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DISTRIBUTION AND FAUNAL COMPOSITION IN NORTH AND NORTHEAST OF SPAIN OF SOME MITES AND TICKS PARASITIC ON CHIROPTERA (SPINTURNICIDAE, MACRONYSSIDAE, IXODIDAE, AND ARGASIDAE)

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CHIROPTERA
SPINTURNICIDAE
MACRONYSSIDAE
IXODIDAE
ARGASIDAE
SPAIN

INTRODUCTION

The mites infesting Chiroptera have been scarcely studied in Spain. During the 59's and 60's, BALCELLS (1952, 1954, 1955, 1959, 1961, 1963a, b, 1965, 1967, 1968) and BALCELLS and GRACIA (1963) collected a few sporadic data about these parasites. Apart from these records, and those carried out by DEUNFF (1977), nothing else is known about their faunal composition and distribution in Spain.

The results reported here refer to the study of a collection assembled by E. BALCELLS et al., kept in the Instituto Pirenaico de Ecología, Jaca, Huesca (today found in Cátedra de Parasitología, Facultad de Veterinaria, Zaragoza) and also a large amount of samples collected by J. SERRA in Cataluña. As a whole, the number of samples is 1585. In this way, we have studied a wide area which involves the North of Spain (Cantabria), the Región Levantina, País Vasco and Cataluña (in these two places the hosts have been more intensively captured) and some areas of Aragón.

SUMMARY: A study over 1,585 individuals about geographical and faunal composition of mites infesting Chiroptera in Spain has been carried out. The authors point out the presence of seven species of Spinturnicidae, ten species of Macronyssidae, two of Ixodidae and two species of Argasidae.

RÉSUMÉ: Les auteurs ont effectué une étude de la composition faunistique et de la distribution en Espagne des acariens parasites de Chiroptères, soit 1 585 individus. Ils signalent la présence de sept espèces de Spinturnicidae, dix espèces de Macronyssidae, deux espèces d'Ixodidae et deux d'Argasidae.

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RESULTS AND DISCUSSION

FAMILY SPINTURNICIDAE.

*S. myoti* Kolenati, 1856.

Leg. Siriá 1 COMAS.
Cueva Castañera (Obregón, Santander), *Ex. Miniopterus schreibersii*, 4♀, 6♂, 2 DN (10-V-64).
Cueva de la Guixas (Villanúa, Huesca), *Ex. My. emarginatus* 1♂, 2 DN (28-VII to 4-VIII-63).
Can Palomeres (Barcelona), *Ex. My. myotis* 11♀, 11♂, 8 DN (6-VI-60).
Cueva del Candil (Campillo, Vallencia), *Ex. My. nattereri*, 1♀ (5-II-67).
Cueva de las Caldas Asturias, *Ex. My. blythi* 5♀, 15♂, 4 PN, 3 DN, (2-VI-65); 20, 52, 4 PN, 6 DN (2-VI-65).
Leg. M. SOLER.
Sima de Sa Guitarreta (Lucmajor, Mallorca), *Ex. My. myotis*, 12♂, 13♀, 4 PN, 10 DN (12-V-68).

It may be the most widely distributed species of *Spinturnix*; in Europe, north Africa and United States. It shows a very low host specificity. In our research, we have found it on species of *Myotis*, *P. savi* and *M. Schreibersi*. Deunff (1977) noted that parasite has been found so many times outside of *Myotis myotis*, that it makes think these different hosts are not casual ones.

*Rhinolophus* does not appear to be a favorite host. Individuals belonging to the *R. euryale* colony found in Cueva de las Guixas have not behaved as host for this mite. On the other hand, the parasite has been isolated from *Myotis emarginatus*, in the same place.

Morphological variation (Deunff 1977) shows evidence for a complex *S. myoti* composed of several groups which could be defined only by the study of aditional information.

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*Spinturnix emarginatus* Kolenati, 1856.

Pons (Lérida), *Ex. My emarginatus*, 2♂, 3♀, 4 PN, 2 DN (25-VI-63).

The distribution of *S. emarginatus* is yet poorly known, maybe because many authors don’t consider this species different from *S. myoti*. It has been described in isolated spots from Europe (Netherlands, Belgium, France, Hungary) being our finding the first occurence in Spain. According to results from Dusbaček (1962, 1964b) and Deunff (1977) the single host for this parasite is *My. emarginatus*. Our results show a high specificity for this bat. We have found 5 specimens on *R. euryale*, a casual parasitism, probably due to the presence of two main colonies of Chiroptera (300 individuals according to Balcells, 1965) in the Cueva de las Guixas: *My. emarginatus* (40 % of individuals) and *R. euryale* (50 %) with a scarce 10 % of *R. ferrumquinum*. The crowds of *My. emarginatus* may be eventually associated with those of *R. euryale* (Balcells, 1965). Ecological conditions in both localities of captures differ clearly one from each other. In Pons, hosts were taken from country house. The ones coming from Villanúa, were found in the dark area of the cave. Much moist doesn’t seem to be requested in any cases.

*Spinturnix psi* Kolenati, 1856.

Avenc del Puig de’n Març (Tarragona), *Ex. M. Schreibersi*, 12♂, 16♀, 2 PN (8-XII-86); 3 (12-1-86); 1, 4, 3 PN (23-II-86); 2 (22-III-86).
Avenc del Davi (Barcelona), *Ex. M. Schreibersi*, 5♀, 5♀ (XII-58); 7♀, 5♀ (XII-82); 2♀, 7♀ (XII-85); 7♀, 12♀, 1 PN (21-XII-85).
Can Palomeres (Barcelona), *Ex. M. Schreibersi*, 3♀, 4♀, 1 PN, 3 DN (16-VI-85); 20♀, 42♀, 30 PN, 9 DN (11-V-86); 6♀, 3♀, 2 DN (1-1VI-86). *Ex. Myotis sp.* 6♀, 3 PN, 2 DN (21-IV-85).
Cova de la Vall de’n Rubi (Tarragona), *Ex. M. Schreibersi*, 14♀, 6♀, 3 PN, 2 DN (6-IV-86).
Mines de la Cartanya (Barcelona), *Ex. M. Schreibersi*,
myotis was collected high enough to make cao be due to the migrating ability of the host type, in the coast of Catalufia. The place this individual Llucamajor (Mallorca). Temperature (21-22°C.) was M. schreibersi, finding of a sample of this species on amount of individuals belonging to parasite. spoke about other on Rhinolophidae and Vespertilionidae. capaccini the island of Mallorca, together with a considerable schreibersi, samples taken from other host for it. RUDNICK widely investigated for many years in Spain, spe­ caucca de las Caldas (Asturias), because its main host, Sima Cueva de la Gran Grieta Central (Orozco, Vizcaya), Ex. Plecotus auritus 5♀, 2 ♀ (20-III-65), Leg. G.E.V. Ortigosa (Rioja), Ex. P. Auritus, 2 ♀, 3 ♀, 3 DN (VIII-85).

Spinturnix plecotinus is distributed all along Europe (Eire, England, Germany, Checoslovakia, Yugoslavia and France) as shown by HIRSE (1927), TURK (1945) and DEUNFF (1977). It had never been found before in Spain.

Its usual host is Plecotus auritus, but TURK (1945) also found it on Nyctalus noctula. DUSBÁ BECK (1964a) added Eptesicus nilssoni and DEUNFF (1977) also spoke about Rhinolophus ferrumequi­num as a host for it. Our finding of the species on E. serotinus must be considered as casual parasiti­sm.


We have studied many specimens of this species because its main host, M. schreibersi, has been widely investigated for many years in Spain, specially in Cataluña.

This species is thought to be host-specific for M. schreibersi, although some authors described many other host for it. RUDNICK (1960) mentions several samples taken from Vesperitollo and Vesperugo as wrongly identified hosts. DUSBÁBEK (1962, 1964a) spoke about other “cave bats” as host for the parasite. BERON (1965) remarked casual parasitism on Rhinolophidae and Vespertilionidae.

In addition to the individuals we found My. capaccini and My. myotis, we want to remark the finding of a sample of this species on My. myotis in the island of Mallorca, together with a considerable amount of individuals belonging to S. myoti. This can be due to the migrating ability of the host type, M. schreibersi, wich is usually found widely spread in the coast of Cataluña. The place this individual was collected (Sima de Sa Guitarreta) is close to Llucamajor (Mallorca). Temperature (21-22°C.) was high enough to make a “Wochenstube” of Myotis myotis (BALCELLS, 1968).

Spinturnix plecotinus Koch 1839
Jaca (Huesca), Ex. Eptesicus serotinus, 2 ♀, 2 ♀ (5-VIII-63).

Sima de les graelles (Valencia). Ex. Myotis daubentonii 2 ♀, 3 ♀, 8 DN (9-V-85).

DEUNFF (1977) described this species as separated from S. myoti complex, working with samples from France and Spain. S. andegavinus differs from S. myoti in body measures and morphological features, as the scales of non-sclerotized integument.

The single capture of this species (13 individuals) carried out in our study, points out its high host specificity for My. daubentonii. In the same place we captured some M. schreibersi on which no mites of this species were found.

Paraperiglischrus rhinolophinus Koch, 1844.
Cueva Castañera (Obregón, Santander), Ex. Rhinolophus euryale, 1 ♀ (20-III-67).
Cueva de las Guixas (Villanúa, Huesca), Ex. R. euryale, 1 ♀, 1 ♀ (28-VII ro 4-VIII-63).
Cova des Terres (Guilleries, Gerona), Ex. R. euryale, 1 ♀ (28-XII-58).
Forat del Gel (Vilanova de Meiá, Lérida), Ex. Barbastella barbastellus, 1 ♀ (4-I-64).

In spite of being widely distributed in Europe, Asia and Africa, only a few specimens of this species have been collected by ZUMPTE (1930), HIREGAUDAR and BAL (1955, 1956), RUDNICK (1960), DUSBÁBEK (1962, 1964a, b) and DEUNFF (1977). The samples
we have studied only reach a very low percentage of
the whole captures carried out.

All the papers referring to the species agree with
its high specificity for Rhinolophidae. So, our capture on *B. barbastellus*, at 1 340 meters over sea,
is to be considered as a case of aberrant parasitism.

*Eynhovenia euryalis* Canestrini, 1884.

Cueva de las Guixas (Villanúa, Huesca), *Ex. R. euryale*
25♂, 29♀, 10 PN, 6 DN (28-VII to 4-VIII-63).

This species has been only found in a place with
a mediterranean vegetational type in the proximities
of the cave. This species presents a high specificity
for bats of the genus *Rhinolophus*. RUDNICK (1960)
and DEUNFF (1977) have pointed out the one-host
qualities of the parasite, although they have also
cited Myotis and Miniopterus as casual hosts. In the
Cueva de las Guixas, they are lots of *Myotis emarginatus*,
on which this species has not been found. Captures made by DEUNFF (1977) in France,
snow an important focus of the parasite in the
Pyrenees. This agres with our only finding of the
species in Spain, which has taken place few kilometers
far from the French border, also in the Pyrenees.

**FAMILY IXODIDAE**

*Ixodes (Eschatocephalus) vespertilionis* Koch, 1844.

Aguilón (Zaragoza), *Ex. R. ferrumequinum*, 1 N (1-III-86).

Avenc del Castellet de Dalt (Barcelona), *Ex. R. euryale*,
1♀ (9-V-54).


Can Palomeres (Barcelona), *Ex. My. myotis*, 1 (4-I-61).

Cueva de la Venta de la Perra (Carranza, Vizcaya), *Ex. R. ferrumequinum* 1 N (4-IV to 8-IV-63). Leg. ESCOLA and SENENT.


Cueva Armiña (Berriatúa, Alava), *Ex. R. ferrumequinum*,
1 N (18-XI-62).

Cueva Brenilla (San Pedro de Galdanes, Vizcaya), *Ex. R. ferrumequinum*, 1 L (22-XI-64).

Cueva Castañera (Oregón, Santander), *Ex. R. euryale*,
5 L (20-III-67).

Cueva Joliana (Aleoy, Alicante), *Ex. My. capaccini*, 1 ♂

Cueva Santimamiñe (Cortezubi, Vizcaya), *Ex. R. ferrumequinum*, 1 L (16-I-67).

Cueva Saspilexeta (Navarniz, Vizcaya), *Ex. ferrumequinum*,
1♀, 1 N, 2 L (25-1-59).

Herrera (Zaragoza), *Ex. R. euryale*, 1 N (13-VI-86).

Irúrzun (Navarra), *Ex. R. ferrumequinum* 1 L (16-X-60).

Itxitxoa (Navarra), *Ex. R. ferrumequinum* 1♀, 1 N (27-III-59).

Mozota (Zaragoza), *Ex. R. ferrumequinum*, 1 L (22-III-86).

Simá de Racheta (Arrátua, Alava), *Ex. R. ferrumequinum*
1♀, 1♂, 4 L (22-II-59); 1, 1 N (12-III-61).

Tosos (Zaragoza), *Ex. R. hipposideros*, 1 L, 1 N (19-IV-86).

Venta de la Perra (Carranza, Vizcaya), *Ex. R. ferrumequinum*,
1♀ (10-IV-63). Leg. PETIT, ESCOLA and SENENT.

It’s a tick species frequently found in Europe,
north of Africa and Oriental Asia (Doss and
ANASTOS, 1977). The present samples were mostly parasitic on *Rhinolophus* and seldom on *Myotis* and *Plecotus*.

Owing to the DUBÁBEK’s criteria (1962, 1964b),
which differ from ours about the parasite prefer­
ces, all the cave bats would be appropiate hosts.
Nevertheless, *I. vespertilionis* has never been found on *M. schreibersi*, which represents the 50 % of captured hosts This tick is widespread in all the studied area.

*Ixodes (Eschatocephalus) simplex* Neumann, 1906

Avenc del Daví (Barcelona), *Ex. M. schreibersi*, 2 N (XII-58); 1♀, 1 N (28-II-60); 1 N (30-XI-60).

Avenc dels Pouetons (Barcelona), *Ex. M. schreibersi*, 1 L, 2 N (20-IV-86).

Can Palomeres (Barcelona), *Ex. M. schreibersi*, 1 N (10-
V-64). Leg. T. PALACIOS.

Mines de la Cartanya (Barcelona), *Ex. M. schreibersi*,
2 L, 4 N (4-V-86).

Cova de la Vall de’n Rubi (Tarragona), *Ex. M. schrei­bersi*, 2 L (6-IV-86).

Its distribution in Spain follows that of the type
host, *M. schreibersi*. In Spain it is quite unusual,
although it has been found on *Miniopterus* (in the
most part of Europe) on *Myotis* (Japan and Africa)
and on *Rhinolophus* (France, China and Africa).

A large number of specimens of this tick have
been found in a small spot of Cataluña, where some
colonie of *M. schreibersi* are located. In this place, *M. schreibersi* spends the winter after coming from the breeding areas in the South of France (Conflent, Vallespir, Ariège and Cerdagne) being the population about 5,000. Those which go back to the south of France, also spend spring there (Can Palomeres).

**FAMILY ARGASIDAE**

*Argas (Carios) vespertilionis* (Koch, 1844)
Campanar (Valencia), *Ex. P. pipistrellus*, 1 L (9-VIII-85).
Castelldefels (Barcelona), *Ex. P. pipistrellus*, 7 L (4-IX-83).
Castellote (Teruel), *Ex. P. pipistrellus*, 7 L (4-IX-83). Leg. EJARQUE.
Jaca (Huesca), *Ex. E. serotinus*, 10 L (5-VIII-63).
Prat de Llobregat (Barcelona), *Ex. E. serotinus* 10 L (8-V-58); 16 L (23-VI-56).
Tosos (Zaragoza), *Ex. P. austriacus*, 1 L (19-IV-86).

*Argas (Secretargas) transgariepinus* (White, 1846)
Prat de Llobregat (Barcelona), *Ex. Eptesicus serotinus*, 1 L (23-VI-56).

No much is known about this species. Nine records had been assembled by Doss *et al.* (1977); with seven different genera of hosts.

**FAMILY MACRONYSSIDAE**

*Bewsiella fiedermaus* Domrow, 1958
Forat del Gel (Vilanova de Meiá, Lérida), *Ex. B. barbastellus*, 2♀ (4-I-64).

This genus is easily differentiated from *Ichoronyssus* by two plates of similar size; something peculiar to this species are the two pairs of accessory setae in the first dorsal hexagonus. This strange species of Macronyssidae was only known by the type collection and some other samples found in Australia. Its hosts are *Hipposideros semoni* and *H. bicolor albanensis*. It is the first finding in Europe.

It is quite surprising that this species has only been found in a village of Spain and on a single host. To ensure that it is distributed in Europe, this species should be more deeply researched.

*M. diversipilis* (Vitzhum, 1920).
Cova des Terres (Guilleries, Gerona), *Ex. R. euryale*, 2 PN (28-XII-63).
Cova des Rates Penades (Barcelona), *Ex. M. schreibersi*, 1♀, 19♀, 1 PN (29-VIII-63).
Cueva de Mancebones (Requena, Valencia), *Ex. M. nattereri*, 1♀, 5♀, 1 PN (11-XII-66). Leg. DONAT.

It has been found in all Central Europe and Russia (RADOVSKY, 1967). This species inhabits many hosts, such as *Pipistrellus, Rhinolophus* and *Myotis*, among which, according to Dusbábek (1964b), *Myotis daubentonii* is the main host.

Our results show that *M. schreibersi* can behave as a casual host. In spite of our numerous captures of *M. schreibersi* in Catalufia, *M. diversipilis* has only been collected on it once, but in such a great amount that we cannot consider it an aberrant parasitism. This species doesn’t appear to have preference for any host, although we must remark that it only infest cave bats, in our samples.
This species is only known in Central Europe and Portugal; its hosts are *Myotis* and *Rhinolophus*. Our finding on *M. schreibersi* may be also casual, with the same restrictions as in *M. diversipilllis*. Hirst (1922) described *Caris longimana* and *C. elliptica* as belonging to the same species, but Radovsky (1967), based on differences in teeth and tarsus, considered the two species as separated.

*Macronyssus flavus* (Kolenati, 1856). Ortigosa (Rioja), *Ex. Nyctalus lasiopterus*, 9 ♀, 1 PN (VIII-85)

Its type host seem to be *Nyctalus noctula*, according to Hirst (1922), Dusbábek (1964b) and Radovsky (1967). Its high specificity for this host makes its inhabiting on other host (such as *Myotis, Pipistrellus* and *Vesperitilio*) quite improbable. Our finding of this mite on *N. lasiopterus*, can be accepted, bearing in mind the mentioned specificity

*Macronyssus granulosus* (Kolenati, 1856)

Avenc de Puig de'n Març (Tarragona), *Ex. M. schreibersi*, 2 ♂, 2 ♀, 1 PN (8-XII-85); 1, 2 PN (12-I-86); 1, 2 PN (12-I-86); 1, 8 PN (23-II-86).

Avenc dels Pouetons (Barcelona), *Ex. M. schreibersi*, 3 ♀, 1 PN (20-IV-86).

Cova de la Vall de'n Rubí (Tarragona), *Ex. M. schreibersi*, 2 ♀ (6-IV-86).

Mines de la Cartanya (Barcelona), *Ex. M. schreibersi*, 1 ♂, 4 ♀, 6 PN (9-III-86); 1 ♀ (4-V-86).


*M. granulosus* is one of the most widely spread of the species belonging to Macronyssidae (Europe, North and South of Africa, Oriental Asia and Japan). The single finding in America (Hoffman, 1944) needs additional confirmation (Radovsky, 1967). It has been found on many genera of hosts (*Rhinolophus, Myotis, Barbastella* and *Miniopterus*) and always in a large number (Dusbábek, 1964b).

*Macronyssus longimanus* (Kolenati, 1856)

Avenc de Puig de'n Març (Tarragona), *Ex. M. schreibersi*, 1 ♂, 1 ♀, 7 PN (12-I-86); 13 ♂, 11 ♀, 39 PN (23-II-86).
Avenc del Davi (Barcelona), *Ex. M. schreibersi*, 1♂, 1♀, 1 PN (21-XII-85).
Mines de la Cartanya (Barcelona), *Ex. M. schreibersi*, 6♂, 17♀, 4 PN (4-III-86); 5♀, 16♂, 61 PN (9-III-86).

The geographical distribution of this Macronyssine may be misunderstood with regard to the taxonomical confusion. Estrada-Peña et al. (in press) point out the conspecificity of both *M. longimanus* and *M. tinae*, invalidate the species *M. tinae* and their synonyms, and describe the proto-nymph of *M. longimanus*.

Considering how *M. tinae* (sensu Lombardini and others) and *M. longimanus* are distributed, we can describe it as a mite present in all Europe, on Myotis, Miniopterus, Barbastella and Plecotus, although these two last may be doubtful.

Macronyssus rhinolophi (Oudemans, 1902)

Avenc de Puig de'n Març (Tarragona), *Ex. M. schreibersi*, 1 PN (8-XII-85).
Mines de la Cartanya (Barcelona), *Ex. M. schreibersi*, 1 PN (10-IX-85).

Dúrbáek (1964b) carried out the proper association of the two sexes in this species. As other species belonging to this genus, it is distributed in all Europe and North Africa. Some hosts for this parasite are Rhinolophus (Turk and Turk, 1952), Pipistrellus, Myotis and Miniopterus (Dúrbáek, 1964a, b). Although it can be found on Vespertilionidae, its most frequent host is Rhinolophus (Radovsky, 1967).

CONCLUSION

As a conclusion on the distribution of mites and ticks parasitic on Chiroptera in North and North East of Spain, we can draft the following notes. *S. myoti*, *S. emarginatus*, and *S. plecotinus* are widely distributed in the study area, although they are been collected only in a few locations. *S. psi* extend their colonization area on Cataluña and Valencia, perhaps due to the efforts in collecting their type host (*M. schreibersi*) in these localities. *P. rhinolophinus* and *E. euryalis* appear to be restricted to North of Spain and have been scarcely collected. *I. vespertilionis* and *A. vespertilionis* are two widely distributed ticks, but *I. simplex* and *A. transgariepinius* seem to be restricted to a small area in Cataluña. Between the Macronyssidae, the greatest number of captures are those of *M. longimanus* and *M. granulosus*, carried out on Miniopterus schreibersi, and by the reasons outlined above. It is quite surprising the capture in Europe of Bewsiella fliedermaus, on *B. barbastellus*; this species is easily differentiated by two dorsal plates of similar size and the two pairs of accesory setae in the first dorsal hexagonus. This species may be more widely distributed in Europe.

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