



Preliminary knowledge for breeding edible caterpillars in Congo-Brazzaville

Connaissances préliminaires pour l'élevage de chenilles comestibles au Congo-Brazzaville

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Résumé: La consommation humaine de Lépidoptères est un thème à la mode. Si une information de base est à présent disponible concernant la diversité des chenilles consommées en République du Congo-Brazzaville, nous ne disposons pas de données préliminaires solides concernant leur distribution, la littérature qui leur a été consacrées, leur saisonnalité et leur cycle de vie, leurs dénominations locales et leurs plantes hôtes. C'est l'objet du présent article, qui en outre permet de dégager les domaines qui nécessitent des études plus approfondies. Vingt taxons sont pris en considération, dont seize identifiés au niveau de l'espèce. Seuls deux cycles de vie sont à présent connus. Quatre-vingt-neuf noms vernaculaires sont cités. Ces chenilles se nourrissent d'au moins 40 plantes hôtes qui sont citées ainsi que des sources de documentation concernant ces dernières.

Mots-clés : Congo-Brazzaville, Lépidoptères, chenilles consommées, distribution, dénominations vernaculaires, plantes hôtes, cycle de vie, valeurs alimentaires.

Abstract: Human consumption of Lepidoptera is a subject of current interest. Though basic information is presently available regarding the diversity of caterpillars eaten in Congo-Brazzaville, no robust data regarding their distribution, reference material, seasonality and life cycle, local names and host-plants is available. The purpose of this article, which also identifies areas that require further study, is to address this gap. Twenty taxa are considered, sixteen of which have been identified to species level. Only two life cycles are known at present. Eighty-nine local caterpillar names are recorded. These caterpillars feed on at least forty host plants. These plants are listed as well as the documentation sources related to them.

Key words: Congo-Brazzaville, Lepidoptera, edible caterpillars, distribution, vernacular names, host-plants, live cycle, dietary values.

“These Lepidoptera larvae are the delicacies of connoisseurs, the equal of caviar, snails or truffles among the European gourmets” [OWEN, 1973]

INTRODUCTION

The utilization of insects as a sustainable and secure source of animal-based food for the human diet has continued to increase in popularity in recent years (SHOCKLEY & DOSSEY, 2014). In particular, human consumption of Lepidoptera receives an increasing interest (MALAISSE *et al.*, 2016).

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Several terms have been suggested to describe this consumption, notably regarding caterpillars, “campeophagy” (MALAISSE, 2002 ; MALAISSE et al. 2016), “anthropolarviphagy of Lepidoptera” (RAMOS-ELORDUY *et al.*, 2011) and of “erucivory”. However this last term is normally applied to animals, rather than humans (RAMADE, 2008).

Lepidoptera appeared some 220 million years ago. They are an Order with adults being named “butterflies” and “moths” and larvae named “caterpillars”. Today about 180,000 Lepidoptera species are recognized; they belong to 128 families, of which 36 include species eaten by man, mostly as caterpillars, more rarely as chrysalises and exceptionally the abdomen of some moths and butterflies are eaten.

Regarding the Lepidoptera, the value of 228 edible species has been published by RAMOS ELORDUY Y CONCONI in 1997, out of a total of 1,391 insects, that is to say 16.39%. But the real value could be around 500 as suggested by MALAISSE *et al.* (2016).

In 2013, the number of insect species eaten by man was given as over 1,900, of which 18 % were caterpillars (VAN HUIS *et al.*, 2013). In their recent paper, SHORKLEY & DOSSEY (2014) indicate that Lepidoptera take the second position, with 396 species having been identified. They represent 18.3 % of the total of insect species eaten by man and belong to 36 families. The family of Saturniidae takes the first place with 109 different species, that is to say 27.5 % of the Lepidoptera.

MALAISSE *et al.* (2016) have calculated that the total number of Lepidoptera eaten by man probably exceeds 500 species, a large number of caterpillars being only known by their vernacular name or “campeonym”. For some of them, photographs are available but these differ from species already named.

Information on the human consumption of Lepidoptera has been carried out at various times and in various forms. For tropical Africa, MALAISSE & LOGNAY (2003) have treated this subject in detail. More recently, MALAISSE & LATHAM (2014) have quoted 370 references on this subject regarding Africa. As far as Congo-Brazzaville Republic is concerned, a first approach is available in (MABOSSY-MOBOUNA *et al.*, 2016). Nevertheless little data is available regarding the distribution of the diverse species involved, their local names, their host-plants and their respective life cycles and seasonality. The present study aims to fill this gap.

ENVIRONMENT AND METHODS

Environment

Straddling the equator, the Republic of Congo in Central Africa, stretches from latitude 4°N to 5°S and between longitude 11° E and 18°E. The country lies in the intertropical warm wet climate zone, with three sub-zones: equatorial in the North, subequatorial in the centre and tropical wet in the South.

The country covers an area of 342,000 km² and has a population of 4,493,000 inhabitants (MBA-ZOO, 2014).

There is a higher urban (61.7 %) than rural (38.3 %) population. The country is bordered in the North by the Cameroon and Central African Republic, in the South by the Democratic Republic of Congo and Cabinda, in the West by the Republic of Gabon, in the South-West by the Atlantic ocean, where the shoreline stretches for about 170 km, and in the East by the Congo river and its tributary the Oubangui, which separated it from Democratic Republic of Congo.

The Congo Republic is made up of two autonomous municipalities, Brazzaville and Pointe Noire, and four municipalities, Dolisie, Nkayi, Mossendjo and Ouesso, and twelve departments, namely Kouilou, Niari, Lékoumou, Bouenza, Pool, Plateaux, Cuvette, Cuvette-Ouest, Sangha, Likouala, Brazzaville and Pointe-Noire.

The Republic of Congo is usually presented as having two major biomes represented by the equatorial evergreen forests and the savannahs. In fact, the equatorial evergreen forest group comprises several clearly distinct units. Three major massifs are distinguished, namely (a) the Mayombe Massif (ombrophilous evergreen forests, 15,000 km²), (b) the Chaillu Massif (ombrophilous evergreen forests dominated by *Aucoumea klaineana* Pierre, 35,000 km²) and (c) the North-Congo Massif (ombrophilous evergreen forests sometimes inundated and dominated by Meliaceae, about 150,000 km²). Moreover mesophilous forests on sandy soils (Batéké plateaus and Cataracte plateau)

and forestry fragments are distinguished. Finally some small units of littoral mangroves (30,000 ha) composed of *Rhizophora racemosa* G.Mey. may be distinguished,

The savannahs, made up of, herbaceous savannahs, shrubby savannahs and wooded savannahs, covers approximately 35 % of the territory (105,000 km²). They can be divided in littoral savannahs of Kouilou, the Niari valley and the Cataractes and Batéké plateaus.

Forestry plantations cover 5% of the territory. The main species are various *Eucalyptus* (*E. torelliana* F.Muell., *E. grandis* W.Hill ex Maiden and *E. citriodora* Hook.), two Pinaceae (*Pinus caraibaea* Morelet and *P. oocarpa* Schiede ex Schlechtendahl) and two Acacia (*Racosperma auriculiforme* (Benth.) Pendley and *Acacia mangium* Willd.).

From an edaphic plan, the Congo Republic has the following six big major units : Arénosols, notably ARfl : Ferralic Arenosols, Cambisols, notably CMfl : Ferralic Cambisols, Ferrasols, notably FRxa : Xanthic Ferrasols, Gleysols, notably GLum : Umbric Gleysols, Plinthosols, notably PTpx : Pisoplinthic Plinthosols and Regosols, notably RGdy : Dystric Regosols.

From the linguistic point of view, the Republic of Congo has a rich diversity of languages spoken. ETHNOLOGUE [Ethnologic Languages of the World] (2016) lists 62 languages for the Congo, of which 55 are indigenous.



Figure 1.- Administrative maps of Congo Republic.

Methods

The methods of our work have been developed in detail in MABOSSY-MOBOUNA *et al.* (2016). The main features are shown below.

Field visits were made between 2014 and 2016. Several criteria were taken into consideration for the programme:-

Firstly we have endeavoured to visit all the main biomes and ecosystems present in Congo. Three fundamental units are considered:- the equatorial evergreen forests on firm soil, the equatorial evergreen forests on periodically flooded and/or marshy (swampy) soils and finally the diverse savannah vegetal formations. On the other hand, units of lesser importance, frequently with weak extension, have not been studied ; this is notably the case with mangroves and with the plant groups linked to rocky outcrops.

Secondly, the visits have been scheduled to take account of the probable life cycle calendar of the Lepidoptera in the different parts of the Congo.

Finally, the accessibility has also been a criteria for the choice of the sites to be prospected. Moreover we should point out that some forest plantations (*Racosperma auriculariforme* (Benth.)

Pendley for instance) and of exotic fruiting trees (*Mangifera indica* L.) may host edible caterpillar species, sometimes in large numbers.

During the period 2014 to 2016, 25 visits were made to eleven of the twelve Départements. Equatorial evergreen forest, tropical shrubby savannahs and periodical inundated or marshy evergreen forests were visited. In addition visits were made to Brazzaville, Pointe-Noire, Makotimpoko and Liranga markets, as well as Brazzaville and Oyo harbours.

Identification of the host plants of edible caterpillars in the various ecosystems visited was carried out with the help of local villagers and autochthons.

Finally, various floras have been consulted for identifying the caterpillar host-plants and we have used the APG IV classification for the naming of the various plant families.

CAMPEOPHAGY IN CONGO REPUBLIC

The historical quotations dealing with caterpillar consumption in Congo Republic have been revised by MABOSSY-MOBOUNA et al., (2016). They quote successively SAVORGNAN de BRAZZA (1992), BASCOULERGES & BERGOT (1959), PAULIAN (1963), BANI (1995), DZONO (2002), MOUSSA (2002) and MABOSSY-MOBOUNA et al. (2013).

MABOSSY-MOBOUNA et al. (2016) also details the various caterpillar instars and life cycles of the species concerned, the diverse local vernacular names or “campeonyms”, and the diversity of plant species eaten.

These items will be commented on below.

SPECIES CONSUMED

Currently the consumption of approximately 28 caterpillars species has been noted for Congo Republic on the basis of a thorough and rigorous identification (MABOSSY-MOBOUNA et al., 2016). The probable consumption of *Dactylocerus lucina* (Drury) and *Eumeta cervina* Druce (KELEMU et al., 2015) are still to be confirmed. Comments regarding some of them are given below. They concern the area of distribution of the concerned species, the life cycle and seasonality, the diverse local names, according to linguistic groups, the diversity of host-plants and finally some information on the various caterpillar stages. The last being excluded as it is already detailed in MABOSSY-MOBOUNA et al. (2016).

The taxa taken into consideration in the present paper are listed in Table 1.

Nr	Family	Sub-family	Taxon
1	Hesperidae	Coelianinae	<i>Coeliades libeon</i> (Druce, 1875)
2	Noctuidae	Ipimorphinae	<i>Spodoptera littoralis</i> (Boisduval, 1833)
3	Notodontidae	Notodontinae	<i>Antheua</i> sp.
4	Notodontidae	Notodontinae	<i>Elaphrodes lactea</i> (Gaede, 1932)
5	Notodontidae	Notodontinae	Undetermined « susu », affinis <i>Elaphrodes</i>
6	Notodontidae	Thaumetopoeinae	<i>Anaphe</i> sp.
7	Notodontidae	Thaumetopoeinae	<i>Epanaphe carteri</i> (Walsingham, 1885)
8	Saturniidae	Saturniinae	<i>Bunaea alcinoe</i> (Stoll, 1780)
9	Saturniidae	Saturniinae	<i>Gonimbrasia alopia</i> Westwood, 1849
10	Saturniidae	Saturniinae	<i>Gonimbrasia anthinoides</i> Rougeot, 1978
11	Saturniidae	Saturniinae	<i>Gonimbrasia dione</i> Fabricius, 1793
12	Saturniidae	Saturniinae	<i>Gonimbrasia eblis</i> Strecker, 1876
13	Saturniidae	Saturniinae	<i>Gonimbrasia melanops</i> (Bouvier, 1930)
14	Saturniidae	Saturniinae	<i>Imbrasia epimethea</i> (Drury, 1773)
15	Saturniidae	Saturniinae	<i>Imbrasia forda</i> (Westwood, 1849)
16	Saturniidae	Saturniinae	<i>Imbrasia obscura</i> (Butler, 1878)
17	Saturniidae	Saturniinae	<i>Imbrasia truncata</i> (Aurivillius, 1908)
18	Saturniidae	Saturniinae	<i>Lobobunaea phaedusa</i> (Drury, 1780)
19	Saturniidae	Saturniinae	<i>Pseudantheraea discrepans</i> (Butler, 1878)
20	Sphingidae	Smerinthinae	<i>Platysphinx</i> cf. <i>stigmatica</i> (Mabille, 1878)

A.- Distribution of the edible caterpillars consumed in Congo-Brazzaville

Maps of distribution for most of the species involved in our study are shown in Plate 1, (on next page). They indicate several zoogeographic distributions. On the one hand, some are narrow, while others present have a wide distribution, not even restricted to Africa. *Elaphrodes lactea* is a good example of a narrow distribution restricted to the Congo River Basin. *Imbrasia truncata*, *I. obscura* and *Epanaphe carteri* are linked to the evergreen rain forest of the South African Ocean, a distribution also known as Congo-Guinean, from a phytogeographic point of view (WHITE, 1983). On the other hand, *Spodoptera littoralis* is a well-known species with a distribution covering Africa, southern Europe and Near East (BROWN & DEWHURST, 1975 and EPPO GLOBAL DATABASE, 2016)

B.- Literature concerning the caterpillars consumed in Congo-Brazzaville

There is a wealth of literature concerning the consumption of edible caterpillars in Africa ; over 300 books and papers, as recently established by MALAISSE & LATHAM (2014), provide information on this food source. At least 50 of these give information concerning the 20 species listed in Table 1.

For detailed treatment, as well as regarding the information on caterpillar breeding, we will quote about thirty papers (in chronological order), namely :

(a) regarding chemical composition MBEMBA & REMACLE (1992), AKINNAWO & KETIKU (2000), AKINNAWO et al. (2002), AMADI et al. (2005), BANJO et al. (2006), OMOTOSO (2006), AGBIDYE et al. (2009 a-b), AKPOSSAN et al. (2009), EKPO et al. (2009), WOMENI et al. (2009), BRAIDE et al. (2010, 2011), OSASONA & OLAOFE (2010), EKPO (2011), ADEPOJU & DABOH (2013), MBEMBA (2013), AKPOSSAN et al. (2014), PAIKO et al. (2014), FOUA BI et al. (2015),

(b) regarding consumption MERLE (1958), MBATA & CHIDUMAYO (1999), TABUNA (1999), MBATA et al. (2001, 2002, 2004), MBETID-MESSANE (2005), AGBIDYE & NONGO (2009, 2012), NSEVOLO (2012), BADANARO et al. (2014), LATHAM (2016), MEUTCHIEYE et al. (2016).

The detailed examination of this literature, and of some other papers, allows us to establish the importance of the consumption of caterpillars. We confirm this with two examples:-

MABOSSY-MOBOUNA et al. (2013) have presented, in detail, all the literature dealing with *Imbrasia truncata*. The human consumption of this species has been quoted in particular from the Central African Republic, (MOTTE, 1980 ; BAHUCHET, 1986, 1992 ; HLADIK & HLADIK, 1995 ; ROULON-DOKO, 1998), from Rep. of Congo (ANKARA, 1996 ; DZONO, 2002 ; MABOSSY-MOBOUNA et al., 2013), and from D.R. Congo (KODONDI et al., 1987 a-b ; PAGEZY, 1988 ; MAPUNZU MONZAMBE, 2002 ; LATHAM, 2003).

The consumption of *Imbrasia obscura* has been quoted from Central African Republic (ROULON-DOKO, 1998 ; NGASSE, 2003), from Gabon [notably eaten by the Bandjabis] (ROUGEOT, 1962), from Congo Republic (BANI, 1995 ; ANKARA, 1996 ; MABOSSY-MOBOUNA et al., 2013), from D.R. Congo (LATHAM, 2003).

C.- Life cycle of the caterpillars consumed in Congo-Brazzaville

Our knowledge of the life cycle of the 20 taxa here studied is incomplete and needs a thorough study. However an example of the various stages of development is illustrated in a recent paper (MABOSSY-MOBOUNA et al., 2016). This concerns *Imbrasia forda*, (synonym *Cirina forda*). Some stages of *Bunaea alcinoe* are also illustrated in this first paper.

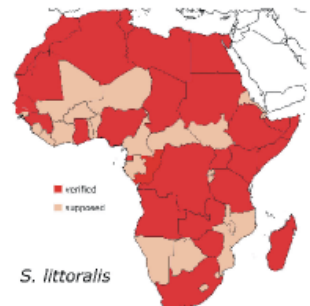
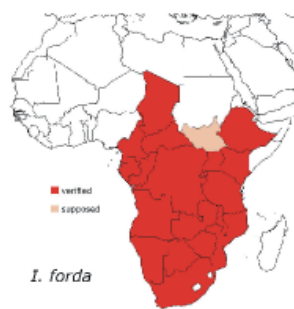


Plate 1 :Distribution maps of 15 Lepidoptera whose caterpillars are eaten in Congo

The biology and life cycle of *Elaphrodes lactea* have been studied in detail, including its nutritional value (DEMESMAECKER, 1997 ; MALAISSE, 2010 ; MALAISSE & LOGNAY, 2003 ; MALAISSE & PARENT, 1980 ; MALAISSE *et al.*, 1969, 1974 ; MALAISSE-MOUSSET *et al.*, 1970). An adaptation of this knowledge with that from Congo-Brazzaville is presented in Figure 2.

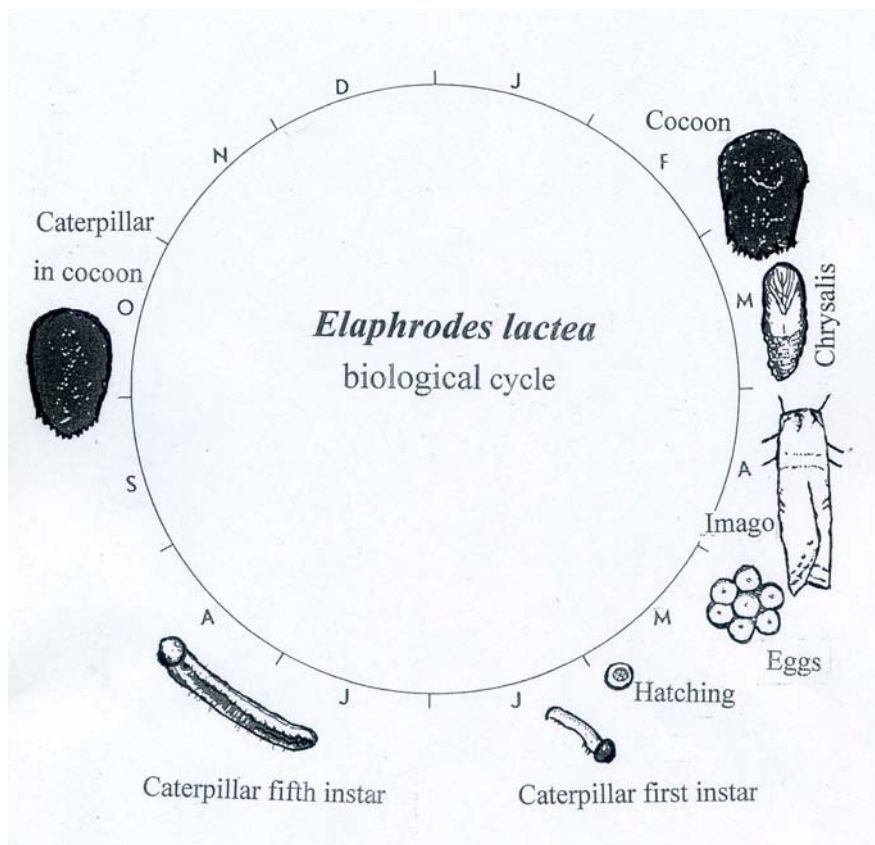
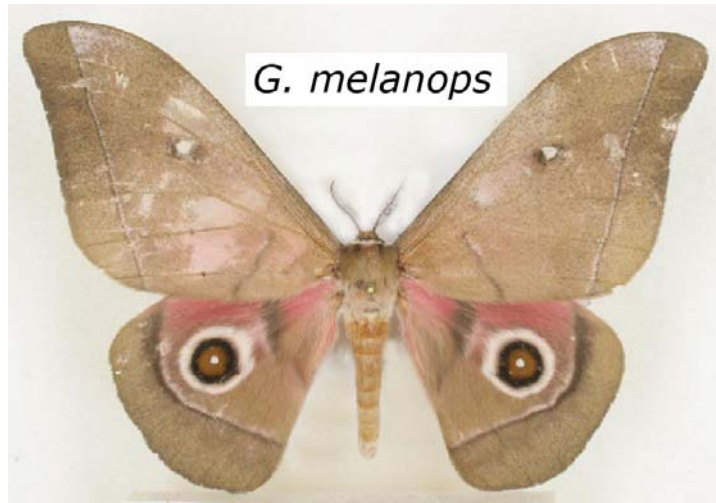


Figure 2.- Biological cycle of *Elaphrodes lactea* (Notodontidae)

This calendar sketch needs to be confirmed with data collected throughout the year. For about five other caterpillars some preliminary information is already available, but there is not enough data to provide a complete picture of the life cycle. This remains a task to be undertaken as soon as possible.

It is nevertheless possible to be precise regarding the periods when caterpillars are present in great amounts for three parts of the country. In the northern part of Congo, caterpillars are present (or collected) during the rainy season from mid-July to mid-August ; in the central-southern part from mid-October to mid-February ; and finally in the southern-western part, in the Chaillu massif, the caterpillars are collected from mid-August to mid-September. Finally, the eggs hatch at the beginning of the rainy season.

Plate 2 presents photos of the imagos of 15 species involved. The following are not shown: *Imbrasia forda* (already available on plate 1 of MABOSSY-MOBOUNA *et al.*, 2016), *Spodoptera littoralis* and *Gonimbrasia melanops*, this last one is presented later.



Credit Thierry BOUYER

Finally we have collected photographs of the chrysalis stage for five edible species. This is a new challenge to realize. Figure 3 presents two examples.



Elaphrodes lactea (© F. Malaisse)

Pseudanthera discrepans (© G. Mabossy-Mobouna)

Figure 3.- Chrysalis of *Elaphrodes lactea* and *Pseudanthera discrepans*.

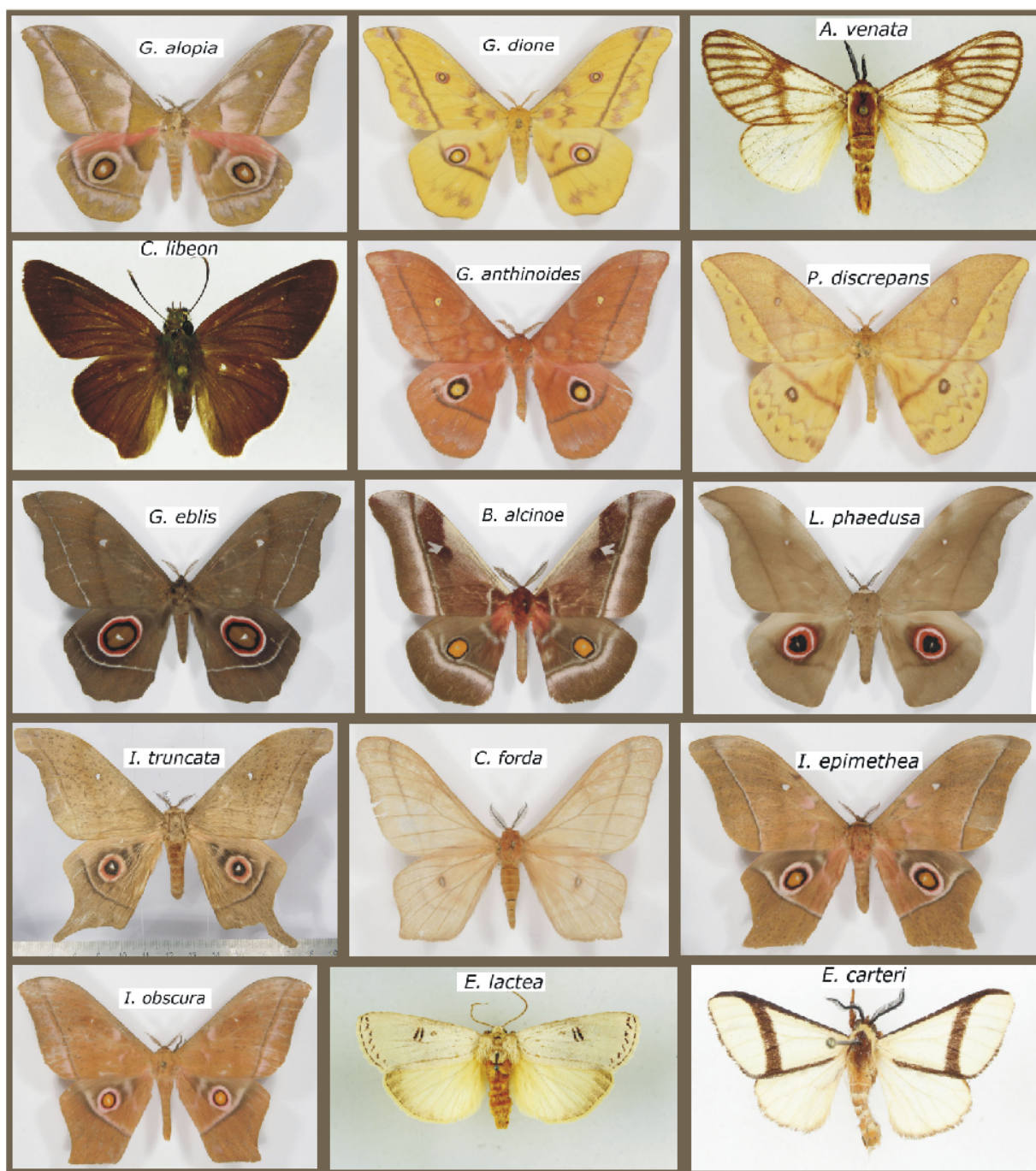


Plate 2 : Photos of 15 Lepidoptera whose caterpillars are eaten in Congo

D.- Local names of the edible caterpillars in Congo-Brazzaville

Most of the languages spoken in Congo are Bantu languages, more precisely of the under-group NARROW BANTU, arranged in accordance with the classical appellations Bantu A, Bantu B, Bantu C and Bantu H. There are also some ubanguian languages present in Congo, (ADAMA-UBANGUI). Two Bantu languages, the Munukutuba and the Lingala, have moreover lingua franca status (Appendix 1). JACQUOT (1971) has been consulted.

The Figure 4 presents a language map of Congo-Brazzaville.

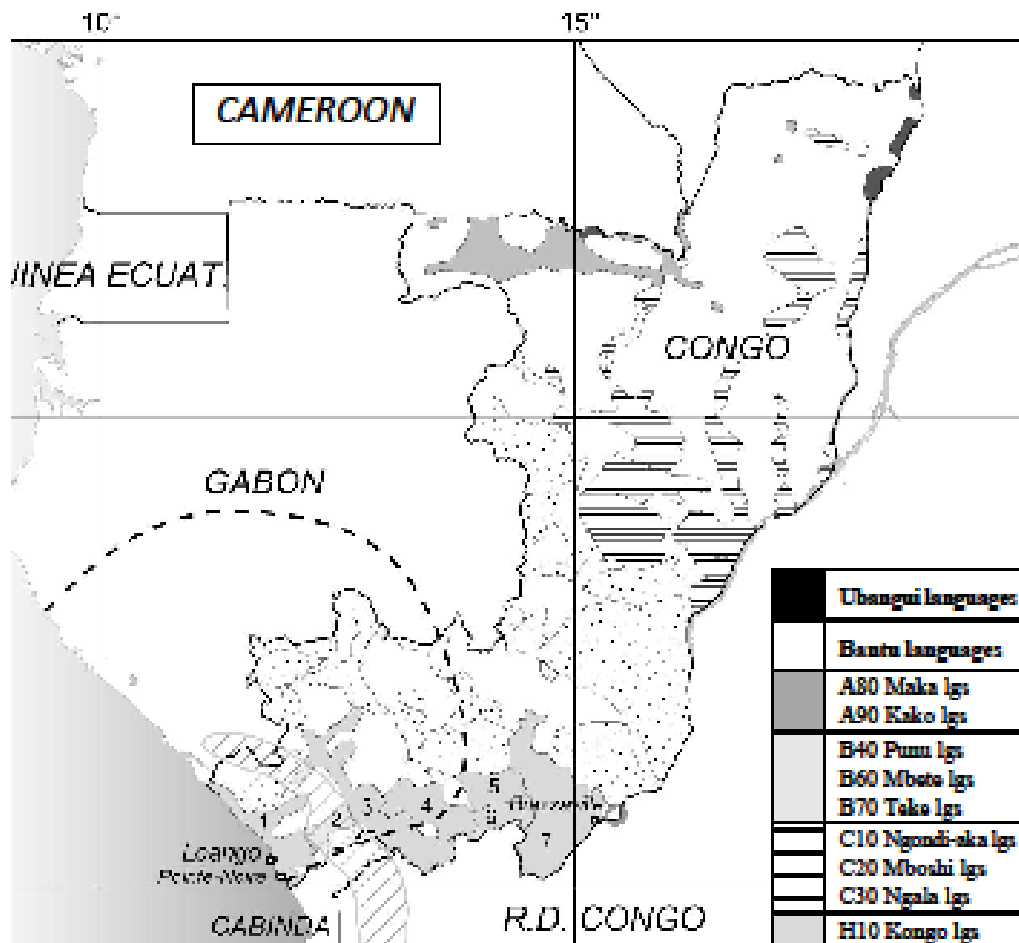


Figure 4.- Language map of Congo-Brazzaville (after Y. MONINO, 2012)

We have put together the various vernacular names used in Congo-Brazzaville regarding the twenty taxa quoted in Table 1. We have also tried to give the available information regarding local names used in other countries.

1.- *Coeliades libeon* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name
Lari	Mitoko	Western Téké	Batôh

2.- *Spodoptera littoralis* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Kongo	Mabilu	Mbere	Ayihi	Western Téké	Babili
Koyo	Ahihi	Northern Téké	Ayihi		
Lari	Mabilu	Téké	Babili		

3.- *Antheua cf. insignata* (Mabossy-Mobouna, unpubl. data)

	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Bangi	Minkongo	Lari	Nsongo-Nsongo	Mbosi	Obura
Kongo	Ntsongo-ntsongo	Mbere	Evurah	Northern Téké	Evurah

The following vernacular names have also been published : for Central African Republic [Gbaya Bodoé = « Nàà-gbèngbè », that is to say « the striped » (ROULON-DOKO, 1998), Kongo = « Nsanga, Minbota bota » (LATHAM, 2003). The same caterpillar, or a very similar caterpillar, is called in D.R.Congo [Bemba = « Katoto » (MALAISSE & PARENT, 1980), in Zambia [Lamba = « Katoto », Lunda = « Ignene » (DEMESMAECKER, 1997)].

4.- *Elaphrodes lactea*

Linguistic group	Vernacular name	Linguistic group	Vernacular name
Baaka	Susu	Mbèndjèlè	Bangôndôtula
Mbanza	Shushu	Monzombo	Susu

The following vernacular names have also been published : for D.R. Congo [Lingala = « Silele » and Komo = « Baiklebe » (LISINGO et al., 2010), Bemba = « Tunkubiu » (MALAISSE-MOUSSET et al., 1970), for Zambia [Lamba = « Tunkubiu » and Lunda = « Kakandu » (DEMESMAECKER, 1997)]. A drawing of F. Crozier in HLADIK (1994) looks like *E. lactea* and is called « Gbadon » in Bofi.

5.- Undetermined « Susu », taxon with affinity to *Elaphrodes* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name
Baaka	Susu	Mbèndjèlè	Bangôndôtula
Mbanza	Shushu	Monzombo	Susu

6.- *Anaphe aff/cf. venata* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Baaka	Ndosi	Bongili	Ndolose	Mbèndjèlè	Ndose
Bakwelé	Mengès, Mingis	Djem	Midziè	Monzombo	Ndosi , Gbadôh
Bomitaba	Ndolosi	Enyellé	Ndosi	Pomo	Ayos
Bomwali	Ayus	Kaka	Ndosi	Western Téké	Benkûbû
Bondongo	Ndosi	Mbanza	Gbadôh	Yasswa	Ngwadô

The following vernacular name has also been published : for Central African Republic [Bofi = « Gbohoko » (HLADIK, 1994)] ; D.R. Congo [Topoke = « Sohu » (KANKONDA & WETSI, 1992)]

7.- *Epanaphe carteri* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
NGangoulou	Atsin	Lari	Mitsîna	Téké	Atsîni, atsèrè
Kongo	Mitsîna	Lingala	Batsina		

8.- *Bunaea alcinoe* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Kongo	Binkélé	Mbosi	Inkèlè	Western Téké	Mpôsô
Lari	Binkélé	Northern Téké	Inkèlè		
Mbere	Inkèlè	Téké	Inkèlè		

The name of « Egu » is given by the Igbo in Nigeria (BRAIDE et al., 2011), of « sélé-în-bé-tòyó » which translates as “the caterpillar with pup teeth” by the Gbaya Bodoé of Central African Republic (ROULON-DOKO, 1998), of « Makedi kedi » in kikongo in D.R. Congo (LATHAM, 2003), of « Aisoalima » in mbole and « Baisobilo » in topoke (KAKONDA & WETSI, 1992 ; LISINGO et al., 2010), of « Finakifumbe » and « Mubambagoma » in chibemba in Katanga (MALAISSE, 2010), of « Chifumbe » and « Muhwititi » respectively in kilamba and kilunda in Zambia (DEMESMAECKER, 1997).

9.- *Gonimbrasia alopia* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Kongo	Binkélé	Mbosi	Inkèlè	Western Téké	Mpôsô
Lari	Binkélé	Northern Téké	Inkèlè		
Mbere	Inkèlè	Téké	Inkèlè		

Moreover the following vernacular name has been published for D.R.Congo [Kongo = « Misongo » and « Malemba » (LATHAM, 2003)].

10.- *Gonimbrasia anthinoides* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Kongo	Binkélé	Mbosi	Inkèlè	Western Téké	Mpôsô
Lari	Binkélé	Northern Téké	Inkèlè		
Mbere	Inkèlè	Téké	Inkèlè		

11.- *Gonimbrasia dione*

Linguistic group	Vernacular names	Linguistic group	Vernacular names
Baaka	Nzangala, Motikaliké	Monzombo	Nzangala, Motikaliké
Mbanza	Baetsuka		

The following vernacular name has been published [Twa = « Mo-lima » (PAGEZY, 1988)].

12.- *Gonimbrasia eblis*

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Kongo	Binkélé	Mbosi	Inkèlè	Western Téké	Nkankah
Lari	Binkélé	Northern Téké	Inkèlè		
Mbere	Inkèlè	Téké	Inkèlè		

13.- *Gonimbrasia melanops* (Mabossy-Mobouna, unpubl. data) (Synonyme : *Imbrasia oyemensis*)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Baaka	Mboyoy	Kaka	Mboyoy	Mbosi	Inkèlè
Bakouelè	Isiè, Esiè	Lari	Binkélé	Moi	Mbindzu
Bobangi	Mbindzu	Likuba	Mbindzu	Mozombo	Mboyoy
Bomitaba	Mboyoy	Lingala	Mbinzo	Northern Téké	Inkèlè
Bondongo	Mboyoy	Mbèndjèlè	Boyoy	Pomo	Mboyoy, Sè
Bonguili	Mboyoy	Mberé	Inkèlè	Western Téké	Etob'etama
Djem	Misiè	Mbonjo	Mboyoy	Yasswa	Mboyoy

The following vernacular names are used in C.A.R. [in Bofi « Mboyoy » (HLADIK, 1994)] ; in D.R.Congo [Kongo = « Minsendi » (LATHAM, 2003), Lingala = « Liboyoy », « E-Otonkala » par les Ba-Twa (PAGEZY, 1988) and Ngando = « Bihoyoy » (LISINGO *et al.*, 2010)].

14.- *Imbrasia epimethea* (Mabossy-Mobouna, unpubl. data)

This caterpillar possesses hairs during the first instars, then loses them during the last instar, which justifies a change in its local name for numerous ethnic groups, notably those of the Sangha and Likouala. The appellation for the penultimate instars (the haired instars) are noted with *

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Baaka	Kuluka, Nzamba	Enyellé	Kulupa, Mapeta*	Mbosi	Mbindzi
Bakwelé	Epak, Ipak, Guk*	Kaka	Kuluka, Mosakapulu*	Moi	Mbindzu
Bambamba	Embii	Kongo	Mihuka	Monzombo	Kuluka
Bangi	Mbinzu	Lari	Mihuka	Ndasa	Mbizu
Bomitaba	Kuluka, Nkuluka, Mamfwèmbo*	Likuba	Mbindzu	Northern Téké	Mbindzi
Bomwali	Mbindzo	Lingala	Mbinzo	Pomo	Pisi
Bondongo	Kuluka, Mapeta*	Mbanza	Kôhoh Apetah*	Western Téké	Mobii
Bongili	Mbindzo, Kuluka	Mbere	Mbindzi	Yasswa	Pusu
Djem	Mepâh, Kuwu*	Mbonjo	Nkuluka		

Moreover the following vernacular names have been noted : in C.A.R. [Bofi = « Sounga » (HLADIK, 1994)], in D.R.Congo [« Pambata » and « Mishila » in bemba, « Mvinsu » in kongo, « Molo » by the Twa (PAGEZY, 1988), « Bafoyo » in komo and « Sogo » in topoke (LISINGO *et al.*, 2010)], in Zambia [« Mishila » in lamba and « Makomechina » in lunda (DEMESMAECKER, 1997), « Mpambata » in bisa (MBATA & CHIDUMAYO, 2003)].

15.- *Imbrasia forda* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Baaka	Ngbanda	Djem	Milun	Mbonjo	Ngwanda
Bakouélé	Elèr, Ilir	Kaka	Ngwanda	Monzombo	Ngbanda
Bomitaba	Ngwanda	Lari	Mpuâmpuala	Pomo	Ngwanda

Bomwali	Ngwanda	Mbanza	Ajôh Gbangbana	Western Téké	Ndzandzaba, Mpampala
Bondongo	Ngwanda	Mbanza	Ajôh Gbangbana	Yasswa	Ngwanda
Bongili	Ngwanda	Mbëndjèlè	Ngbanda		

Caterpillars having the former name « *Cirina forda* » are known under several names in Africa. Let us notably quote the following campeonims : « Chitoumou » in dioula and bôbô in the vicinity of Bobo-Dioulasso in Burkina Faso (MAKHADO et al., 2015 ; ANVO et al., 2016), « Salantonda » for the Moba of Togo (BADANARO et al., 2014), « Kanni » for the Nupe of Nigeria (FASORANTI & AJIBOYE, 1993), « Ngala » for the Kongo of D.R. Congo (LATHAM, 2003), « Ndanda » in lingala of D.R. Congo and « Bihomi » for the Ngando of D.R. Congo (LISINGO et al., 2010), « Bolabda » for the Topoke of D.R. Congo (KANKONDA & WETSI, 1992), « Makoso » for the Bapende and the Kitshok of Kwango (LELEUP & DAEMS, 1969), « Mikoso » for the Bemba of Katanga (MALAISSE, 2010), « Mukoso » for the Lamba of Zambia (DEMESMAECKER, 1997), « Masesi » for the Lunda of Zambia (DEMESMAECKER, 1997), « Fikoso » for the Bisa of Zambia (MBATA & CHIDUMAYO, 2003), « Harati » for the Shona of Zimbabwe (CHAVANDUKA, 1975).

16.- *Imbrasia obscura* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular names	Linguistic group	Vernacular names	Linguistic group	Vernacular names
Baaka	Kenakènè	Enyellé	Mankènkènè	Mbëndjèlè	Kènènè
Bakwelé	Daswah	Kaka	Gengènè	Mbere	Inkèlè
Bangi	Mbinzu	Kongo	Binkélé	Mbonjo	Gègènè
Bomitaba	Mantsètsènè, Mankènkènè	Lari	Binkélé	Mbosi	Ikèlè
Bomwali	Makèkènè	Likouba	Mbindzu	Moi	Mbindzu
Bondongo	Mankènkènè	Likwala	Mbindzu	Monzombo	Gènègènè
Bongili	Makèkènè	Lingala	Mbinzo	Northern Téké	Inkèlè
Djem	Dzaswom	Mbanza	Baladjah. Bladjah	Western Téké	Mayulbatsié

Moreover the following vernacular names have been quoted, in C.A.R. [Bofi = Nguéguélé (Hladik, 1994) ; Gbaya = dok-kpàrè (ROULON-DOKO, 1998)], in D.R.Congo [Kongo = Minsendi, Twa = « Mo-pakala » (PAGEZY, 1988)].

17.- *Imbrasia truncata* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular names	Linguistic group	Vernacular names	Linguistic group	Vernacular names
Akwa	Mbindzu	Kaka	Mbambanga	Mbosi	Mbindzi
Baaka	Mbambanga	Kongo	Bimbami	Moi	Mbindzu
Ba(n)gandu	Bangondjo	Koyo	Mbindzu	Monzombo	Mbabanga
Bangi	Mbindzu	Lari	Bimbami	Munukutuba	Bindongolo*
Bekwel	Mbangôh	Likuba	Mbindzu	Ndasa	Mbizu
Bomitaba	Mbabanga	Likwala	Mbindzu	Ngkaka	Soé
Bomwali	Akwata	Mbanza	Alebalâgondah	Njem	Mbâkom
Bongili	Mbabanga	Mbanza	Gbagonda	Punu	Miongu
Enyellé	Bambanga	Mbere	Mbimbange	Western Téké	Mbihi
Issongo	Mbanga	Mbonjo	Mbabanga	Western Téké	Embah

More over the following vernacular names have been quoted : in C.A.R. [Bofi = « Mbanga » (Hladik, 1994) ; Gbaya = « Dok-zui » (ROULON-DOKO, 1998); Aka = « Bà.bánbángá, Mbálángá »], in D.R. Congo [Twa = « I-nkonzo » (PAGEZY, 1988), Ngando = « Bangondjo» and also frequently « commando » (LISINGO et al., 2010),].

18.- *Lobobunaea phaedusa* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Kongo	Kungunu	Lari	Kungunu	Western Téké	Mbaah

The following vernacular name has been quoted in D.R.Congo [Kongo = Kaba (LATHAM, 2003)].

19.- *Pseudantheraea discrepans* (Mabossy-Mobouna, unpubl. data)

Linguistic group	Vernacular name	Linguistic group	Vernacular name	Linguistic group	Vernacular name
Baaka	Kanga, Ekeso	Bongili	Kanga	Mbonjo	Mbônah
Bakouelé	Ikwô	Djem	Mikwo	Mbosi	Ibaniah
Bambamba	Embânyeh	Enyellé	Mbônah	Monzombo	Mbônah

Bomitaba	Mbônah	Kaka	Kanga	Ndasa	Mimbânyeh
Bambamba	Embânyeh	Mbanza	Gongoh	Northern Téké	Ebaniah
Bondongo	Kanga	Mbëndjèlè	(Bo)Kanga	Western Téké	Montsènè

More over the following vernacular names have been quoted : in C.A.R. [« Kanga » in Bofi (HLADIK, 1994)] ; in D.R. Congo [« Sombotela » in Mbole and « Bitombo » in Topoke (LISINGO et al., 2010), « Mahondela » in Kipende and in Kitshok in Kwango (LELEUP & DAEMS, 1969), Twa = « Mo-langa » (PAGEZY, 1988)].

20.- *Platysphinx cf. stigmatica*

Linguistic group	Vernacular name
Western Téké	Enkakah

All the edible caterpillars in the Likouala and Sangha departments have the same specific names. Outside these last two departments, in the other departments of Central and Southern Congo, all the edible caterpillars bearing spines have the same name, namely « Inkèlè » in Mbéré, « Mbosi » and Téké and « Binkélé » in Kongo and Lari.

E.- The food plants of the edible caterpillars of Congo-Brazzaville

We have summarized the present information available regarding the hosts-plants of the 28 Lepidoptera taxa presently listed as having their final stage caterpillar eaten by human in Congo-Brazzaville. We have only checked the host-plants quoted in Congo-Brazzaville and the neighbouring areas of Gabon, Cameroon, Central African Republic and D.R. Congo. The information we were able to put together is presented in Table 2.

Table 2.- Foodplants of edible caterpillars eaten in Congo-Brazzaville (regarding the naming of families we follow the new classification of APG IV, but Leguminosae has been replaced by Fabales with three subfamilies, namely Caesalpiniodeae, Faboideae and Mimosoideae) and references to illustrations (in LATHAM & KONDA KU MBUTA, 2014 ; in MEUNIER et al., 2015 ; plates from the Flore du Congo belge et du Ruanda-Urundi (courtesy of Meise Botanical Garden) or drawn by Malaisse after diverse authors, but lightly modified). [LK 213= Latham & Konda ku Mbuta, page 213; ME 90 = Meunier et al., page 90; pl 3 = plate 3.

Nr	Family Subfamily	Species	Caterpillars	Illustrations
1	Anacardiaceae	<i>Mangifera indica</i> L.	8, 12, 18, 19	LK 213
2	Anacardiaceae	<i>Spondias dulcis</i> Forst.	19	
3	Anacardiaceae	<i>Spondias monbim</i> L.	19	LK 319
4	Annonaceae	<i>Annona senegalensis</i> Pers. ssp. <i>oulotricha</i> Le Thomas	18	LK 40, pl 4
5	Annonaceae	<i>Cananga odorata</i> (Lam.) Hook.f. & Thompson	8	
6	Apocynaceae	<i>Diplorhynchus condylocarpon</i> Pichon	8	LK 141

7	Apocynaceae	<i>Funtumia africana</i> (Benth.) Stapf.	14	LK 162, ME 90
8	Apocynaceae	<i>Holarrhena floribunda</i> (G.Don) Dur. & Schinz	14	LK 182, pl 5
9	Burseraceae	<i>Dacryodes edulis</i> (G.Don) H.J.Lam.	8, 18	LK 132
10	Connaraceae	<i>Manotes expensa</i> Sol. ex Planch.	12	LK 219
11	Euphorbiaceae	<i>Alchornea cordifolia</i> (Schumach. & Thonn.) Müll.Arg.		LK 27
12	Euphorbiaceae	<i>Antidesma venosum</i> E.Mey. ex Tul.	10	LK 45
13	Euphorbiaceae	<i>Macaranga monandra</i> Müll.Arg.	14	LK 209
14	Euphorbiaceae	<i>Macaranga spinosa</i> Müll.Arg.	16	
15	Euphorbiaceae	<i>Ricinodendron heudelotii</i> (Baill.) Pierre ex Heckel subsp. <i>africanum</i> (Müll. Arg.) Léonard	11, 14	LK 286
16	Fabaceae <i>Caesalpinioideae</i>	<i>Amphimas ferrugineus</i> Pierre ex Pellegrin	16, 17	
17	Fabaceae <i>Caesalpinioideae</i>	<i>Amphimas pterocarpoides</i> Harms	17	pl 3
18	Fabaceae <i>Caesalpinioideae</i>	<i>Erythrophleum ivorense</i> Chevalier	15	
19	Fabaceae <i>Caesalpinioideae</i>	<i>Erythrophleum suaveolens</i> (Guill. & Perr.) Brenan	15	
20	Fabaceae <i>Faboideae</i>	<i>Eriosema glomeratum</i> (Guill. & Perr.) Hook.f.	7	
21	Fabaceae <i>Faboideae</i>	<i>Eriosema psoraleoides</i> (Lam.) G.Don.	7	LK 154
22	Fabaceae <i>Faboideae</i>	<i>Leptoderris congolensis</i> (De Wild.) Dunn		
23	Fabaceae <i>Faboideae</i>	<i>Milletia eetveldeana</i> (Micheli) Hauman		LK 226
24	Fabaceae <i>Faboideae</i>	<i>Milletia laurentii</i> De Wild.	1, 5, 20	LK 227
25	Fabaceae <i>Faboideae</i>	<i>Milletia versicolor</i> Baker	20	LK 228
26	Fabaceae <i>Mimosoideae</i>	<i>Albizzia ferruginea</i> (Guill. & Perr.) Benth.	4, 5, 9, 16	LK 25
27	Fabaceae <i>Mimosoideae</i>	<i>Pentaclethra macrophylla</i> Benth.	16	LK 257

28	Fabaceae <i>Mimosoideae</i>	<i>Piptadeniastrum africanum</i> (Hook.f.) Brenan	4, 5	LK 267
29	Fabaceae <i>Mimosoideae</i>	<i>Racosperma auriculiforme</i> (Benth.) Pedley	12, 14, 16, 18	LK 10
30	Hymenocardiaceae	<i>Hymenocardia ulmoides</i> Oliv.	3, 13	LK 186, pl 3
31	Lecythidaceae	<i>Petertianthus macrocarpus</i> (P.Beauv.) Liben	14, 17	LK 260, pl 5
32	Loganiaceae	<i>Strychnos pungens</i> Soler		
33	Malvaceae <i>Sterculioideae</i>	<i>Eribroma oblonga</i> (Mast.) Bod.	16	pl 5
34	Malvaceae <i>Sterculioideae</i>	<i>Triplochiton scleroxylon</i> K.Schum.	6	pl 3
35	Meliaceae	<i>Entandrophragma candollei</i> Harms	9, 19	pl 4
36	Meliaceae	<i>Entandrophragma cylindricum</i> (Sprague) Sprague	13	
37	Moraceae	<i>Musanga cecropioides</i> R.Br. ex Tedlie	8, 11	LK 238
38	Myristicaceae	<i>Pycnanthus angolensis</i> (Welw.) Warb.	14	LK 278, ME 240
39	Myristicaceae	<i>Staudtia kamerunensis</i> Warb.	19	
40	Ochnaceae	<i>Lophira alata</i> Banks ex Gaertn.	16	
41	Ochnaceae	<i>Ochna afzelii</i> R.Br. ex Oliv.	12	LK 245
42	Phyllanthaceae	<i>Bridelia micrantha</i> (Hochst.) Baill.	6	LK 69
43	Phyllanthaceae	<i>Chaetocarpus africanus</i> Pax	12	LK 90
44	Phyllanthaceae	<i>Uapaca guineensis</i> Müll.Arg.	17, 19	
45	Rhamnaceae	<i>Maesopsis eminii</i> Engl.	16, 18	LK 211
46	Rubiaceae	<i>Crossopteryx febrifuga</i> (Afzel. ex G.Don) Benth.	8, 13, 15	LK 121, pl 4
47	Rubiaceae	<i>Sarcocephalus latifolius</i> (Sm.) E.A.Bruce	8	
48	Rubiaceae	<i>Psydrax</i> sp.	*	
49	Sapotaceae	<i>Autranella congolensis</i> (De Wild.) A. Chev.		
50	Zingiberaceae	<i>Aframomum alboviolaceum</i> (Ridl.) K.Schum.	10	LK 17

* This plant is eaten by "Emuali", a caterpillar not yet identified. Some plants are presented in plates 3 to 5.

DISCUSSION

Taxa involved

The caterpillar called "Ngwanda" in various languages of the Republic of Congo, unquestionably belongs to the old species "*Cirina forda*" *sensu lato*. The taxon present in our study certainly does not fall within the *Cirina butyrospermi sensu stricto*, in the North West of Africa, (from Senegal to Chad) which feeds on *Vitellaria paradoxa* C.F. Gertn. The latter is the subject of various studies including ODEBIYI et al. (2003, 2009). The status of this taxon in the Republic of Congo is problematic and requires further study beyond the scope of this study (BOUYER, forthcoming). This is probably the *Cirina forda amieti* Darge 1975 described from southern Cameroon but doubts persist as to the name and the status. The relatively late description for this taxon, its relative rarity in the old collections or old publications and the fact that it is now present in large populations (sometimes outbreaks) throughout the central forest block to South Africa suggests it is a recent invasive colonizing species.

We should ideally engage in a study programme of the genus *Cirina* based on genetic and ecological data, as these are the only reliable ways of identifying the different taxa involved and the history of the genus. This study may seem unimportant but given our current knowledge, nothing should lead us to suppose that the entomophagy of the various taxa of *Cirina* are identical or even similar. The genus *Cirina* is often associated with (or sometimes confused with) *Imbrasia*. A systematic proximity is found in the biology of highly gregarious caterpillars that provide together the largest quantity of food species and economic interest.

The preliminary knowledge presented here allows us to consider different aspects related to the techniques of breeding caterpillars that will be necessary later. We will successively approach : (a) obtaining the eggs (laying) of concerned taxa, (b) the management of the ecosystems in which the breeding takes place, from the planting of exotic species able to produce firewood and also which produce leaves eaten by the caterpillars, to their integration into the forest types evolving to wooded or tree savannahs (FRESON et al., 1974).

Life cycle

Obtaining laying of eggs is possible either by catching imagos and putting them in cages, or by the collection of chrysalids and/or cocoons, mainly in the vicinity of feeding trees. The first technique has been applied with success in Madagascar regarding *Borocera cajani* (RAZAFIMANANTSOA et al., 2013 a-b).

Vernacular names

For the twenty taxa being considered in the present paper, 235 pairs of language and vernacular name are summarized. The highest number, 37 is for *Imbrasia epimethea* and the lowest, one pair for *Platysphinx cf. stigmatica*. In total 89 different campeononyms have been listed, with 16 for *Imbrasia epimethea*. Moreover fifty or so local names are quoted which are used elsewhere in Africa.

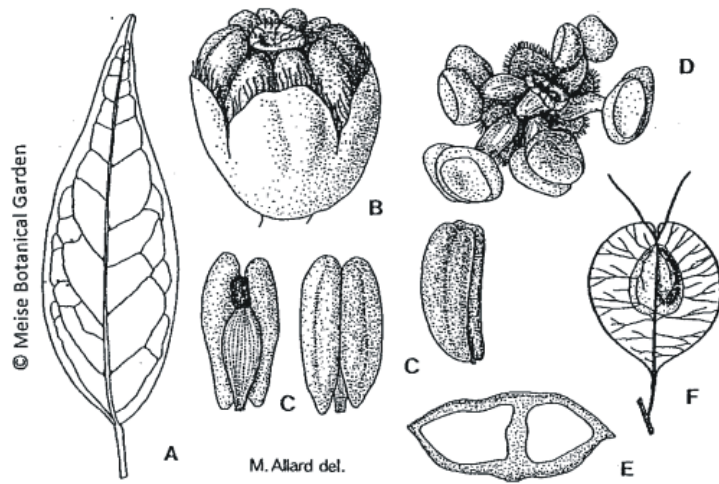
Food plants

Forty-four diverse host plants are listed in Table 2.

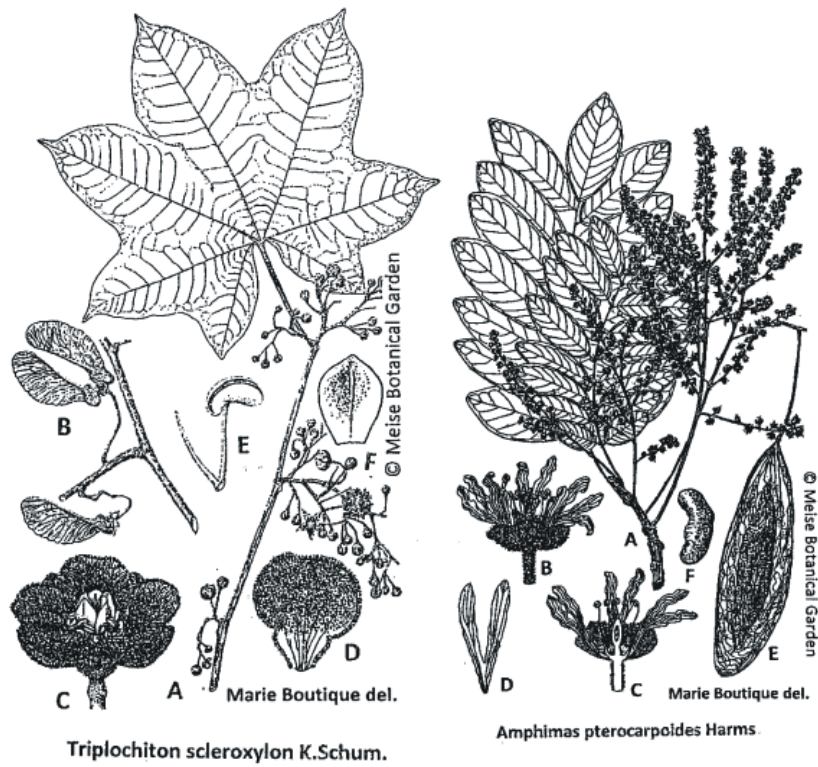
We distinguish the species with a monophagous diet versus those that are polyphagous. This is fundamental information needed for breeding and later, when we are engaged in the option to participate in animal protein production, for human as well as for livestock.

Last, but not least, attention must be paid to the fact that the presence of one of these plants in an ecosystem does not always indicate the presence of the caterpillar at that site. Amongst other things, the soil and the climatic conditions may influence the presence of a taxon in an ecosystem.

As an example, in the Pool Department which has a tropical climate, *Crossopteryx febrifuga*, host-plant of *Imbrasia forda*, is widespread in the Mbanza Ndounga district, but these caterpillars are absent.



Hymenocardia ulmoides Oliv.



Triplochiton scleroxylon K.Schum.

Amphimas pterocarpoides Harms.

Plate 3 : *Hymenocardia. ulmoides* : A.- Leaf, B.- Young flower, C.- Young stamens, D.- Male flower, E.- Ovary transversal medium section, F. Fruit. (LÉONARD & MOSANGO, 1985). *Triplochytton scleroxylon* : A.- Flower-bearing branch, B.- Fruit-bearing branch, C.- Full bloom flower, D.- Petal, E.- Stamen, F.- Bracteola. (GERMAIN, 1963). *Amphimas pterocarpoides* : A.- Flower-bearing branch, B.- Flower, C.- Flower, longitudinal section, D.- Petal, E.- Pod, F.- Seed. (WILCZEK, 1952).

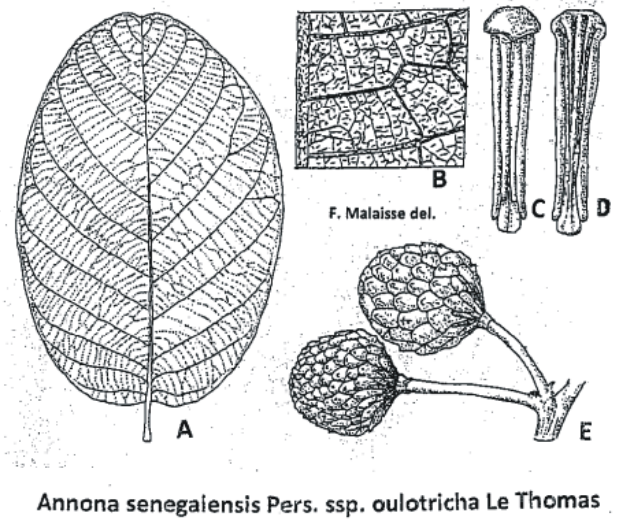
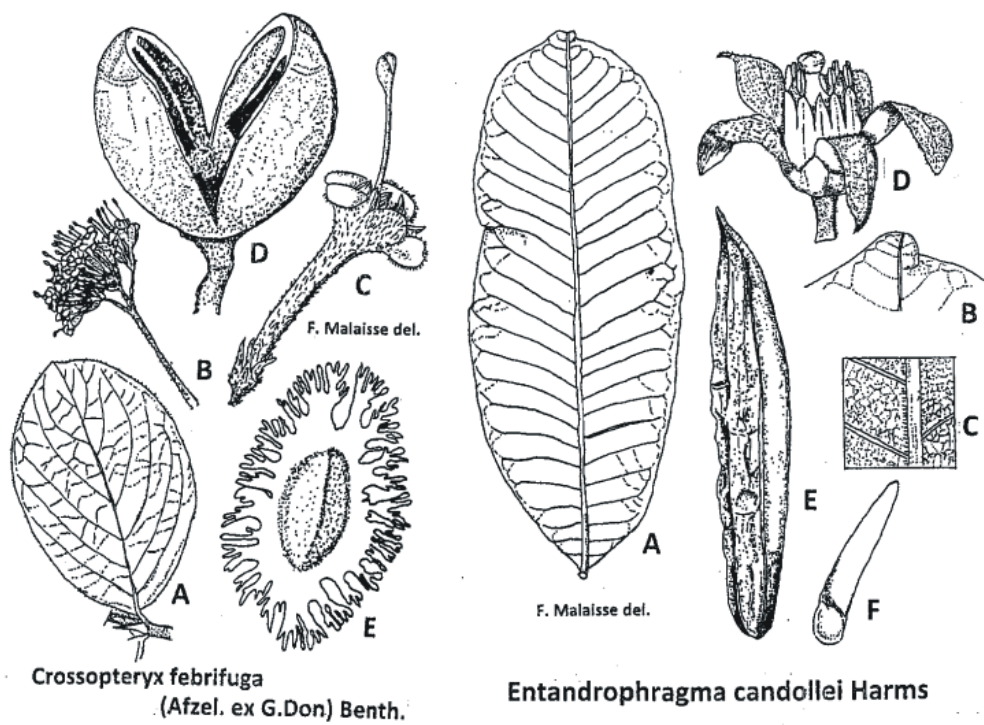


Plate 4 : *Crossopteryx febrifuga* : A.- Leaf, B.- Flower-bearing branch, C.- Flower, D.- Open fruit, E.- Seed [drawn after PAUWELS (1993)]. *Entandrophragma candollei* : A.- Leaf, B.- Summit of leaf, C.- Detail of lower face of leaf, D.- Flower, E.- Fruit, F.- Seed [drawn after L. van der Riet and L. van der Rent]. *Annona senegalensis* var. *oulotricha* : A.- Leaf, B.- Detail of lower face of leaf, C.- Stamen, front view, D.- Stamen, dorsal view, E.- Intruscence [drawn after Hélène Lamourdedieu in AUBRÉVILLE (1949) and after Hélène Durand in ROBYNS & GHESQUIÈRE (1934)].

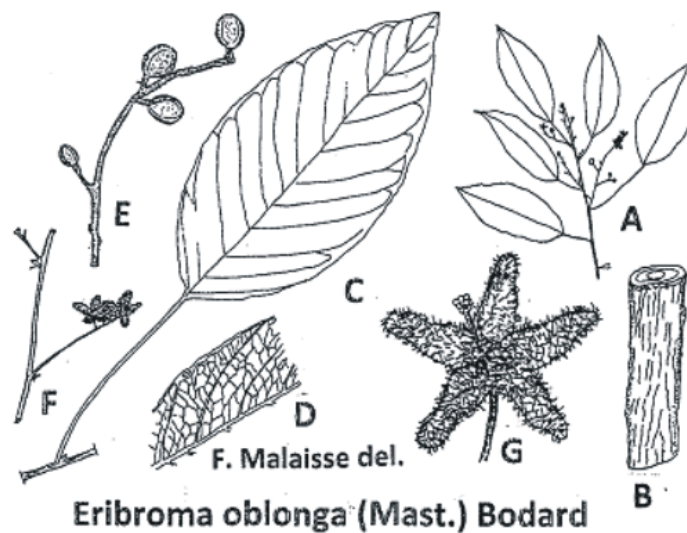
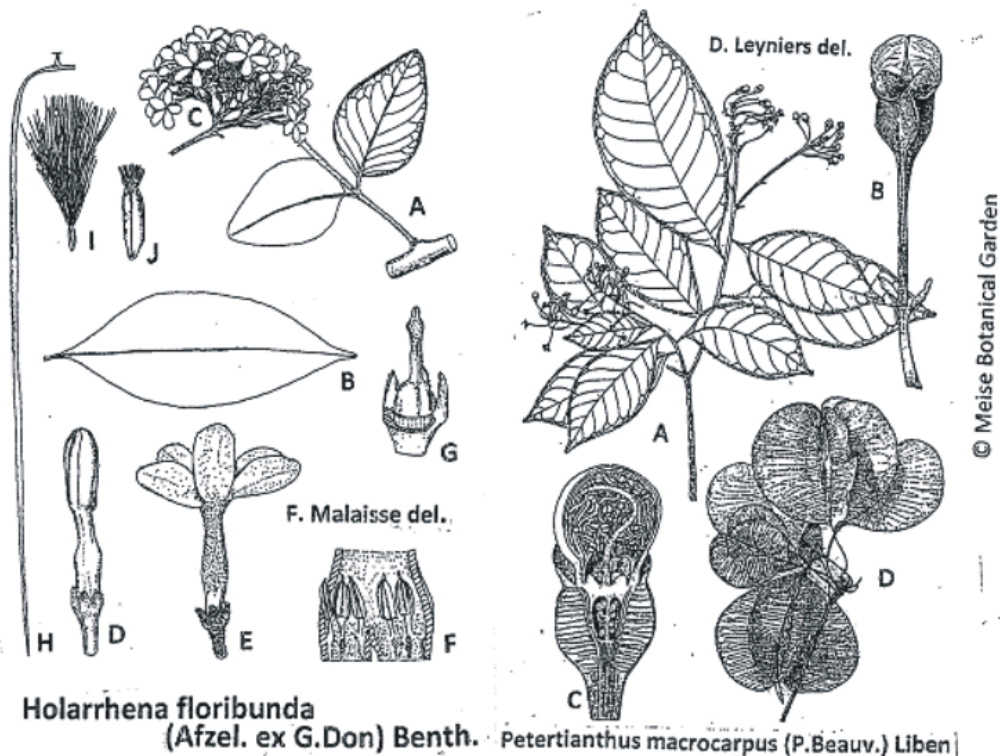


Plate 5.- *Holarrhena floribunda* A.- Part of branch, B.- Leaf, C.- Inflorescence, D.- Flower in bud, E.- Flower, F.- Part of corolla with stamens, G.- Part of calyx with pistil, H.- Fruit, I.- Seed, J.- Detail of seed. [Drawn after J. Williamson in DE KRUIF (1981)]. *Petertianthus macrocarpus* A. Flower-bearing branch, B.- Floral bud, C.- Floral bud, longitudinal section, D.- Fruit-bearing branch [Drawn by D. Leyniers in LIBEN (1971)]. *Eribroma oblonga* A.- Flower-bearing branch, B.- Part of branch, C.- Leaf, D.- Leaf, detail nervation, E.- Flower buds, F. Part of inflorescence, G. Flower [Drawn by F. Malaisse].

The village residents explain that this absence is due to the nature of the soil which is rich in sand. In the neighbouring Boko district, which has a clayish soil, these caterpillars swarm on the same plant. This statement is confirmed everywhere where a sandy or clayish soil appears on the surface in this department.

CONCLUSION

At a time when the consumption of insects by man is being increasingly encouraged around the world, and in particular in tropical Africa (MIGNON, 2002, ADAGBOLA et al., 2013 ; LAVALETTE, 2013, TCHIBOZO et al., 2016), the information gathered above is well-timed and moreover indicates further trails to follow up.

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Appendix 1.- The Congo-Brazzaville languages

Narrow Bantu	Languages
Bantu A	
Makaa-Nyem A80-90	Bekwel=Bakouélé A85b
	Bomwali=Sangha-sangha A87
	Njem=Djem A84
Kako A90	Kako=Kaka A93
	Pomo A 92b
	Yasswa=Jasua
Bantu B	
Sira Ig B40	Punu=Pounou B43
Mbate languages B60	Mbate=Mbere B61
	Lembaamba=Bambamba B62
Teke languages B70	Teke B74 and others
	Ngungwel=Ngangoulou B72a
Kota ou Kele B20	Ndasa= Ndassa B201
Bantu C	
Ngondi-Aka = Ndondi-Ngiri Ig C10	Bomitaba Ig C14
	Enyele=Enyellé C141
	Mbonzo= Mbonjo C142
	Bondongo C142
	Bongili=Bonguili C15
	Mbendjele
	Baka=Baaka
Mboshi Ig C20	Akwa C22
	Koyo C24
	Mbosi=Mboshi C25
	Likwala C26

	Likuba =Likouba C27
Bangi-Ntomba Ig (Lingala et al.) C 30	Bobangi=Bangi C32
	Moi C32
	<i>Lingala C30B</i>
Bantu H	
Kongo Ig H 10	Koongo H16
	Laadi =Lari H16
	<i>Kituba=Munukutuba H10B</i>
Oubanguian languages	
Central Banda	Mbandja=Mbanza
Monzombo-Ngbaka	Monzombo=Mondjombo
Gbaya-Mbanza-Ngbaka	Ngbaka (minagende) not ma'bo