

## Soil Mites and Collembola from Al-Qaşım Province, Saudi Arabia

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**ABSTRACT.** A qualitative faunal analysis of soil mites and Collembola, collected from several biotopes at Al-Qaşım province, was carried out.

Among the identified specimens, eleven species of soil mites and two collembolan ones are reported for the first time to exist in Saudi Arabia. A systematic list is submitted, which contains zoogeographical and distributional data for the species included.

Mites are more abundant than Collembola both in number of species and collected specimens. Cryptostigmatid mites are by far the major faunal elements in all examined samples.

Acari and Collembola form the base of the soil animal food chain (Williams 1942). Therefore, taxonomical studies of soil animals are essential in order to assess their roles in the soil ecosystem.

In the Arabian peninsula, insects have received relatively more attention than any other group of the soil fauna. However, few systematic faunal reports of soil mites and Collembola existing in some areas of Saudi Arabia have been published (*e.g.* Abu Yaman 1966, Soliman and Al-Yousif 1979, Hammad *et al.* 1981 and Al-Khalifa and Bayoumi 1982).

As far as we are aware, the present study is the first faunistic survey of soil mites

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and Collembola at Al-Qaṣīm area. It is hoped that this and future investigations in other regions of Saudi Arabia will increase our knowledge on the pattern of distribution of these important soil animals in the Arabian peninsula.

### Material and Methods

Soil samples were collected from different biotopes within Al-Qaṣīm province (Table 1). Sampling was performed by means of a quadrangular metal frame (30 × 30 × 10 cm). Mites and Collembola were extracted in the usual manner using Tullgren's funnels. Small tubes containing a mixture of 70 percent ethyl alcohol and ethylene glycol (9:1) served as traps. Trapped animals were cleared up on uncovered slides by lactic acid according to the method of Grandjean (1949), identified and counted.

**Table 1.** Main Characteristics of the Samples Collected at the investigated Localities.

Sample No.	Locality	Soil Texture	Vegetation	Date of Sampling
1	Al-Rass	Loamy	Pine trees	11.X.1981
2	Al-Rass	Silty loam	Palm trees	25.XII.1981
3	Al-Rass	Silty loam	Pomegranate trees	25.XII.1981
4	Al-Methneb	Sandy loam	Mint plantation	25.XII.1981
5	Unayzah	Loamy	Grapes	3.I.1982
6	Unayzah	Sandy clay	Palm trees	3.I.1982.
7	Al-Badaya	Silty loam	Pine trees	3.I.1982
8	Al-Badaya	Sandy loam	Palm trees	12.III.1982
9	Al-Badaya	Sandy	Alghada trees ( <i>Haloxylon persicum</i> )	12.III.1982
10	Buraydah	Sandy loam	Pine trees	13.IV.1982
11	Buraydah	Silty loam	Grapes	13.IV.1982
12	Buraydah	Sandy	Palm trees	13.IV.1982
13	Al-Bakiriyah	Silty sand	Pomgranate trees	13.IV.1982
14	Al-Bakiriyah	Loamy	Palm trees	13.IV.1982
15	Al-Bakiriyah	Sandy loam	Orange trees	13.IV.1982
16	Al-Khabra	Sandy	Palm trees	13.IV.1982

### Taxonomic Account

Specific references in the check-list below contain the sample number, followed by

the number of individuals in the same sample (in parenthesis). Newly recorded species are marked with asterisks. The known zoogeographical range for each species is also given.

The faunal list of soil mites is arranged following the order of Turk (1953).

#### A. ACARINA

##### Astigmata

1. *Glycyphagus domesticus* (De Geer).  
Locality: 2(3); 8(2); 11(25); 14(3).  
Range: Cosmopolitan.
2. *Tyrophagus palmarum* (Oudemans).  
Locality: 1(5); 3(11); 8(3); 10(2).  
Range: Cosmopolitan.
- \* 3. *Nanacarus minutus* Oudemans.  
Locality: 5(3); 6(1); 10(3); 16(5).  
Range: Cosmopolitan.

##### Prostigmata

1. *Raoiella indica* Hirst.  
Locality: 2(1); 4(7); 8(3); 14(6).  
Range: Palaearctic, Oriental.
2. *Cunaxa simplex* Ewing.  
Locality: 1(3); 3(10); 9(1); 12(3).  
Range: Palaearctic.
3. *Cunaxa capreolus* (Berlese).  
Locality: 1(2); 4(3); 6(5); 11(2); 16(3).  
Range: Palaearctic.
4. *Eutetranychus afriasiaticus* McGregor.  
Locality: 5(2); 14(3); 15(2).  
Range: Ethiopian, Oriental.

##### Mesostigmata

1. *Macrocheles apacus* (Koch).  
Locality: 2(1); 7(2); 9(1); 11(3).  
Range: Cosmopolitan.
2. *Pergamasus (Pergamasus) longicornis* (Berlese).

Locality: 1(2); 8(3); 13(4); 15(2).  
Range: Cosmopolitan.

- \* 3. *Rhodacarus roseaus* Oudemans.  
Locality: 3(2); 9(1); 11(3); 16(5).  
Range: Palaearctic.
4. *Zercon* sp.  
Locality: 1(1); 2(3); 9(1); 14(1).

#### Cryptostigmata

1. *Rhysotritia ardua* (Koch).  
Locality: 2(15); 3(7); 5(12); 6(2).  
Range: Cosmopolitan.
- \* 2. *Cryptacarus promecus* (Grandjean).  
Locality: 9(1).  
Range: Palaearctic.
- \* 3. *Lohmannia regalis* (Berlese).  
Locality: 9(1).  
Range: Palaearctic.
4. *Epilohmannia cylindrica cylindrica* (Berlese).  
Locality: 1(22); 4(16); 5(13); 8(6); 11(3); 14(2).  
Range: Cosmopolitan.
5. *Epilohmannia pallida aegyptica* Bayoumi et Mahunka.  
Locality: 3(3); 5(12); 9(2); 11(4); 15(6).  
Range: Palaearctic.
- \* 6. *Cyrthermannia ezzati* Bayoumi et Mahunka.  
Locality: 4(3); 11(2).  
Range: Palaearctic.
- \* 7. *Tectocephus sarekensis* (Tragardh).  
Locality: 1(3); 5(2); 11(3).  
Range: Cosmopolitan.
8. *Tectocephus velatus* (Michael).  
Locality: 1(21); 3(5); 8(6); 10(103); 12(36).  
Range: Cosmopolitan.
- \* 9. *Fosseremus laciniatus* (Berlese).  
Locality: 4(2).  
Range: Cosmopolitan.

- \* 10. *Oppia arcidiaconoae* Bernini.  
Locality: 10(1).  
Range: Palaearctic.
- \* 11. *Oppia cylindrica* Perez-Inigo.  
Locality: 8(39); 9(17).  
Range: Palaearctic.
- \* 12. *Oppia fasciata* (Paoli).  
Locality: 3(2); 5(6); 14(3).  
Range: Palaearctic.
13. *Oppiella nova* (Oudemans).  
Locality: 10(2).  
Range: Cosmopolitan.
14. *Rectoppia mihelcici* (Perez-Inigo).  
Locality: 1(3); 7(1).  
Range: Palaearctic.
15. *Striatoppia niliaca* (Popp).  
Locality: 6(2); 13(1).  
Range: Palaearctic.
16. *Scheloribates fimbriatus africanus* Wallwork.  
Locality: 7(3).  
Range: Ethiopian.
17. *Scheloribates laevigatus* (Koch).  
Locality: 2(16); 5(18); 6(3); 13(4); 16(7).  
Range: Cosmopolitan.
18. *Xylobates capucinus* (Berlese).  
Locality: 10(6); 11(5).  
Range: Cosmopolitan.
19. *Rostrozetes foveolatus* Sellnick.  
Locality: 8(4).  
Range: Palaearctic, Ethiopian.
- \* 20. *Galurva flagellata* (Willmann).  
Locality: 14(1).  
Range: Palaearctic.

**B. COLLEMBOLA**

1. *Hypogastrura manubrialis* (Tulberg).  
Locality: 3(16); 10(5).  
Range: Palaearctic.
2. *Hypogastrura armata* (Nicolet).  
Locality: 1(3); 5(13); 12(26).  
Range: Cosmopolitan.
- \* 3. *Proistoma minuta* (Tulberg).  
Locality: 3(1); 8(2).  
Range: Palaearctic.
- \* 4. *Pseudosinella octopunctata* (Born).  
Locality: 2(6); 5(9).  
Range: Palaearctic, Ethiopian.
5. *Seminuthrus viridis* L.  
Locality: 1(2); 3(11); 7(3); 11(6).  
Range: Palaearctic.

**Conclusion**

Although the collections examined in the present investigation are rather small, they allow the drawing of some interesting inferences about the distribution patterns of mite and collembolan fauna in the Arabian peninsula.

Arabia's geographical position makes the subcontinent outstandingly interesting to the zoologist. It is the meeting point of three major zoogeographical realms; namely, the Palaearctic (Europe, North Africa and northern Asia), the Afrotropical (Ethiopian) and the Oriental. These three biogeographical fauna components could be recognized from the available data presented in this study (Table 2) and from previously published species lists of some regions of Saudi Arabia. It could be suggested that Collembola and soil mites, especially the Cryptostigmata which is the most ancient acarine group, were in existence before drift caused the separation of the African and Asian continents. Furthermore, the greater species diversity shown by the cryptostigmatid fauna indicates that members of this group are relics of an earlier continuous distribution pattern.

**Table 2.** Zoogeographical origin of the mite and Collembolan fauna within Al-Qaşim Province.

Locality	Cosmopolitan		Palaeartic		Oriental		Afrotropical	
	Acari	Coll.	Acari	Coll.	Acari	Coll.	Acari	Coll.
Al-Rass	9	2	7	3	1	—	—	1
Al-Methneb	2	—	3	—	1	—	—	—
Unayzah	5	1	4	1	1	—	1	1
Al-Badaya	6	—	9	2	1	—	2	—
Buraydah	8	1	6	2	—	—	—	1
Al-Bakiriyah	4	—	4	—	2	—	1	—
Al-Khabra	2	—	2	—	—	—	—	—
Total	36	4	35	8	6	—	4	3

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# أكاروسات التربة وذوات الذنب القافز في منطقة القصيم المملكة العربية السعودية

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يشمل هذا البحث دراسة نوعية لمختلف مجموعات أكاروسات التربة وذوات الذنب القافز (الكولبولا) في عدة بيئات بمنطقة القصيم. وقد تم تسجيل أحد عشر نوعاً من أكاروسات التربة بالإضافة إلى نوعين من الكولبولا وذلك لأول مرة بالمملكة. هذا وقد أدرجت في هذا البحث قائمة تصنيفية ملحقه بمعلومات عن التوزيع الجغرافي للأنواع المختلفة بها. ولوحظ أن أكاروسات مجموعة الحلم الخنفسية (الكريبتوستيجماتا) فاقت بكثير أنواع الأكاروسات الأخرى في جميع العينات التي تم فحصها.

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