A new species of *Palpares* Rambur (Neuroptera: Myrmeleontidae) with an identification key to the species of West Africa

MASSOUROUDINI AKOUDJIN¹ & BRUNO MICHEL²

¹CIRDES, BP 454, Bobo-Dioulasso, Burkina Faso. E-mail: akoudjin@yahoo.fr
²CIRAD, UMR CBGP (INRA/IRD/CIRAD/Montpellier SupAgro), Campus International de Baillargeru, CS 30016, F-34988, Montferrier-sur-Lez, France. E-mail: bruno.michel@cirad.fr

Abstract

*Palpares longimaculatus* nov. sp. is described from West Africa. This species resembles *P. radiatus* Rambur, 1842 and *P. incommodus* (Walker, 1853) from the same region and is very similar to *P. kalahariensis* Stitz, 1912 from South Africa. The characters differentiating these species are indicated. An identification key to the West African species of *Palpares* is provided and all the keyed species are illustrated.

Key words: Palparinae, Africa, Afrotropical Region, antlion

Introduction

The West African Palparinae have been revised by Prost (1995) who included 18 species: *Stenares arenosus* Navás, 1924, *S. hyaena* (Dalman, 1823), *Lachlathetes gigas* (Dalman, 1823), *Nosa tigris* (Dalman, 1823), *Tomatares clavicorpus* (Latreille, 1830), *Palpares cephalotes* (Klug, 1834), *P. digitatus* Gerstaecker, 1894, *P. furfuraceus* Rambur, 1842, *P. incommodus* (Walker, 1853), *P. latipennis* Rambur, 1842, *P. nigrescens* Navás, 1913, *P. obsoletus* Gerstaecker, 1888, *P. radiatus* Rambur, 1842, *P. reticulatus* Stitz, 1912, *P. spectrum* Rambur, 1842, *P. tessellatus* Rambur, 1842, *P. umbrosus* Kolbe, 1898 and *P. zebroides* Fraser, 1950. Since this publication, some nomenclatural changes have been made. Mansell (1996) confirmed *P. spectrum* as type species of the re-instated genus *Palparellus* Navás, 1912. Stange (2004) retained the genus *Parapalpares* Insom & Carfi, 1988 whose type species is *P. latipennis*. He also transferred *P. furfuraceus* to the genus *Lachlathetes* Navás, 1926 and *P. reticulatus* into the genus *Goniocercus* Insom and Carfi, 1988, synonymising it with *G. klugi* (Kolbe, 1898) and synonymising *P. tessellatus* with *P. percheronii* (Guérin-Méneville, 1831). Finally *Parapalpares papilionoides* (Klug, 1834) must be added to the list of Prost (1995) (Aspöck *et al*., 2001; Insom & Carfi, 1988; Prost, 2010; Stange, 2004). Taking all of these modifications into account, the genus *Palpares* Rambur is currently represented by 10 species in West Africa. Still, the placement of these species is largely unresolved and most, if not all, should be transferred to other genera after revision of the entire tribe Palparini (Mansell, 2004). The proposal of Insom & Carfi (1988) for the division of the genus *Palpares* into several genera cannot be regarded as an exhaustive revision of the genus because of the low number of species examined (Mansell, 1992). According to these authors only the Palaearctic species *P. libeluloides* (Linnaeus, 1764) should be retained in the genus *Palpares*.

In this paper we describe a new species in the genus *Palpares*, but which will probably be transferred to another genus after the revision of the tribe Palparini. An identification key to the West African species retained in the genus *Palpares* including the new species is provided and all the keyed species are illustrated.

Material and methods

All specimens representing the type series were collected at the same locality, a rather small savanna with lateritic soil, covered by patches of dry grass. This site is located close to the city of Bobo-Dioulasso in the South West of
Burkina Faso. One female was collected with an entomological net at 05:30 p.m., and 5 specimens were attracted to a light trap between 07:00 and 10:00 p.m. the same day. Additional material was found in the collection of the Muséum d’Histoire Naturelle in Paris. A. Prost provided us a photograph of a female he collected in Senegal.

Material examined for the production of the dichotomous key is in the collection of CIRAD, Montpellier and of the Muséum National d’Histoire Naturelle, Paris, France.

Taxonomy

_Palpares longimaculatus_ nov. sp.
(Figs 1, 2, 15, 26, 27)

**Diagnosis.** Yellow head bearing a conspicuous black stripe on vertex and occiput extending to metathorax, and a light brown abdomen. Wing narrow. Membrane with pale markings in forewings, mostly restricted to some longitudinal and cross veins. Posterior margin of wings bordered by a conspicuous pseudo-fringe comprising a series of cells delimited by brown veins. In hind wing the longitudinal apical stripe reaches the level of the pterostigma. Terminal segment of labial palpus very slightly clavate at extremity with slit-shaped sensory opening. Gonarcus with a well developed, regularly rounded, hood-shape bulla.

**Description.** Forewing length: ♂ 45–54 mm; ♀ 55–56 mm. Hind wing length: ♂ 41–50 mm; ♀ 51–53 mm. Abdomen: ♂ 41–46 mm; ♀ 33 mm.

**Head.** Face pale yellow. Vertex moderately inflated. Vertex and occiput light brown with a large brown longitudinal stripe extending on the membrane between head and prothorax. Apical segment of labial palpus yellowish, very slightly clavate and shortly pointed at apex. Palpimacula with slit-like opening, limited to clavate part (Fig. 15). Antennal scape yellow. Pedicel light brown. Flagellomeres black.

**Thorax.** Pronotum yellow with a median brown stripe. Brown laterally. Anterior and posterior margin with long thin light brown setae. Mesothorax yellow with a broad median brown stripe and two lateral narrower brown stripes on mesoscutum. Metathorax yellow with a median brown stripe and two light brown spots on the disc of the metascutum. Meso and metathorax covered laterally with dense long white setae.

**Legs.** Coxae yellow. Femora yellow, brown dorsally. Tibiae coloration uniform varying from yellowish to light brown. Anterior tibiae paler. Tarsi dark brown.

**Wing.** Narrow, with the posterior margin slightly less convex in female than in male. Fore and hind wings with a well delimited row of cells along the posterior margin, like a pseudo-fringe, extending from origin of recurrent vein to middle of apical stripe, not reaching apex of wings. Membrane hyaline with most longitudinal veins entirely or mainly brown except branches of Rs which are brown apically only. Remaining longitudinal and cross veins pale. Hind wing with more conspicuous markings, the first marking close to origin of the recurrent vein extending from M₁ to first branch of recurrent vein, paler between anterior branch of M₁ and recurrent vein. Second marking discal, limited by Rs and 3rd branch of recurrent vein. Third marking between branches of Rs fork. Fourth marking striped, extending from level of pterostigma to apex of wing, separated from precedent marking by one or two rows of cells only (Fig. 2).

**Abdomen.** Light brown. Each tergite variably darker dorsally. Male tergites II to IV with long slender erect setae becoming stouter on distal part of tergite IV. Tergites V and VI with lateral pilosity only. Tergites VII and VIII glabrous. In female all setae are short and stout except laterally on tergite II where they are longer and more slender. Ectoproct of male slightly curved with two stout spine-like setae at base of the post-ventral lobe and a brush-like patch of stout setae on inner surface extending on the distal half (Fig. 1b). Gonarcus with well-developed hood-like bulla (Figs 26, 27).

**Type material.** Holotype ♂, BURKINA FASO, Bobo-Dioulasso (11°07' N–04°42'W), 04.vi.2009, light-trap between 07:00 p.m. and 10:00 p.m. (coll. CIRAD). Paratypes. 3 ♂♂ and 2 ♀♀, same data as holotype, except one male collected with entomological net at 05:30 p.m.

**Additional material.** SENEGAL, 1 ♂, Tiaroye (14°44’N–17°21’W), vi.1923, Millet-Horsin (MNHN); 1 ♀, M’Bayakh (= Bayakh) (14°49’N–17°08’W), 19.vii.1982, Niayes region, B. Sigwalt leg. (MNHN); 1 ♀ (picture), Noflaye (14°47’N–17°12’W), vii.1971 (coll. A. Prost) (this specimen is figured as _P. radiatus_ in Prost, 1995).
FIGURES 1–5. Palpares spp. 1a—*P. longimaculatus*, holotype ♂; 1b—*P. longimaculatus*, right ectoproct, inner face; 2—*P. longimaculatus*, paratype ♀ (as = apical stripe); 3—*P. kalahariensis* ♀ (from South Africa); 4—*P. radiatus* ♂; 5—*P. radiatus* ♀ (coll. MNHN).
**Distribution and biology.** To date, specimens of *Palpares longimaculatus* nov. sp. have only been recorded from the region of Dakar and from Bobo-Dioulasso (Fig. 6); it is not known whether these populations are contiguous or isolated from each other. Despite the intensive prospecting carried out during six years by the second author, *P. longimaculatus* nov. sp. has never been collected in the region of Sikasso in southern Mali (Michel, 1999) which is only 170 km from Bobo-Dioulasso and with quite similar climatic conditions. In Senegal the collection localities are located in the extreme South of the Niayes region where the climate is characterised by the alternation of a dry season from October to June and a rainy season from July to September, with an annual rainfall of around 400 mm. The climate here is quite different from the region of Bobo-Dioulasso, where the rainy season extends from May to October with an annual rainfall of around 1000 mm. Despite the low rainfall, the Niayes region is characterized by high relative humidity due to the proximity of the ocean and to the exposure of the water table. This region was previously more humid than at present and it is known for harbouring Sudano-Guinean relictual species of plants that persisted during the successive climatic conditions since the early Holocene (ca. 10,000 years BP) (Lézine, 1989; Lézine & Chateauneuf, 1991; Maugis *et al.*, 2009). This could be the case for the population of *P. longimaculatus* nov. sp., but knowledge of the distribution of Myrmeleontidae in West Africa is too poor to make clear conclusions. In Burkina Faso *P. longimaculatus* nov. sp. was collected in association with *P. spectrum* in dry savanna. It should be noted that in southern Mali the intense collecting showed that *P. spectrum* is often associated with *P. incommodus*. The larva is unknown.

**FIGURE 6.** Collect localities of *Palpares longimaculatus*.

**Etymology.** Referring to the length of the apical stripe of the wings.

**Remarks.** *Palpares longimaculatus* nov. sp. is very similar to *P. kalahariensis* (Fig. 3) from South Africa. These species can be distinguished by the length of the apical stripe in the wings, the shape of the last palpmere of the labium (Figs 15, 16) and the shape of the gonarcus-parameres complex (Figs 26, 28). In the female of *P. kalahariensis*, the posterior margin of the wings is more convex than in *P. longimaculatus*. In the two specimens of *P. kalahariensis* we examined the wing markings are more extensive and conspicuous than those of *P. longimaculatus* (Figs 1, 2, 3). The male of *P. radiatus* very strongly resembles *P. longimaculatus* (Figs 1, 4), but it can be distinguished from the latter by the following characters: distal palpmere of labium more enlarged on the distal third (Figs 15, 17), apical stripe of hind wing short, shape of the gonarcus-parameres complex which was similar to the figure published by Prost (1995) (Figs 26, 29) in the male from Mali we dissected. *P. longimaculatus* can be distinguished from *P. incommodus* by the following characters: presence of a conspicuous pseudo-fringe along the posterior margin of the wings (Figs 1, 2, 7), the less slender distal palpmere of labium and the rounded gonarcal bulla of male (Figs 26, 30).
FIGURES 7–14. *Palpares* spp. 7—*P. incommodus* ♂; 8—*P. cephalotes* ♂ (coll. MNHN); 9—*P. obsoletus* ♂; 10—*P. zebroides* ♀ (coll. MNHN); 11—*P. digitatus* ♀; 12—*P. umbrosus* ♀; 13—*P. percheronii* ♂; 14—*P. nigrescens* ♂.
FIGURES 15–25. Distal palpomere of labium. 15—*P. longimaculatus*; 16—*P. kalahariensis*; 17—*P. radiatus*; 18—*P. incommodus*; 19—*P. cephalotes*; 20—*P. obsoletus*; 21—*P. digitatus*; 22—*P. umbrosus*; 23—*P. zebroides*; 24—*P. percheronii*; 25—*P. nigrescens*.

**Key to species of *Palpares* recorded from West Africa**

This key is based on morphological characters to identify specimens of both sexes. Additional characters of the gonarcus-parameres complex are provided to confirm the identification when males are available. For two very close species, *P. digitatus* and *P. umbrosus*, we provide the description of the hypandrium internum which is a better differential character than the shape of the male ectoprocts (Prost, 1995).

1. Dorsal surface of thorax yellow with a conspicuous dark longitudinal stripe ........................................... 2
   - Dorsal surface of thorax uniformly or mainly dark, without a longitudinal median dark stripe ............................. 6
2. Distal palpomere of labium rounded at apex with palpimacula slit-like, reaching the apex (Fig. 19). Gonarcal bulla large, almost conical. A tuft of long setae present between the parameres (Fig. 31) ......................................................... cephalotes (Fig. 8)
   - Distal palpomere of labium pointed or truncated at apex ........................................................................... 3
3. Distal palpomere truncated at apex with the part beyond the palpimacula representing a fifth of its length. Palpimacula small and rounded (Fig. 20). No gonarcal bulla. A row of setae of decreasing length between the parameres (Fig. 32) .......................................................... obsoletus (Fig. 9)
   - Distal palpomere pointed at apex with the part beyond the palpimacula short, clearly shorter than the fifth of its length. Palpimacula slit-like. Gonarcal bulla variously developed .......................................................... 4
4. No pseudo-fringe along the posterior margin of the wings. Distal palpomere of labium enlarged at apex (Fig. 18). Gonarcal bulla ovoid with a backward developed process on each side (Fig. 30) ................................................................. incommodus (Fig. 7)
   - A conspicuous pseudo-fringe along the posterior margin of the wings ............................................................... 5
5. Hind wing with apical stripe short, not reaching the level of the pterostigma and separate from the precedent marking by more than three rows of cells. Forewing with the extremity of some longitudinal veins brown, forming a series of curved lines reaching the posterior margin. Distal palpomere of labium with a third of its length enlarged (Fig. 17). Gonarcal bulla small and triangular (Fig. 29) ................................................................. radiatus (Figs 4, 5)
   - Hind wing with apical stripe long, reaching the level of pterostigma and separate from the precedent marking by one or two rows of cells only. Forewing without a series of curved lines along posterior margin. Distal palpomere only very slightly enlarged at apex. (Fig. 15). Gonarcal bulla large, regularly rounded (Figs 26, 27) ................................................................. longimaculatus (Figs 1, 2)
6. Dorsal surface of thorax uniformly dark .................................................. 7
   - Dorsal surface of thorax dark with pale markings ......................................................................................... 9
7. Hind wing with a large marking at the origin of recurrent vein reaching anteriorly from R to hind margin or nearly so. Distal palpomere of labium rounded at apex with the palpimacula long, reaching the apex (Fig. 23). Male unknown ................................................................. zebroides (Fig. 10)
   - Hind wing with only some small dots at the origin of the recurrent vein. Distal palpomere of labium with the part beyond the palpimacula long and truncated (Figs 21, 22) ................................................................. 8
8. Dorsal surfaces of thorax and legs black. Palpimacula round or slightly elongate (Fig. 21). Gonarcal bulla smooth (Fig. 33). Hypandrium internum hook-shaped with the dorsal process shorter than the lateral expansions (Figs 38, 39, 40). .......................................................... digitatus (Fig. 11)

- Dorsal surface of thorax and legs brown. Palpimacula oblong, somewhat slender and slit-like (Fig. 22). Gonarcal bulla slightly rounded (Fig. 34). Hypandrium internum trapezoidal with the dorsal process thin and longer than the lateral expansions (Figs 41, 42, 43) .......................................................... umbrosus (Fig. 12)

9. Thorax brown with posterior half of mesonotum mainly pale yellow. Femora and tibiae yellow. Abdomen yellow. Distal palpomere of labium sharply pointed (Fig. 24). Gonarcus flat with the posterior margin indented. Parameres absent (Figs 35, 36) .......................................................... percheronii (Fig. 13)

- Thorax black with yellow markings. Legs black. Abdomen black with dorsal yellow stripe. Distal palpomere of labium rounded at apex (Fig. 25). Parameres tooth-like (Fig. 37) .......................................................... nigrescens (Fig. 14)


FIGURES 38–43. Hypandrium internum. 38—P. digitatus, lateral view; 39—P. digitatus, dorsal view; 40—P. digitatus, anterior view; 41—P. umbrosus, lateral view; 42—P. umbrosus, dorsal view; 43—P. umbrosus, anterior view.
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References


