

Genus *Euliphyra* Holland, 1890 Moth Butterflies

Psyche, a Journal of Entomology. Cambridge, Mass. **5**: 423 (423-431).

Type-species: *Euliphyra mirifica* Holland, 1890 by subsequent designation (Hemming, 1964. *Annotationes lepidopterologicae* (Part 4): 132 (132-134).).

The genus *Euliphyra* belongs to the Family Lycaenidae Leach, 1815; Subfamily Liphyrinae Doherty, 1889; Tribe Liphyrini Doherty, 1889. The other genus in the Tribe Liphyrini in the Afrotropical Region is *Aslauga*.

Euliphyra (**Moth Butterflies**) is a purely Afrotropical genus comprising six species. First revised by Poulton *et al.* (1913: 504). Updated by Libert in 1995 and 2016. The genus can be divided into two species groups, the *mirifica* group (5 species) and the *leucyania* group (1 species) (Libert, 2016).

Euliphyra mirifica Holland, 1890 African Moth Butterfly

Euliphyra mirifica Holland, 1890. *Psyche, a Journal of Entomology. Cambridge, Mass.* **5**: 423 (423-431).
Euliphyra mirifica Holland, 1890. d'Abrera, 2009: 600.

Type locality: Gabon: Kangwe. Holotype (male) in the

Diagnosis: Male larger than *Euliphyra hewitsoni* and deeper brown on the upperside; on the forewing underside the area between the white spot in spaces 1a and 1b and the margin is almost as dark as the rest of the wing (much lighter in *Euliphyra hewitsoni*) (Larsen, 2005a). Female with a white discal area on hindwing upperside (absent in *Euliphyra hewitsoni*) (Larsen, 2005a).

Distribution: ?Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Gabon (Libert, 2016), Angola (Larsen, 2005).

Two males caught in Senegal (Londia and Oussouye, south of Ziguinchor) cannot be attributed to a particular species (Libert, 2016).

Specific localities:

Guinea – Sereidou, Ziama (Libert, 2016; species identity requires confirmation).

Sierra Leone – Moyamba (Libert, 2016); Kambui Hills (Libert, 2016); Guma Valley (Libert, 2016).

Liberia – Putu (Libert, 2016); Sapo N.P. (Libert, 2016); Harbel (Libert, 2016).

Ivory Coast – Lamto (Larsen, 2005a – requires confirmation according to Libert, 2016); Banco (Libert, 2016); Kounougou (Libert, 2016); Monogaga, near San Pedro (Libert, 2016).

Ghana – Kakum National Park (Larsen, 2005a); Bobiri Butterfly Sanctuary (Larsen *et al.*, 2007), Kumasi (single female) (Larsen, 2005a); Sekondi (single female) (Larsen, 2005a); Ankasa (Libert, 2016); Bia N.P. (Libert, 2016).

Nigeria – Oni Creek (Lamborn, 1914); Kagoro (single specimen) (Larsen, 2005a – requires confirmation according to Libert, 2016); Sapoba (Libert, 2016); Uzuakoli, near Umuhaia (Libert, 2016); Warri (Libert, 2016). Two males from Zaria, in the north, could not be identified (Libert, 2016).

Cameroon – Batanga (Libert, 2016; single pair).

Gabon – Upper waters of the Ogove River (TL); Mboumie (Vande weghe, 2010); Ndjole (Vande weghe, 2010).

Habitat: Forest (Larsen, 2005a).

Habits: A rare butterfly with an uncoordinated moth-like flight (Larsen, 2005a).

Flight period: Recorded in June and July (Lamborn, 1914).

Early stages:

Lamborn, 1914: 450 [Oni Camp, 110 km east of Lagos, Nigeria].

The larvae live and pupate in the nests of *Oecophylla smaragdina longinoda*. The larvae are protected by a hard, leathery skin that forms a carapace. The head is hidden by a fold of skin and is extended and swung from side to side when the larva crawls forward. Trophallaxis was observed on a number of occasions but larvae were not seen to feed on ant brood at any time. When the head is extended during trophallaxis the anterior fold forms a cone shape, protecting the neck. Larvae grew very slowly and pupated inside the nest. The DNO and TO's were absent. Ants will attack the larvae if they can get under the carapace to bite a limb or the soft parts. The pupal period is 17-19 days (n = 5).

Eltringham, in Lamborn, 1914: 509.

“The [final instar] larva is about 20 mm in length, and the dorsal and lateral views present an appearance recalling that of a mollusc rather than of a lepidopterous larva. The ground-colour is brownish ochreous, and there are several irregular markings of a rich umber brown. The general appearance from a dorsal view may be gathered from fig. 1. The lateral portion of the larval skin is extended and modified into a kind of mantle, the edge of which touches whatever the larva may be resting upon. From the edge of the mantle, the sides, which present an irregular and wavy surface, slope up to the dorsal area, along the whole length of which is a deep groove bounded on each side by a hard chitinous ridge, the latter, except at the extremities, being thrown into a series of deep curving folds. This dorsal groove curves down to the mantle edge rather abruptly at the hinder end but more gradually at the anterior extremity. Round the edge of the mantle are twenty-four dark brown spots, many of which are extended towards the dorsal region as irregular marks, and between these markings there are sometimes smaller spots of the same colour. On each side there are nine spiracles. The first lies just above the second dark spot of the mantle edge, the second is above the fourth spot, and the remainder correspond in position to the mantle spots beneath them. The third is placed very far up the side, the fourth a little lower, and the remainder still lower and in a nearly straight line.

The whole structure of the exposed portion of this remarkable larva is profoundly modified, presumably as a protection against the attacks of the ants by which in life it is surrounded. The entire skin is covered with thick chitinous plates which are irregularly radiate, and have sloping edges. The projections of these plates interlock with the lateral cavities of those adjacent, and the appearance under a high power is not unlike that of a complicated armour sheet of cog-wheels. Such an arrangement doubtless provides a very efficient protective covering with a maximum of flexibility. One of these plates is shown highly magnified at fig. 7, but they vary considerably in size and in the extent to which the edges are sloped. Further microscopic examination shows that the brown markings on the larva are caused by the presence of small brush-like chitinous tufts, fig. 8, one of which arises from the socket in the centre of each chitinous plate. In the unpigmented parts of the skin, from which these tufts are absent, the plates still have the sockets, so that at one period of its evolution the larva probably had the tufts or at least some scale-like growth on every plate. Here and there in the armour, especially (probably exclusively)¹ on the pigmented areas, there are small round openings, the edges of the adjacent chitinous plates being neatly hollowed so that each forms its respective part of the circle. Possibly these apertures are the external openings of glands, though I have as yet no proof of this. If, as I think, they are confined to the pigmented areas, this would probably account for the correlated presence of the brush-like tufts, which may either protect the openings, or, as Prof. Poulton has suggested, hold some attractive secretion prized by the ants.

Fig. 5 shows a portion of the margin of the mantle. The extreme outer edge is armed with a regular fringe of flat chitinous projections, their bases furnished with interlocking processes. On the upper side of each projection there is a thin scale, very narrow at its socket but increasing outwardly to about the same width as the projection on which it lies. The purpose of these scales is not very obvious, but possibly they may have a tactile function. Within the peripheral fringe so formed there is a row of thick elongated chitinous plates, the edges of which are provided with somewhat irregular interlocking processes. One of these plates is shown highly magnified at fig. 6. Each has a scale-socket, but, apparently, does not bear either a scale or a brush-like tuft.

Fig. 9 shows one of the spiracles. Most, if not all, of these have the openings represented on the plate, although it is sometimes difficult to be sure of the presence of all three. Protection is afforded by stiff pointed hairs, for the most part curving inwards towards or over the spiracular orifices. Finally, the hard chitinous ridges of the dorsal groove are armed with very short hook-like spines and there are a few spines or hairs on the underside of the mantle edge, so arranged as to preclude entry if the mantle were raised at any part.

On turning the larva over its lepidopterous character becomes more evident (see fig. 3). The head, three pairs of true legs, and five pairs of prolegs can now be seen. The true legs seem to be progressively slightly larger as we proceed backwards, whilst the last pair of prolegs are much smaller than the remainder. The prolegs are of what Dr. Chapman has described as the “Macro” type, having hooks only on the inner margins of the feet.

The head calls for special remark, owing to its modification in adaptation to the habits of the species. It is elongated and somewhat conical in form, and when withdrawn there is round the base a deeply invaginated fold of the cuticle. At fig. 10, I have prepared a semidiagrammatic illustration of the anterior portion viewed from beneath, to show the mouth parts, etc., though it must be understood that in the actual specimen the parts are all very small and close together, and cannot be distinguished so easily. There are six ocelli situate at *o*, four of which are anterior and lie in a small semicircle, the remaining two being rather more posteriorly placed. The

antennae, *a*, are placed laterally just above the labrum, *l*, and beneath the latter, and in a dorsal view concealed by it, are the mandibles, *md*. These have four ridge-like teeth. The maxillae, *m*, have two large lobes each with two small points, and in the actual specimen lie close together, forming what looks like a pointed organ projecting from beneath the labrum, when viewed from above. There are large maxillary palpi, *mp*, and the labium, *lb*, is long and somewhat pointed, and has on it a small papilla, possibly a tactile organ. There is some evidence of a second and smaller papilla not shown in the drawing. As already stated the mouth parts are exceedingly small and difficult to make out distinctly.

At fig. 4, I have shown the larval and pupal skins as seen after the emergence of the butterfly. The pupa is attached in a peculiar way to a leaf, its sucker-like extremity being spread out and apparently cemented down. It will be noted that the larval skin is not completely shed, but has been split open on the exposure of the pupa, afterwards remaining in this expanded condition. Viewed from the other side the empty shells of head, feet, etc., are easily seen.

This interesting larva resembles in some respects that of the Australian *Liphyra brassolis* described by Dr. Chapman (*Entomologist*, p. 225, 1902). Both the specimens of *E. mirifica* sent by Mr. Lamborn are about the same size, so that I am unable to compare two stages of its growth, but evidently in *L. brassolis* the form in an earlier stage differs from that at a later period. Through the kindness of my friend Mr. G.T. Bethune-Baker, I have had an opportunity of examining larvae of this species. The cuticle is not provided with interlocking plates, but is covered all over with chitinous tubercles, and at the edges of the mantle is provided with numerous short setae. There is no dorsal groove and the cuticle is not thrown into ridges. As Dr. Chapman has stated, the spiracles are "minute holes without marginal structure". I have not been able to examine the mouthparts, but they are evidently larger than in *Euliphyra*. The antennae are certainly longer and more conspicuous, and the jaws are more adapted for piercing and tearing. Dr. Chapman describes a peculiar modification of the prolegs which is not evident in *Euliphyra*.

A further interesting point of comparison is that whilst in *E. mirifica* the pupa is formed half out of the larval skin [but see remarks in Eltringham, 1921b: 474], in *L. brassolis* it remains inside the larval cuticle, the latter forming a puparium like that of many Diptera.

¹ The openings described can be seen only in a carefully made microscopic preparation, and proof that they occur on the pigmented areas alone could only be obtained by making preparations of the skin of the entire larva.

Eltringham, 1921b: 474 [ex Lamborn, Oni, Nigeria].

"... the larval skin is not always, perhaps not generally, retained, since several examples are entirely without it. The pupa is attached by a sucker-like expansion of the terminal segments, and a depression of the abdominal segments forms a deep dorsal furrow. Its support is a leaf. On the thoracic region is a central ridge from which smaller ridges extend at right angles. The cuticle, especially of the abdominal region, is much folded and shrivelled. Length 19 mm."

Cottrell, 1984: 6.

"*Relationships with ants*: Probably specific to *Oecophylla*; older larvae known to live in arboreal nests of *Oecophylla*; larvae withstand ant attacks by means of armoured limpet-shaped carapace but there is also definite evidence of ability to solicit regurgitation; DNO and TOs apparently absent. Pupation in *Oecophylla* nests. *Larval food*: Details uncertain but older larvae apparently solicit for, and receive, regurgitation from ants. *Adult emergence*: Has occurred in captivity but there is no mention of vestiture of deciduous secondary scales."

Dejean & Beugnon, 1996.

The larvae of *Euliphyra mirifica* and *E. leucyana* live inside the nests of *Oecophylla longinoda*, in direct contact with workers and brood. They feed on prey collected by the ants and on sugar sources provided during trophallactic exchanges between workers (Farquharson, 1921; Lamborn, 1913; personal observation). We have never observed these caterpillars attacking host brood, as occurs in *Liphyra brassolis*, which live in colonies of *Oecophylla smaragdina* (Cottrell, 1987). Hence these two *Euliphyra* species are commensal rather than parasitic. Adult eclosion takes place inside the ants' nest, the wings being expanded while resting on the nest itself or on neighbouring branches. They are not attacked by the ants. Females oviposit directly on the host nest of *O. longinoda*. First instar larvae are transported into the nest by foraging workers. Thus *Euliphyra* species are obligate myrmecophiles, living in association with their host ant throughout their larval life.

The host ant nests are made of living leaves, stitched together with silk. Over the course of time the leaves dry out or the nests are broken open by storms, forcing the ants to migrate and build a new nest elsewhere. *Euliphyra* larvae are stimulated by recruitment behaviour which triggers migration of their host. They then follow the ant trails that lead to the new nesting site. Laboratory experiments showed that the larvae are able to follow host trails under a number of conditions: 1) fresh trails used by workers, 2) fresh trails in the absence of workers, 3) heterocolonial, 2-month-old trails, and 4) fresh trail washed with water (simulating tropical rains). They are also

able to bridge trail gaps of more than 1 cm. Under natural conditions trails are often situated along thin branches and twigs. In these situations the forward progress of the ants is not impeded by large larvae. Workers merely climb over the larvae. This suggests that an allomone is secreted on the dorsal surface of the larva. When crawling along heterocolonial trails about 20% of the workers from the new colony spread their mandibles when encountering larvae but the larvae are not attacked and they are admitted to the nest of the new colony .

Larval food:

Apparently ant-regurgitations [Lamborn, 1914].

Associated ant:

Oecophylla smaragdina F. race *longinoda* Latr. (Formicidae) [Lamborn, 1914; Nigeria].

hewitsoni Aurivillius, [1899] (as sp. of *Euliphyra*). *Kungliga Svenska Vetenskapakademiens Handlingar* **31** (5): 286 (1-561). **Type locality:** Nigeria: "Old Calabar". [Libert (1995: 578) asserts that this is a false locality and that the holotype probably originated from Sierra Leone.]. Synonym of *Euliphyra mirifica sjostedti* Aurivillius, 1895 (Ackery *et al.*, 1995). *Euliphyra hewitsoni* Aurivillius, 1899. Libert, 1995: 578 **stat. rev.** Synonymized with *mirifica* by Libert, 2016: 94.

Euliphyra hewitsonioides Libert, 2016

Euliphyra hewitsonioides Libert, 2016. *African Liphyrini: updating the taxonomy (Lepidoptera: Lycaenidae)*, ABRI, Nairobi: 97 (128pp.).

Type locality: Ghana: Aburi, IX 2005 (*S. Collins*). Holotype (female) in A.B.R.I., Nairobi.

Distribution: Ghana, Nigeria, Cameroon (north).

Specific localities:

Ghana – Aburi (TL); Ankasa (Libert, 2016); Bobiri (Libert, 2016); Kumasi (Libert, 2016); Sekondi (Libert, 2016); Amedzofe (Libert, 2016); Ho (Libert, 2016); Likpe (Libert, 2016); Pampusu (Libert, 2016).

Nigeria – Oni (Libert, 2016).

Cameroon – Wak (Libert, 2016).

Habitat: Nothing published.

Habits: Nothing published.

Early stages: Nothing published.

Larval food: Nothing published.

Associated ant: Nothing published.

Euliphyra brevis Libert, 2016

Euliphyra brevis Libert, 2016. *African Liphyrini: updating the taxonomy (Lepidoptera: Lycaenidae)*, ABRI, Nairobi: 97 (128pp.).

Type locality: Central African Republic: Yakoli, X 1996 (*S. Collins*). Holotype (female) in A.B.R.I., Nairobi.

Distribution: Guinea, Sierra Leone, Ivory Coast, Central African Republic.

Specific localities:

Guinea – Banan Forest, south of Nzerekore (Libert, 2016).

Sierra Leone – Bumbuna (Libert, 2016).

Ivory Coast – Bolequin (Libert, 2016); Bouake (Libert, 2016); Kounougou (Libert, 2016).

Central African Republic – Yakoli (TL); Bimbo (Libert, 2016); Bimon (Libert, 2016); "Corniche" (Libert, 2016); Maka (Libert, 2016); Ngbo (Libert, 2016).

Habitat: Nothing published.

Habits: Nothing published.

Early stages: Nothing published.

Larval food: Nothing published.

Associated ant: Nothing published.

Euliphyra cameruna Libert, 2016

Euliphyra cameruna Libert, 2016. *African Liphyrini: updating the taxonomy (Lepidoptera: Lycaenidae)*, ABRI, Nairobi: 98 (128pp.).

Type locality: Cameroon: Ebogo, Nyong River, V 2008 (*ABRI leg.*). Holotype (female) in A.B.R.I., Nairobi.

Distribution: Cameroon.

Specific localities:

Cameroon – Ebogo (TL); Campo (Libert, 2016); Ndzi (Libert, 2016); Afanessele, north Yaounde (Libert, 2016); Mount Febe (Libert, 2016); Douala (Libert, 2016); Sangmelima (Libert, 2016); Bitje (Libert, 2016); Dja (Libert, 2016); Lolodorf (Libert, 2016); Efulen, near Akom (Libert, 2016); Akoafim (Libert, 2016); Maan (Libert, 2016).

Habitat: Nothing published.

Habits: Nothing published.

Early stages: Nothing published.

Larval food: Nothing published.

Associated ant: Nothing published.

Euliphyra mirabilis Libert, 2016

Euliphyra mirabilis Libert, 2016. *African Liphyrini: updating the taxonomy (Lepidoptera: Lycaenidae)*, ABRI, Nairobi: 99 (128pp.).

Type locality: Central African Republic: Yakoli, II 2009 (*leg. ABRI*). Holotype (female) in A.B.R.I., Nairobi.

Distribution: Gabon (south), Angola (north), Congo (south), Central African Republic, Democratic Republic of Congo.

Specific localities:

Gabon – Mayumba (Libert, 2016).

Angola – Ambriz (Libert, 2016).

Congo – Kounzoulou, north of Brazzaville (Libert, 2016).

Central African Republic – Yakoli (TL); Bangui (Libert, 2016); Bimon (Libert, 2016); Botambi (Libert, 2016); Lobaye (Libert, 2016); Maka (Libert, 2016); Mokpoto (Libert, 2016); Pissa (Libert, 2016); Moloukou (Libert, 2016).

Democratic Republic of Congo – Bamanya (Libert, 2016); Flandria (Libert, 2016); Isiro (Libert, 2016); Katako-Kombe (Libert, 2016); Upper Kasai district (Libert, 2016); Baliko-Basayo (Libert, 2016); Bangupa (Libert, 2016); Lubudi, Katanga (Libert, 2016).

Habitat: Nothing published.

Habits: Nothing published.

Early stages: Nothing published.

Larval food: Nothing published.

Associated ant: Nothing published.

Euliphyra leucyana (Hewitson, 1874)

Lesser Moth Butterfly

Liphya leucyana Hewitson, 1874. *Transactions of the Entomological Society of London* **1874**: 355 (343-355).

Euliphyra leucyana (Hewitson, 1874). Kielland, 1990d. Misspelling.

Euliphyra leucyana Hewitson, 1874. d' Abrera, 2009: 600.



Euliphyra leucyana leucyana. Female. Left – upperside; right – underside.
Bobiri, Ghana. 20 May 2014. A. Gardiner.
Images M. Williams ex Gardiner Collection.

Type locality: Sierra Leone: Sierra Leone. Holotype (male) in the N.H.M., London.

Distribution: Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Gabon, Congo, Central African Republic, Democratic Republic of Congo, Tanzania.

Habitat: Forest, including riverine forest.

Habits: Generally rare with a weak, moth-like, flight pattern (Larsen, 2005a). Kielland (1990d) noted a male flying before sunrise. He states that it soared up into the air and then fluttered to the ground like a dead leaf.

Early stages:

Dejean & Beugnon, 1996.

Larsen (2005a).

A. Dejean, *vide* Larsen (2005a), raised two males in Cameroon from larvae found in a nest of *Oecophylla longinoda*.

Congdon *et al.*, 2017 [final instar larva].

Larval food:

Detritus in ant nests? [Congdon *et al.*, 2017].

Associated ant:

Oecophylla longinoda (Formicidae) [Dejean, *vide* Larsen, 2005a; Cameroon].

Euliphyra leucyana leucyana (Hewitson, 1874)

Liphya leucyana Hewitson, 1874. *Transactions of the Entomological Society of London* **1874**: 355 (343-355).

Euliphyra leucyana (Hewitson, 1874). Kielland, 1990d. Misspelling.

Euliphyra leucyana Hewitson, 1874. d’Abrera, 2009: 600.



Euliphyra leucyana leucyana. Female. Left – upperside; right – underside.
Bobiri, Ghana. 20 May 2014. A. Gardiner.
Images M. Williams ex Gardiner Collection.

Type locality: Sierra Leone: Sierra Leone. Holotype (male) in the N.H.M., London.

Distribution: Guinea (west), Sierra Leone, Liberia, Ivory Coast, Ghana,

Specific localities:

Guinea – Dieke Forest (Libert, 2016); Ziama Forest (Libert, 2016).

Sierra Leone – near Freetown? (Libert, 2016).

Liberia – Bigtown (Libert, 2016); Harbel (Libert, 2016); East Nimba N.R. (Libert, 2016).

Ivory Coast – Danane (Libert, 2016); Abengourou (Libert, 2016).

Ghana – Bobiri Butterfly Sanctuary (Larsen *et al.*, 2007); Kintampo (Libert, 2016).

Euliphyra leucyana sjostedi Aurivillius, 1895

Euliphyra sjostedi Aurivillius, 1895. *Entomologisk Tidskrift* **16**: 204 (195-220, 255-268).

Euliphyra mirifica sjostedi Aurivillius, 1895. Ackery *et al.*, 1995.

Synonym of *Euliphyra leucyana* (Hewitson, 1874). Libert, 1995: 577.

Euliphyra mirifica sjostedi Aurivillius, 1895. Ackery *et al.*, 1995. **Stat. rev.**

Type locality: Cameroon: Bonge, Fluss Meme, 8 X 1891 (*Sjoestedt*). Holotype in the Swedish Natural History Museum, Stockholm (images available at www2.nrm.se/en/lep_nrm/s).

Distribution: Nigeria (south), Cameroon, Gabon, Congo, Central African Republic, Democratic Republic of Congo, ?Uganda (Larsen, 2005a – requires confirmation according to Libert, 2016).

Specific localities:

Nigeria – Lagos (Libert, 2016); Olokomeji Forest (Libert, 2016); Uwet (Libert, 2016); Oban Hills (Libert, 2016).

Cameroon – Bonge (TL); Takamanda (Libert, 2016); Ebogo (Libert, 2016); Wak, north of Ngaoundere (Libert, 2016).

Gabon – Ipassa (Libert, 2016); Ogoue (Libert, 2016).

Congo – Kelle (Libert, 2016).

Central African Republic – Boukoko (Libert, 2016); Mbata (Libert, 2016); near Bangui (Libert, 2016).

Democratic Republic of Congo – Kinshasa (Libert, 2016); Beni (Libert, 2016); Katako-Kombe (Libert, 2016); Dimbelenge (Sankuru) (Libert, 2016); Ituri Forest (Ducarme, 2018).

Euliphyra leucyana tanzanica Collins & Libert, 2016

Euliphyra leucyana tanzanica Collins & Libert, 2016. *African Liphyrini: updating the taxonomy (Lepidoptera: Lycaenidae)*, ABRI, Nairobi: 104 (128pp.).

Type locality: Tanzania: Lubalizi, 1100 m, Kigoma, 30 XI 1970 (*J. Kielland*). Holotype (male) in A.B.R.I., Nairobi. Only known from the holotype.

Distribution: Tanzania (west).

Specific localities:

Tanzania – Lubalizi (TL).