

# ARACHNIDA



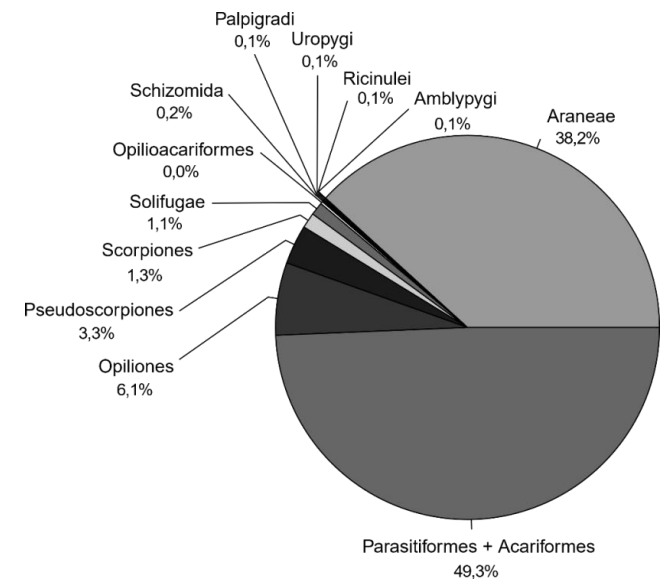
*Arachnology*

**Stano Pekár**

# Diversity

12-16 extant orders

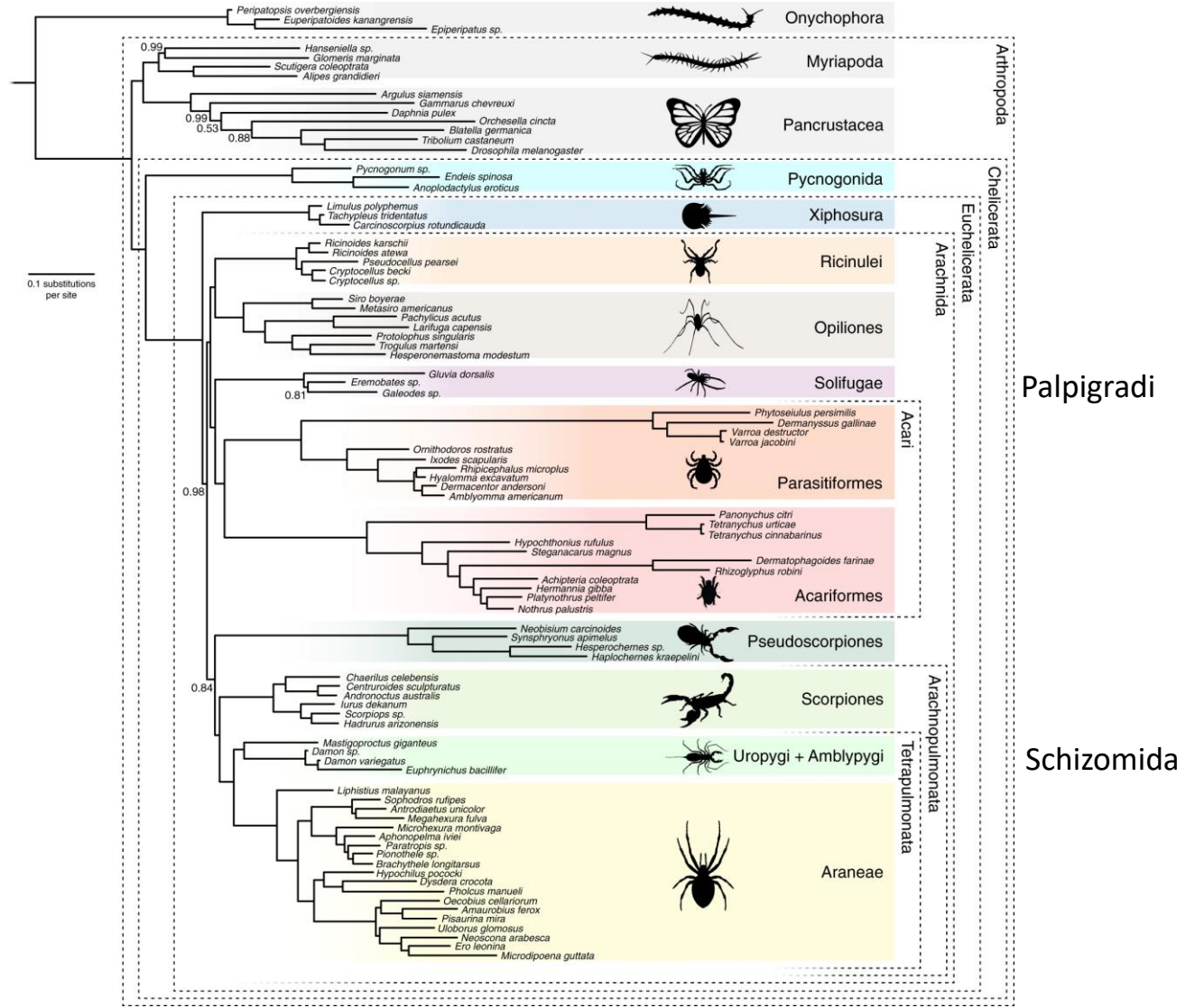
Order	Families	Genera	Species
Opilioacariformes	1	9	20
Ricinulei	1	3	55
Palpigradi	2	6	78
Uropygi	1	16	106
Amblypygi	5	17	136
Schizomida	2	34	205
Solifugae	12	141	1,087
Scorpiones	16	155	1,279
Pseudoscorpiones	24	425	3,239
Opiliones	25	500	6,000
Araneae	106	3,450	37,296
Parasitiformes	350-422	3,300-4,000	48,181
Acariformes			
<b>TOTAL</b>	<b>545-617</b>	<b>8,055-8,755</b>	<b>97,682</b>



(Harvey 2002)

# Phylogeny

missing: Schizomida  
Palpigradi



# Pseudoscorpiones

**Origin:** Devonian

**Diversity:** 4 200 species

**Distribution:** whole world

**Body size:** 2-8 mm

**Prosoma:** rostrisoma (projections on palpal coxae in front of mouth)

**Pedicel:** absent

**Opisthosoma:** 12 segments

**Eyes:** 0-2 pairs

**Chelicerae:** 2 segments, chelate, with spinning glands

**Pedipalps:** 6 segments, with chela, with venom gland

**Legs:** 6-7 segments, elongated patellae

**Respiration:** 2 pairs of trachea on 3th & 4th abdominal segments

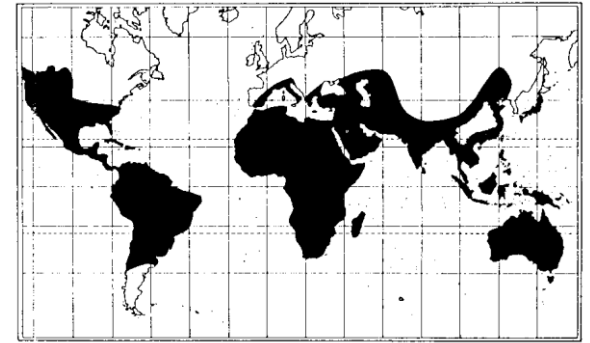


# Scorpiones

**Origin:** Silur

**Diversity:** 2 500 species

**Distribution:** whole world



**Body size:** 1–20 cm

**Prosoma:** gnathosoma

**Mesosoma:** 8 segments, 2nd: gonopore,  
3rd: pektines, 4-7th: book lung openings

**Pedicel:** absent

**Metasoma:** 5 segments + telson,  
paired venom gland

**Eyes:** 1 pair of median, 0-5 pairs of lateral

**Chelicerae:** 3 segments, chelate

**Pedipalps:** 6 segments, flexible finger

**Legs:** 7 segments

**Respiration:** 4 pairs of book lungs



*Euscorpium tergestinus*

# **Thelyphonida (Uropygi)**

**Origin:** Carbon

**Diversity:** 130 species

**Distribution:** tropics

**Body size:** up to 75 mm

**Prosoma:** carapace

**Pedicel:** present

**Opisthosoma:** 12 segments, flagellum with repugnatory glands

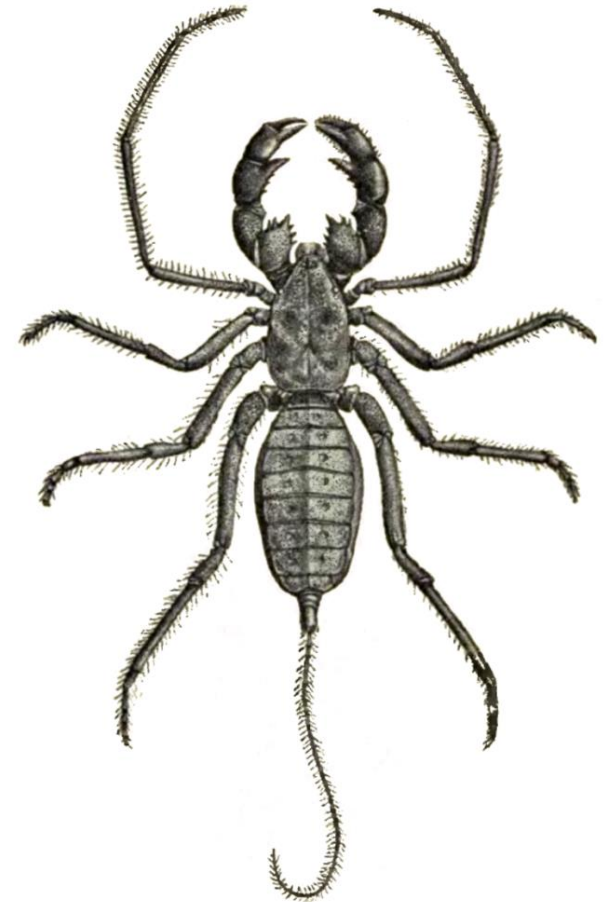
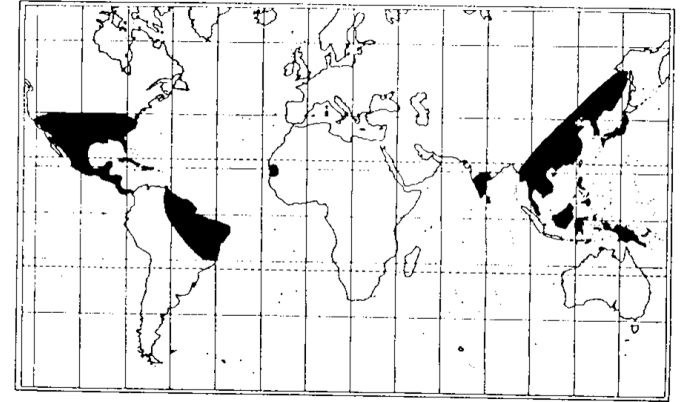
**Eyes:** 1 pair of median, 3-5 pairs of lateral

**Chelicerae:** 2 segments, subchelate

**Pedipalps:** 6 segments

**Legs:** 7 segments, 1st pair elongated

**Respiration:** 2 pairs of book lungs



# Schizomida

**Origin:** Paleogene

**Diversity:** 400 species

**Distribution:** circum-tropical,  
introduced to Europe

**Body size:** up to 18 mm

**Prosoma:** propeltidium, mesopeltidium,  
metapeltidium

**Pedicel:** present

**Opisthosoma:** 12 segments, repugnatory glands,  
mesosoma, metasoma (pygidium+flagellum)

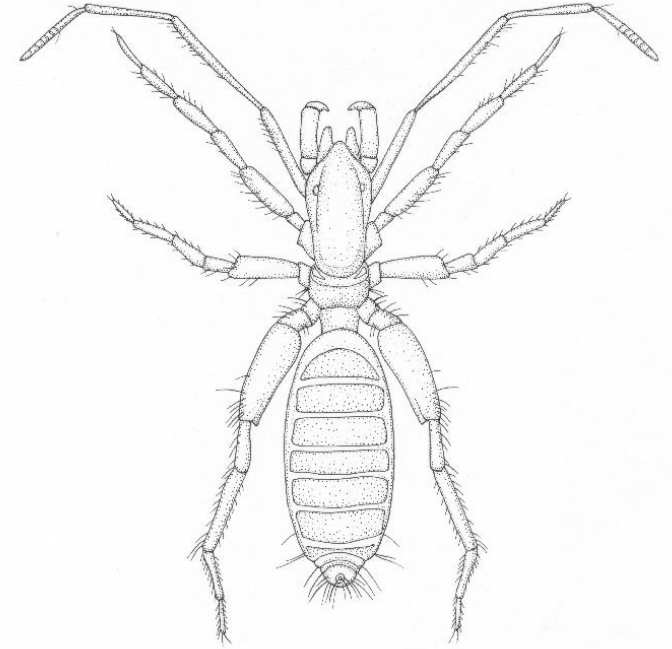
**Eyes:** absent

**Chelicerae:** 2 segments, almost chelate

**Pedipalps:** 6 segments

**Legs:** 7 segments, 1st pair elongated

**Respiration:** 1 pair of book lungs



*Stenochrus portoricensis*

# Amblypygi

**Origin:** Devonian

**Diversity:** 250 species

**Distribution:** circum-tropical

**Body size:** 10-45 mm

**Prosoma:** carapace,

**Pedichel:** present

**Opisthosoma:** 12 segments,  
last one – pygidium

**Eyes:** 2 median, 6 lateral

**Chelicerae:** 2 segments, subchelate

**Pedipalps:** 6 segments, elongated

**Legs:** 1st pair elongated,  
3-segmented tarsi

**Respiration:** 2 pairs of book lungs

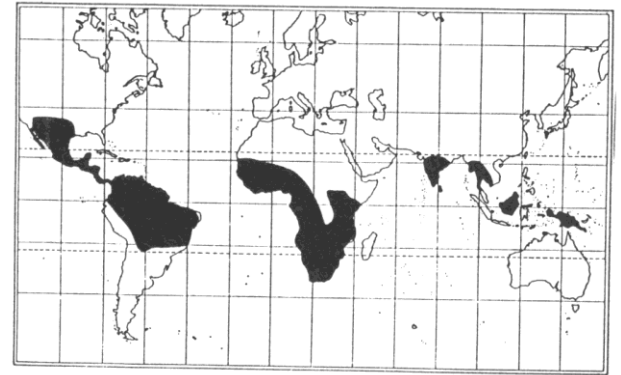
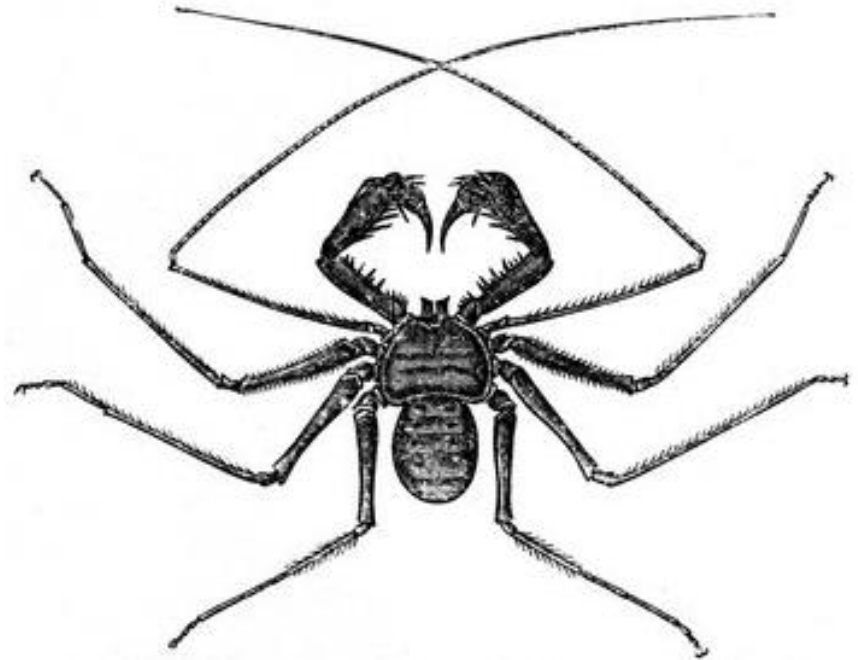


FIG. 49. Map showing the distribution of Amblypygi.





# Ricinulei

**Origin:** Carbon

**Diversity:** 100 species

**Distribution:** tropical Africa and America

**Body size:** 3-10 mm

**Prosoma:** carapace, cucullus

**Pedicel:** present

**Opisthosoma:** 9 segments, 3-segmented pygidium

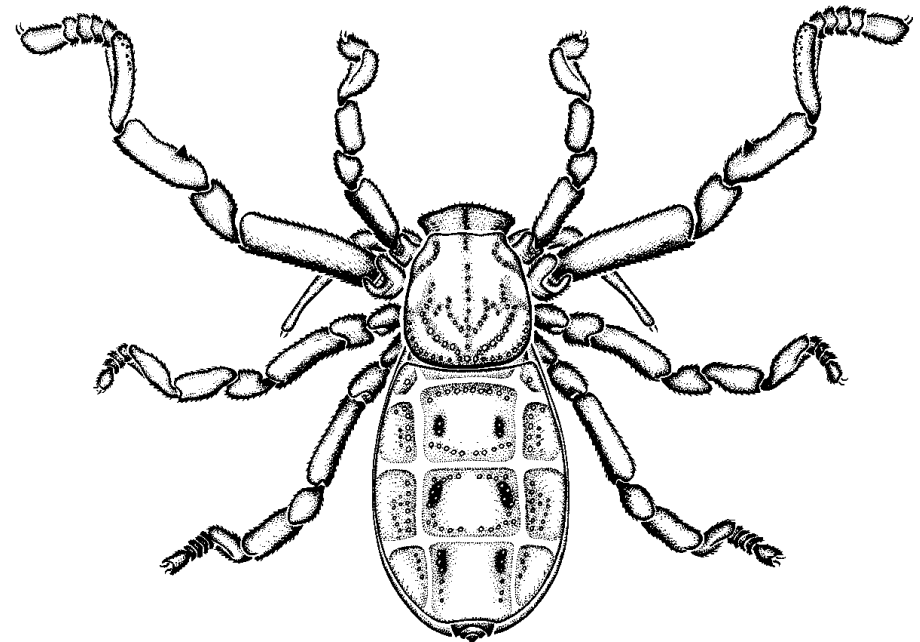
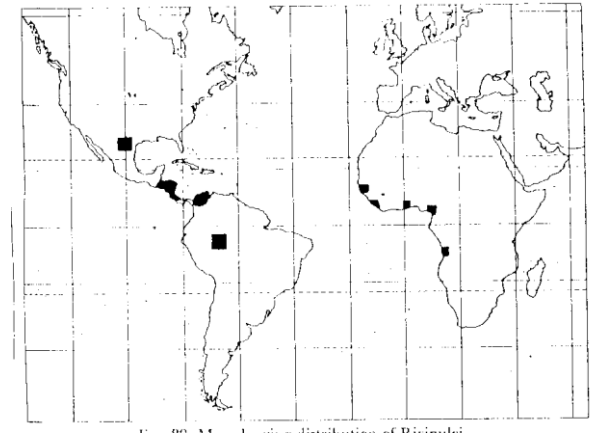
**Eyes:** absent

**Chelicerae:** 2 segments, chelate

**Pedipalps:** 6 segments

**Legs:** 7 segments, 2nd pair elongated

**Respiration:** one pair of tracheae



# Opiliones

**Origin:** Devonian

**Diversity:** 7 000 species

**Distribution:** whole world

**Body size:** 2-22 mm

**Prosoma:** carapace, pro-, meso-, metapeltidium, orificia of scent glands

**Opisthosoma:** 9-10 segments

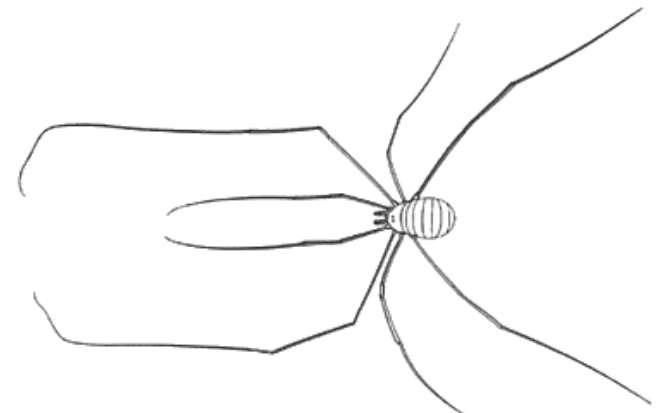
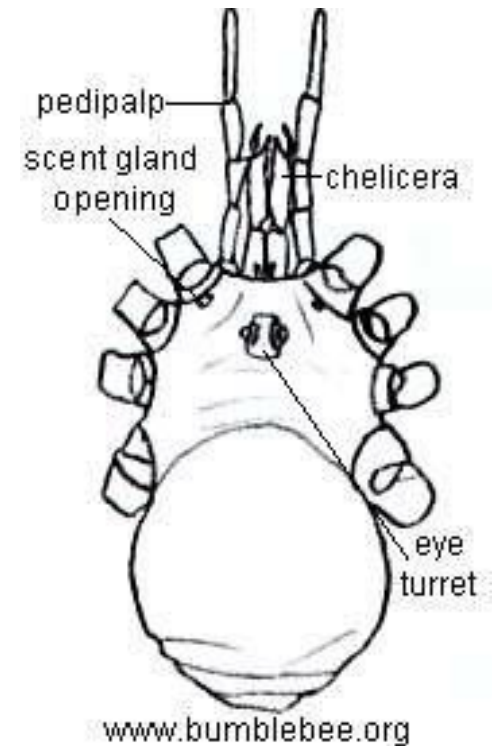
**Eyes:** pair of median on ocularium

**Chelicerae:** 3 segments, chelate

**Pedipalps:** 6 segments

**Legs:** 6-7 segments, tarsi sub-segmented

**Respiration:** openings of tracheae on 8th sternite



**Czechia: 33 species**

**Suborders:**

### **Cyphophthalmi**

- body size: 1-6 mm
- eyes: 2 or completely blind
- *Siro carpaticus*

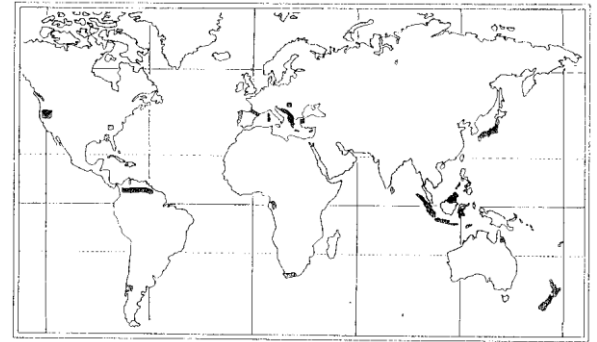
### **Laniatores**

### **Dispnoi**

- cheliceral fingers with small regular teeth
- Dicranolasmatidae, Ischyropsalidae, Nemastomatidae, Trogulidae

### **Eupnoi**

- tibia of adults with additional stigmata
- ovipositor articulated
- Sclerosomatidae, Phalangiidae



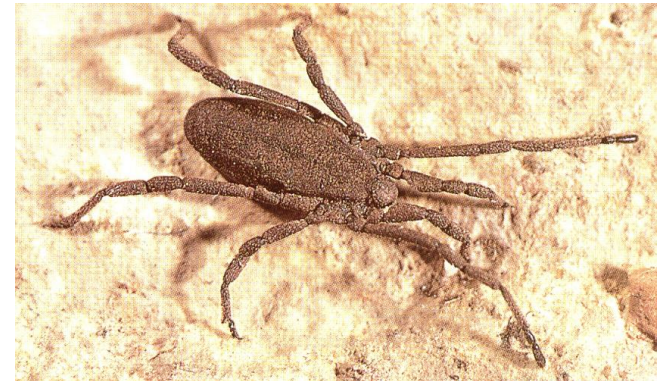
## Ischyropsalidae

- large chelicerae, longer than body
- specialised on snails
- *Ischyropsalis hellwigi*



## Trogulidae

- flat body with hood
- eye tubercle absent
- legs short
- *Trogulus tricarinatus*



## Dicranolasmatidae

- eyes on the hood
- *Dicranolasma scabrum*



## Nemastomatidae

- pedipalpal Ti with clavate setae
- *Nemastoma lugubre*



## Sclerosomatidae

- pedipalpal claws smooth
- *Leiobunum limbatum*



## Phalangiidae

- elongated gnathocoxa of the 2nd leg pair
- *Phalangium opilio*



# Palpigradi

**Origin:** Neogene

**Diversity:** 150 species

**Distribution:** tropics, under ground

**Body size:** 3 mm

**Prosoma:** 3 segments, rostrum,  
mesopeltidium small

**Opisthosoma:** 11 segments,  
flagellum (14-15 segments)

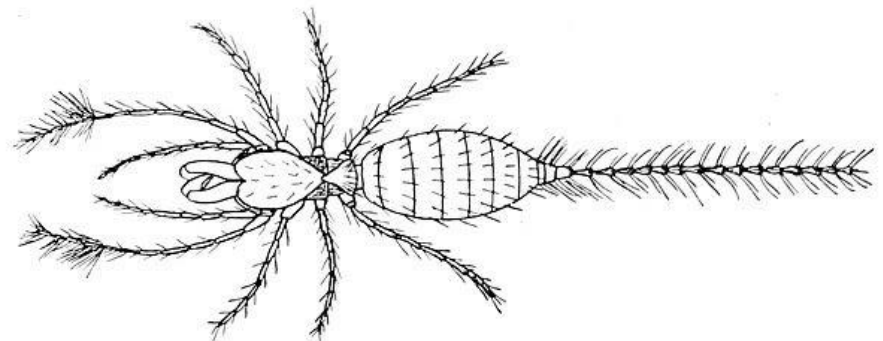
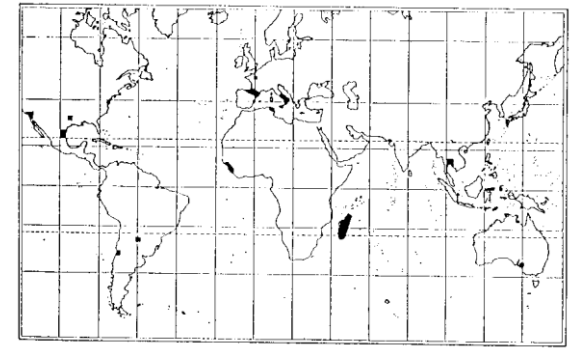
**Eyes:** absent

**Chelicerae:** 3 segments, chelate

**Pedipalps:** 6 segments

**Legs:** 1st pair with tactile organ

**Respiration:** no organs



*Eukoenenia spelaea*

# Solifugae

**Origin:** Carboniferous

**Diversity:** 1 200 species

**Distribution:** arid parts of tropics and subtropics  
(Greece 10 species)

**Body size:** 8-80 mm

**Prosoma:** pro-, meso-, metapeltidium

**Pedicel:** absent

**Opisthosoma:** 11 segments

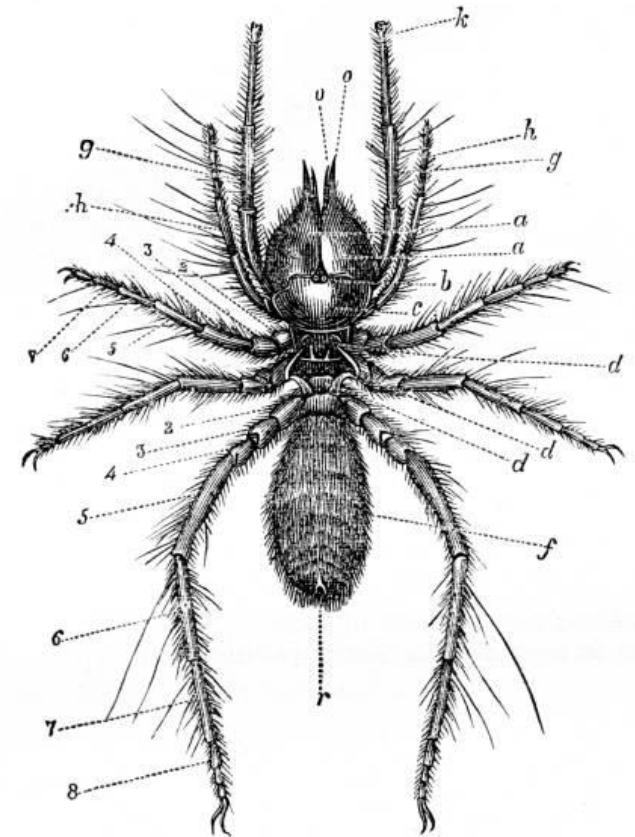
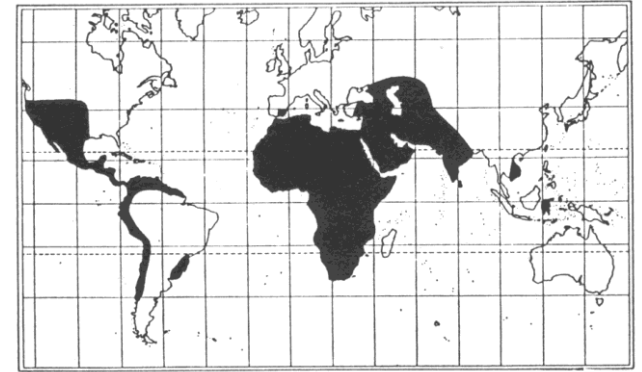
**Eyes:** 2-6 median eyes

**Chelicerae:** 2 segments, chelate

**Pedipalps:** 6 segments, sucking organ

**Legs:** 7 segments, 3-5 malleoli

**Respiration:** 3-5 pairs of tracheae



*Galeodes araneoides.*

# Acari

**Origin:** Devonian

**Diversity:** more than 50 000 species

**Distribution:** whole world

**Body size:** 0.1-30 mm

**Tagmata:** gnathosoma, idiosoma

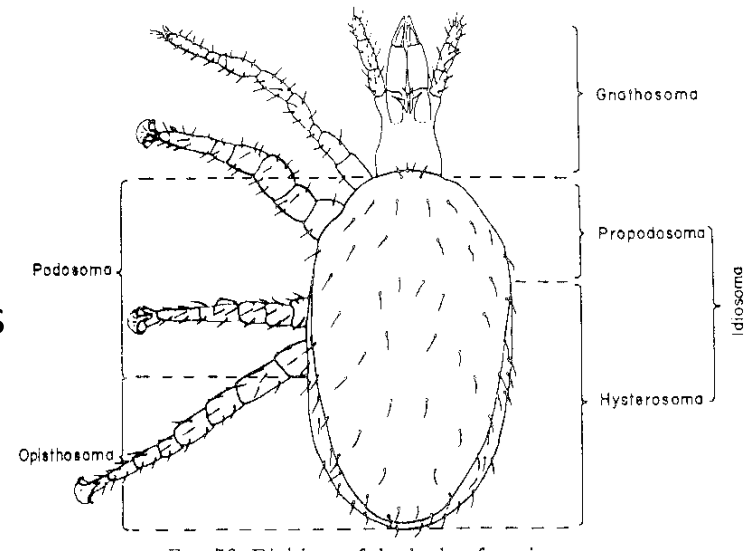
**Eyes:** lateral or absent

**Chelicerae:** originally chelate, 2-3 segments

**Pedipalps:** 6 segments

**Legs:** 6 (2-7) segments, larva with 3 pairs of legs

**Respiration:** tracheae or no organs



## Superorders

**Parasitiformes:** Opilioacaridae, Holothyrida, Ixodida, Gamasida

**Acariformes:** Actinedida, Sarcoptiformes



# Opilioacaridae

**Origin:** Cretaceous

**Diversity:** 40 species

**Distribution:** subtropical and tropical areas

**Body size:** 1-2.5 mm

**Body:** originally 18 segments

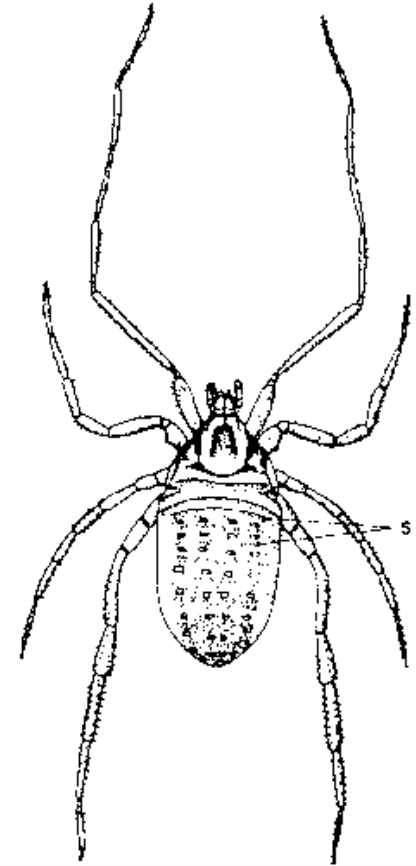
**Idiosoma:** undivided

**Eyes:** 2-3 pairs

**Chelicerae:** 3 segments

**Legs:** coxae loose (separate segments)

**Respiration:** tergites with 4 pairs of stigmata



# Holothyrida

**Origin:** Cretaceous

**Diversity:** 30 species

**Distribution:** southern Hemisphere

**Body size:** 2-7 mm

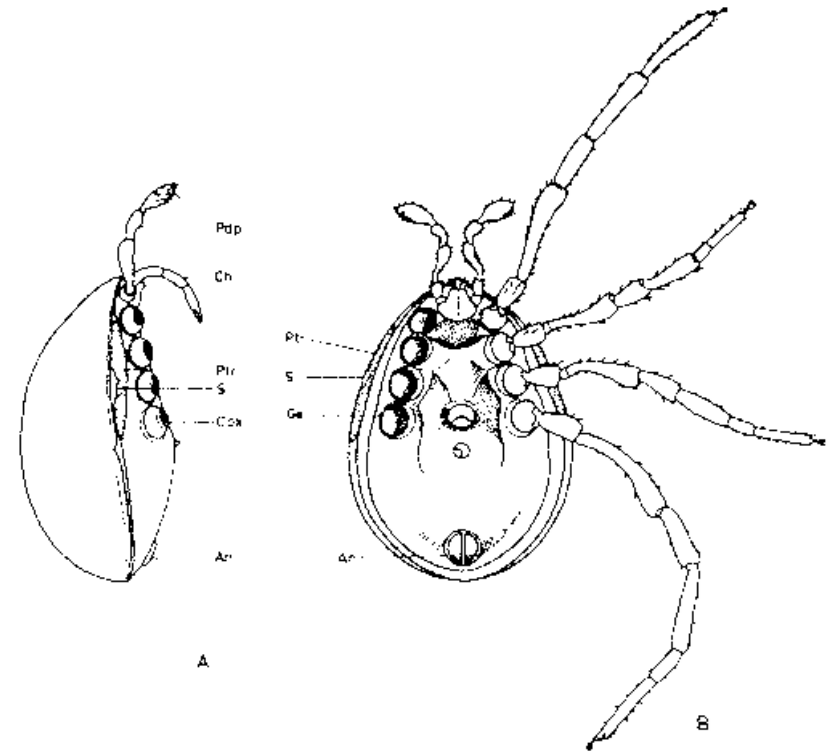
**Body:** originally 18 segments, sclerotised

**Idiosoma:** undivided

**Eyes:** often absent

**Legs:** coxae loose (separate segments)

**Respiration:** 1 (2) pair of stigmata  
laterally on Cx



# Ixodida

**Origin:** Cretaceous

**Diversity:** 1 000 species

**Distribution:** whole world

**Body size:** less than 2 mm

**Body:** originally 18 segments

**Idiosoma:** undivided

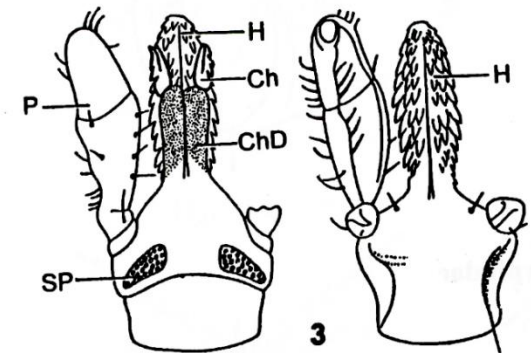
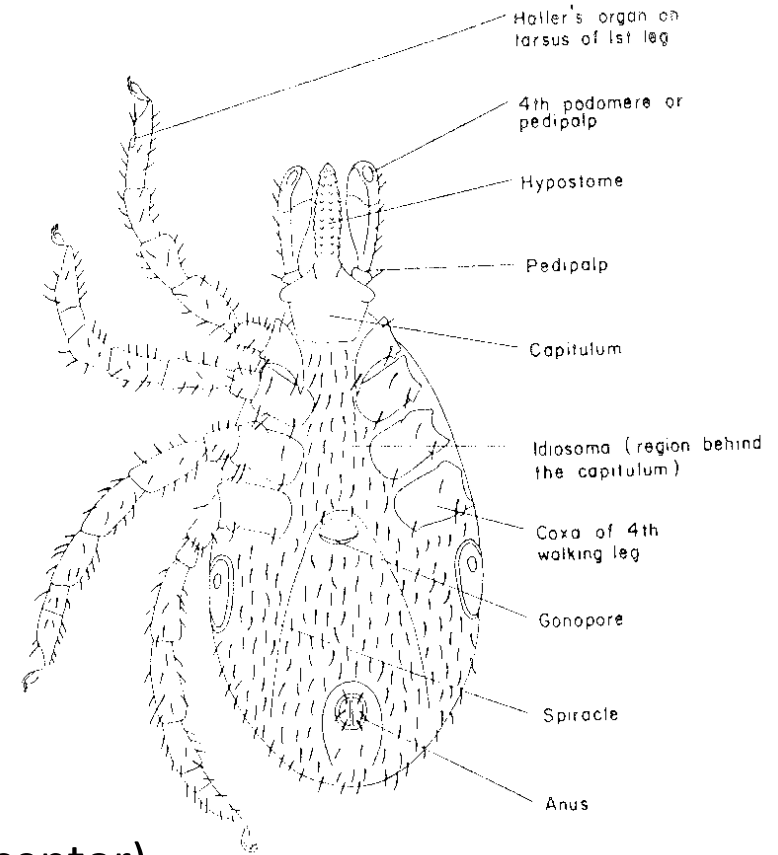
**Chelicerae:** hypostome

**Pedipalps:** 3 segments

**Legs:** Cx loose (separate segments),

Ta of the 1st pair with Haller's organ (chemoreceptor)

**Respiration:** stigmata on special plates in front or behind 4th leg pair



# Gamasida

**Origin:** Cretaceous

**Diversity:** 12 000 species

**Distribution:** whole world

**Body size:** 0.5-3 mm

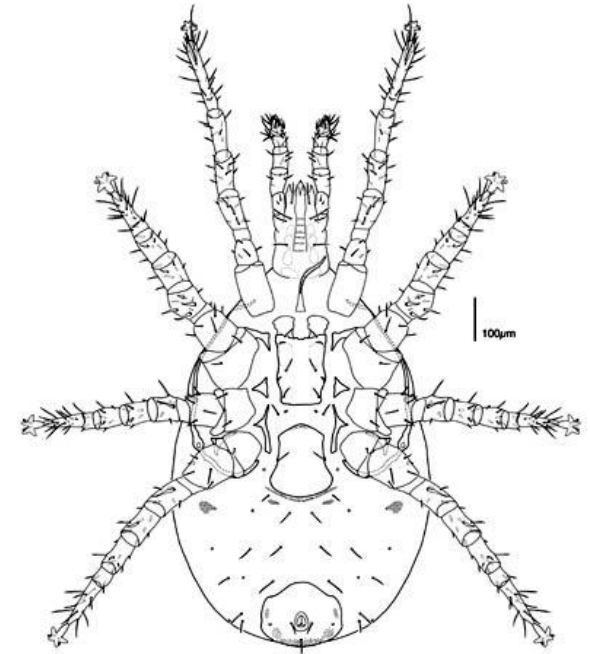
**Body:** originally 18 segments

**Idiosoma:** undivided

**Chelicerae:** retractible

**Legs:** Cx loose (separate segments)

**Respiration:** 1 pair of stigmata laterally on Cx II-IV



*Varroa jacobsoni*



*Dermanyssus gallinae*



*Phytoseiulus persimilis*



# Actinedida

**Origin:** Devonian

**Diversity:** 25 000 species

**Distribution:** whole world

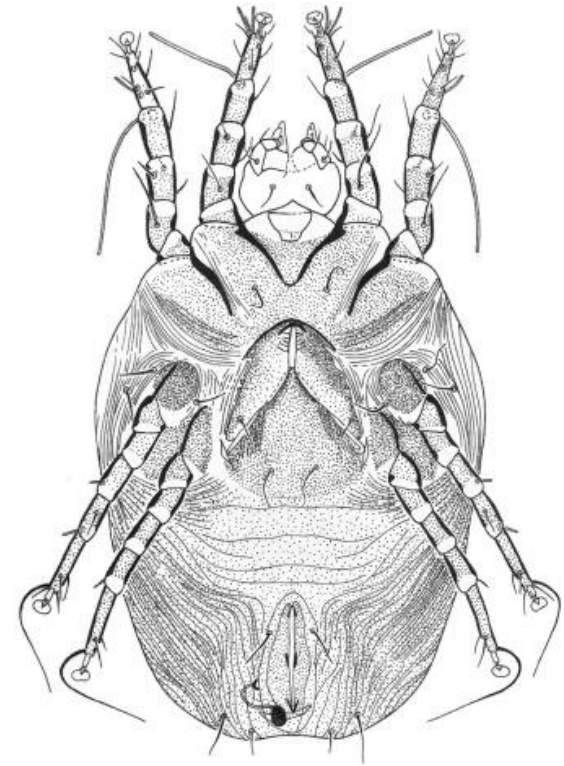
**Body size:** less than 2 mm

**Body:** originally 16 segments

**Idiosoma:** divided to propodosoma and histerosoma

**Legs:** Cx fused with ventral body wall

**Respiration:** stigmata close to bases of chelicerae or pedipalps



*Trombidium holosericeum*

*Tetranychus telarius*



*Demodex folliculorum*



# Sarcoptiformes

**Origin:** Devonian

**Diversity:** 16 000 species

**Distribution:** whole world

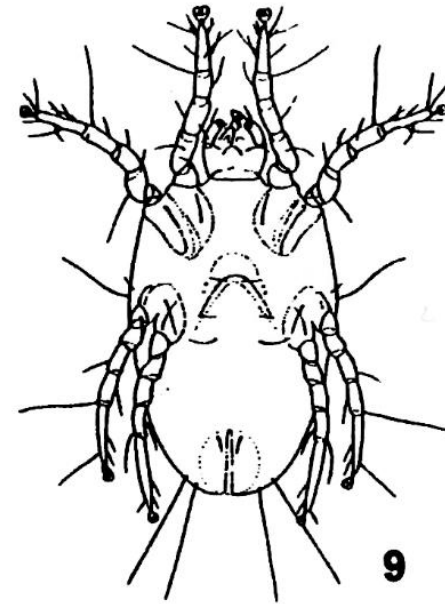
**Body size:** less than 2 mm

**Body:** originally 16 segments

**Idiosoma:** divided to propodosoma and histerosoma

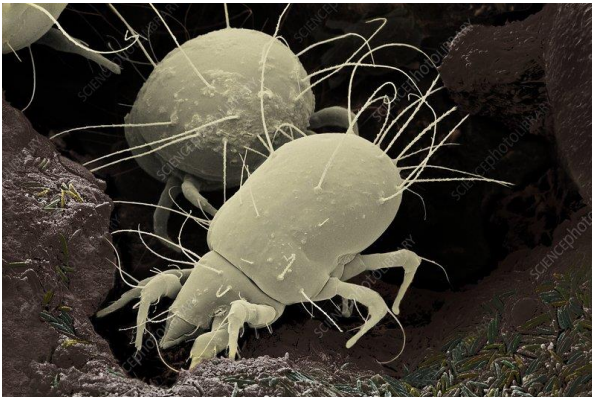
**Legs:** Cx fused with ventral body wall

**Respiration:** tracheae absent

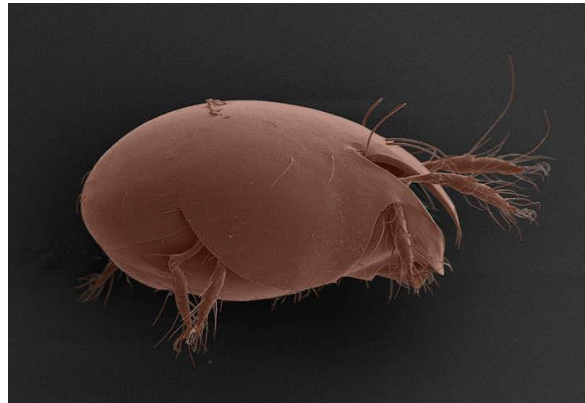


*Sarcoptes scabiei*

*Acarus siro*



Oribatid



# Araneae

**Origin:** Carbon

**Diversity:** 52 000 species

**Distribution:** whole world

**Body size:** 1-80 mm

**Prosoma:** carapace

**Pedicel:** petiolus

**Opisthosoma:** 1-2 pairs of spinnerets

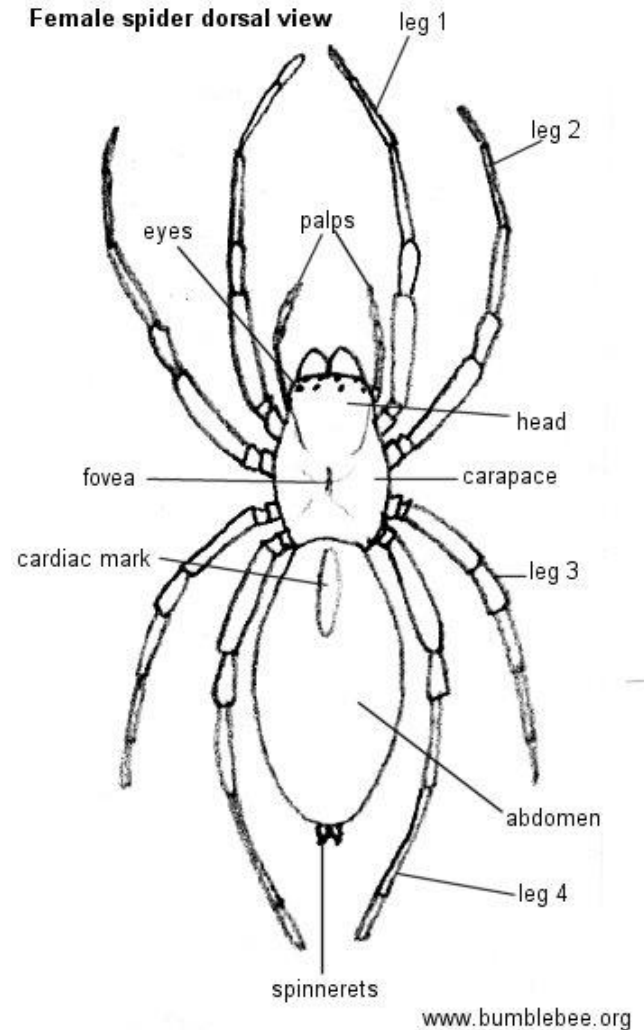
**Eyes:** 2-8

**Chelicerae:** 2 segments, subchelate, venom gland

**Pedipalps:** 6 segments, in males with copulatory organs

**Respiration:** 0-2 pairs of book lungs

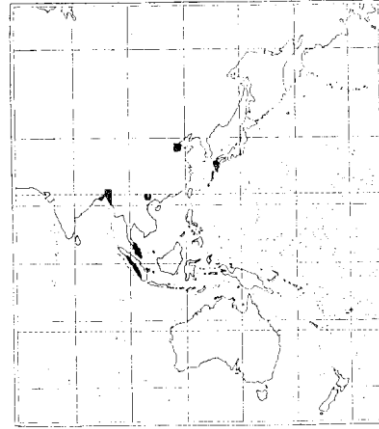
0-2 pairs of tracheae



## Suborders:

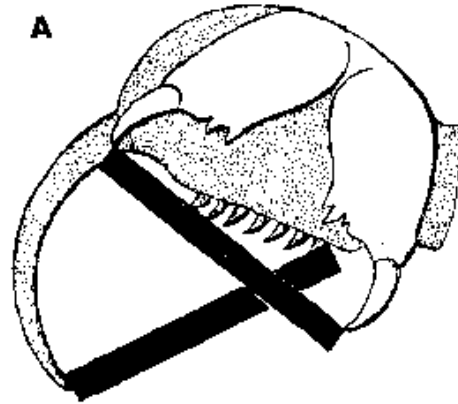
### Mesothelae

- chelicerae paraxial
- 4 pairs of spinnerets, on 4th-5th abdominal segments
- segmented abdomen



### Mygalomorphae

- chelicera prognathous



### Araneomorphae

- chelicera labidognathous



# Czech spiders

900 species

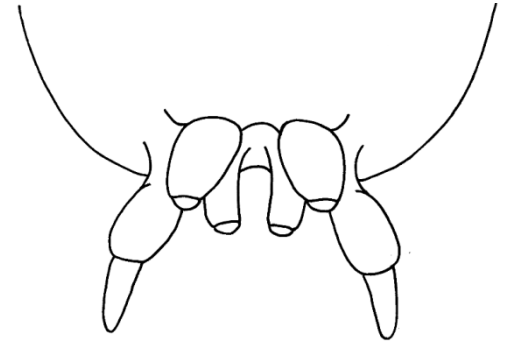
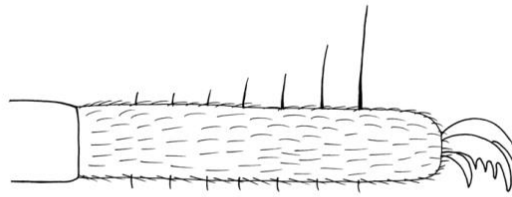
- AMAUROBIIDAE (4 species)
- ANAPIDAE (1 species)
- CYBAEIDAE (2 species)
- LIOCRANIDAE (10 species)
- MYSMENIDAE (2 species)
- OCHYROCERATIDAE (1 species)
- SPARASSIDAE (1 species)
- TRACHELIDAE (1 species)
- ZOROPSIDAE (1 species)



# AGELENIDAE

↔ 5-20 mm

14 species



- series of trichobothria of increasing length on Ta
- 2 segmented posterior spinnerets longer than anterior
- \* build sheet webs with tubular retreat

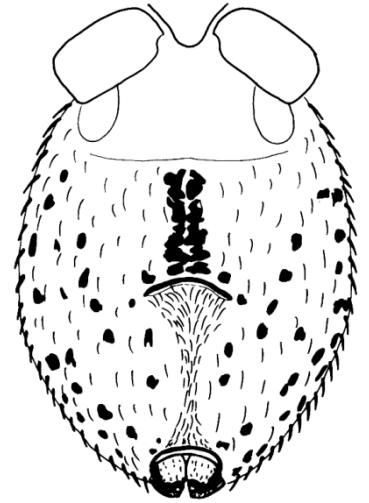
## *Tegenaria*



# ANYPHAENIDAE

↔ 4-8 mm  
2 species

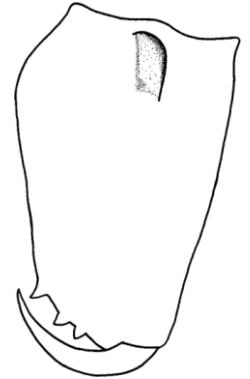
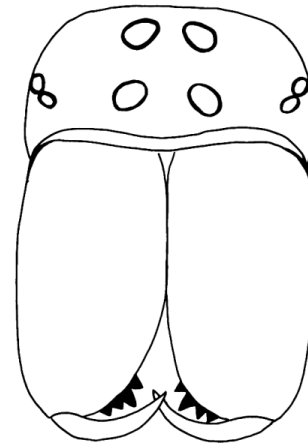
- tracheal stigma in the middle of abdomen (ventrally)
- \* free-living hunters, common on plants or trees



*Anyphaena*

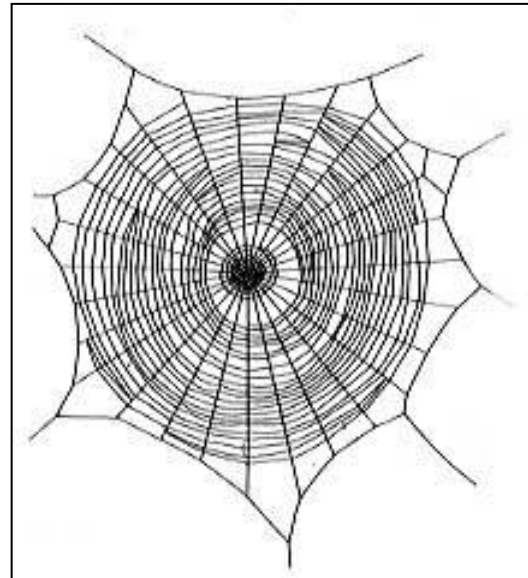
# ARANEIDAE

↔ 2-20 mm  
46 species



- height of clypeus = diameter of AE (cf. Linyphiidae)
- chelicerae often with condylus
- legs with strong spines
- \* build vertical orb webs with a sticky spiral

*Hypsosinga*



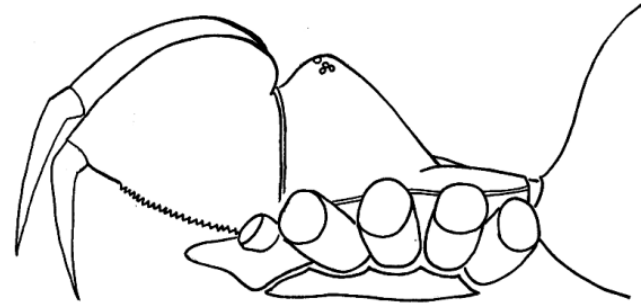
*Argiope*



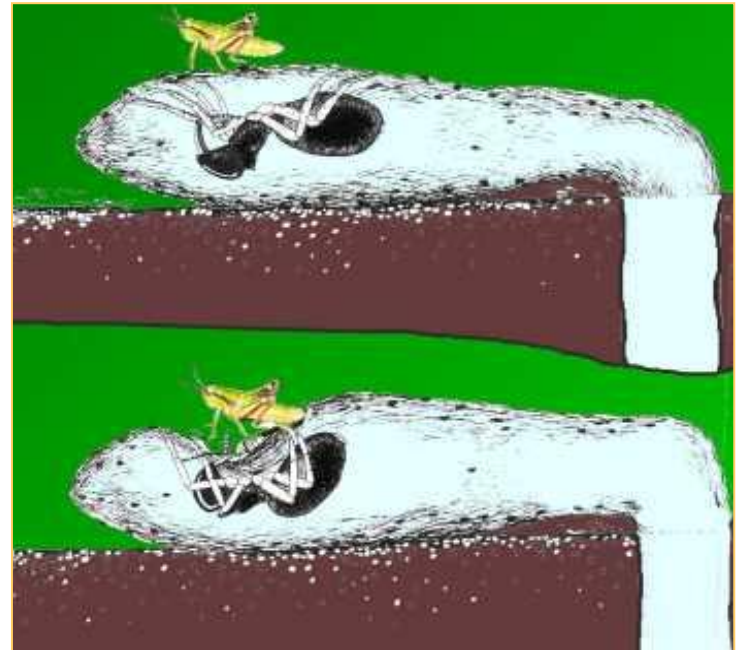
# ATYPIDAE

↔ 7-15 mm  
3 species

- massive orthognath chelicerae (as long as the carapace)
- \* live inside closed tube-like burrows dug in the ground



*Atypus*

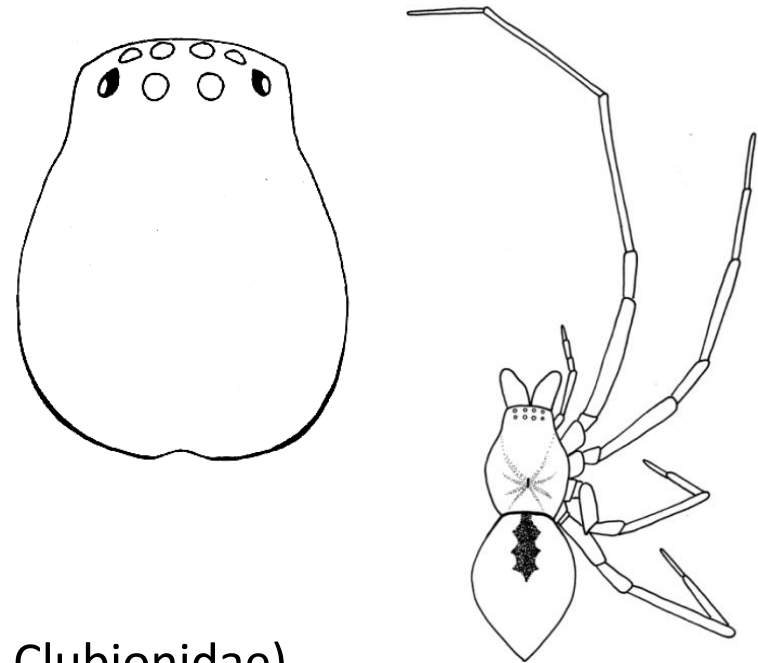


# CHEIRACANTHIDAE

## (Miturgidae)

↔ 5-15 mm  
10 species

- width of eye field  $\geq$  half of prosoma width
- legs long, leg I considerably longer than leg II (cf. Clubionidae)
- \* free-living nocturnal hunters on foliage



### *Cheiracanthium*

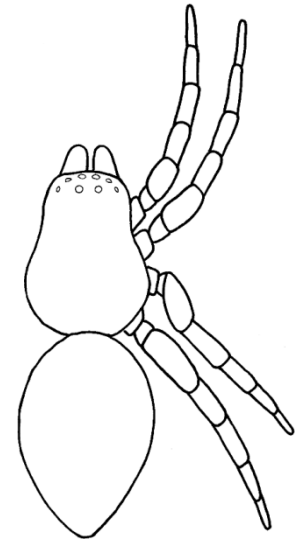
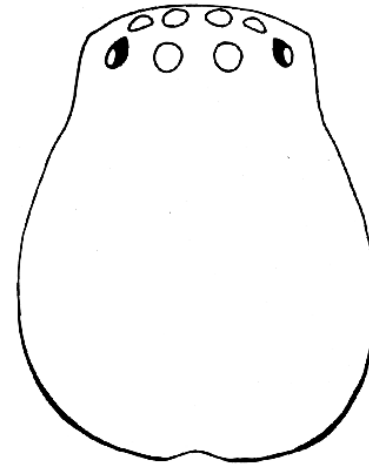


# CLUBIONIDAE

↔ **3-11** mm  
27 species

- width of eye field  $\geq$  half of the largest width of prosoma
- legs short and stout, of similar length (cf. Cheiracanthidae)
- \* free-living nocturnal hunters on foliage

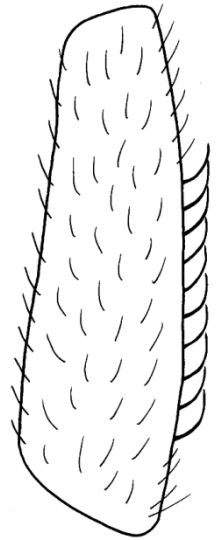
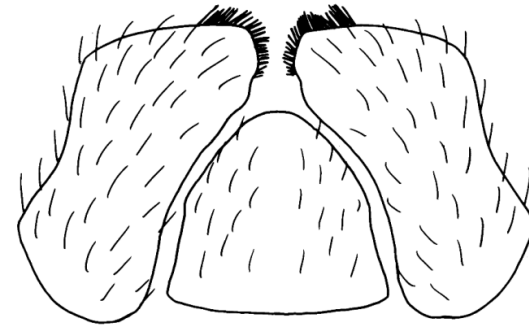
*Clubiona*



# DICTYNIDAE

↔ 1-4 mm  
23 species

- ♀ calamistrum in one row
- gnathocoxae enclosing labium (cf. Titanoecidae)
- \* build tangled cribellate webs on vegetation



*Dictyna*

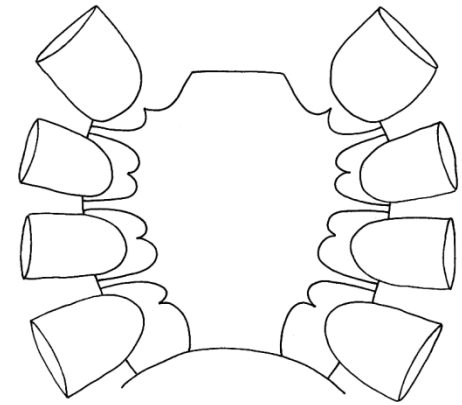




# DYSDERIDAE

↔ 5-15 mm  
10 species

- 6 eyes arranged in a circle
- sternum with intercoxal sclerites
- chelicerae may be porrect
- \* free-living nocturnal ground-dwellers



*Harpactea*

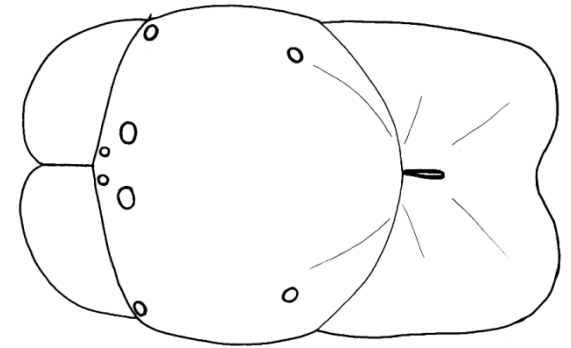


*Dysdera*



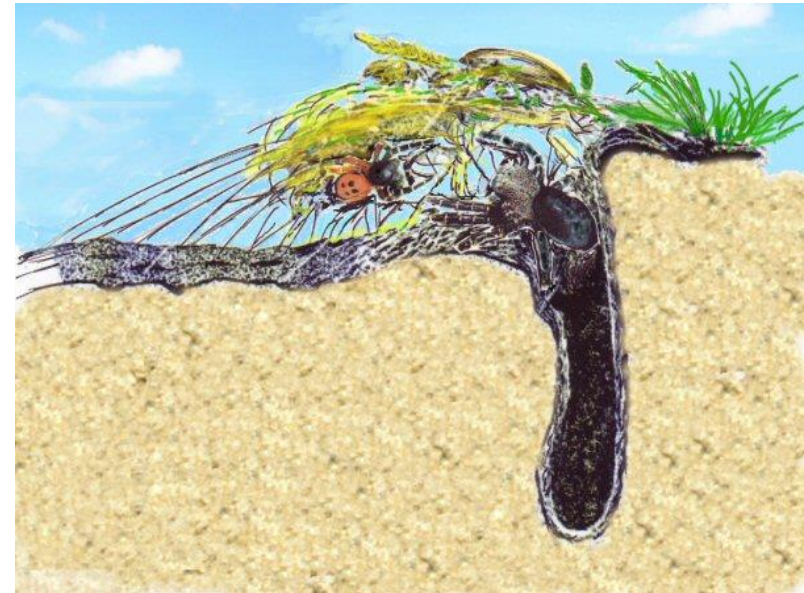
# ERESIDAE

↔ 3 - 20 mm  
4 species



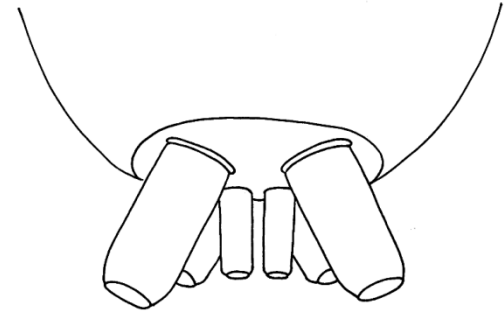
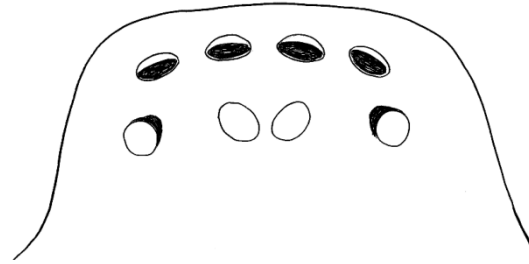
- 8 small eyes, ME close together, LE at corners of prosoma
- carapace dorsally rectangular
- \* build tangled webs with tube retreat in the ground

## *Eresus*



# GNAPHOSIDAE

↔ 2-18 mm  
75 species



- 8 small eyes, in 2 rows, PME usually oval
- anterior spinnerets cylindrical, parallel and longer than others
- \* nocturnal free-living hunters on the ground

*Drassodes*



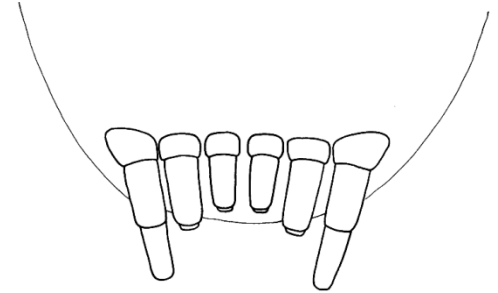
*Zelotes*



# HAHNIIDAE

↔ 1-3 mm  
12 species

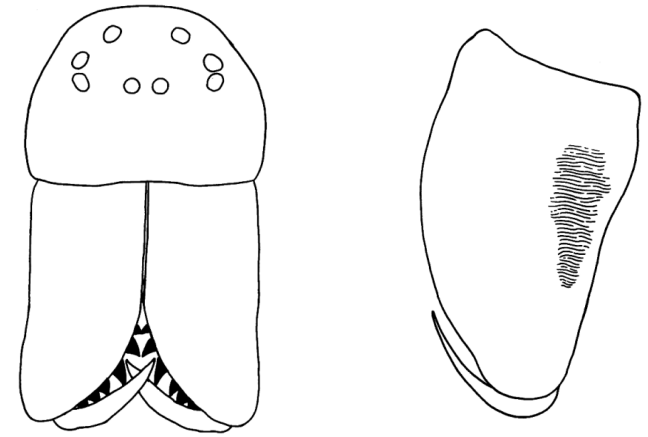
- 8 eyes in 2 rows
- all spinnerets arranged in a transverse row
- \* build small sheet webs on ground



*Hahnia*

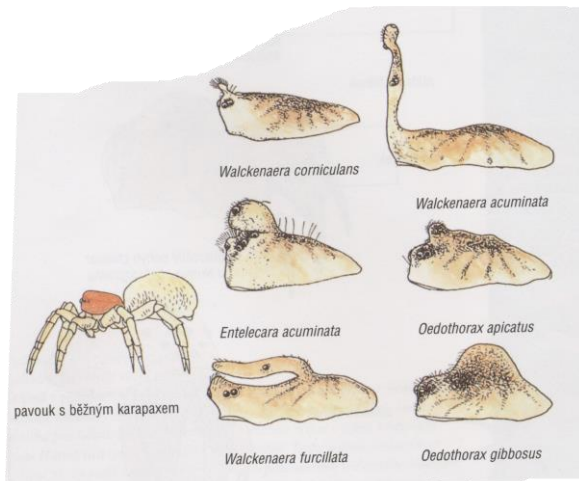
# LINYPHIIDAE

↔ 1-7 mm  
320 species



- height of clypeus > 2x diameter of AE (cf. Araneidae)
- chelicerae often with stridulating ridges
- \* build sheet webs on ground and in foliage

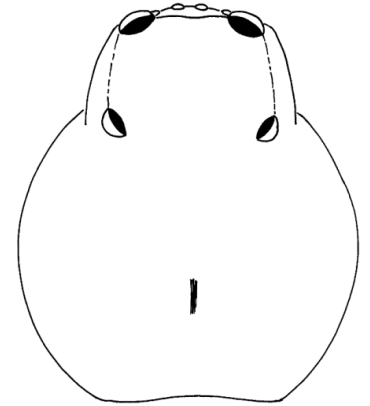
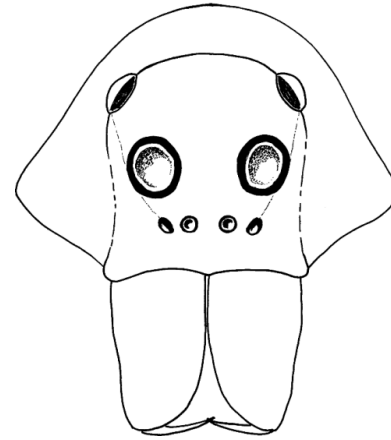
## *Linyphia*



# LYCOSIDAE

↔ 3-30 mm  
65 species

- 8 eyes in 3 rows, PME largest
- \* free-living ground-dwellers



*Trochosa*



*Pardosa*



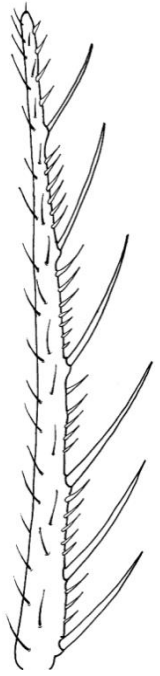
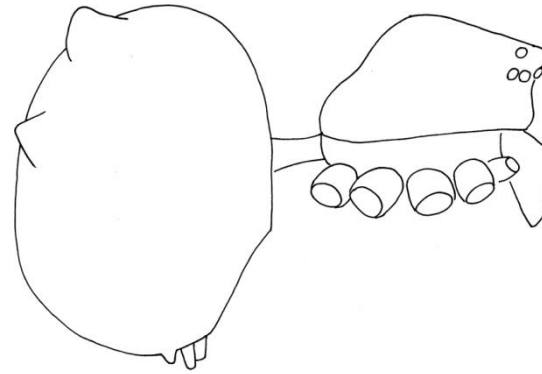
*Pirata*



# MIMETIDAE

↔ 3-4 mm  
4 species

- 1 to 3 pairs of small tubercles on abdomen
- Mt I, II and Ta I, II with series of prominent spines
- \* free-living on foliage, araneophagous



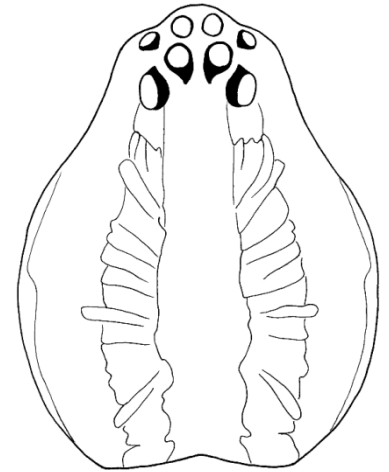
*Ero*



# MITURGIDAE (Zoridae)

↔ 4-7 mm

8 species



- 8 eyes closely grouped, first row procurved
- carapace pale yellowish with pair of longitudinal brown bands
- \* diurnal free-living ground-dwellers



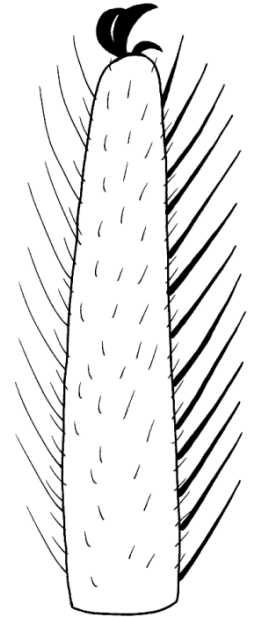
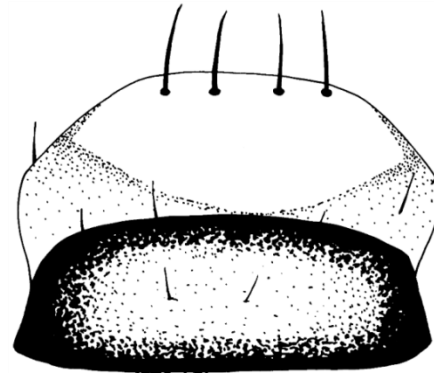
*Zora*



# NESTICIDAE

↔ 2-6 mm  
2 species

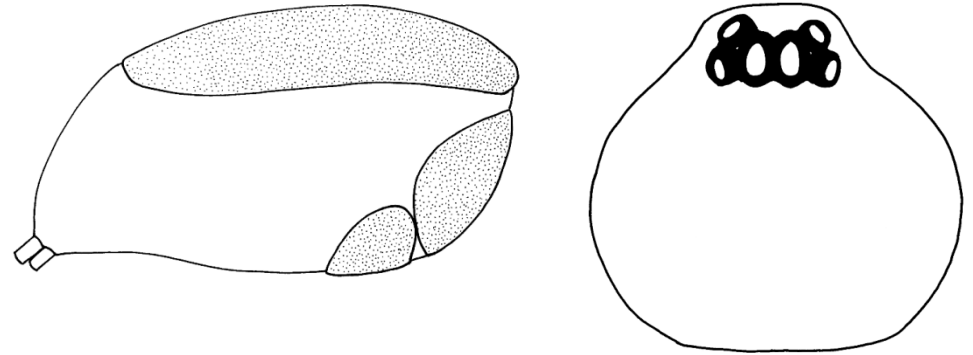
- legs with few or no spines, bristles on Ta IV
- labium with front margin swollen (cf. Theridiidae)
- \* build tangled webs in dark places



*Nesticus*

# OONOPIDAE

↔ < 2 mm  
4 species



- 6 eyes arranged in a compact group
- abdomen often with scuta
- \* free-living ground-dwellers, mostly synanthropic

*Triaeris*



*Oonops*

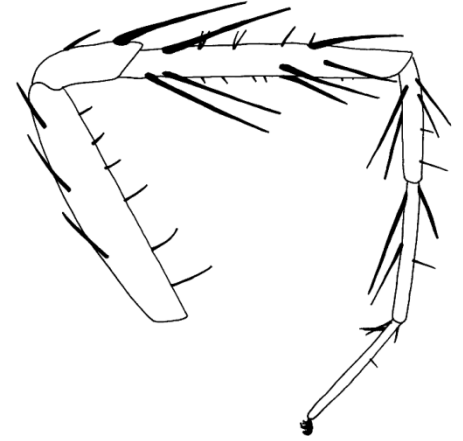
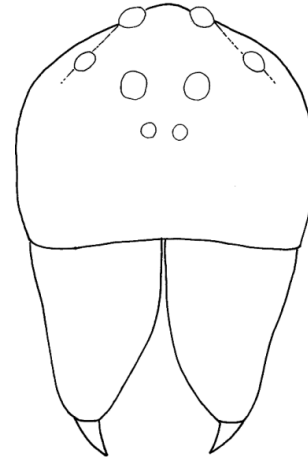


# OXYOPIDAE

↔ 5-10 mm

1 species

- 8 eyes in 4 rows, hexagonal eye field
- legs with very long spines
- \* diurnal free-living plant-dwellers

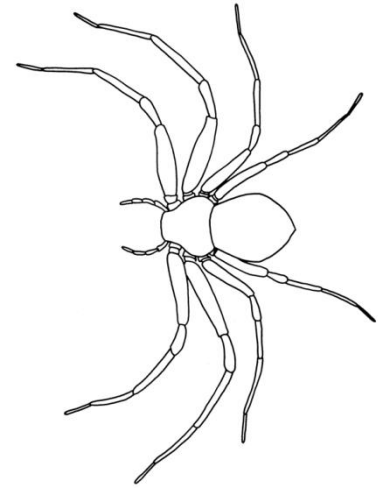
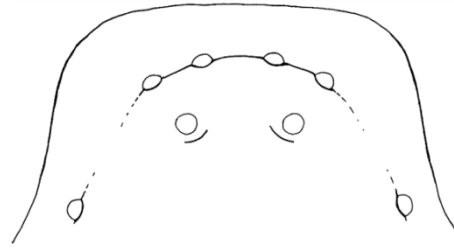


*Oxyopes*

# PHILODROMIDAE

↔ 3-10 mm  
25 species

- 8 eyes, row of PE recurved, similar in size
- legs long, prograde, legs II usually longer than others
- \* free-living hunters common on foliage



*Tibellus*



*Philodromus*

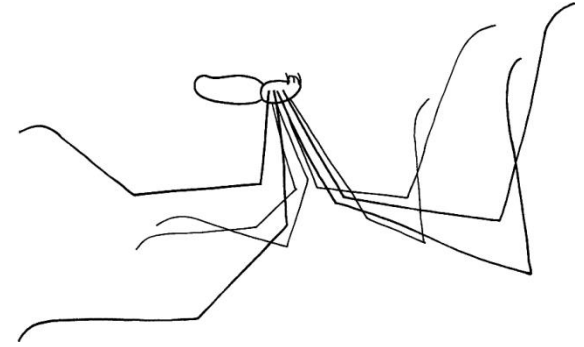
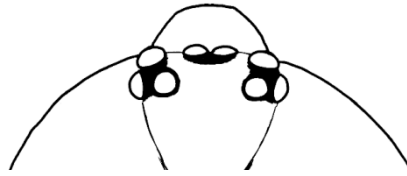


*Thanatus*



# PHOLCIDAE

↔ 2-10 mm  
8 species



- 6 of 8 eyes arranged in 2 triads, AME much smaller than the rest
- very long and slender legs
- \* build tangled webs, mostly synanthropic

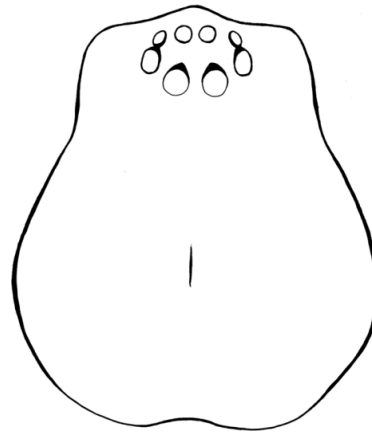
## *Pholcus*



# PHRUROLITHIDAE

## (Corinnidae)

↔ 3-5 mm  
4 species



- width of eye field < half of largest width of prosoma (cf. Clubionidae)
- Mt I+II with long ventral bristles
- \* diurnal free-living ground-dwellers

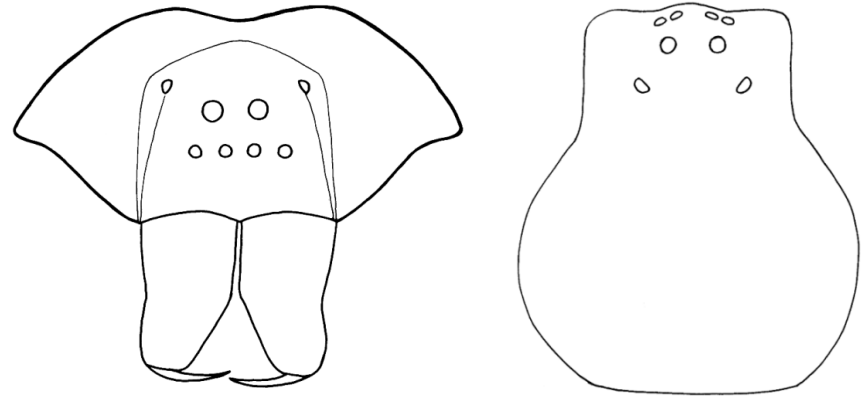


*Phrurolithus*

# PISAURIDAE

↔ 9-20 mm

3 species



- 8 eyes in 3 rows, similarly sized
- \* diurnal, free-living on low vegetation or water surface

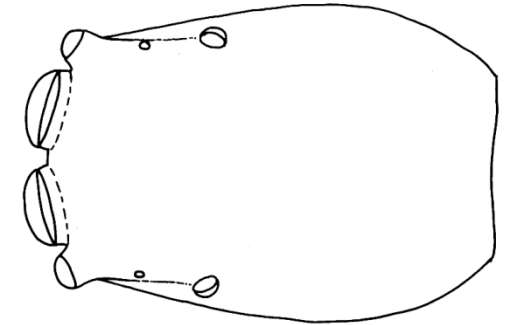
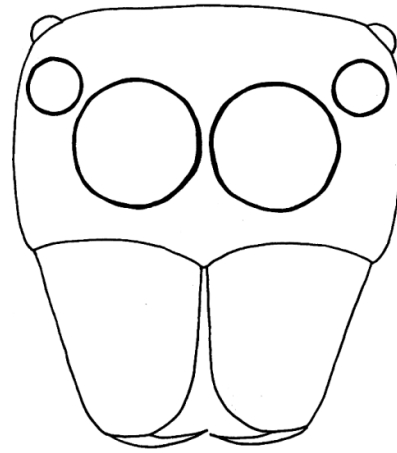
*Pisaura*

*Dolomedes*



# SALTICIDAE

↔ 2-12 mm  
72 species



- 8 eyes in 3 rows, AME largest, quadrangular eye field
- \* diurnal jumping hunters in canopy and on ground

*Philaeus*



*Myrmarachne*



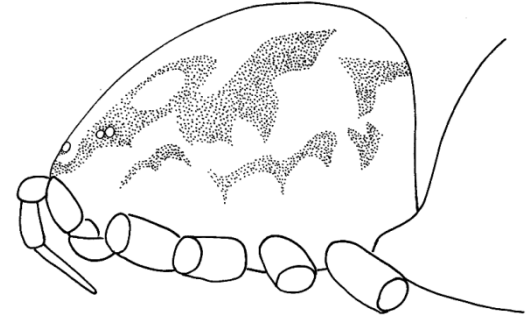
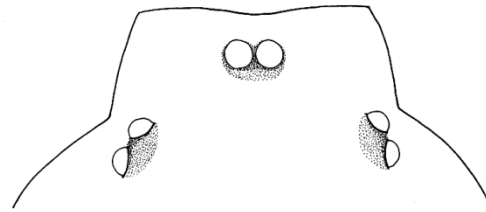
*Salticus*





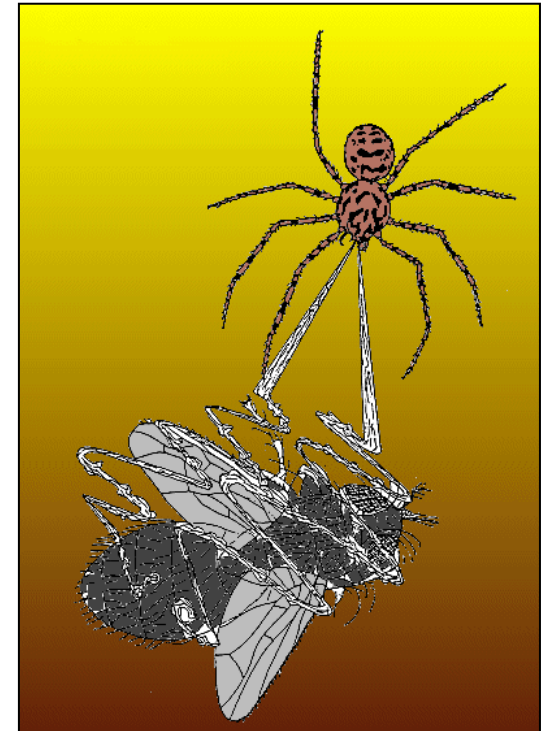
# SCYTODIDAE

↔ 3-6 mm  
1 species



- 6 small eyes in 3 separated groups of 2
- carapace very domed
- \* nocturnal free-living hunter, spray gum and poison from chelicerae, synanthropic

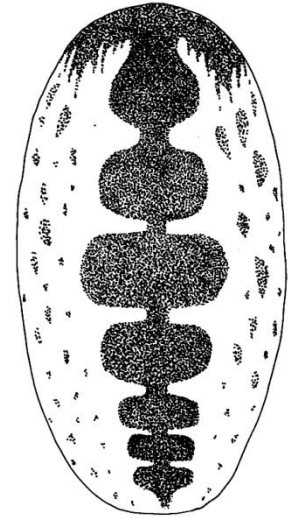
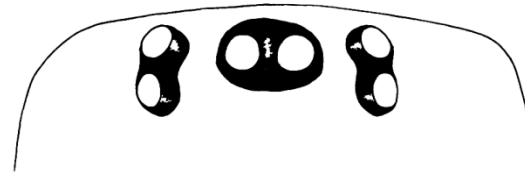
*Scytodes*



# SEGESTRIIDAE

↔ 6-15 mm  
2 species

- 6 eyes in 3 groups of 2
- abdomen with a clear dark pattern
- \* build tube-webs with radiating silk in walls or barks



## *Segestria*

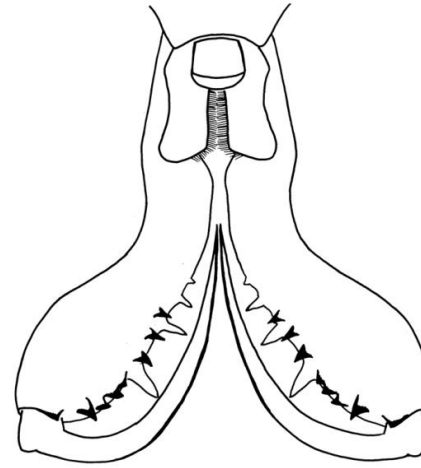


# TETRAGNATHIDAE

↔ 3-15 mm

15 species

- chelicerae often long and massive
- maxillae much longer than wide
- \* build orb webs with open hub



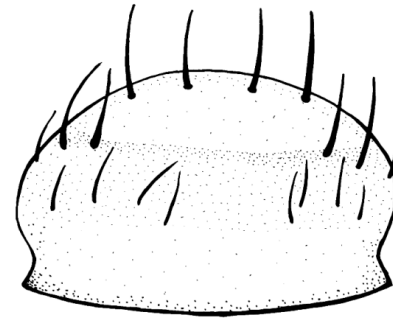
*Tetragnatha*



# THERIDIIDAE

↔ 2-13 mm  
74 species

- legs with few or no spines, serrated bristles ventrally on Ta IV
- labium with the front margin NOT swollen (cf. Nesticidae)
- \* build tangled webs in vegetation



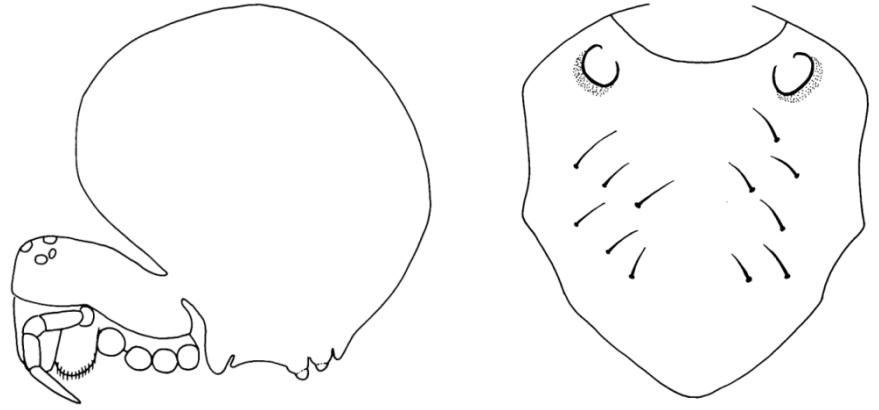
## *Phylloneta*



# THERIDIOSOMATIDAE

↔ 1-3 mm  
1 species

- sternum with two depressions
- globular abdomen
- \* build small horizontal orb webs, inverted umbrella-like

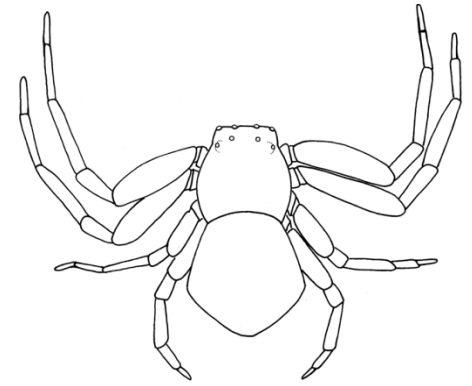
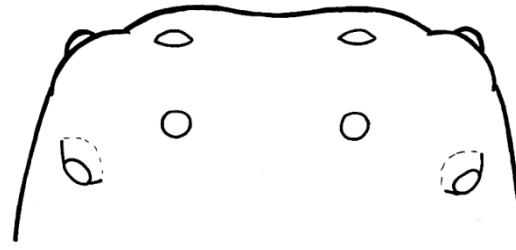


*Theridiosoma*



# THOMISIDAE

↔ 3-10 mm  
42 species



- 8 eyes, row of PE recurved, similar in size
- legs long, prograde, legs II usually longer than others
- \* free-living hunters common on foliage

*Thomisus*



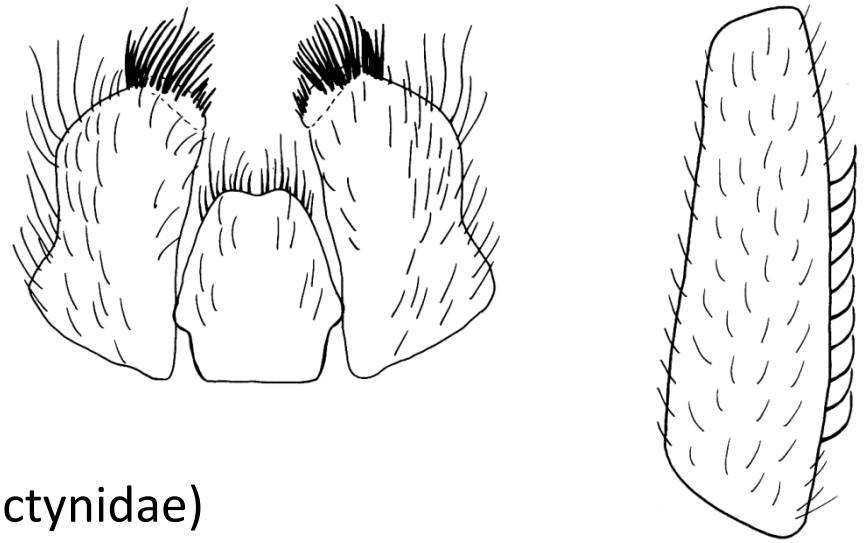
*Diaea*



# TITANOECIDAE

↔ 3-7 mm  
4 species

- ♀ calamistrum in one row
- gnathocoxae parallel with labium (cf. Dictynidae)
- \* build tangled cribellate webs under stones



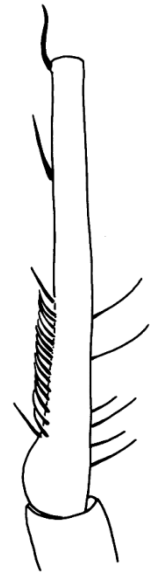
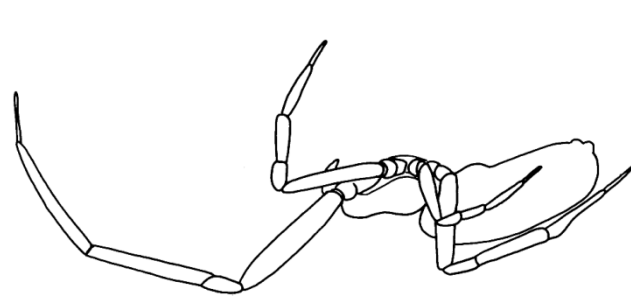
*Titanoeca*



# ULOBORIDAE

↔ 3-6 mm  
3 species

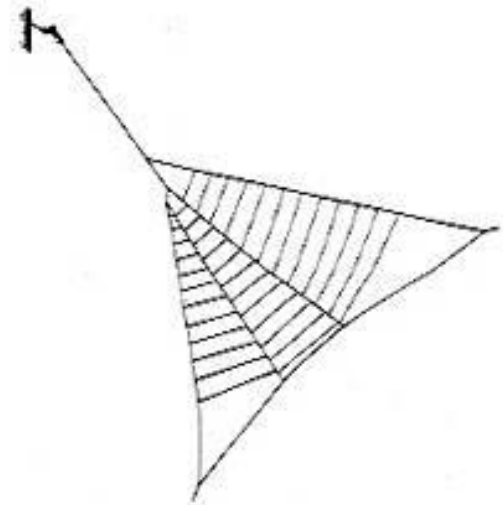
- legs I and IV clearly longer than others
- Mt IV curved with calamistrum
- \* build horizontal orb webs or triangular webs with cribellate silk



*Uloborus*



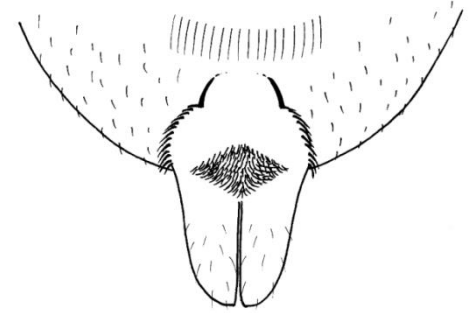
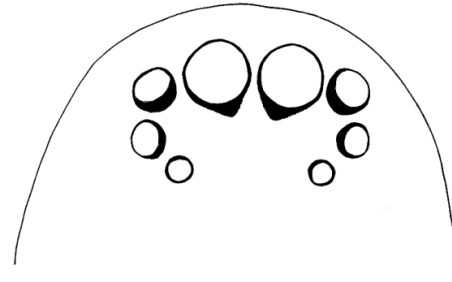
*Hyptiotes*





# ZODARIIDAE

↔ 2-5 mm  
4 species



- 8 eyes arranged in heart-like shape
- anterior spinnerets much larger than the rest
- \* free-living ground-dwellers

*Zodarion*

