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# Parasitism of *Mesohomotoma tessmanni* Aulmann (Psylloidea, Carsidaridae) Psyllid Pest of *Theobroma cacao* and *Octolobus spectabilis* (Sterculiaceae) in Cameroon and Taxonomy of Parasitoids

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**Abstract:** *Mesohomotoma tessmanni* is the pest of cocoa (*Theobroma cacao* L.) and *Octolobus spectabilis* W. in Cameroon. The parasitoids complex of this psyllid was studied in 1999, 2000, 2002 and 2006 in some cocoa areas in Cameroon (Yaounde, Obala and Santchou). Two hundred and ninety eight (298) and three hundred and twenty nine (329) mummified larvae were collected on *T. cacao* and *O. spectabilis*, respectively. The rate of parasitism was estimate as 78.1%. The emergence level was 87.9% on *T. cacao* and 75.4% on *O. spectabilis*. The emerged parasitoids belong to the families Encyrtidae and Figitidae. The Encyrtidae's specie belongs to the genus *Psyllaephagus*; this specie is described, *Psyllaephagus mesohomotomae* sp.n.. The Figitidae's specie belongs to the genus *Dilyta*; this species is described, *Dilyta camerounensis* sp.n.. These important parasitoids will help to reduce the level of the infestations of cocoa during the process of the biological control of the psyllid in Cameroon.

**Key words:** *Theobroma cacao*, *Mesohomotoma tessmanni*, *Psyllaephagus mesohomotomae*, *Dilyta camerounensis*

## INTRODUCTION

Cocoa, *Theobroma cacao* (Linné), originated from tropical America, has been introduced in Cameroon. This plant is cultivated in various provinces: South, Centre, East, West and Littoral (Mbondji, 1984). Cocoa is a major export crop in several West African countries. In Cameroon, insects and fungi caused serious damages that have been on the contributory factors for the decline in the yield of cocoa. The depredations of insects on cocoa caused about 30% loss in the yield (Kumar, 1991). *Mesohomotoma tessmanni* is the West African cocoa psyllid which occurs from Sierra Leonne to the Congo Republic and in the island of Sao-Tome (Entwistle, 1972). In Cameroon, this pest has also been observed to attack different Sterculiaceae (Messi, 1984; Tamesse, 2005). The main host plants of this pest in Cameroon are of the genus *Theobroma*, *Octolobus*, *Cola* and *Sterculia* (Tamesse, 2005). According to Tamesse (2005), *M. tessmanni* were collected on nine different species of host plants: *Theobroma cacao* L. *Sterculia rhinopetala* K. Schum, *S. oblonga* Mast, *Cola nitida* (Vent. Schott) and Endl, *C. acuminata* (P. Beauv.) Schott and Endl. *C. anomala*, *C. flaviflora*, *C. lateritia* K. Schumann and *Octolobus spectabilis* Welwitsch. *M. tessmanni* and few other pests were classified as minor pests of cocoa (Picket, 1968; Lodos, 1968). On the contrary, *M. tessmanni* is considered as a major pest in the cocoa area of the Centre and South Provinces of Cameroon (Messi, 1984). According to Igboekwe (1984), the pest is increased in importance in Nigeria; it has been observed as major pest causing severe damage to cocoa when the population became very high. The mode of insertion of eggs in the leaf tissue provokes necrosis of the organ; according to Messi (1986) these necrosis can be considered as the main severe damage caused by this pest to cocoa. The pest laid their eggs on young flushes, buds and young fruits (Messi *et al*., 1998). Also, attacks of *M. tessmanni* on young seedlings caused loss of weight and retardation of new leaf development (Igboekwe, 1983).

The control of *M. tessmanni* population until now was essentially chemical in Cameroon as in other cocoa areas in the tropical region (Decazy, 1976; Kadje and Tondje, 1988). The use of the pesticides assures the spectacular results short-term, but the chemical controls are very expensive for farmers in the tropical region. Consequently, the used of insecticides didn't permit until now to reduce significantly the level of the infestations of cocoa psyllids in all the cocoa area. No biological control method was experimented to fight against this important

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pest. The parasitoids complex of this psyllids is not clearly known. Entwistle (1972) noted that larvae of *M. tessmanni*, in Ghana, was parasited by *Psyllaephagus cellulatus* (Encyrtidae) and *Alloxysta* sp. (Cypinidae). Messi (1984), in Cameroon, collected from psyllids mummified larvae two parasitoids, *Psyllaephagus phytolymae* (Encyrtidae) and *Aphidencyrtus* (*Syrphophagus*) sp. The level of parasitism and the level of emergence of cocoa psyllids parasitoids is not known. Studying the parasitoids-host index of Afrotropical Encyrtidae (Hymenoptera: Chalcidoidea), Prinsloo (1983) didn't mention the parasitoids wasps associated with cocoa psyllid. The parasitoids complex of *M. tessmanni* should be studied and species involved identify in all the cocoa production areas in the tropical region in general and in Cameroon in particular. The present study was conducted in three different cocoa areas in Cameroon (Yaounde, Obala and Santchou) and on two different host plants (*Theobroma cacao* and *Octolobus spectabilis*). The aim of this study was to investigate and to better known the parasitoids complex of *M. tessmanni* in Cameroon for the biological control of the pest.

## MATERIALS AND METHODS

The observations and surveys took place once a week, from November 1999 to February 2000; from January to February 2002 and from January to February 2006. The first two surveys took place in Yaounde (11°31' N, 3°51'E, altitude 759 m, Mfoundi Division, Center Province) and Obala (11°32' N, 4°10'E, altitude 560 m, Lekie Division, Center Province); the last one took place at Santchou (9°58' N, 5°17'E, altitude 709 m Menoua Division, West Province). According to Messi (1984), from November to February, the population of cocoa psyllid is always very high, in the Yaounde region. The larvae and mummified nymphs of the psyllid were collected in the experimental cocoa plantation of the Institut of Agricultural Research for the Development (IRAD) in Yaounde and in an cocoa plantation at Obala and Santchou. Others mummies were collected on *Octolobus spectabilis*, a native Sterculiaceae, at Eloundem forest mountain near Yaounde (11°31' N, 3°51'E, altitude 900 m). During each of our survey, 50 cocoa trees were inspected to collect nymphs and mummified larvae. In the forest zone, 20 *Octolobus spectabilis*'s trees were inspected for each survey. The cocoa plantations didn't undergo any insecticide treatments during the period of observations. The number of last instars larvae and mummified larvae were counted. Under laboratory conditions, mummified larvae were kept in the petri-dishes and emerged adults of hymenopterans were identified using Paretas-Martinez and Pujade-Villar (2006)'s key for Figitidae Charipinae and Prinsloo (1981)'s key for Encyrtidae.

The terminologies used for the description of Encyrtidae follow Prinsloo (1981, 1984). The terminologies used for the description of Figitidae follow Kierych (1979a, 1979b), Paretas-Martinez and Pujade-Villar (2006). All insects were conserved dry or in 70% alcohol. The insects' collection was kept in the Laboratory of Zoology, University of Yaounde I (LZU1).

## RESULTS AND DISCUSSION

Eight hundred and three larvae of 4th and 5th instars of *Mesohomotoma tessmanni* were collected during this study. Three hundred and ninety three larvae were collected on *T. cacao* and 410 on *O. spectabilis*. Two hundred and ninety eight mummified larvae were collected on *T. cacao*, the parasitism rate was estimated to 75.8%. Two hundred and sixty two adults of hymenopteran emerged from these mummies. The rate of emergence was 87.9%. Three hundred and twenty nine mummified larvae were collected on *O. spectabilis*, the rate of parasitism was estimated to 80.24% and two hundred and forty eight adults of hymenopteran emerged from these mummies. The rate of emergence was 75.4%. Considering all the data, eight hundred and three psyllids larvae for 4th and 5th instars were collected, 627 mummified larvae were collected, the rate of parasitism was 78.1% and 510 adults of hymenopteran emerged from these mummies; the rate of emergence was 81.3% (Table 1).

The parasitism rate of *M. tessmanni* larvae (78.1%) was very high compared to the parasitism of *T. erytreae* in the Yaounde region (15%) (Tamesse *et al*., 2002). The parasitism rate is higher on *O. spectabilis*. *O. spectabilis*, as a native Sterculiaceae from Cameroon, could be the primitive host plant of *M. tessmanni* before the importation of *T. cacao* in this region. Then, the psyllids and its parasites were well established and the later usually regulated the population dynamic of its host. The

Table 1: Parasitism rate and number of adults of hymenopteran emerged from mummified larvae of *Mesohomotoma tessmanni*

| Host plant | 4th and 5th instars larvae | Mummified larvae | Parasitism rate (%) | Adults of hymenopteran emerged | Rate of emergence (%) |
|---|---|---|---|---|---|
| *T. cacao* | 393 | 298 | 75.8 | 262 | 87.9 |
| *O. spectabilis* | 410 | 329 | 80.24 | 248 | 75.4 |
| Total | 803 | 627 | 78.1 | 510 | 81.3 |

rate of parasitism of *M. tessmanni* on *T. cacao* indicated that the parasitoids were able to reduce significantly the number of psyllids larvae on its host plant during the most important period of the development of the pest from November to February. This particular period was considered as the most convenient period for the development of *M. tessmanni* in the Yaounde region (Messi, 1984). It is during this period that most of the injuries were committed on young flushes, buds and fruits of *T. cacao*. Then, this result suggested that the integrated pest management against *M. tessmanni* is possible. It is important to note that the insecticide spray should be forbidden in all cocoa farm and plantation from November to February in order to preserve the population dynamic of the parasitoids complex.

**Taxonomy of Hymenopteran parasitoids of *M. tessmanni*:** The parasitoids complex of *M. tessmanni* was studied and adults of Hymenopteran were identified. Two species of Hymenoptera was identified belonging respectively to Encyrtidae and Figitidae families. The species involved in the parasitoids complex of cocoa psyllid belong to the genus *Psyllaephagus* (Encyrtidae) and *Dilyta* (Figitidae). The parasitoid complex of this psyllid is less diversified than the one of the citrus psyllid, *Trioza erytreae*, in the Yaounde region as described by Tamesse *et al*. (2002). According to the last author, the parasitoid complex of *T. erytreae* include 14 species of 5 different families: Encyrtidae, Eulophidae, Aphelenidae, Ceraphronidae and Figitidae. The results obtained during this work complete those of Messi (1984) and Entwistle (1972). Messi (1984) noted that *Psyllaephagus phytolymae* (Encyrtidae) and *Aphidencyrtus* (*Syrphophagus*) sp. was the two parasitoids of *M. tessmanni* in Cameroon. According to Prinsloo (1983), *P. phytolymae* is restricted to *Phytolyma lata*, psyllid pest of *Millicia excelsa* and never be recovered on other psyllid. This should be a misidentification of the specie involved. In the other hand, Entwistle (1972) argued that in Ghana, the specie involved was *Psyllaephagus cellulatus*. In contrast, more than ten years after the work of Entwistle (1972), *P. cellulatus* as parasitoid of cocoa psyllid, was not include within the parasitoids-host index of Afrotropical Encyrtidae published by Prinsloo in 1983. The description of this specie is not available. We are convincing that the *Psyllaephagus* specie involved in the parasitoid complex of *M. tessmanni* in Cameroon is a not described. In the other hand, the specie of *Syrphophagus* genus cited by Messi (1984) was not recorded during this survey. Entwistle (1972) noted that the second specie involved in the parasitoid complex of *M. tessmanni* was a Cynipidae of *Alloxysta* genus. In Cameroon, a Figitidae of *Dilyta*

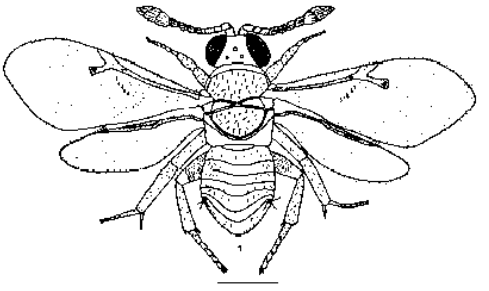

Fig. 1: Adult female of *Psyllaephagus mesohomotomae* sp.n. (dorsal view); scale bar: 0.2 mm.

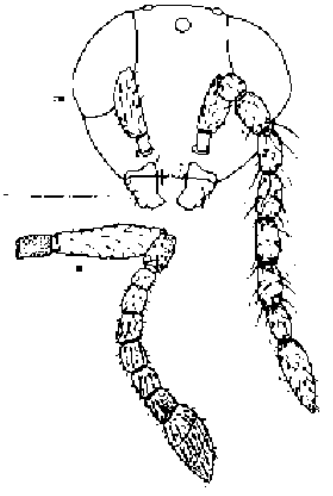

Fig. 2 and 3: Head and antenna of *P. mesohomotomae* sp.n. 2: female antenna; 3: head and male antenna ; scale bar: 0.2 mm.

genus was recorded. The Cynipidae are very closed to the Figitidae and they would be some confusion during the taxonomy of the specie recorded by Entwistle (1972). The two species involved in the parasitoid complex of *M. tessmanni* in Cameroon are poorly known and these hymenopterans are described as new species. One belong to Chalcidoidea super family, Encyrtidae family and *Psyllaephagus* genus. The second one belong to the Cynipoidea super family, Figitidae family and *Dilyta* genus.

Chalcidoidea super family are parasitoids of several insects comprising some Psyllids, pest of cultivated plants. Forewing venation is greatly reduced, comprising at most a submarginal, marginal, stigmal and postmarginal.

Encyrtidae family is one of the largest families of the Chalcidoidea, comprising more than 500 genera and 1000 described species (Prinsloo, 1984). Encyrtids are characterised by their forewing structure (Fig. 1)

submarginal vein very long, marginal vein very short, postmarginal vein short but longer than the marginal vein and the stigmal vein short, but longer than the post marginal vein. Fore wing are hyaline. Axillae of the thorax are widely separated from each other on the midline of the thorax (Fig. 1). The female antenna (Fig. 2) is 11-segmented, comprising a six-segmented funicle and three-segmented club which together form the flagellum and which is always clothed with short setae which are set close to the segments. The male antenna is often nine segmented with six funicle segments and one segmented club; the female antenna differs from the male antenna (Fig. 3), the latter is slender and covert with long setae, lending the antenna a hairy appearance. The legs (Fig. 4-6) have the tarsi with five segments and the middle leg with a large, strongly developed, straight tibial spur, which is developed for jumping. The gaster is broadly attached to the thorax, without forming a constriction (Fig. 1). The ovipositor is at most weakly exserted at the apex of the abdomen (Fig. 7).

Fig. 4-6: Legs and its maculation of *P. mesohomotomae* sp.n. 4: fore leg; 5: middle leg; 6: hind leg ; scale bar: 0.2 mm

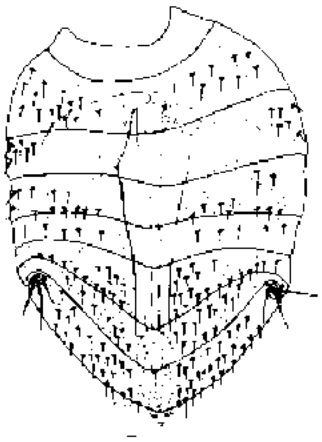

Fig. 7: Female abdomen and its ovipositor of *P. mesohomotomae* sp.n. ; scale bar: 0.2 mm

*Psyllaephagus* Ashmead genera is characterised by their head and their entire body which is metallic in colour, or black with a metallic lustre on certain parts; the marginal vein of the fore wing punctiform or short, plainly shorter than the stigmal vein (Fig. 1). This is a cosmopolitan genus, the species of which are all primary parasites in the nymphs of psyllids. According to Prinsloo (1981) the combination character useful to distinguish the eighteen new species of *Psyllaephagus* from southern African region are host preference, body colour and maculation of legs. This author gives the useful diagnostic characters for southern African *Psyllaephagus*.

***Psyllaephagus mesohomotomae*** **sp.n. (Fig. 1-9):** Female. Length: 1.60-2.28 mm; mean: 1.91 mm (24 specimens). Colour: head with face from antennal sockets to junction with frontovexter dark, the lower part of face from toruli to mouth margin, genae and frontovertex, dark metallic green; tegulae whitish basally, the remainder brown; mesoscutum with frontovertex dark with the posterior margin of mesoscutum yellowish to brown; axillae and scutellum dark; sides of thorax and abdomen black; scape sordid white to brown, pedicel brownish to darker, which are sordid white; flagellum for all funicle segments yellow-brown to brown, legs pale yellow except all coxae and hind femur, which are largely blackish-brown to black, basal half of the tibia blackish-brown to black (Fig. 4-6).

Head, in dorsal view (occiput perpendicular), with anterior margin concave medially; fronto-occipital margin almost acute; head about 2.5 times as wide as frontovertex at median occelus; occeli in a slightly obtuse-angled triangle; head, in frontal view, with upper limits of toruli about level with lower eye margins; scrobed deep, impressed on face as an inverted V; interscrobal prominence extending to near upper scrobal limits: Antenna (Fig. 2) with scape about 4 times as long as broad; funicle segments I-V each subquadrate, longer than broad, the basal segment a little smaller than each of II-V; funicle VI wider than long; club about as long as funicle segments IV-VI together; funicle segments III-VI with rhinaria; mandible with two teeth separated by a

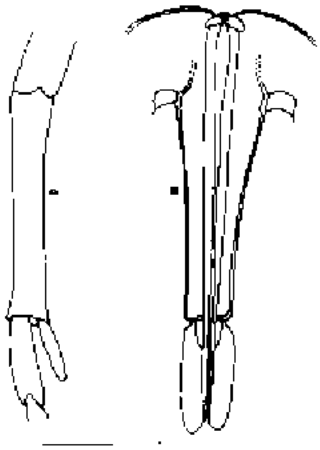

Fig. 8-9: Comparison of ovipositor and middle tibia length of *P. mesohomotomae* sp.n. 8. ovipositor; 9. middle tibia, tibial spur and first segment of the tarsus; scale bar: 0.2 mm

shallow furrow (Fig. 3). Sculpture of head moderately coarse, the frontovertex densely and finely punctate.

Thorax convex from lateral view; mesonotal sculpture finer than on head, the cells not raised, much the same on mesoscutum and scutellum except those along sides of scutellum, which are somewhat elongate and longitudinally oriented; scutellum, with several setae. Basal part of fore wing finely setose, the setae evenly spaced from a level about halfway along submarginal vein; venation as in fig.1. Middle tibia spur shorter than adjacent tarsal segment (Fig. 5).

Abdomen (Fig. 7) plainly longer than thorax; ovipositor, as seen through the derm, about 4/5 as long as length of gaster, about 1,7 times as long as middle tibia (Fig. 8-9), about 4 times as long as gonostyli (Fig. 8). The gonostyli is about 1.5-1.65 times as long as tibial spur of the middle leg (Fig. 8-9).

**Male:** Length: 1.52-2.04 mm; mean: 1.77 mm (27 specimens). Colour: head brilliant metallic green; antennal radicle and scape pale yellow; pedicel largely brownish to dark on its dorsal and lateral surface; remainder of antenna very slightly darker than scape; thorax colour as in female; abdomen and legs much as in female. Antenna bearing densely and longer setae, with hairing appearance (Fig. 3).

**Comments:** This specie collected on *Mesohomotoma tessmanni* can be compared to *Psyllaephagus bicolor* Prinsloo (Prinsloo, 1981). *P. bicolor* is the primary parasite of undetermined psyllid on *Acacia* sp. The following characters can distinguish from the new specie the later. In *P. mesohomotomae*, the female antennal scape is entirely brown but the distal half of the scape of *P. bicolor* is yellowish. In *P. mesohomotomae*, female scape is 4 times as long as broad, but for *P. bicolor*, the scape is 4.5-4.8 as long as broad. In *P. mesohomotomae*, funicle segments I-V each subquadrate, longer than broad, the basal segment a little smaller than each of II-V; funicle VI wider than long; club about as long as funicle segments IV-VI together. In *P. bicolor*, funicle segments I-V each subquadrate or quadrate, the basal two segments a little smaller than each of III-V; funicle VI wider than long; club about as long as funicle segments III-VI together. In *P. mesohomotomae*, ovipositor, as seen through the derm, about 4/5 as long as length of gaster, about 1.7 times as long as middle tibia, about 4 times as long as gonostyli; the gonostyli is about 1.5-1.65 times as long as tibial spur of the middle leg. In *P. bicolor*, ovipositor, as seen through the derm, about one-half length of gaster, about 1.4 times as long as middle tibia, about 5 times as long as gonostyli; the gonostyli is slightly as long as tibial spur of the middle leg.

**Synonym:** The name of this specie follows the name of the cocoa psyllid, *Mesohomotoma tessmanni*.

**Material examined:** Holotype female: Cameroon, Yaounde, 5 xi 1999 on *T. cacao* (JL Tamesse). Paratypes: 5 females, 9 males, Cameroon, Yaounde, 5 xi 1999 (JL Tamesse); 7 females, 3 males, Cameroon, Yaounde, 20 xi 1999 (JL Tamesse and BM Tiyo); 7 females, 5 males, Cameroon, Yaounde, 25 i 2000 (JL Tamesse and BM Tiyo); 7 females, 6 males, Cameroon, Obala, 19 ii 2000 (JL Tamesse and BM Tiyo); 15 females, 5 males, Cameroon, Obala, 16 x 2002 (JL Tamesse and BM Tiyo); 8 females, 5 males, Cameroon, Santchou, 19 ii 2006 (JL Tamesse and BM Tiyo). Materials kept dry or in 70% alcohol.

Cynipoidea is a super family containing both parasitic and phytophagous species. They are small insects of 1-5 mm length, although some exceed 10 mm in length. They are often black, dull or shiny, but never with a metallic sheen as in Chalcidoidea. The diagnosis characters of Cynipoidea are given by Schottz and Holm (1985). The antenna (Fig. 10-11) are filiform, with 11-19 segments often without a differentiated club; female antennae (Fig. 11-12) are usually 13 segmented, those of male quite often with 14 or 15 segments (Fig. 10; 13). The pronotum, unlike that of chalcidoids, reaches back-wards to meet the tegulae (Fig. 10-11) and the mesoscutum has no taulices. The fore wing venation (Fig. 10) is reduced, but not to the extent of that found in the chalcidoids. There is no pterostigma, but a radial cell, which may be

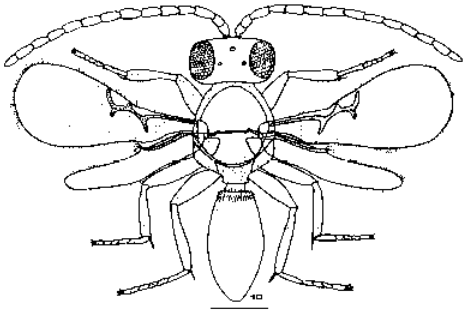

Fig. 10: Adult male of *Dilyta camerounensis* sp.n. (dorsal view) ; scale bar: 0.2 mm

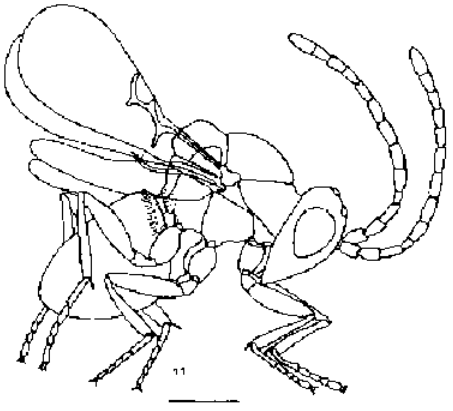

Fig. 11: Adult female of *Dilyta camerounensis* sp.n. (lateral view) ; scale bar: 0.2 mm

open or closed, is always present. The hind wing (Fig. 10) is without anal lobe. Legs always have tarsi with five segments. The gaster is either sessile, subsessile, or distinctly petiolate. The gastral tergites usually overlap the sternites laterally. The ovipositor of the female does not protrude caudally, being concealed within the gaster (Fig. 11).

Figitidae family is the cosmopolitan cynipoids comprising approximately 110 genera and 1500 species. It is the most abundant species-rich and abundant cynipoid family. The diagnosis characters of Figitidae is given by Hanson and Gauld (1995). Mesoscutum (Fig. 11) smooth or with light sculpture, without strong transverse ridges; ovipositor not forming a complete loop; small wasps, 1-6 mm, usually under 4 mm; largest segment of metasoma, in lateral view, the second or third. Fore wing with innermost (proximal) trace of vein Rs+M 'pointing' to the junction of Rs+M with M+Cu; tergite IX of metasoma without depressed area; female frequently with the third metasomal tergite the largest, sometimes the second; mesosoma usually smooth and shiny.

Charipinae Dalla Torre and Kieffer subfamily includes small wasps of two tribes Alloxystini and Charipini. Menke and Evenhuis (1991) and Carver (1993) defined the diagnostic character of the Charipini. This tribe are distinguishable from the Alloxystini by having the last two antennal segments of the female clavate and incompletely separated and by the shape of the gaster (Fig. 15); the most significantly they are primary parasites of Psylloidea and not like Alloxystini, hyperparasites of Aphids. The morphological characters that define the tribe Charipini are given by Paretas-Martinez and Pujade-Villard (2006). Metasomal T2-T3 fused or T2 very small; last two flagellomeres broadly joined or fused, forming an apical club, preceding flagellomeres with constrictions between them (Fig. 12-13); posterodorsal extension of axillar strip absent; metasoma almost symmetrical, higher and lower points close to transversal axis.

*Dilyta* Förster is one of the four genera described by Paretas-Martinez and Pujade-Villard (2006) from Australia. The main character of *Dilyta* is that the visible metasoma is not segmented, only one tergite visible (Fig. 15); R1 and Rs not parallel, R1 very short, not reaching wing margin; apex of scutellum with inverted U shaped projected plate (Fig. 11), female antenna with 11 flagellomeres (Fig. 12). The type species, *Dilyta subclavata* Förster was redescribed by Kierych (1979a, 1979b). Kierych (1979b) described a new sub family Dilytinae and the type genus *Dilyta* Förster. The latter gives a generic characters of *Dilyta* and the illustrations of the type species. From Democratic Republic of Congo or Congo Belgian, Benoit (1956) described one specie name *Alloxysta africana*. The author makes little confusion between male and female and Menke and Evenhuis (1991) who examined the holotype and species belonging to *Dilyta* corrected some errors. The description of the specie indicates that this specie belong to *Dilyta*. Then, Menke and Evenhuis (1991) create for this species a new combination and name it as *Dilyta africana* (Benoit). The holotype is a male and not a female as stated by Benoit. Menke and Evenhuis (1991) described the first valid North American species, *Dilyta rathmanae* Menke and Evenhuis. This species is a parasitoid of *Cacopsylla alba*, psyllid of *Salix exigua*. Also, according to Menke and Evenhuis (1991), only six species were described within the genus *Dilyta*. No specie was recorded on psyllids from Africa.

***Dilyta camerounensis* sp.n. (Fig. 10 and 15):** Female length: 1.32-2.00 mm; mean: 1.65 mm (74 specimens). Male length: 1.20-1.88 mm; mean: 1.59 mm (56 specimens). Black except antenna and legs yellowish, about 2/3 apical half of flagellum yellowish to brown and hind tarsi brownish. Thorax with patches of dense, wool-like, white setae as follows. Patches of dense setae present on pronotum

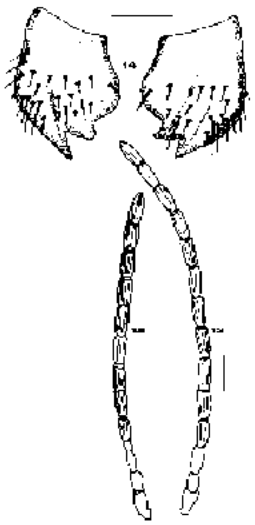

Fig. 12-14: Antenna and mandible of *D. camerounensis* sp.n. 12: female antenna; 13: male antenna; scale bar: 2 mm; 14: mandible; scale bar: 0.2 mm

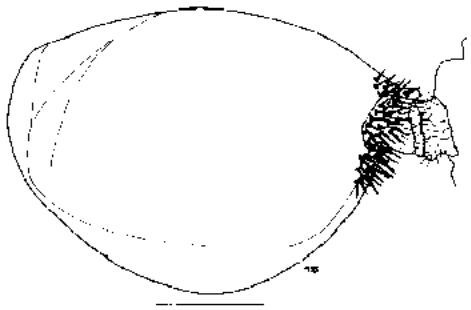

Fig. 15: Abdomen of *D. camerounensis* sp.n. ; scale bar: 2 mm

dorsolaterally and laterally, on scutellum laterally, on subalar fossa of mesopleuron, on metapleuron just beneath hind wind base, on propodeum posterolaterally just above hind coxa and also posteromedially. Setae girdle are abundant at base of tergum I. Female antenna as in Fig. 12. Pedicel is longer than flagellomere II and shorter than each other segments of funicle. Flagellomeres I is 2.4 times longer than width; Flagellomeres I-II without linear rhinaria, following articles with them. Male antenna as in Fig. 13. Pedicel is shorter than each other segments of funicle. Flagellomere I without linear rhinaria, following segments with them. Mandible with two strong teeth separated by a furrow (Fig. 14).

**Comments:** *D. camerounensis* differs from others *Dilyta* species described by the structure of antenna, the pronotum and the shape of scutellum. In *D. subclavata*, rhinaria are absent on flagellomeres I-III. of female antenna and I-II on male antenna (Kierych, 1979a); in *D. rathmanae*, rhinaria are absent on flagellomeres I-VI of female antenna and I-III or IV of male antenna (Menke and Evenhuis, 1991); in *D. camerounensis*, the first two flagellomeres of female and the first flagellomeres of male are without rhinaria. The anterior margin of pronotum of *D. subclava* is largely concave and the one of *D. camerounensis* is straight or slightly convex. The inverted U shape of scutellum is more pronounced.

**Synonym:** The name of this specie follows the name of the country where this work was conducted, Cameroon.

**Material examined:** Holotype female: Cameroon, Yaounde 5 xi 1999, on *T. cacao* (JL Tamesse). Paratypes: 12 females, 14 males, Cameroon, Yaounde, 5 xi 1999 (JL Tamesse); 10 female, 20 males, Cameroon, Yaounde, 20 xi 1999 (JL Tamesse and BM Tiyo); 17 females, 14 males, Cameroon, Yaounde, 25 i 2000 (JL Tamesse and BM Tiyo); 15 females, 14 males, Cameroon, Obala, 19 ii 2000 (JL Tamesse and BM Tiyo); 10 females, 7 males, Cameroon, Obala, 16 x 2002 (JL Tamesse and BM Tiyo); 13 females, 15 males, Cameroon, Santchou, 19 ii 2006 (JL Tamesse and BM Tiyo). Materials kept dry or in 70% alcohol.

## CONCLUSION

In Cameroon, *Mesohomotoma tessmanni*, psyllid pest of cocoa is parasited by hymenopteran parasitoids. The rate of parasitism was 78.1% of larvae of 4th and 5th instar. The mummified larvae were collected on *Theobroma cacao* and on *Octolobus spectabilis*, a native host plant of *M. tessmanni* in Cameroon. Two different parasitoids emerged from mummified larvae. The rate of emergence of adults was 81.3% of mummified larvae collected. Two new species of parasitoids were described. *Psyllaephagus mesohomotomae* sp.n. is an Encyrtidae (Chalcidoidea) and *Dilyta camerounensis* sp.n. is an Figitidae (Cynipoidea). It is important to better know the biology of the two parasitoids and their capacity of controlling the population of the pest in the natural conditions. Also, it would be important to correlate the population dynamic of psyllids with the level of parasitism.

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