ABOUT A NEW SPECIES OF ORIBATID MITES FROM THE HOLOMON FOREST, GREECE : *ACHIPTERIA HOLOMONENSIS* N. SP. (ACARINA, ORIBATIDA)

BY J. P. CANCELA DA FONSECA * and G. P. STAMOU **

TAXONOMY
ORIBATIDA
ACHIPTERIIDAE

ABSTRACT : Some morphological characters of a new species of Achipteriidae from Greece, *Achipteria holomonensis* n. sp., are described and compared with those of the similar species, *Achipteria italicus* (Oudemans).

TAXONOMIE
ORIBATIDA
ACHIPTERIIDAE

RÉSUMÉ : Quelques caractères morphologiques d'une espèce nouvelle d'Achipteriidae de Grèce, *Achipteria holomonensis* n. sp., sont décrits et comparés avec ceux de l'espèce voisine, *Achipteria italicus* (Oudemans).

INTRODUCTION

This *Achipteria* species was collected from *Quercus confertae* litter at the Holomon Forest, Halkidiki, Greece and its biology and ecology studied by STAMOU (STAMOU *et al.*, 1979, 1981 ; STAMOU, 1981).

The morphological characters of the adults seem at first to be those of the *Achipteria italicus* (Oudemans, 1914) (Fig. 1 : A1, B1) according to the description of OUDEMANS (1927), but when we compared the specimens of the greek species with the type specimens of *A. italicus* some quite important features separate them. They are described in this paper along with those of *A. italicus* redescribed from the OUDEMANS types. A more detailed description of the adults and the immatures of *A. holomonensis* will be made later, in another paper.

A. holomonensis type specimens will be stocked at the Muséum National d'Histoire Naturelle, Paris. *A. italicus* type specimens (two slides) were kindly lent by Dr. L. VAN DER HAMMEN Rijksmuseum van Natuurlijke Historie, Leiden.

COMPARATIVE DESCRIPTION OF THE ADULTS

Dimensions.

A. holomonensis. — Legth, up to the tip of the rostrum : 512-556 μm. Width, at the basis of the pteromorphae : 338 μm.

A. italicus. — Two type specimens were measured. Length, up to the tip of the rostrum : 483 μm and 546 μm. Width, at the basis of the pteromorphae : 295 μm and 238 μm. — According to OUDEMANS (1927) : length, 488 μm and 303 μm ; and according to TRAVÉ (1960) : length, 490-580 μm.

* C.N.R.S., Laboratoire de Biologie Végétale et d'Écologie Forestière, Université Paris 7, 77300 Fontainebleau, France.
** Division of Ecology, Department of Biology, University of Thessaloniki, 54006 Thessaloniki, Greece.

Colour.

A. holomonensis. — Dark brown.

A. italicus. — Dark brown. — According to OUDEMANS (1927), black when observed on a white background and chestnut-brown when observed in transmitted light.

Dorsal region : Prodorsum.

A. holomonensis. — The lamellae are smooth, long and broad, sub-trapezoidal (Fig. 1 : A2). The proximal part of their paraxial margins are coalescent for a short distance from the vertex of the angle formed by their basis (lambda-shaped). These lamellar insertions are relatively broad and delimit with the dorsosejugal (disjugal) furrow the interlamellar region of the prodorsum, isosceles-like. From the coalescent point the two inner (paraxial) margins run parallel till the insertion point of the lamellar setae (collar). There, the inner margins start to diverge slightly, the distal or anterior (paraxial) margins diverging completely (U-shape drawing). The antiaxial of the lamellae are almost straight and clearly sclerotized from the cuspis till the dorsosejugal furrow, the cuspis being somewhat blunt.

The paraxial lamellar structure corresponds to the features of the paraxial borders of the lamellae (Fig. 1 : A2). The lamellar setae insert on the ventral side of the lamellae, which cover about 1/3 of the body of the setae, and at short distance of their paraxial margins. Although they were referred above as inner paraxial margins of the lamellae they are not the real ones. The true (free) paraxial barders of the lamellae incurve downwards surrounding the base, the root and the sensory canal (cf. GRANDJEAN, 1934) of the lamellar setae. In transmitted light these doubie chitinous structures are more opaque and look like some king of " sheath " going up to the tip of the lambda-shaped lamellar insertions where both sensory canals join each other (cf. GRANDJEAN, 1932, fig. 6 A). These canals run along the antiaxial inner of these " sheaths " (the real paraxial margins of the lamellae) from almost their beginning.

The rostral setae (Fig. 1 : A3) are directed forwards and are strongly curved inwards, finely pectinate outside and of about 60 μm length.

The lamellar setae (Fig. 1 : A2) are smooth, straight, directed forwards and slightly downwards, and of about 80 μm. The interlamellar setae (Fig. 1 : A2) are also smooth, directed firstly upwards and outwards, and after forwards, more or less parallel to the lamellae, and inwards. Their insertions are not very far from the disjugal furrow and near the " arms " of the lambda-shaped structure. They are of about 160 μm long and do not pass beyond the anterior margin of the lamellae.

The sensilli (Fig. 1 : A4) are smooth, clavate (club-shaped) and of about 90 μm long (from the bothridium).

A. italicus. — The lamellae are smooth, long and broad, trapezoidal (OUDEMANS, 1927) (Fig. 1 : B2). The proximal part of their paraxial margins are coalescent for a very short distance (OUDEMANS, 1927) from the broad vertex of the angle formed by their basis (lambda-shaped). These lamellar insertions, ticker at and near the vertex become progressively slender and delimit with the dorsosejugal (disjugal) furrow the interlamellar region of the prodorsum, equilateral-like. From the coalescent point the two inner (paraxial) margins run almost parallel up to the insertion point of the lamellar setae (collar) where they, as anterior (paraxial) margins, diverge completely (V-shape drawing). The antiaxial margins of the lamellae are undulated (OUDEMANS, 1927) and weakly sclerotized from the cuspis till the dorsosejugal furrow, the cuspis being sharp.

The lamellar setae insert on the ventral surface of the lamellae near their anterior margin (cf. OUDEMANS, 1927). The paraxial lamellar structure has the same general characteristics than in *A. holomonensis* (Fig. 1 : B2) but the sensory canals run inside the median part of the " sheaths ".

The rostral setae (Fig. 1 : B3) are directed forwards and strongly curved inwards, pectinate outside (OUDEMANS, 1927), and about 70 μm long.

The lamellar setae (Fig. 1 : B2) are smooth, straight, directed forwards (OUDEMANS, 1927)

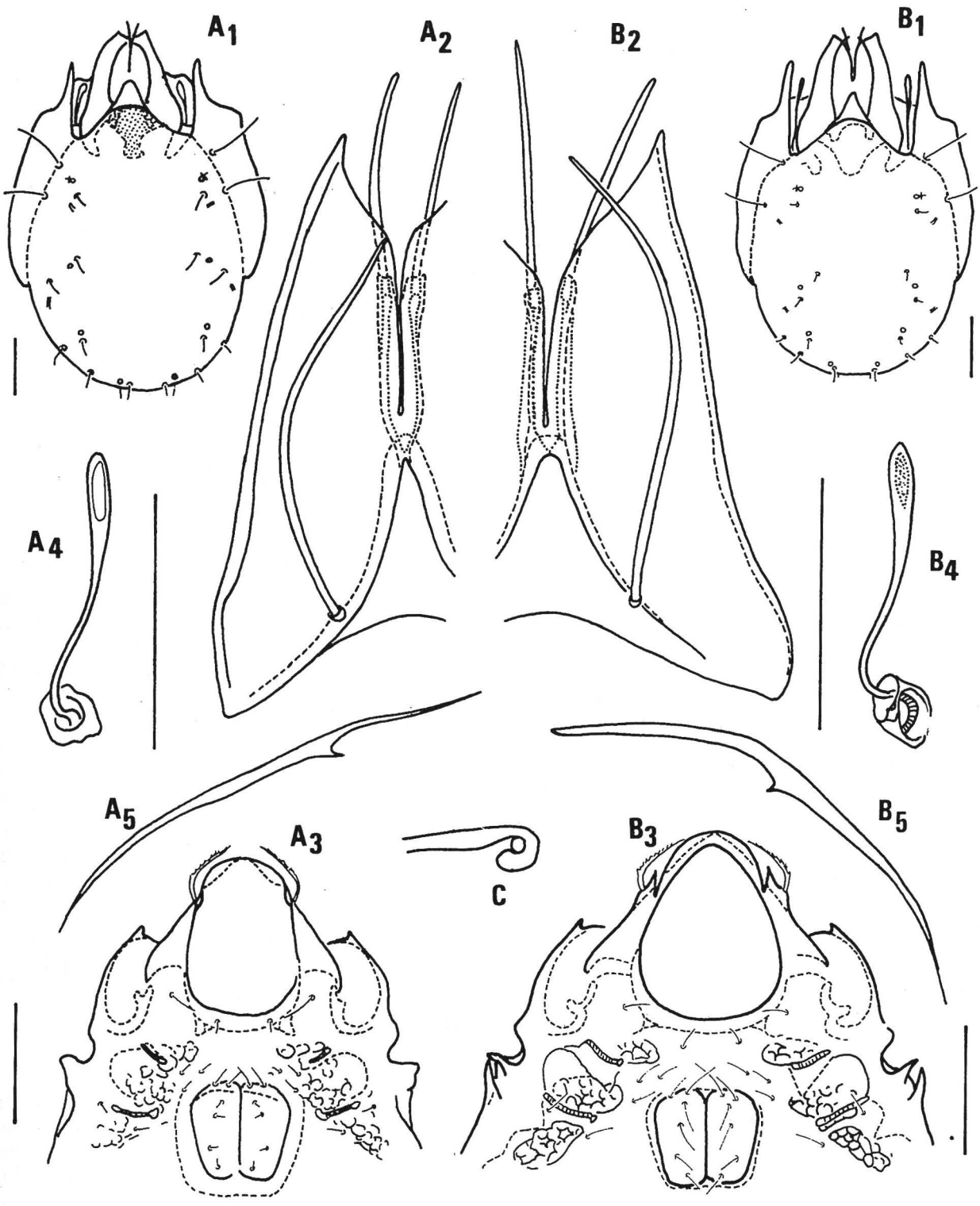

FIG. 1 : A. — *Achipteria holomonensis* n. sp. ; B. — *Achipteria italicus* (Oudemans)

A1, B1 — Adults : general view, dorsal region ; A2, B2 — Lamella, lamellar and interlamellar setae, " paraxial lamellar structure " ; A3, B3 — Pdosoma : ventral region ; A4, B4 — Sensillus ; A5, B5 — Tutorium ; C — Section of the paraxial border of the lamella of *Achipteria coleoptrata* (Linné) (WAUTHY, comm. pers.). — (Drawing scales : 100 μm).

(? and slightly downwards), and of about 100 μm long.

The interlamellar setae (Fig. 1 : B2) are also smooth (sparsely dotted according to OUDEMANS, 1927), directed firstly (? upwards and) outwards and then forwards (? more or less parallel to the lamellae) and inwards (OUDEMANS, 1927). Their insertions are not very far from the disjugal furrow and from the " arms " of the lambda-shaped structure. According to OUDEMANS 1927), they insert on the lamellae just in front of the disjugal furrow. They are of about 190 μm long and extend beyond the anterior margin of the lamellae (" longer than the lamellae " according to OUDEMANS, 1927). The sensilli (Fig. 1 : B4) are smooth, clavate (club-shaped) and of about 100 μm long (from the bothridium).

Dorsal region : Notogaster.

A. holomonensis. — The notogaster and the pteromorphae surfaces are finely punctate. The " clear spot " (" tache claire " : GRANDJEAN, 1961) is cup-like and more densely punctate (Fig. 1 : A1).

A. italicus. — The notogaster and the pteromorphae surfaces are smooth, but according to OUDEMANS (1927) they are densely punctate with almost invisible small pores (' punctatissima '). The " clear spot " (" tache claire "), also smooth, is more or less triangular (Fig. 1 : B1) (" broad pyriform ", according to OUDEMANS, 1927).

Lateral region : Podosoma.

A. holomonensis. — The tutorium (Fig. 1 : A5) is relatively thin (about 4 to 5 μm) with the free cuspis thinner (1 to 2 μm) and more or less straight. The total length of the tutorium is about 195 μm and the length of the free cuspis about 60 μm.

A. italicus. — The tutorium (Fig. 1 : B5) is relatively thick (about 3 to 8 μm) with the free cuspis slightly thinner (3 to 6 μm) and more or less curved downwards. The total length of the tutorium is about 200 μm and the length of the free cuspis about 95 μm.

Ventral region : Podosoma.

A. holomonensis. — Seen from the ventral side, the pedotectum 2 is broad and triangular, directed slightly backwards, and the discidial apophysis (? custodium) is not very well marked (Fig. 1 : A3).

A. italicus. — Seen from the ventral side, the pedotectum 2 is like a sharp projection directed backwards, and the discidial apophysis (? custodium) is also very sharp (Fig. 1 : B3).

DISCUSSION

In such ecological researches as those on the soil sub-ecosystem where normally a great number of individuals of several species must be counted and identified, it is very important tc separate then easily, and the even more if two species are morphologically similar. In general, the characters that differentiate then can be more less easily detected but not always easly described, unless by drawing (Fig. 1 : A, B).

This is waht we can observe with *A. holomonensis.* At first, it was identified, according to the description of OUDEMANS (1927), as *confer* (cf.) *A. italicus*, but the comparison of our specimens with those of the Oudemans types of *A. italicus* demonstrate that it can not be the same species. Thus, to be as clear as possible we used the computer technique of describing qualitative variables and data (data banks) for quantitative and qualitative analysis (CANCELA DA FONSECA and DE BAILLIENCOURT, 1980).

A. holomonensis and *A. italicus* have the same colour but the first species seems slightly bigger. But to these greater dimensions of the *A. holomonensis* correspond smaller dimensions of the prodorsal setae, the sensilli and the tutoria. The free cuspis of the *A. italicus* tutorium is almost half of its total length and that of the *A. holomonensis* only about one third (Fig. 1 : A5, B5).

Two other points make clear differences. The first concerns the notogaster and the pteromor-

phae surfaces : they are finely punctate on *A. holomonensis* and smooth on *A. italicus* (type specimens) although OUDEMANS in his paper (1927) says they are also punctate (' punctatissima ').

The second relates to the pedotectum 2 and the discidial apophysis (? custodium). Seen from the ventral region of the body they are in *A. italicus* well separated and sharp (Fig. 1 : A3, B3).

However, in our opinion, one of the most important and practical differences not only between these two species of *Achipteria* but also among other species of *Achipteria* and *Parachipteria* (like, e.g., *A. coleoptrata* (Linné), *Parachipteria punctata* (Nicolet), *P. willmannii* van der Hammen ; CANCELA DA FONSECA) is the structure of what we have called the " paraxial lamellar structure ", quite different from one species to another (Fig. 1 : A2, B2).

The root of the setae inside the limbus of a tectum is surrounded by a sheath which can run freely through the limbus (sheath-canal) if the insertion of the root is near the edge of the limbus (GRANDJEAN, 1934, fig. 1). As the lamellae are tecta, the lamellar setae of the Achipteriidae have a behaviour similar to any other setae inserted in tecta, with a sheath and a sensory canal associated to their root (see e.g., OUDEMANS, 1927 ; GRANDJEAN, 1932, 1935 ; AOKI, 1961, 1970). Neverthless, the " paraxial lamellar structure " is more complex. According to the observations of WAUTHY (comm. pers.) on the lamellae of A. *coleoptrata*, this structure seems due to the position of the paraxial border of the lamellae around the lamellar setae which is thicker and incurved downwards (Fig. 1 : C).

Thus, the specific differences would be due to the relative positions and shapes of the incurved paraxial border of the lamellae, the root of the setae and the sensory canal associated to the root, as it is suggested also by the *A. holomonensis* and the *A. italicus* " paraxial lamellar structures " (Fig. 1 : A2, B2). In any case this structure separates distinctly the two species.

ACKNOWLEDGEMENTS

We wan to express our gratitude to Dr. L. VAN DER HAMMEN, Professor J. C. LIONS, Dr. J. TRAVÉ and Dr. G. WAUTHY for their assistance, remarks and suggestions, and to Mrs. C. MASSON for her kind help with the drawings.

LITERATURE CITED

AOKI (J.), 1961. — Beschreibungen von neuen Oribatiden Japans. — Jap. J. Appl. Ent. Zool., **5** : 64-69.

AOKI (J.), 1970. — Descriptions of Oribatid Mites collected by smoking of trees with insecticides. I. Mt. Ishizuchi and Mt. Odaigahara. — Bull. Nat. Sci. Mus. Tokyo, **13** : 585-602.

CANCELA DA FONSECA (J. P.) & DE BAILLIENCOURT (P.), 1980. — Sur l'organisation d'une banque de données écologiques et de données taxonomiques en Écologie du sol. — Actes 8e Colloq. Informatique et Biosphère « Faune, Microfaune et Informatique », Paris 1980, p. 121-145.

GRANDJEAN (F.), 1932. — Observations sur les Oribates (3e série). — Bull. Mus. nat. Hist. natur. (2), **4** : 292-306.

GRANDJEAN (F.), 1934. — Observations sur les Oribates (6e série). — Bull. Mus. nat. Hist. natur. (2), **6** : 353-360.

GRANDJEAN (F.), 1935. — Observations sur les Oribates (9e série). — Bull. Mus. nat. Hist. natur. (2), **7** : 280-287.

GRANDJEAN (F.), 1961. — Nouvelles observations sur les Oribates (1re série). — Acarologia, **3** : 206-231.

OUDEMANS (A. C.), 1914. — Acarologisches aus Maulwurfsestern. — Arch. Naturg., **79** (A. 10) : 1-69.

OUDEMANS (A. C.), 1927. — Notizen über Acari. 27. Reihe (Oribatiden). — Arch. Naturg., **91** : 120-147.

STAMOU (G. P.), 1981. — Population dynamics of *Achipteria* cf. *italicus* in the soil of an oak canopy in Holomon Mountain. (In greek). — Ph. D. Thesis, University of Thessaloniki.

STAMOU (G. P.), SOTIROPOULOS (A.) & MITROU (P.), 1979. — Populations composition of Oribatei in Holomon forest. (In greek). — Proc. 1st Colloq. Greek Soc. Biol. Sci. : 147-154.

STAMOU (G. P.), KATTOULAS (M.), CANCELA DA FONSECA (J. P.) & MARGARIS (N. S.), 1981. — Observations on the biology and ecology of *Achipteria holomonensis* (Acarina, Oribatida). — Pedobiologia, **23** : 53-58.

TRAVÉ (J.), 1960. — Contribution à l'étude de la faune de la Massane (3e note). Oribates (Acariens) 2e partie. — Vie et Milieu, **11** : 209-232.

Paru en mars 1987.