

## *Hypolimnas aubergeri* Hecq, 1987 (Nymphalidae: Nymphalinae) a little-known West African butterfly

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Sz. Sáfíán and H. Takano

African Natural History Research Trust, Street Court, Kingsland, Leominster, Herefordshire, HR6 9QA, UK. Email:

[szsafian@gmail.com](mailto:szsafian@gmail.com)

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**Abstract:** New distribution records of the Guinea Highlands endemic Nymphalid *Hypolimnas aubergeri* are presented, supplemented by behavioural observations of adults and information on its habitats and potential conservation issues.

**Key words:** Distribution, Guinea Highlands, biogeography, endemism, premontane, conservation.

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### INTRODUCTION

*Hypolimnas aubergeri* Hecq, 1987, or *Côte d'Ivoire Eggfly* as attributed by Larsen in Butterflies of West Africa (2005) is a little known, large nymphalid near *H. chapmani* (Hewitson, 1873), which was described from a series collected near Danané, Ivory Coast by Maurice Auberger in 1975. Until recently, the species was known only from its type locality whilst Larsen (2005) provides records from the Nimba area (Yéalé), Mount Tonkoui, Tiassale and Tiapleu in Ivory Coast, as well as from Sérédou in Guinea (misattributed to the Nimba Mountains, Sérédou is actually in Zياما Forest). *H. aubergeri* is among the 300 or so Central and West African butterfly species selected for conservation assessments by the IUCN. Larsen (2011) classified the species as Least Concern (LC) with the note that “certain parts of its populations” could be endangered by deforestation.

### MATERIAL AND METHODS

The authors have been collecting butterflies on various field surveys between 2013 and 2019 where a number of *H. aubergeri* specimens were observed and collected: Loma Mountains, Sierra Leone (Takano), Nimba Mountains, Wologizi Mountains, Liberia (Sáfíán) and Zياما Forest, Guinea (Sáfíán). Further reliable field records of the species were obtained from literature and personal communications.

The specimens collected by the authors are deposited in the African Natural History Research Trust (ANHRT) collections in Leominster, UK, except those collected in the Zياما Forest, Guinea, which are deposited in the Nature Education Centre, Jagellonian University, Kraków, Poland.

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### RESULTS

Two males and a female showing slight individual variation of size and pattern are illustrated in Figure 1 and an updated distribution map of the species is presented in Figure 2.

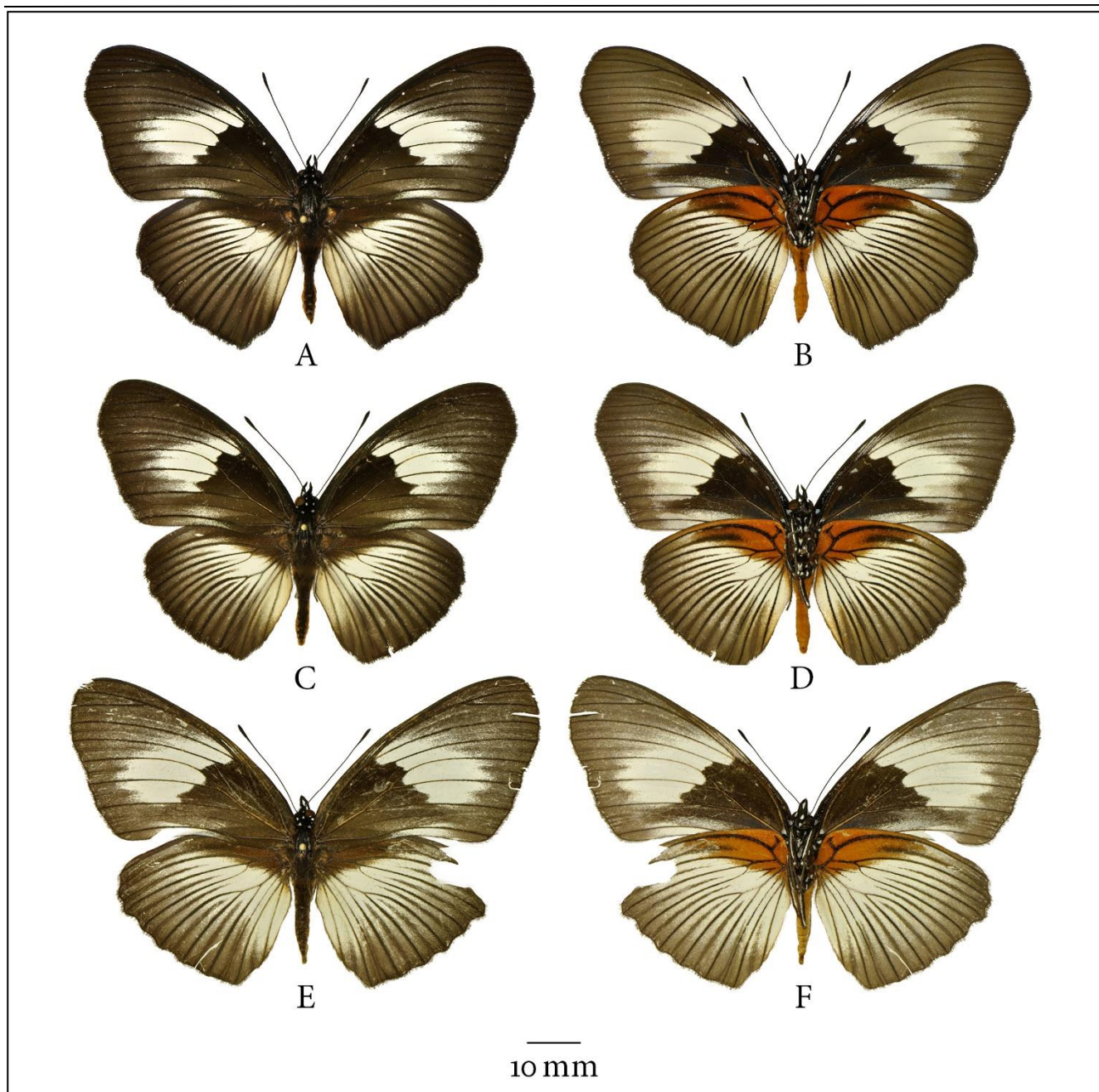
#### New distribution records and behavioural observations

##### Liberia

The first Liberian specimen of *H. aubergeri* was collected by Patrick Boireau during a biodiversity survey for ArcelorMittal, Liberia organised by Afrique Nature (Boireau, 2009). He found a single specimen in the forests below Tokadeh Mine (Mount Tokadeh) at circa 600 m in the Nimba Mountains (Western Range). The second specimen was also found in the Nimba Mountains at Coldwater, East Nimba Nature Reserve and Blei Community Forest by the senior author in September 2013 (Sáfíán, 2014). The female specimen was resting on a bush in young secondary (*Musanga*) forest near a stream at about 550 m about 15.30 in the afternoon. Upon disturbance, it flew rather slowly in a semi-circle and landed just two metres away from its original perch. Another colony of the species was discovered in the Wologizi Mountains in November 2018. The first male specimen was collected near a river at the foothills of Belegizi Mountain (Fig. 3). It came to investigate various items in the camp, probably seeking minerals. Further specimens were attracted to urine bait purposely established around the camp where altogether six or seven males were observed. Some of these specimens were photographed and collected (Figs 4–5).

##### Specimen data:

1♂ Liberia, Nimba County, Nimba Mountains, Coldwater, Blei Community Forest and East Nimba Nature Reserve, 15–29.ix.2013, General collecting, Sáfíán, Sz., Kőrösi, Á Leg. ANHRT: 2017:36. DNA leg tissue sampled: SZS-KW-308. [ANHRTUK00056590].



**Figure 1** – *Hypolimnas aubergeri*: male (Nimba Mountains, Liberia) upperside – A, underside – B; male (Loma Mountains, Sierra Leone) upperside – C, underside – D; female (Loma Mountains, Sierra Leone) upperside – E, underside – F.

1♂ Liberia, Nimba County, Nimba Mountains, Western Range, Gba Community Forest, Vanyanpah Camp General collecting, Sáfián, Sz., Simonics, G. ANHRT: 2018.43. [ANHRTUK00025205].

4♂♂ Liberia, Lofa County, Wologizi Mountains, Rosewood Camp General collecting, Sáfián, Sz., Simonics, G. ANHRT: 2018.43. [ANHRTUK00025201-00025204].

#### Guinea

The senior author spotted a photograph of *H. aubergeri* on the Flickr website taken on 16 November 2013 by Rainer Wendt, which showed this species identified as a female *Acraea* (*Bematistes*) *macaria* (Fabricius, 1793). The females of this *Acraea* species and *A. (B.) alcinoe* Weymer, 1892 are presumed to be the models in this model-mimic relationship. According to the accompanying information and subsequent

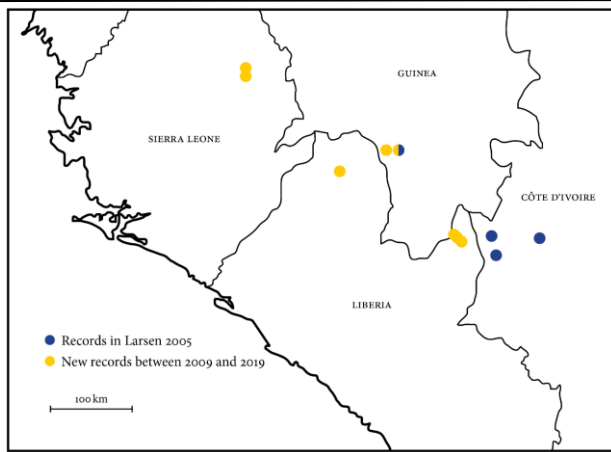
communications with the photographer, it was found in an extensively managed coffee farm in the buffer zone of the Zياما Forest (Forêt Classée de Zياما) near Sérédou.

Further Guinean specimens were recorded during a field survey in mid-March 2019 by Sáfián, Simonics and Florczyk, who found one pair alongside a dry stream bed in lowland forest in the north-western foothills of the Zياما Massif (Massadou) at 550 m. The specimens were worn and seemingly had been on the wing for a long time. No specimens were collected or seen in Zياما during subsequent visits by the ANHRT team in April and July 2019.

#### Specimen data:

1♂, 1♀ Guinea, Forêt Classée de Zياما (Zياما Forest), Massadou lowland forest, General collecting, Sáfián, Sz., Simonics, G., Florczyk, K., Koivogui, S. Leg.





**Figure 2** – Known distribution of *H. aubergeri* with older and recent records. The non-confirmed records from southern Ivory Coast (Tiassale) and Ghana are not illustrated.



**Figure 3** – Habitat of *H. aubergeri* in the Wologizi Mountains, Liberia. The butterfly seems to follow streams and smaller rivers at the foothills of mountainous areas in the Guinea Highlands (Photo: Sz. Sáfián).

### Sierra Leone

*H. aubergeri* was found as new for Sierra Leone in the Loma Mountains on a recent ANHRT expedition in 2016, despite it being overlooked by the IFAN expedition to Loma in the 1960's (Condamin, 1971). Two males and a female were captured in disturbed farmland-forest mosaic at 420 m (Fig. 6) in the eastern foothills of the mountains near a temporary stream. One of these male specimens was captured in the camp, investigating damp patches near the cooking quarters. A further male was attracted to artificial mercury vapour light at 1050 m next to a stream in closed-canopy submontane forest (Fig. 7), arriving at the light in the early hours of the morning between 0300–0600hrs.

### Specimen data:

2♂♂, 1♀ Sierra Leone, 420m, Loma Mountains, farmland/forest mosaic, 09°07'47"N 11°05'24"W, 11–15.vi.2016, general coll., leg. Takano, Miles & Goff. ANHRT: 2017.18. [ANHRTUK00078296-00078298].

1♂ Sierra Leone, 1050m, Loma Mountains, closed-canopy forest, 09°10'35"N 11°05'25"W, light trap, leg. Takano, Miles & Goff. ANHRT: 2017.18. [ANHRTUK00076849].



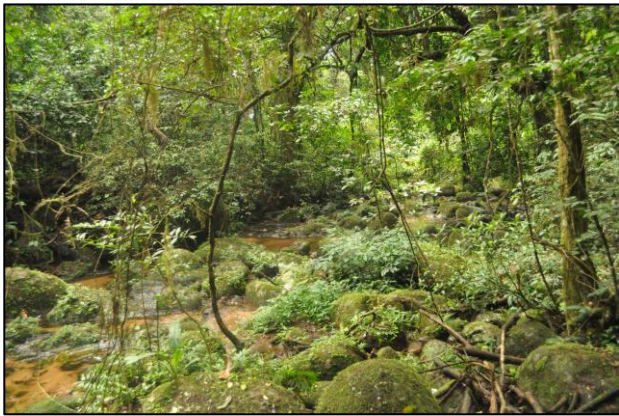
**Figure 4** – Upperside of a male *H. aubergeri*. When disturbed, males tend to fly off and settle on leaves a few metres up, overlooking the approaching “danger”. They often return to their spot after a short period of rest (Photo: Sz. Sáfián).



**Figure 5** – Males of *H. aubergeri* always sit with wings closed vertically above their body while feeding. They usually remain wary and are easily disturbed from butterfly assemblages (Photo: Sz. Sáfián).

### **DISCUSSION**

Larsen (2005) estimates the distribution of *H. aubergeri* based on a few confirmed (Danané, Mount Tonkoui, Sérédou) and further unconfirmed records from Ghana. Based on the new data discussed above (Fig. 2), it is predicted that the species is probably restricted to the forests surrounding the major mountains of the southern Guinea Highlands (e.g. Nimba, Zيامa Massif, Wologizi, Loma) in the Liberian sub-region of West Africa. It appears to be a species of lowland forests at the foothills of mountainous areas (pre-montane), penetrating deeper into the upland forests following rivers and streams. However, it is not yet known how widely it is distributed in the lowland forests which once connected these mountains. Despite extensive surveys in Liberia, *H. aubergeri* has never been found in the lowland forests of the Foya Proposed Protected Area which is adjacent to Wologizi, nor has it been found in the large lowland forests of Gola on the Liberia-Sierra Leone border (Belcastro & Larsen, 2006; Sáfián, 2012). Furthermore, this species has not been recorded from the largest lowland forest in Guinea, Diecké Forest, despite its presence in the nearby Gba Community Forest at the foothills of the Western Range of Nimba Mountains, only 10 km or so east of the north-eastern boundary of Diecké.



**Figure 6** – Habitat of *H. aubergeri* at mid-altitude in the Loma Mountains, Sierra Leone (Photo: W. Miles).



**Figure 7** – Farmland-forest mosaic at the foothills of Loma Mountains, Sierra Leone, where three *H. aubergeri* specimens were captured (Photo: W. Miles).

The majority of Gba Community Forest lies above 500 m, whereas Diecké lies at a lower elevation (305–480 m), the terrain being more rugged with only a few hills reaching the 500 m mark. Still, another species discovered by Auberger in Danané and believed to be endemic to the Nimba area, *Euphaedra aubergeri* Hecq, 1987, was recently collected in Diecké, so the presence of *H. aubergeri* in this forest cannot be ruled out.

Although the current conservation status of the species is that of Least Concern (LC) according to IUCN criteria (Larsen, 2011), *H. aubergeri* could easily become endangered without the implementation of further conservation measures to protect its newly discovered habitats. Natural forests around its type locality in Ivory Coast are all but destroyed (Marios Aristophanous (ANHRT), pers. comm. 2018) and this species has not been encountered by the ANHRT team on numerous visits to the Ivorian sites of Mont Tonkoui, Yéalé and the lowland forests of Parc National de Taï. In Liberia, the species was found at an active mining site (Mount Tokadeh), where the majority of the forest has already been cleared since the discovery of the species in 2009. Two other records come from community forests, where inappropriate management or uncontrolled activities could easily lead to the degradation of the existing forest habitats. Its strongest Liberian population was found in intact rainforest in the Wologizi Mountains, where the status of the forest is currently being disputed between international conservation organisations and the Government of Liberia. Its only known Guinean site, the

Ziama Classified Forest currently receives the status of UNESCO Man and Biosphere Reserve although the foothills of the Ziama Massif where the populations are found, actually fall in the buffer zone (les zones tampon), where multiple human activities are allowed, including utilisation of land along streams and rivers for rice-growing. The only population of *H. aubergeri* that receives protection in a national park is that of the Loma Mountains in Sierra Leone, where a single specimen was collected in upland forest deep within the protected area. The other specimens were found in degraded lowland forest outside the national park where there is an ever-present threat of encroachment from villages just beyond the park boundary.

Although this species appears to be able to withstand some disturbance to their habitat and in spite of the aforementioned discovery of new populations, as the lowland forests in the foothills of the southern Guinea Highlands continue to be cleared, this enigmatic butterfly will undoubtedly become endangered.

## ACKNOWLEDGEMENTS

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