

DESCRIPTIONS OF TWO NEW SPECIES OF THE GENUS *RUBROSCIRUS* DEN HEYER (CUNAXIDAE: ACARINA) FROM PAKISTAN

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The authors have collected and described 2 new species, viz., *Rubroscirus rasile* and *R. otiosus* from Pakistan. A key to 6 new species has been given. Studies of the phenetic affinities of species taxa of this genus, so far, described has been made.

INTRODUCTION

Mites of the genus *Rubroscirus* Den Heyer are predatory in nature and play an important role in biological control by feeding on phytophagous mites and small insects.

Den Heyer (1978) erected the new genus *Rubroscirus* and designated *Rubroscirus africanus* as its type species. He also described 3 new species in this genus which he collected from Ethiopian region. Taj and Chaudhri (1989) described a new species in this genus from Pakistan making a total of 4 species in it.

Sepasgosarian (1984) provided a detailed information about the classification of world genera and species of the family Cunaxidae. He placed the genus *Rubroscirus* under subfamily Cunaxidnae, new tribe Cunaxini and also included genus *Cunaxa* in this tribe.

The authors have collected and described 2 new species in this genus from Pakistan, making a total of 6 species in it. A comprehensive key for these 6 species alongwith their similarity matrix and phenogram are given.

KEY TO KNOWN SPECIES OF GENUS *RUBROSCIRUS* (Females)

1. Genital papillae randomly arranged
R. vestus Den Heyer
 Genital papillae in rows2
2. Leg III basifemur with solenidion
R. africanus Den Heyer
 Leg III basifemur without
 solenidion.....3
3. Setae *dc2* - *dc6* simple
R. africanus Den Heyer
 Setae *dc2* - *dc6* serrate4
4. Palp length 213 μ ;
 leg tibiae II - IV
 with 5-5-5 setae*R. valentis*
 Taj and Chaudhri
 Palp length less than 213 μ ;
 leg tibiae II-IV not
 with 5-5-5 setae5
5. Leg genu II with 7 setae;
 leg tibia I with 7 setae*R. rasile* n.sp.
 Leg genu II with 8 setae;
 leg tibia I with 9 setae*R. otiosus* n.sp.

1. *Rubroscirus rasile*, new species
(Fig. 1)

FEMALE

Dorsum: Body 468 μ long (with gnathosoma), 312 μ wide. Integument with papillae bearing striations as shown in Figure 1-A. Dorsal shield 1, on prodosoma papillae form reticulations; Dorsal setae: Two pairs sensillae (*Ps1*, *Ps2*); *dl* setae 3 pairs (*dl1*, *dl2*, *dl6*); *dc* setae 6 pairs (*dc1* - *dc6*). Dorsal setae: *Ps1*, *Ps2*, *dc1* and *dl1* on propodosomal shield; *dl2*, *dl6*, *dc2* - *dc6* on integument. Dorsal setae: *Ps1* 250 μ long, serrate, 23 μ apart; *Ps2* 312 μ long, serrate, 143 μ apart, *dl* setae, simple 11 μ , 25 μ and 9 μ long; *dc* setae *dc1* simple, others serrate 31 μ , 52 μ , 42 μ , 42 μ , broken, 47 μ long. A pair of pores near *dc4* setae (Fig. 1-A).

Venter: Sejugal groove present but not forming nose posteriorly. Idiosoma base with transverse dotted striations extending posterior medially up to hystergastric setae 1. Coxae I-IV each with dotted striations. Rest of ventral side with dotted striations running in different directions as shown in Figure 1-B. Propodogastric setae 1 pair, simple. Hystergastric setae 10, simple. Genital valves 2, with longitudinal rows of dots, each valve with 4 (*gi* - *g4*) genital setae, simple, 2 poorly developed genital papillae, anterior divided into 2 parts. Anal setae 1 pair, simple. One pair pores anterior to anal setae (Fig. 1-B).

Gnathosoma: Hypognathum 172 μ long, 86 μ wide at base, 2 times longer than wide, with random dots, 2 pairs adoral setae and 4 pairs hypognathal (*hg1* - *hg4*) setae, simple (Fig. 1-C).

Palp 2, 172 μ long with random dots; 5 segmented. Palp chaetotaxy: Segment I zero, II 1 seta, III 2 (1 simple tactile seta + 1 apophysis), IV 3 (1 simple tactile seta + 2 spine-like setae), tibiotarsus (V) 6 (1 long

sts + 1 tubercle + 1 spine-like seta + 3 sts), tibiotarsus terminating in a claw (Fig. 1-E).

Chelicera 2, 143 μ long, basal half with lobes, distal half smooth, claw well-developed; dorsolateral cheliceral seta 1. Ratio: Chelicera/hypognathum = 0.83 (Fig. 1-D).

Legs: Four pairs, with random lobes. Legs I-IV (trochanter base to tarsus tip): 348 μ , 343 μ , 384 μ and 411 μ long. Setae and solenidia on legs I-IV segments: *Coxae* 4 (1 pc + 3 sts) - 1-3-1, *trochanters* 1-1-2-1, *basifemora* 3-3-3-1, *telofemora* 4-4-4-4, *genua* 9 (3 asl + 1 bsl + 5 sts) - 7 (1 asl + 6 sts) - 6 (1 asl + 5 sts) - 6 (1 asl + 5 sts), *tibia* 7 (3 bsl + 4 sts) - 6 (1 bsl + 5 sts) - 6 (1 bsl + 5 sts) - 5 (1 T + 4 sts), *tarsi* 29 (4 bsl + 1 pc + 2 tsl + 22 sts) - 25 (1 bsl + 1 tsl + 23 sts) - 23 (1 tsl + 22 sts) - 20 sts (Fig. 1-F).

Type: Holotype female, collected from Cotton Experimental Area, Department of Plant Breeding and Genetics, University of Agriculture, Faisalabad on cotton on 10.xi.1984 (Taj and Chaudhri) and deposited in Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad.

Remarks: This new species, *R. rasile* comes closer to *R. otiosus*, new species but the following points separate them:

1. Hypognathum length/breadth ratio 1.9 in *otiosus*, but 2 in this new species.
2. Genua II with 8 setae in *otiosus* but 7 in this new species.
3. Tibia I with 9 setae in *otiosus* but 7 in this new species.
4. Genital setae II and III form a row whereas I and IV form a row lateral in position in *otiosus* but I - III form a row and IV lateral in position in this new species.

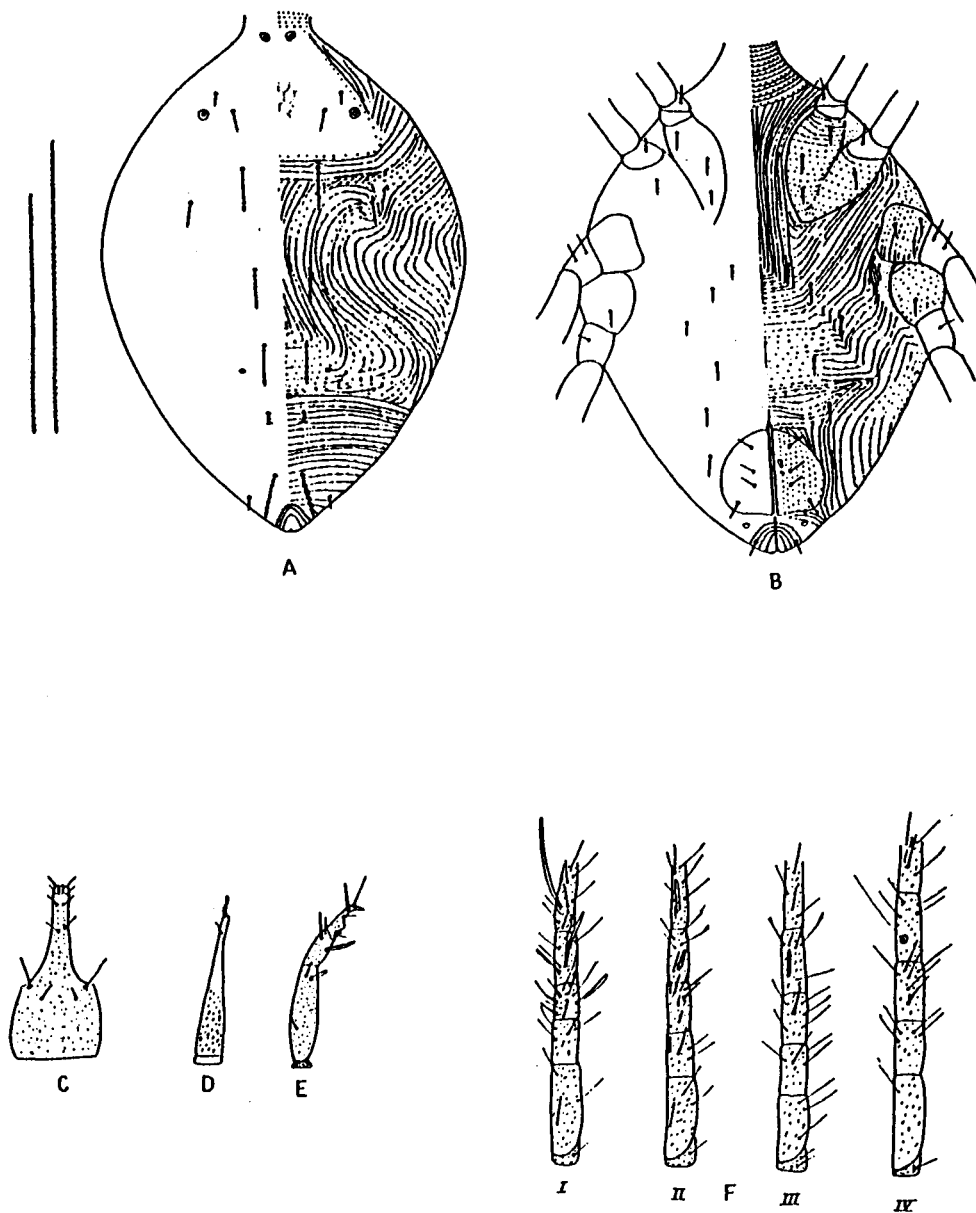


Fig. 1. *Rubroscirus rasile*, n.sp.
A. Dorsal side; B. Ventral side; C. Hypognathum;
D. Chelicera; E. Palp; F. Legs I-IV.

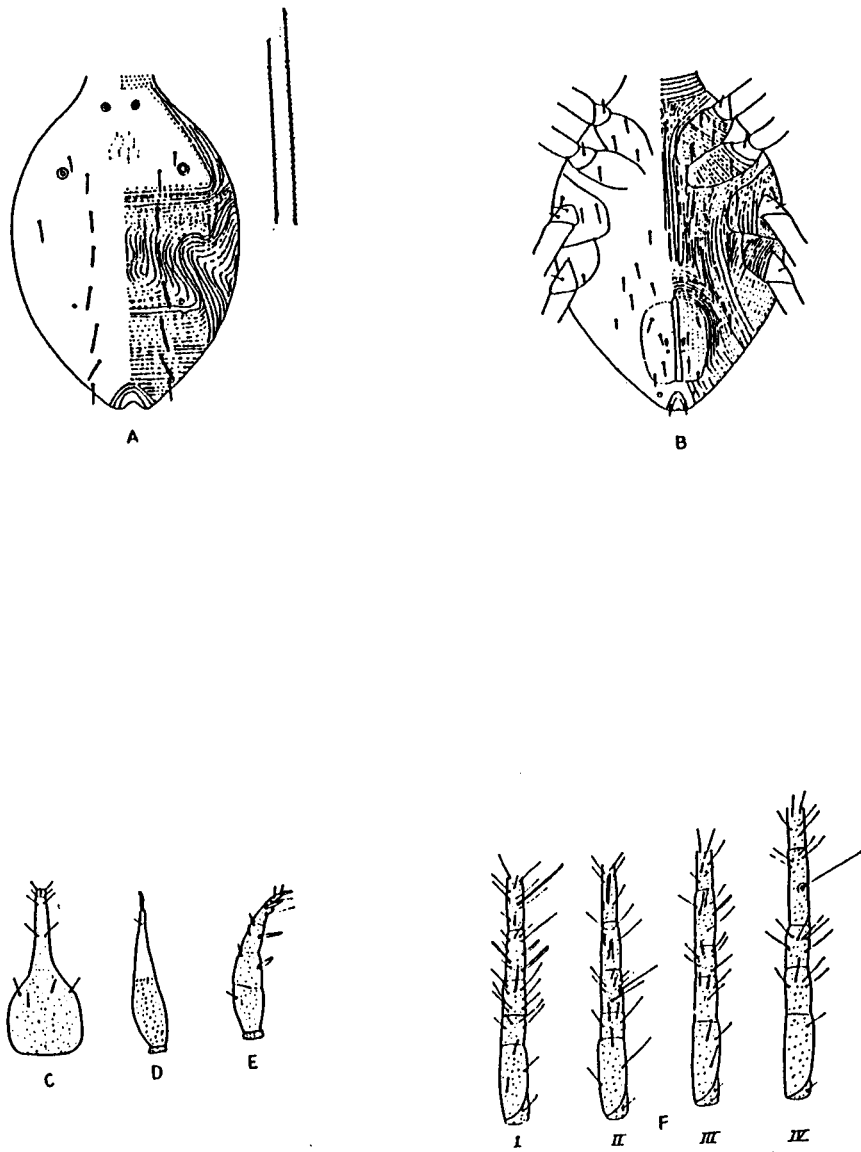


Fig. 2. *Rubroscirus ostiosus*, n.sp.
A. Dorsal side; B. Ventral side; C. Hypognathum;
D. Chelicera; E. Palp; F. Legs I-IV.

Table 1. Comparison of characters in known species of genus *Rubroscinus* Den Heyer

Characters	<i>vestus</i>	<i>rarus</i>	<i>africanus</i>	<i>valentis</i>	<i>rasile</i>	<i>otiosus</i>
Propodosomal papillae form primary and secondary reticulations	+	+	+	+	-	-
Dorsal setae <i>dc2</i> - <i>dc6</i> serrate	-	-	-	+	+	+
Genital valves with rows of papillae	+	-	+	+	+	+
One pair pores present near anal valves	+	-	+	+	+	+
Palp 172 μ long	-	-	-	-	+	-
Chelicera 127 μ long	+	-	-	-	-	-
Chelicera/hypognathum ratio = 0.83	-	-	-	-	+	-
Hypognathum L/B ratio = 1.6	+	+	-	-	-	-
Leg basifemur III solenidion	-	+	-	-	-	-
Genu I with 9 setae	-	-	-	+	+	+
Genu II with 7 setae	-	-	-	+	+	-
Tibia II with 5 setae	-	-	-	+	-	-
Tibia III with 5 setae	-	-	-	+	-	+
Tarsus III with 21 setae	-	-	-	+	-	-
Tarsus IV with 19 setae	-	-	-	+	-	-

2. *Rubroscirius otiosus*, new species (Fig. 2)

FEMALE

Dorsum: Body 343 μ long (without gnathosoma), 250 μ wide. Integument with papillae bearing striations as shown in Figure 2-A. Dorsal shield 1, on propodosoma, papillae form reticulations; dorsal setae: *Ps1*, 239 μ long, 23 μ apart, serrate; *Ps2* 281 μ long, serrate, 124 μ apart; *dl* setae 3 pairs (*dl1*, *dl2*, *dl6*) simple 10 μ , 18 μ and 17 μ long; setae *dc6* pairs (*dc1* - *dc6*), *dc1* simple, others serrate, 31 μ , 42 μ , 34 μ , 34 μ , 44 μ and 42 μ long. Dorsal setae *Ps1*, *Ps2*, *dc1*, *dl1* on propodosomal shield; *dl1*, *dl6*, *dc2* - *dc6* on integument. A part of pores near *dc4* setae (Fig. 2-A).

ple. One pair pores anterior to anal setae (Fig. 2-B).

Gnathosoma: Hypognathum 156 μ long, 80 μ wide at base; 1.9 times longer than wide, with random dots, 2 pairs adoral setae and 4 pairs hypognathal (*hg1* - *hg4*) setae, simple (Fig. 2-C).

Palp 2, 185 μ long with random dots; 5 segmented. Palp chaetotaxy: Segment I zero, II 1 seta, III 2 (1 sts + 1 apophysis), IV 3 (1 sts + 2 spine-like setae), tibiotarsus (V) 6 (2 long sts + 1 tubercle + 1 spine-like seta + 2 sts), tibiotarsus terminating in a claw (Fig. 2-E).

Chelicera 2, 151 μ long, basal half lobed, distal half smooth, claw well-developed; dorsolateral cheliceral seta 1. Ratio: Chelicera/hypognathum = 0.96 (Fig. 2-D).

Table 2. Matrix showing percentage of similarity in known species of genus *Rubroscirius* Den Heyer

	<i>vestus</i>	<i>rarus</i>	<i>africanus</i>	<i>valentis</i>	<i>rasile</i>	<i>otiosus</i>
<i>vestus</i>	XX					
<i>rarus</i>	73.33	XX				
<i>africanus</i>	86.67	73.33	XX			
<i>valentis</i>	40.00	26.67	53.33	XX		
<i>rasile</i>	46.67	33.33	60.00	53.33	XX	
<i>otiosus</i>	60.00	46.67	73.33	66.67	73.33	XX

Venter: Sejugal groove present but not forming nose posteriorly. Idiosoma base with transverse, dotted striations extending postero-medially up to hysterogastric setae. Coxa I-IV each with dotted striations running in different directions as shown in Figure 2-B. Propodogastric setae 1 pair, simple. Hysterogastric setae 10, simple. Genital valves 2, with longitudinal dotted rows, each valve with 4 genital (*g1* - *g4*) setae, simple, 2 poorly developed genital papillae, anterior divided into 2 parts. Anal setae 1 pair, sim-

Legs: Four pairs, with random lobes. Legs I-IV (trochanter base to tarsus tip): 343 μ , 333 μ , 364 μ and 406 μ long. Setae and solenidia on legs I-IV segments: Coxa 4 (1 pc + 3 sts) - 1-3-1, trochanters 1-1-2-1, basifemora 3-3-3-1, telofemora 4-4-4-4, genua 9 (3 asl + 6 sts) - 8 (2 asl + 6 sts) - 6 (1 asl + 5 sts) - 6 (1 bsl + 5 sts), tibiae 9 (3 bsl + 6 sts), - 6 (1 bsl + 5 sts), - 6 (1 bsl + 5 sts), - 5 (1 T + 4 sts), tarsi 29 (4 bsl + 1 pc + 2 tsl + 22 sts) - 25 (1 bsl + 1 tsl + 23 sts) - 23 (1 tsl + 22 sts) - 20 sts (Fig. 2-F).

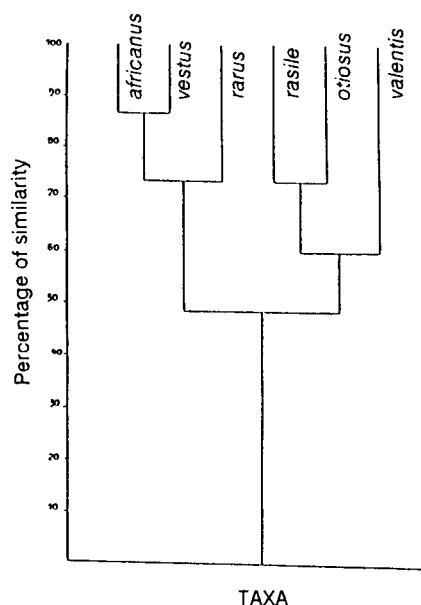


Fig. 3. Phenogram of species of genus *Rubroscirus* Den Heyer.

Type: Holotype female, collected 4 km N. Faisalabad from *Mentha* sp. on 4.xi.1976 (Taj and Chaudhri) and deposited in Acarology Research Laboratory, Department of Agri. Entomology, University of Agriculture, Faisalabad.

Remarks: This new species *R. otiosus* can be separated from *R. rasile*, new species due to the following points:

1. Hypognathum length/breadth ratio 2 in *rasile* but 1.9 in this new species.
2. Genu II with 7 setae in *rasile* but 8 setae in this new species.
3. Tibia I with 7 setae in *rasile* but 9 in this new species.
4. Genu II with 7 setae in *rasile* but 9 setae in this new species.
5. Genital setae I - III form a row but IV lateral in position in *rasile*. Genital setae II and III form a row whereas I and IV lateral in position in this new species.

DISCUSSION

The genus *Rubroscirus* includes 6 species (3 already described from Ethiopian region and 3 new species from arid plains of Pakistan). The phenogram (Fig. 3) of these species presents two interesting clusters. One cluster comprises of the species from the Ethiopian region and second, all the species from arid plains of Pakistan. The species *africanus* shows highest affinity (86.67%) with *vestus* and *rarus* joining this pair at 73.33%. In the second cluster, the species *rasile* depicts (73.33%) affinity with *otiosus* and *valentis* join this pair at 60% level. As these species have been collected from the same ecological area, their high affinity could thus be attributed to their similar ecological habitats. A similar inference could be true to the cluster of Ethiopian species. It is obvious that the species in both the clusters are localised in occurrence and hence can be presumed to have a narrow genetic plasticity. Further, the phenetic affinity between the two clusters does not necessarily reflect their ecological relatedness rather most of the similarity could be attributed to common occurrence of such characters which embody the genus. Comparison of characters and similarity matrix for these species have been given in Table 1 and 2.

REFERENCES

- Den Heyer, J. 1978. *Rubroscirus*, a new cunaxid genus (Prostigmata: Acari) with three new species from the Ethiopian region. *Acarologia*, 20: 70-92.
- Sepasgosrarian, H. 1984. The world genera and species of the family Cunaxidae (Actinedidae: Acarida). *Angew. Ecol.* 71: 135-150.
- Taj, M. and W.M. Chaudhri. 1989. A new species of genus *Rubroscirus* (Acarina: Cunaxidae) from Pakistan. *Pak. Entomol.* 11: 1-4.