Pakistan J. Zool., vol. 39(1), pp. 17-20, 2006.

A New Cunaxid Mite of Genus *Pulaeus* (Cunaxidae) from Punjab, Pakistan

M. HAMID BASHIR AND M. AFZAL
Department of Agricultural Entomology, University of Agriculture, Faisalabad, Pakistan.

Abstract.- Adult female of a new Cunaxid mite, *Pulaeus anjumi* is described and illustrated. The type was collected from Faisalabad from leaf debris. Twelve female paratypes were collected from Khanewal, Okara, Pakpatan, and Faisalabad. All specimens have been deposited in the Acarology Research Laboratory, Department of Agricultural Entomology, University of Agriculture, Faisalabad.

Key words: *Pulaeus*, mites, Cunaxidae.

INTRODUCTION

Mites belonging to the family Cunaxidae are well known predators of other harmful mites and small soft bodied insects (Smiley, 1992). Schruft (1971) reported that *Cunaxoides oliveri* as a predator of grape wine mite *Clepitrimerus vitus*. Walter and Kaplan (1991) found *Coleoscirus simplex* colonizing greenhouse pot cultures of root knot nematodes (*Meloidogyne* spp.) in Florida where it feeds on vermiform nematodes and other soil arthropods. They also studied the feeding behaviour of Cunaxidae. Arbabi *et al*. (2002) reported the family Cunaxidae as in important predatory family from Sistan Baluchistan and Hormozgan provinces of Iran. Tagore and Putatunda (2003) reported that cunaxid mites are important predators in the ornamental plants in Haryana. De-Oliveira and Daemmon (2003) found that cunaxid mites are important component of fauna in the dust samples from the rural dwellings of Zona da Mata region Brazil.

Genus *Pulaeus*, an important genus of the family Cunaxidae, was erected by Den Heyer (1980) on the basis of presence of setae D4 and basifemur bearing setae. He separated species bearing these characters from the genus *Neocunaxoides* and included them in the genus *Pulaeus*. He designated *Eupalus* (= *Pulaeus*) *pectinatus* Ewing as its type species. A lot of taxonomic work has been carried out on this genus by El-Bishlawy and Rakha (1983), Sepasgosarian (1984), Liang (1985), Bu and Li (1987) and Smiley (1992). From Pakistan Muhammad and Chaudhri (1990, 1991) illustrated and described 4 and 6 new species respectively of this genus. Chaudhri (1977) described *Neocunaxoides krama*, Chaudhri and Akbar (1985) described *Neocunaxoides cinctus*, Inayatullah and Shahid (1989) described *Neocunaxoides kalamiensis* and *Neocunaxoides dilato* bearing these characters. The present authors agree with the creation of genus *Pulaeus* Den Heyer 1980 included the above mentioned species into genus *Pulaeus*. In the present manuscript one new species of this genus has been described thus making a total of 15 species in this genus from Pakistan.

0030-9923/2007/0001-0017 $ 8.00/0
Copyright 2007 Zoological Society of Pakistan.

MATERIALS AND METHODS

For extraction of mites, the samples of leaf debris were processed through Berlese's funnel for at least 24 hours. The cunaxid mites were sorted out by using binocular microscope from the collection received in beaker containing 50% alcohol and preserved in small vials having 70% alcohol and few drops of glycerin. Permanent slides were prepared by using Hoyer's medium. The mounted specimens were identified using a phase contrast microscope and sketches were prepared with the help of an ocular grid. Existing keys and literature on the genus was used for the identification of the species. The setal nomenclature of Smiley (1992) has been followed. All the measurements (in µm), ranges, means along with standard deviations and number of specimens is also given in the

description. Following abbreviations have been used: asl, attenuate solenidion; bsl, blunt ended solenidion; sts, simple tactile setae; T, trichobothrium.

RESULTS

Key to species of genus *Pulaeus* from Pakistan

1. Palp tibiotarsus with a mushroom shaped seta 2
   Palp tibiotarsus without a mushroom shaped seta 13
2. Dorsal platelets six 3
   Dorsal platelets less than six 5
3. Dorsal shield smooth .....*anjumi* n. sp.
   Dorsal shield not smooth 4
4. Genital ridge extending anteriorly; venter with 15 setae between lateral and genital plates ....*verno* Muhammad and Chaudhri
   Genital ridge not extending anteriorly; venter with 11 setae between lateral and genital plates ....*desitis* Muhammad and Chaudhri
5. Dorsal platelets 4..... 6
   Dorsal platelets less than 4..... 10
6. Dorsal shield smooth..... 7
   Dorsal shield not smooth..... 8
7. Dorsal platelets smooth ....*osculum* Muhammad and Chaudhri
   Dorsal platelets not smooth .... *ferventis* Muhammad and Chaudhri
8. Venter with 6 pairs simple setae between lateral and genital plates; basifemur IV with 1 seta .... *haurio* Muhammad and Chaudhri
   Venter with more than 6 pairs simple setae between genital and lateral plates; basifemur IV with 2 setae 9
9. Venter with 14 simple setae between genital and lateral plates; genu I with 8 setae .... *erinaceus* Muhammad and Chaudhri
   Venter with 15 setae between genital and lateral plates; genu I with 9 setaet *silicula* Muhammad and Chaudhri
10. Dorsal shield smooth.... *stultus* Muhammad and Chaudhri
    Dorsal shield dotted 11
11. Genital shield striated; genu II with 7 setae..... 12
    Genital shield dotted; genu II with 8 setae ....*camar* Muhammad and Chaudhri
12. Genu I with 8 setae; tibia I with 7 setae..... .....*dilato* (Inayatullah and Shahid)
    Genu I with 9 setae; tibia I with 8 setae..... .....*glumma* Muhammad and Chaudhri
13. Palp trochanter without a seta..... ..... *kalamiensis* (Inayatullah and Shahid)
    Palp trochanter with a seta 14
14. Genu I with 7 setae..... *cinctus* (Chaudhri and Akbar)
    Genu I with 9 setae .....*krama* (Chaudhri)

1. *Pulaeus anjumi*, new species (Fig. 1 A – F)

Female

Gnathosoma

Gnathosoma 130 µm (120–130; 122.50±3.77; n=8) long and 75 µm (70–80; 76.87±3.72; n=8) wide. Hypostome subrectangular, attenuate distally, with 4 pairs simple hypognathal setae (hg_1–hg_4) (Fig. 1–E).

Palp 3 segmented, measuring 67.50 µm (67.50–72.50; 70.31±1.73; n=8). Chaetotaxy of palp: trochanter none; femurogenua with six simple setae; tibiotarsus with a tooth or hook like structure, one knob like apophysis and 4 simple setae, tibiotarsus terminating in a small claw (Fig. 1–C).

Chelicerae 112.50 µm (92.50–112.50; 102.50±6.54; n=8) long, terminating in a claw, dorsal and ventral sides with longitudinal rows of lobes, with one dorsolateral simple seta (Fig. 1–D).

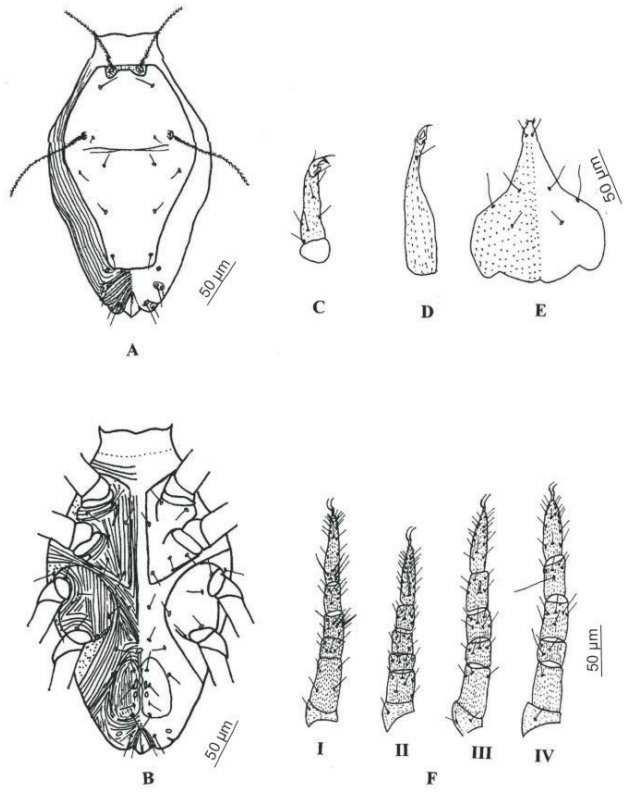


Fig. 1. *Pulaeus anjumi*, new species, A, dorsal side; B, ventral side; C, palp; D, chelicera; E, hypostome; F, legs I–IV.

Dorsum

Body 310 µm (300–330; 312.50±10.35; n=8)

long (without gnathosoma) and 180 µm (180–200; 185±7.55; n=8) wide.

Propodosoma with dorsal shield, originating behind the base of gnathosoma and extending posteriorly to region of metapodosoma. Dorsal shield smooth but with few dot like lobes at the base of PS_1. The dorsal shield with PS_1 measuring 95 µm (95–100; 97.18±2.47; n=8), PS_2 100 µm (95–100; 97.81±2.47; n=8), P_1 26.25 µm (26.25–30; 28.43±1.60; n=8), P_2 25 µm (25–30; 27.50±1.61; n=7), D_1 17.50 µm (15–17.5; 16.66±1.02; n=6), D_2 17.50 µm (15–17.50; 16.87±0.94; n=8), D_3 22.50 µm (22.50–25; 24.37±0.94; n=8) and L_1 17.50 µm (15–18.75; 17.32±1.12; n=7). Setae D_4 30 µm (27.50–30; 28.43±1.10; n=8), D_5 27.50 µm (27.50–32.50; 28.75±1.76; n=8), L_4 12.50 µm (10–12.50; 11.71±1.14; n=8), L_5 15 µm (12.50–15; 14.37±1.15; n=8) long. All setae simple. Hysterosoma with one pair pores posterior to dorsal shield on membrane. Dorsum with 6 platelets. Seta D_4 and L_4 present on a single platelet; setae D_5 and L_5 present on separate platelets (Fig. 1–A).

Venter

Venter with smooth striations. Anterior portion divided medially, forming two distinct plates with coxae I and II on each side. Each plate with six setae. Coxae III and IV coalesced, forming two separate, strong, elongate lateral plates; each lateral elongate plate with six simple setae. Medial plate adjacent to anterior plates or sternal shield and elongate lateral plates absent; hysterosoma with 4 pairs of simple setae adjacent to lateral and genital plates. Genital shield with two valves having weak longitudinal striations. Each valve with 4 genital setae (g_1–g_4) in a row and two well developed genital papillae. Anal setae (a) 1 pair, para–anal setae (pa) 1 pair. One pair minute pores near anal shield (Fig. 1–B).

Legs

All legs pitted with papillae, blunt ended without bilobed flanges. Legs I–IV measuring (from trochanter base to the tip of tarsus) 157.50 µm (157.50–175; 166.25±6.68; n=8), 145 µm (145–155; 149.37±2.91; n=8), 180 µm (172.50–182.50; 177.18±3.39; n=8) and 200 µm (197.50–202.50; 199.37±1.76; n=8) respectively. Chaetotaxy of legs I–IV: Coxae 3–3–3–3; trochanters 1–1–2–1; basifemora 4–6–3–1; telofemora 5–5–4–3; genua 8 (3 asl + 5 sts)–6–6–6; tibiae 7–6–6(1 bsl + 5 sts)–5 (1 T + 4 sts) and tarsi 20 (4 asl + 16 sts)–18(1 bsl + 17 sts)–15–14 (Fig. 1–F).

Male

Male specimens were not found in collection.

Type

Holotype female, collected Faisalabad from leaf debris on 30–06–2004 (Hamid), twelve female paratypes collected from the following localities.

Locality	No. of Paratypes	Date	Source
Khanewal	3	03–07–2004	Leaf debris
Faisalabad	3	30–06–2004	Leaf debris
Okara	2	30–05–2004	Leaf debris
Pakpatan	4	04–06–2004	Leaf debris

All types deposited in Acarology Research Laboratory, Department of Agricultural Entomology, University of Agriculture, Faisalabad, Pakistan.

Etymology

This species is named in honour of Dr. Anjum Suhail, Chairman, Department of Agricultural Entomology, University of Agriculture, Faisalabad.

Remarks

This new species *Pulaeus anjumi* is closely related to *Pulaeus verno* Muhammad and Chaudhri, but can be separated from it on account of following characters.

1. Dorsal shield and platelets dotted in *Pulaeus verno* while these are smooth in this new species.
2. Venter with 15 setae adjacent to lateral and genital plates in *Pulaeus verno* as against 8 in this new species.
3. Leg segments I–IV basifemora; telofemora; genua; tibiae and tarsi with 4–6–3–2; 5–5–4–3; 8–7–5–6; 7–5–6–5 and 29–25–17–17 setae in *Pulaeus verno* as against 4–6–3–1; 5–5–4–

3; 8–6–6–6; 7–6–5 and 20–18–15–14 setae respectively in this new species.

This new species can also be separated from *Pulaeus zaheri* EL–Bishlawy and Rakha on the basis of following characters.

1. Seta D_3 twice longer than distance between D_1–D_2 in *Pulaeus zaheri* while in this new species D_3 is almost of same length as distance between D_1–D_2.
2. Venter with 5 pairs of simple setae adjacent to lateral and genital plates in *Pulaeus zaheri* as against 4 pairs in this new species.

REFERENCES

ARBABI, M., GOLMOHAMMADZADEH-KHIABAN, N. AND ASKARI, M., 2002. Plant mite fauna of Sistan-Baluchestan and Hormozgan provinces. *J. ent. Soc. Iran*, **22**: 87-105.

BU, G. AND LI, L., 1987. Two new species of the genus *Pulaeus* from China (Acariformes: Cunaxidae). *J. Southw. Agric. Univ*., **9**: 22-26.

CHAUDHRI, W.M., 1977. Description of the mite of the family Cunaxidae (Acarina) from Pakistan. *Pak. J. agric. Sci.*, **14**: 41-52.

CHAUDHRI, W.M. AND AKBAR, S., 1985. Studies on biosystematics and control of mites of field crops, Vegetables and fruits plants in Pakistan. *U.A.F. Tech. Bull*., **3**: 1-314.

DEN HEYER, J., 1980. *Pulaeus*, a new cunaxid genus (Prostigmata: Acari). *Acarologia*, **21**: 18-33.

DE-OLIVERIRA, A.J. AND DAEMON, E., 2003. Quantitative and qualitative assessment of mites (Acari) in the domiciliary dust in the "Zona da Mata" region, Minas Gerais, Brazil. *Rev. Brasil. Zool*., **20**: 675-679.

EL-BISHLAWY, S.M. AND RAKHA, M.A., 1983. A new cunaxid mite *Pulaeus zaherii* sp. n. from rat burrows in Egypt (Actinedida: Cunaxidae). *Acarologia*, **24**: 373-375.

INAYATULLAH AND SHAHID, M., 1989. Two new predatory mites of genus *Neocunaxoides* Smiley (Acarina: Cunaxidae) from Pakistan. *Pakistan J. Zool*., **21**: 221-228.

LIANG, G.W., 1985. New species and new record of cunaxid mites from China. *Acta Zootaxon*, **7**: 79-81.

MUHAMMAD, T. AND CHAUDHRI, W.M., 1990. Descriptions of four new species of genus *Pulaeus* Den Heyer from Pakistan (Acarina: Cunaxidae). *Pak. Entomol*., **12**: 18-25.

MUHAMMAD, T. AND CHAUDHRI, W.M.,1991. Six new Cunaxid mites of the genus *Pulaeus* Den Heyer (Acarina: Cunaxidae) from Pakistan. *Pak. Entomol*., **13**: 9-22.

SCHRUFT, G., 1971. *Haleupalus oliveri* new species, A "Thorn-palped" mite on grape vines (*Vitis* Spp.) Acari: Cunaxidae. *Dtsch. entomol. Z*., **18**: 379-382.

SEPASGOSARIAN, H., 1984. The world genera and species of the family Cunaxidae (Actinedida: Acarida). *Z. angew. Zool*., **71**: 135-150.

SMILEY, R.L., 1992. *The predatory mite Family Cunaxidae (Acari) of the World with a new classification.* Indira Publishing House, Michigan USA, 356 pp.

TAGORE, A. AND PUTATUNDA, B. N., 2003. Mites associated with some ornamental plants at Hisar, Haryana. *Pest Manag. Econ. Zool*., **11**: 37-44.

WALTER, D.E. AND KAPLAN, D.T., 1991. Observations on *Coleoscirus simplex* (Acarina: Prostigmata), a predatory mite that colonizes greenhouse cultures of rootknot nematode (*Meloidogyne* spp.), and a review of feeding behaviour in Cunaxidae. *Exp. appl. Acarol*., **12**: 47-59.

(Revised 18 October 2005, revised 5 June 2006)