

REVISION OF THE GENUS *Pediculaster* VITZTHUM, 1927 (ACARI: PYGMEPHORIDAE) OF EGYPT WITH THE DESCRIPTION OF A NEW SPECIES

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ABSTRACT:

*A new pygmephorid mite species, *Pediculaster egypticus* n. sp. (Acari: Tarsonemida), associated with the housefly, *Musca vicina* (Macquart) (Insecta: Diptera) is illustrated and described morphologically along with a revision and a key to the recorded Egyptian species, *P. gallinae* Zaher & Kandeel; *P. arabicus* Zaher & Kandeel; *P. monoufiensis* Sevastianov & Abo-Korah; *P. amerahae* Sevastianov & Abo-Korah and *P. zaheri* Sevastianov & Abo-Korah.*

Key words: Taxonomy, *Pediculaster egypticus* n. sp., *Musca vicina*, Egypt.

INTRODUCTION

The genus *Pediculaster* Vitzthum, 1927 is one of the largest genera in the family Pygmephoridae Kramer (Acari: Tarsonemida). About 100 species are included in the world Acarofauna till now by many authors such as: Khaustov *et al.* 2013; Khaustov 2008, 2011^a, 2011^b and 2011^c; Camerik, 1996; Camerik and Ueckermann 1995; Zaher, 1986; Sevastianov and Abo-Korah, 1984, 1985; Mahunka, 1969^a, 1969^b, 1970, 1972, 1973, 1974, 1975^a, 1975^b, 1976, 1980, 1981^a and 1981^b; Kandeel, 1977; Rack 1974, 1975, 1976; Cross, 1965. Some species of this genus inhabit dung and decaying organic materials. Other members of the genus are usually phoretic on different Diptera and characterized by the presence of two morphologically different forms of females, phoretic and non-phoretic (Martin, 1978). Five species, *P. arabicus*, *P. gallinae*, *P. zaheri*, *P. amerahae* and *P. monoufiensis* were described from Egypt.

Therefore, the present work aims to describe *Pediculaster egypticus* n. sp., phoretic on the house fly, *Musca vicina* (Macquart) (Diptera: Muscidae), Zagazig, Egypt. Also, to establish a key to the new species along with its Egyptian representatives in the genus *Pediculaster*.

MATERIALS AND METHODS

Individuals of genus *Pediculaster* were collected from the housefly, *Musca vicina* (Macquart). Mites were cleared in lactophenol, mounted in Hoyer's medium, examined and drawn through a compound binocular microscope (oil immersion). Terminology of structures and setal notation were taken from Lindquist (1986) and Dastych & Rack (1993). Measurements are in μm and were taken with a calibrated micrometer. Type material is deposited in Faculty of Technology & Development microfauna collection, Zagazig University, Zagazig, Egypt.

Genus *Pediculaster* Vitzthum, 1927

Diagnosis:

Females of the genus *Pediculaster* are distinguished from those of other genera in the family Pygmephoridae by the following combination of characters: Leg I with four segments, claw I sessile and often deformed, Seta c of trochanter I stout and straight, blunt or spatulate apically; Propodosoma with three pairs of dorsals. Sensillus on posterior third. Anterior sternal plate with four (usually) to six pairs of setae, if five pairs then coxal plate II with only two pairs. Sejugal apodeme well – developed. Posterior sternal plate entire, or (rarely) divided by a single transverse line between centers of trochanter III, with 4–6 pairs of setae. Opisthosoma longer than posterior sternal plate.

Key to species of genus *Pediculaster* in Egypt:

(Phoretic non- gravid females)

- 1- Propodosoma convex anteriorly , not covering gnathosoma, sensillus with a smooth spherical head(2)
- * Propodosoma truncate anteriorly , covering most of gnathosoma, sensillus with a calyciform head with dentated anterior margin..... *Pediculaster arabicus*
- 2- Third propodosomal seta arising from distinctive tubercle..... *Pediculaster gallinae*
- * Third propodosomal seta v_1 arising on normal alveoli(3)
- 3- Tergite C with seta c_1 shorter than c_2 (4)
- Tergite C with seta c_1 longer than c_2 *Pediculaster monofiensis*
- 4- Prosternal apodeme (appr) thin; sensillus with a short stalk..... *Pediculaster zaheri*
- * Prosternal apodeme (appr) thick ; sensillus with a long stalk.....(5)
- 5- Sensillus with a leaf-like head, longer than its long stalk; seta c of trochanter I spoon- shaped..... *Pediculaster amerahae*

* Sensillus with a smooth spherical head, shorter than its long stalk; seta c of trochanter I thick with a straight blunt apical margin..... *Pediculaster egypticus* n. sp.

***Pediculaster egypticus* n. sp.**

(Figures,1-6)

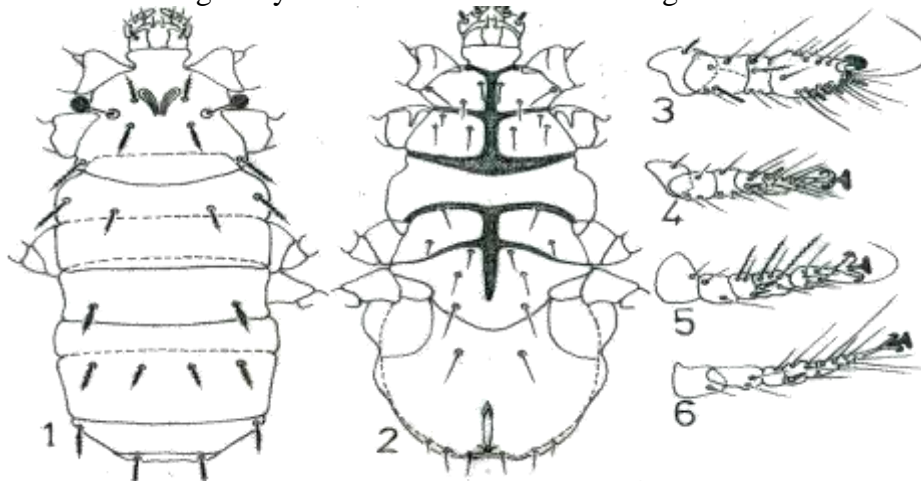
Phoretic non-gravid female :

Dorsum ((Figure 1):

Body elongated oval, pale yellowish in colour when alive. Gnathosoma quadrate, broadly ovate, with two pairs of setae of the same length, the apical pair simple, the second is finely barbed. Palp elongate, stout, consisting of two segments, the basal segment with two setae and broad than the apical which having one seta. Propodosoma semi-triangular, with a truncate anterior edge. Peritreme elongate, peanut like, located between setae p₁. Sensillus spherical, smooth, with a long stalk, arising from a rounded bothridium, occurring between the level of trochanters I & II.

All propodosomal dorsals finely feathered, seta p₁ slightly shorter than p₂, seta p₃ the longest propodosomals and hardly reaching the base of seta d₁ and subequals it. Hysterosoma, elongated oval, truncate posteriorly, covered by five segments. Segment I (clypeus) extending anteriorly covering the basal portion of the propodosoma, approaching the posterior part in the level of trochanter II, measuring more than half length of the hysterosoma; segment II shorter than the former; segment III slightly longer than the former; segment IV trapezoidal, equals one third the former; segment V, the narrowest, nearly covered by the former.

All dorsal hysterosomal setae finely feathered and of the usual number; seta c₂ and seta f the longest hysterosomals and of the same length.



Figures.(1-6): *P. egypticus* n. sp.; 1:dorsum, 2: venter, 3-6: legs I- IV, respectively.

Venter (Figure 2):

Gnathosoma with the internal gnathosomal ventral seta, simple; palpal proximal segment having a spatulate solenidion, distal segment having a basal solenidion. Apodeme 1 inverted v-shaped, well developed, not reaching trochanter I; apodeme 2, transverse and of the same broad of the former, extending anteriorly ending just anterior to trochanter II; sternum I broad, thin at coxisternal plate I, much broad at coxisternal plate II, connecting with a well-developed sejugal apodeme, sejugal apodeme thin posterior to coxa II; apodeme 3 well developed; apodeme 4 much narrower than the former; apodeme 5 reduced; sternum II wide, being thin and pointed posteriorly.

Coxisternal plates I & II having six pairs of simple seta, three of which occurring on each plate, normally of the same length except the long seta coxalis I externae (1c) and the shorter one coxalis II mediae(1b); coxisternal plates III&IV with five pairs of simple setae, nearly subequal except setae coxales III externae (3c) which highly exceed the length of any of the former setae.

Opisthoma elliptical, longer than the coxisternal plates III&IV, having a pair of long, simple metasternals.

Genital opening spindle-shaped having eversible v-shaped pre-genital plate; vulva longitudinal.

Legs I- IV (Figures 3-6, respectively):

Leg I four segmented, Legs II- IV five segmented, setal formula of trochanters (1-1-1-1), seta of trochanter I finely barbed; the setal formula of femora (4-3-2-2), genua (4-3-3-1), tibiae II- IV (4-4-4-4), tarsi II- IV (6-6-6), tibiotarsus I (15 seta + 4 solenedia), each of tibiae II- IV and tarsus II with one solenidion, seta c of femur I broad with a blunt apical margin. Leg I with a single stout sensilla, anchor-shaped claw; leg II- IV with a curved narrow terminus; empodia II- IV calyciform.

Body 290 μ long and 112 μ wide.

Type specimens:

Holotype : Phoretic, non-gravid female attaching with the abdomen of the house-fly, *Musca vicina* (Macquart), Sharkeia Governorate, Egypt, around January 2013.

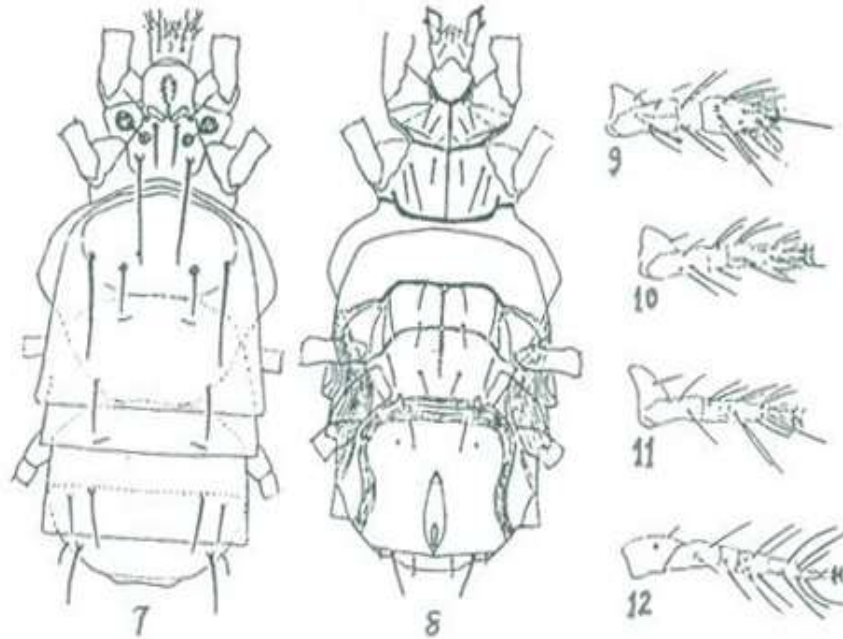
Paratypes: Several Phoretic non-gravid females from the same habitat and locality of holotype.

Allotype : Male not captured.

***Pediculaster gallinae* Zaher&Kandeel,1986.**

(Figures.: 7-12)

Phoretic non- gravid females of this species were found in soil under chickens at Dakahleia Governorate, Egypt, described by Kandeel (1977) and published by Zaher 1986 where he recorded it form the same habitat.

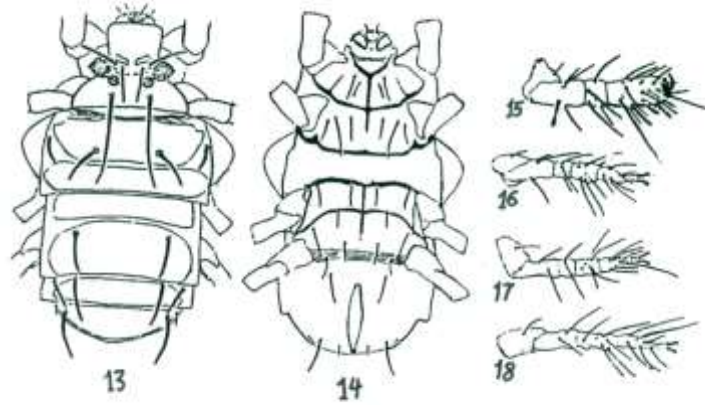


**Figures (7-12): *P. gallinae*: 7:dorsum, 8: venter, 9-12: legs I- IV, respectively.
After Zaher, 1986**

***Pediculaster arabicus* Zaher&Kandeel,1986**

(Figures.: 13-18):

Phoretic non-gravid females of this species were found in organic manure at Giza, Egypt, described by Kandeel (1977) and published by Zaher 1986 where he recorded it form the same habitat.

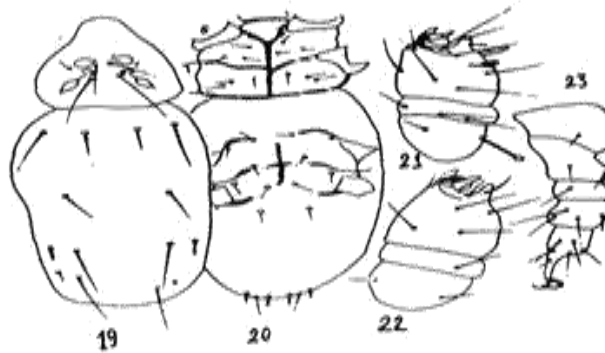


Figures.(13-18): *P. arabicus*: 13:dorsum, 14: venter, 15-18: legs I- IV, respectively.
After Zaher, 1986

***Pediculaster amerahae* Sevastianov&Abo-Korah,1984**

(Figures.: 19-23)

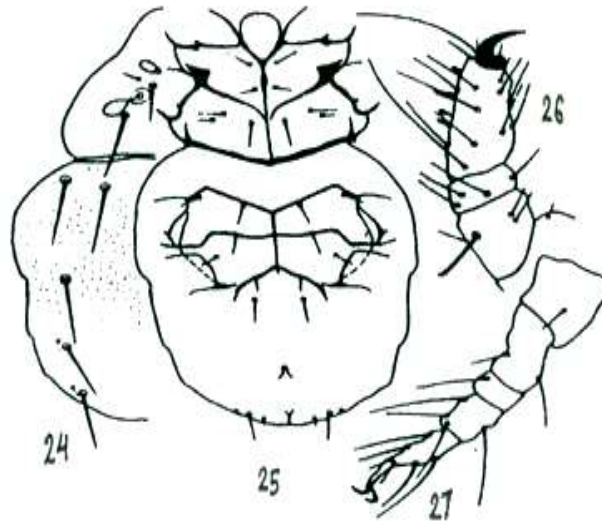
Sevastianov & Abo-Korah (1984) described *Pediculaster amerahae* from vicinity of Shibin-el-Kom, soil under cabbage, Egypt. Later, Sevastianov *et al.*(1994) described *Pediculaster crassipedis* Sevastianov *et al.*,1994 from Turkmenistan. Khaustov (2011^o) examined holotypes of both species and revealed their conspecificity. Therefore he considered *P. crassipedis* syn. nov. as a junior synonym of *P. amerahae*.



Figures.(19-23): *P. amerahae*: 19:dorsum, 20: venter, 21: leg I dorsum, 22: leg I venter, 23: leg IV. After Sevastianov&Abo-Korah, 1984.

Pediculaster monofiensis* Sevastianov&Abo-Korah,1985*(Figures.: 24-27)**

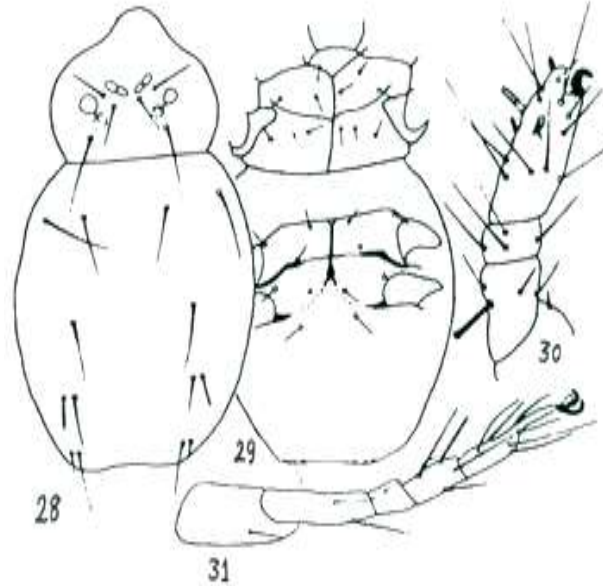
Sevastianov & Abo-Korah (1985) described *Pediculaster monofiensis* from vicinity of Shibin-el-Kom, Egypt on jimson weed, *Datura stramonium* (Dicotyledones : Solanaceae). Wicht, 1970 described three new species of pyemotid mites associated with commercial mushroom of them *Pygmephorous kneeboni*. Khaustov (2011^c) examined phoretic female holotype of *P. monofiensis* and revealed its conspecificity with *P. kneeboni* Wicht, which was also redescribed by Martin (1978). Therefore, he considered *P. monofiensis* syn. nov. as a junior synonym of *P. kneeboni* (Wicht).



Figures.(24-27): *P. monofiensis*: 24:dorsum, 25: venter, 26-27: legs I& IV, respectively.
After Sevastianov&Abo-Korah, 1985.

Pediculaster zaheri* Sevastianov&Abo-Korah,1984*(Figures.: 28-31)**

Sevastianov & Abo-Korah(1984) described *Pediculaster zaheri* from vicinity of Shibin-El-Kom, Egypt under wheat.



Figures (28-31): *P. zaheri*: 28:dorsum, 29: venter, 30-31: legs I& IV, respectively.
After Sevastianov & Abo-Korah, 1984.

The new species *P. egypticus* n. sp. is close to *P. gallinae* Zaher&Kandeel but differs in having seta p_1 finely serrate, all dorsal setae arise from normal alveoli; sensillus with a long stalk and a rounded head; seta c of trochanter I broad with a blunt apical margin in addition to many other features.

Martin (1978) described *Pediculaster portatus* from New Zealand where it was collected from the fly, *Musca domestica*. Khaustov (2008) considered that species as a new record for the European and Ukrainian fauna.

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مراجعة جنس *Pediculaster* Vitzthum, 1927 (Acari: Pygmephoridae) في مصر مع وصف نوع جديد

نبيل عبد الله عمر

قسم الإنتاج النباتي - كلية التكنولوجيا والتنمية - جامعة الزقازيق- مصر.

تم *Pediculaster egypticus* n. sp. والمرتبطة بالذباب المنزلية *Musca vicina* جمع النوع الجديد (رتبة ذات الجناحين) خلال شهر يناير ٢٠١٣ وتم رسمه ووصفه مورفولوجيا، بالإضافة إلى تجميع علمي للأنواع الخمسة لجنس *Pediculaster* ، في جمهورية مصر العربية وهي:

P. gallinae Zaher & Kandeel; *P. arabicus* Zaher&Kandeel; *P. monoufiensis* Sevastianov&Abo-Korah; *P. amerahae* Sevastianov&Abo-Korah and *P. zaheri* Sevastianov & Abo-Korah.