



Journal of
Entomology

ISSN 1812-5670



Academic
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***Pseudophacopteron burckhardti* sp.n. (Hemiptera: Phacopteronidae), New Species of Psyllid Associated with *Zanthozyllon gillettii* (Rutaceae) from Cameroon**

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ABSTRACT

A new *Pseudophacopteron* species from Cameroon is described, *Pseudophacopteron burckhardti* sp.n is described from Cameroon and feeds on *Zanthozyllon gillettii* (Rutaceae), Fifth instar nymphs and adults are described and compared to the description of the psyllid species of *Pseudophacopteron* previously described in Cameroon.

Key words: *Pseudophacopteron burckhardti*, Phacopteronidae, *Zanthozyllon gillettii*, Cameroon

INTRODUCTION

Psyllids or jumping plant-lice are phloem feeding insect with a high degree of specificity towards their host plant. Often closely related psyllid species develop on closely related host plant. In Cameroon few taxonomic works were carried out within psyllid of Phacopteronidae family. Malenovsky *et al.* (2007) and Malenovsky and Burckhardt (2009) described new species of Phacopteronidae of *Pseudophacopteron* genus from Cameroon. The Phacopteronidae family is morphologically distinct from other psyllid groups and there little doubts its monophyly (Brown and Hodkinson, 1988). This family is one of the smallest psyllid families with 31 species described from Afrotropical regions (Malenovsky and Burckhardt, 2009). Malenovsky *et al.* (2007) and Malenovsky and Burckhardt (2009) described respectively nine and two new psyllids species of *Pseudophacopteron* from Cameroon. Most species within this family are associated with plants of the order Sapindales (or Rurales) (Burseraceae 8 spp., Meliaceae 7, Sapindaceae 5, Rutaceae 4, Anacardiaceae 2 and Anacardiaceae/Simaroubaceae 1). Adults of one species were collected on *Tabernaemontana stapfiana* Britten (Apocynaceae) in Kenya and many of them are gall-inducers (Hollis, 1984; Malenovsky *et al.*, 2007; Malenovsky and Burckhardt, 2009). No psyllid species, collected on *Zanthozyllon gillettii* (Rutaceae) was included in the material studied by previous authors from Cameroon. But Malenovsky and Burckhardt (2009) included an unknown species very closed to *P. stigmatum* Malenovský and Burckhardt collected on *Fagara* sp. (Rutaceae) from Cameroon. *Fagara* sp. was identified as *Zanthozyllon gillettii* (Rutaceae). The Phacopteronidae are usually associated with tropical forest ecosystems, which are generally threatened by habitat loss and as such they are of potential interest to conservation biologists. Some Phacopteronidae are pests of commercially valuable timber and fruit trees (Malenovsky *et al.*, 2007).

Zanthozyllon gilletii Wilds is widespread in the tropical West Africa, Central Africa, East Africa (Letouzey, 1963). *Z. gilletii* is of great interest as regard of its medicinal and insecticidal abilities. According to Noel *et al.* (2007), *Z. gilletii* barks are used traditionally to heal malaria; its barks had very good antiplasmodium in vitro activities. They are also used in african traditional medicine to fight again headache, rheumatics and uro-genital infections.

This study described a new psyllid species of Phacopteronidae family associated with *Z. gilletii* from Cameroon.

MATERIALS AND METHODS

The following abbreviations are used: LZUY = Laboratoire de Zoologie, Université de Yaoundé I, Cameroon; MRAC = Musée Royal d'Afrique Centrale, Belgium; NHMB = Naturhistorisches Museum Basel, Switzerland.

The psyllids were captured in the Central Region of Cameroon; the following localities were inspected: Kala, 03°50'121"N, 11°21'004"E, 1122 m, Libellingoï, 03°54'236"N, 10°55'031"E, 396 m, Nkomilong, 03°49'954"N, 11°20'504"E, 1161 m, Ongot, 03°54'753"N, 11°23'070"E, 782 m and Oyack, 03°29'110"N, 11°30'050"E, 696 m.

Adult psylloids were captured with a sweep net of 0.5 mm mesh size and an aspirator. Nymphs were sampled directly from buds and leaves of the host plant. The specimens are preserved dry and slide-mounted or in 70% ethanol and are deposited in LZUY, MRAC and NHMB. Morphological terminology follows Malenovsky and Burckhardt (2009). The host plant was identified at the National Herbarium at Yaounde (Cameroon) and is deposited in LZUY. The morphology was illustrated using transmission (Leica microscope) and measurements were made from slide-mounted using Leica stereomicroscope. The following characters were measured for adults: BL, body length; BW, body width; HW, head width; AL, antenna length; F₁, length of first antennal flagellomere; WL, fore wing length; WW, fore wing width; wL, hind wing length; wW, hind wing width; MTL, metatibial length; MFL, metafemur length; MP, male proctiger length; PL, paramere length; DL, length of distal segment of aedeagus; FP, female proctiger length; SL, female subgenital plate length. Also the following characters were measured for the fifth instar nymph: BL, body length; BW, body width; AL, antenna length; FL, fore wing-pad length; ML, metatibial length.

Material examined: Kala: 23 iii 2007, 5 males, 6 females, 17 nymphs; 27 iv 2007, 4 males, 2 females, 3 nymphs; 27 vi 2007, 2 females; 20 vii 2007, 1 female, 1 nymph; 22 ix 2007, 1 male, 7 nymphs; 24 x 2007, 2 males, 2 females; 17 xi 2007, 5 males, 1 female; 27 xii 2007, 9 males, 6 females. Libellingoï: 7 vii 2007, 2 males, 3 females, 10 nymphs. Nkomilong: 19 ii 2007, 14 males, 11 females, 18 nymphs; 29 iii 2007, 8 males, 3 females; 30 iv 2007, 3 males, 1 female, 10 nymphs; 6 v 2007, 2 males; 29 vi 2007, 2 males, 3 females; 21 vii 2007, 1 male, 2 females; 22 viii 2007, 4 males, 4 females, 17 nymphs; 24 xi 2007, 1 male, 2 females. Ongot: 26 ix 2009, 3 males, 2 females, 20 nymphs. Oyack: 26 xii 2009, 2 females, 8 nymphs.

RESULTS AND DISCUSSION

Description

Fifth instar nymph

Coloration: Body uniformly pale yellow, compound eyes translucent with a reddish spot, anterior region of abdomen with five transverse brown bands and the posterior region with a large brown band.

Structure: Final instar nymph (Fig. 2a), elongate, not clearly divided into head, thorax and abdomen; the final instar nymphs length, 1.37 mm and wide, 0.48 mm; it is 2.9 times as long as wide. Antennae (Fig. 2b) slightly elongated with indistinctly segmented flagellum with three apically rhinarium. Antenna length, 0.20 mm. The head margin, thorax, anterior region of fore wing pads, wingpads and abdomen are covered by lanceolated setae. The hind leg (Fig. 2c) elongate, metatibia and metabasitarsus not clearly separated, tarsal arolium in a trapezoidal form, metatibia length, 0,19 mm. Abdomen dorsally weakly sclerotized, apex of abdomen broadly rounded, anus in ventral position; circumanal ring strongly sinuate, composed of a single row of pores.

Adult

Coloration: Overall body yellow. Pronotum, mesopraescutum, mesoscutum and mesoscutellum entirely dark brown. Antenna brown, segment 8 dark-brown apically, segments 9-10 entirely dark-brown. Compound eyes dark-brown and ocelli transparent. Metatibia and metabasitarsus with several clear strong setae and metabasitarsus with two black spurs. Fore wing membrane clear, transparent with a large dark-brown which cover the most part of the fore wing cells. The dark-browning area along all the veins except the C+Sc, An, half of R, middle of M_{3+4} and Cu_1 veins. A small dark-brown spot on An vein. Hind wing clear, transparent.

Structure: Head (Fig. 1a), in dorsal view, slightly wider than mesonotum, subglobular; vertex convex and frontal margin sharply defined and deeply incised by median suture. Lateral ocelli placed posteriorly on vertex. Vertex wider than higher and lack lanceolate setae. Genae distinctly not swollen but flat. Antenna long, slender, segments cylindrical, only segments 2 and 9 are widening to apex (Fig. 1b); Antennal flagellum 1.2 times longer than head width, first flagellomere, 0.09 times longer than antenna and it's lacks rhinarium. Flagellomeres 2, 3, 5, 6, 7 with single rhinarium apically; flagellomere 4 with two rhinaria apically. Rhinarium of flagellomere 7 larger than the other ones and bear cuticular spines. Terminal setae subequal. Fore wing moderately elongate, outer anterior margin less evenly curved, apex rounded; spinules present in apical part of r_2 , m_2 , m_1 and cu_1 cells; cu_1 cell more wider than higher; fore wing 2.5 times longer than wide and 1.03-1.2 times longer than Hind wing. Costal break of C+Sc absent (Fig. 1c). Hind wing (Fig. 1d) with grouped costal setae: 1 before costal break and 3 after costal break; hamulus absent (1+3+0). Hind wing 3.2-3.5 times longer than wide. Hind legs (Fig. 1e and f), long and robust; metacoxa long with a short acute pointed meracanthus; the internal margin of metafemur relatively incurved on the middle part and bearing lanceolate setae; metatibia bearing along site 12-15 spaced slender, unsclerotized spurs and lanceolate setae, metatibia lacks apical sclerotized spurs; metabasitarsus bearing two black sclerotized spurs and the external face bearing two slender unsclerotized spurs; metatibia 0.77-0.79 times longer than head wide. Male terminalia as in Fig. 1g; proctiger relatively short, cylindrical (Fig. 1h); subgenital plate, in profile slightly longer than high; paramere (Fig. 1i), relatively long, in profile incurved on external margin, proximal region slightly narrow, on subapical part paramere bearing three slender unsclerotized spurs, paramere, 0.2 times longer than head wide; apical segment of aedeagus shorter than proximal segment, with narrow head weakly, gradually widening from base to apex, dorsal margin straight, sclerotized end tube of ductus ejaculatorius less longer (Fig. 1k), apical segment of aedeagus, 0.17 times longer than head wide. Female terminalia as in Fig. 1g; proctiger relatively long and bearing four setae, dorsal margin straight, apical process long, circumanal ring with two rows of pores, but pores of outer row on

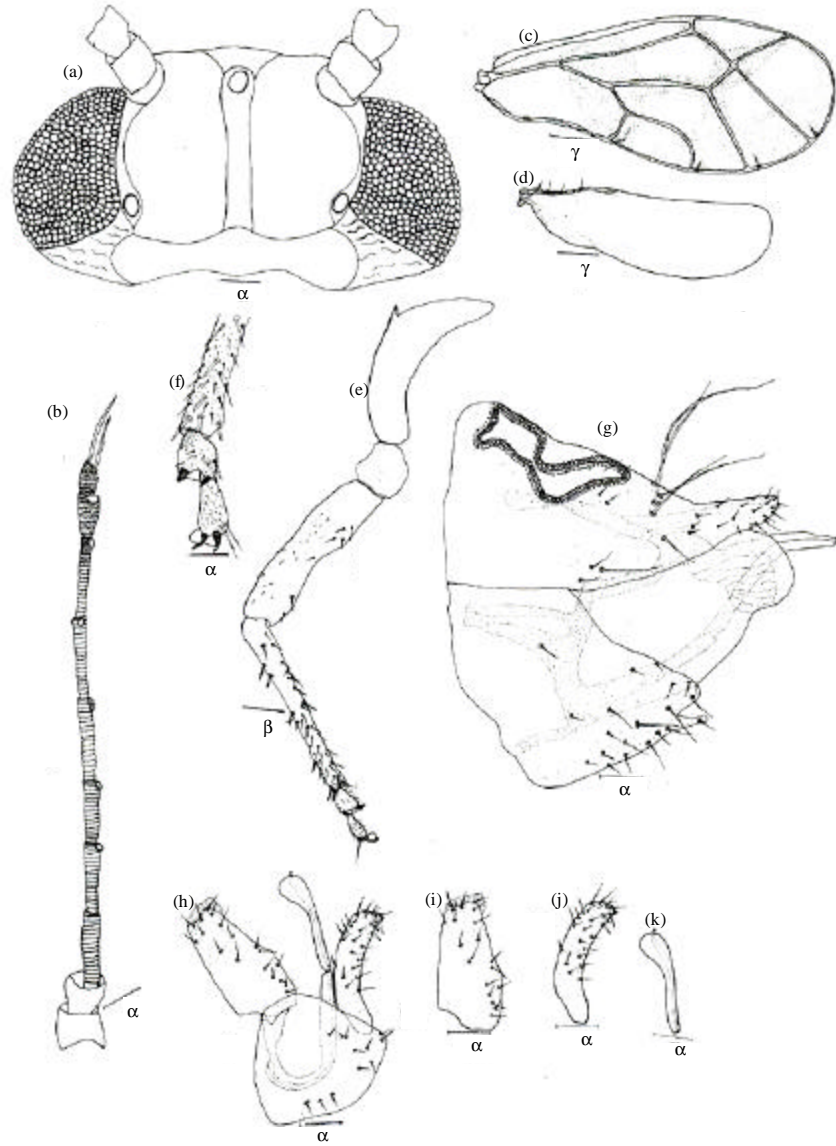


Fig. 1(a-k): *Psedophaceopteron burchardti* sp.n., (a) Head, (b) Antenna, (c) Fore wing, (d) Hind wing, (e) Hind legs, (f) Hind legs apical extremity, (g) Female terminalia, (h) male terminalia, (I) Proctiger, (j) Paramere and (k) Apical segment of aedeagus, Scale Bars: α : 0.04 mm, β : 0.08 mm, γ : 0.016 mm

dorsal margin are wider than the inner pores row; the outer row of the inner margin of circumanal pores are narrowed than the inner row; circumanal is very narrowed on his middle part; subgenital plate, in profile, relatively long, dorsal margin weakly concave, ventral margin more or less straight, apex divided on two lobes, external lobe narrow and internal lobe wide; dorsal valvulae are long; female proctiger is 0.4 times longer than head wide and female subgenital plate 0.3 times longer than wide head.

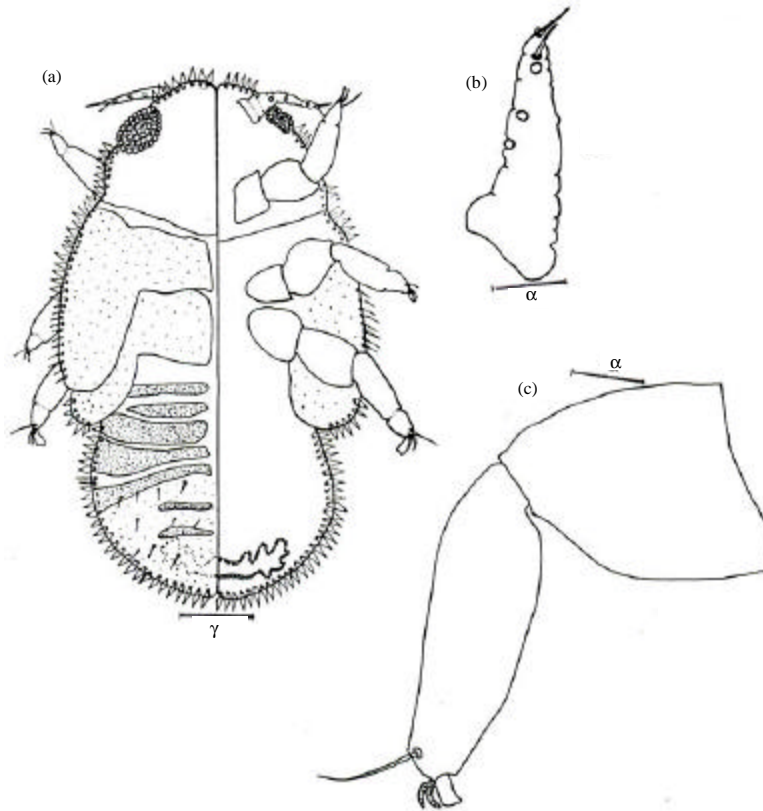


Fig. 2(a-c): Final instar nymph of *Pseudophacopteron burckhardti* sp.n., (a) Final instar nymph, (b) Antenna and (c) Hind leg. Scale Bars: α : 0.04 mm, β : 0.08 mm, γ : 0.016 mm

Comment: *Pseudophacopteron burckhardti* sp.n. differs from the nine described species from Cameroon (Malenovsky *et al.*, 2007). Nymphs are closed to *P. morion* and *P. electum* with the antenna structure, *P. cuniculus* with the circumanal ring structure. Adults are closed to *P. eastopi* with male and female terminalia.

Fifth instar nymph antenna of *P. burckhardti* lacking distinct segments as *P. morion* and *P. electum* but the latter two previously described species have two rhinaria; *P. burckhardti* have three rhinaria. Also outer surface basally with 7 sharp cuticular teeth compared to 8-12 sharp cuticular teeth of *P. morion*. Others *Pseudophacopteron* spp., previously described have distinct antennal segments. Tarsal arolium of *P. burckhardti* longer than wide, rectangular, different in shape with *P. cuniculus*, triangular and the others *Pseudophacopteron* spp. which are commonly broad. Circumanal ring large and sinuate, widely extending on the dorsal and ventral surface of caudal plate. Circumanal large and sinuate is different from *P. morion* which is small and oval, *P. cuniculus* which strongly sinuate or *P. electum* which is wide, fore and hind margin close together. Abdomen dorsally on each side with seven sclerites but the number of sclerites is six with *P. cuniculus* and five with *P. morion* and others species described from Cameroon.

The disposition of the spots on the fore wing is very different of those of species described by Malenovsky *et al.* (2007) and fore wing without the costal break. The structures of the male terminalia especially the paramere and female terminalia are different from the structures of the

nine species but *P. burckhardti* is getting closer with *Pseudophacopteron eastopi* on the structure of the smallest size of adult (fore wing length, *P. eastopi*: 0.90-1.26, *P. burckhardti*: 1,18-1,48 mm; head width, *P. eastopi*: 0.35-0.41 mm, *P. burckhardti*: 0.48-0.73 mm). In *P. burckhardti*, antenna long, slender, segments cylindrical, only segments 2 and 9 are widening to apex, rhinarium of flagellomere 7 larger than the other ones and bear cuticular spines but in *P. eastopi*, antenna long, slender, segments cylindrical, weakly widening to apex, the last rhinarium with a wreath of cuticular spines; antenna length (*P. eastopi*: 0.46-0.57 mm, *P. burckhardti*: 0.48-0.75 mm). In *P. burckhardti*, male proctiger cylindrical but in *P. eastopi*, male proctiger slightly narrowing to apex (*P. burckhardti*: 0.15-0.20 mm, *P. eastopi*: 0.11-0.13 mm). In *P. burckhardti*, apical segment of aedeagus with narrow head weakly, gradually widening from base to apex, sclerotized end tube of ductus ejaculatorius less longer but in *P. eastopi*, apical segment of aedeagus with a slightly hooked head, broad and rounded at apex, sclerotized end tube of ductus ejaculatorius relatively long. In *P. burckhardti*, subgenital plate, in profile slightly longer than high but in *P. eastopi*, subgenital plate, in profile as long as high; subgenital plate length (*P. eastopi*: 0.18-0.21 mm, *P. burckhardti*: 0.15-0.35 mm).

CONCLUSION

P. burckhardti is different of the nine species described by Malenovsky *et al.* (2007) in Cameroon, according to the original description as follows. For the fifth instar nymph, the posterior region of fore wing pads is covered by the simple lanceolate setae; tarsal arolium with a trapezoidal form, circumanal ring less large and strongly sinuate, composed of a single row of pores. For adult, the fore wing maculation occupy the $\frac{1}{2}$ of r_1 and r_2 cells; $\frac{2}{3}$ of m_2 , m_1 and cu_1 cells; $\frac{1}{3}$ of cu_2 cell; Hind wing with grouped costal setae: 1 before costal break and 3 after costal break; hamelus absent (1+3+0); paramere is relatively long, in profile incurved on external margin, proximal region slightly narrow, on subapical part paramere bearing three slender unsclerotized spurs; female proctiger with a narrowing circumanal, subgenital plate, in profile, relatively long, dorsal margin weakly concave, ventral margin more or less straight, apex divided on two lobes, external lobe narrow and internal lobe wide. *Pseudophacopteron burckhardti* is a newly described psyllids species from Cameroon. The new species does not induce galls on its host; the sucking activities of nymphs distort leaves which become necrotic in part. *Z. gilletii* is a commercial timber used in traditional medicine. *P. burckhardti* could be consider as a pest of this plant in Cameroon.

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