

A REVIEW OF THE AFROTROPICAL SPECIES OF THE GENUS *MNEMOSYNE* STÅL (HOMOPTERA, FULGOROIDEA, CIXIIDAE)

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Résumé. — L'auteur donne un aperçu des espèces afrotropicales du genre *Mnemosyne* Stål (Homoptera, Fulgoroidea, Cixiidae). En Afrique, le genre compte actuellement six espèces. *Mnemosyne camerunensis* Distant et *M. evansi* Muir sont redécrites par les génitalia mâles et deux espèces nouvelles sont ajoutées : *M. lefiniensis*, n. sp. et *M. apicifumata*, n. sp.

Summary. — A review is given of the afrotropical species of the genus *Mnemosyne* Stål (Homoptera, Fulgoroidea, Cixiidae). In Africa, the genus actually counts six species. *Mnemosyne camerunensis* Distant and *M. evansi* Muir are redescribed by means of the male genitalia and two species are newly described: *M. lefiniensis*, n. sp. and *M. apicifumata*, n. sp.

The genus *Mnemosyne* accomodates six african species with a mainly tropical distribution. They represent the largest species of the family Cixiidae and can be recognized by the presence of five longitudinal keels on the mesonotum and the venation pattern of the median sectors on the tegmina (fig. 5). The latter character easily separates *Mnemosyne* from other five-carinate genera.

The genus was erected by Stål (1866) and then contained one species, viz. the neotropical species *Mnemosyne cubana* Stål. At present the genus accomodates fourteen species in the neotropical, afrotropical and oriental regions. The real number of species is difficult to estimate because many species are yet to be discovered.

This paper gives a redescription of *Mnemosyne camerunensis* Distant and *Mnemosyne evansi* Muir based on the male terminalia. *Mnemosyne hirta* (Melichar) (= *Mnemosyne maculipennis* Muir) was recently redescribed by Van Stalle and Lauterer (*in press*) and is therefore not illustrated here. For the same reason we have not figured *Mnemosyne lamabokensis* Synave; nevertheless, both species are treated in the key given below. Finally, two species are newly described, namely *Mnemosyne lefiniensis*, n. sp. and *Mnemosyne apicifumata*, n. sp.

Taken into account our present knowledge of this group it would be preliminary to discuss the phylogenetic relationships between the neotropical fauna with the type species and the african taxa, and hence their generic position. We assume that the

differences between these groups are of subgeneric rank and accordingly maintain the genus name for the afrotropical species until the reverse has been proved; only a complete revision of the species groups related to *Mnemosyne cubana* can solve this problem. Unfortunately these species have never been described with reference to the male and female genitalia. Consequently such a project would exceed far the aim of the present paper in which we redescribe and characterize the african taxa, in order to provide a further contribution to the taxonomy and study of the african Cixiidae.

The material studied below is deposited in the following museums: Koninklijk Museum voor Midden Afrika, Tervuren (KMMA), Muséum national d'Histoire naturelle, Paris (MNHN), Hungarian Natural History Museum, Budapest (HNHM), Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussel (KBIN) and British Museum (Natural History), London (BMNH).

GENUS *MNEMOSYNE* STÅL, 1866

Type species: *Mnemosyne cubana* Stål, 1866.

Except for *Mnemosyne hirta* the species are rather uniform in their external morphology. Below we will summarize the characters present in *Mnemosyne camerunensis*, *M. lefiniensis*, *M. evansi*, *M. apicifumata* and *M. lamabokensis*. At the end we will give the differences with *M. hirta*.

Large Cixiidae (9-12 mm), general colour ochreous with brown marks on tegmina. Frons and clypeus flat, with a sharp median keel, only forked on horizontal surface of vertex at level of supposed junction of frons and vertex. Median ocellus present, situated at level of lower margin of antennae. Rostrum long, appreciably exceeding hind-coxae. Length of vertex between apex and tip of basal emargination equal or subequal to width at this level, subapical transverse keel arcuate, connected apically to the two branches of frontal carina. Median and lateral keels of pronotum distinct, mesonotum with five longitudinal keels. Tegmina with venation pattern as illustrated in figure 5, veins including costal margin covered with small granules, except in *Mnemosyne camerunensis* where absent; only apical part of tegmina with granules between veins. Hind tibiae (fig. 4) with two lateral spines, one situated near base, second situated on 1/2 distance, and six apical spines grouped as follows: an internal group of three spines, consisted of two large spines and one small in middle; a second group of two equal spines and finally one stout external spine. First and second segment of hind tarsi with a single row of four to six apical teeth.

Male genitalia: anal segment, pygofer and genital styles symmetrical. Anal segment with an apical lobe; pygofer with lateral margins broadly rounded and provided with a large medioventral process. Aedeagus articulating with anal segment, consisting of a sclerotized perianthrium and a long recurved membranous flagellum, with or without spinose processes.

Female genitalia: very uniform; pregenital sternite small, cephalic border rounded, caudal border slightly convex medially. Anal segment small, rectangular. Ovipositor of Pentastirine type, longer than anal segment, reduced, with three valvulae, the first one broadening basally.

Mnemosyne hirta differs in the following characters: median keel on frons and clypeus absent, frons convex, forming an angle with postclypeus; tegmina densely covered with granules all over their surface. Pygofer with a blunt lobe, anal segment devoid of an apical process and aedeagus shaped otherwise (see Van Stalle & Lauterer, *in press*).

Taxonomic position: the five-carinate mesonotum and the form of the female genitalia suggest that *Mnemosyne* should belong to the tribe Pentastirini; other characters however are against: the tegminal venation, viz. the furcation of the median sectors is different from all other hitherto examined Pentastirini; the apical spinulation of the hind tibiae shows three unequal outer spines, the median one of this group being small instead of subequal in length to the others; the medioventral process of the pygofer is fairly different from Pentastirini and last but not least, the aedeagus is connected to the anal segment as is the case in most Cixiidae, and not to the pygofer as in Pentastirini.

The character states discussed above allow us to conclude provisionally that *Mnemosyne* should be separated from the tribe Pentastirini; it is thereby the only known five-carinate genus which is not included within the tribe. Its position within the Cixiidae remains uncertain until a thorough revision of the higher classification of the family becomes available.

Distribution: *M. camerunensis*, *M. evansi*, *M. lamabokensis* and *M. apicifumata* have, as far as records are present, a West-African distribution. *M. lefiniensis* is described from Congo-Brazzaville. *M. hirta* is widely distributed into Africa south of the equator. *M. camerunensis* and *M. hirta* can be called "common" while records of other species are scarce.

Key to the afrotropical species

1. Tegmina in apical part devoid of granules between veins; no granules along costal margin..... *M. camerunensis* Distant
- Tegmina with granules, all over their surface or only in apical part..... 2
2. Tegmina with granules only in apical cells..... 3
- Tegmina densely covered by dark granules all over their surface..... *M. hirta* (Melichar)
3. Inner apical cell of tegmina partly or totally brown..... 4
- Inner apical cell hyaline..... *M. apicifumata*, n. sp.
4. Tegmina with two transverse fuscous bands (Synave, 1978; 588 fig. 1), the basal one sometimes lacking..... *M. lamabokensis* (Synave)
- Tegmina without such transverse bands..... 5
5. Tegmina brown, only costal cell and first apical cell hyaline, colourless; one transverse brown mark in costal cell at level of bifurcation of Sc and R.....
- *M. lefiniensis*, n. sp.
- Tegmina hyaline, major part colourless, only with small brown marks; two transverse brown spots in the costal cell..... *M. evansi* Muir

Mnemosyne camerunensis Distant (fig. 1 to 13)

Mnemosyne camerunensis Distant, 1907: 283.

Mnemosyne camerunensis Distant; Muir, 1923: 558; Fennah, 1957: 11; Synave, 1960: 7; 1963: 5; 1967: 354; 1969: 182.

Mnemosyne camerounensis (sic) Distant; Synave, 1971: 2.

Material examined: holotype male, "Cameroon, Escalera", BMNH.

Other material: 56 specimens from *Cameroon*: Tsama; Foubot; Elounou; Nkolbisson; Evindissi; Mbalmayo; Yaoundé; *Nigeria*: Ile-Ife; *République Centrafricaine*: La Maboke; Boukoko; *Zaire*: Parc national Garamba; Parc national Albert; Bas-Uele, Koteli; Haut-Uele, Moto; Haut-Uele, Watsa; Mayumbe, Kikionga; Mayumbe, Luvu; Mayumbe, Tshela; Ituri, Obongena; Bunla; Mongbwalu; *Ruanda*: Kasenyi; Likengi; *Guinea*: Mongo; *Uganda*: Bwamba, KMMA, MNHN, BMNH, KBIN.

Redescription: head ochreous, vertex somewhat darker. Pronotum dark brown, paler medially; mesonotum brown to black, abdomen dark brown. Colour of tegmina variable, dark specimens with a series of spots as illustrated in figure 5, paler specimens only with brown marks in apical part; no granules on veins nor in apical cells. Legs ochreous, first and second segment of hind tarsi with four or five stout spines.

Length: 10.5-12 mm.

Male genitalia: anal segment (fig. 9-10), pygofer (fig. 7-8) and genital styles (fig. 1) symmetrical. Anal segment with an apical process deflected ventrally and triangular in caudal view. Aedeagus (fig. 6) with five spines apically on flagellum (three long ones, two short), and a slender spinose process along right side of periandrium.

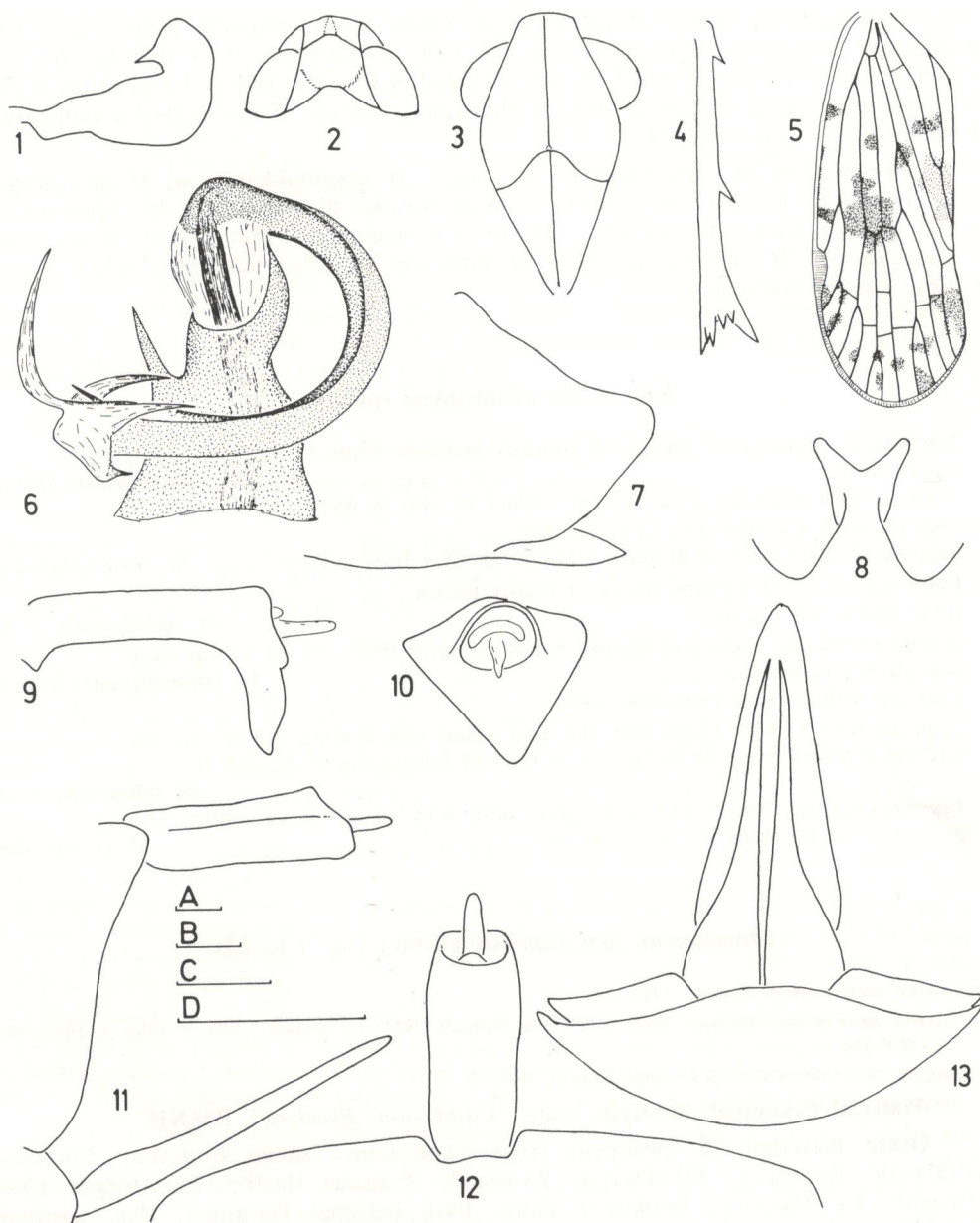


Fig. 1 to 13, *Mnemosyne camerunensis* Distant; 1, right genital style; 2, head; 3, head, frontal view; 4, hind tibia; 5, left tegmen; 6, aedeagus, dorsal view; 7, pygofer, left lateral view; 8, medioventral process of pygofer; 9, anal segment, left lateral view; 10, anal segment, caudal view; 11, female genitalia, lateral view; 12, idem, dorsal view; 13, idem, ventral view. — Scale A (1 mm): fig. 5; B (0.2 mm): fig. 6, 8; C (1 mm): fig. 2, 3, 4; D (1 mm): fig. 1, 7-13.

Mnemosyne lefiniensis, n. sp. (fig. 14 to 20)

Material examined: holotype male, Congo Brazzaville, Lefinie reservation, Nambouli river, 12-1-1964, "sampled under bark in gallery forest", leg. Balogh and Zicsi, HHNM. — Paratypes: 1 male 1 female, same locality, HHNM, KMMA.

Description: face, pronotum and legs yellowish. Vertex with transverse subapical keel forming an anterior yellowish compartment and a basal brown part with fuscous hing-edges. Mesonotum ochreous with brown suffusions. Major part of tegmina fumated with brown,

costal cell, first and second apical cell behind it hyaline; apical cells provided with small dark granules with setae.

Length: 9 mm.

Male genitalia: anal segment, pygofer and genital styles symmetrical. Anal segment (fig. 18) apically deflexed into a ventral lobe (fig. 19); medioventral process of pygofer (fig. 17) with four small elevations. Aedeagus (fig. 14-15) with a long spine apically on flagellum and three spinose processes apically on periandrium, right process varying considerably in length; the slender right apical process of the male paratype (fig. 15) is broken off.

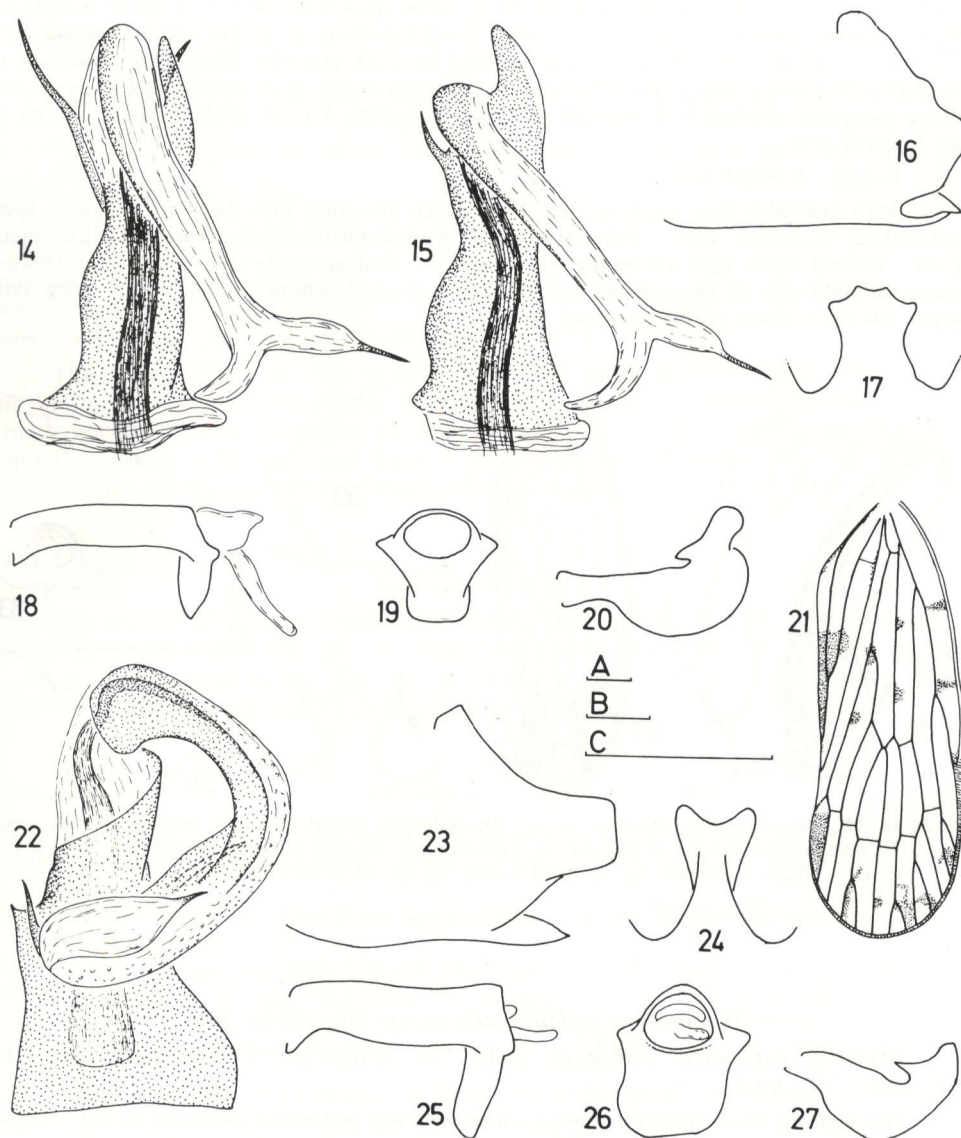


Fig. 14 to 20, *Mnemosyne lefiniensis*, n. sp.: 14, aedeagus, dorsal view, holotype; 15, idem, paratype (one spine broken off); 16, pygofer; 17, medioventral process of pygofer; 18, anal segment; 19, apical process of anal segment, caudal view; 20, left genital style.

Fig. 21 to 27, *Mnemosyne evansi* Muir; 21, right tegmen; 22, aedeagus, dorsal view; 23, pygofer; 24, medioventral process of pygofer; 25, anal segment; 26, apical process of anal segment, caudal view; 27, left genital style. — Scale A (1 mm): fig. 21; B (0.2 mm): fig. 14, 15, 17, 24; C (1 mm): others.

Mnemosyne evansi Muir (fig. 21 to 27)

Mnemosyne evansi Muir, 1923: 558.

Mnemosyne evansi Muir; Synave, 1969: 182.

Material examined: Holotype female, "Gold Coast", 1913, A.E. Evans, BMNH.

Other material: 1 male, 1 female, Togo, "Bismarckburg", 7/11-IV-1983 (L. Conradt S.), KBIN; 1 female, Liberia, Mt. Coffee, IV-1897, "Liberian collection of O.F. Cook", KBIN.

Redescription: Externally like *M. camerunensis*. Head, pronotum and mesonotum ochreous, vertex somewhat darker. Abdomen brown. Tegmina (fig. 21) subhyaline, yellowish, with brown marks as illustrated, but variable; in other specimens the brown mark on the clavus may be smaller, reduced to a spot just before the bifurcation, or a spot can be present on the bifurcation of R and M. Veins densely covered by dark granules, apical and subapical cells provided with a single row of granules, almost two rows in the inner apical cell. Legs ochreous, femora somewhat darker, first segment of hind tarsi with 5 or 6 teeth apically, second with 4 or 5 apical teeth.

Length : 9,5-10,5 mm.

Male genitalia: anal segment (fig. 25-26) with an apical lobe deflexed ventrally, slightly asymmetrical in caudal view. Pygofer (fig. 23) with a medioventral process as illustrated in fig. 24. Genital styles with a tapering apex (fig. 27). Aedeagus (fig. 22) with a small tooth-like process on right side of periandrium and three spines on flagellum, one of which along ventral margin, the two others visible in dorsal view.

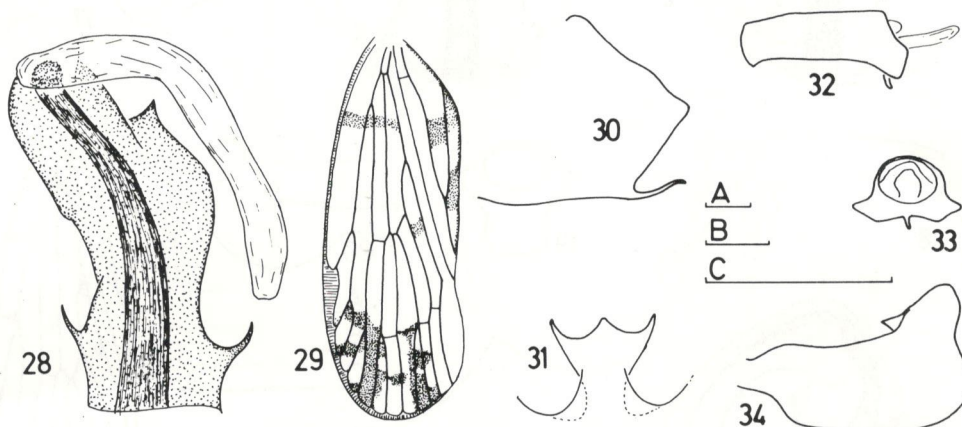


Fig. 28 to 34, *Mnemosyne apicifumata*, n. sp.: 28, aedeagus, dorsal view; 29, left tegmen; 30, pygofer; 31, medioventral process of pygofer; 32, anal segment; 33, anal segment, caudal view; 34, left genital style. — Scale A (1 mm): fig. 29; B (0.2 mm): fig. 28, 31; C (1 mm): others.

Mnemosyne apicifumata, n. sp. (fig. 28 to 34)

Material examined: Holotype male, "N. Kamerun, J. Albrechtshöhe, III-96, L. Conradt S.", KBIN.

Description: head, pronotum, mesonotum and legs ochreous; abdomen brown. Tegmina (fig. 29) hyaline, provided with brown marks as illustrated, inner apical cell hyaline, veins brown and ochreous, apical part of tegmina with granules between veins. Wings fumated with brown along their apex.

Length: ± 10 mm (tegmina of holotype spread open).

Male genitalia: anal segment, pygofer and genital styles bilaterally symmetrical; anal segment (fig. 32-33) with a minute process medially along its apex. Aedeagus (fig. 28) with two basal spines, one on each side, and a third tooth-like process close to apex.

Diagnosis: *Mnemosyne apicifumata* can be distinguished from the other African species by the absence of spines on the flagellum and the presence of a minute process along the apical margin of the anal segment. The inner apical cell of the tegmina is hyaline instead of brown as is the case with other species.

Mnemosyne lamabokensis Synave

Mnemosyne lamabokensis Synave, 1978: 587, fig. 1-6.

Material examined: 1 male, Zaïre, Haut Uélé: Moto, II/III-1923 (*L. Burgeon*), KMMA; 1 female, Haut Uélé: Watsa, 1922 (*L. Burgeon*), KMMA; 1 male, République Centrafricaine, La Maboke, 21-IV-1972 (*M. Boulard*), KBIN; 1 male, Uganda, Mengo Mpanga forest, at light, III-1958 (*P.E.S. Whalley*), BMNH.

The species has been accurately illustrated by Synave (1978). It can be distinguished externally from all other African species by the presence of one or two broad transverse brown bands on the tegmina, but the basal one may sometimes be lacking.

Mnemosyne hirta (Melichar)

Oliarus hirtus Melichar, 1904: 31.

Mnemosyne maculipennis Muir, 1923: 557.

Mnemosyne hirta (Melichar); Van Stalle & Lauterer, *in press*, fig. 9-14.

The morphology of *Mnemosyne hirta* has been discussed and illustrated by Van Stalle & Lauterer (*in press*). The species can be distinguished from all other African species by the presence of a dense granulation all over the surface of the tegmina. It has been recorded from Somalia, Kenya, Ruanda, Malawi, Tanzania, Mozambique and South Africa (Transvaal only).

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