

Haymaking in the Aggtelek National Park

Background

On 2nd July at Kelemér, the first day of our visit to the Aggtelek National Park,



under the supervision of Sandor Boldogh, we observed the effects of cutting hay with the mower set at different heights and also the effects of the speed of the tractor on insects caught up in the hay cutting process.



Our task was to search the mown hay for injured crickets,

grasshoppers and other insects that might have been unable to escape the cutting process. Interestingly, no butterflies or moths were

observed as having been injured in the process.

Cutting hay in wet conditions

A few days later during the evening of 7th July we experienced a thunderstorm and subsequent heavy rain considerably reduced the temperature and left the ground well soaked overnight. In the morning it was cloudy and cool when we set off to do our next survey at Perkupa and as we left the hostel shortly after 9 am we noticed that several of the meadows adjacent to the road from the Szalamandra Haz to Szogliget had been cut early that morning.

Prompted by first day's task of careful analysis of cutting techniques, I wondered what effect cutting hay in cool, wet conditions might have on insects roosting within the meadow. With limited time available, mostly before the 8 am breakfast at the hostel, I decided to study the positions of roosting insects in the small remaining uncut meadows near the Szalamandra Haz and to attempt to find out how they would survive in wet, cut hay.

Temperature

The meadows along the road near the hostel are sheltered by trees and hills and do not catch the very early morning sun. One meadow was photographed as the sun came into the valley and temperatures taken at ground level.

The sun reaches a roadside meadow



06.00 ground temp 10°C



07.05 ground temp 10°C



07.10 ground temp 12°C

07.22 ground temp 13°C



The early morning ground-level temperature of the meadow at 06.00 varied from 10 -12°C. By 07.22 the sun had reached the entire meadow and the temperature started to rise steadily. By 07.30 the temperature was 15°C. Each morning the ground was wet with dew and meadow grasses wet to a height of approximately 1 metre in sheltered areas. No rain was recorded in the study period until the final day and the daytime temperatures were in the high 20s to 30s.

Roosting Positions

Most butterflies and moths found roosting in the meadows were covered with droplets of dew early in the morning which quickly dried out as soon as the

sun rose. Butterflies also roost in trees and shrubs as well as within meadow grasses and flowers.



Fritillaries of different species were found in various roosting positions, singly or in pairs, at different sward heights on prominent flowers such as *Stenactis annus*, yarrow, dried grasses, agrimony etc. Roosting heights varied from about 70 cm to 100 cm but generally an exposed flower-head was chosen.

Moths such as the Nine-Spot and other Burnet species were found at similar heights on exposed flower-heads as the fritillaries.



The Forester moth preferred the underside of a leaf on a nearby shrub

The Marbled White was also found to roost in an exposed position, usually head down.





A few Ringlets were found very low down in vegetation, as were day-flying moths and other species of moths. No roosting Meadow Browns were found during my brief survey but it is possible that they prefer to roost in shrubs or trees at the sides of the meadows, as well as deep within the meadow sward.



The only Wasp Spider found quickly dropped to the ground when disturbed but returned to its web shortly after.

Dew-covered crickets and grasshoppers were found at ground level, lethargic but able to jump when disturbed.

The start of the day for two *Mellicta athalia* (Heath Fritillaries)

To find out how butterflies started their day, I watched two *Mellicta athalia* (Heath Fritillary) which had roosted together on a flowerhead of *Achillea millefolium* (Yarrow). When the first rays of sunshine reached the fritillaries at their roosting height of approximately 1 metre, it had the effect of drying out the butterflies' wings within approximately three minutes and consequently the fritillaries were usually the first butterfly species on the wing. The temperature also rose rapidly.



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1. Fritillaries in roosting position.
2. At 07.43 with the air temperature now 15°C and the first rays of sunshine on the butterfly, the first fritillary starts to wake up and puts its proboscis straight into the flower-head.
3. It then slowly turns to expose maximum wing area to the rising sun. It is ready to fly 3 minutes later at 07.46.
4. The second fritillary wakes at 07.46.
5. It dries its wings by 07.49 and (6) briefly basks with the first fritillary before flying away. The temperature in the meadow is now 17°C.



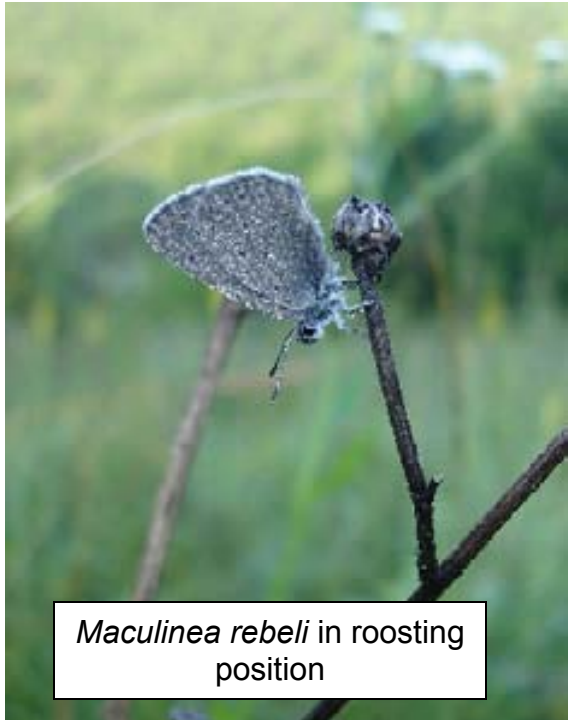
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Protected Species

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Two species of the Large Blue family, *Maculinea rebeli* and *Maculinea arion* were found in another small meadow just off the road.



Maculinea rebeli in roosting position

Like other members of the Blue family, they were found to roost head down and lower down in the vegetation than the fritillary species. However, when disturbed they dropped deeper into the vegetation and were unable to fly until dried out and warmed by the rising temperature.



Roosting *Maculinea arion*

The roosting position of the large blue species and their habit of dropping deeper into the vegetation when disturbed, probably leaves these rare butterflies more vulnerable than more common species, to crushing during mowing in wet, cool conditions.



Female *Maculinea rebeli* laying eggs on *Gentiana cruciata*.

A Wet Morning

This brief study was carried out between 9th July and 15th July 2008 early in the mornings of typical summer days when the temperature rose occasionally to 35°C.

No rain was recorded until the night of 15th July when torrential rain flattened some of the taller flowers where the fritillaries normally roosted.



Roosting fritillaries after torrential rain the previous night were washed out but not washed away!

A *Thymelicus acteon* (Lulworth Skipper) was found roosting at approximately 50cm off the ground, completely unscathed by the downpour with no sign of water droplets or damage.



The temperature was a humid 15°C and Roman Snails were widespread.



Conclusions

Even the most delicate of creatures can survive heavy rain at any time and when the sun reaches them they dry out within minutes. Grasshoppers and crickets are probably not affected by the time of mowing although they are possibly more active in warm, dry conditions.



It is very unlikely that mowing of a wet, cool meadow would have a significant effect on butterfly populations but it is probable that more butterflies will be damaged when they are unable to fly due to lack of warmth and sunshine. Even so they would probably be able to crawl out through the mown hay to reach sunlight reasonably quickly.

The only adverse effects that may arise from cutting hay very early in the morning may be on the rare blue species such as the *Maculinea arion*

(Large Blue) and *Maculinea rebeli* (Mountain Alcon Blue) observed in the meadow close to the road as these blues appeared unable to fly until warmed and dried by the sun

There are probably many colonies of these protected butterflies within the Aggtelek National Park and I am sure most of them will already be noted on the Park records. It may be beneficial to ensure that the areas where the colonies are known to exist are only mown, say, after 9 am when either the temperature or the sun, or a combination of both, will give sufficient warmth for all butterflies to be flying.

I hope these notes may be of some interest to staff involved in managing the hay meadows. I would like to congratulate all those involved in the management and conservation of the Aggtelek National Park which I found during my brief visit to be a beautiful area with a flourishing diversity of flora and fauna, well cared for by a very knowledgeable and capable conservation team.

Christine Tracey
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