Atalanta (Juni 2001) 32(1/2):75-79, Würzburg, ISSN 0171-0079

On the occurrence of *Vanessa atalanta* (Linnaeus, 1758) and *Vanessa cardui* (Linnaeus, 1758) in Central Norway 1999 and 2000, and earlier stage records of both species north of the Arctic Circle in North Norway 2000

(Lepidoptera, Nymphalidae)

by

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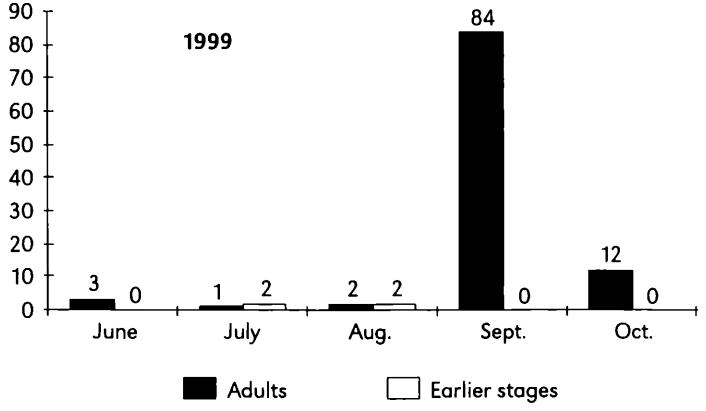
received 12.II.2001

Abstract: *Vanessa atalanta* migrated to Central Norway both in 1999 and 2000. According to records of earlier stages, the migration which took place in 2000 was considerable larger than the migration of the previous year. Between 16. August and 27. October 2000 the author recorded totally 723 larvae and 57 pupae in Central Norway, mainly around Trondheim.
Vanessa cardui did not appear in Central Norway in 1999, but a minor migration of this species took place in 2000.
On 29. and 30. August 2000 the author collected caterpillars of both *V. atalanta* and *V. cardui* in Bodø, 67.3 degrees north latitude, in North Norway.

1999

Weather dates are obtained from the Weather Service at the Trondheim airport. The temperatures in spring and summer was close to normal. The average temperature in September was 4.8 degrees higher than average for the last 30 years. October was close to normal. May and August were drier than the average for the last 30 years. In both June and July the precipitation was about 50% higher (105 and 143 mm) than the average for these months. September was the driest month with only 30% (34 mm) precipitation compared to average.

9. to 11. June warm winds from the southeast with a clear sky occured. Traditionally this is the weather pattern which allows migrant lepidoptera to arrive in Central Norway. On 10. June the author observed one single individual of *V. atalanta* flying two meters above the ground towards northwest. On 11. June one individual behaving stationary was seen. Both observations were made at the authors home in Buvika, close to Trondheim. Next observation was done at the same place on 26. June and included another stationary individual. A worn male was seen hilltopping in Buvika on 13. July. This was the fourth and last observation of *V. atalanta* representing the migrants, and the author believes that these migrants arrived in one single wave around 10. June. The general impression of days with cloudy weather and rain in much of June and July made it difficult for the author to do observations. Besides, with the exception of the mentioned short period in June, the unfavourable weather most probably did not allow *V. atalanta* to arrive at other times in June and July.
The author collected two 5th instar caterpillars on the same *Urtica dioica* plant in Buvika on 22. July, and when comparing this date to the suggested time for arrival of the parent generation,



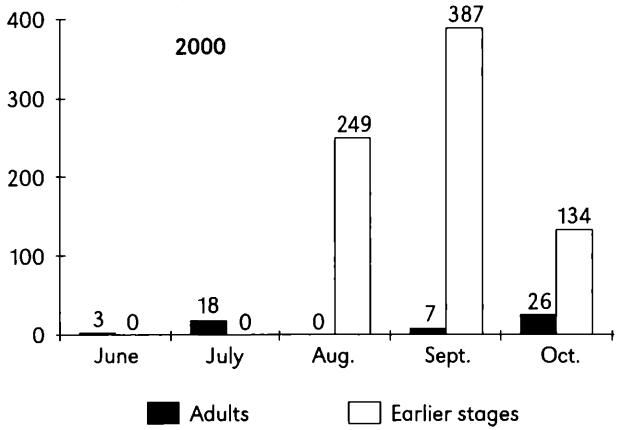
they originated from eggs deposited short after arrival. Perhaps the female was fertilized even before the arrival. Another two 5th instar caterpillars, also feeding on *U. dioica*, were collected on 22. August in Buvika. The author searched for more caterpillars in the area, but did not succeed in finding any.

The first fresh individual of the new generation *V. atalanta* was observed in Buvika on 26. August when feeding on fermented fruit. This bait was placed close to a forest edge running from northeast towards the southwest a few meters behind the authors house. From 26. August to 17. September the number of individuals feeding on the fruit differed from one to three on days with fair weather. Single individuals were also seen in other localities in Central Norway, especially in Trondheim. Most of these were stationary and were often observed when nectaring on flowers.

From 18. to 21. September the number of individuals which were observed increased for a short time. On 21. September 9 individuals of *V. atalanta* were seen at the same time during a couple of afternoon hours in the authors garden when feeding. A few of these were observed when arriving in the garden along the forest edge from the northeast. The author suggests that they represented a part of a migration from areas farther north. The following day the number of individuals was reduced to three, and on 23. September only one single individual stayed in the garden.

The author observed the last two individuals of *V. atalanta* in Buvika on 19. October, a day with sunshine but temperature reaching only 5 degrees. These two individuals had stayed permanently around the authors house since early October, and were easily identified by lacking smaller pieces of the wings due to attacks from birds.

Even though many individuals of *V. atalanta* behaved stationary during late summer and autumn 1999, the author did not observe any territorial and mating behaviour among them. It is worth mentioning that the native *Aglais urticae* and *Polygonia c-album* normally begin to hibernate during September. In 1999 the last butterfly for the season, with the exception of *V. atalanta*, was a single individual of *P. c-album* observed on 26. September. Individuals of *V. atalanta* which do not migrate south, obviously continue to stay on the wing until severe weather kills them. The author did observe that *V. atalanta* appeared earlier in the morning



than *P. c-album*, which also regularly feeds on fermented fruit in the authors garden. Likewise, *V. atalanta* was the last species to be observed in the afternoon when the conditions had become chilly. Even a high tolerance to windy weather was observed among individuals of *V. atalanta. P. c-album* is more sensitive to strong and gusty wind, and under such conditions the species seek shelter in the vegetation. On certain cases, both in 1999 and 2000, the author was amazed by observing individuals of *V. atalanta* thrown up in the air and transported far away by strong gusts but manoeuvring safely back against the strong wind to the fruit shortly after.
From 26. August to 19. October 1999 the author observed totally 98 individuals of *V. atalanta* in Central Norway representing the new generation. This "large" number must be seen in view of the fact that the warm and dry September gave the author numerous opportunities to observe butterfies on the wing.

2000

Spring was warm, and especially from 25. April to 17. May the temperature was high for the season. During this period winds from the south and southeast dominated. In both April and May the temperature was above average. Precipitation was only 30% of average for the period. In deep contrast to climate in spring, summer was cold. Central Norway experienced sunny and warm weather at the end of June and early July, and again at the end of July. June, July and August were cold months. On average precipitation was close to normal during these months. Temperature in both September and October was above average, and these two months were very dry. The first half of October was warm. At the end of the month, temperature began to drop well below zero.

Having established a territory, the author observed one male *V. cardui* on a hilltop on 1. June. About 20 meters further down one male *Vanessa atalanta* had set up a territory along a line

of trees. This was the first observations of both species for the season, and the individuals looked rather fresh. They had probably arrived before 18. May. The conditions during three weeks before this date were very good for migrants from the south. The rest of May was rather cold and wet. Observations from Sweden and Denmark strengthen this theory. In southern Sweden *V. atalanta* was reported on 23. April, and in both southern Sweden and Denmark *V. atalanta* and *V. cardui* occured during the first half of May.
The author observed only four individuals of *V. cardui* during the summer. In addition to the one mentioned seen on 1. June, the species was observed by the author in July on following dates: 10., 21. and 29. Also the last three individuals represented hilltopping males, and these were worn and faded.
The situation for *V. atalanta* was different. In June only two more individuals were seen after the first observation done on 1. June. In July the number of individuals of *V. atalanta* obviously increased, and the author suggests that a second wave migrants arrived during a few warm and sunny days with easterly wind in late June and early July. On 9. and again on 22. July three males were seen at the same time when fighting for a territory. On 21. July one female was seen when depositing eggs on *U. dioica*. On the few sunny days in July 18 individuals of *V. atalanta* were seen.

The first seven *V. atalanta* caterpillars were collected on 16. August in Buvika. A pupa, killed by a wasp, was found in Trondheim on 19. August. The author observed 248 caterpillars in August, mainly in Buvika and Trondheim. Only the above mentioned pupa was found. The caterpillars represented all five stages. In September 356 caterpillars and 31 pupae were found. In one single locality in Trondheim, about 25 meters along a dirtroad where *U. dioica* is growing commonly on both sides, 55 caterpillars and 4 pupae were collected on 9. September. In other localities where *U. dioca* is a common plant, few if any earlier stages *V. atalanta* occurred. The females are obviously attracted to certain localities when ovipositing. Most caterpillars were seen in sunny situations, but with a certain degree of vegetation close to the foodplant, *U. dioica*. Also the quality of the foodplant plays an important matter. Dry and open areas were generally poor in larvae.
In October 109 caterpillars and 25 pupae were collected. While caterpillars observed in September still represented all five stages, only 4th and 5th stage larvae occurred in October. The last caterpillar alive, was found on 22. October in Buvika.

The author collected caterpillars of *V. cardui* only on two occasions in Trondheim in September. On 6. and 22. September 39 3rd to 5th stage caterpillars were collected when feeding on *Cirsium arvense* in dry and open localities. Further searching in identical localities gave no results.

No *V. atalanta* were seen in August. The first two fresh individuals were observed on 23. September in Buvika. Even though larvae of *V. atalanta* still were common in the end of September and in October, a certain number of adults hatched during this period. Adults were never seen commonly, and the highest number for a day, four individuals, were observed on 13. October in the authors garden. At the same place the last three individuals for the season were observed on 20. October. A few days later the temperature stayed permanently below zero for a couple of days, and both adults and earlier stages *V. atalanta* were killed. The author found a frozen caterpillar on 27. October.

33 adult individuals of *V. atalanta* were observed from 23. September to 20. October. Most of the observations were done in October. No individuals of *V. cardui* were seen on the wing during autumn. Probably this species did not succeed in producing a new generation in Central Norway in 2000. Both *V. atalanta* and *V. cardui* suffered from the cold conditions in June, July and August which influenced on mating, ovipositing and the development of eggs and caterpillars.

Individuals of *V. atalanta* migrating south were seen in October. On 2. October two indivduals were observed when flying south along a dirtroad surrounded by trees in Trondheim. One of these was observed when entering a spot where the road turned west. Here the individual left the road by circling 20 meters upwards and continued the travel towards the south at this height over an open area.
On 13. October another individual was seen migrating towards the southwest at 5.30 p.m. about 25 meters above the ground over the authors house. At this time the sun was so close to horizon that it was not visible from the ground.Tropical hurricane Isaac dominated the weather in the Norwegian Sea between 5. and 10. October. Strong, warm sutherly winds dominated. This weather pattern was very unfavourable as migration to the south against the strong wind was impossible.
As was the case in 1999, also stationary individuals of *V. atalanta* were seen in Central Norway late in season in 2000.

In connection with the profession, the author participated in a conference in Bodø, north of the Arctic Circle in North Norway, on 29. and 30. August. During some short walks on these days caterpillars of both *V. atalanta* and *V. cardui* were accidentally collected. All appeared almost in the center of Bodø in an industrial area where scattered colonies of *U. dioica* and *C. arvense* grow. 24 caterpillars, 12 of each species, were found. The author has never before observed earlier stages *V. atalanta* and *V. cardui* in North Norway. This is probably the northernmost earlier stages record of both species in Norway.

Acknowledgements
I thank James Mori, Sonora, CA, USA, for reading my manuscript critically.

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