

# BUTTERFLIES OF SISTEMA IBÉRICO

Mountain ranges in the Mediterranean basin are home to a rich biodiversity. However, climate change may expose these mountains to warmer and drier conditions, driving species to range constrictions or local extinctions, and altering the composition of butterfly communities over the altitudinal range.

The Sistema Ibérico is a calcareous mountain range in the east of the Iberian Peninsula stretching 500 km from northwest to southeast, separating the depression of the river Ebro from the Iberian central plateau. Oak, pine, and juniper forests are part of a heterogeneous landscape together with agricultural land. The topography and location in the peninsula have shaped the distribution of many interesting flora and fauna taxa, and approximately 155 butterfly species occur in the area.

My objective was to gather distributional information for 13 butterfly species that were classified as Near Threatened (NT) in the European Red List that occur in the Sistema Ibérico, specifically in the Spanish provinces of Guadalajara, Cuenca and Teruel (Table 1 and 2). I set 500 metre transects in 30 locations (Figure 1) in the 3 provinces, and visited the transects on several trips, trying to cover the phenology of the species, from May until July. During 2020 3 visits were completed in June and July. During 2021, I conducted 2 visits in May to complete coverage of the phenology of the target species.

Table 1. Near Threatened target species, ordered by flight period

Scientific name	Common name	Family	Flight period
<i>Erebia epistygne</i>	Spring Ringlet	Nymphalidae	March-May
<i>Pseudophilotes panoptes</i>	Panoptes Blue	Lycaenidae	March-May
<i>Polyommatus nivescens</i>	Mother-of-Pearl Blue	Lycaenidae	April-August
<i>Thymelicus acteon</i>	Lulworth Skipper	Heperiidae	April-July
<i>Iolana debilitata</i>	Iolas blue	Lycaenidae	April-June
<i>Zegris eupheme</i>	Sooty Orange Tip	Pieridae	April-May
<i>Euphydryas desfontainii</i>	Spanish Fritillary	Nymphalidae	May-June
<i>Phengaris arion</i>	Large Blue	Lycaenidae	May-June
<i>Polyommatus dorylas</i>	Turquoise Blue	Lycaenidae	May-September
<i>Parnassius apollo</i>	Apollo	Papilionidae	June-August
<i>Hipparchia hermione</i>	Rock Grayling	Nymphalidae	June-September
<i>Chazara briseis</i>	Hermit	Nymphalidae	July-August
<i>Polyommatus damon</i>	Damon Blue	Lycaenidae	July-August

Table 2. Near Threatened species distribution in the 30 locations of the study. “ \* ” marks species seen in other trips. “ # ” Species located by its eggs

Scientific name	Guadalajara				Cuenca							Sierra Albarracín							Javalambre												
	Torremoncha del Pinar	Pinilla de Molina	El Recuenco	Salmerón	Buenache	Masegosa	Uña	Las Majadas	Tragacete	Vega del Codorno	Nacimiento Río Cuervo	Tramacastilla	Villar del Cobo	Griegos	Monterde de Albarracín	Cella	Gea de Albarracín	Nacimiento Río Tajo	Moscardón	Valdeuena	1	2	3	4	5	6	7	8	9	10	
<i>Erebia epistygne</i>																			x												
<i>Pseudophilotes panoptes</i>	x	x	x	x	x		x			x		x			x	x	x			x							x	x	x	x	
<i>Polyommatus nivescens</i>	x		x					x		x				x	x									x							
<i>Thymelicus acteon</i>	x		x											x						x									x	x	
<i>Iolana debilitata</i>												#																			
<i>Zegris eupheme</i>															x																
<i>Euphydryas desfontainii</i>			x			x			x																				x		
<i>Phengaris arion</i>										*																					
<i>Polyommatus dorylas</i>																							x	x	x	x		x	x		
<i>Parnassius apollo</i>																					x	x	x		x						
<i>Hipparchia hermione</i>	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x		x	x	x								x			
<i>Chazara briseis</i>	x	x				x	x	x	x				x																		x
<i>Polyommatus damon</i>														x				x	x				x	x	x	x			x		

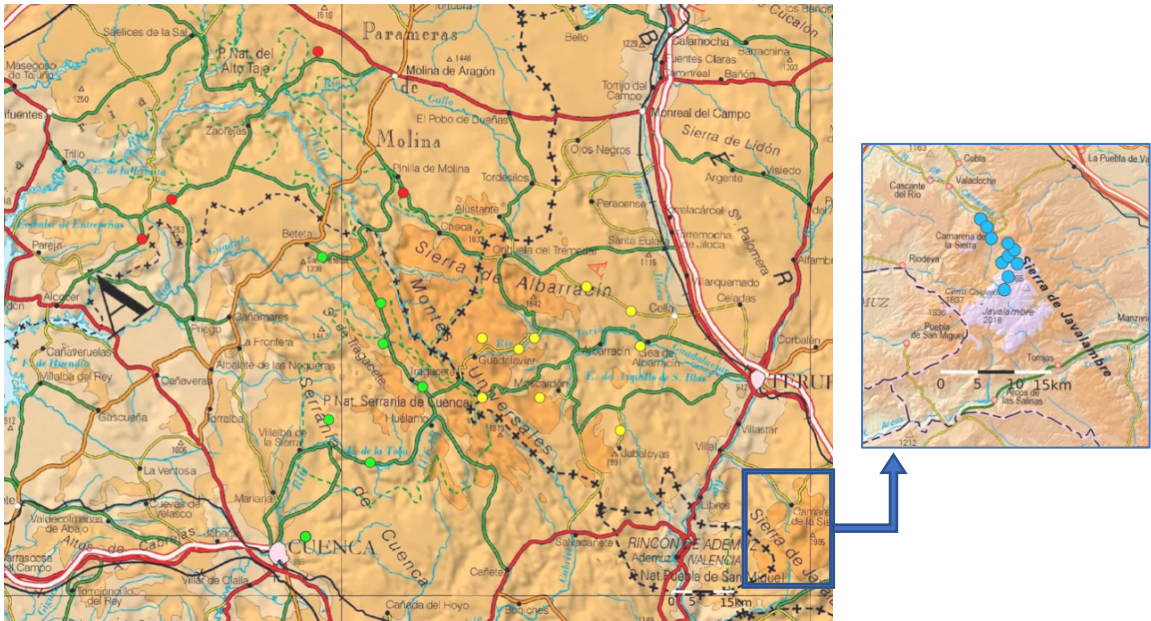


Figure 1. Map showing the 30 points of the study belonging to Cuenca, Guadalajara and Teruel-Sierra de Albarracín with a zoom-in for Sierra de Javalambre.

## Guadalajara

*H. hermione*

*C. briseis*

*P. nivescens*

*T. acteon*

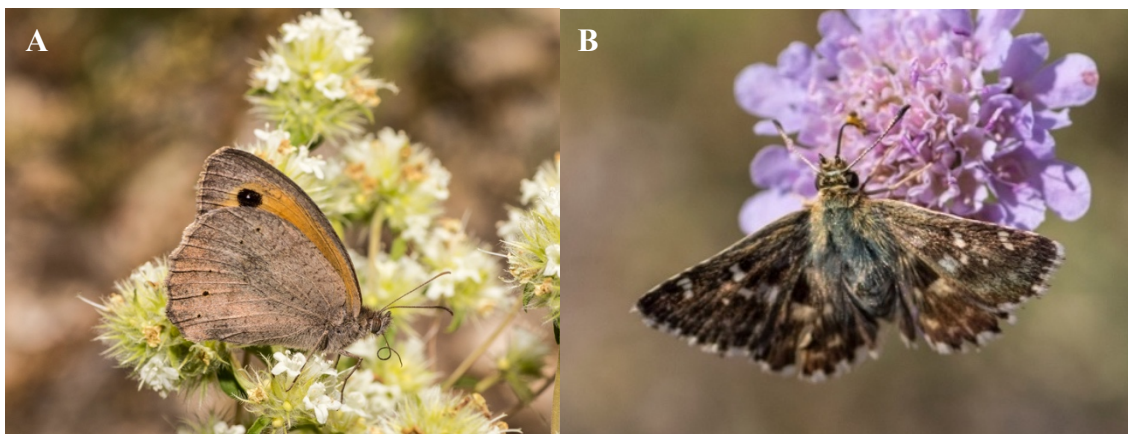
*P. panoptes*

*E. desfontainii*

In Guadalajara I visited four locations, near the villages of Torremocha del Pinar, Pinilla de Molina, El Recuenco and Salmerón. The first two have an altitude of approximately 1300 m above sea level (masl) in the upper reaches of the Río Tajo and represent areas of open woodland with juniper and holm oak. The latter two are in lower areas (1100 m asl) of evergreen oak and pine woodland further to the west. Livestock grazing on the grassland at Pinilla de Molina appears to have been abandoned and the site is showing evidence of dense scrub encroachment in some areas.

The most abundant species at these sites were nymphalids typical of open habitats, such as Meadow Brown (*Maniola jurtina*), Spanish Gatekeeper (*Pyronia bathseba*), Iberian Marbled White (*Melanargia lachesis*), as well as skippers such as Small Skipper (*Thymelicus sylvestris*) and Sage skipper (*Muschampia proto*). These species fly with other grassland species characteristic of the Mediterranean basin such as Dusky Meadow Brown and Oriental Meadow Brown, as well as several species of blue representative of the calcareous habitats, including the endemic Oberthür's Anomalous Blue *Polyommatus fabressei*.

Six of the target Near Threatened species were found in the Guadalajara sample sites. The most widespread and abundant of these was the **Rock Grayling** *Hipparchia hermione*, which was detected in all sites. **Hermit** *Chazara briseis* and **Lulworth Skipper** *Thymelicus acteon* were found at the higher altitude open woodland and scrub sites. **Mother-of-Pearl blue** *Polyommatus nivescens* was only seen at El Recuenco and Torremocha del Pinar. In 2021 I found **Spanish Fritillary** *Euphydryas desfontainii* at El Recuenco and **Panoptes blue** *Pseudophilotes panoptes* was widespread at the sites.





A) *Maniola jurtina*, B) *Muschampia proto*, C) *Hipparchia hermione*, D) *Thymelicus acteon*, E) *Polyommatus fabressei* and F) *Euphyryas desfontainii*.

## Cuenca

*H. hermione*

*P. arion*

*C. briseis*

*P. nivescens*

*P. panoptes*

*E. desfontainii*

The seven transects of Cuenca were located in Serranía de Cuenca Natural park, placed between the city of Cuenca and the border with Teruel province. Vegetation and altitude varied among the transects. Open oak woodlands were present in Uña, Las Majadas, Masegosa and Tragacete, placed between 1200 and 1400 masl. Pine forests dominated in Vega del Codorno and Nacimiento Rio Cuervo (both at 1500 msl) with scarce clearings. Close to Cuenca city, a transect was set in an area with spread Juniper trees at 1100 m asl.

The most abundant species in Serranía de Cuenca were similar to the ones in Guadalajara, specially numerous was the Iberian Marbled White. The species of the genus *Hipparchia*, with records for four species and *Melitaea* were common along the visits. In Oak forest clearings several Hairstreak species were detected, for instance, the Spanish Purple, Ilex and False Ilex hairstreak. The endemic Azure chalkhill blue (*Lysandra caelestissima*) had good numbers, especially in Vega del Codorno.

Six target species were localized in this region. The **Rock Grayling** was abundant in all sites and visits. **Hermit** was detected in the four oak forest sites, especially in the rocky sections of the transects. **Mother-of-Pearl Blue** was recorded in Las Majadas and Vega



del Codorno, where I detected a single **Large blue** *Phengaris arion* adult in another trip in 2019. However, the weak populations and tricky phenology did not help in the detection of this species during 2020 and 2021. **Panoptes blue** was spotted in most of the places unlike the **Spanish fritillary**, only spotted in Masegosa and Tragacete in low numbers.



A) *Satyrrium ilicis*, B) Habitat of *Chazara briseis*, C) Male of *Chazara briseis*, D) *Lysandra caelestissima*, E) *Pseudophilotes panoptes* and F) Vega del Codorno habitat.

## Teruel

This province has a very rich fauna and almost all the species of the Sistema Ibérico can be spotted here. 19 of the 30 locations of the study were there, divided in two geographical areas: Sierra de Albarracín to the west, adjacent to the Serranía de Cuenca, and Gúdar-Javalambre to the south-east, close to the border with Valencia province.

## Sierra de Albarracín

*P. nivescens*

*H. hermione*

*P. damon*

*C. briseis*

*T. acteon*

*E. epistygne*

*P. panoptes*

*Z. eupheme*

*I. debilitata*

Vegetation ranges from pine forests in Griegos and Nacimiento Rio Tajo, open areas of holm oak in Cella and Villar del Cobo, to dry juniper forests interspersed with pine trees and agricultural áreas in Tramacastilla, Monterde de Albarracín, Valdecuenca and Gea de Albarracín. Altitudes in this region ranged from 1000 to 1600 m asl.

In Sierra de Albarracín the most abundant species were the nymphalids dusky heath *Coenonympha dorus*, Iberian marbled white and Gatekeeper *Pyronia tithonus* and the lycaenids Silver-studded blue *Plebejus argus*, Escher's blue and Oberthür's Anomalous Blue. Griegos, Monterde de Albarracín and Moscardón hosted high numbers of blue butterflies, concentrating up to eight species in some visits. Black satyr *Satyrus actaea* (Cella), Southern hermit *Chazara prieuri* (Gea de Albarracín), chequered blue *Scolitantides orion*, false baton blue *Pseudophilotes abencerragus*, Spanish zephyr blue *Kretania hesperica* (Villar del Cobo) were interesting sightings that appeared in different sites in low numbers.

Nine target species were detected in this region. **Rock grayling** was the most abundant among the target species. I recorded very few individuals of **Mother-of-Pearl Blue** and **Damon blue** (*Polyommatus damon*). **Hermit** was spotted in Villar del Cobo while **Lulworth Skipper** was in Griegos and Valdecuenca. In Tramacastilla I spotted around 20 **Iolas blue** (*Iolana debilitata*) food plants (*Colutea hispanica*) but no adult was detected. Luckily, a close inspection of the fruits (checking the interior of the dry sepals) revealed the presence of several empty eggs per fruit (inside sepals) totaling around 30 in just one plant. In 2021 I detected **Spring Ringlet** (*Erebia epistygne*) in Moscardón. **Panoptes blue** was on the other hand more spread along the region with good numbers in Gea de Albarracín. A single **Sooty Orange Tip** *Zegris eupheme* detected in Monterde de Albarracín closed the list of near threaten species in the region.







A) *Polyommatus nivescens*, B) *Chazara prieuri*, C) *Polyommatus fabressei*, D) Eggs of *Iolana debilitata*, E) *Polyommatus damon* and F) *Zegris eupheme*.

### Gúdar Javalambre

*P. apollo*  
*P. dorylas*  
*P. nivescens*  
*T. acteon*  
*H. hermione*

*C. briseis*  
*P. damon*  
*E. desfontainii*  
*P. panoptes*  
*E. epistygne*

In Gúdar-Javalambre 10 localities were visited from the base of Javalambre mountains (1100 m asl) to the summit (Javalambre peak, 2005 m). The localities are a representation of the vegetation forms present in the area: River forest, grasslands, pine forest with different densities, Juniperus forest and high mountain habitats.

The most abundant species in these transects were grayling *Hipparchia semele*, Spanish marbled white, meadow fritillary *Melitaea parthenoides*, Southern mountain argus *Aricia montensis*, dusky meadow brown and Silver-studded blue *Plebejus argus*, especially in the habitats of pine forest, from 1400 to 1600 masl. The clearings of the pine forest and the grasslands close to the river Camarena were the most productive habitats for butterflies, recording between 30 and 40 species in some visits. Blues were very diverse in some habitats, recording the presence of Mazarine blue *Cyaniris semiargus*, Amanda's blue *Polyommatus amandus* among others. The false grayling *Arethusana arethusa* and Zapater's ringlet *Erebia zapateri* together with European beak *Libythea celtis* were interesting species recorded at the end of July at middle mountain areas.

Ten near threatened species were detected in this region. In this case, all the species showed similar abundances. **Turquoise Blue** *Polyommatus dorylas* was always recorded above 1600, with preference for pine forest clearings. **Mother-of-Pearl Blue** was spotted once at around 1900 masl. **Rock grayling** and **Damon blue** were recorded at several altitudes and habitats. **Apollo** *Parnassius apollo* was usually recorded at altitudes above 1900 although some adults were spotted at 1600 masl. In contrast, **Lulworth Skipper** was recorded only in the transects in the base of the mountain, without being reported above 1300 masl; similarly to **Hermit**. **Spring ringlet** *Erebia epistygne* adults were spotted resting on the rocky matrix present between the limit of the forest and the summit of the mountain. Both **Spanish Fritillary** and **Panoptes blue** were detected at low altitudes.



A) *Polyommatus dorylas*, B) *Erebia zapateri*, C) *Parnassius apollo*, D) Habitat of *P. apollo* and *E. epistygne*, E) *Erebia epistygne* and F) *Polyommatus amandus*.