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# *PSEUDALETIS LEONIS*: A RARE MIMETIC BUTTERFLY IN A WEST AFRICAN RAIN FOREST (LEPIDOPTERA: LYCAENIDAE)

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**ABSTRACT**.– *Pseudaletis leonis* is a rare, black and white lycaenid butterfly known only from a few specimens collected in West African rain forests. At one site in Sierra Leone, which had previously been well-investigated, the species suddenly and unexpectedly became quite common. The butterfly is probably a mimic of a black and white day-flying moth, *Nyctemera apicalis* (Arctiidae), or of the much larger, black and white monarch butterfly, *Amauris niavius* (Danaidae). However, its rarity defies detailed investigation and its placement in the mimetic assemblage of forest butterflies in the area must be regarded as tentative.

**KEY WORDS**: *Acraea*, Acraeinae, Africa, *Aletis*, *Amauris*, Arctiidae, *Bematistes*, Cameroon, *Cooksonia*, Danaidae, *Danaus*, defensive behavior, Ethiopian, Geometridae, Hypsidae, Liberia, *Liptena*, *Liptenaria*, *Mimacraea*, mimicry, Noctuoidea, *Nyctemera*, *Pitthea*, *Pseudaletis*, rain forest, rarity, Sierra Leone, *Telipna*.

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A remarkable number of African butterflies are known from one or just a few specimens accumulated over many years and now scattered in museums and private collections in various parts of the world (D'Abrera, 1980). There are several explanations for such extreme rarity. One is that the species exist in populations that extend over very small areas and, as a consequence, they are rarely discovered; the few specimens that do exist are strays from more substantial populations. Another is that the species are inaccessible; in rain forests they might be restricted to the canopy and would therefore not often be encountered. A third is that most of the time the populations exist at low density and only occasionally build up in numbers: discovery is therefore a matter of chance or opportunity. Here, I describe the discovery of a rare African lycaenid *Pseudaletis leonis* Staudinger, which at one site became relatively common for a short period, and ponder its position in a previously described (Owen, 1974) model-mimic assemblage in the area.

The genus *Pseudaletis* is confined to tropical Africa. It was first described by Druce (1888) on the basis of a single female, which he named as *Pseudaletis agrippina*, collected in Cameroon. Concluding the description, Druce adds, "This fine species bears a close resemblance to *Aletis helcita* (Linnaeus) (which occurs in the same place), it appears to be very rare, as amongst the enormous number of butterflies received from the Cameroons it does not seem to have been noticed before." Stempffer (1967), noting the rarity of specimens of *Pseudaletis* in collections, recognises 20 species and two subspecies, and figures three species in colour. D'Abrera (1980) lists 18 species and figures 13 in colour, but admits that some may be incorrectly diagnosed, particularly when it comes to matching males to females, and notably in those species with strong sexual dimorphism. The structure of the genitalia suggests that *Pseudaletis* is discrete and homogeneous (Stempffer, 1967), and this is confirmed by external morphology, including wing-pattern and wing-shape (Eliot, 1973). The rarity of *Pseudaletis* is highlighted by Fox, et al. (1965) who made an analysis of an extensive collection of Lycaenidae from Liberia and found none even though several species should occur there. The exceptionally good collection of African butterflies in the Hope Entomological Collections, Oxford University, has only one specimen and one species, *Pseudaletis clymenus* Druce, which further highlights the rarity of these butterflies. Stempffer (1957) describes the male of *Pseudaletis leonis* Staudinger, but not the female, which was evidenly not known, and gives Sierra Leone as its distribution. D'Abrera (1980) figures a male and female in colour but is uncertain that the two are really the same species; he gives the distribution as Sierra Leone to Ivory Coast.

On 26 Oct 1967 I collected a male *Pseudaletis leonis* in secondary rain forest near Freetown, Sierra Leone. I was attracted by its bold black and white coloration because at the time I was studying mimicry in forest butterflies and the dominant coloration of both mimics and models is black and white or orange and black. It was the first of this species I had ever seen and only the second species of *Pseudaletis* I had encountered during eight years of collecting in both East and West Africa. The specimen is figured in Owen (1971) and is now in the Natural History Museum, London (BMNH).

On 12 Oct 1972 I was astonished to find three male *Pseudaletis leonis* flying at 2-4m around a tall shrub at the edge of secondary rain forest about 2km from the original site of discovery. I had previously (1966-1970) examined this area repeatedly without finding the species. I collected two of the three and next day found three more males, one of which I

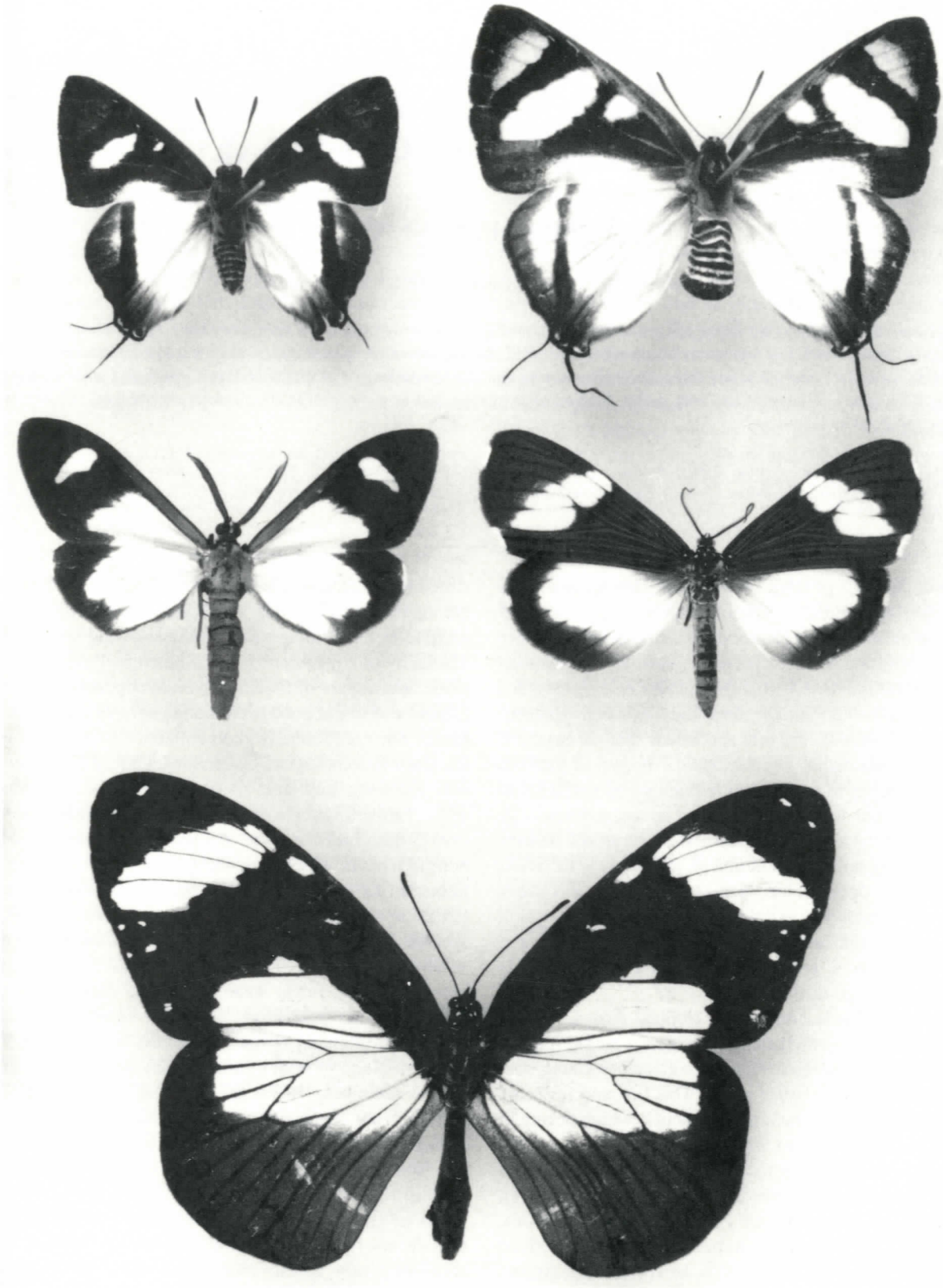

Fig. 1. Top: *Pseudaletis leonis* male (left) and female (right); middle: *Pitthea famula* (left) and *Nyctemera apicalis* (right); bottom: *Amauris niavius*.

collected. On 14 Oct there were two and I collected both of them. None appeared on 15 Oct but I saw one on 16 and 17 Oct, and saw and collected one on 18 Oct. Two more appeared on 21 Oct and both were collected. On 23 Oct there were three and I collected two, including the first female. Another female appeared on 24 Oct, but could not be caught. There were two males on 27 Oct, one of which was caught, and the last specimen, a female, was collected on 2 Nov. This gives 12 males and two females collected, a minimum figure of the number present from the 19 sightings.

All the butterflies appeared from the interior of the forest in the middle hours of the day and were strongly associated with the same shrub. There was no sign of feeding or egg-laying, although judged by the way they interacted, the males were aggressive to one another and perhaps territorial. It is possible that my deliberate and repeated removal of specimens provided opportunities for others to take their place, and that if I had not collected I would never have known there were more than three or four individuals; I have described a similar experience with another rare African lycaenid, *Mimacraea neurata* (Holland) (Owen, 1983).

No African lycaenid has been identified as a distasteful model (Eltringham, 1912; Punnet, 1915; Owen, 1971), but the possibility has to be admitted. Species in several genera, notably *Mimacraea*, *Liptenaria, Telipna, Cooksonia, Liptena* and *Pseudaletis*, are thought because of their coloration to be mimics of species of *Acraea* and *Bematistes* (Acraeidae), and possibly moths, Hypsidae (Noctuoidea), and even of the much larger monarch butterflies, *Amauris* and *Danaus* (Danaidae). Fig. 1 shows a male and a female *Pseudaletis leonis* and three other similar-looking species found in the same area. All specimens have a bold black and white coloration, and in particular a conspicuous white subapical bar in the forewing and an extensive white area in the hindwing. The moth, *Pitthea famula* (Drury) (Geometridae), flies by day and when at rest holds its wings vertically over its back like a butterfly. In life it looks remarkably like *Pseudaletis leonis* as it has the same darting flight and tendency to perch high on bushes. Two features argue against it being the model: it is rare, and it is a member of the Geometridae, a family which in Africa seems to contain few truly unpalatable species. Another moth, *Nyctemera apicalis* (Walker) (Arctiidae: Nyctemerini) is a more likely candidate as the model. In flight it is slower than *Pseudaletis leonis* and it rests with wings flattened, the forewings effectively obscuring the hind wings. When disturbed it produces a copious, rather acrid-smelling, foamy secretion from thoracic glands; this is similar to members of the related Hypsidae (Noctuoidea), a family containing many species thought to be toxic. It is also much more common than *Pseudaletis leonis* and *Pitthea famula*. The third candidate is the butterfly, *Amauris niavius* (L.) (Danaidae), common in the forest region of Sierra Leone and regarded as a model for a host of Batesian and some Müllerian mimics (Owen, 1974). It could be argued that *Amauris niavius* is far too large to be a model for *Pseudaletis leonis*, but much depends on how good predators are at judging the size of potential prey items.

Two males and a female of *Pseudaletis leonis* have been donated to the Hope Entomological Collections, University Museum, Oxford.

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