarsal solenidion (ω) 6 (6–7) distally slightly knobbed.

Leg II 23 (22–24), femur 7 (7–8), setae (*bv*) absent; genu 3 (3–4), setae (*l''*) absent; tibia 3 (3), tarsus 6 (5–7), setae (*ft'*) 8 (6–8), (*ft''*) 22 (20–23), setae (*u'*) 4 (3–4); tarsal empodium (*em*) 5 (5–6), divided, 4–rayed in each branch, tarsal solenidion (*ω*) 6 (6–7) distally slightly knobbed.

Opisthosoma dorsally with 25 (24–25) broad, with 53 (50–56) narrow ventral semiannuli (counted from the first annulus after the coxae II), Coxigenital region with 10 (8–10) semiannuli between coxa and genital coverflap with spiny microtubercles set on posterior part of ventral semiannuli. Dorsal semiannuli with a dorso-median longitudinal furrow from 2-3 dorsal semiannuli ending near 6-7th annulus of body from end; slightly elongate microtubercles set on posterior part of ventral semiannuli; Setae *c2* 30 (27–32), 43 (42–44) apart, on ventral semiannulus 7 (6–7); setae *d* and setae *e* absent; setae *f* 20 (18–23), 20 (20–21) apart, on 6th ventral semiannulus from rear; setae *h1* absent; setae *h2* 50 (47–53), 9 (9-10) apart. Female genital coverflap 19 (17–20) long, 22 (20–23) wide, anterior region with elongate granules, proximal setae on coxisternum III (*3a*) 13 (12–15), 15 (15–16) apart.

Male: (n = 3). Similar to female, body fusiform, 159 (140–160) long, 45 (45–50) wide, 57 (47–50) thick. **Gnathosoma** 15 (14–15), pedipalp coxal setae (*ep*) 4 (3–4), dorsal pedipalp genual setae (*d*) minute, chelicerae 10 (10–11).

Prodorsal shield 45 (44–46) long including frontal lobe 6 (6–7), 46 (44–47) wide. Coxal plates with granules; setae (*1b*) 6 (6–7), 10 (10–11) apart; setae (*1a*) 17 (15–18), 4 (4–5) apart; setae (*2a*) 20 (19–20), 18 (18–20) apart. Internal coxisternal apodeme a line 5 (4–5) forked anterior.

Leg I 24 (22–24); femur 7 (7–8), basiventral femoral setae (*bv*) absent; genu 4 (3–4), antaxial genual setae (*l''*) 24 (22–24); tibia 3 (3–4), paraxial tibial setae (*l'*) 8 (7–8), located 3/4 from dorsal base, tarsus 6 (5–6), paraxial, fastigial, tarsal setae (*ft'*) 8 (8–10), antaxial, fastigial, tarsal setae (*ft''*) 21 (20–22), setae (*u'*) 4 (3–4); tarsal empodium (*em*) 5 (5–6), divided, 4–rayed in each branch, tarsal solenidion (*ω*) 6 (6–7) distally slightly knobbed.

Leg II 22 (22–23), femur 6 (6–7), setae (*bv*) absent; genu 3 (3–4), setae (*l''*) absent; tibia 3, tarsus 6 (5–7), setae (*ft'*) 8 (6–8), (*ft''*) 22 (20–23), setae (*u'*) 4 (3–4); tarsal empodium (*em*) 5 (5–6), divided, 4–rayed in each branch, tarsal solenidion (*ω*) 6 (6–7) distally slightly knobbed.

Opisthosoma dorsally with 24 (22–24) broad, with 45 (42–50) narrow ventral semiannuli (counted from the first annulus after the coxae II), Coxigenital region with 8 (8–9) semiannuli between coxa and genital coverflap with spiny microtubercles set on posterior part of ventral semiannuli. Dorsal semiannuli with a dorso-median longitudinal furrow from 2-3 dorsal semiannuli ending near 6th annulus of body from end; slightly elongate microtubercles set on posterior part of ventral semiannuli; Setae *c2* 25 (25–27), 36 (35–38) apart, on ventral semiannulus 5 (4–5); setae *d* and setae *e* absent; setae *f* 20 (18–23), 20 (20–21) apart, on 5-6th ventral semiannulus from rear; setae *h1* absent; setae *h2* 42 (40–45). male genitalia 12 (12–13) long, 15 (15–17) wide, granulated, proximal setae on coxisternum III (*3a*) 20 (15–21), 12 (11–12 apart.

Host plant: *Imperata cylindrical* (L.) (Poaceae)

Relation to the host plant: The mites cause rust on inner surface of leaves of the host plant

Type Locality: Qalyubia Egypt, 30°15'14.41"N, 31°16'53.97"E, 12 November 2014, Coll. Ashraf El–Halawany, and Sharkia governorate, Egypt, 10 January 2015. Coll. Amira Mesbah

Type material: Holotype, single female on a microscope slide (slide no. EGP–Erio54.1), deposited at Fruit Acarology Department Collection, Plant Protection Research Institute (PPRI), Dokki, Egypt.

Paratypes, 10 females and 5 males on 10 separate microscope slides.

Etymology: This specific name "*imperata*" is derived from the name of the host plant on which the new species was collected, and "*aegypt*" derived from locality Egypt.

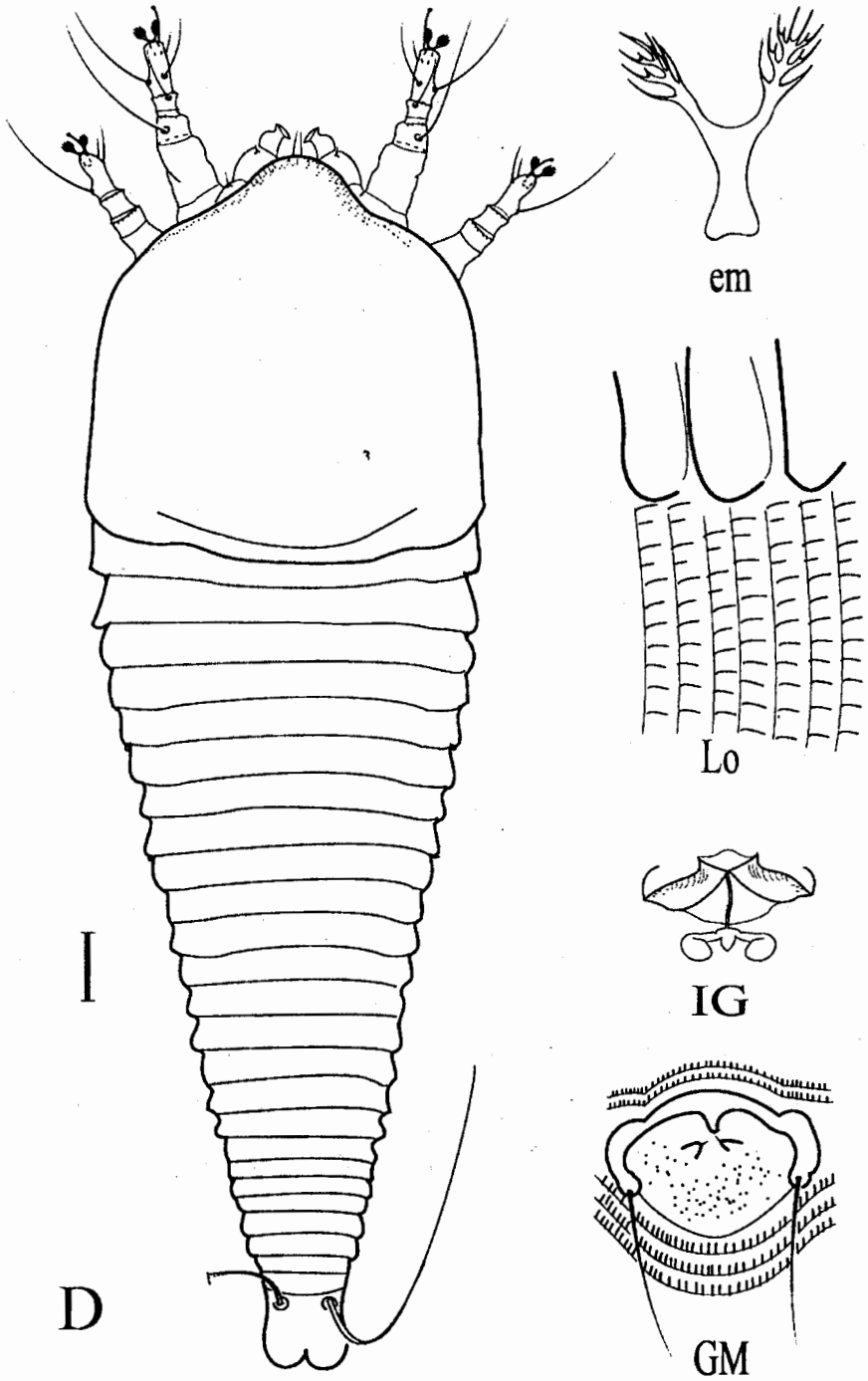

Fig. (1) Schematic line drawing of *Schizacea aegyptimperata* **sp. nov.**: **D**– dorsal view of female; **GM**– male genitalia; **em**– empodium; **IG**– female internal genitalia; **Lo**– microtubercles in lateral view. Scale bar-10µm for D and IG; 5µm for GM; 2.5 µm for em.

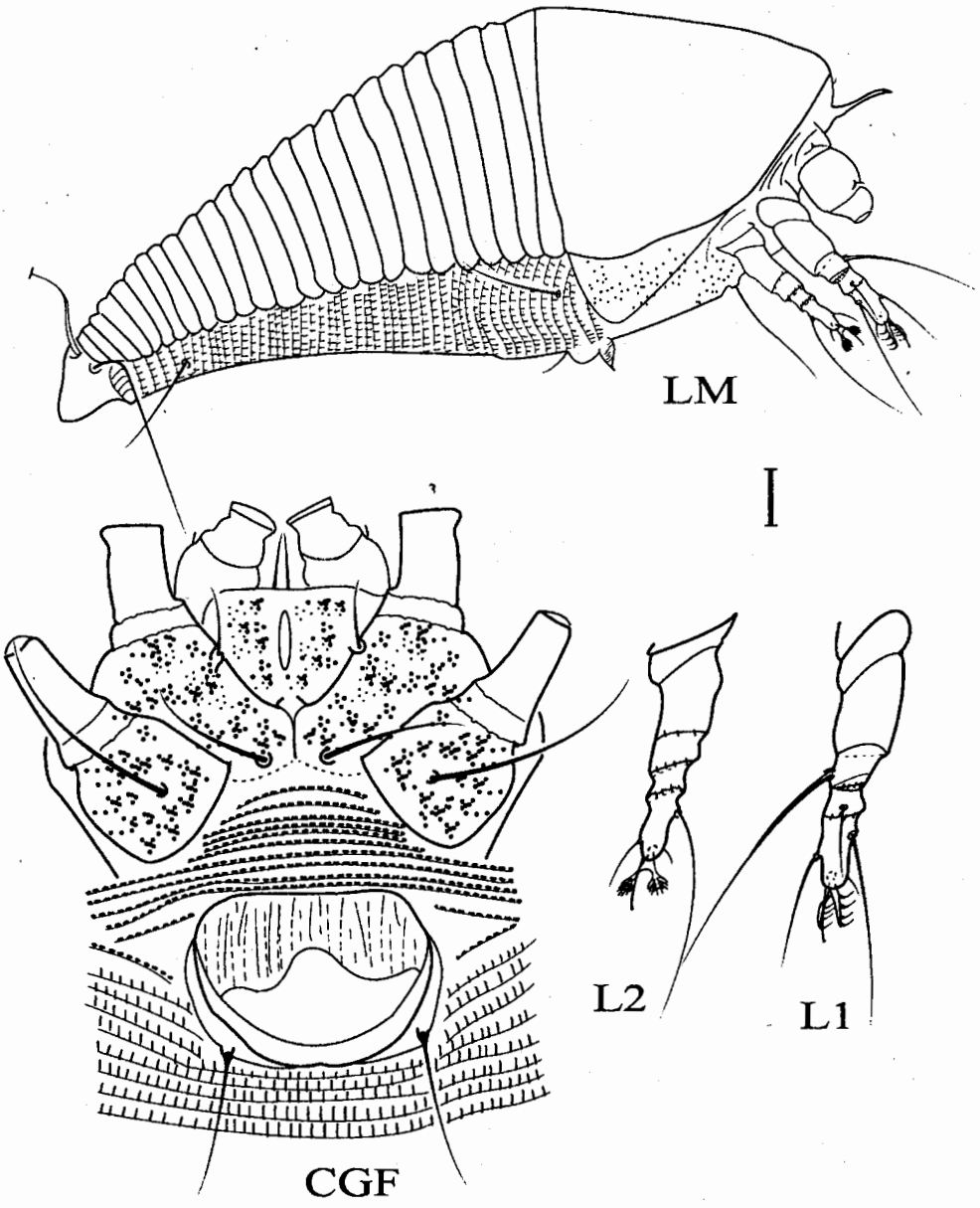

Fig. (2) Schematic line drawing of *Schizacea aegyptimperata* **sp. nov.: LM**– lateral view of female; **CGF**– coxi-gental female region; **L1**, **L2**– Leg I, leg II. **Scale bar**-10µm for LM; 5µm for CGF and L1, L2.

Differential diagnosis:

The new species is the fourth species in the genus *Schizacea*. The new species herein described was compared with all *Schizacea* species and no complete similarities along with any of the other three species were observed. Few similarities were observed with *Schizacea gynerii* Keifer, 1977 on *Gynerium sagittatum* (Aubl.)

Beauv. (Poaceae) from Colombia in shape of genitalia, but differs from *S. gynerii* in the prodorsal shield pattern, frontal lobe, empodium rayed and microtubercles ventrally. Also differs from *Schizacea chinenseae* Huang& Wang, 2003 on *Persicaria chinensis* (L.) (Polygonaceae) from China in prodorsal shield design; genital coverflap with 13 longitudinal ridges in *S. chinenseae.* (prodorsal shield smooth and genitalia with elongate dashes in *S. aegyptimperata*).

Key to the world species of *Schizacea* Keifer

1. Opisthosoma with dorso-median longitudinal ridges, genital coverflap with elongate granules 2
- Opisthosoma with dorso-median longitudinal furrow, genital coverflap with elongate granules or longitudinal ridges 3
2. Empodium 5-rayed, microtubercles spiny ventrally and fine elongate dorsally ..... ***S. gynerii* Keifer, 1977**
- Empodium 7-8-rayed, microtubercles slightly elongate ventrally and absent dorsally ..... ***S. geonomae* Navia & Flechtmann, 2002.**
3. Prodorsal shield with complete admedian line, genital coverflap with 13 longitudinal ridges ..... ***S. chinenseae* Huang& Wang, 2003.**
- Prodorsal shield without admedian line, genital coverflap with elongate granules ..... ***S. aegyptimperata* sp. nov.**

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تسجيل جديد لجنس *Schizacea* (Aari: Eriophyidea) في مصر، مع وصف نوع جديد

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تم وصف ورسم نوع جديد من الحلم الـــدودي يســـمى *Schizacea aegyptimperata* sp. nov. على حشائش الحلفا في مصر. ويعتبر هذا أول تسجيل لجنس *Schizacea* في مصر، و يسبب هذا النوع صدأ وجفاف الأوراق الداخلية لنبات الحلفا. كما تم إعداد مفتاحا تقسيميا للأنواع التابعـــة للجنس على المستوى العالمي.