Diversità, adattamenti e conservazione degli Insetti sulle Alpi

Ortotteri come modello di studio

Daniele Baroni

Gli Ortotteri

Ensifera

Ovopositore a sciabola molto lungo
Antenne più lunghe del corpo
Apparato stridulatore di tipo tegmina-tegmina
Dieta varia, spesso in parte zoofaga
Abitudini parzialmente notturne

Caelifera

Ovopositore corto a forma di pinza
Antenne più corte della metà del corpo
Apparato stridulatore di tipo femore-tegmina
Dieta quasi esclusivamente di tipo erbivoro
Abitudini esclusivamente diurne

Diversità degli Ortotteri sulle Alpi

Nemobius sylvestris

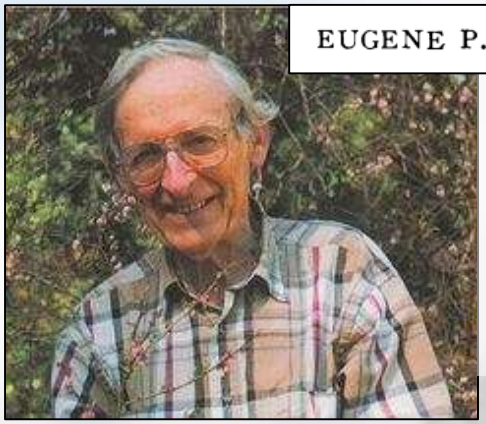
Conocephalus fuscus

Melanoplus frigidus

Diversità degli Ortotteri sulle Alpi

Dolichopoda azami

Perché studiare gli Ortotteri

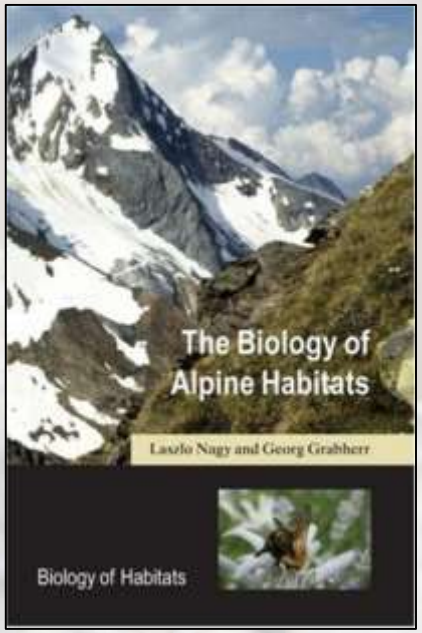


EUGENE P. ODUM, CLYDE E. CONNELL AND LESLIE B. DAVENPORT Ecology, Vol. 43, No. 1

"…consumption of vegetation by the total insect population is between one and a half and two times that of the orthoptera alone, or between 75 and 200 kcal/M^2/year"

Importanti consumatori primari nelle praterie alpine.

"…a rare estimate of the rate of herbage removal by grasshoppers (*Aeropus sibiricus, Melanoplus frigidus*) in two *Carex*-dominated habitats in the Swiss Alps. Values of 19% and 30% biomass removal in zonal *C.curvula* sedge heath and adjacent snowbed (*C. foetida*)"



Gli Ortotteri come risorsa trofica

Componente importante nella dieta di Vertebrati di rilevante interesse conservazionistico

ACTA ORNITHOLOGICA
Vol. 38 (2003) No. 1

Food of the Red-backed Shrike *Lanius collurio*: a comparison of three methods of diet analysis

Piotr Tryjanowski[1], Małgorzata K. Karg[2], Jerzy Karg[2]

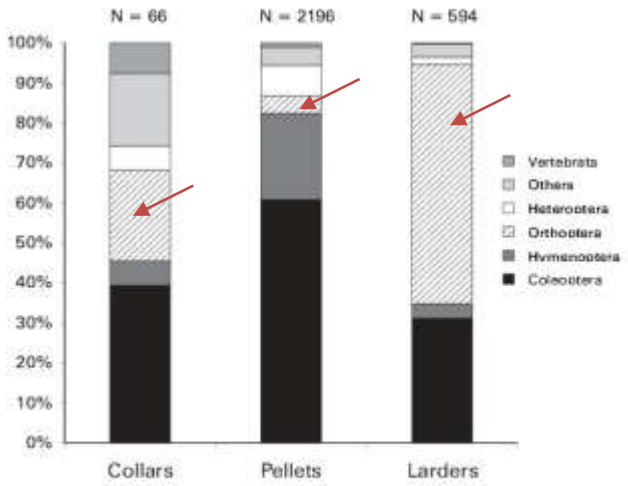


Fig. 1. Differences in the diet composition of the Red-backed Shrike in the present study determined by three different methods. N — sample size (number of prey items).

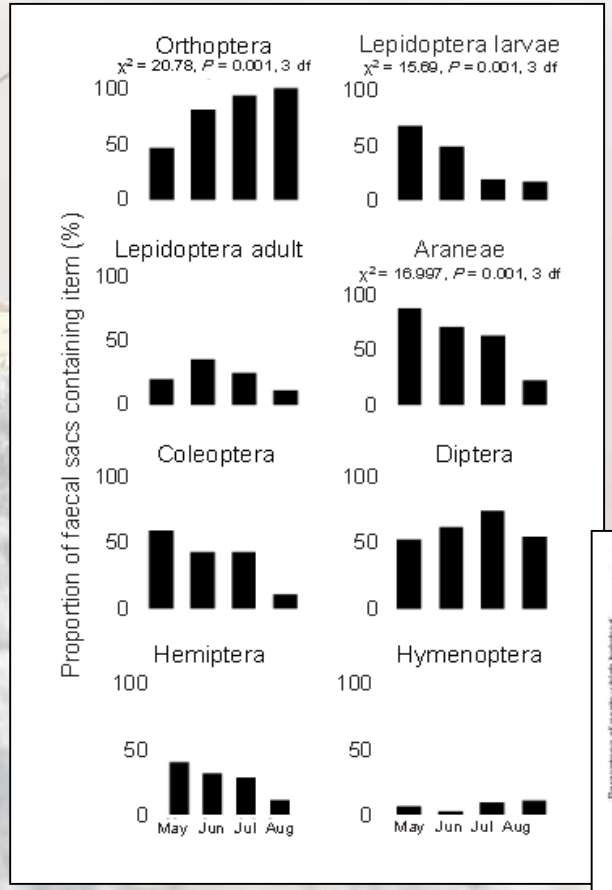
Gli Ortotteri come risorsa trofica

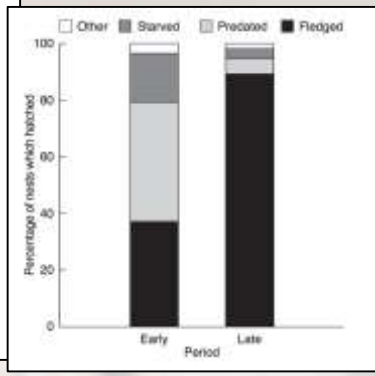
Componente importante nella dieta di Vertebrati di rilevante interesse conservazionistico

Bird Study (1997) **44**, 66–79

Seasonal variation in breeding performance and nestling diet of Cirl Buntings *Emberiza cirlus* in England

ANDY D. EVANS*, KEN W. SMITH, DAVID L. BUCKINGHAM *and* JULIANNE EVANS *Royal Society for the Protection of Birds, The Lodge, Sandy, Bedfordshire SG19 2DL, UK*





Gli Ortotteri come risorsa trofica

Componente importante nella dieta di Vertebrati di rilevante interesse conservazionistico

Altre specie di predatori si nutrono in gran parte di singole specie di Ortotteri. Nel caso dell'Assiolo la dieta è dominata da *Tettigonia viridissima*.

Ibis (2005), 147, 176–187

Distribution, density, diet and productivity of the Scops Owl *Otus scops* in the Italian Alps

LUIGI MARCHESI & FABRIZIO SERGIO*
Raptor Conservation Research Unit, Trento Natural History Museum, via Calepina 14, 38100 Trento, Italy

Table 4. Diet composition of Scops Owls in the central–eastern Alps (2002–03), as assessed by direct observation at five nests and by collection of pellets and prey remains at 15 nests.

	Pellets		Remains		Direct observation		Pooled	
Prey taxa	*n* (%)	% by mass	*n* (%)	% by mass	*n* (%)	% by mass	*n* (%)	% by mass
Insecta	340 (99.42)	98.27	75 (90.36)	2.85	79 (100)	100.00	494 (98.02)	17.03
Coleoptera	5 (1.46)	0.47					5 (0.99)	0.06
Carabidae	5 (1.46)	0.47					5 (0.99)	0.06
Unidentified Diptera	3 (0.88)	0.19					3 (0.60)	0.02
Lepidoptera	50 (14.62)	9.92	23 (27.71)	0.69	1 (1.27)	0.84	74 (14.68)	1.80
Geometridae			1 (1.20)	0.07			1 (0.20)	0.06
Noctuidae	4 (1.17)	0.79	22 (26.51)	0.61	1 (1.27)	0.84	27 (5.36)	0.64
Unidentified Lepidoptera	46 (13.45)	9.13					46 (9.13)	1.09
Hemiptera			2 (2.41)	0.07			2 (0.40)	0.06
[illegible]			[illegible]	[illegible]			[illegible]	[illegible]
Orthoptera	269 (78.65)	80.53	49 (59.04)	2.06	78 (98.73)	99.13	396 (78.57)	14.21
Tettigoniidae	269 (78.65)	80.53	49 (59.04)	2.06	78 (98.73)	99.13	396 (78.57)	14.21
Tettigonia viridissima			19 (22.9)	0.8	34 (43.0)	43.1	53 (10.5)	1.9
Platycleis spp.			8 (9.6)	0.3	18 (22.8)	22.8	26 (5.2)	0.9
Hymenoptera			1 (1.20)	0.03			1 (0.20)	0.03
[illegible]			[illegible]	[illegible]			[illegible]	[illegible]
Unidentified insect	13 (3.80)	7.16					13 (2.56)	0.86
Arachnids	2 (0.56)	1.74	2 (2.41)	0.33			4 (0.79)	0.49
Unidentified Araneae	1 (0.29)	1.19	2 (2.41)	0.33			3 (0.60)	0.43
Chactidae (*Euscorpius* spp.)	1 (0.29)	0.55					1 (0.20)	0.07
Mammals			5 (6.02)	93.50			5 (0.99)	79.65
Edible Dormouse *Glis glis*[a]			4 (4.82)	88.48			4 (0.79)	75.36
Unidentified Muridae[b]			1 (1.20)	5.02			1 (0.20)	4.28
Birds			1 (1.20)	3.32			1 (0.20)	2.83
Great Tit *Parus major*			1 (1.20)	3.32			1 (0.20)	2.83
Total	342	63.59 g	83	452.10 g	79	14.96 g	504	530.67 g

Gli Ortotteri come risorsa trofica

Componente importante nella dieta di Vertebrati di rilevante interesse conservazionistico

L'Upupa invece alimenta le proprio nidiate specializzandosi nella cattura delle *Gryllotalpa*.

Ibis (2001) **143**, 2–10

Food provision to nestlings in the Hoopoe *Upupa epops*: implications for the conservation of a small endangered population in the Swiss Alps

JÉRÔME FOURNIER[1] & RAPHAËL ARLETTAZ[2,3]*
[1]Institute of Zoology, University of Neuchâtel, CH–2000 Neuchâtel, Switzerland
[2]Swiss Ornithological Institute, Valais Field Station, Nature Centre, CH–3970 Salgesch, Switzerland
[3]Institute of Ecology, Laboratory of Conservation Biology, University of Lausanne, CH–1015 Lausanne, Switzerland

	Site A									Site B		
	1989, 1st brood 3 days			1990, 1st brood 9 days			1990, 2nd brood 7 days			1990, 1st brood 14 days		
	Frequency		Mass	Frequency		Mass	Frequency		Mass	Frequency		Mass
	N	%	%	*N*	%	%	*N*	%	%	*N*	%	%
Annelida (*Lumbricus* sp.)	3	1.3	4.8	11	0.9	3.1	2	1.0	1.5	0	0	0
Mollusca (*Arion ater*)	0	0	0	0	0	0	0	0	0	0	0	0
Araneidae	8	3.5	1.7	51	4.0	2.0	4	2.1	0.1	2	0.4	0.1
Diplopoda (Iulidae)	1	0.5	0.4	1	0.1	0.1	0	0	0	0	0	0
G. gryllotalpa	10	4.5	25.4	93	7.8	34.6	84	43.3	81.9	342	48.5	86.4
G. campestris	0	0	0	0	0	0	0	0	0	0	0	0
Acrididae (larvae)	0	0	0	1	0.1	0	0	0	0	0	0	0
Mantis religiosa (larvae)	0	0	0	1	0.1	0	0	0	0	0	0	0
Heteroptera	0	0	0	2	0.2	0	0	0	0	0	0	0
Libelluloides sp. (larvae)	0	0	0	4	0.3	0.1	15	7.7	0.9	0	0	0
Lepidoptera (larvae)	173	78.2	58.4	890	75.0	52.0	77	39.7	12.3	354	50.2	13.3
Lepidoptera (pupae)	0	0	0	59	5.0	3.9	7	3.6	1.3	1	0.1	0.1
Lepidoptera (imagos)	0	0	0	0	0	0	1	0.5	0.1	0	0	0
Diptera (larvae)	1	0.5	0.1	9	0.8	0.1	0	0	0	0	0	0
Formicidae	0	0	0	0	0	0	0	0	0	0	0	0
Other Hymenoptera	0	0	0	1	0.1	0	0	0	0	0	0	0
Scarabaeidae (larvae)	24	10.8	9.1	1	0.1	0.1	0	0	0	0	0	0
Other Coleoptera (larvae)	0	0	0	11	0.9	0.2	1	0.5	0.1	2	0.3	0.1
Coleoptera (imagos)	1	0.5	0.2	10	0.8	0.3	0	0	0	2	0.3	0.1
Unidentified larvae	0	0	–	16	1.3	–	1	0.5	–	0	0	–
Podarcis muralis	0	0	0	0	0	0	1	0.5	1.1	0	0	0
Podarcis muralis (eggs)	0	0	0	23	1.9	3.5	1	0.5	0.4	1	0.1	0.1
Total identified prey	221	100	100	1187	100	100	194	100	100	705	100	100
Unidentified prey items	5			21			1			5		
Prey not visible on slides	96			318			12			298		
Total provisioned prey	322			1526			207			1008		

Gli Ortotteri come risorsa trofica

"Katydids are the potato chips of the rainforest," says Laurel Symes, a biologist at Dartmouth College. The hungry bats listen for the ultrasonic calls of the katydids, then use their own ultrasonic signals to locate the insects, much the way ships use sonar to find objects beneath the sea.

Indicatori ecologici

Ecological Indicators 20 (2012) 337–344

Contents lists available at SciVerse ScienceDirect

Ecological Indicators

journal homepage: www.elsevier.com/locate/ecolind

Orthoptera as ecological indicators for succession in steppe grassland

Thomas Fartmann*, Benjamin Krämer, Friederike Stelzner, Dominik Poniatowski

Department of Ecology, Institute of Landscape Ecology, University of Münster, Robert-Koch-Straße 28, 48149 Münster, Germany

I diversi stadi di una successione ecologica ospitano specifiche comunità di Ortotteri, che sono validi indicatori ecologici.

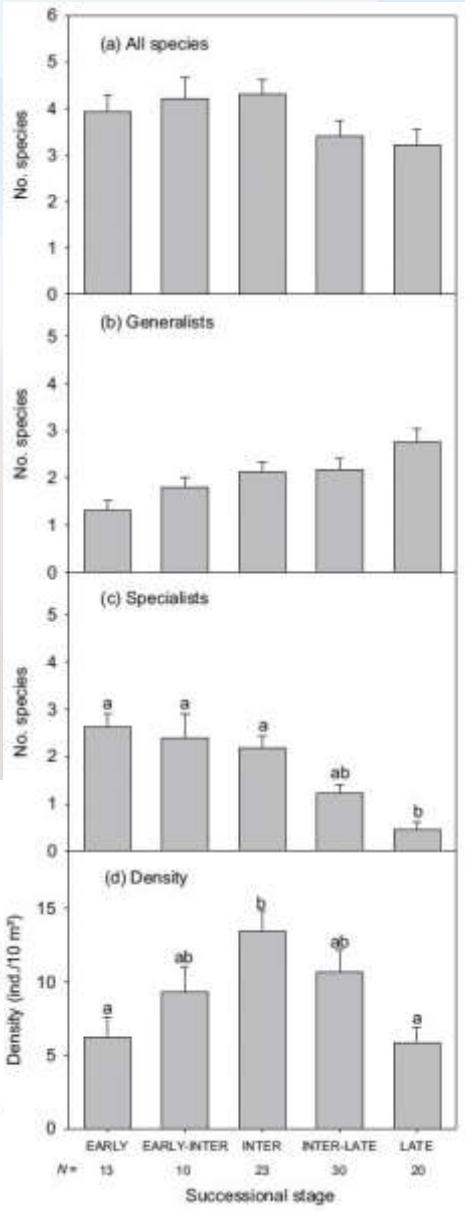


Fig. 2. Mean values (±SE) of (a) all Orthoptera species, (b) habitat generalists, (c) habitat specialists and (d) Orthoptera density in five successional stages of steppe grassland. Differences between the successional stages were tested for all four response variables using a Poisson GLMM with patch as a random factor. Statistics of GLMM: all species: $Chi^2 = 5.120$, df = 4, P = 0.28; habitat generalists: $Chi^2 = 8.653$, df = 4, P = 0.07; habitat specialists: $Chi^2 = 37.916$, df = 4, $P < 0.001$, density: $Chi^2 = 1536.8$, df = 4, $P < 0.001$. Different letters indicate significant differences between stages (Dunn's test; $P < 0.05$).

Indicatori ecologici

Bioindicatori delle modificazioni dell'habitat

Caratteristiche microclimatiche
Struttura vegetazionale

Contents lists available at ScienceDirect

Agriculture, Ecosystems and Environment

journal homepage: www.elsevier.com/locate/agee

Response of orthopteran diversity to abandonment of semi-natural meadows

Lorenzo Marini [a,*], Paolo Fontana [a], Andrea Battisti [a], Kevin J. Gaston [b]

[a] University of Padova, Department of Environmental Agronomy and Crop Production, Viale dell'Università 16, 35020 Legnaro, Padova, Italy
[b] University of Sheffield, Department of Animal and Plant Sciences, Biodiversity and Macroecology Group, Sheffield S10 2TN, UK

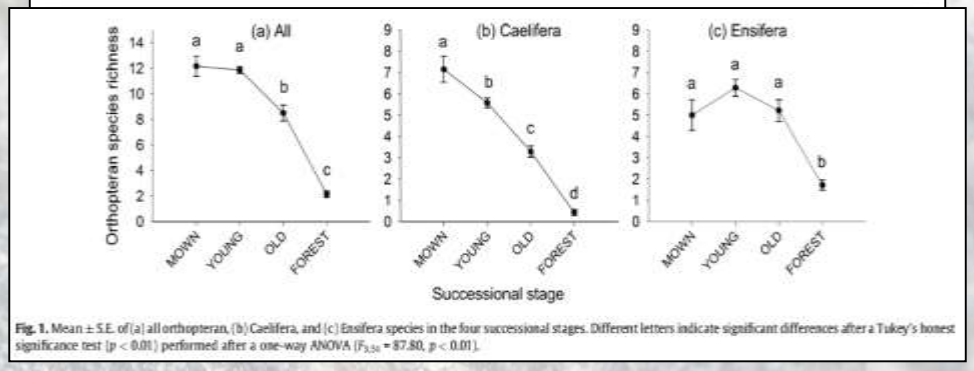


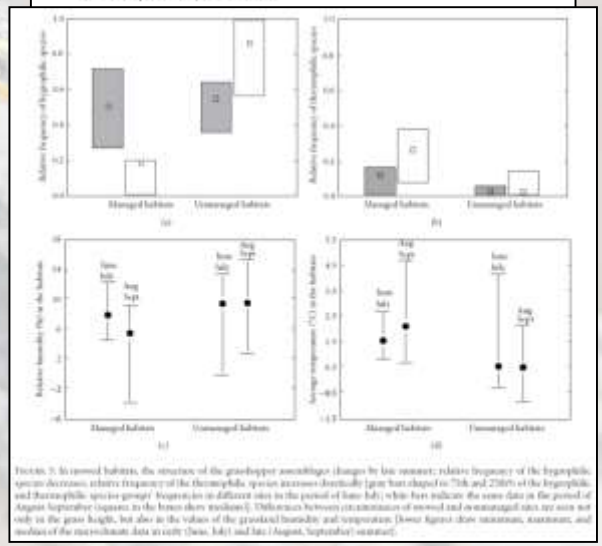
Fig. 1. Mean ± S.E. of (a) all orthopteran, (b) Caelifera, and (c) Ensifera species in the four successional stages. Different letters indicate significant differences after a Tukey's honest significance test ($p < 0.01$) performed after a one-way ANOVA ($F_{3,56} = 87.80$, $p < 0.01$).

Hindawi

Research Article

Effects of Climate Change and Various Grassland Management Practices on Grasshopper (Orthoptera) Assemblages

Zoltán Kenyeres and Judit Csorvenka



Indicatori ecologici

Bioindicatori delle modificazioni dell'habitat

Uso del suolo

Biodivers Conserv (2013) 22:687–700
DOI 10.1007/s10531-013-0438-z

ORIGINAL PAPER

Rapid response of Orthoptera to restoration of montane heathland

Fabian Borchard · Axel M. Schulte · Thomas Fartmann

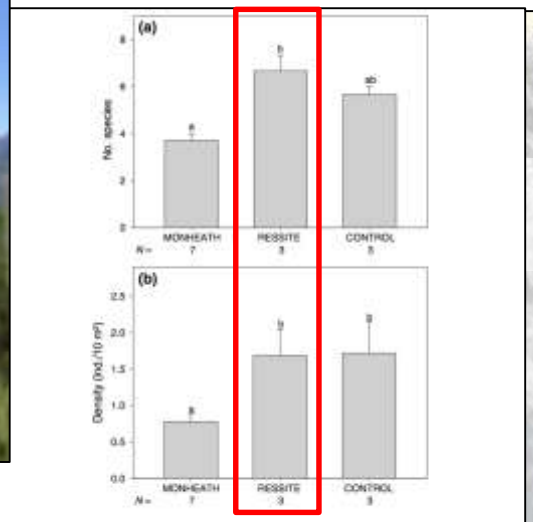


Fig. 3 Mean values (±SE) for montane heath (MONHEATH), restoration sites (RESSITE) and control sites (CONTROL) of a Orthoptera species richness (ANOVA, $F = 11.154$, df = 2, $P < 0.001$, Holm-Sidak post hoc test) and b density (Kruskal–Wallis ANOVA on ranks, $H = 7.631$, df = 2, $P < 0.01$, Dunn's test). Different letters indicate significant differences between treatments at $P < 0.05$

Ripristino

MITTEILUNGEN DER SCHWEIZERI
BULLETIN DE LA SO

Response of Orthoptera assemblage composition to land-use in the southern Alps of Italy

Marco Guido[1] & Claudio Chemini[1]

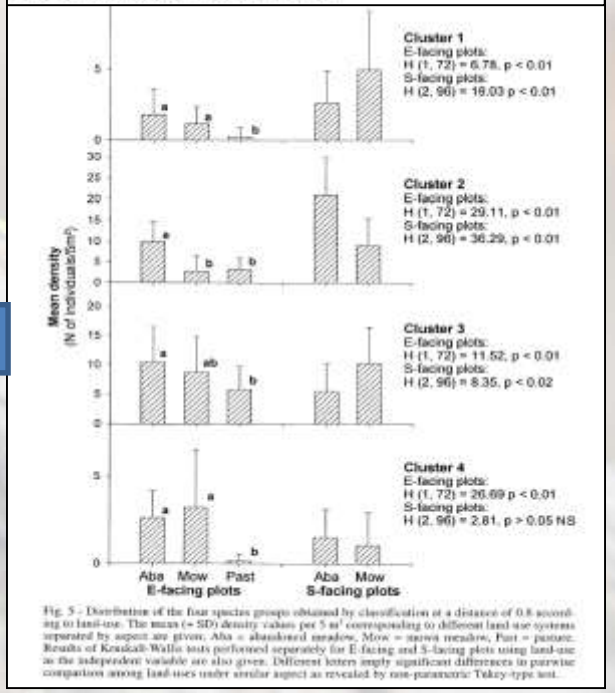
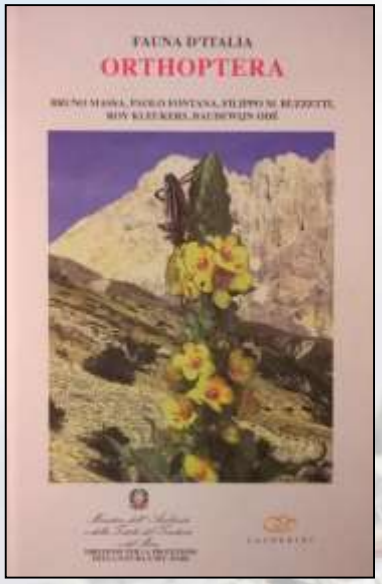


Fig. 5 – Distribution of the four species groups obtained by classification at a distance of 0.8 according to land-use. The mean (± SD) density values per 5 m² corresponding to different land-use systems separated by aspect are given. Aba = abandoned meadow, Mow = mown meadow, Past = pasture. Results of Kruskall-Wallis tests performed separately for E-facing and S-facing plots using land-use as the independent variable are also given. Different letters imply significant differences in pairwise comparison among land-uses under similar aspect as revealed by non-parametric Tukey-type test.

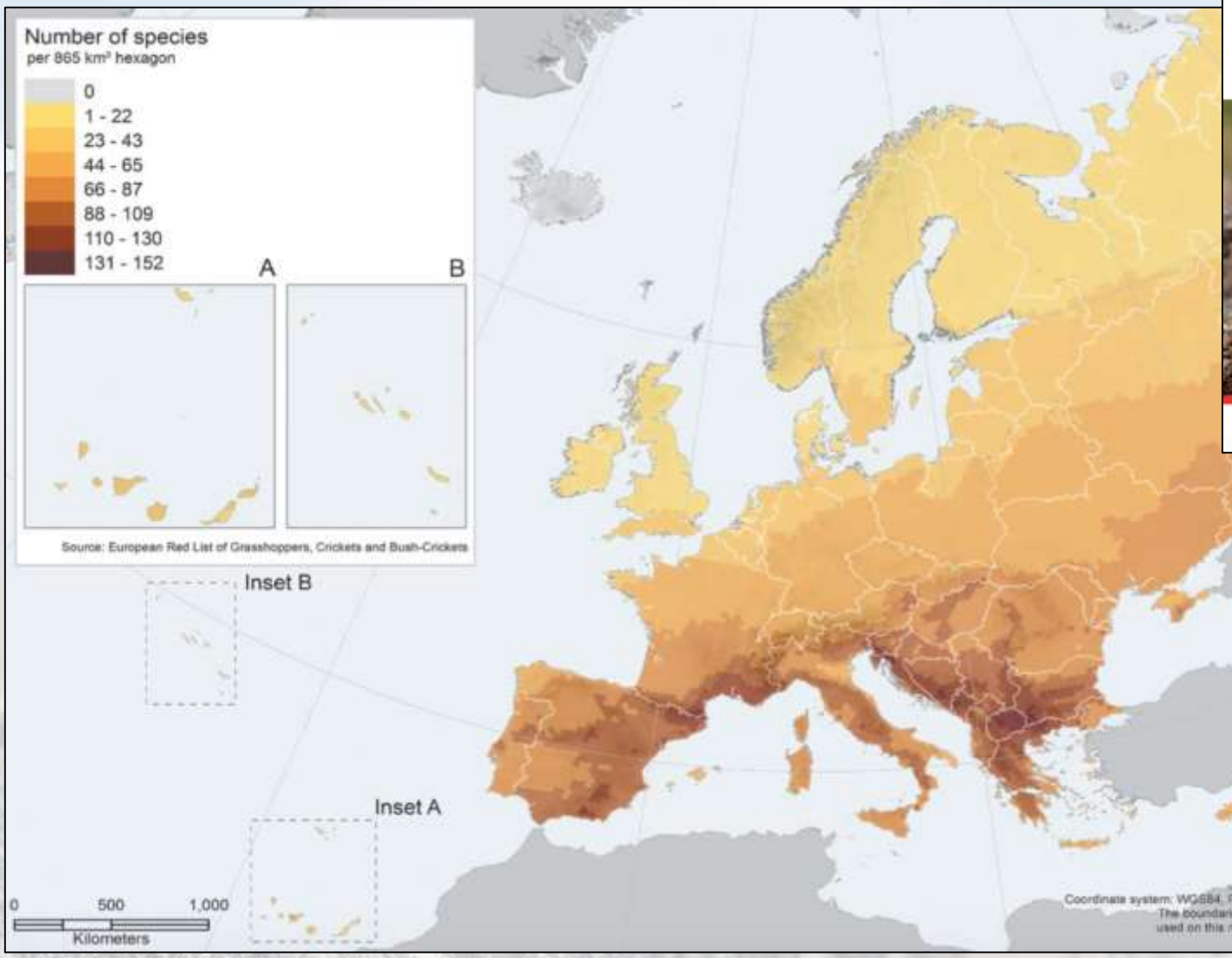
Valore conservazionistico



Elevato tasso di endemismo

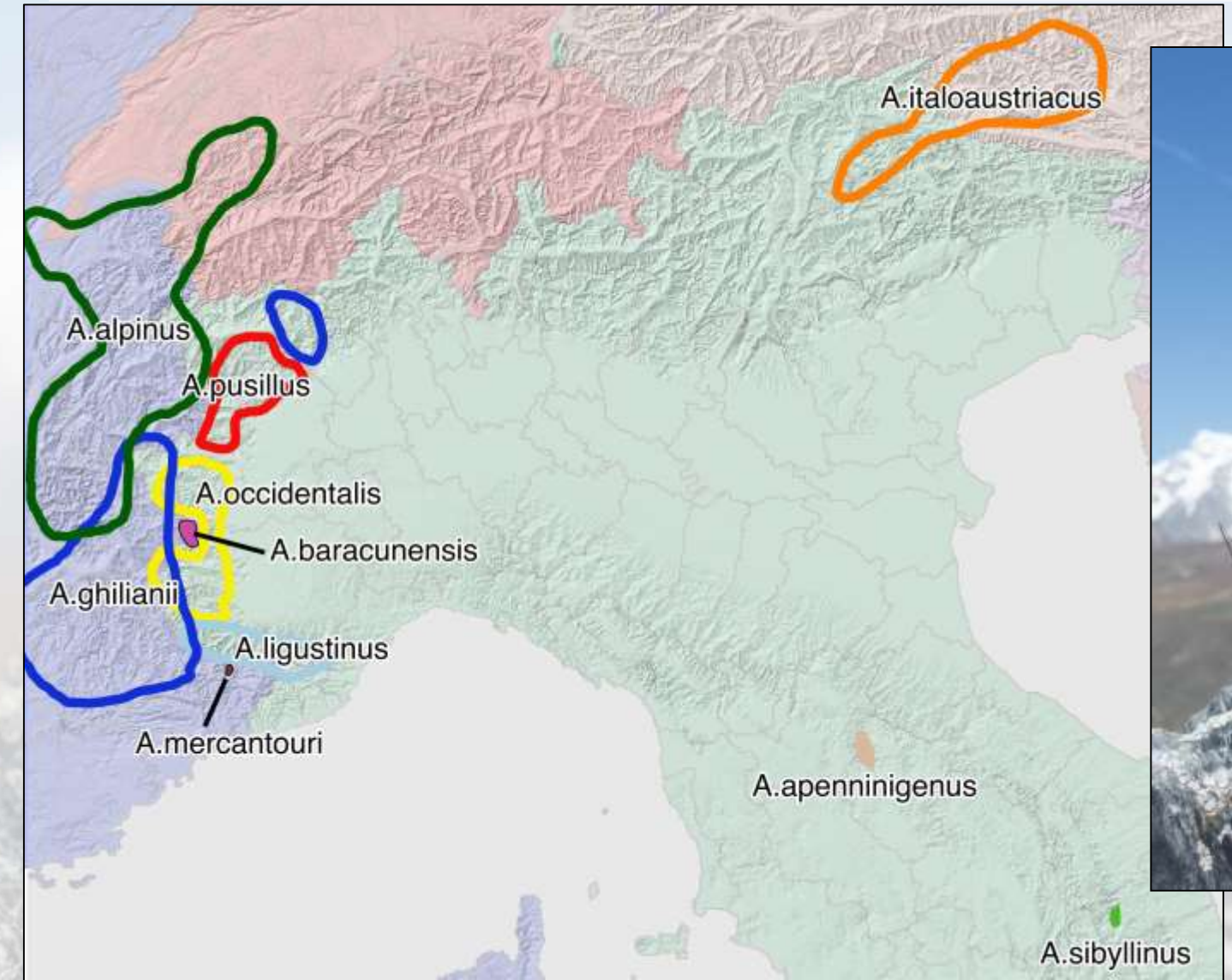
"…144 taxa endemici italiani. È un numero davvero rilevante, che rappresenta il 37,9 % di quelli attualmente conosciuti…Questi 144 taxa contribuiscono notevolmente alla diversità biologica del nostro Paese"

Valore conservazionistico

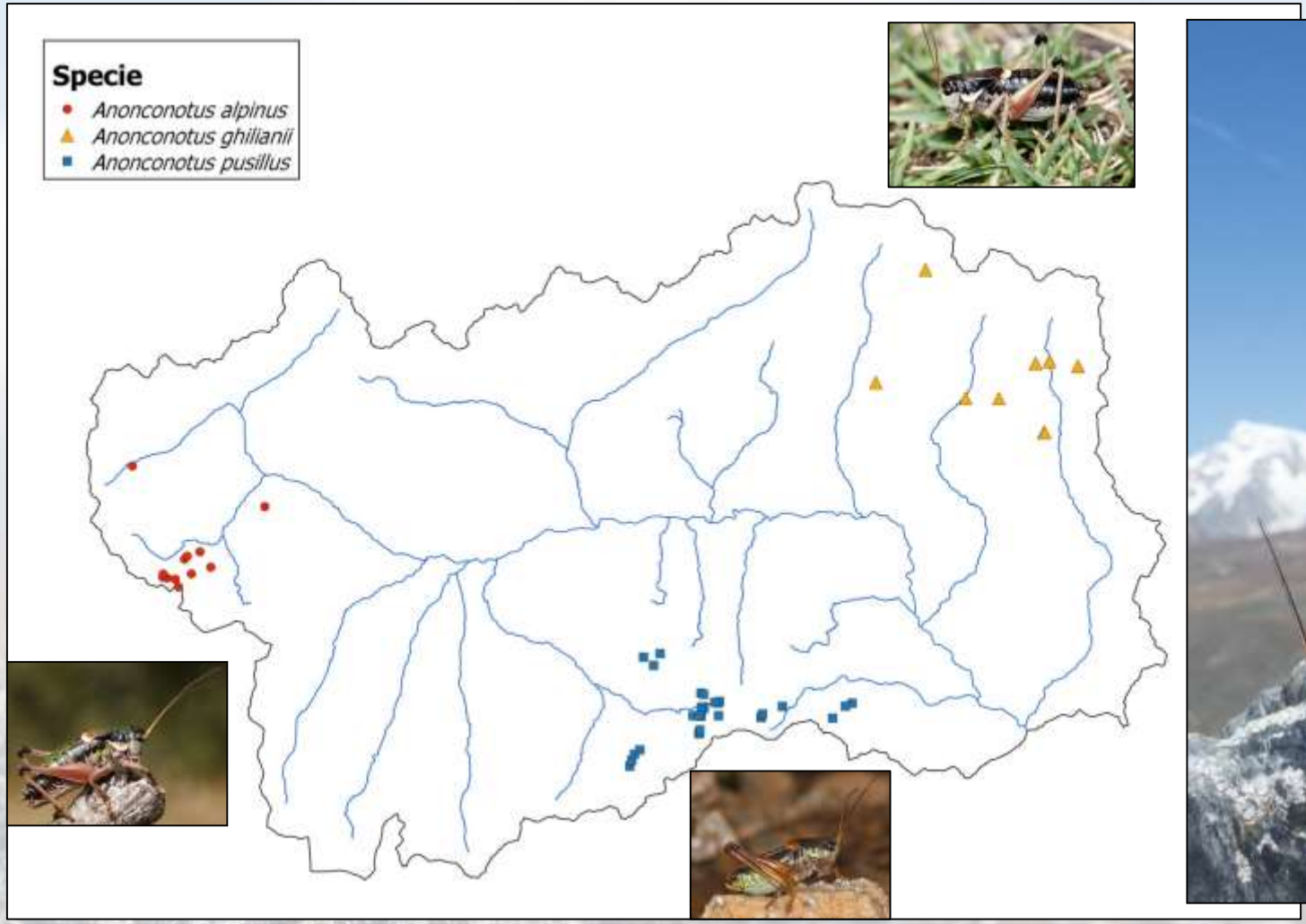


Valore conservazionistico

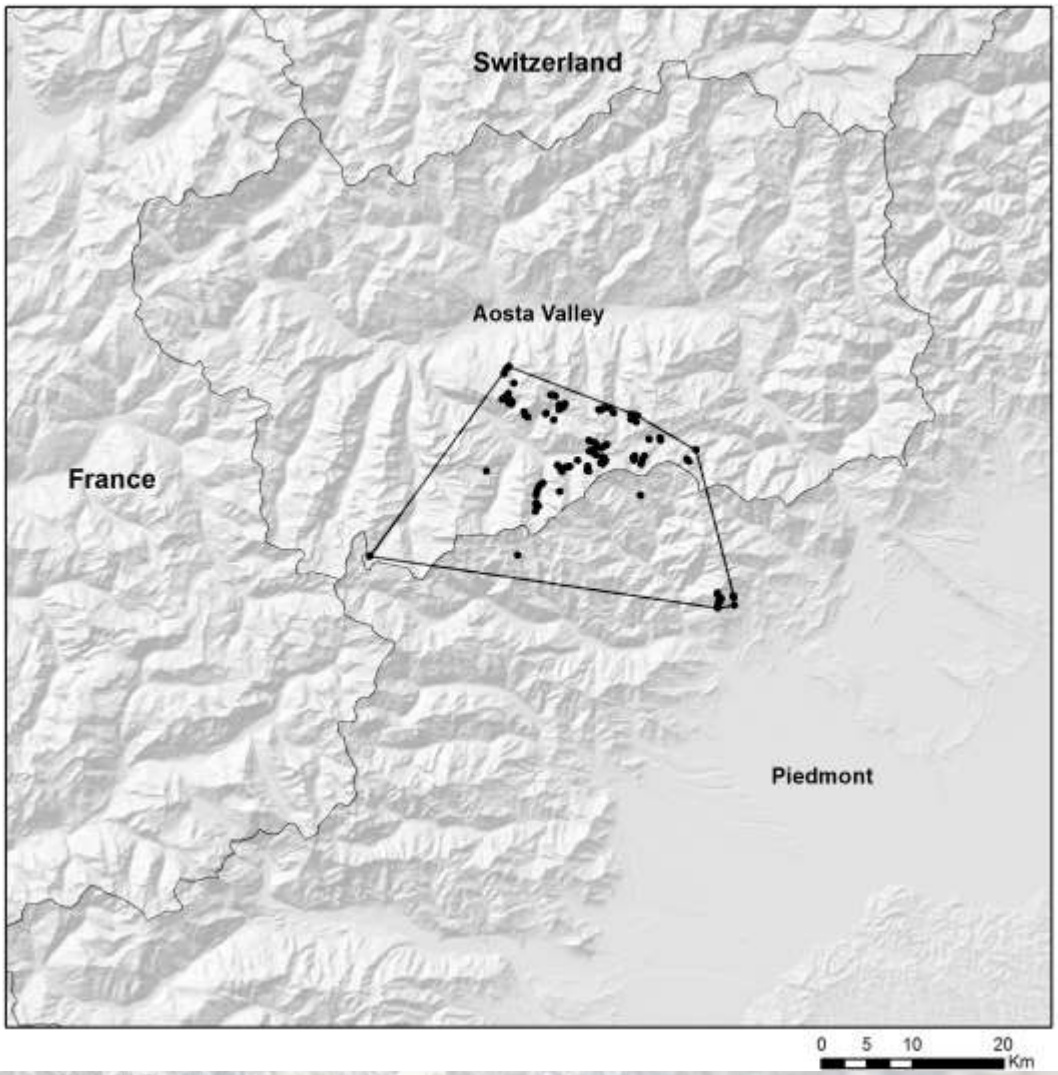
Il Genere Anonconotus



Il Genere Anonconotus



Stenobothrus ursulae



Grazie per l'attenzione!