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Biodiversity of jumping plant-lice of the Psyllidae family from the Adamawa region of Cameroon: Faunistics, Phenology and Host plants

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Abstract
From April 2011 to July 2015, in different localities of the Adamawa Region of Cameroon, prospections undertaken permitted to evaluate the biodiversity of psyllids of the Psyllidae family. This survey documented 14 species belonging to 3 subfamilies and 7 genera: Aphalaroidinae with *Yangus* genus (5 species), Ciriacreminae with *Heteropsylla* genus (1 species), Psyllinae with 5 genera, *Palaeolindbergiella* (1 species), *Psylla* (3 species) and 3 new genera (4 species). The proliferation period of each psyllid species depends on the phenology of the host plants. Host plants belong to three families, Fabaceae, Combretaceae and Rubiaceae. The Fabaceae family constitutes the most important one with the largest number of associated psyllids species. The damages caused by psyllids on their host plants are: distortion of leaves, rolling of leaves, discolouration and necrosis of leaves, development of galls. This study enriched the biodiversity of psyllids of the Psyllidae family from Cameroon in particular and Afrotropical in general.

Keywords: Adamawa-Cameroon, host plants, phenology, faunistic, Psyllidae

1. Introduction
Adamawa Region is one of the ten administrative Regions of Cameroon; it is situated between 6°49'59N latitude and 13°15'0E longitude, altitude level is situated between 1000-2000 m. The climate of third Region is mainly tropical soudanian type with two seasons: dry season from November to March and rainy season from April to October. The main temperature is around 22°C and rain fall are between 900-1500 mm water per year [1]. The vegetation is savannah Guinean type constituted of shrub and herbaceous. This type of vegetation constitute a transition between the forest type from the Southern Region and steppe type from the Northern Region, with dominant species such as *Daniella oliveri*, *Lophira lanceolata*, *Terminalia macroptera*, *Piliostigma thonningii*, *Vitex doniana*, *Albizia zygia* and *Sterculia* sp. [2].

Jumping plant-lice or psyllids (Hemiptera: Psylloidea) are phytophagous insects feeding on phloem sap of vascular plants, largely the Dicotyledonous. Most psyllids species described in the world are oligophagous being restricted to one or a few closely related host plants, particularly in their immature stages [3-5]. Psyllids can be harmful to their host plants because they are removing large quantities of plant-sap, producing honey dew and thus soiling leaves and fruits or attracting slime molds, or by transmitting diseases [6]. Presently almost 4000 psyllids species have been described from all biogeography regions of the world. Most species are recorded from tropical and South temperate regions. There are big gaps of knowledge on the Afrotropical and Neotropical fauna [7].

According to Burckhardt [8], Psyllidae Family included 16 subfamilies: Acizziinae, Anomoneurinae, Aphalarinae, Aphalaroidinae, Arytaininae, Ciriacreminae, Diaphorinae, Euphalerinae, Euphyllurinae, Liviinae, Pachypsyllinae, Paurocephalinae, Psyllinae, Rhinocolinae, Spondyliaspidinae and Togepsyllinae. A revised classification of jumping plant-lice [9] assign to the Psyllidae family five subfamilies: Acizziinae, Aphalaroidinae, Ciriacreminae, Macrocorsinae and Psyllinae.

Previously in Cameroon, some studies on the biodiversity of psyllids were carried out [10] recorded 37 species in Triozidae family; [11] recorded 21 species in Psyllidae family from West Region of Cameroon with 20 undescribed species; [12] recorded 31 species in Psyllidae family from the Centre Region of Cameroon with 30 undescribed species; [13] recorded 22 species in

Psyllidae family from the South Region of Cameroon with 21 undescribed species.

Among the Psyllidae family, four subfamilies were recorded within the psyllids fauna of Cameroon [14]: Aphalaroidinae, Ciriacreminae, Macrocorsinae and Psyllinae. In the Center Region, [12] recorded within the Psyllidae family four subfamilies as it is the case in the other regions of Cameroon [13, 11]. But [11], in the West Region, recorded the Acizzinae subfamily for the first time as new records. Up to now, no record of psyllids of Psyllidae family was published from Adamawa Region. Prospections were conducted in different localities of Adamawa Region in Cameroon to study the biodiversity of psyllids of the Psyllidae family with the respective host plants.

2. Materials and methods

The psyllids were sampled from April 2011 to July 2015 in 16 different localities of the Adamawa Region of Cameroon (Beka-Hossere, Banyo, Dang, Falaise Wack, Libong, Mbe, Mbizoro, Meiganga, Nganha, Ngaoundal, Ngaoundere, Nyambaka, Tchabal, Tibati, Tignere and University Campus of Ngaoundere). Geographical coordinates of theses localities are listed in table 1. Four localities were chosen for regular monthly collection from 2011 to 2013: University Campus of Ngaoundere, Dang, Mbizoro and Tchabal; these localities were visited occasionally in 2014 and 2015. In others localities, prospections were done occasionally.

Adults' psyllids were captured with entomological net of 0.5 mm mesh size and an aspirator. Larvae were sampled directly from buds and leaves of the host plant. All specimens were preserved in 70% ethanol. The damages caused by the psyllids on the host plants were recorded and photographed. Sample of the host plants were carried out for its identification at the National Herbarium, Yaounde. In the Laboratory of Zoology, Higher Teachers Training College, University of Yaoundé I, psyllids specimens were examined under a stereomicroscope, sorted to species and identified using psyllid identification keys [9, 15]. Psyllids are preserved in 70% alcohol, dry and slide mounted in the laboratory collection.

Table 1: localities of Adamawa Region of Cameroon where psyllids were collected with geographical coordinates

Division	Sub-division	Localities	Latitudes (N)	Longitudes (E)	Altitude (m)
Djerem	Ngaoundal	Ngaoundal	6°27'	13°16'	951
	Tibati	Tibati	6°28'	12°36'	876
Faro et Deo	Tignere	Tignere	7°22'	12°39'	1131
	Tignere	Libong	7°19'	13°13'	940
Mayo Banyo	Banyo	Banyo	6°45'	11°48'	1097
Mbere	Meiganga	Meiganga	6°30'	14°17'	981
Vina	Ngaoundere I Ngaoundere II Ngaoundere III	Ngaoundere Town	7°20'	13°33'	1111
		Beka-Hossere	7°20'	13°33'	1111
		Mbizoro	7°24	13°32	1069
		University Campus of Ngaoundere	7°25'	13°32	1085
		Dang	7°24'	13°32	1077
		Tchabal	7°32	13°33	1365
	Nyambaka	Nyamabaka	6°53'	14°05'	1158
	Mbe	Mbe	7°51'	13°35'	616
		Falaise de Wack	7°33'	13°33'	1375
	Nganha	Nganha	7°19'	13°43'	1075

3. Results

3.1 Faunistic

During the survey, 6674 specimens (2821 males, 2754 females and 1353 larvae) of Psyllidae family were captured. This collection included 3 subfamilies, 7 genera and 14 species. 13 host plants of psyllids species were recorded.

Subfamily Aphalaroidinae Loginova

Genus *Yangus* Fang

Five psyllids species of *Yangus* were collected during this survey. These psyllids feed on host plant of Fabaceae family specially of *Albizia* genus for 4 species and *Parkia* for one species.

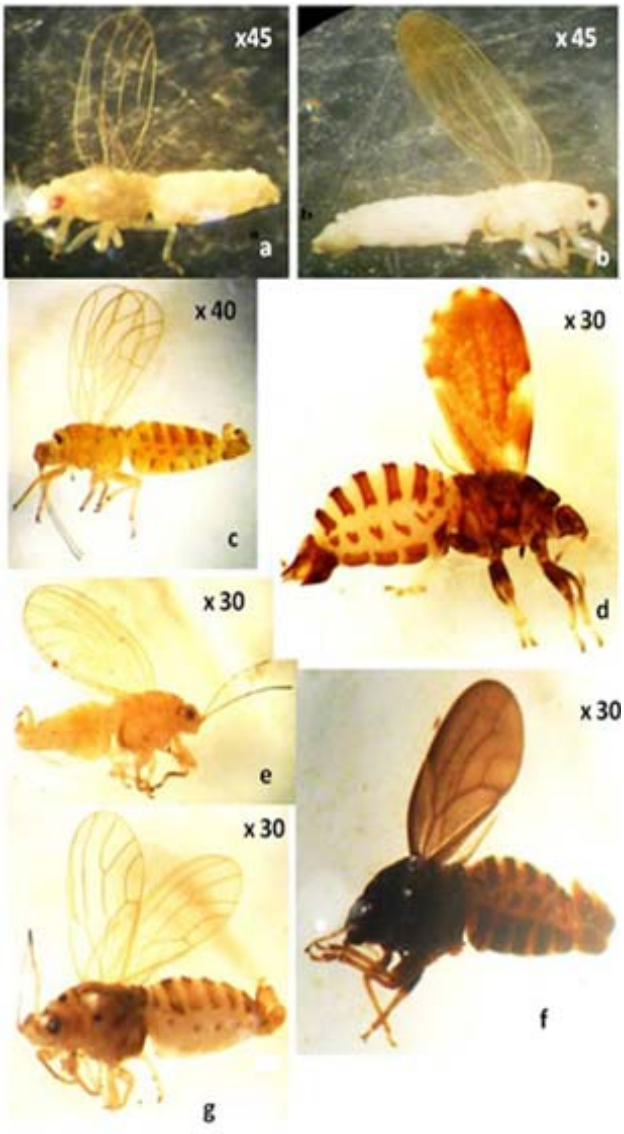

Fig 1: Some psyllids species of Psyllidae family from the Adamawa Region (Cameroon). a. *Yangus* sp.n. 1 psyllid of *Albizia adianthifolia*, Fabaceae, b. *Yangus* sp.n. 2, psyllid of *Albizia zygia*, Fabaceae (Aphalaroidinae subfamily); c. *Heteropsylla cubana*, psyllid *of Leucaena leucocephala*, Fabaceae (Ciriacreminae subfamily); d. *Palaeolindbergiella* sp. psyllid of *Gardenia erubescens*, Rubiaceae; e. *Psylla* sp.n. 3 psyllid of *Entada abyssinica* f. Psyllinae gen.1 sp., psyllid of *Burkea fricana*, Fabaceae; g. Psyllinae gen.2 sp., psyllid of *Terminalia* sp., Combretaceae.

Yangus sp.1 (fig.1a) (host plant: *Albizia adianthifolia*: Fabaceae): University Campus of Ngaoundere: 12,31 v 2011, 17 males, 22 females, 2 larvae; 21 vi 2011, 17 males, 7 females; 16 vii 2011, 10 males, 16 females, 2 larvae; 2 iv 2012, 2 males, 10 females, 12 larvae; 20 vii 2013, 1 male, 7 females. Mbizoro: 30 iv 2011, 7 males, 5 females, 13 larvae; 19, 28 v 2011, 17 males, 23 females, 2 larvae; 4 iv 2012, 1 male, 11 females. Meiganga: 3 vii 2015, 4 males, 1 female. Tchabal: 3 iv 2012, 2 males, 6 females.

From April 2011 to July 2013, *Yangus* sp.1 was collected at the University Campus of Ngaoundéré 6 times on *A. adianthifolia* (fig.2a). The highest number of individuals of developmental stages was noted during the month of May 2011 for adults stages and July for larvae stages (fig. 3); during this period host plant renews its leaves.

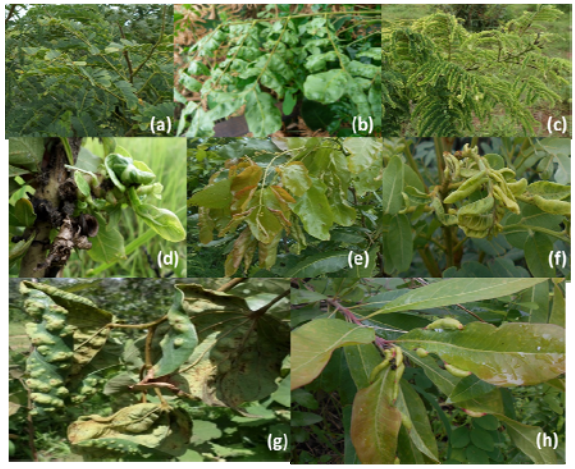

Fig 2: Psyllids damages on host plants: (a) leaves discolouration of *A. adianthifolia*, (b) distortion of leaves and development of galls on *A. zygia*, (c) leaves discolouration of *Entada abyssinica*, (d) rolling of leaves of *G. erubescens*, (e) rolling and necrosis of leaves of *Berlinia doka*, (f) distortion and deformation of leaves on *Burkea africana*, (g) development of galls and swelling of leaves of *Bauhinia thonningii* or *P. thonningii*

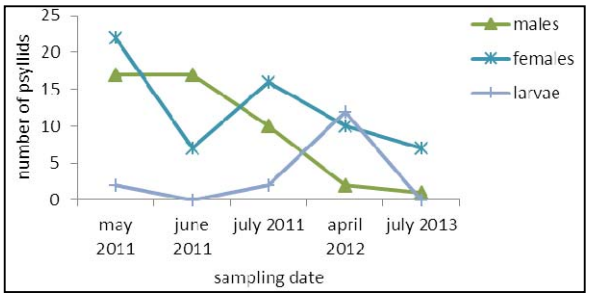

Fig 3: number of larvae, females and males of *Yangus* sp.1 collected at University Campus at Ngaoundere on *Albizia adianthifolia*

Yangus sp.2 (fig.1b) (host plant: *Albizia zygia*: Fabaceae): Beka-Hossere: 20 vii, 1 male. University Campus of Ngaoundere: 20 xii 2011, 3 males, 5 females. Dang: 17 v 2011, 3 females, 2 larvae. Mbizoro: 9,28 vii 2011, 5 males, 14 females, 21 larvae; 6 viii 2011, 7 males, 6 females, 2 larvae; 28 iii 2012, 10 males, 9 females, 1 larvae; 20 vii 2013, 8 males, 2 females. Meiganga: 3 vii 2015, 5 females. Ngaoundal: 7 vii 2015, 1 female. Tibati: 7 vii 2015, 1 male, 3 females, 4 larvae.

From April 2011 to July 2013, *Yangus* sp.2 was collected at Mbizoro 6 times on *Albizia zygia* (fig. 2b). The highest number of individuals of developmental stages was noted during the month of March 2012 for adults and July 2011 for larvae (fig. 4); during this period, the host plant renews its leaves just before the beginning of the rainy season.

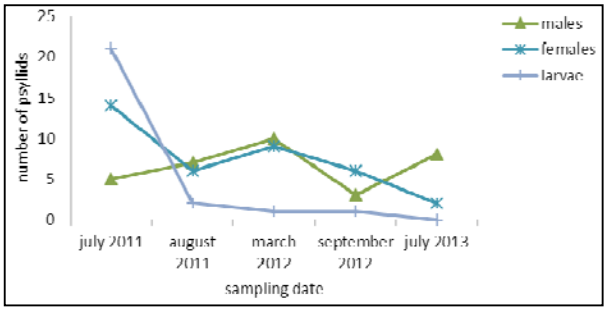

Fig 4: number of larvae, females and males of *Yangus* sp.2 collected at Mbizoro on *Albizia zygia*

Yangus sp.3 (host plant: *Albizia julibrissin*: Fabaceae): Tignere: 30 vi 2015, 36 males, 36 females, 3 larvae.
Yangus sp.4 (host plant: *Parkia biglobosa*: Fabaceae): Banyo: 6 vii 2015, 3 males, 2 females. Meiganga: 3 males, 7 females, 2 larvae.
Yangus sp.5 (host plant: *Albizia chevalieri*: Fabaceae): Ngaoundal: 7 vii 2015, 4 males, 1 female. Tibati: 7 vii 2015, 8 males, 12 females, 1 larve.

Subfamily Ciriacreminae
In the Ciriacreminae subfamily, only one species was recorded, *Heteropsylla cubana*, psyllid of *Leucaena leucocephala*, Fabaceae.

Genus: *Heteropsylla*
Heteropsylla cubana (fig. 1c) (host plant: *Leucaena leucocephala*: Fabaceae): Ngaoundere: 31 viii 2015, 29 males, 42 females, 183 larvae.

Subfamily Psyllinae Latreille
The subfamily Psyllinae psyllid fauna included *Palaeolindbergiella* genus and one species, *Psylla* genus with 3 species and 3 undescribed genera with one species each.

Genus: *Palaeolindbergiella* Heslop-Harrison
Palaeolindbergiella sp. (fig.1d) (host plant: *Gardenia erubescens*: Rubiaceae, fig 2d): Banyo: 6 vii 2015, 6 males, 9 females. University Campus of Ngaoundere: 3, 2011, 43 males, 10 females, 21 v21 vi 2011, 11 males, 11 females, 2 larvae; 7,16 vii 2011, 70 males, 43 females, 10 larvae; 4,20 viii 2011, 65 males, 39 females, 29 larvae; 20 xii 2011 6 males, 8 females; 2 i 2012, 2 males, 27 iii 2012, 9 males, 9 females; 1 larvae; 2 iv 2012, 13 males, 14 females, 1 larvae; 4,23 viii 2012, 9 males, 2 females; 1 ix 2012, 6 males, 4 females; 20 xii 2012, 1 female; 3 i 2013, 25 males, 14 females; 2 iv 2013, 1 male, 1 female; 20 vii 2013, 2 males, 5 females. Dang: 17 v 2011, 35 males, 32 females, 7 larvae; 14 vi 2011, 20 males, 22 females, 1 larvae; 14 vii 2011, 1 female; 24 xii 2011, 16 males, 16 females, 31 larvae; 5 iv 2012, 8 males, 7 females; 21 viii 2012, 7 males, 4 females; 6 ix 2012, 3 males; 22 xii 2012, 5 males, 3 females, 4 larvae; 5 i 2013, 2 females; 4 iv 2013, 7 males, 5 females, 52 larvae; 22 vii 2013, 3 males, 10 females, 6 larvae; 30 viii 2013, 4 males, 3 females, 1 larvae. Falaise Wack: 7 viii 2014, 6 males, 5 females. Mbizoro: 10,28 v 2011, 31 males, 11 females, 5 larvae; 6,30 vi 2011, 55 males, 46 females, 2 larvae; 9 vii 2011, 5 males, 3 females; 6,16 viii 2011, 7 males, 7 females; 4 ix 2011, 5 males, 7 females, 9 larvae; 29 iii 2012, 1 male; 4 iv 2012, 1 male, 2 females; 18,28 viii 2012, 18 males, 9 females, 2 larvae; 27 xii 2012, 8 males, 9 females, 2 larvae; 2 i 2013, 110 larvae; 27 iii 2013, 8 males, 14 females, 5 larvae; 1 iv 2013, 25 males, 14 females, 14 larvae. Tchabal: 28 iv 2011, 16 males, 16 females, 1 larvae; 14,24 v 2011, 47 males, 59 females, 14 larvae; 11,23 vi 2011, 109 males, 68 females, 2 larvae; 21 vii 2011, 83 males, 59 females, 13 larvae; 13 viii 2011, 54 males, 22 xii 2011, 6 males, 8 females; 27 females, 34 larvae; 2 i 2012, 2 females, 2 larvae; 3 iv 2012, 13 males, 13 females; 16 viii 2012, 58 males, 41 females, 1 larvae; 3 ix 2012, 4 males, 4 females; 24 xii 2012, 11 males, 11 females; 29 iii 2013, 6 males, 5 females; 26 vii 2013, 3 males, 1 female, 3 larvae. Tignere: 29 vi 2015, 4 males, 2 females.
From April 2011 to December 2012, *Palaeolindbergiella* sp. was collected at Tchabal 19 times (fig.5). The highest number of individuals of developmental stages was noted from June to August 2011 for adults and larvae stages (fig. 5); during this period, host plant renews its leaves.

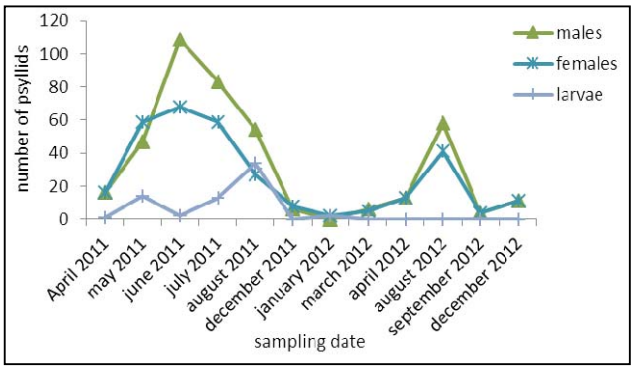

Fig 5: number of larvae, females and males of *Palaeolindbergiella* sp. collected at Tchabal on *Gardenia erubescens*

Genus *Psylla* Geoffroy
Psylla sp.1 (host plant: *Pterocarpus lucens*: Fabaceae): Falaise Wack: 11 vii 2015, 5 males, 16 females, 72 larvae. Mbe: 13 vii 2015, 3 males, 4 females.
Psylla sp.2 (host plant: *Berlinia doko*: Fabaceae): Mbe: 13 vii 2015, 1 male, 3 females, 22 larvae.
Psylla sp.3 (fig.1e) (host plant: *Entada abyssinica*: Fabaceae): Banyo: 6 vii 2015, 3 males, 1 female, 2 larvae. University Campus of Ngaoundere: 13, 20 viii 2011, 16 males, 44 females, 47 larvae. Dang: 11 viii 2011, 9 males, 16 females, 12 larvae. Falaise Wack: 11 vii 2015, 2 males, 3 females. Libong: 29 vi 2015, 8 males, 6 females, 8 larvae. Meiganga: 3 vii 2015: 1 male, 2 females, 1 larvae. Ngaoundal: 7 vii 2015, 22 males, 27 females, 2 larvae. Nyambaka: 10 vii 2015: 2 males, 2 females, 1 larvae. Tchabal: 18 viii 2011, 6 males, 15 females, 6 larvae. Tibati: 7 vii 2015, 1 male, 1 female. Tignere: 29 vi 2015, 5 males, 2 females, 1 larvae.
Psyllinae gen. sp. 1 (fig 1f) (host plant: *Burkea fricana*: Fabaceae): Falaise Wack: 11 vii 2015, 2 males, 3 females. Mbe: 13 vii 2015, 26 males, 36 females, 70 larvae.
Psyllinae gen. sp. 2 (fig. 1g) (host plant: *Terminalia laxiflora*.: Combretaceae): Falaise Wack: 7 viii 2014, 12 males, 8 females, 15 larvae; 4,11 vii 2015, 2 males, 5 females, 70 larvae. Tignere: 30 vi 2015, 23 males, 22 females, 36 larvae.
Psyllinae gen. sp. 3 (host plant: *Bauhinia thonningii*: Fabaceae): Banyo: 6 vii 2015, 5 males, 5 females. Beka-Hossere: 10 vii 2015, 2 males, 3 females. University Campus of Ngaoundere: 26 iv 2011, 19 males, 28 females, 79 larvae; 3,31 v 2011, 67 males, 61 females, 4 larvae; 9,21 vi 2011, 59 males, 57 females, 1 larvae; 16 vii 2011, 47 males, 40 females; 4,20 viii 2011, 81 males, 64 females, 25 larvae; 20 xii 2011, 22 males, 30 females, 80 larvae; 2 i 2012, 33 males, 44 females, 16 larvae; 27 iii 2012, 36 males, 37 females, 11 larvae; 2iv 2012, 17 males, 28 females, 4 larvae; 4 viii 2012, 35 males, 29 females; 1 ix 2012, 7 males, 2 females; 20 xii 2012, 1 male, 6 females; 28 iii 2013, 10 males, 15 females, 4 larvae; 2 iv 2013, 7 males, 4 females, 7 larvae; 20 vii 2013, 7 males, 6 females. Dang: 27 v 2011, 41 males, 64 females, 5 larvae; 14 vi 2011, 46 males, 52 females, 3 larvae; 14 vii 2011, 37 males, 36 females; 11 viii 2011, 11 males, 21 females, 22 larvae; 31 iii 2012, 19 males, 20 females, 1 larvae; 21 viii 2012, 25 males, 36 females, 10 larvae; 6 ix 2012, 6 males, 3 females, 2 larvae; 29 xii 2012, 1 male, 4 females; 30 iii 2013, 4 males, 2 females, 3 larvae; 4 iv 2013, 8 males, 7 females, 1 larvae. Mbe: 13 vii 2015, 5 males, 6 females; Mbizoro: 30 iv 2011, 11 males, 18 females, 6 larvae; 28 v 2011, 20 males, 17 females; 7,30 vi 2011, 119 males, 134 females, 2 larvae; 9,19 vii 2011, 68 males, 86 females, 2 larves; 16 viii 2011, 12 males, 22 females, 5 larvae; 29 iii 2012, 33 males, 31 females, 5 larves; 4 iv 2012, 22 males, 26

females, 23 larvae; 8 viii 2012, 19 males, 18 females, 2 larvae; 4 ix 2012, 13 males, 6 females; 27 iii 2013, 6 males, 4 females; 1 iv 2013, 13 males, 14 females, 55 larvae. Meiganga: 3 vii 2015, 5 males, 2 females, 1 larvae. Libong: 29 vi 2015, 9 males, 10 females. Nganha: 8 vii 2015, 4 males, 6 females. Ngaoundal: 7 vii 2015, 9 males, 2 females. Nyambaka: 10 vii 2015, 10 males, 4 females. Tchabal: 5 v 2011, 48 males, 43 females, 2 larves; 11,23 vi 2011, 77 males, 76 females, 1 larvae; 2,30 vii 2011, 56 males, 63 females, 3 larvae; 9 viii 2011, 31 males, 46 females, 1 larvae; 22 xii 2011, 15 males, 10 females; 2 i 2012: 24 males, 12 females; 28 iii 2012, 11 males, 18 females; 3 iv 2012, 16 males, 28 females, 1 larvae; 16 viii 2012, 38 males, 41 females, 3 larvae. Tibati: 7 vii 2015, 5 males, 1 female. Tignere: 30 vi 2015, 5 males, 2 females, 1 larvae.

From April 2011 to July 2013, psyllids of Psyllinae genus sp.3 were collected at University Campus of Ngaoundéré 24 times. The highest number of individuals of developmental stages was noted during the months of May and August 2011 for adult stages, and April and August 2011 for larvae (fig. 6). The host plant phenology may explain the proliferation of psyllid outbreaks, the renewing period of news leaves are appropriate for psyllid development.

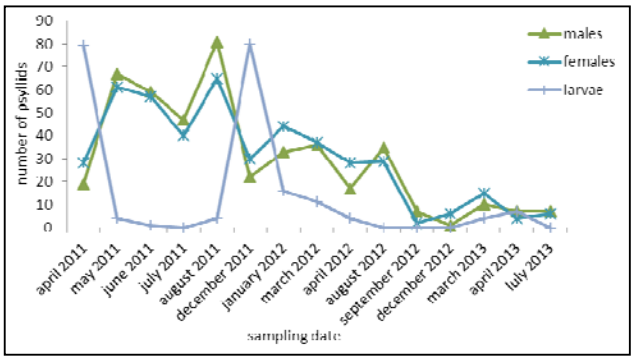

Fig 6: number of larvae, females and males of Psyllinae genus n.3 collected at University Campus at Ngaoundere on *Bauhinia thonningii*

3.2 Host plants

Thirteen host plants were recorded belonging to three families: Combretaceae, Fabaceae and Rubiaceae (table 2). The Combretaceae family includes one endemic species; *Terminalia laxiflora*. The Fabaceae family includes 10 species of host plants belonging to the following genera: *Berlinia*, *Burkea*, *Bauhinia* (*Piliostigma)*, *Pterocarpus*, *Albizia, Parkia* (*Mimosa*), *Entada and Leucena.* The most important genus was *Albizia* with four different host plants. *Albizia julibrissin* and *A. chevalieri* are endemic species while *A. adianthifolia* and *A. zygia* could be recorded in others regions. The Rubiaceae family includes one species of host plants belonging to *Gardenia* genus.

Table 2: List of host plants with associated psyllids species from the Adamawa Region of Cameroon

Host plant	Associated psyllids species	Host plant family
	Aphalaroidinae subfamily	
Albizia adianthifolia	*Yangus* sp.1	Fabaceae
Albizia zygia	*Yangus* sp.2	Fabaceae
Albizia julibrissin	*Yangus* sp.3	Fabaceae
Parkia biglobosa	*Yangus* sp.4	Fabaceae
Albizia chavalieri	*Yangus* sp.5	Fabaceae
	Ciriacreminae subfamily	
Leucaena leucocephala	*Heteropsylla cubana*	Fabaceae
	Psyllinae subfamily	
Pterocarpus lucens	*Psylla* sp.1	Fabaceae
Berlinia doka	*Psylla* sp.2	Fabaceae
Entada abyssinica	*Psylla* sp.3	Fabaceae
Gardenia erubescens *Burkea africana*	*Palaeolindbergiella* sp. Psyllinae gen.1 sp.	Rubiaceae Fabaceae
Terminalia laxiflora	Psyllinae gen.2 sp.	Combretaceae
Bauhinia thonningii	Psyllinae gen.3 sp.1, Psyllinae gen.3 sp.2	Fabaceae

3.3 Damages

Damages caused by psyllids species of Psyllidae family in the Adamawa region are leaves discolouration (fig 2a, 2c), distortion of leaves and development of galls (fig. 2b, 2 f), rolling and necrosis of leaves (fig 2d, 2e) (fig 2e), development of galls and swelling of leaves which finally provokes necrosis of leaves (fig. 2g).

4. Discussion

We recorded during a survey in the Adamawa Region of Cameroon 14 species of Psyllidae family from April 2011 to July 2015. Theses psyllids species belong to following 3 subfamilies: Aphalaroidinae with *Yangus* genus (5 species), Ciriacreminae with *Heteropsylla* genus (1 species) and Psyllinae with 5 genera, *Palaeolindbergiella* (1 species), *Psylla* (3 species) and 3 new genera (4 species). The biodiversity of psyllids of Psyllidae family in the Adamawa Region is less than the biodiversity of Psyllidae collected in the Centre Region of Cameroon [12], South Region of Cameroon [13] and West Region of Cameroon [11] which have more genera and more species. In the Centre Region [12] recorded 18 genera with 30 species, in South Region [13] recorded 11 genera with 22 species and in West Region [11] recorded 13 genera with 21 species. Within the Psyllidae family collected during this survey in our region only one psyllid is well known and described, *Heteropsylla cubana* [14]. All others are unknown psyllid species. Among these species 10 are reported for the first time in Cameroon: *Yangus* with 3 species, *Palaeolindbergiella* sp., *Psylla* spp., and new genera and species of Psyllinae sub family.

5. Conclusion

The survey of the psyllids biodiversity undertaken in the Adamawa Region of Cameroon, from April 2011 to July

2015, permit us to collect within the Psyllidae family, 3 subfamilies, 7 genera and 14 species. Ten species are reported for the first time in Cameroon. *Yangus* genus included 3 species; *Palaeolindbergiella*, one species; *Psylla*, 3 species; Psyllinae new genus 1, 1 species; Psyllinae new genus 2, 1 species; Psyllinae new genus 3, 2 species. This study enriched the biodiversity of psyllids fauna from Cameroon in particular and the afrotropical region in general. Host plants recorded are endemic from the Adamawa Region of Cameroon. Damages caused by psyllids species of Psyllidae family are discolouration of leaves, distortion and deformation of leaves, development of galls on the leaves, leaves rolling and necrosis of host plants. These species of psyllids cause important damages on their host plants.

6. Acknowledgments

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