The Apollo butterfly (*Parnassius apollo*) on Gotland, Sweden: An assessment of habitat preferences and the negative impact of grazing

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BACKGROUND

Pollinating insect populations, such as grassland butterflies, are currently declining due to fragmentation and loss of habitat. Habitat management implemented to preserve a species should be based on species specific needs. Hence, assessing a species habitat preference is crucial to its preservation. **This study aimed** to assess the habitat preference of the Apollo butterfly on the island of Gotland in order to identify ecological key factors that determine habitat quality.

METHODS

- Surveys were primarily conducted within three fixed focus areas of 3x3 hectare each.
- Environmental variables in circular plots (Ø80cm), with and without larvae, were surveyed along transects.
- Capture-mark-recapture of adult butterflies.
- 3x3 circular plots (Ø80cm)/hectare were surveyed for flowering nectar plants.
- Generalised linear models were used to analyse variation in occurrence/densities.

RESULTS

- Variation in larval occurrence was significantly impacted by seven variables (**Figure 1**).
- Larval density was negatively impacted by grazing (**Figure 2**).
- Adult butterfly density increased with decreasing forest cover and increasing nectar plant abundance.
- Adult butterflies utilised nine out of 30 recorded nectar plants, of which 76.5% were purple (**Figure 3**).

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Mean bush height	Bushes cover
Mosses/Lichens cover^2	Hostplant cover
Distance to hostplant	
Ground moisture index	
Other plants cover^2	

Figure 1. *Variables from generalised linear model, explaining 35.97% of variation in larval occurrence*

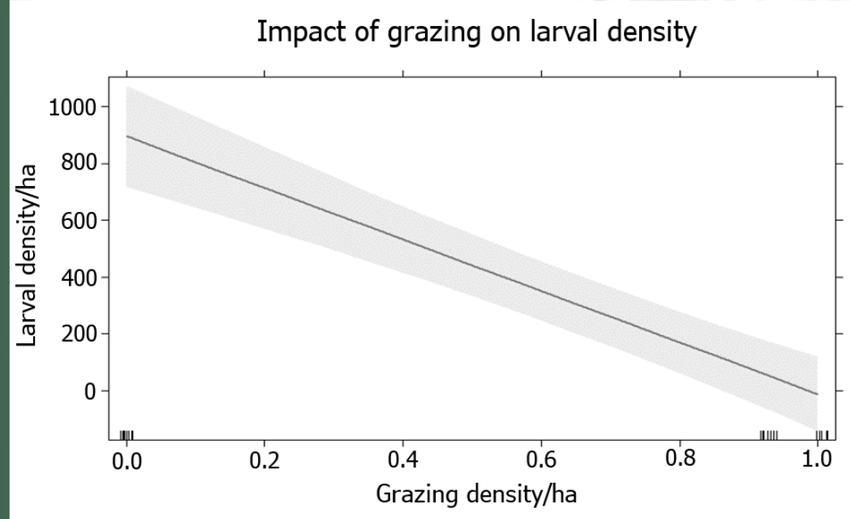

Figure 2. *Regression line (dark grey) with SE (light grey) from generalised linear model explaining 86.35% of variation in larval density*

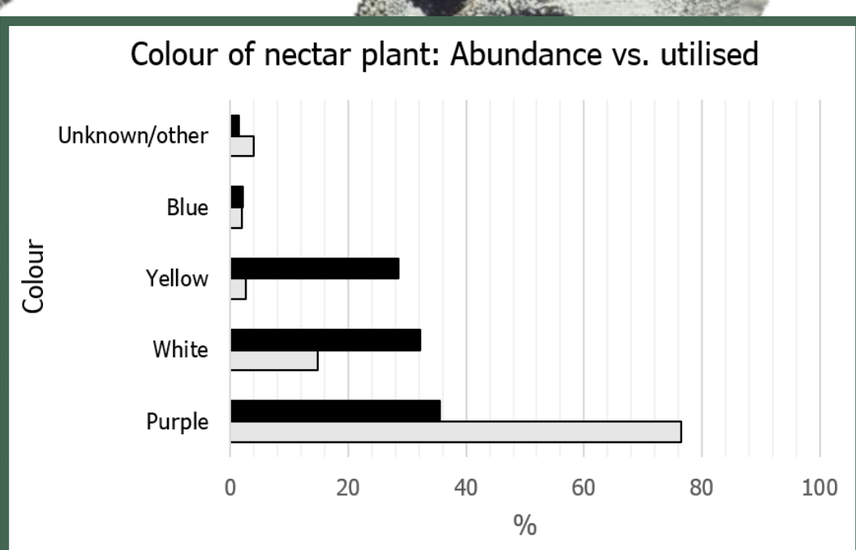

Figure 3. *Utilised colour of nectar plant flowers (light bars) compared to their abundance (black bars)*

CONCLUSIONS

- Larvae preferred habitat heterogeneity, which provided to their thermoregulatory needs.
- The current grazing density in the study site had a negative impact on larval density.
- Adult butterflies preferred open areas with high abundance of flowering nectar plants.
- There was a trend towards selective choice of nectar plants, of which most were purple.

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