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New Mite (Hypopus) from Central Punjab (Pakistan) in the Family Acaridae (Acari: Astigmata)

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One new species *Lackerbaueria fatigo* representing the genus *Lackerbaueria* Zakhvatkin, 1941 is described from the hypopial stage. A key, comparison of characters, similarity matrix and phenogram are given to all the known species in this genus.

Key words: *Lackerbaueria,* Mite, Acaridae.

Introduction

Mites occurring in stored grain and stored products including *Lackerbaueria* are considered to be of great economic importance as they are reported to infest and damage stored grain and such food stuffs as cheese, flour, seeds, bulbs, tubers and dried fruits of all kinds. Decaying materials and other such items where putrefaction or biochemical decay also appears to be a cognitive factor for the habitation of this group of mites.

Genus *Lackerbaueria* was erected by Zakhvatkin in 1941 and *Lackerbaueria cribratissima* species was designated as type species. Baker (1962) and Ashfaq *et al* (1988) described 2 and 1 new species, respectively in this genus.

During these studies one new species (hypopus) of this genus has been collected and described from Pakistan. A comprehensive key to the new species of the genus *Lackerbaueria* along with already described 4 species is given. The comparison of characters, similarity matrix and phenogram include all the 5 species.

Key to species of genus ***Lackerbaueria*** Zakhvatkin (Hypopi)

1. Hysterosomal setae simple; tarsus IV with more than 1 leaf-like setae ---------- 2

   Hysterosomal setae not simple; tarsus IV with 1 leaf-like seta ---------- 4

2. Propodosoma with pattern; tarsus I with more than 1 leaf-like setae ---------- 3

   Propodosoma without pattern; tarsus I with 1 leaf-like seta ------- *L. americana* Baker

3. Tarsus I with 2 sensory rods; sternum 2 (*st2*) not free anteriorly ---------- *L. lahoriensis* Ashfaq, Aheer and Chaudhri

   Tarsus I with 1 sensory rod; sternum 2 (*st2*) free anteriorly ---------- *L. cribratissima* Zakhvatkin

4. Seta *scs* present; gnathosoma segmented ---------- *L. fatigo,* n.sp.

   Seta *scs* absent; gnathosoma not segmented ---------- *L. krombeni* Baker

Hypopus:

Dorsum: Body 230 mμ long, 140 mμ wide, divided into propodosomal and hysterosomal shields. Propodosomal shield 85 mμ long, 138 mμ wide, dotted and microtuberculated, having rostral projection anteriorly, 1 pair visible pores near antero-medial margin, convexed line antero-medially; setae *vi, ve, sci, sce* and *scs* each 1 pair 29 mμ, 10 mμ, 62 mμ, 55 mμ and 30 mμ long, respectively; *sci-sci* 43 mμ, *sce-sce* 81 mμ, *sci-sce* 24 mμ apart; setae *sci* and *sce* forming circular-line, middle in position, setae *sci*, *sce* and *vi* serrated (Fig 1-A). Hysterosomal shield 160 mμ long, 140 mμ wide, dotted and with micro-tubercles entirely, straight anteriorly with dots and transverse broken striations, lateral margins turn towards venter, longitudinal broken striations laterally. Hysterosomal shield setae, 11 pairs, larger in size, 1 pair visible pores near lateral margins, setae measuring *d1* = *d2* = 40 mμ, *d3* 38 mμ, *d4* 22 mμ; *hi*=*he* = 10 mμ; *la* 16 mμ, *lp1* = *lp2* = 10 mμ; *sae* 10 mμ, *sai* 20 mμ in length; *d1* - *d1* 102 mμ, *d2* - *d2* 54 mμ, *d3* - *d3* 48 mμ, *d4* - *d4* 43 mμ; *d1* - *d2* 23 mμ, *d2* - *d3* 45 mμ, *d3* - *d4* 58 mμ and *la* - *la* 115 mμ apart. Setae *d1, d2, d3* and *d4* serrated; *hi, he, lp1, lp2, sae* and *sai* simple. Hysterosomal shield anterior margin overlaping

propodosomal shield posterior margin upto 8 mμ, overlaping area dotted with transverse,broken striations (Fig 1-A).

Venter: Gnathosoma , broad and rounded at base, bifurcated anteriorly, 2 segmented, 22 mμ long, arista 1 pair, 36 mμ long, 2 pairs small setae (1 pair on lateral margin and 1 pair dorsal in position) (Fig 1-C). Apodeme 1 (*ap1*) largely Y-shaped, continuing with sternum 1 (*st1*). Sternum 1 (*st1*) free, 30 mμ long, pointed posteriorly. Apodeme 2 (*ap2*) free, slightly curved. Apodeme 3 (*ap3*) meeting apodeme 4 (*ap4*). Apodemes 4 (*ap4*) meeting medially making almost straight line. Apodeme 5 (*ap5*) not meeting apodeme 4 (*ap4*), broader at anterior tip. Sternum 2 (*st2*) free from both sides, 17 mμ long. Metasternal seta (*mts*) 1 pair, above the tip of apodeme 5 (*ap5*) (Fig 1-D). Seta *hv* not visible. Coxal fields I and II, III and IV open, smooth. Ventral shield not separated from genital shield. Genital shield as shown in figure 1-B, smooth, genital silt elongated and bifurcated from either sides, 2 pairs genital suckers and 1 pair paragenital seta (*pr*) antero-medial to genital disc (*gdi3*). Coxal discs *di1* and *di2* present. Genital disc (*gdi3*) conoids, without radial striations (Fig 1-B). Suctorial shield concave and wavy antero-medially, rounded and pointed posteriorly, dotted, 38 mμ long, 43 mμ wide, 1 pair of suckers below the shield; anterior suckers 1 pair, anal suckers 1 pair, larger than anterior suckers with 2 dots in between, 1 pair well developed lateral conoids, 1 pair posterior suckers, 1 pair vestigial suckers, 1 pair suckers antero-medial to anterior suckers (Fig 1-E). Suctorial shield separated from posterior end of body by 18 mμ, a distance smaller than suctorial shield length (Fig 1- B).

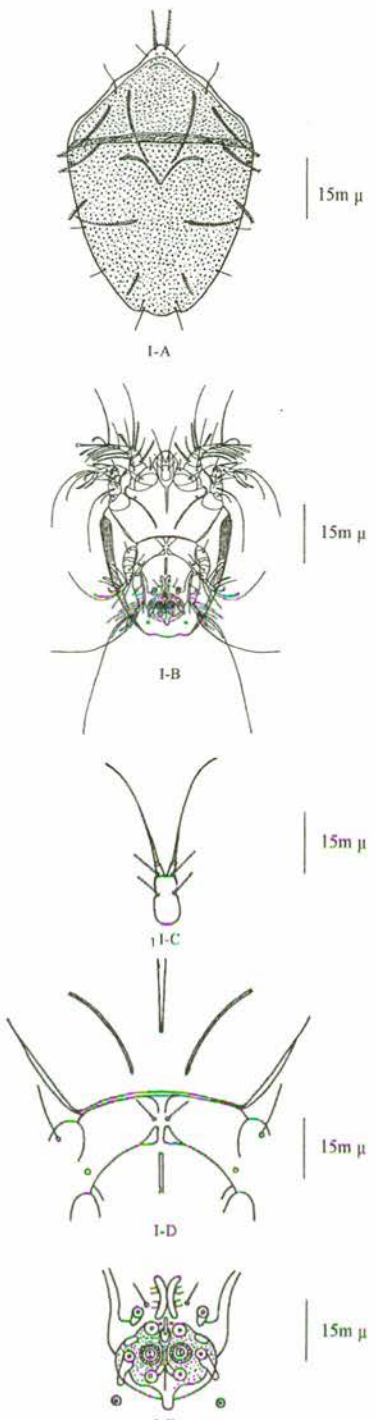

Fig 1A-E. *Lackerbaueria fatigo*, new species.
I-A, Dorsal view; I-B Ventral view; I-C, Gnathosoma; I-D, Sternum; I-E, Suctorial shield.

Legs: Strong and stout, I-IV measuring 85 mμ, 73 mμ, 70 mμ and 60 mμ in length, respectively (trochanter base to tarsus tip). Setae and solenidia on legs I-IV segments: coxae 0-0-0-0, trochanters 2-1-1-0, femora 1-1-0-1, genua 3-3-1-0, tibiae 3-3-2-2, tarsi 9-8-7-7-. Tarsi I and II 10 mμ and 9 mμ long, respectively. Seta *vF* on femora I, II and IV 63 mμ, 50 mμ and 15 mμ long, respectively, absent on femur III. Seta *e* on tarsi I-IV measuring 30 mμ, 25 mμ, 70 mμ and 201 mμ in length, respectively. Seta mG on genua I serrated, on II a simple seta; *hT* on tibiae I serrated, on II a seta 18 mμ, 10 mμ, 15 mμ and 10 mμ long, respectively. A serrated seta on genu II. Seta σ on genua I, a seta, on II a solendion 23 mμ and 28 mμ long, respectively. Tarsi I and II each with a solenidion *w1* 20 mμ and 18 mμ in length, respectively. Dorsal seta Φ on tibiae I and II 75 mμ and 25 mμ long, respectively. Seta *ba* on tarsus I 20 mμ long. Tarsi I-VI provided with 2 leaf-like + 1 club-shaped; 2 leaf-like; 2 leaf-like; 1 leaf-like setae, respectively. Large seta on tarsi IV about 201 mμ in length (Fig 1-B).

Type: Holotype, hypopus, collected from Sheikhupura from rice (*Oryza sativa* L.) on 15.9.94 (Sarwar) and deposited in Acarology Research Laboratory, Department of Agricultural Entomology, University of Agriculture, Faisalabad.

Remarks: In general appearance and structure this new species has greater resemblance with *Lackerbaueria lahoriensis* Ashfaq, Aheer and Chaudhri but the main differences are

Table I

Comparison of characters in species of genus *Lackerbaueria* Zakhvatkin

	CHARACTERS	*1	2	3	4	5
1.	Propodosomal and hysterosomal setae of same length	+	-	+	-	-
2.	Seta *scs* present	-	-	-	+	+
3.	Propodosoma without pattern	+	+	-	-	-
4.	Hysterosomal setae serrated	+	-	-	-	+
5.	Gnathosoma not segmented	+	+	+	-	-
6.	Gnathosoma protrude beyond the body	+	+	-	-	-
7.	Sternum 2 *(st2)* free	+	+	+	-	+
8.	Genital seta present on outer side	+	+	+	-	-
9.	Suctorial shield lateral suckers anterior to anal suckers	+	+	+	-	-
10.	Leg IV tarsus with a very long seta	-	-	+	+	+
11.	Tarsus I with 2 sensory rods	-	-	-	+	-
12.	One leaf-like seta on tarsus I	+	+	-	-	-
13.	One leaf-like seta on tarsus II	+	-	-	-	-
14.	One leaf-like seta on tarsus III	+	-	-	-	-
15.	One leaf-like seta on tarsus IV	+	-	-	-	+

* See name on Table 2.

described below:

1. Hysterosomal setae not serrated in *L. lahoriensis* but serrated in this new species.
2. Gnathosoma notched posteriorly in *L. lahoriensis* but not notched in this new species.
3. Sternum 2 (*st2*) not free from either side in *L. lahoriensis* but free in this new species.
4. Coxal field III closed in *L. lahoriensis* but open in this new species.
5. Tarsus 1 with 2 sensory rods in *L. lahoriensis* but with 1 sensory rod in this new species.

Discussion

Genus *Lackerbaueria* embodies only 4 (including 1 from Pakistan) species. The author has now added 1 new species, thus making a total of 2 species in this genus from Pakistan. The phenogram (Fig 2) of so far recorded species of this genus depicts 2 clusters. Species *lahoriensis* and *fatigo* have the highest level of shared affinity (73.33%). Such pattern of high affinity between species could possibly be due to the fact that these species are the dwellers of the adjacent areas of arid plains, as these species are exposed to similar ecological

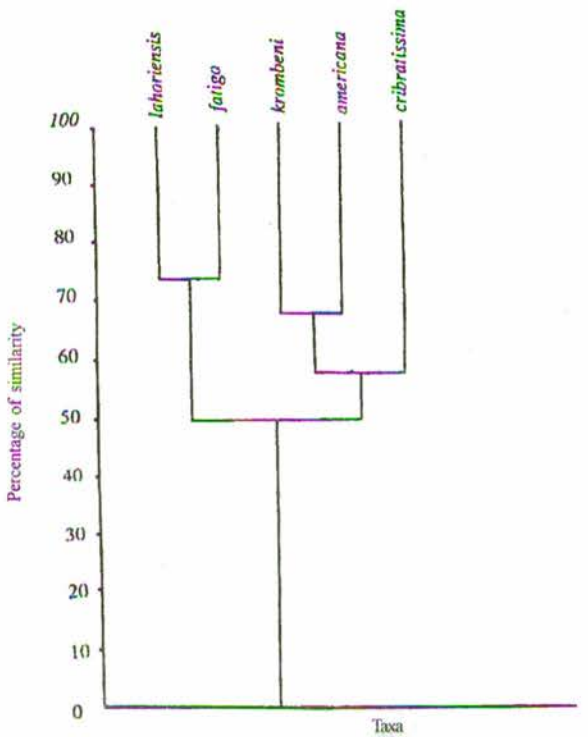

Fig 2. Phenogram of species of genus *Lackerbaueria* Zakhvatkin.

Table 2

Matrix showing percentage of similarity in species of genus *Lackerbaueria* Zakhvatkin

	1	2	3	4	5
	krombeni	*americana*	*cribratissima*	*lahoriensis*	*fatigo*
krombeni	XX				
americana	66.67	XX			
cribratissima	46.67	66.67	XX		
lahoriensis	Zero	33.33	53.33	XX	
fatigo	26.66	33.33	53.33	73.33	XX

conditions, and as such the affinity could thus be attributed to the ecological relatedness.

The second cluster composing of *americana* and *krombeni* species join each other at 66.67% similarity level while species *cribratissima* is joining this pair at 56.67% similarity. Both these clusters are linked at 50% affinity level. All these 3 species were collected from the same host i.e., wasps. These are thus having ectoparasitic habit on the same host. This establishes that species under study are ecologically related sharing the same host.

These studies lead us to conclude that there is a wide range of flexibility of adaptation of these species to the hosts, both of animal and plant origin. It is interesting that the former 2 species in the cluster are of local origin and are from similar ecological zones and as such the high affinities among them could be attributed to the ecological relatedness. As far as the 3 later species are concerned, they are dwellers of discrete localities yet their phenetic relationships do not reflect their ecological links, rather their affinity could be the attribute of occurrence of common generic characters in them.

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