



## Two species of psyllids genus *Paurocephala* (Hemiptera: Psyllidae) pest insects associated to Connaraceae in Cameroon

Wenceslas Yana<sup>1\*</sup>, Victor Joly Dzokou<sup>2</sup>, Yves Patrick Mveyo Ndankeu<sup>3</sup>, Joseph Lebel Tamesse<sup>4</sup>

<sup>1</sup>Laboratory of Biological Sciences, Faculty of Sciences, University of Bamenda, Bambili, Cameroon

<sup>1-4</sup>Laboratory of Zoology, Higher Teacher's Training College, University of Yaounde, Yaounde, Cameroon

<sup>2</sup>Laboratory of Agricultural Zoology, Faculty of Agronomy and Agricultural Sciences, Department of Plant Protection (UR\_PHYZA), University of Dschang Dschang, Cameroon

<sup>3</sup>Laboratory of Zoology, Faculty of Sciences, University of Yaounde, Yaounde, Cameroon

### Abstract

Two species of *Paurocephala* genus are described and illustrated from Cameroon. The psyllid of *Cnestis ferruginae* described here is morphological identical to *Paurocephala sinuata* from Tanzania. *Paurocephala nkomekui* sp. n. psyllid of *Agelaea hirsuta* is described as new because the morphological examination with the previous described species shows that *P. nkomekui* is different morphologically but it is closely related to *P. hollisi* psyllid of *Agelaea heterophylla* from Tanzania. The two species of psyllids develop on the plants belonging to Connaraceae family with medicinal importance on which they cause serious damage by inducing necrosis to their host plants.

**Keywords:** *Paurocephala*, psyllids, Connaraceae, Cameroon, taxonomy

### 1. Introduction

Psyllids or jumping plant lice (Hemiptera: psylloidea) are sap sucking insects that are typically monophagous or oligophagous. They are significant pest insects for their host plants in removing large quantities of plant sap or by transmitting pathogens. Psyllids hinder the growth and the development of the crop and the forest timber with economic and pharmaceutical importance. The larvae cause more damages to their host plants than adults and only adults can transmit disease to their host (Hodkinson, 1974, Burckhardt 1994, Hollis 2004) [10, 2, 12]. Psyllids are often associated with Dicotyledonous plants and related host taxa (Burckhardt, 2005) [4]. They are generally highly host specific in particular during their larval development.

At least 3000 psyllid species have been described from all biogeographic regions of the world (Mifsud & Burckhardt, 2002) [15]. Most of the described species are from the tropical and the temperate regions (Hollis, 2004) [12]. So far, psyllid species have been recorded in Cameroon and few of them have been described by some authors as Dzokou *et al.*, (2019, 2017, 2009) [9, 8, 7] described 3 species: *Pseudoeriopsylla bitomi*, *P. etoundii* and *Trioza messii*; Tamesse & Dayang (2018) [22] described *Diclidophlebia andjigae*; Yana *et al.*, (2017, 2015) [27, 26] described *Trioza kala* and 6 species in Carsidaridae family; Tamesse *et al.*, (2014, 2011, 2010) [25, 24, 23] described 3 species: *Pseudophacopteron burckhardti*, *Phytolyma tchuentei*, and *Blastopsylla occidentalis*; Malenovsky *et al.*, (2007) [14] described 9 species in *Pseudophacopteron* genus; Burckhardt *et al.*, (2006) [5] described 5 species in *Diclidophlebia* genus; Hollis (1984) [11] described 14 species in Triozidae family. Many psyllid species remain undescribed and there is no publication concerning *Paurocephala* genus in Cameroon.

*Paurocephala* genus is characterized by the head with a

concave vertex, transversely flat apart from foveae, ocelli not raised, rounded down at front and merging smoothly with genae, genae without processes. Hind leg is very long and slender; meracanthus is narrow, often strongly elongate, metatibia lacking genual spine; metabasitarsus lacking saltatorial spurs. Forewing rounded apically usually constricted basally and broadest in apical half. Male proctiger short broad, weakly lobed posteriorly or unlobed; apical segment of aedeagus usually bisegmented with an end tube often very long and thick. Female proctiger is variously concave, often noticeably upturned; dorsomedial setae forming a prominent transverse row; circumanal ring is usually cruciform (Brown & Hodkinson, 1988) [1]. According to literature information, the systematic position of *Paurocephala* genus was discussed by many authors. Crawford (1914) [6] noted a resemblance between *Paurocephala* genus and *Pauropsylla* genus and thereby implying a close phylogenetic relationship. The two genera were re-examined by Hollis (1984) [11]; and placed the genus *Paurocephala* near *Haplaphalara* Uichanco and *Moraniella* Loginova which confirmed the placement of *Paurocephala* in the Aphalaridae proposed by several authors. *Pauropsylla* genus was redefined within the Triozidae family (Hollis, 1984) [11]. The survey of Yang *et al.*, (1986) [28] solved some of the confusion around *P. psylloptera* Crawford. They concluded that three different species were involved; one developing on *Ficus*, one on *Trema* and one on *Morus*, all three species having restricted geographical distributions. These results were based on host plant alternation and mating experiments, courtship behaviour, acoustic analysis and adult morphology. Li & Yang (1987) [13] described five new species of *Paurocephala* from China, but failed to examine type material of previously described species. Pettey (1924, 1933) [18, 19] described two *Paurocephala* species from South Africa based on absence of genal

processes and presence of pterostigma. Russell (1943, 1946)<sup>[20,21]</sup> described two new Afrotropical species in *Paurocephala*, they differed substantially from the type species, most conspicuously in the presence of prominent peg-like setae on the inner surface of the paramere. Brown and Hodkinson (1988)<sup>[1]</sup> described two Neotropical species, *P. lanceomedia* and *P. paucivena*. They suggested that the former was closely related to the Afrotropical species, differing in the absence of peg-like setae on the inner surface of the paramere and in wing venation. They did not comment on the relationships of *P. paucivena* Brown and Hodkinson, due to lack of males and antennal structures. Burckhardt (1996)<sup>[3]</sup> described two *Paurocephala* spp. from Paraguay. These two species differed from all other species included in *Paurocephala* in the distinctly short head, thickened antennal flagellum and presence of a small subapical rhinarium on segment 3. He suggested that two Asian groups of *Paurocephala* can be distinguished. One group has long and slender metatibiae, a long rostrum, antennae longer than head width and long female terminalia. The second group, consisting of *P. brevicephala* Crawford, *P. kleinhofiae* Uichanco, *P. minuta* Crawford and *P. russellae* Mathur, has short metatibiae and rostrum, antennae shorter than head width and short female genitalia, which are usually upturned apically. He also suggested that the Afrotropical species are intermediate between these two Asian groups. The host plants of the two new species of *Paurocephala* belong to Connaraceae family: *Cnestis ferruginea* and *Agelaea hirsuta* with medicinal importance.

## 2. Materials and methods

The following abbreviations are used: LZUY= Laboratory of Zoology, University of Yaounde I; NHMB= Naturhistorisches Museum Basel, Switzerland; NHY= National Herbarium of Yaounde, Cameroon. The following abbreviations are used in the descriptions and measurement tables. Adult: BL, body length; BW, body width; HW, head width; AL, antenna length; F<sub>1</sub>, length of first antennal flagellomere; FCL, frontal cone length; WL, forewing length; WW, forewing width; wL, hindwing length; wW, hindwing width; MTL, metatibial length; MFL, metafemur length; MP, male proctiger length; PL, paramere length; DAEL, distal segment of aedeagus length; FP, female proctiger length; SL, female subgenital plate length. Fifth instar larva: BL, body length; BW, body width; AL, antenna length; WL, forewing-pad length; MTL, metatibial length.

Adult psyllids were captured with a sweep net of 0.5 mm mesh size and mouth aspirator. Larvae were sampled directly from buds and leaves of the host plant at Kala (latitude: 03°50'121''N, longitude: 11°26'004''E, altitude: 1122 m) and Nkomilong (latitude: 03°49'954''N, longitude: 11°20'504''E, altitude: 1161 m) of Cameroon for the psyllid of *Cnestis ferruginea*. The distribution of *Agelaea hirsuta* psyllid in Cameroon is large. The specimens were collected at the following localities: Akonolinga (03°46'551''N; 12°14'687''E, and 665 m); Bokito (04°33'497''N; 11°06'907''E, and 474 m); Ekekom (04°10'028''N; 11°32'097''E, and 550 m); Yaounde (03°57'395''N; 11°31'995''E, and 694 m); Kala; Leboth (04°00'042''N; 11°25'488''E, and 639 m); Libellingoï (03°54'236''N; 10°55'031''E, and 396 m); Minkoameyos; (03°52'990''N; 11°25'420''E, and 740 m); Minwoho (04°06'155''N; 11°11'730''E, and 573 m); Mbalmayo (03°29'110''N;

11°30'050''E, and 696 m); Soa (03°58'112''N; 11°35'435''E, and 674 m). The field survey was carried out from January 2006 to December 2009. The specimens are preserved dry and slide-mounted or in 70% ethanol and are deposited in LZUY and NHMB. Measurements of descriptive parameters were made from slide-mounted using Leica stereomicroscope. Concerning the *Cnestis ferruginea* psyllid 30 larvae, 30 males and 30 females were measured. Concerning the *Agelaea hirsuta* psyllid 10 larvae, 50 males and 50 females were measured. The morphology of descriptive parameters was illustrated using Leica microscope. Morphological terminology follows (Ossiannilsson, 1992; Mifsud & Burckhardt, 2002; Brown & Hodkinson, 1988)<sup>[17, 15, 1]</sup>. The host plants were identified at NHY. Drawings and measurements were made from slide-mounted material.

## 3. Results

### 3.1 Description of *Paurocephala sinuata*

Fifth instar larva

**Coloration:** the overall body is brown but the thorax and anterior part of abdomen bear dark spots; posterior part of abdomen is completely dark.

**Structure:** the fifth larva (fig.1) is dorsoventrally flattened; head is not really separated with the thorax. Antenna is distinctly 3-segmented, flagellum is not subdivided with pointed sectasetae and three rhinaria; second antennal segment with a funnel seta (fig.3). The head bears two pointed sectasetae and two truncate sectasetae. The wing pads also bear pointed sectasetae and truncate sectasetae. The legs bear simple setae but the metathoracic leg bears two pointed sectasetae, the arolium is globular (fig.4). The abdominal tergites bear pointed and truncate sectasetae. The margin of the posterior part of abdomen presents branching finger-like structures ended by pointed sectasetae. The circumanal is an arch circular form, composed of a single row of elongate pores (fig.6). The ventral face of the abdomen is covered by simple setae. Measurements and ratios in table 1.

### Adult

**Coloration:** the overall body colour is brown, but the thorax is dark-brown than the abdomen; the forewing is yellowish and hyaline while hindwing is translucent.

**Structure:** the head (fig.8) is moderately short and wider than mesoescutum; vertex is transversely flat, rounded down at front and merging smoothly with genae but the genal cones are absent. The vertex is covered by inconspicuous setae; each genal lobe of genae bears two long simple setae. Antenna (fig.10) is relatively long and is 1.02-1.03 times longer than head width; the antenna is composed of 10 segments and the first flagellomere is the longest; single simple subapical rhinarium on segments 4, 6, 8 and 9; each rhinarium is bordered a wreath of cuticular spines. The thorax is moderately arched, pronotum short merging smoothly with propleurites laterally, propleurites are elongate and narrow. Forewing (fig.12) is rounded apically and constricted basally and broadest in apical half, the forewing is 2.2 times longer than wide; the pterostigma is elongate with a pointed end, it is 3.7 longer than R<sub>s</sub> vein; pterostigma and cell *cu<sub>1a</sub>* are similar in shape, R and M+Cu<sub>1</sub> veins have the same length; dorsal surface of veins with hairs; there is no cellular pattern. Hindwing (fig.14) presents

2 setae before the costal break and 1 seta plus 1 seta after the costal break. The hind leg has a long coxa with a short and apically blunt meracanthus; metatibia is lacking basal spine the length of matatibia and metafemur are approximately equal; the metatibia apical spurs are arranged 2+3; metabasitarsus without spurs and the arolium is globular (fig. 16, 17).

Male genitalia (fig.20) has a short proctiger with short pedonculate proximal part and broad medial part, its half apical part is covered by simple setae; paramere (fig.22) is elongate, inner margin incurved with four stout or peg-like setae situated from basal third to medial part, apical surface sparse by short robust setae, the apex of paramere is pointed. Apical segment of aedeagus (fig.23) is relatively short and composed of two segments, rounded apex with an end-tube relatively long and thick.

Female genitalia (fig.27) is elongate, proctiger is incurved on the apical third and upturned with rounded apex; the apical part of the proctiger is sparse by short robust setae; the female proctiger bears 6 long setae; circumanal is cylindrical with a broadly subapical part and formed of two rows of elongate pores; subgenital plate is short than the proctiger incurved on apical part with a pointed apex and bears the simple long setae; ovipositor well developed. Measurements and ratios in tables 2 and 3.

**Examined materials:** host plant *Cnestis ferruginae* (Connaraceae).

Holotype : Libellingoï : 8 vii 2007, 3 ♂, 5 ♀, 45 larvae ; Kala: 28 vii 2006, 16 ♂, 20 ♀, 2 larvae; 27 iv 2007, 2 ♂, 4 ♀; Leboth: 23 x 2006, 11 ♂, 19 ♀, 55 larvae; 12 x 2007, 4 ♂, 2 ♀, 1 larva; Minwoho: 22 viii 2006, 5 ♂, 4 ♀, 5 larvae; Soa: 26 i 2006, 15 ♂, 5 ♀, 57 larvae; 12 ii 2007, 10 ♂, 5 ♀, 2 larvae; 31 v 2007, 3 ♂, 7 ♀, 3 larvae.

### 3.2 Description of *Paurocephala nkomekui* sp.n.

Fifth instar larva

**Coloration:** the overall body is yellow but the thorax and anterior part of abdomen bear brown spots; the eyes are reddish.

**Structure:** the fifth larva (fig.2) is dorsoventrally flattened; head is not really separated with the thorax. Antenna is distinctly 3-segmented, flagellum is not subdivided with short and robust pointed sectasetae and four rhinaria; the terminal seta of the antenna is short and truncate while the sub-terminal seta is long and pointed. The head bears two pointed sectasetae on the left and right halves. The forewing pads bear seven pointed sectasetae marginally and the hindwing pads bear two apical pointed sectasetae. The legs bear simple setae but the metatarsus bears one funnel seta, the arolium of the metathoracic leg is triangular (fig.5) while the one of the mesothoracic leg is globular and petiolate. The abdominal tergites bear pointed sectasetae; the margin of abdomen presents branching finger-like structures ended by pointed sectasetae or pointed and truncate sectasetae. The circumanal is an arch circular form, composed of a single row of elongate pores (fig.7). The ventral face of the abdomen is covered by simple setae. Measurements and ratios in table 1.

### Adult

**Coloration:** the overall body colour is brown, but the tergites and sternites are dark-brown and the female is a bit more dark-brown than the male; the forewing is yellowish and hyaline while hindwing is translucent.

**Structure:** the head (fig.9) is moderately short and wider than mesoescutum; vertex is transversely flat, rounded down at front and merging smoothly with genae but the genal cones are absent. The vertex is covered by inconspicuous setae; each genal lobe of genae bears two long simple setae; the vertex is wider than long. Antenna (fig.11) is relatively long and is 1.3 times longer than head width; the antenna is composed of 10 segments and the first flagellomere is the longest; single simple subapical rhinarium on segments 4, 6, 8 and 9. The thorax is moderately arched, pronotum short merging smoothly with propleurites laterally, propleurites are elongate and narrow. Forewing (fig.13) is rounded apically and constricted basally and broadest in apical half, the forewing is 2.2 times longer than wide; the pterostigma is elongate with a pointed end, it is 2.3 longer than  $R_S$  vein; pterostigma and cell  $cu_{1a}$  are similar in shape, R and  $M+Cu_1$  veins have the same length; dorsal surface of veins with hairs; there are radular spinules on  $m_1$ ,  $m_2$  and  $cu_1$  cells. Hindwing (fig.15) presents 3 setae before the costal break and 1 seta plus 1 seta after the costal break and the veins are apparent. The hind leg has a long coxa with a long meracanthus rounded apically; metatibia is lacking basal spine; the metatibia apical spurs are arranged 3+3; metabasitarsus without spur; and the arolium is globular (fig.18, 19).

Male genitalia (fig.21) has a short proctiger with short pedonculate proximal part and broad medial part,  $\frac{3}{4}$  of paramere is covered by simple setae; paramere (fig.24) is elongate, inner margin incurved with five stout or peg-like setae situated from basal third to medial part, and the rest part of the paramere is covered by few inconspicuous simple setae, the apex is pointed. Apical segment of aedeagus (fig.25) is relatively long apparently divided in two segments, rounded apex with an end-tube relatively long and thick.

Female genitalia (fig.27) is relatively elongate, proctiger is incurved from the end of the circumanal and upturned with pointed apex; the apical part of the proctiger is sparse by simple setae; the female proctiger bears a single long seta; circumanal is elongate with a medial groove and formed of two rows of rounded pores; subgenital plate is short than the proctiger with broad proximal part and straight tapering apical half ending by a pointed apex, it bears simple setae; ovipositor well developed. Measurements and ratios in tables 2 and 3.

**Examined materials:** host plant *Agelaea hirsuta* (Connaraceae).

Holotype : Nkomekui : 23 i 2006, 3 ♂, 5 ♀; 25 ii 2006, 3 ♂, 5 ♀, 93 larvae; 30 iv 2007, 2 ♂, 1 ♀, 20 larvae; 22 viii 2007, 8 ♂, 5 ♀, 6 larvae; 29 ix 2007, 3 ♂, 2 ♀. Kala: 28 vii 2006, 5 ♂, 6 ♀, 5 larvae; 28 viii 2006, 3 ♂, 3 ♀, 33 larvae; 25 v 2007, 9 ♂, 3 ♀, 10 larvae; 24 x 2007, 9 ♂, 12 ♀, 9 larvae.

**Etymology:** the species is named after its locality of provenance: Nkomekui-Cameroon.

**Table 1:** measurements (in mm) of fifth instar larvae of *Paurocephala* species of Cameroon (N= number of measured specimens)

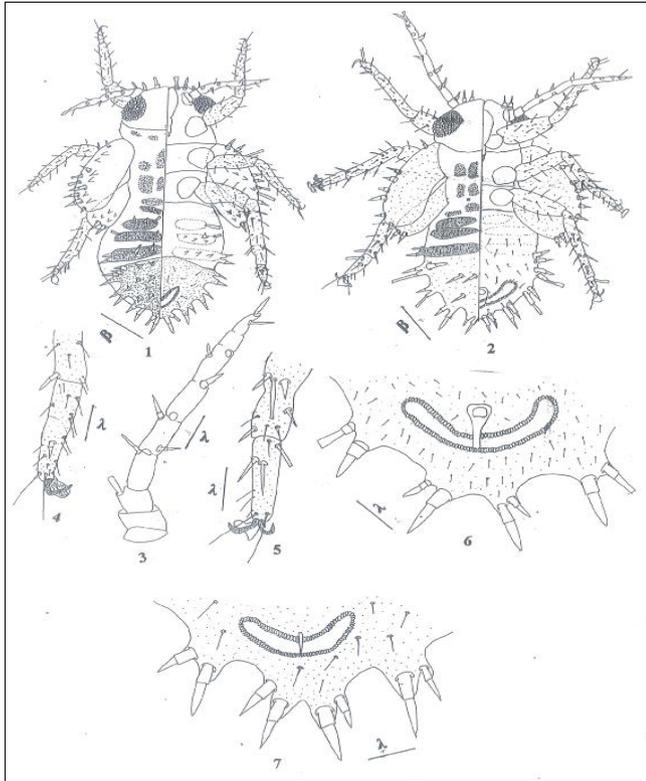
Parameters	<i>Paurocephala sinuata</i>				<i>Paurocephala nkomekui</i>			
	N	min	max	average	N	min	max	average
BL	30	0.84	1.80	1.30	10	1.16	1.65	1.40
BW	30	0.32	0.48	0.43	10	0.35	0.45	0.41
AL	30	0.24	0.56	0.46	10	0.49	0.64	0.54
WL	30	0.24	0.56	0.49	10	0.45	0.56	0.52
MTL	30	0.16	0.48	0.34	10	0.24	0.29	0.27
BL/BW	30	1.7	4.7	3.0	10	3.3	3.6	3.4

**Table 2:** measurements (in mm) of males of *Paurocephala* species of Cameroon (N= number of measured specimens)

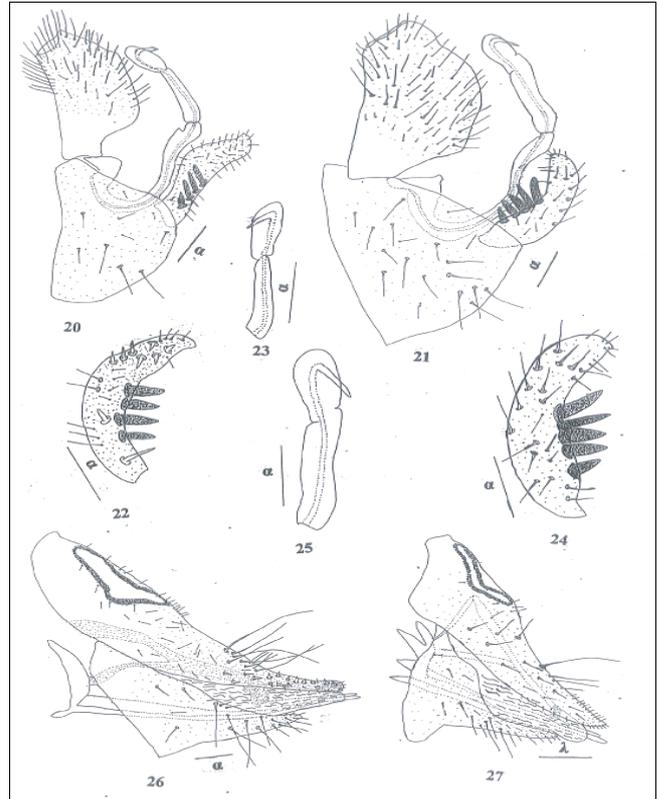
Parameters	<i>Paurocephala sinuata</i>				<i>Paurocephala nkomekui</i>			
	N	min	max	average	N	min	max	average
BL	30	1.48	2.32	1.76	50	1.66	2.34	2.02
BW	30	0.40	0.64	0.54	50	0.40	0.51	0.47
HW	30	0.48	0.68	0.59	50	0.49	0.57	0.56
AL	30	0.44	0.76	0.61	50	0.51	0.86	0.75
F1	30	0.12	0.6	0.17	50	0.11	0.20	0.17
WL	30	1.24	2.0	1.63	50	1.51	1.97	1.74
WW	30	0.64	0.80	0.69	50	0.69	0.80	0.75
wL	30	0.80	1.56	1.20	50	1.14	1.54	1.39
wW	30	0.08	0.56	0.39	50	0.40	0.49	0.45
MTL	30	0.32	0.64	0.49	50	0.49	0.60	0.57
MFL	30	0.16	0.4	0.32	50	0.40	0.51	0.47
MP	30	0.12	0.24	0.17	50	0.17	0.26	0.21
PL	30	0.08	0.30	0.12	50	0.09	0.17	0.12
DAEL	30	0.08	0.2	0.11	50	0.11	0.17	0.14
BL/BW	30	3.7	3.6	3.2	50	4.1	4.5	4.2
WL/WW	30	1.9	2.5	2.3	50	2.1	2.4	2.3
WL/wL	30	1.5	1.2	1.3	50	1.3	1.2	1.2
wL/wW	30	10.0	2.7	3.0	50	2.8	3.1	3.0
MTL/HW	30	0.6	0.9	0.8	50	1.0	1.0	1.0
WL/HW	30	2.5	2.9	2.7	50	3.0	3.4	3.1
MP/HW	30	0.2	0.3	0.2	50	0.3	0.4	0.3
AL/F1	30	3.6	1.2	3.5	50	4.6	4.3	4.4
PL/HW	30	0.1	0.4	0.2	50	0.1	0.2	0.2

**Table 3:** measurements (in mm) of females of *Paurocephala* species of Cameroon (N= number of measured specimens)

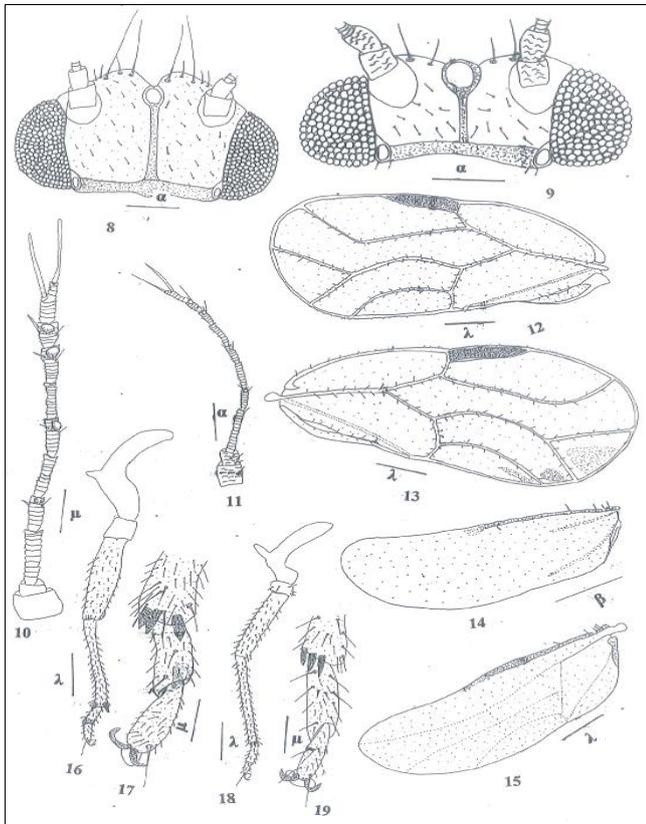
Parameters	<i>Paurocephala sinuata</i>				<i>Paurocephala nkomekui</i>			
	N	min	max	average	N	min	max	average
BL	30	1.44	2.36	1.92	50	1.77	2.57	2.27
BW	30	0.52	0.64	0.57	50	0.46	0.57	0.50
HW	30	0.28	0.72	0.62	50	0.51	0.63	0.58
AL	30	0.52	0.80	0.63	50	0.57	0.91	0.79
F1	30	0.12	0.24	0.16	50	0.17	0.23	0.20
WL	30	1.48	2.32	1.77	50	1.77	2.20	1.98
WW	30	0.64	1.12	0.77	50	0.74	0.94	0.86
wL	30	1.16	1.48	1.33	50	1.26	1.71	1.53
wW	30	0.36	0.56	0.42	50	0.43	0.57	0.52
MTL	30	0.36	0.60	0.49	50	0.51	0.69	0.60
MFL	30	0.16	0.48	0.33	50	0.46	0.57	0.51
FP	30	0.08	0.48	0.29	50	0.26	0.43	0.31
SL	30	0.01	0.30	0.13	50	0.17	0.31	0.23
BL/BW	30	2.7	3.6	3.3	50	3.8	4.5	4.5
WL/WW	30	2.3	2.0	2.2	50	2.3	2.3	2.3
WL/wL	30	1.2	1.5	1.3	50	1.4	1.2	1.2
wL/wW	30	3.2	2.6	3.1	50	2.9	3.0	2.9
MTL/HW	30	1.2	0.8	0.7	50	1.0	1.1	1.0
WL/HW	30	5.2	3.2	2.8	50	3.4	3.4	3.4
FP/HW	30	0.2	0.4	0.2	50	0.5	0.6	0.5
AL/F1	30	4.3	3.3	3.9	50	3.3	3.9	3.9
PF/SL	30	8.0	1.6	2.2	50	1.5	1.3	1.3



**Fig 1-7:** *Paurocephala* species: (1, 3, 4, 7) *P. sinuata*; (2, 5, 6) *P. nkomekui*. (1, 2) fifth instar larvae dorsal and ventral views; (3) larval antenna; (4, 5) metatarsi; (6, 7) ventral caudal plate. Scale lines:  $\beta$ = 0.2 mm;  $\lambda$ = 0.06 mm.



**Fig 20-27:** *Paurocephala* species: (20, 22, 23, 26) *P. sinuata*; (21, 24, 25, 27) *P. nkomekui*. (20, 21) male genitalia; (22, 24) paramere; (23, 25) apical segment aedeagus; (26, 27) female genitalia. Scale lines:  $\lambda$ = 0.1 mm;  $\alpha$ = 0.06 mm.



**Fig 8-19:** *Paurocephala* species: (8, 10, 12, 14, 16, 17) *P. sinuata*; (9, 11, 13, 15, 18, 19) *P. nkomekui*. (8, 9) head; (10, 11) antenna; (12, 13) forewing; (14, 15) hindwing; (16-19) metathoracic leg. Scale lines:  $\beta$ = 0.8 mm;  $\lambda$ = 0.2 mm;  $\alpha$ = 0.1mm;  $\mu$ = 0.06 mm.

#### 4. Discussion

The two species of psyllids described in this work belong to the genus *Paurocephala* the psyllid of *Cnestis ferruginae* is morphological identical to *Paurocephala sinuata* collected in Ghana and Nigeria described by Mifsud & Burckhardt (2002) [15]. Description of *P. sinuata* was limited on adults but this work completes the identification of this species with the description of the fifth instar larva. The little difference observed between the specimens described in Cameroon and the specimens collected from Ghana and Nigeria is that the paramere carries four stout or peg-like setae instead of five or six peg-like setae. Concerning *Paurocephala nkomekui* psyllid of *Agelaea hirsuta* is different to the 51 species revised by Mifsud & Burckhardt (2002) [15] but similar to *P. hollisi* psyllid of *Agelaea heterophylla* collected in Tanzania. *Paurocephala nkomekui* differs, from *P. hollisi* according to the original description as follows: the antennal segment 9 of *P. nkomekui* bears a long basal seta while in *P. hollisi* the long basal seta is lacking; in *Paurocephala nkomekui* the hind leg has a long coxa with a long meracanthus rounded apically while in *P. hollisi* the hind leg has a long coxa with a short meracanthus rounded apically; the pterostigma of *P. nkomekui* is more elongate than the pterostigma of *P. hollisi*; forewing of *P. hollisi* without radular spinules while in *P. nkomekui* has radular spinules; paramere of *P. nkomekui* is cylindrical with incurved internal margin and five peg-like setae while in *P. hollisi* the paramere is triangular with external margin slightly incurved and six peg-like setae; the distal segment of aedeagus is not completely divided while in *P. hollisi* the

distal segment of aedeagus is completely divided; the female proctiger has a circumanal with a single row of rounded pores, apical third of female proctiger is more tapering with rounded apex, the subgenital plate is short with apical part more tapering while in *P. nkomekui* the female proctiger is incurved from the end of the circumanal and upturned with pointed apex, circumanal is formed of two rows of rounded pores; subgenital plate is short than the proctiger with broad proximal part and straight tapering apical half ending by a pointed apex. *Paurocephala nkomekui* is hosted by *Agelaea hirsuta* while *P. hollisi* is hosted by *Agelaea heterophylla*. The genus *Paurocephala* has been revised by Mifsud & Burckhardt (2002) <sup>[15]</sup> and recognised 51 species, and one species has been described by Navasero & Calilung (2001) <sup>[16]</sup>. According to these authors, *Paurocephala* is restricted to the Old World and is most diverse in the Oriental region (43 spp.) with some Afrotropical species. Host records include: Moraceae, Urticaceae, Ulmaceae (all Urticales), Malvaceae, Sterculiaceae (all Malvales) and Clusiaceae (Theales). The two species of *Paurocephala* recorded in Cameroon are hosted by the plants which belong in Connaraceae.

## 5. Conclusion

The two species described in this work, one species was described previously by others authors then we redescribed it in this work; it is: *Paurocephala sinuata* but we completed the description of *P. sinuata* with the description of the fifth instar larva which was not described previously. The second species is described for the first time and is new species in the *Paurocephala* genus. The two psyllid species described in this work feed on the plant species belonging to Connaraceae family which has a medicinal importance in Cameroon. These psyllid species cause serious damage to their host plants by inducing leaf necrosis.

## 6. Acknowledgements

We thank Prof Bonaventure Sonke of the Yaounde I University for the identification of the host plants. We also thank Dr Daniel Burckhardt of the Naturhistorisches Museum of Basel in Switzerland for the preliminary identification of the specimens.

## 7. References

1. Brown RG, Hodkinson ID. Taxonomy and ecology of jumping plant-lice of Panama Homoptera: Psylloidea. Entomograph. 1988; 9:1-304.
2. Burckhardt D. Psyllid pests of temperate and subtropical crops and ornamental plants (Hemiptera, Psyllidea): a review. Tren. in Agric. Sci. Ent. 1994; 2:173-186.
3. Burckhardt D. Two new *Paurocephala* species from Paraguay (Hemiptera, Psylloidea). *Deutsche Entomologische Zeitschrift*. 1996; 43:77-82.
4. Burckhardt D. *Ehrendorferiana*, a new genus of Neotropical jumping plant lice (Insecta: Hemiptera: Psylloidea) associated with conifers (Crupressaceae). Org. Div. & Evol., 5, Electr. Suppl. 2005; 12:1-10.
5. Burckhardt D, Aléné DC, Ouvrard D, Tamesse JL, Messi J. Afrotropical members of the jumping plant-louse genus *Diclidophlebia* (Hemiptera: Psylloidea). Inv. Syst. 2006; 20:367-393.
6. Crawford DI. A monograph of jumping plant-lice or Psyllidae of new world. Bull.. U.S. Nat. Mus. 1914; 85:1-182.
7. Dzokou VJ, Tamesse JL, Burckhardt D. *Triozza messii* sp.n., a new species of jumping plant-louse (Hemiptera: Triozidae) from Cameroon associated with *Caloncoba welwitschii* (Oliv.) Gilg. (Flacourtiaceae). Cam. J. Exp. Biol. 2009; 5(1):29-36.
8. Dzokou VJ, Yana W, Tamesse JL, De Coninck E. *Pseudoeriopsylla etoundii* sp.n., a new species of Psyllids (Hemiptera-Homotomidae), pest of *Ficus lepreuri* (Moraceae) from West-Cameroon. Int. J. Biol. Chem. Sci. 2017; 11(4):1592-1600.
9. Dzokou VJ, Yana W, Tamesse JL. *Pseudoeriopsylla bitomi* sp. n. (Hemiptera: Homotomidae), a new pest of *Ficus platyphylla* (Moraceae) from the Western Region of Cameroon. International J. Agric., Env. and Bioresearch. 2019; 4(1):18-27.
10. Hodkinson ID. The biology of the Psylloidea (Homoptera): a review. Bulletin of Entomological Research. 1974; 64:325-339.
11. Hollis D. Afrotropical jumping plant-lice of the family Triozidae (Homoptera: Psylloidea). Bull. Brit. Mus. (Natural History), Ent. Series. 1984; 49(1):1-103.
12. Hollis D. Australian Psylloidea: jumping plant-lice and lerp insects. Aust. Biol. Res. Study, 2004, 216.
13. Li F, Yang CK. Six new species of *Stenopsylla* of the family Triozidae and a new genus of the family Carsidaridae from China (Homoptera: Psylloidea), Wuyi Sci. J. 1987; 7(12):27-38.
14. Malenovský I, Burckhardt D, Tamesse JL. Jumping plant-lice of the family Phacopteronidae (Hemiptera: Psylloidea) from Cameroon. J. Nat. Hist. 2007; 41(29-32):1875-1927.
15. Mifsud D, Burckhardt D. Taxonomy and phylogeny of the Old World jumping plant-louse genus *Paurocephala* (Insecta, Hemiptera, Psylloidea). J. Nat. Hist. 2002; 36:1887-1986.
16. Navasero MV, Calilung VJ. The Psyllids (Hemiptera: Psylloidea) of the Philippines: an annotated checklist, The Philippine Entomologist. 1998; 12(1):13-28.
17. Ossiannilsson F. Psylloidea (Homoptera) of Fennoscandia and Denmark. Fau. Ent. Scand. 1992; 26:1-347.
18. Pettey FW. South African psyllids, *Ent. Mem.*. 1924; 2, 21-30.
19. Pettey FW. New species of South African Psyllids III, Ent.Mem. 1933; 8:3-23.
20. Russell LM. An apparently new species of *Paurocephala* Crawford (Homoptera, Psyllidae, Pauropsyllinae), Proc. Ent. Soc. of Washington. 1943; 45:115-120.
21. Russell LM. A new African species of *Paurocephala* Crawford (Homoptera: Psyllidae: Pauropsyllinae), J. Washington Acad. Sci. 1946; 36:94-97.
22. Tamesse JL, Dayang LD. Newly Described Psyllid *Diclidophlebia andjigae* sp.n. (Hemiptera:Liviidae), on *Grewia venusta* (Tiliaceae) from Cameroon. *J. Ent.* 2018; 15(1): 19-27.
23. Tamesse JL, Soufo L, Yana W, Dzokou VJ. First record of *Blastopsylla occidentalis* Taylor, 1985 (Hemiptera: Psyllidae), a *Eucalyptus* psyllid in Cameroon, Central Africa. Ent. Res. 2010; 40:211–216.
24. Tamesse JL, Dzokou VJ, Yana W. *Phytolyma tchuentei* sp.n. (Hemiptera: Homotomidae), a new species of psyllid associated with *Morus mesozygia* (Moraceae)

- from Cameroon. Ent. Res. 2011; 41:174-177.
25. Tamesse JL, Mapon IN, Yana W. *Pseudophacopteron burckhardti* sp.n. (Hemiptera: Phacopteronidae), new species of psyllid associated with *Zanthoylon gilletii* (Rutaceae) from Cameroon. J. Ent. 2014; 11(3):176-181.
  26. Yana W, Ndankeu Mveyo YP, Dzokou VJ, Tamesse JL. Jumping plant lice of the family Carsidaridae (Hemiptera: Psylloidea) taxonomic, faunistic; phenology and host plants. I. Bio. And Env. Sci. 2015; 6(6):1-20.
  27. Yana W, Mveyo Ndankeu YP, Dzokou VJ, Tamesse JL. *Triozia kala* sp.n. (Hemiptera: Triozidae), a new species of psyllid associated with *Beilschmiedia obscura* (Fouilloy *et al.* 1974) (Lauraceae) from Cameroon. J. Ent. and Zool. Studies. 2017; 5(6):2179-2183.
  28. Yang MM, Yang CT, Chao JT. Reproductive isolation and taxonomy of two Taiwanese *Paurocephala* species (Homoptera: Psylloidea), Taiwan Mus. Special Pub. Series. 1986; 6:L177-203.