

1 **SUPPLEMENTARY ELECTRONIC MATERIAL (APPENDIX 3)**

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3 **ARDEOLA 69(1)**

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7 **VARIATIONS IN NICHE BREADTH AND POSITION OF ALPINE**
8 **BIRDS ALONG ELEVATION GRADIENTS IN THE EUROPEAN**
9 **ALPS**

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13 **VARIACIONES EN LA AMPLITUD Y POSICIÓN DEL NICHU DE LAS AVES**
14 **ALPINAS A LO LARGO DE LOS GRADIENTES DE ALTITUD EN LOS ALPES**
15 **EUROPEOS**

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43 **DETAILED RESULTS**

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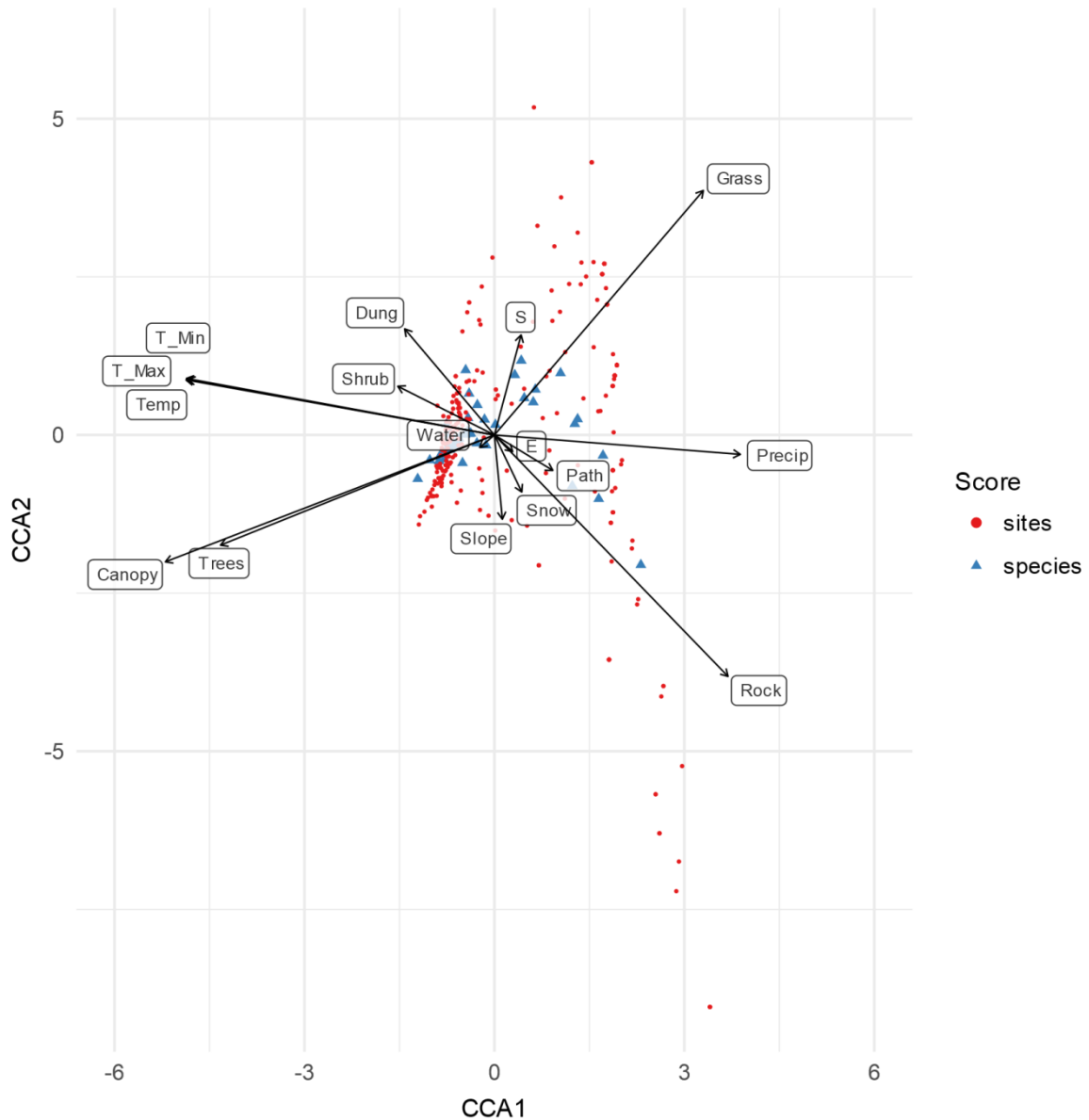
45 **Full figures for the results of the CCA with the complete data set**46 *Bird distribution along the elevation gradient*

Figure C1 Results of the CCA. Environmental variables are shown. (See Table S1 for variable definition).

47 Full page figures for the results of the CCA with the complete data set are shown
 48 in Figure C1 and C2. **Figure C1** shows all the variables used in the analyses. **Figure**
 49 **C2** shows all the species that occurred at least three times during the surveys.

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52 **Habitat scores on the first four axes of the CCA**

53 The scores on the first four axes of the CCA for each environmental variable used
54 to perform the CCA are given in **Table C1**.

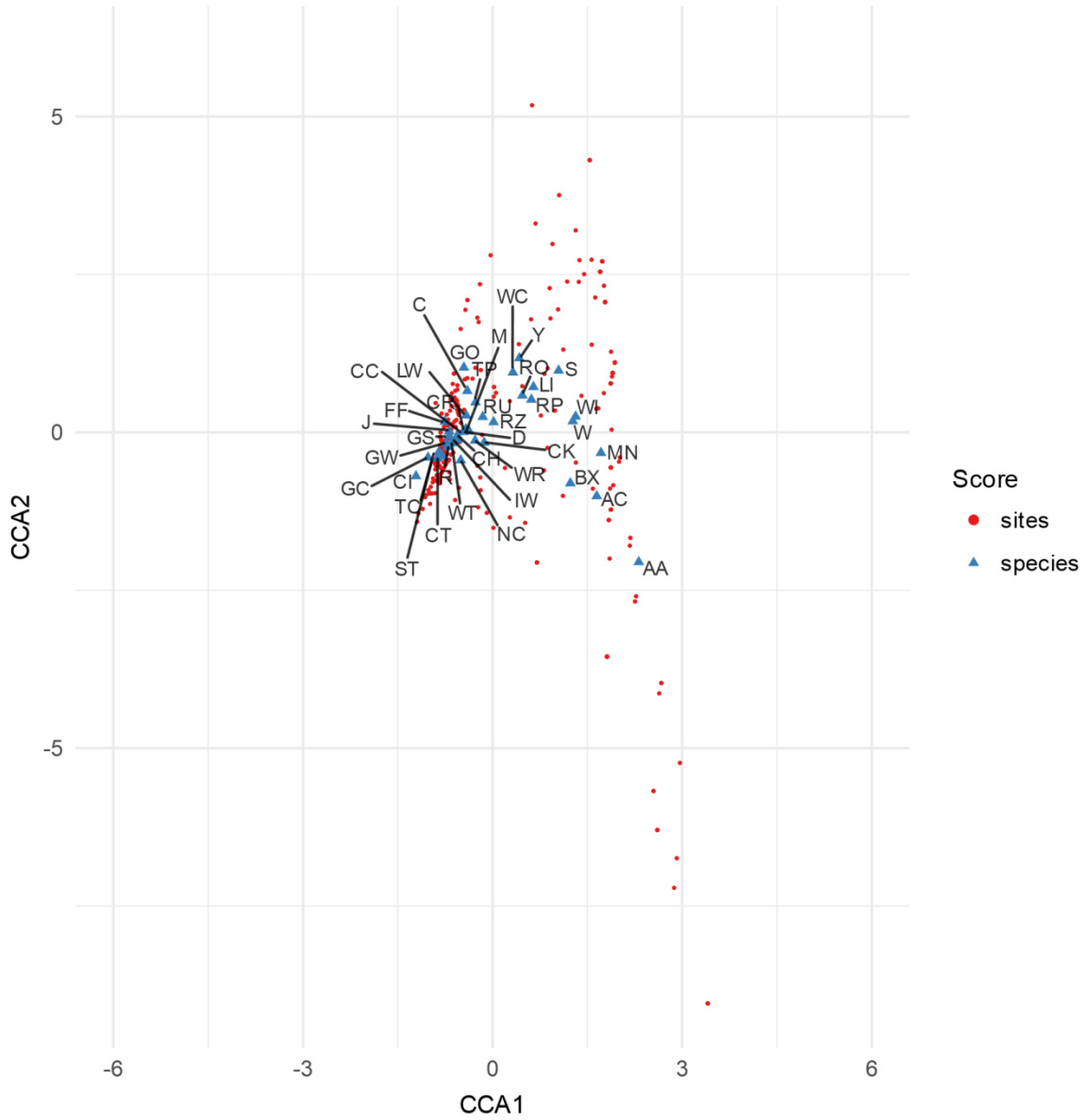


Figure C2 Results of the CCA. Species with at least 3 records are shown. (See Table 1 for species codes).

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TABLE C1

60 Scores of each environmental variable on the first four axes of the CCA.

61 *[Puntuación del CCA para las variables ambientales.]*

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	CCA1	CCA2	CCA3	CCA4
SLOPE	0.0120	-0.211	-0.174	0.339
S	0.067	0.237	0.394	-0.072
E	0.046	-0.064	0.428	0.120
Canopy	-0.852	-0.349	0.235	0.085
Shrub	-0.248	0.171	-0.876	-0.058
Grass	0.540	0.623	0.386	0.031
Rock	0.607	-0.617	-0.222	-0.065
Snow	0.072	-0.145	-0.057	0.155
Trees	-0.709	-0.305	0.277	-0.065
Water	-0.037	-0.034	0.024	-0.229
Path	0.150	-0.086	-0.273	0.345
Dung	-0.233	0.267	0.094	-0.365
Precip	0.637	-0.027	-0.291	0.249
Temp	-0.788	0.131	0.086	0.313
T_MAX_NOW	-0.789	0.131	0.079	0.322
T_MIN_NOW	-0.790	0.129	0.086	0.318

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65 **Detailed model results**

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 67 The detailed results of the models showing a significant result in the main text
 68 are presented **Table C2**.

69 **TABLE C2**

70 Final significant model-averaged parameters of the model set derived by combining
 71 significant model-averaged parameters for niche position, niche breadth and standard
 72 deviation of elevation. Estimate, SE, (t) and p-value are given for each parameter.

73 *[Parámetros promediados entre modelos.]*

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Dependent variable	Parameter	Estimate ± SE	t	p
Niche position	Elevation	0.058 ± 0.094	0.618	0.541
	Elevation ²	0.130 ± 0.051	2.565	0.015
Niche breadth (without MN)	Elevation	0.121 ± 0.031	3.888	<0.001
Niche breadth	SD elevation	0.118 ± 0.043	2.781	0.009
Niche breadth (without MN)	SD elevation	0.140 ± 0.026	5.396	<0.001
Niche position	SD elevation	-0.678 ± 0.270	-2.516	0.017
	SD elevation ²	3.259e-0.5 ± 1.116e-05	2.920	0.006
Niche position	Habitat diversity	-3.213 ± 0.729	-4.404	<0.001
Niche breadth (without MN)	Habitat diversity	-1.180 ± 0.372	-3.175	0.003
Niche breadth (without AA, AC, MN)	Habitat diversity	-0.485 ± 0.822	-0.590	0.559

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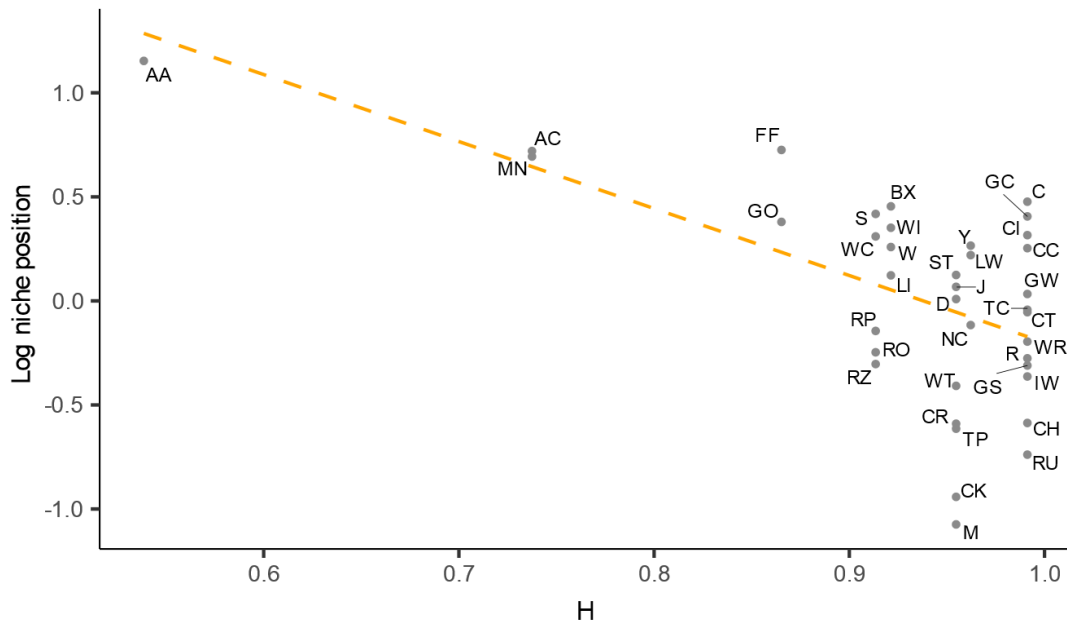
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77 **Relationship between niche position/breadth and habitat diversity**

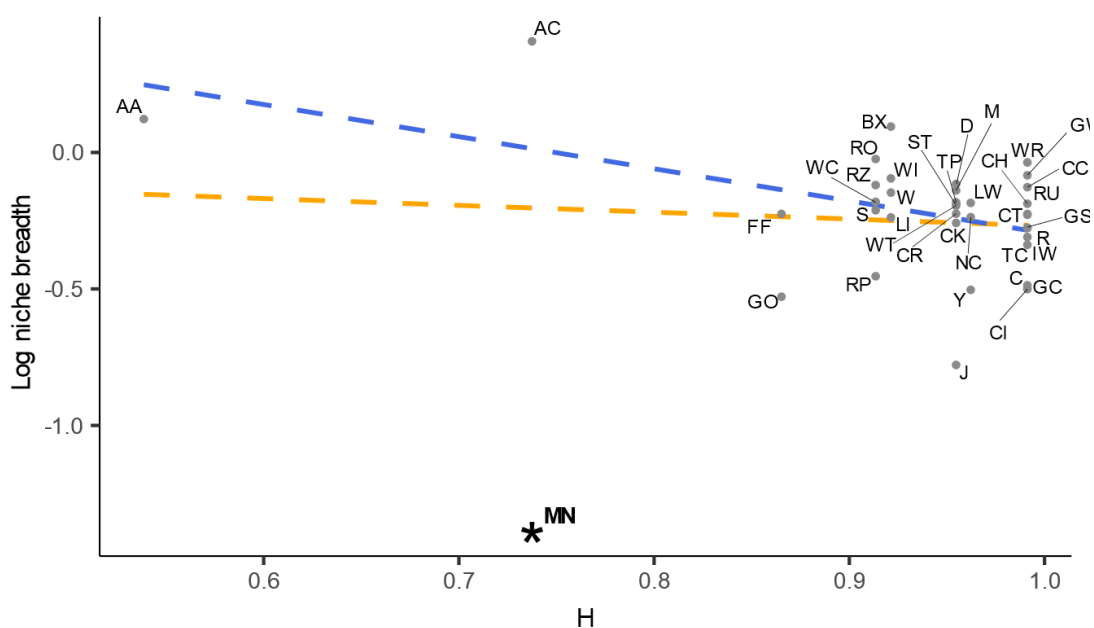
78 *[Relación entre la posición/amplitud del nicho y la diversidad del hábitat.]*

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80 Habitat niche position was negatively related to habitat diversity but the
81 relationship was mainly driven by high elevation species as presented in Fig.C3.

82 On the contrary, no relationship was found between habitat niche breadth and
83 habitat diversity (Fig. C4).



84 Figure C3 Niche position in relation to habitat diversity measured by the Shannon index. The dashed
85 line represents the prediction of the linear model with all the species. See Table 1 for species codes



86 Figure C4 Niche breadth in relation to habitat diversity measured by the Shannon index. The blue
dashed line represents the prediction of the linear model without the outlier represented by a bold
black star (Snowfinch MR). The orange dashed line represents the prediction of the linear model
without the species of high elevation (Alpine Accentor, Alpine Chough and Snowfinch). See Table 1