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Redescription of *Spinturnix punctata* (Sundevall, 1833) (Acari, Mesostigmata, Spinturnicidae), a specific parasite of *Barbastella barbastellus* (Chiroptera, Vespertilionidae)

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Redescription of *Spinturnix punctata* (Sundevall, 1833) (Acari, Mesostigmata, Spinturnicidae), a specific parasite of *Barbastella barbastellus* (Chiroptera, Vespertilionidae). – The authors redescribe *Spinturnix punctata* (Sundevall 1833) (Acari, Mesostigmata, Spinturnicidae), specific parasite of *Barbastella barbastellus* (Chiroptera, Vespertilionidae) with original illustrations and morphology study. A synopsis of the knowledge, concerning the Spinturnicidae ectoparasites of Vespertilionidae in the palearctic region is presented.

Key-words: taxonomy – Acari – Spinturnicidae – *Spinturnix punctata* – Chiroptera.

INTRODUCTION

During the revision of the family Spinturnicidae in 1960, RUDNICK placed many species under the heading "*species inquirendae*", considering that these species, poorly described, cited in several publications and whose types may still exist, would be further redescribed. ("I hopefully anticipate that these species may be identified and adequately described in the foreseeable future"). This was the case for *Spinturnix emarginata* (Kolenati, 1856) redescribed by DUSBABEK in 1964. As part of our study on the "*acuminata*" complex we were interested in ectoparasites of *Barbastella barbastellus*. In 1833 in Sweden, SUNDEVALL described, under the name of *Pteroptus punctatus*, a Spinturnicidae twice found on the wing membranes of *B. barbastellus*. The type specimens unfortunately disappeared and all attempts to find them again (OUDEMANS 1936), including ours, have failed. KOLENATI, probably unaware of SUNDEVALL's publication, described the same parasite in 1857 under the names *Pteroptus barbastelli*, and then *Diplostaspis barbastelli* in 1859. Types are intraceable

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in the collections of Kolenati. Finally, this ectoparasite was described again by DUSBABEK (1962) as a subspecies of *Spinturnix acuminata*, *S. a. barbastelli*. Our research on the "*acuminata*" group allows us to consider the ectoparasite of *B. barbastellus* as a genuine species and not as a subspecies of *S. acuminata*. We therefore redescribe this species keeping the name *S. punctata* (Sundevall, 1833), as the oldest name available; RUDNICK (1960) kept the same name.

MATERIAL AND METHODS

As a result of the small number of *B. barbastellus* captured few authors have been able to examine their parasites. We were able to gather 17 specimens of *S. punctata* (8 males, 7 females and 2 nymphs) in Switzerland and Corsica.

List of the material

NOBLET rec.: Col de Capronale, Corsica, France (2 ♀, 29/08/87); Frauenfeld, Suisse (1 ♂, 1 ♀, 13/07/53).

AELLEN rec.: n° 296: grotte aux Fées infér., Vallorbe, Vaud, Suisse (1♂, 28/01/50); n° 2644: (1♂, 24/01/62); n° 458-468: grotte aux Fées supér. Vallorbe, Vaud, Suisse (3♂, 2♀, 25/11/51); n° 2685: Col de Bretolet, Valais, Suisse (2♂, 1♀, 2 Nymphs, 02/08/62); n° 3149: grotte de la Diau, Thorens-les-Glières, Haute-Savoie, France (1♀, 09/12/65).

Method: the specimens were processed according to a previously described method (DEUNFF 1978), the mounting was carried out in Canada balsam and the photonic microscrope observation occurred in clear background and principally in phase contrast. Drawings were made with a ZEISS camera lucida.

Spinturnix punctata (Sundevall, 1833)

SYNONYMY

Pteroptus punctatus Sundevall, 1833; STILES & NOLAN 1931; OUDEMANS 1936.
Spinturnix punctatus, VAN EYNDHOVEN 1943; RUDNICK 1960; DEUNFF *et al.* 1986.
Pteroptus barbastelli Kolenati, 1857; BERLESE 1892; STILES & NOLAN 1931; COLLINS 1931.
Diplostaspis barbastelli, KOLENATI 1859; KOCH 1865.
Spinturnix sp., van EYNDHOVEN 1950.
Spinturnix barbastelli, COLLINS 1931; van EYNDHOVEN 1943; HAITLINGER 1978; RYBIN 1983.
Spinturnix acuminatus bohemicus DUSBABEK, 1962; DUSBABEK 1964, 1970; BERON 1965.
Spinturnix acuminatus barbastelli, DUSBABEK 1964, 1970, 1972; PINCHUK 1971.
Spinturnix punctata, UCHIKAWA *et al.*, 1994.

REDESCRIPTION

F e m a l e : neotype (figures: 1, 2 and 3)

Dimensions: length (from anal extremity to the point of the hypostome): 1,169 µm; width (at the level of the peritremes): 784 µm. Sternal shield: length: 166 µm; greatest width: 134 µm. Dorsal plates: length: 799 µm; greatest width: 576 µm.

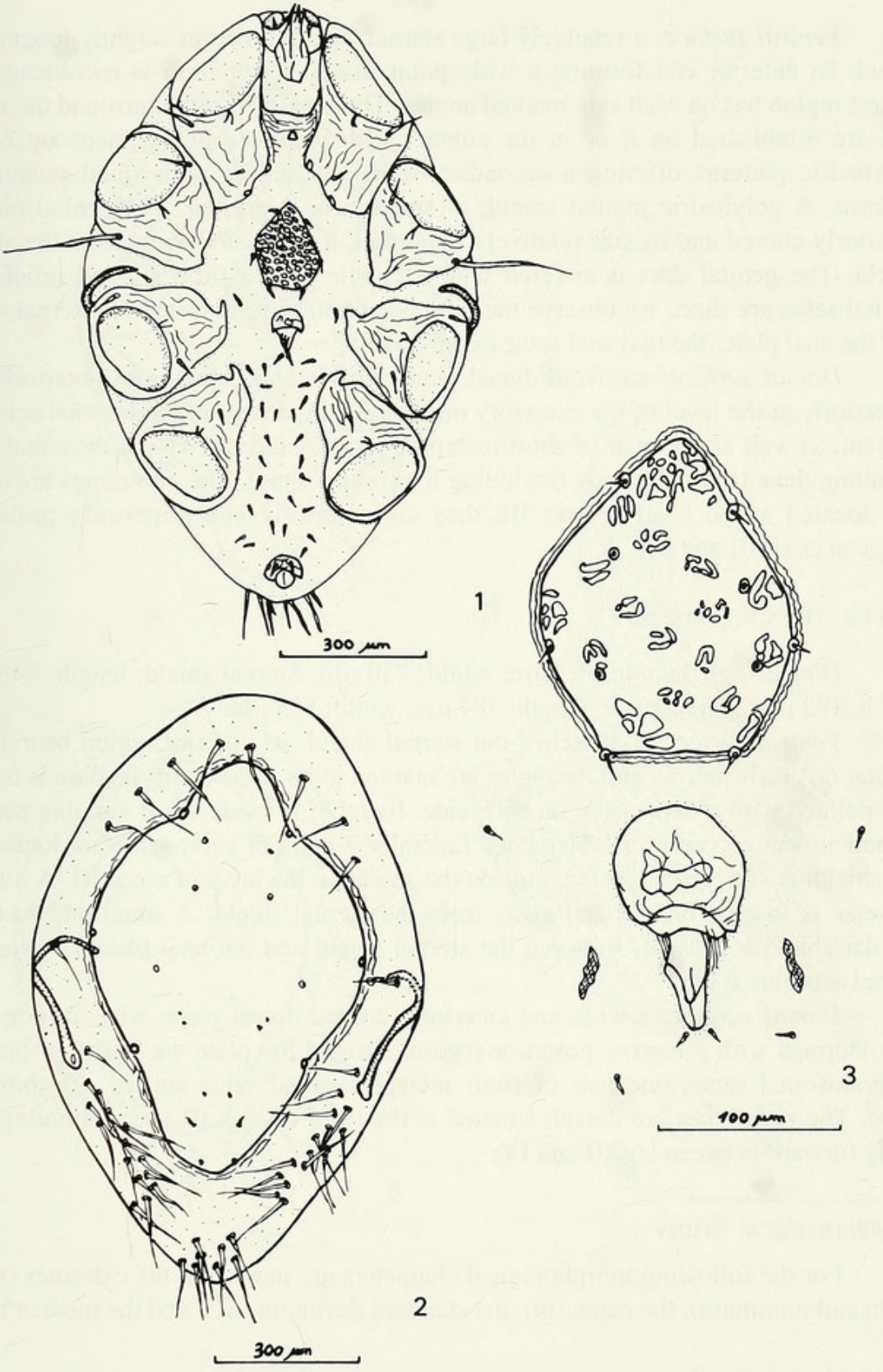


Fig. 1-3

1. Female *Spinturnix punctata*, ventral view; 2. Female *Spinturnix punctata*, dorsal view; 3. Female *Spinturnix punctata*, sternal and genital shield.

Ventral surface: a relatively large sternal shield: piriform, slightly longer than broad. Its anterior end forming a wide point. Its posterior limit is rectilinear. The widest region has on each side marked angles. Three pairs of setae surround the shield and are established on it or in the contact with it. The relief is made up of big polyhedric patterns offering a secondary relief alternating with small punctiform patterns. A polyhedric jugular shield, of small size, is present. The genital plate is anteriorly curved and its size relatively important, it is situated away from the sternal shield. The genital duct is covered with a cuticle with a little marked relief. The genital setae are short; we observe the presence of 30 setae between the sternal shield and the anal plate (the two anal setae excepted).

Dorsal surface: an ovoid dorsal plate, with lateral depressions anteriorly and posteriorly at the level of the excretory orifices. Four pairs of propodosomal setae are present, as well as one pair of short metapodosomal setae and 41 opisthosomal setae set along the edge of the body (including 8 terminal setae). The peritremes are dorsal and located at the level of legs III, they are anteriorly and posteriorly prolonged between coxae II and III.

M a l e (figs: 4, 5 and 6)

Dimensions: length: 992 µm; width: 730 µm. Sternal shield: length: 348 µm; width: 182 µm. Dorsal plate: length: 784 µm; width: 553 µm.

Ventral surface: a stretched-out sternal shield, its anterior region bearing the genital orifice is narrow and its angles are marked in its widest part. Its base is narrow and pointed with a depression on each side. Its relief is made up of variable patterns of punctiform or vermiform elements. Laterally 3 pairs of short setae are located on the shield. A 4th pair is located, outside the shield, at the level of coxæ III. A 5th pair of setae is located behind and away from the sternal shield. A small and fusiform jugular shield is present. Between the sternal shield and the anal plate 15 generally paired setae are found.

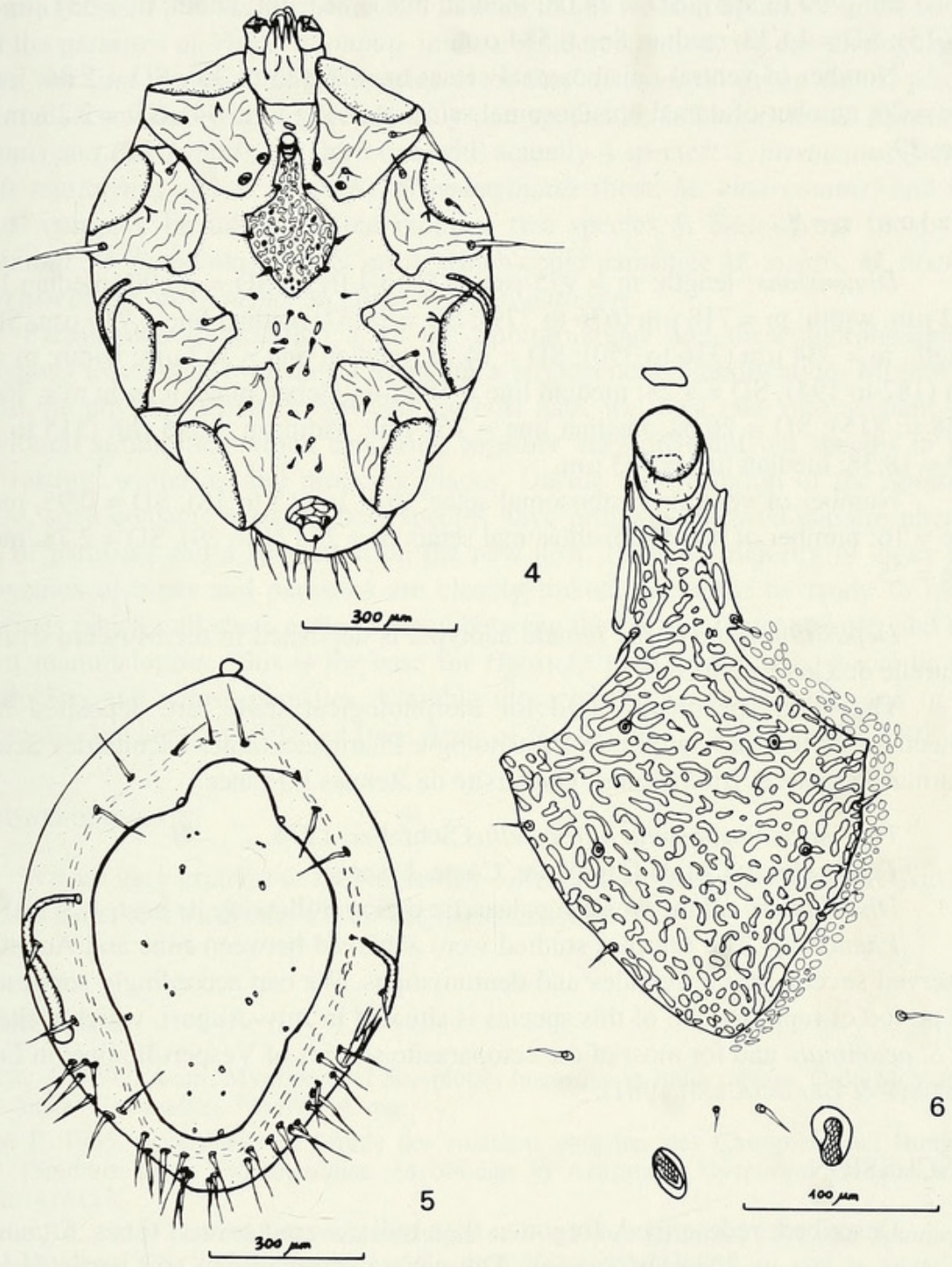
Dorsal surface: a wide and anteriorly curved dorsal plate, with little marked shoulderings with a narrow posterior region. Around the plate we find four pairs of propodosomal setae, one pair of short metapodosomal setae and 21 opisthosomal setae. The peritremes are dorsal, situated at the level of legs III and continuing ventrally forward between legs II and IV.

MORPHOLOGICAL STUDY

For the following morphological characters are indicated: the extremes (maximum and minimum), the mean (m), the standard deviation (SD) and the median line.

F e m a l e s : n = 7.

Dimensions: length: m = 1,273 µm (1,138 to 1,430); SD = 107; median line = 1,238 µm; width: m = 893 µm (784 to 999 µm); SD = 85.91; median line = 876 µm. Shield: length: m = 179 µm (166 to 194); SD = 10.35; median line = 180 µm; width:



FIGS 4-6

4. Male *Spinturnix punctata*, ventral view; 5. Male *Spinturnix punctata*, dorsal view; 6: Male *Spinturnix punctata*, sternal shield.

m = 150 µm (134 to 168); SD = 10.98; median line = 148 µm. Dorsal plate: length m = 852 µm (799 to 868); SD = 24.08; median line = 861 µm; width: m = 591 µm (576 to 615); SD = 14.33; median line = 584 µm.

Number of ventral opisthosomal setae: m = 26 (23 to 30), SD = 2.36, median line = 26; number of dorsal opisthosomal setae: m = 40 (37 to 44), SD = 2.28, median line: 39.

Males: n = 8.

Dimensions: length: m = 975 µm (922 to 1,015); SD = 32.99; median line = 992 µm; width: m = 718 µm (676 to 779); SD = 29.37; median line = 715 µm. Shield: length: m = 334 µm (316 to 350); SD = 14.28; median line = 342 µm; width: m = 187 µm (182 to 194); SD = 4.28; median line = 188 µm. Dorsal plate: length: m = 766 µm (738 to 815); SD = 26.62; median line = 761 µm; width: m = 545 µm (515 to 569); SD = 18.38; median line = 553 µm.

Number of ventral opisthosomal setae: m = 16 (15 to 18), SD = 0.95, median line = 16; number of dorsal opisthosomal setae: m = 25 (21 to 29), SD = 2.78, median line = 25.

Deposition of type: the female neotype, is deposited in the Muséum d'histoire naturelle de Genève, Suisse.

The other specimens, used for morphological study, are deposited in the collections of the Laboratoire de Parasitologie Pharmaceutique, Faculté des Sciences Pharmaceutiques et Biologiques, Université de Rennes I, France.

Type host: Barbastella barbastellus Schreber, 1774.

Type habitat: Col de Capronale, Corse, France.

Distribution: all the western palearctic region, following its host.

Phenology: The samples studied were achieved between June and August, we observed several gravid females and deutonymphs. We can accordingly suppose that the period of reproduction of this species is situated in July–August, which is the case for *S. acuminata* and for most of the ectoparasite species of Vespertilioninæ in Europe (Deunff & Beaucournu 1981).

DISCUSSION

Described, redescribed, forgotten then rediscovered several times, *S. punctata* deserves at last its status of species. The general morphology and particularly the shields, classifies it in the group "*acuminata*" beside *S. acuminata* (host: *Nyctalus noctula*), *S. helvetiæ* (host: *N. leisleri*) and *S. nobleti* (host: *Pipistrellus savii* = *Hypsugo savii*). From a parasitology point of view we therefore find in the western palearctic region a relatively homogeneous group of Spinturnicidae parasites of the genus *Nyctalus*, of *B. barbastellus* and of *Pipistrellus savii* (genus: *Hypsugo*). This last genus is yet considered by mammalogists as close to Eptesicus which carries a parasite totally different from the "*acuminata*" complex (Deunff *et al.* 1986). On the

other hand affinities probably exist between the group of the "*acuminata*" and *S. plecotina* (hosts: *Plecotus auritus* and *P. austriacus*). If we sum up all we know so far about the parasites of *Vespertilioninae* in the considered region, we can distinguish 3 groups: the first one including 5 species (4 of the "*acuminata*" group and *S. plecotina*), the second one with apparently only one species *S. kolenatii* (hosts: *Eptesicus serotinus* and *E. nilsonni*), the third one with actually 4 species: *S. mystacinus* (hosts: *Myotis mystacinus* and *M. brandti*), *S. emarginatus* (host: *M. emarginatus*) and the "*myoti*" complex including for the moment two species *S. andegavina* (host: *M. daubentoni*: *M. nathalinae*) and *S. myoti* which could parasitize *M. myotis*, *M. blythii*, *M. bechsteini*, *M. dasycneme*, *M. capaccinii*, *M. nattereri*.

Parasitism has modified a lot the Spinturnicidae and these morphological adaptations leave us few elements allowing a phylogenetic classification. Moreover, beyond the phyletic affinities between the host bats, we must take into account the behavioural similarities which can bring together very different bat species in the same resting, wintering and dropping places. During the evolution of the *Spinturnicidae*, such contacts between host species have probably allowed capture phenomena of parasites and a speciation on the new host. If in the majority of cases the phylogenies of hosts and parasites are closely linked, one must be ready to meet exceptions which will show a discrepancy between the parasitological results and the data of mammalogists. This is the case for *Hypsugo savii*, close to *E. serotinus* for mamalogists and whose parasites resemble those of the genus *Nyctalus* and of *B. barbastellus* but are very different from those of *E. serotinus* (DEUNFF *et al.* 1990).

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