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CONTRIBUTION TO THE KNOWLEDGE OF *CARABODES PALMIFER* BERLESE, 1904  
(ACARI: ORIBATIDA: CARABODIDAE)

BY A.I. CABALLERO, J.C. ITURRONDOBEITIA *  
(Accepted March 2000)

**ABSTRACT:** *Carabodes palmifer* Berlese, 1904 is redescribed. Leg setation and solenidial formula are described for the first time in this species giving figures of them. This new finding represents the first record of this species in the Iberian Peninsula.

**INTRODUCTION**

*Carabodes palmifer* is an oribatid mite described by Berlese in 1904, originally known from Italy and all the records founded up to now related with *Castanea sativa* humus. A male of this species was found in pine culture from Mendata (Biscay, Northern Spain) in December 1995. This new finding represents the first record of this species in the Iberian Peninsula. Due to fact that its general morphology, such as its body length was much greater than width and its sensilli, it seemed to belong, in a first view, to the genus *Odontocepheus* although it has been identified as *Carabodes* (Mahuñka, 1986). It was the first step of what we plan as an exhaustive revision of species of the genus *Carabodes* in Spain. Finally we found two that looked like our finding, they were: *Carabodes palmifer* Berlese, 1904 and *C. peniculatus* Aoki, 1970. Nevertheless, Bernini (1970) suggests Aoki’s species a junior synonym of *C. palmifer*. We have not found a detailed description of *C. palmifer* apart from what Berlese did in 1904 in which *Carabodes palmifer* was described as follows (translated from original Latin description): light brown color integument, foveolated. Postmarginal body setae short and spatulate-palm-leaf like type and penicilated. Sensillus long clavate, penicilated. Size 400-460 μm in length by 180-220 μm in width. Found in decomposed wood of *Castanea sativa*.

Bernini (1970) makes a first comparison between the species *Carabodes palmifer* and *C. areolatus* Berlese, 1916. Later, Bernini (1982) found more individuals of *C. palmifer*, always on chestnut, *Castanea sativa*, qualifying the species as rare. We have confirmed this, as we have sampled many areas and biotopes, finding only a single individual. Our individual and those sent by Dr. Bernini labelled as *C. palmifer*, are the same species.

Since nothing else is known about this species, we contribute the following details, relating to leg setation.

MATERIAL EXAMINED

Five individuals of this species were studied. One male oribatid mite was collected in Mendata (Biscay, Northern Spain) in December of 1995 on organic matter from Pinus radiata (code sample: S5B + o5). Body dimensions are 395 $\mu$m length by 195 $\mu$m width. This finding represents the first record of this species in the Iberian Peninsula. Four individuals (3 females and a male) were collected by Dr. Bernini, from Italy (Sila Massif, region of Calabria) found in humus of chestnut (Castanea sativa). Female body dimensions are 420-450 $\mu$m length by 200-220 $\mu$m width, the male 420 $\mu$m length by 200 $\mu$m width. The individual found in Mendata and one of the Italian females were dissected for study. The material will be preserved in Hoyer solution and will be kept in the laboratory of Zoology of Basque Country University.

REDESCRIPTION

of Carabodes palmifer Berlese, 1904

Integument and measurement: light brown colour. A thin layer of cerotegument covering the body, which is mostly foveolated with foveae not smoothly rounded, but rather regular in shape without fusion and a fine granulate is observed among them. Total body length 395-450 $\mu$m by 195-220 $\mu$m total body width.

<table>
<thead>
<tr>
<th>Femur</th>
<th>Genum</th>
<th>Tibia</th>
<th>Tarsus</th>
<th>Claw</th>
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<td>Leg I</td>
<td>4</td>
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<td>4</td>
<td>15</td>
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<td>Solenidia</td>
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<td>Leg II</td>
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<td>Solenidia</td>
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<tr>
<td>Leg III</td>
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<td>Solenidia</td>
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<td></td>
<td>σ</td>
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<td>σ, v</td>
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<tr>
<td>Leg IV</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Solenidia</td>
<td>d, er</td>
<td>d, fr</td>
<td>d, v</td>
<td>(h)</td>
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Table I: Carabodes palmifer Berlese, 1904 solenidial and leg setation

Prodorsum (Fig. 1): Rostral (ro) and lamellar (le) setae setiform, arched medially, ro glabrous, le minutely barbed on lateral margin. Interlamellar (in) setae palm-leaf-like shaped whose small leaves are located from the base to the tip of the setae. The straight in are inserted laterally on the outer margin of lamellae. Sensillus with long stalk and large clavate head presenting small lobular projections, resembling the sensillus of Odontocephus elongatus. Exobothridial setae (ex) absent.

Notogaster (Fig. 1): Dorsosejugal groove without depression, hollow or elevation as found in other Carabodes species (see Pérez-IGÍNO, 1997). Humeral projection hardly protrudes beyond the lateral margin of notogaster, but projects anteriorly in triangular form. Ten pairs of notogastral (N) palm-leaf-like setae as the interlamellar (in) ones.

Ventral region (Fig. 2): Surface with polygonal foveae mostly regular in shape and partially fused with fine dots among them. Epimerae with short setiform setae, in the formula (3-1-3-3) typical of Carabodidae (Mahunka, 1986). In the anogenital region there are 4 pairs of setiform genital setae (g), 1 pair of small spiniform aggenital setae (ag), 2 pairs of anal setae (an) and 3 pairs of adanal setae (ad). Adanal setae ad1 and ad2 are palm-leaf-like but shorter than notogastral setae, while ad3 are short, thick and laterally serrated.
Fig. 1. — Curabodes palmiifer Berlese, 1904. (adult). Dorsal aspect (bar scale 100 µm)

Fig. 2. — Curabodes palmiifer Berlese, 1904. (adult). Ventral aspect (bar scale 100 µm)
FIG. 3. — *Carabodes palmifer* Berlese, 1904. (adult) Leg I, and Leg II, antiaxial surface (bar scale 100 μm).
Fig. 4. — *Carabodes palmifer* Berlese, 1904. (adult) Leg III, right. Tibia and tarsus little bit twisted (bar scale 100 µm).
Fig. 5. — *Carabodes palnijer* Berlese, 1904. (adult) Leg IV, (bar scale 100 μm).
**Gnathosoma:** Palp setal formula from femur to tarsus, solenidia included, is (2-1-3-9). Chaelicerae are normal (chelate-dentate type).

**Legs:** We have followed different authors such as (GRANDJEAN, 1946; NORTON, 1977; REEVES 1987, 1990, and 1995) in order to identify leg setae, but the most important ones are those based on the ontogeny of some species of the genus *Carabodes* (Reeves, 1991, 1992 and 1998). They are single-clawed; antialaxial surfaces of femora I and II and trochanters and femora III and IV partially or entirely covered with foveolae. Leg setation and solenidial formula is given in the Table. It is remarkable the similarity between leg chaetotaxy formulae of *C.mabodes palmifer* and those of the species *C. dendrodaetus, C. wonalancetanus, C. polyporotes, C. coweetaensis* described by Reeves in 1987, 1990, 1991 and 1995 respectively.

**Leg I** (Fig. 3) Setae l' of femur and v' of genu serrated, thick and spiniform. Tibia: solenidia q1 and q2 ceratiform (NORTON, 1977) the former being longer than the latter. Tarsus: solenidia o1 and o2 are short and ceratiform and inserted close together, o2 being slightly shorter than o1.

**Leg II** Femur and genu as in leg I. Tibia: the only solenidion q1 is ceratiform and the setae are thin, spiniform and without barbation. Tarsus: solenidia o1 and o2 are short, equal in length, ceratiform, and are inserted close together.

**Leg III** (Fig. 4). Femur: dorsal seta more slender than the homologous setae of previous legs. Genu: the only seta, d, is small thick, short and barbed; solenidion d short and baculiform. Tibia: setae l' and v' short the former being thicker and barbed while v' is spiniform and without barbation.

**Leg IV** (Fig. 5). Femur: seta d thick, barbed and similar in shape to that of leg III; v' short, thin and spiniform. Genu: there are two short, thin and slightly barbed setae. Tibia: the only solenidion, φ, is ceratiform; the two ventral setae are very thin, v'' is spiniform while v' is thicker, longer, and a fine barbation can be discerned.

**ACKNOWLEDGEMENTS**

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