

On the supposed distribution of *Euchloe falloui* (Allard) (Pieridae) in Somaliland: a critical review

ICHIRO NAKAMURA

41 Sunrise Blvd., Williamsville, New York 14221, U.S.A.

Somaliland is widely accepted as a part of the range of *Euchloe falloui* (Allard), even though this Palaearctic species has been recorded only twice from the area. The first record (Sharpe, 1898) appeared long before *Euchloe belemia abyssinica* Riley (1928) was known to occur in this part of Africa. The possibility of confusion between these two taxa therefore existed (Riley, 1928), yet there were no a priori reasons to believe that such confusion did occur. Thus, with the second record subsequently published (Talbot, 1932 a), the presence of *E. falloui* in Somaliland would appear an established fact. Nevertheless, these Somali records seemed questionable in view of the specialised ecological, biological and systematic characteristics (Nakamura, unpublished) of this Palaearctic species that clearly point to the Saharo-Arabian endemism known also in certain animal groups and higher plants. A critical assessment of these records was therefore made. The results presented below appear to invalidate both of them.

1. Review of the records

The first record of *E. falloui* from Somaliland (more exactly the northern part of the Somali Republic, formerly British Somaliland) was published by Sharpe (1898) and included the following specimens:

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|-------|-------------------------------|
| 1 ex. | 23. ii. 1897, Wagga, 6500 ft. |
| 1 ex. | 2. iii. 1897, Wagga, 6500 ft. |
| 1 ex. | iii. 1897, Rugga Pass. |

This record was immediately cited by Aurivillius (1899) and later also in Aurivillius (1908—1925). These two well-known works provided the main basis for a wide acceptance.

This was the situation when Riley (1928) recorded *E. belemia* (Esper) for the first time from this part of Africa and described the very distinct subspecies *abyssinica*. The data mentioned are as follows:

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| Holotype ♀ | 11. xi. 1926, Abyssinia, Mt. Chillalo, 8000 ft., H. Scott leg. and |
| 1 ♀ | 18.—25. vi. 1919, Ogo, 5000 ft. British Somaliland, J. P. S. Clarke leg. |

The latter, somewhat worn, specimen was not designated as paratype, but was mentioned as "almost certainly to be referred to this subspecies". The specimen in the British Museum (Natural History) confirms his view. In his paper, Riley pointed out a possible confusion in the earlier record of *E. falloui*.

Nonetheless, Talbot (1932a, b) shortly afterwards reported another specimen of *E. falloui*, referring it to the "ssp. *obsolescens* Rothschild" which is in fact best regarded as representing extreme "dry season" forms. This record was based on a single specimen:

1 ♀ xii. 1929, Shimba Beris, lat. 10.45N., long. 47.12E., 7000 ft. This record, by one of the then leading specialists of Pieridae who obviously knew Riley's work, must have dispelled the doubt raised by Riley (1928). However, as will be seen below, Talbot in reality succumbed to the pitfall of which Riley had implicitly warned and, in retrospect, only strengthened Riley's point.

In the collection of the British Museum (Natural History) there is a female specimen of *E. belemia abyssinica* with the following data: Br. Somaliland. Shimba Beris, Surud Range 7000 ft. (10.45N/47.12E), Dec. 1929, C.L. Collenette.

An attached note by G. Bernardi, dated 1963, gives the identification of this specimen with which I completely agree. There is hardly any doubt that this specimen was the one on which Talbot based his record of *E. falloui*. The following reasons may be listed. 1.) The data published by Talbot completely agree with those on the label; 2.) Although Talbot found this specimen in the course of studying a collection made by C. L. Collenette, *E. belemia* is not listed as found in the collection (Talbot, 1932a); 3.) This specimen has been arranged in the Museum (at least until 1975 when I last saw it) with *E. falloui* and not in a drawer containing *E. belemia*. Thus, it must be concluded that the more recent of the two Somali records of *E. falloui* was an error.

Unfortunately, I have been unable to trace Sharpe's specimens, nor could I find any authentic specimens of *E. falloui* from the area. Therefore, a formal verification or refutation of her record based on actual specimens is not feasible. Under these circumstances, another approach is necessary if we are to have more than a guess since she could be correct.

2. Habitat of Sharpe's „*E. falloui*“.

As described in detail elsewhere (Nakamura, in prep.), the main ecological characteristic of the habitat of *E. falloui* can be defined in relatively simple terms. In both the Negev Desert, southern Israel, and the northwest Africa, *E. falloui* is confined to the desert with less than about 125 mm of annual rainfall. In contrast, the 125 mm isohyet approximately marks the dry end limit of a permanent habitat of *E. belemia*. Thus, both species are largely allopatric with a relatively narrow overlap. *E. belemia* occasionally penetrates deep into the habitat of *E. falloui*, but the opposite, namely an intrusion of *E. falloui* into the more humid territory of *E. belemia*, does not seem to happen. The scanty data available for the habitats of these species in the Arabian Peninsula are also in agreement. A second aspect of *E. falloui* to be noted is the apparent lack of migratory tendency. Because of this, or rather instead of acquiring such capacity, *E. falloui* has developed a highly sophisticated means of coping *in situ* with the irregular desert climate, i.e. an ability to remain in pupal diapause for at least three years (Oberthür, 1915; Nakamura and Ae, 1977). As a widespread desert species ranging

from western Sahara to Saudi Arabia without showing appreciable geographical variations in the habitat preference as well as in superficial characters, we can safely assume that its ecological characteristics in Somaliland, if it did occur, would not be markedly different. With this in mind, we now ask if Sharpe's localities possess ecological conditions acceptable to *E. falloui*.

The Waggar Mountains („Wagga“ of Sharpe) lie about 40 miles (64 km) southeast of Berbera along the coast of the Gulf of Aden. The highest point of the range is about 6670 ft. (2002 m). Sharpe's altitude of 6500 ft. (1950 m) is therefore close to the summit. The exact location of „Rugga Pass“ is not known to me, but it is probably also on high ground in the same area. Detailed information is available for the vegetation and ecology of the area (Hemming, 1966), as follows. The higher parts of the Waggar are well inside the „*Juniperus procera* Endl. forest zone“ which in this area consists of extensive climax forests of tall *Juniperus* trees. These trees grow close together with minimal development of side branches so that the forest floor is poorly lit. Only a few other trees contribute to the forest vegetation; a shrub *Pavetta phillipsiae* and a small (6—8 m) tree *Cassipourea malosnan* at about 6000 ft. (1800 m). The lichen *Usnea articulata* flourishes on the trees wherever it is exposed to light. Below the „*Juniperus* forest zone“ is the „evergreen scrub zone“ which occupies from about 5000 ft. (1500 m) up to the lowest limit of the *Juniperus* forest. The ecological zonation in the whole area depends heavily on the rainfall. Thus the „evergreen scrub zone“ in the Waggar Mts. is estimated to have between 450 and 600 mm of annual rainfall, while the wetter „*Juniperus* forest zone“ may receive 600 to over 800 mm. Mist develops frequently. As probably is the case with „Ogo“ (? = „Wagga“), 5000 ft., „Rugga Pass“ may traverse the „*Acacia etbaica* Schweinf. open woodland“ which can be found in this area from about 3000 ft. (900 m) to 6000 ft. (1800 m), depending on the edaphic and other local factors, with a minimum of 300 mm of rainfall. Several specimens of *E. belemia abyssinica* have been collected in Ethiopia in this type of open *Acacia* woodland at 6—7000 ft. (1800—2100 m), south of Addis Abeba, including Bishoftu [K. M. Guichard, pers. commun.; the specimens in the British Museum (Nat. Hist.)]. The misidentified specimen of *E. belemia abyssinica* recorded by Talbot (1932a) comes from 7000 ft. (2100 m) in the „*Juniperus* forest zone“ of Surud Mts. which receives about 750 mm of rainfall (Hemming, 1966). The above reference to the *Juniperus* forest in the Waggar is not meant to suggest that Sharpe's specimens were actually caught inside the forest, although according to Talbot his specimen was found „in an extensive forest of *Juniperus procera* Hochst. [sic]“. What concerns us here is the relatively wet and cool climatic conditions that support such vegetations. It is obvious that her „*E. falloui*“ were flying in an environment entirely different from any normal habitat of *E. falloui*. It is a habitat *E. falloui* appears unable to penetrate elsewhere in its range. On the contrary, these habitats seem to be characteristic of *E. belemia abyssinica* in Somaliland. In view of the observations mentioned earlier, these specimens are also unlikely to be strays of *E. falloui* from lower altitudes. Therefore, the most reasonable conclusion would be that Sharpe, like Talbot, misidentified specimens of *E. belemia abyssinica* and that Somaliland should now be excluded from the known range of *E. falloui*.

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Autor(en)/Author(s): Nakamura Ichiro

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