

The Australian painted lady butterfly, *Cynthia kershawi*, in Dunedin, 1980-1981 (Lepidoptera: Nymphalidae).

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Abstract

An account is given of the 1980-1981 *Cynthia kershawi* McCoy migration to southern New Zealand, with records of sightings of adults over 7 months, host-plants, and general bionomics.

Keywords: Lepidoptera; Nymphalidae; *Cynthia kershawi*; Otago; New Zealand.

INTRODUCTION

Among the Australian Lepidoptera there are several species that migrate fairly regularly to New Zealand, but by far the most persistent of these is the Australian painted lady butterfly, *Cynthia kershawi* McCoy. Although its invasions of New Zealand are well documented (e.g., by Gibbs 1969; Fox 1975, 1978) the present note is the first record of its breeding in the wild in Otago.

Table 1. Sightings of *C. kershawi* adults in the wild. * = specimens very tattered and faded. E.C. = Mrs E. Cook; A.H. = A. Harris; J.E. = Miss J. Egerton; B.P. = Mr B. Patrick.

Date	NUMBER SIGHTED
October 2-5	hundreds, Invercargill, B.P.
10	14, Dunedin, A.H.
11	17, Dunedin, A.H., J.E.
12	23, Dunedin, A.H.
13	12, Dunedin, A.H. "About 24", Dunedin Peninsula, J.G. Pilkington.
17	15, Dunedin, A.H., J.E.
18	6, Dunedin, A.H., J.E.
November 6	12, Dunedin, A.H.
10	2, Central Otago, E.C.; 1 Central Otago, B.P.
12	6, Central Otago, F. Wilson.

(In addition to these sightings, visitors to the Otago Museum reported sightings throughout Dunedin, the Peninsula, and Central Otago during October-February.)

December 7	6, Dunedin, A.H.
12	6, Central Otago, F. Wilson, 2, Dunedin, A.H.
January 5	1, Central Otago, E.C.
25	7, Dunedin, A.H., J.E.
February 1	2, Dunedin, A.H.
12	2, Dunedin, A.H.
17	1, Dunedin, A.H.
21	3, Dunedin, A.H.
26	1, Dunedin, A.H.
March 10	2, Dunedin, A.H.*
17	1, Dunedin, E.C.*
22	2, Dunedin, A.H.*
April 3	1, Dunedin, A.H.*
7	1, Dunedin, A.H.*

C. kershawi IN OTAGO-SOUTHLAND 1980-1981

The first South Island record of the 1980 *C. kershawi* invasion was that of Mr B. Patrick who noted (pers. comm.) that hundreds of painted lady butterflies appeared in Invercargill between 1-5 October 1980. These were mostly flying rapidly and high, arriving over the sea and disappearing inland. The first Dunedin sightings were on 10 October 1980, and from then until mid April 1981 they were recorded all over Dunedin and the Peninsula and throughout Otago (Table 1).

The butterflies were uniformly of exceptionally vivid colouration and in perfect condition, and almost all of them were females. They would seem to have belonged to a freshly-emerged spring generation.

Behaviour of the butterflies in Dunedin differed notably from that in Invercargill. When they first appeared numbers of them hovered about the tops of hills (e.g., Peggy's Hill, Flagstaff, Mt Cargill). On the flats during the same day they were very low flying, and appeared in urban gardens in groups of 5 or 6, where they would search out composite plants and oviposit rapidly in small bursts, between hovering above host plants and basking on the ground for short intervals, as described by Gibbs (1980:123).

Eggs were laid in the wild on chrysanthemum, Scotch thistle (*Cirsium vulgare*), and various *Helichrysum* and *Gnaphalium* species. Larvae on Scotch thistle and chrysanthemum did not develop beyond the 1st instar, whereas those on *Helichrysum* and *Gnaphalium* developed into adult butterflies. In captivity, larvae developed more rapidly on *Gnaphalium sphaerium* than they did on both *Helichrysum bracteatum* (an Australian annual) and *H. bellidioides* (a New Zealand endemic), on which they were very restless, almost constantly wandering about the plants and their containers. Larvae very noticeably wandered less on *Gnaphalium sphaerium*.

Eclosion occurred 7½-8 days after the eggs were laid in the Otago Museum, in the wild, and in private dwellings (A.H., J.E.) (c.f. "about 12 days", Gibbs 1980). Larval development from eclosion of the egg to pupation was in all cases grossly retarded, varying from 61 to 104 days. The pupal stage lasted from 14 to 18 days. A large proportion of butterflies that spent over 80 days in the larval stage (mostly those reared on *Helichrysum*) were malformed, being typically minute (wing-span 20-21 mm versus 26 mm for the parents), or had the wings on one side of the body very notably smaller than the corresponding pair. In addition, the abdomen frequently failed to separate from the exuviae on emergence (Table 2).

Table 2. Development rates of life history stages on different host plants.

Host plant	Egg	Days	Larva	Days	Pupa	Days	Adult (Comments)
<i>Gnaphalium sphaerium</i> A.H.	11-18 Oct 1980	8	18 Oct 1980 to		19/20 Dec 1980		10 normal
	(11 individuals)		-19 Dec 1980		to . . .		(1 did not separate from pupa)
			(8 individuals)	61-63	-3 Jan 1981	15-	
			-20 Dec 1980		(8 individuals)	18	
			(3 individuals)		-4 Jan 1981		
					(2 individuals)		
					-6 Jan 1981		
					(1 individual)		
<i>Helichrysum bellidioides</i> A.H.	11-18 Oct 1980	8	18 Oct 1980 to	78-86	6/15 Jan 1980		6 normal
			6/15 Jan 1981		to 20/30 Jan 1981		1 minute
			(26 individuals)		(26 completed pupation, 12 pupal mortalities	14-15	7 teratological abnormalities
<i>H. bracteatum</i> J.E.	11-18 Oct 1980	8	18 Oct 1980 to	82-104	7/29 Jan 1981		4 teratological abnormalities,
	(23 individuals)		7/29 Jan 1981		to 21 Jan/11 Feb 1981	14	10 normal
			(23 1st instars; 6 subsequent mortalities)		(17 individuals)		(3 did not separate from pupa)
Scotch Thistle A.H.	14-21 Oct 1980	8	(all died in 1st instar)				
(12 individuals)							
Chrysanthemum sp. A.H.	11-18 Oct 1980	8	(all died in 1st instar)				

9 larvae taken in the wild in about the 3rd instar on *Helichrysum bracteatum* during late November and reared indoors on that plant gave rise to normal butterflies that emerged between 29 January and 11 February 1981 (J.E.). Brightly-coloured, non-tattered adults sighted throughout Otago in January and February, and faded, tattered individuals sighted in March and April, were probably from a New Zealand-bred generation.

PARASITISM

The following Hymenoptera emerged from pupae collected in the wild during December 1980 and January 1981: *Pteromalis puparum* (Linnaeus) (Chalcidoidea: 1 pupa, A.H.; 2 pupae, J.E.); *Lissopimpla excelsa* (Costa) (Ichneumonidae: 2 pupae, A.H.); *Ecthomorpha intricatoria* (Fabricius) (Ichneumonidae: 3 pupae, A.H.); *Aucklandella pyrastis* (Cameron) (Ichneumonidae: 1 pupa A.H.).

OTHER AUSTRALIAN LEPIDOPTERA IN DUNEDIN IN 1980

Also present in Dunedin between 10-20 October 1980, were *Danaus chrysippus petiola* (Stoll) (1 sighting); *Othreis materna* (Linnaeus) (2 sightings); *Heliothis punctigera* (Walk.) (5 sightings); and *Agrotis munda* Walk. (3 sightings). It is likely that these migratory species were brought to Dunedin by the same set of circumstances that applied for *Cynthia kershawi*. On 16-17 November 1980, one *Melanitis leda bankia* (Fabricius) with

large ventral eyespots was observed by Mrs P. Boocock and myself at dusk and at dawn flying around a porch light in Leith St.

DISCUSSION

Large immigrations of Australian butterflies may occur in New Zealand when population numbers are high in Eastern Australia and trans-Tasman winds are favourable (Gibbs 1969). Both conditions occurred in early October 1980. Mr I. F. B. Common stated (pers. comm.) that *C. kershawi* was "very abundant in eastern New South Wales in October 1980"; from his personal experience "especially on the southern tableland and at the higher altitudes in the Brindabella Range, near Canberra". "During October, large numbers of these butterflies moved roughly in a south-westerly direction". Hickman (1980, p. 3631) noted that in New Zealand an "exceptionally high frequency of north-west winds occurred during September 1980". Mr A. I. Tomlinson (pers. comm.) stated that there were unusually strong and persistent northwest winds in September 1980, while in August the westerlies over the Tasman sea were more persistent and stronger than usual. In October, the strong west to northwest conditions over the Tasman Sea broke on the 4th, but reestablished on the 6th and continued until the 9th. There is therefore little doubt that during September and the early part of October 1980 there were abundant opportunities for trans-Tasman insect dispersal.

The fact that larvae took up to 104 days to pupate suggests that Otago is almost too cold for even a summer generation of *C. kershawi*. Nevertheless, the discovery of larvae and pupae in the wild between November and February, and the scattered observations of freshly-emerged adults in January and February indicate that a few individuals were able to develop to maturity in the wild.

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