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NEW CUNAXID MITES OF THE GENUS *ARMASCIRUS* FROM PUNJAB PAKISTAN

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Cunaxid mites are important predators of harmful mites, small soft bodied insects and their eggs. In order to explore Cunaxidae from Punjab- Pakistan the survey resulted in the collection of two new species of genus *Armascirus* i.e *Armascirus asghari* and *Armascirus satianaensis*. These were described and illustrated. Types are deposited in the Acarology Research Laboratory University of Agriculture, Faisalabad, Pakistan. To incorporate these new species, a key of all the known species of the genus *Armascirus* from Pakistan was also prepared.
Key words: Acari, cunaxidae, *Armascirus*, Punjab, Pakistan

INTRODUCTION

Mites belonging to the family Cunaxidae are well known predators of harmful mites and small soft bodied insects (Smiley, 1992). Walter and Kaplan (1991) reported colonization of *Coleoscirus simplex* from greenhouse pot cultures of root knot nematodes (*Meloidogyne* spp.) in Florida where it fed on vermiform nematodes and other soil arthropods. They also studied the feeding behaviour of Cunaxidae. Tagore and Putatunda (2003) reported that cunaxid mites were important predators in the ornamental plants in Haryana.

Armascirus an important genus of the family Cunaxidae was erected by Den Heyer in 1979 designating *Armascirus huyssteeni* as its type species. Muhammad and Chaudhri (1991) collected and described two new species of this genus from Pakistan. The present authors have described two more new species viz., *asghari* and *satianaensis* of the genus *Armascirus* from Punjab- Pakistan, thus making a total of four species in this genus from Pakistan.

MATERIALS AND METHODS

During the survey of different climatic regions of Punjab- Pakistan two new species of the genus *Armascirus* were collected from leaf debris. For extraction of mites the samples 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 a 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. The sketches were prepared by using an ocular grid. The identification of the species was done with the help of the existing keys and literature. The setal nomenclature of Smiley (1992) has been followed. All the measurements were given in µm, Ranges, means along with standard deviations and number of specimens were also given in the description.

Following abbreviations are used in this manuscript.

asl	attenuate solenidion
bsl	blunt ended solenidion
sts	simple tactile setae
T	trichobothrium

RESULTS

Key to known species of Genus *Armascirus* from Pakistan

1) Venter with 6 pairs of simple setae between coxae II and distal part of the body in addition to setae of anal and genital region ----------2
   Venter with 7 pairs of simple setae between coxae II and distal part of the body in addition to setae of anal and genital region ---------- *asghari,* n. sp.
2) Palp genu with 3 spine like setae and one simple seta ----------3
   Palp genu with only 3 spine like setae---------- ----------*satianaensis* n. sp.
3) Genu I with 9 setae; genital valve with longitudinal rows of dot like lobes ---------- ----------*mactator* Muhammad and Chaudhri
   Genu I with 8 setae; genital valve with random dot like lobes ---------- *pluri* Muhammad and Chaudhri

1. *Armascirus asghari*, new species (Fig. 1 A – F)

Female:

Gnathosoma:

Gnathosoma 431 (421-470; 442.37 ± 15.74; n=8) long and 127 (107-127; 118.37 ± 9.21; n=8) wide. Hypostome dotted, subrectangular in shape and cone shaped distally with almost parallel sides, with 4 pairs simple hypognathal setae (hg_1-hg_4) and two pairs adoral setae (Fig. 1-E).

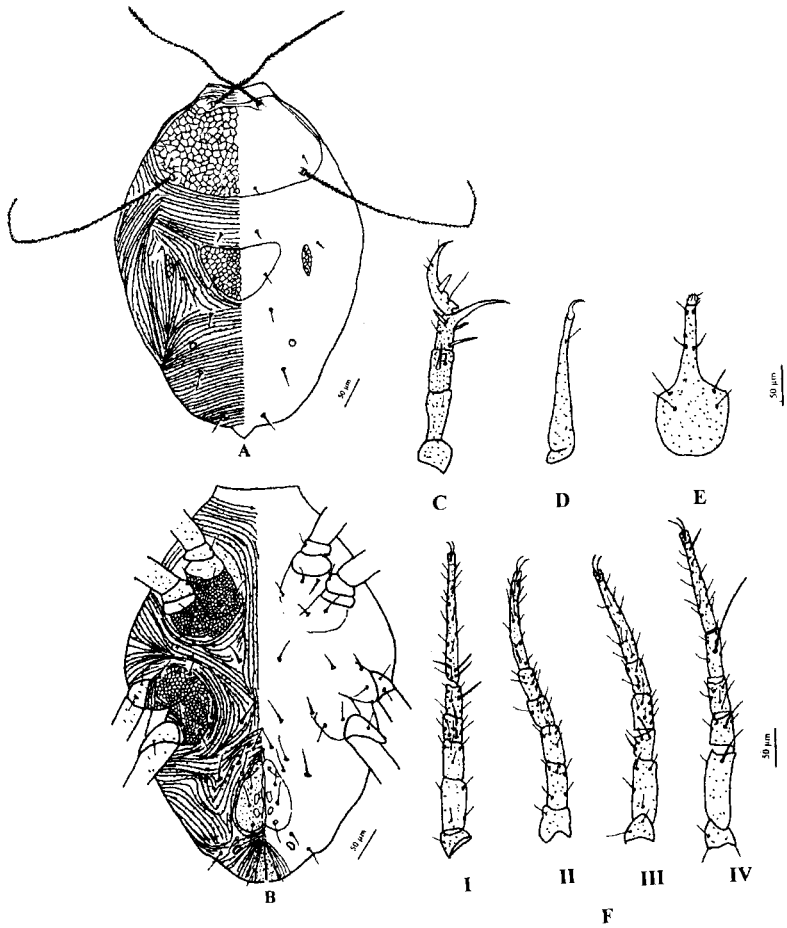

Fig.1 ***Armascirus asghari*** **n.sp.**
A- Dorsal Side; B- Ventral Side; C- Palp; D- Chelicera; E- Hypostome; F- legs I-IV

Palp 5 segmented, all segments dotted, measuring 320 (320-325; 322.50 ± 2.67; n=8). Chaetotaxy of palp as follows: trochanter none; basifemur with one simple seta; telofemur with one apophysis and one spine like seta; genu with one long triangular apophysis, one simple seta and 3 spine like setae; tibiotarsus terminating in a small claw, with 4 (1 long + 3 small) simple setae and one thick stout spine like seta (Fig.1-C).

Chelicera 220 (215-220; 218.12 ± 2.58; n=8) long, terminating in a claw; dorsal and ventral sides with lobes; with one dorsolateral simple seta (Fig. 1-D).

Dorsum:

Body 558 (539-578; 559.37 ± 13; n=8) long (without gnathosoma) and 401 (401-431; 415.25 ± 12.66; n=8) wide.

Propodosoma with reticulated subrectangular shield, originating behind the base of gnathosoma and extending to the anterior region of hysterosoma. Propodosomal shield with anterior and posterior sensillae PS_1, PS_2 measuring 372 (313-372; 349.62 ± 16.74; n=8), 470 (441-470; 450.5 ± 10.74; n=8), respectively, and propodosomal setae P_1, P_2 both simple 14.63 (10.97-14.63; 12.60 ± 1.71; n=8) and 12.19 µm (10.97-12.19; 11.73 ± 0.63; n=8) long respectively.

Hysterosoma separated from propodosoma by striae bearing dot like lobes. Hysterosoma with one triangular reticulated median shield complemented with setae D_2 measuring 12.19 (12.19-13.41; 12.64 ± 0.63; n=8) and two lateral elongate reticulated shields. Setae L_1, D_1, D_3, D_4, D_5 present on dorsal hysterosomal membrane. Setae L_1 9.75 (9.75-12.19; 10.59 ± 1.05; n=8), D_1 9.75 (9.75-12.19; 10.66 ± 1.26; n=8), D_3 19.51 (18.51-19.51;

18.93 ± 0.63; n=8), D_4 31.70 (31.70-36.58; 34.14 ± 1.84; n=8) and D_5 31.70 (31.70-41.46; 35.66 ± 3.67; n=8) long, all simple. Hysterosoma with one pair pores lateral in position between setae D_3 and D_4 (Fig. 1-A).

Venter:

Venter with dotted striations. Coxae I-II and coxae III-IV contiguous and reticulated. Hysterosoma with 7 pairs of simple setae between coxae II and distal part of the body in addition to setae of genital and anal region. Genital shield with two valves having random lobe like dots, each valve with 4 simple genital setae (g_1-g_4) in a row and 2 genital suckers. Anal setae (a) 1 pair, paranal setae (pa) 2 pairs. One pair minute pores near anal shield (Fig. 1-B).

Legs:

Legs I-IV measuring (from trochanter base to the tip of tarsus) 431 (421-441; 430.12 ± 6.66; n=8), 362 (362-372; 367.87 ± 4.35; n=8), 441 (431-450; 440.87 ± 7.19; n=8) and 470 (460-490; 468.87 ± 9.93; n=8) respectively. All legs with dot like lobes, tarsi I-IV long, slender and attenuate, terminating with conspicuous lateral bilobed flanges. Chaetotaxy of legs I-IV as follows: coxae 3-2-3-2; trochanters 1-1-2-1; basifemora 4-5-4-2; telofemora 4-4-4(1 asl + 3 sts)-4(1 asl + 3 sts); genua 8(3 asl + 5 sts)-6-6-6; tibiae 6(1 asl+ 5 sts)- 5-6(1 bsl + 5 sts)-5(1 T + 4 sts) and tarsi 18(3 asl + 15 sts)-15(1 bsl + 14 sts)-13-12(1 asl + 11 sts) (Fig. 1-F).

Male:

Not known

Type:

Holotype female, collected from Faisalabad from leaf debris on 22-09-2004 (Hamid). Eleven female paratypes were collected from the following localities.

Locality	No. of Paratypes	Date	Source
Faisalabad	3	22-09-2004	Leaf debris
Okara	2	10-07-2004	Leaf debris
Kahror Paka (Lodhran)	1	05-08-2004	Leaf debris
Rahim Yar Khan	4	16-08-2004	Leaf debris
D.G. Khan	1	19-08-2004	Leaf debris

All deposited in Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture Faisalabad - Pakistan.

Etymology:

This species is named after Ch. Abdullah Asghar, who has been an eminent teacher of Entomology.

Remarks:

This new species can be separated from *Armascirus heryfordi* Smiley by following characters.

1. Dorsal hysterosoma in *Armascirus heryfordi* with subrectangular shield, but dorsal hysterosoma with triangular reticulated shield in this new species.
2. Ventral hysterosoma with 5 pairs simple setae between coxae II and distal part of the body in addition to setae of anal and genital region in *Armascirus heryfordi* as against 7 pairs setae in this new species.
3. Chaetotaxy of legs I-V in *Armascirus heryfordi* is: coxae 3-2-3-3; basifemora 5-5-4-2; genua 8-7-6-7; tibiae 7-6-6-5 and tarsi 19-13-13-13 while chaetotaxy of legs I-IV in this new species is: coxae 3-2-3-2; basifemora 4-5-4-2; genua 8-6-6-6; tibiae 6-5-6-5 ands tarsi 18-15-13-12.

2. *Armascirus satianaensis*, new species (Fig. 2 A – F)

Female:

Gnathosoma:

Gnathosoma 362 long and 117 wide. Hypostome dotted, subrectangular in shape and cone shaped distally with almost parallel sides, with 4 pairs simple hypognathal setae (hg_1-hg_4) and two pairs adoral setae (Fig. 2-E).

Palp 5 segmented, all segments dotted, measuring 260. Chaetotaxy of palp as follows: trochanter none; basifemur with one simple seta; telofemur with one apophysis and one spine like seta; genu with one long triangular apophysis and 3 spine like setae; tibiotarsus terminating in a small claw, with 4 (1 long + 3 small) simple setae and one thick stout spine like seta (Fig. 2-C). Chelicerae 150 long, terminating in a claw; dorsal and ventral sides with lobes, with one dorsolateral simple seta (Fig. 2-D).

Dorsum:

Body 460 long (without gnathosoma) and 372 wide. Propodosoma with reticulated subrectangular shield, originating behind the base of gnathosoma and extending to the anterior region of hysterosoma. Propodosomal shield with anterior and posterior sensillae PS_1, PS_2 measuring 284, 372 and propodosomal setae P_1, P_2 both simple 8.53 and 8.53 long respectively.

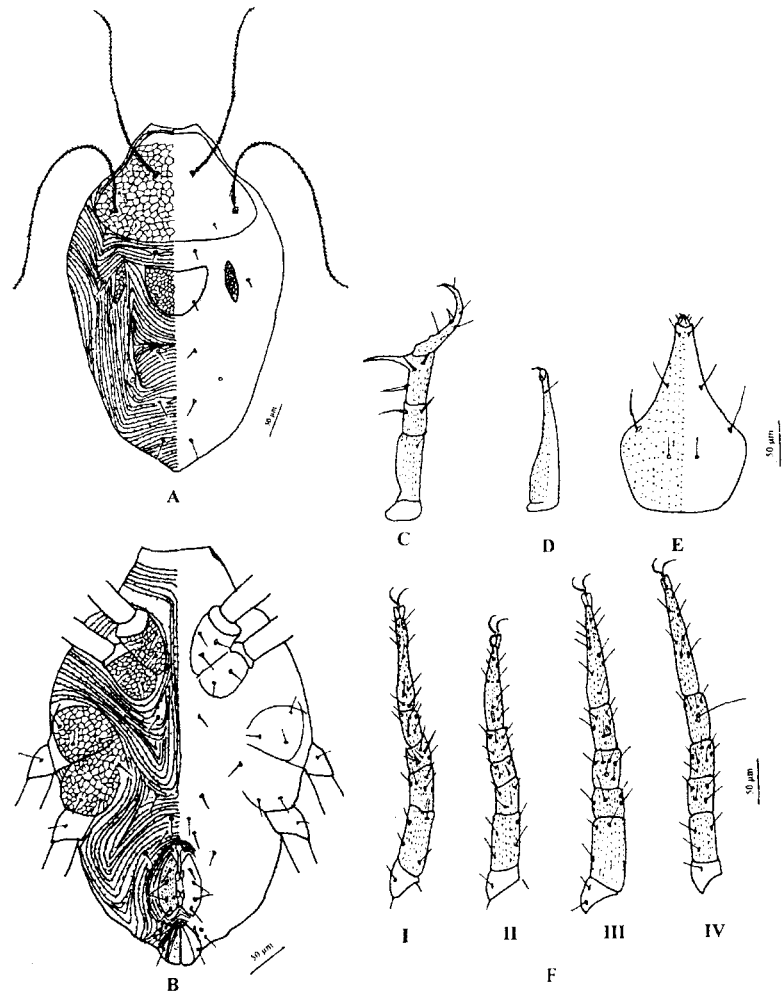

Fig.2 ***Armascirus satianaensis*** **n.sp.**
A- Dorsal Side; B- Ventral Side; C- Palp; D- Chelicera; E- Hypostome; F- legs I-IV

Hysterosoma separated from propodosoma by striae bearing dot like lobes. Hysterosoma with two lateral reticulated shields and one triangular reticulated median shield complemented with setae D_2 measuring 9.75. Setae L_1, D_1, D_3, D_4, D_5 present on dorsal hysterosomal membrane. Setae L_1 8.53, D_1 9.75, D_3 15.85, D_4 29.26 and D_5 31.70 long, all simple. With one pair pores lateral in position, between setae D_3 and D_4 (Fig. 2-A).

Venter:

Venter with dotted striations. Coxae I-II and coxae III-IV contiguous and reticulated. Hysterosoma with 6 pairs of simple setae between coxae II and distal part of the body in addition to setae of genital and anal region. Genital shield with two valves having lobe like dots arranged in rows, each valve with 4 simple genital setae (g_1-g_4) in a row and 2 genital suckers. Anal setae (a) 1 pair, paranal setae (pa) 2 pairs. One pair minute pores near anal shield (Fig. 2-B).

Legs:

Legs I-IV measuring (from trochanter base to the tip of tarsus) 333, 274, 343 and 352 respectively. All legs with dot like lobes; tarsi I-IV long, slender and attenuate, terminating with conspicuous lateral bilobed flanges. Chaetotaxy of legs I-IV as follows: Coxae 3-2-3-2; trochanters 1-1-2-1; basifemora 4-4-3-3;

telofemora 4-4-4-4; genua 8(3 asl + 5 sts)-4-6-7; tibiae 6-(1 asl + 5 sts)-5-6(1 bsl + 5 sts)-5(1 T + 4 sts) and tarsi 11(4 asl + 7 sts)-10(1 bsl + 9 sts)-9-7 (Fig. 17-F).

Male:

Not known

Type:

Holotype female, collected from Satiana (Faisalabad) from leaf debris on 07-09-2004 (Hamid) and deposited in Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture Faisalabad - Pakistan.

Etymology:

This species epithet is derived for the locality from where the type was collected.

Remarks:

This new species comes closer to *Armascirus mactator* Muhammad and Chaudhri but can be separated from it on account of following characters.

1. Palp telofemur with two apophyses in *Armascirus mactator* while only one in this new species.
2. Palp genu in *Armascirus mactator* with two spine like setae and two simple setae while in the new species palp genu with three spine like setae only.
3. Chaetotaxy of legs I-IV in *Armascirus mactator* is as follows: Coxae 3-2-3-3; basifemora 5-5-4-2; genua 9-7-6-7; tibiae 7-6-6-5 and tarsi 29-24-22-21 whereas in the new species it is: Coxae 3-2-3-2; basifemora 4-4-3-3; genua 8-4-6-7; tibiae 6-5-6-5 and tarsi 11-10-9-7.

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