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Taxonomy of Two New Zealand Butterfly Species
(Nymphalidae: Satyrinae)

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Abstract

COMPARATIVE descriptions of the genera *Erebiola* Fereday, *Coenonympha* Hübner, *Percnodaimon* Butler, and *Erebia* Dalman, based on male genitalia, are given in a note by B. C. S. Warren. It is confirmed that the two New Zealand species, known as *Erebia pluto* and *Erebia butleri*, are not congeneric and they are re-established in the genera *Percnodaimon* and *Erebiola* respectively. *Dubierebia* Muschamp is synonymised with *Erebiola* Fereday.

The two species *Percnodaimon pluto* (Fereday) and *Erebiola butleri* Fereday are listed, and the validity of the name *pluto* is discussed.

Two dark Satyrine butterfly species in New Zealand have long been known as *Erebia pluto* Fereday and *Erebia butleri* (Fereday) following publications by Hudson (1898, 1928, 1939). The former species had earlier been designated type species of the genus *Percnodaimon* Butler, 1876, and the latter was first described as the type species of the genus *Erebiola* Fereday, 1879.

Specimens of these species have recently been examined to determine the generic position of each, particularly in relation to the genus *Erebia*. The following section of this paper has been prepared by Mr B. C. S. Warren, of England, author of the "Monograph of the Genus *Erebia*" (1936). Descriptions and synonymy herein should, in future, be credited to him.

ANATOMICAL NOTES ON THE SATYRID GENERA *Percnodaimon* BUTLER AND *Erebiola* FEREDAY (= *Dubierebia* MUSCHAMP).

B. C. S. WARREN

It is now fairly certain that all true phylogenetic genera are clearly distinguished by the characters of the male genitalia. Chapman was, I think, the first to suggest this in his "Review of the genus *Erebia*" (1898. *Trans. Ent. Soc. Lond.*, 1898 (3): 209-239), and it is interesting in the present connection to note that on that

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occasion he removed the Palaearctic species then known as *Erebia myops* from *Erebia*, remarking that the form of the tegumen (implying the entire dorsal part of the structure), suggested an alliance with *Coenonympha*. Muschamp in his critical study of that genus (1915. *Mitt. Entomologia Zürich*, 1915 (1): 12-26), points out that in fact *myops* is not a true *Coenonympha*, adding that he was unable to find any Holarctic Satyrid genus with which he could unite it. He therefore erected a new genus, *Dubierebia* Muschamp, for it. I had never dissected a specimen of *myops*, but on examining *Erebiola butleri* I realised that this species must be con-generic with *myops*. Muschamp's action, based entirely on his study of the male genitalia in Satyrid genera, was a remarkable confirmation of Fereday's recognition of the genus *Erebiola* 36 years before.

As *myops* has usually been placed with *Coenonympha* in recent times I here contrast *Erebiola* with the latter genus.

Genus *EREBIOLA* Fereday, 1879 (= *Dubierebia* Muschamp, 1915 syn. nov.) Fig. 1.

Uncus; short and broad, shorter than the tegumen, dorsal ridge flat; the *brachia* short, curved, directed upwards, their tips reaching or just passing above the uncus. (The concise term "brachia" was introduced by Muschamp in his work on the genus *Epinephele* (1915. *Ent. Record*, 27: 152-156), in place of the cumbersome "Lateral process of the uncus". I have employed it in all my works).

Claspers; short, broad in proportion to their length, terminating, but little reduced in width, the tips curiously twisted, the ventral edge curling above the dorsal; entirely without spines or teeth. The *saccus* without lateral lobes.

Genus *COENONYMPHA* Hübner, 1819

Uncus; longer than the tegumen, very slender, little broader than the *brachia*, dorsal ridge convex; *brachia* also long and narrow, the tips passing well above the uncus, dorsal edges flat. *Claspers*; long and slender tapering rapidly to a fine, simple point. *Saccus*; without lateral lobes.

The latter feature and the upward direction of the *brachia* are the only characters suggestive of affinity between the two genera; on the other hand the short, thick uncus, the concave dorsal edge of the *brachia* and their lesser length and the unique type of clasper, in *Erebiola*, all indicate some completely independent line of evolution from *Coenonympha*. *Erebiola* is equally widely separated from *Erebia*; the direction of the *brachia*, the even, unbroken curve of the dorsal edge of the clasper, entirely without spines or teeth, the absence of lateral lobes to the *saccus* in *Erebiola*, result in a structure that does not exhibit a single character of importance in common with *Erebia*.

It will be useful to compare Fig. 1, with the plates given by Muschamp in his paper on *Coenonympha* (1915. *Mitt. Entomologia Zürich*, 1915 (1): 12-26), and with those in my "Monograph of the genus *Erebia*" and with the only figure I know of, of the genitalia of *Erebiola myops*, that given by Chapman (1898. *Trans. Ent. Soc. Lond.*, 1898 (3): Pl. XVI, fig. 56). It may be noted that all figures of complete genitalia of any species, large or small, given in my works and done by myself, were taken at exactly the same magnification, so that any comparison between different species will be absolutely reliable.

Genus *PERCNODIAMON* Butler, 1876. Fig. 2.

This genus is an extremely primitive one, as a glance at the featureless claspers will show. The differences that separate it from *Erebia* can be listed as follows.

Uncus; dorsal edge concave. *Brachia*; straight, dorsal and ventral edges flat. *Claspers*; roughly elliptical, dorsal edge an unbroken, gradual curve; entirely without spines or teeth; distal extremity bluntly pointed, resembling proximal end so closely that if the clasper were reversed from end to end the overall appearance would scarcely be changed. *Saccus*; without lateral lobes.

Genus *EREBIA* Dalman, 1816

Uncus; dorsal edge flat or convex. *Brachia*; very variable, but curved in some manner. *Claspers*; multi-formed, highly specialised, dorsal edge extensively irregular, elaborate development of spines and teeth of infinite variety; distal extremity highly specialised, reversal of position would produce grotesque appearance. Lateral lobes of *saccus* always present and strongly developed.

It remains obvious that these two genera are entirely dissimilar, the only reason for uniting them has been similarity of colour of the butterfly, but this colour is by no means confined to the *Erebias*, it appears in many Satyrid genera. It would be equally unjustifiable to unite *Percnodaimon* and *Erebiola* as one genus, or to include either in any well-known Satyrid genus.

The two species, *Percnodaimon pluto* and *Erebiola butleri*, were omitted from my "*Monograph of the genus Erebia*" because their superficial characters did not correspond with those typical of the genus; further, the true *Erebias* are restricted to the arctic and alpine regions of the northern Hemisphere. Only a very few species have attained the lower levels of southern Europe and none has reached the mountains of north Africa or even the islands of the Mediterranean. That they could have passed through the tropics to reach New Zealand seems out of the question.

Consequent upon the above generic re-descriptions by Warren it is now possible to list the New Zealand species as follows. Only the most pertinent references are included in the synonymic lists.

Family NYMPHALIDAE

Subfamily SATYRINAE

Genus *PERCNODAIMON* Butler, 1876

Type species: *Erebia pluto* Fereday, 1872

Percnodaimon pluto (Fereday, 1872)

- 1872. *Erebia pluto* Fereday, *Trans. Proc. N.Z. Inst.*, 4: 217.
- 1875. *Erebia merula* Hewitson, *Ent. mon. Mag.* 12: 10.
- 1876. *Oreina* (?) *othello* Fereday, *Trans. Proc. N.Z. Inst.*, 8: 302-4.
- 1876. *Percnodaimon pluto*: Butler, *Ent. mon. Mag.*, 13: 153.
- 1878. *Percnodaimon pluto*: Butler, *Trans. Proc. N.Z. Inst.*, 10: 268 (repr. in Enys, 1880, *Cat. Butterflies N.Z.*: 10).
- 1879. *Percnodaimon pluto*: Fereday, *Ent. mon. Mag.*, 16: 128, 129 (repr. 1880, *Trans. Proc. N.Z. Inst.*, 12: 264, 265; repr. in Enys, 1880, *Cat. Butterflies N.Z.*: 19).
- 1880. *Percnodaimon pluto*: Enys, *Cat. Butterflies N.Z.*: 21, 23.
- 1883. *Percnodaimon pluto*: Fereday, *Trans. Proc. N.Z. Inst.*, 15: 197.

1898. *Percnodaimon pluto*: Fereday, *Trans. Proc. N.Z. Inst.*, 30: 327.
 1898. *Erebia pluto*: Hudson, *N.Z. Moths and Butterflies (Macro-Lepidoptera)*: 114.
 1928. *Erebia merula*: Philpott, *Trans. Proc. N.Z. Inst.* 59(3): 481.
 1928. *Erebia pluto*: Hudson, *Butterflies and Moths N.Z.*: 31.
 1939. *Erebia pluto*: Hudson, *Suppl. Butterflies and Moths N.Z.*: 387.

Lectotype (new designation): ♂. Mountain near Enys' Station, Porters Pass. 30+31.XII.68+1.I.69. Fereday collection.

This specimen, in the collection of the Canterbury Museum, Christchurch, New Zealand, has been labelled "Lectotype *Erebia pluto*" and determined as *Percnodaimon pluto* (Fered.) by the present author. The male specimen examined by Warren, is in the Canterbury Museum with the genitalia mounted separately on a micro-slide labelled "Dissected by B. C. S. Warren, No. 2438".

Philpott (1928) believed *Erebia merula* Hewitson to be the correct name of this species, considering Fereday's original mention of the species to be an inadequate description. Hudson (1939) stated a case for the retention of the name *Erebia pluto*. In recent discussion with several interested entomologists in New Zealand the author has found that different opinions are still held so this point needs to be clarified.

The pertinent phrases of Fereday's original publication (1872) are as follows, ". . . black butterfly . . . on the range near Castle Hill Station, West of Porters Pass . . . Mr J. D. Enys was . . . the first person to discover this species . . . I believe it to be a species of *Erebia*, and have named it *E. pluto*." The present author accepts the name *pluto*, in accordance with Articles 12 and 23 of the International Code (1961), being the oldest available name by description or definition. If it is considered that the above words of Fereday are an inadequate description, at least the species is adequately defined. The lectotype specimen is a black butterfly in the Fereday collection, collected on a "Mountain near Enys' Station, Porters Pass", approximately three years before Fereday's paper was published. Although the actual description is brief it should be remembered that many wordier descriptions have been found inadequate for the separation of species until the type specimens have been re-described.

The only similar New Zealand Satyrine butterfly which could possibly be confused with *Percnodaimon pluto*, in general appearance, is *Erebiola butleri*, but the former was well described and the name established before the latter was discovered. Fereday (1876) re-described the species under the name *Oreina* (?) *othello*, but this name change was made in error as *pluto* had not previously been used for a species of *Erebia*. Butler (1876) established the combination *Percnodaimon pluto* and synonymised *Erebia merula* Hewitson, stating "Although Mr Fereday only describes this species as black, . . . his name will have to stand, since there is no other black *Erebia* in New Zealand". Butler (1878) listed both *Erebia merula* Hewitson and *Oreina* (?) *othello* Fereday as synonyms of *Percnodaimon pluto* Fereday. It is of interest to note that when the second dark mountain butterfly species, *Erebiola butleri*, was discovered, it was immediately considered by Fereday to be generically distinct from *Percnodaimon pluto*, a position which is now re-affirmed.

There is one further matter which must be mentioned. *Papilio pluto* de Prunner, 1798, was placed in *Erebia* by Warren (1929). Thus the names *Erebia pluto* Fereday, 1872, and *Erebia pluto* (de Prunner, 1798) are secondary homonyms, the former being junior to the latter. Under Article 59(b) of the International Code (1961), the junior homonym should be rejected, but such action has never been taken. As *pluto* Fereday and *pluto* de Prunner are now considered not to be congeneric, the former name is still available under Article 59(b).

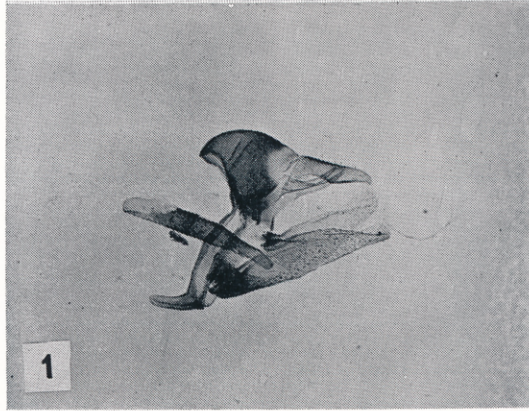


FIG. 1.—*Erebiola butleri*, ♂ genitalia ($\times 18$ diameter).

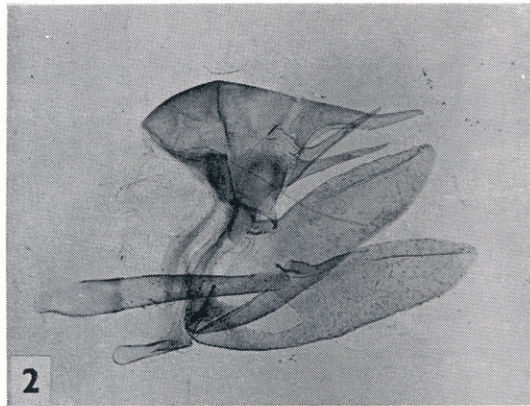


FIG. 2.—*Percnodaimon pluto*, ♂ genitalia ($\times 18$ diameter).

It is considered by the present author that the combination *Percnodaimon pluto* (Fereday, 1872) is the correct and valid name for this species.

Genus *EREBIOLA* Fereday, 1879

Type species: *Erebiola butleri* Fereday, 1879

Erebiola butleri Fereday, 1879

1879. *Erebiola butleri* Fereday, Ent. mon. Mag. 16: 129-30 (repr. 1880, *Trans. Proc. N.Z. Inst.* 12: 264-66; repr. in Enys, 1880, *Cat. Butterflies N.Z.*: 19-20).
 1880. *Erebiola butleri*: Enys, *Cat. Butterflies N.Z.*: 23.
 1898. *Erebiola butleri*: Fereday, *Trans. Proc. N.Z. Inst.*, 30: 327.
 1898. *Erebia butleri*: Hudson, *N.Z. Moths and Butterflies (Macro-Lepidoptera)*: 115.
 1928. *Erebia butleri*: Hudson, *Butterflies and Moths N.Z.*: 31.

HOLOTYPE: ♂. Whitcombes Pass, 1878, from J. D. Enys. Fereday collection.

This specimen is in the Canterbury Museum collection with a printed label "Type specimen" pinned beside it in the drawer. It is dated 1878, not 1879 which is the year of collection given in the original description.

The male specimen examined by Warren is in the Canterbury Museum, with the genitalia mounted separately on a micro-slide labelled "Dissected by B. C. S. Warren. Slide No. 2439".

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Mr B. C. S. Warren, of England, has kindly examined specimens of the two New Zealand species concerned, and given permission to incorporate his findings in this paper. Mr E. G. Turbott, then Assistant Director, Canterbury Museum, Christchurch, gave permission for Canterbury Museum specimens to be studied. Part of this work was carried out while the author was on the staff of the Bernice P. Bishop Museum, Honolulu.

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