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## ***Pseudoeriosylla etoundii* sp.n., a new species of Psyllids (Homotomidae), pest of *Ficus lepriouri* (Moraceae) from West-Cameroon**

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### **ABSTRACT**

In order to investigate the biodiversity of psyllids in Cameroon, we collected a new *Pseudoeriosylla* species on *Ficus lepriouri* (Moraceae), *Pseudoeriosylla etoundii* sp.n.. Before this work, *Pseudoeriosylla laingi* Hollis and Broomfield 1989 was the only known species of the genus *Pseudoeriosylla* from Cameroon. The new species is diagnosed, illustrated and described. Information is given on its distribution, host plants and biology. This new species feeds on the leaves and young buds of its host plant. Larva of this species produces wax on their anal pore which covers the attacked organs.

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**Keywords:** Taxonomy, Macrohomotominae, sap-sucking insects, host plant, Cameroon.

### **INTRODUCTION**

Psyllids are sap-sucking insects causing many damages to their host plants. Some become significant pest and slow down the growth and the development of the crop plants and the forest timber of economic and pharmaceutical importance. Data on biodiversity and taxonomy of psyllids are well known in the temperate and sub-tropical regions. Few records are known from Africa South of the Sahara and in Cameroon in particular. The Convention on the Biological Diversity adopted during the summit of Rio de Janeiro recommends the conservation and the sustained use of biodiversity and genetic

resources. In several groups in particular those rich in number of species as it is the case of insects, only a little proportion of existing species is described. This situation has been considered as an obstacle to the taxonomy by the Global Taxonomy Initiative.

Homotomidae family is characterized by the presence of a solid pair of tubercle on the metapostnotum, ventral sensoria of hind femur in basal position, male proctiger with 2 segments and its subgenital plate without dorsolateral process, vein rs-m absent in the fore wing. According to Hollis and Broomfield (1989), this family is closed to that of Carsidaridae and includes 10 genera

and 72 species. Hollis (1973) described 4 species of *Phytolyma*: *Phytolyma. lata*, *P. fusca*, *P. tuberculata* and *P. minuta*. The recent work undertaken in Cameroon described *Phytolyma tchuentei* (Tamesse et al., 2011). On the whole, Homotomidae family has 77 species. The sub-family of Dynopsyllinae which has 9 species and that of Homotominae and Macrohomotominae have 34 species each. In the sub-family of Macrohomotominae, 9 species belong to *Mycopsylla* genus, 14 to *Macrohomotoma* genus, 6 to *Pseudoeriopsylla* genus (Hollis and Broomfield, 1989) and 5 to *Phytolyma* genus (Hollis, 1973; Tamesse et al., 2011). The species of *Pseudoeriopsylla* genus are exclusively african and are characterized by the presence of a pterostigma on the fore wing and the absence or not of the costal break (Hollis and Broomfield, 1989).

Moraceae is a family of Dicotyledonous Angiosperms pantropical made with more than 1400 species belonging to 53 genera (Hollis and Broomfield, 1989). According to Berg (1977), the families of Moraceae and Urticaceae are much closed. The *Ficus* genus is one of the significant genera in the Plantae kingdom with more than 700 species described (Aubreville, 1959). The leaves of *Ficus* spp. are used in several regions in the North of Ivory Cost to cure rheumatism (Kone et al., 2004).

## MATERIALS AND METHODS

The psyllids were captured on *Ficus lepriouri* (Moraceae) at Tsinkop, Dschang subdivision, Menoua division, in the West Region of Cameroon. Adults were captured with the help of an entomological net of 0.5 mm mesh size and with the help of a mouth aspirator. Larvae were sampled using a mouth aspirator. The material is mounted on slides in Canada balsam and conserved in 70% ethanol in the Laboratory of Zoology of the University of Yaoundé I (LZUY). It is deposited in the Museum of Natural History of Basle (NHMB) in Switzerland and in the Royal Museum for Central Africa (RMCA) in Belgium. The morphological terminology

follows Hollis and Broomfield (1989). The illustrations were achieved under a microscope LEICA DM. 1000 with a drawing tube. Measurements are given in mm and were made from specimens preserved in 70% ethanol. The host plant was identified at the National Herbarium at Yaoundé (Cameroon) and is deposited in LZUY. **Material examined:** Holotype: Male, **Cameroon**: West Region, Tsinkop, 10°04'N, 5°26'E, 1385 m, 30 January 2007, *Ficus lepriouri* (V.J. Dzokou & J.L. Tamesse). Slides mounted (LZUY). Paratypes: **Cameroon**: 6 males, 17 females, 30 larvae, same data as holotype; 3 males, 2 females, 3 larvae, dry and slide mounted or preserved in 70% ethanol (NHMB); 1 female, 1 larva, preserved in 70% ethanol (RMCA).

## RESULTS

### Taxonomy

#### *Pseudoeriopsylla* Newstead

*Pseudoeriopsylla* Newstead, 1911: p 105; Yang & Li, 1984b: p 370 (as a synonym of *Macrohomotoma*); White & Hodkinson, 1985: p 242. Type species: *Pseudoeriopsylla nyasae* Newstead, by monotypy.

*Pseudoeriopsylla* Newstead; Crawford, 1914: p 62 (as a synonym of *Macrohomotoma*)

[Misspelling.]

*Pseudoeriopsylla* Newstead; Hollis & Broomfield, 1989: p 153, 154.

#### Key to *Pseudoeriopsylla*

#### from Cameroon

- 1- Fore wing with a pterostigma partially sub-rounded or entirely mottled.....2
- 2- Opaque band along the cubital vein Cu<sub>1</sub> and Cu<sub>1b</sub> of the fore wing.....3
- 3-Presence of a dark spot in the cell Cu<sub>2</sub>..... *Pseudoeriopsylla laingi* Hollis & Broomfield.
- 4-Absence of opaque band along the cubital vein Cu<sub>1</sub> and opaque spot only at the apex of the Cu<sub>1b</sub>..... *Pseudoeriopsylla etoundii* sp.n.

***Pseudoeriosylla etoundii* sp.n.**

**Description**

**Adults. Colour.** Adults brownish to whitish, cephalothorax dark.

**Morphology.** Head (Figure 1) overall round, genal cones absent. In dorsal view, median epicranian suture divided vertex into 2 blocks; median ocellus, well defined dorsally, placed almost in the centre of the head. Median epicranian suture with 2 extensions into the 2 vertex. Vertex, ornamented, with a triangular form. Lateral ocelli at the base of the vertex and the compound eyes; compound eyes clearly visible. Antennae cavities average. Dorsally, metapostnotum with a process in form of two spines; central tergites very sclerified and rounded. Mesoscutellum with a triangular form whose base fixed the mesoscutum. In profile view, mesoscutellum rounded and seemed to cover the metascutum. Tergites, a bit darker than sternites; 4 stigmas orifice visible at the limit of tergites-sternites.

Scape and pedicel of the antenna (Figure 2) big and carry silks; 1<sup>st</sup> flagellomere too elongated and provided with an apical rhinarium, flagellomeres 2, 3, 4, 5 and 6 with the same length approximately, bearing each an apical rhinarium except flagellomeres 5 and 7. The other flagellomeres carried scattered silks. Flagellomeres 7 and 8 shorter and thick; 7 with 2 apical neighbours rhinaria; 8 bears 2 rhinaria at the base of each of the two sub terminal setae of which one truncated.

Fore wing (Figure 3) with rounded pterostigma (ovoid), pigmented edge and clear centre. Vein R+M+Cu<sub>1</sub> robust and short; R item two times longer than R+M+Cu<sub>1</sub> item. R<sub>1</sub> item very short because of existence of the pterostigma. Ovoid pterostigma closer to Rs item at its base. Cu<sub>1</sub> item short; Cu<sub>1a</sub> almost parallel to M item with its basal portion before being folded up in parallel line with the M<sub>3+4</sub> on the anal. A thickly pigmented area between the anal break and the Cu<sub>1b</sub> item. Anal item organized in anal A<sub>1</sub> and A<sub>2</sub>, at the proximal side. Claval suture well defined. M item longer than Rs item. Not far from the apex of the wing, M<sub>1+2</sub> item joined the anal. Cells m<sub>1</sub>, m<sub>2</sub> and Cu<sub>1</sub> with a radular area each one on

its anal portion, surrounded by an area of more widened pigmentation. All the other veins equipped with scattered silks except the anal.

Hind wing (Figure 4) with a slight depression on anal just before the joins of Cu<sub>2</sub> item. Anal item divided into two at its base. Basal side of C+Sc vein with spines organized in three groups: the first group with several spines; the second group with seven spines, the last turned downwards; the last, an insulated spine, also downwards. Back portion of R and M items visible, other veins not well defined.

Hind leg coxa (Figure 5) with a well-developed meracanthus; metafemur apical portion and metatibia with spines. Metatibia apical portion with a crown of inner spines and four spurs. Metabasitarsus, with two inner spines.

Male terminalia as in Figure 6. Proctiger made of two segments; basal segment lengthened at the inner side and equipped with silks, its external side swollen. Tip of second segment truncated and very rich in silks and with a small pigmented area. Apex of sub-genital plate rounded with a rectilinear base. Paramere (Figure 7), entirely covered with silks, lengthened with some pigmented lines in profile view. Proximal segment of aedeagus very long; distal segment (Figure 8) short and rounded at the tip.

Female terminalia (Figure 9) with a dorsal valvula larger than the ventral and inner valvulae. Ventral and inner valvulae with the same length approximately. Dorsal plate with many silks especially in its apical part. Circumanal ring surrounded by two rows of pores in complex convolutions. Ventral plate very large, equipped with silks especially in its ventral side.

Measurements and ratios in Tables 1 and 2.

**Fifth instar Larva**

**Colour.** Larvae green, wing pads dark.

**Morphology.** Body (Figure 10) divided into head, thorax and abdomen. Antenna made of three segments. Dorsally, the outlines of the wings with short silks on

their contour and on their surface. Four abdominal sclerites quite visible; sub-genital plate entirely with a dorsal circumanal pore; circumferences of the abdomen papered short silks. Centre of abdomen with a characteristic pigmented structure in ventral sight; leg made of six segments and arolium of tibiotarsus (Figure 11) between two outlines of claws. Arolium and final assessories characteristics. Measurements and ratio in Table 3.

**Host plant:** *Ficus lepriouri* (Moraceae)

**Biology:** Adults and larvae feed on the lower face of the leaves of *F. lepriouri*. The youngest larvae are between the buds. Larvae of this species produce wax on their anal pore. This wax covers their bodies.

**Distribution: Cameroon**

**Etymology:** The species is dedicated to Professor Laurent Serges Etoundi Ngoa, Animal Physiologist, Minister of small and medium sized enterprises of Cameroon for his support and encouragement to carry out this work.

**Table 1:** Measurements (in mm) of adult *Pseudoeriopsylla etoundii* sp.n. (N= number of measured specimens).

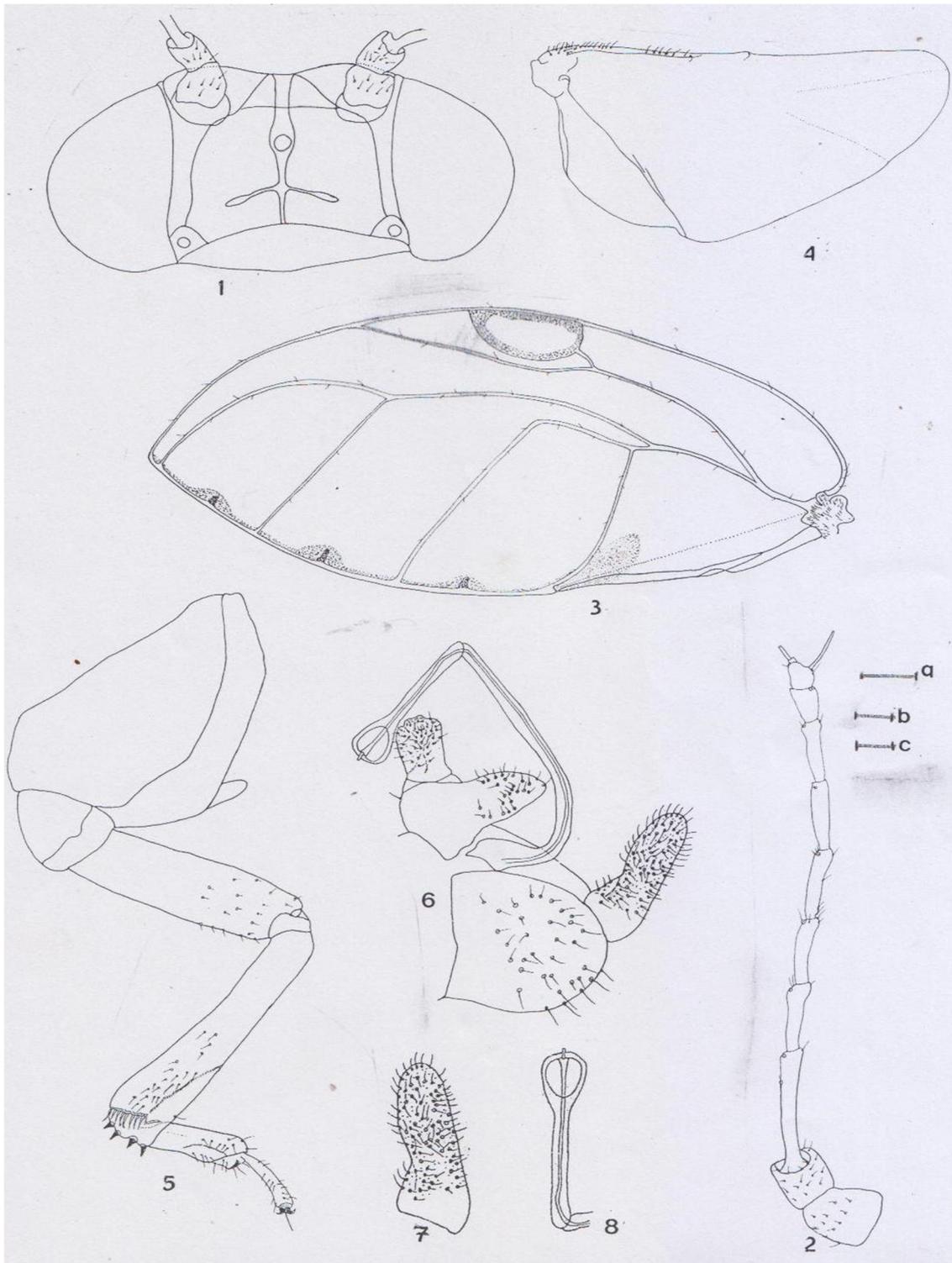
Measured parameters	♂(N=7)	♀(N=17)
Body length	4.31-6.25	5-6.5
Body width	1.62-1.87	2
Head width	1.5	1.3-1.6
Antenna length	1.5-1.87	1.4-1.7
Flagellomere 1 length	0.25-0.37	0.19-0.31
Fore wing length	6.62-7.5	7-9.81
Fore wing width	3.12-3.37	3.12-3.62
Hind wing length	2.87-4.25	3.4-3.9
Hind wing width	1.5-2.37	1.5-2.12
Length of distal segment of aedeagus	0.56-0.62	
Paramere length	0.4-0.5	
Male proctiger length	0.25-0.62	
Metafemur length	0.81-1	0.5-1.13
Metatibia length	1.12-1.25	0.69-1.37
Female proctiger length		1.37-1.94
Female subgenital plate length		1-2
Pterostigma length	1.12-1.25	1.19-1.37
Vein Rs length	2.5	2.31-2.87
Length margin of cells r <sub>2</sub> , m <sub>1</sub> and m <sub>2</sub>	-	3
Vein M <sub>1+2</sub> length	2.31-2.75	2.44-2.87
Vein M <sub>3+4</sub> length	1.94-2.19	2-2.37
Length margin of cell m <sub>1</sub>	1.19-1.25	1.25-1.37
Length margin of cell cu <sub>1</sub>	1.4-1.5	1.37-1.62
cu <sub>1</sub> cell width	2	1.87-2.37

**Table 2:** Ratios (in mm) of adult *Pseudoeriopsylla etoundii* sp.n.

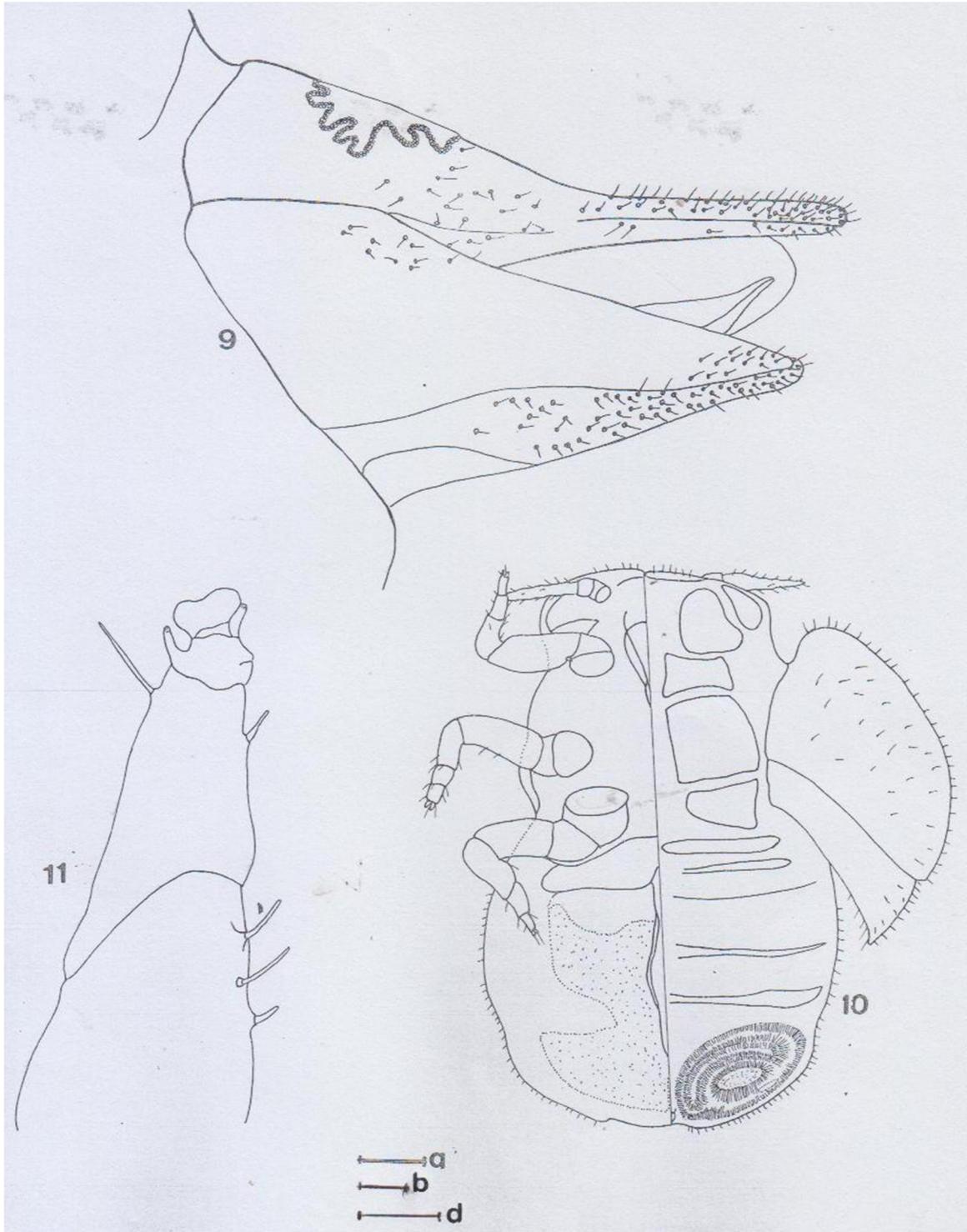
Measured parameters	♂(N=7)	♀(N=17)
Fore wing length / fore wing width	2.12-2.22	2.24-2.71
Fore wing length / paramere length	1.76-2.31	2.06-2.51
Paramere length / hind wing width	1.79-1.91	1.84-2.27
Antenna length / flagellomere 1 length	5.05-6	5.48-7.37
Male proctiger length / head width	0.17-0.41	-
Metatibia length / head width	0.75-0.83	0.53-0.85
Antenna length / head width	1-1.25	1.06-1.08
Flagellomere 1 length / head width	0.16-0.25	0.15-1.19
Female proctiger length / female subgenital plate length	-	0.97-1.37

**Table 3:** Measurements (in mm) of fifth instar larva of *Pseudoeriopsylla etoundii* sp.n.

Measured Parameters	<i>P. etoundii</i> sp.n. (N=30)
Body length	3-4
Body width	3-4
Antenna length	0.56-0.94
Fore wing-pad length	1.87-2.37
Caudal plate length	0.5-1
Caudal plate width	1.75-2.12



**Figures 1-8:** *Pseudoeriopsylla etoundii* sp.n., 1: Head, dorsal view; 2: Antenna; 3: Fore wing; 4: Hind wing; 5: Hind leg, in profile; 6: Male terminalia, in profile; 7: Paramere in profile; 8: Distal segment of aedeagus in profile, inner surface. Scales bars: a=4 mm (4); b=1.6 mm (1, 3, 5, 6, 7, 8); c=0.8 mm (2)



**Figures 9-11:** *Pseudoeriopsylla etoundii* sp.n., 9: Female terminalia in profile; 10: Fifth instar larva: left dorsal and right ventral surfaces; 11: Fifth instar larva, tibiotalar apex. Scales bars: a=4 mm (10); b=1.6 mm (9); d=0.4 mm (11).

## DISCUSSION

*Pseudoeripsylla* genus is African. Two species living on *Ficus* genus (Moraceae) are exclusively known in the highlands of Western-Cameroon. The new species of *Pseudoeripsylla* from Western-Cameroon is compared with the African species of the same genus. Anal of the hind wing carries a depression just in front of the joins of Cu<sub>2</sub> vein. 1<sup>st</sup> flagellomere of the antenna carries an apical rhinarium at *Pseudoeripsylla kenyae*, *P. etiennei* and *Pseudoeripsylla etoundii* sp.n. ; at *P. nyasae*, *P. laingi*, *P. medleri*, *P. carvalhoi*, the 1<sup>st</sup> flagellomere carries several rhinaria or at least more than one rhinarium (Hollis and Broomfield, 1989). *Pseudoeripsylla etoundii* sp.n. Proximal segment of aedeagus very long; distal segment characteristic: short and rounded at the tip. *Pseudoeripsylla nyasae* is known in Malawi and Mozambique on *Ficus thonningii*; *Pseudoeripsylla laingi* from Angola, Kenya, Uganda, Nigeria, Sierra Leone, Guinea and Senegal on *Ficus thonningii* and *Ficus natalensis*. In Cameroon, a female of *Pseudoeripsylla laingi* was collected on yellow trap in 1957 by Eastop in the areas of Bamenda (North-West) (Hollis and Broomfield, 1989); *Pseudoeripsylla medleri* is known in Nigeria and *Pseudoeripsylla carvalhoi* in Angola, Democratic Republic of Congo and Nigeria, this psyllid lives on *Ficus ovata*, but its larvae remain unknown. *Pseudoeripsylla kenyae* lives in Kenya and *Pseudoeripsylla etiennei* lives in Senegal on *Ficus* spp. (Hollis and Broomfield, 1989).

## Conclusion

This work increases the number of described species of *Pseudoeripsylla* genus from six to seven and brings up to two the described species in Cameroon. The

investigations on the field will permit the discovery of other species as well as their parasitoids for a biological or an integrated pest management against those insects in Cameroon and in other countries where they are already present.

## COMPETING INTERESTS

The authors declare that they have no competing interests.

## AUTHORS' CONTRIBUTIONS

VJD did the collection of the insects, realization of the drawings and measurements, preparation of the article. WY prepared the article and realized the drawings. JLT did the collection of the insects and the supervision of work. EDC granted the material of laboratory, reception in its laboratory for comparisons of samples of Cameroon and those of the MRAC.

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## REFERENCES

- Aubreville A. 1959. *La Flore de la Côte d'Ivoire* (2<sup>ème</sup> édition révisée, Tome 1). Centre Technique Forestier Tropical, Nogent-Sur- Marne (France), 365 p.
- Berg CC. 1977. Urticales, their differentiation and systematic position. *Plant Systematics and Evolution.*, 1: 349-374.
- Crawford DL. 1914. A monograph of jumping plant-lice or Psyllidae of a new world. *Bulletin Unated States National Museum*, 85: 1-182.
- Hollis D. 1973. African gall bugs of the genus *Phytolyma* (Hemiptera, Psylloidea).

- Bulletin of Entomological Research*, **63**: 143- 154.
- Hollis D, Broomfield PS. 1989. *Ficus*-feeding psyllids (Homoptera) with special reference to the Homotomidae. *Bulletin of the British Museum (Natural History)*, (*Entomology*), **58**(2): 131-183.
- Koné WM, Kamanzi Atindehou K, Terreaux C, Hostettmann K, Traoré D, Dosso M. 2004. Traditional medicine in North Côte-d'Ivoire: screening of 50 medicinal plants for antibacteria activity. *Journal of Ethnopharmacology*, **93**: 43-49.
- Newstead R. 1911. On a new genus of Psyllidae from Nyasaland. *Bulletin of Entomological Research*, **2**: 105-106.
- Tamesse JL, Dzokou VJ, Yana W. 2011. *Phytolyma tchuentei* sp.n. (Hemiptera: Homotomidae), a new species of psyllid associated with *Morus mesozygia* (Moraceae) from Cameroon. *Entomological Research*, **41**: 174-177. Doi: 10.1111/j.1748-5967.2011.00335.x
- White IM, Hodkinson ID. 1985. Nymphal Taxonomy and systematics of the Psyllidae (Homoptera). *Bulletin of the British Museum (Natural History) (Entomology)*, **50**: 153-301.