«Danilo Re 2024 - Ranger Seminar»

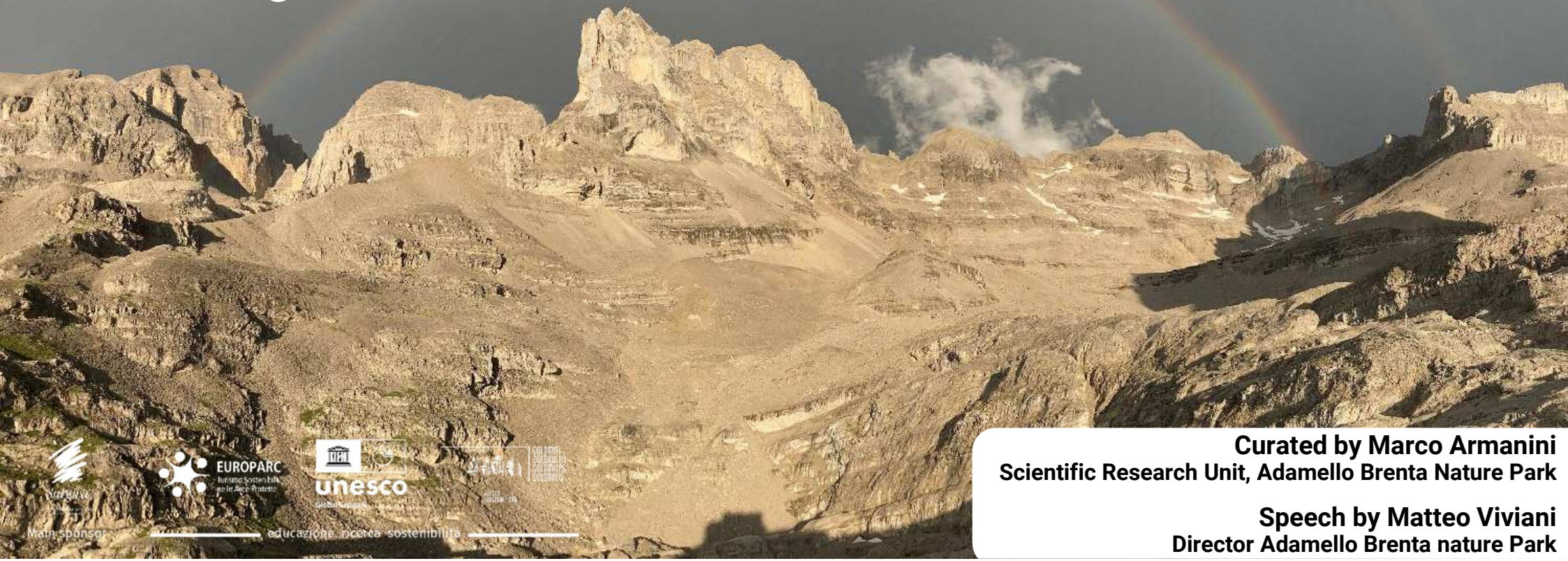
Biodiversity monitoring in protected areas – a base for management and conservation measures

BioMiti Project

Discovering Life on the Brenta Dolomites

PARCO NATURALE ADAMELLO BRENTA Geopark

Naturalmente Vostro



Main sponsor

EUROPARC Turismo Sostenibile nelle Aree Protette

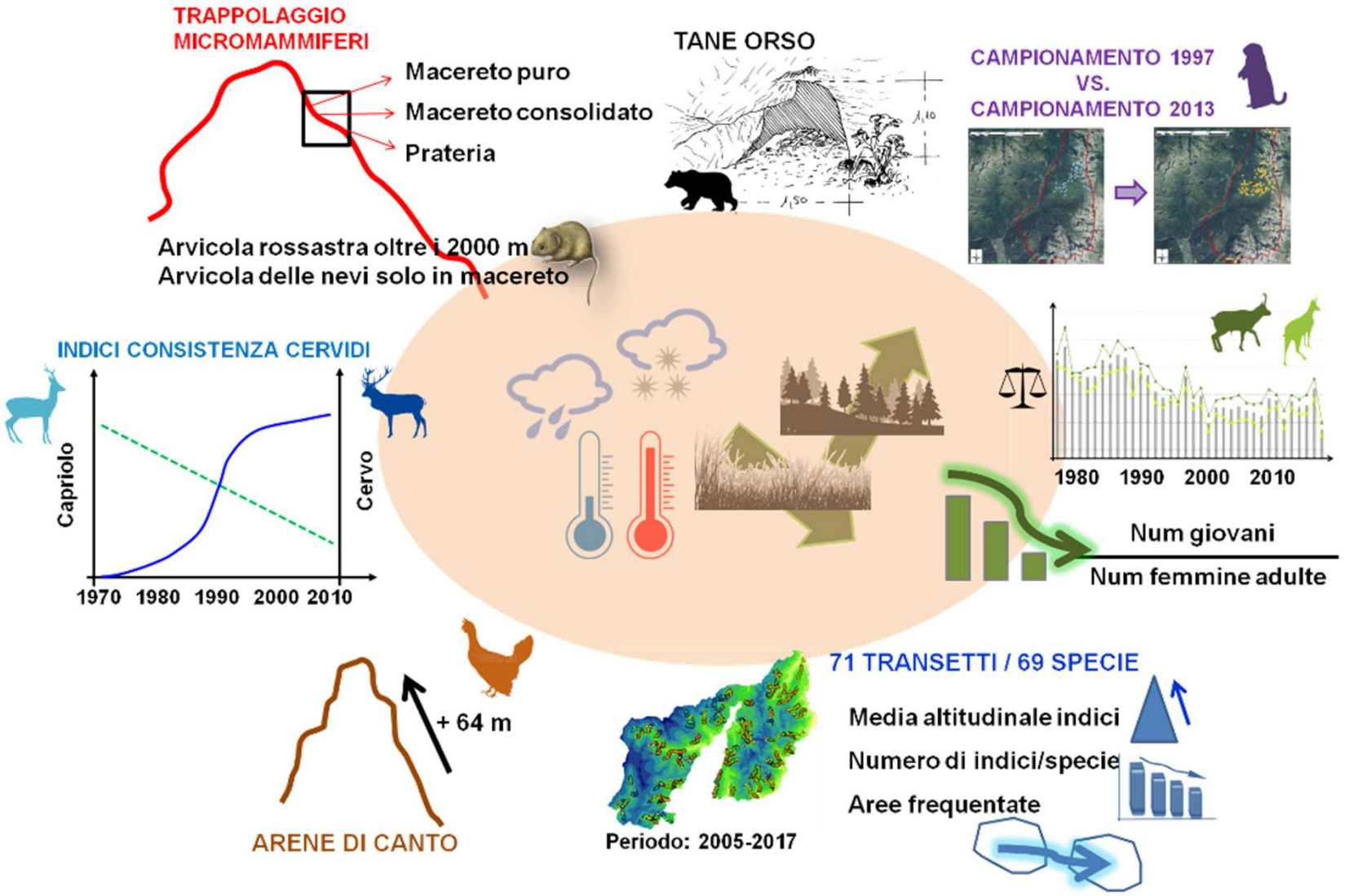
unesco

educazione ricerca sostenibilità

Curated by Marco Armanini
Scientific Research Unit, Adamello Brenta Nature Park

Speech by Matteo Viviani
Director Adamello Brenta nature Park

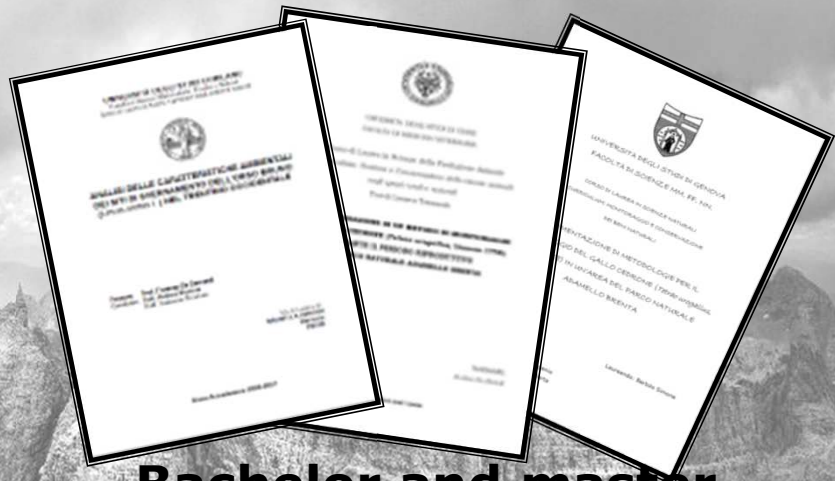
Knowing to manage and conserve: a long tradition for the Adamello Brenta Nature Park



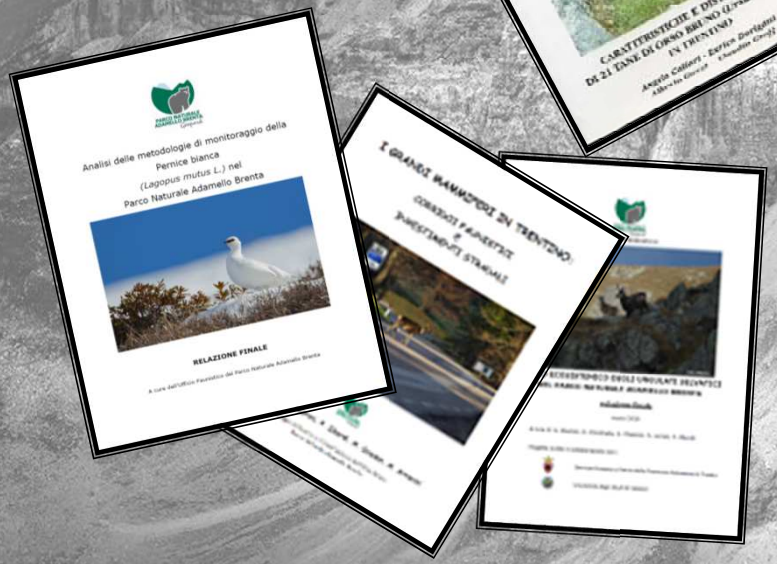
Knowing to manage and conserve: a long tradition for the Adamello Brenta Nature Park

Scientific publications

Bachelor and master thesis

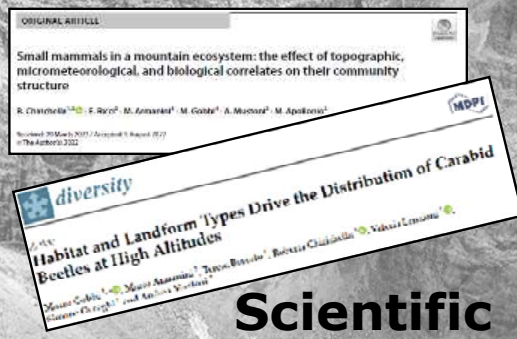


Project reports

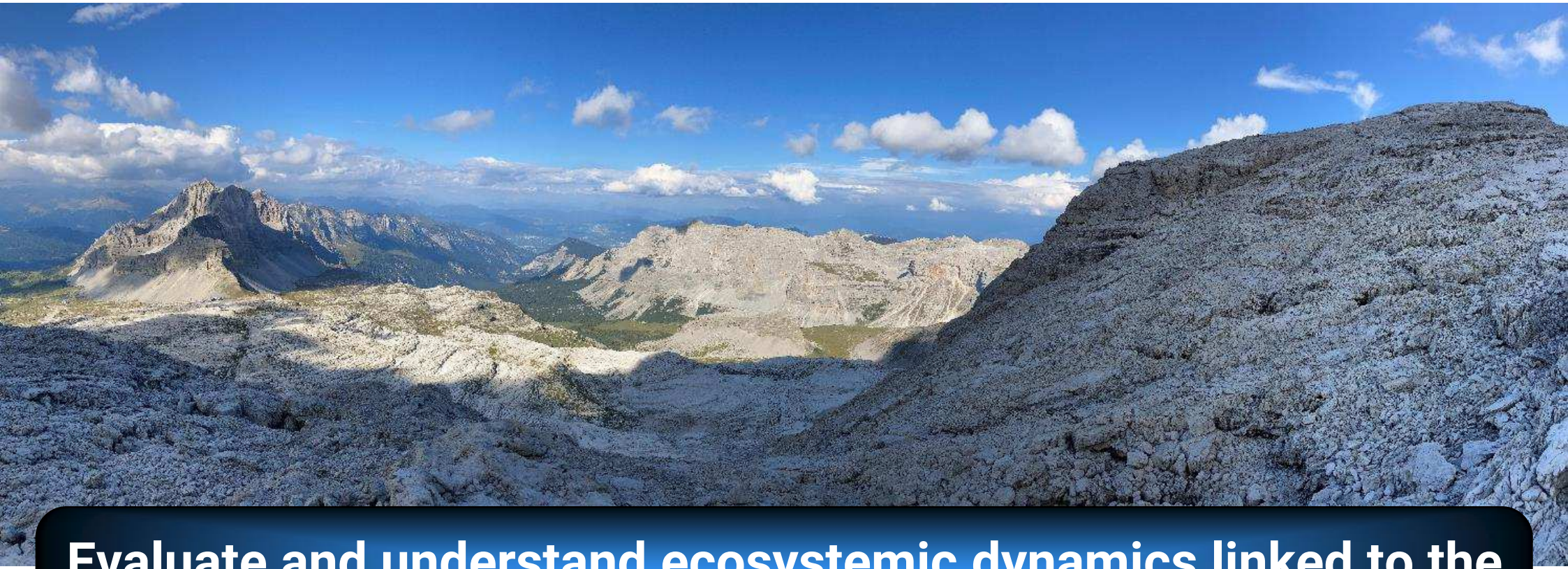


Working group reports

Scientific articles



Knowing to manage and conserve: a long tradition for the Adamello Brenta Nature Park



Evaluate and understand ecosystemic dynamics linked to the global warming in high altitude environments

Alexander von Humboldt

1769-1859

"I have an idea in mind:
encapsulate in a work everything in the material world, all that we currently know about the appearances of the celestial vault and life on Earth."

Collaboration Network

Syntesis work among specialists

- **Adamello Brenta Nature Park;**
- **University of Sassari;**
- **MUSE: Science Museum of Trento;**
- **FMCR: Civic Museum of Rovereto;**
- **University of Pavia;**
- **University of Padova;**
- **University of Bologna;**
- **Freelance experts;**

Geographic Comparability of Data

Progetto Ministeriale di Monitoraggio della Fauna Alpina (inizio: 2006)

Study area: 3.847 ha

Let’s start from the base…

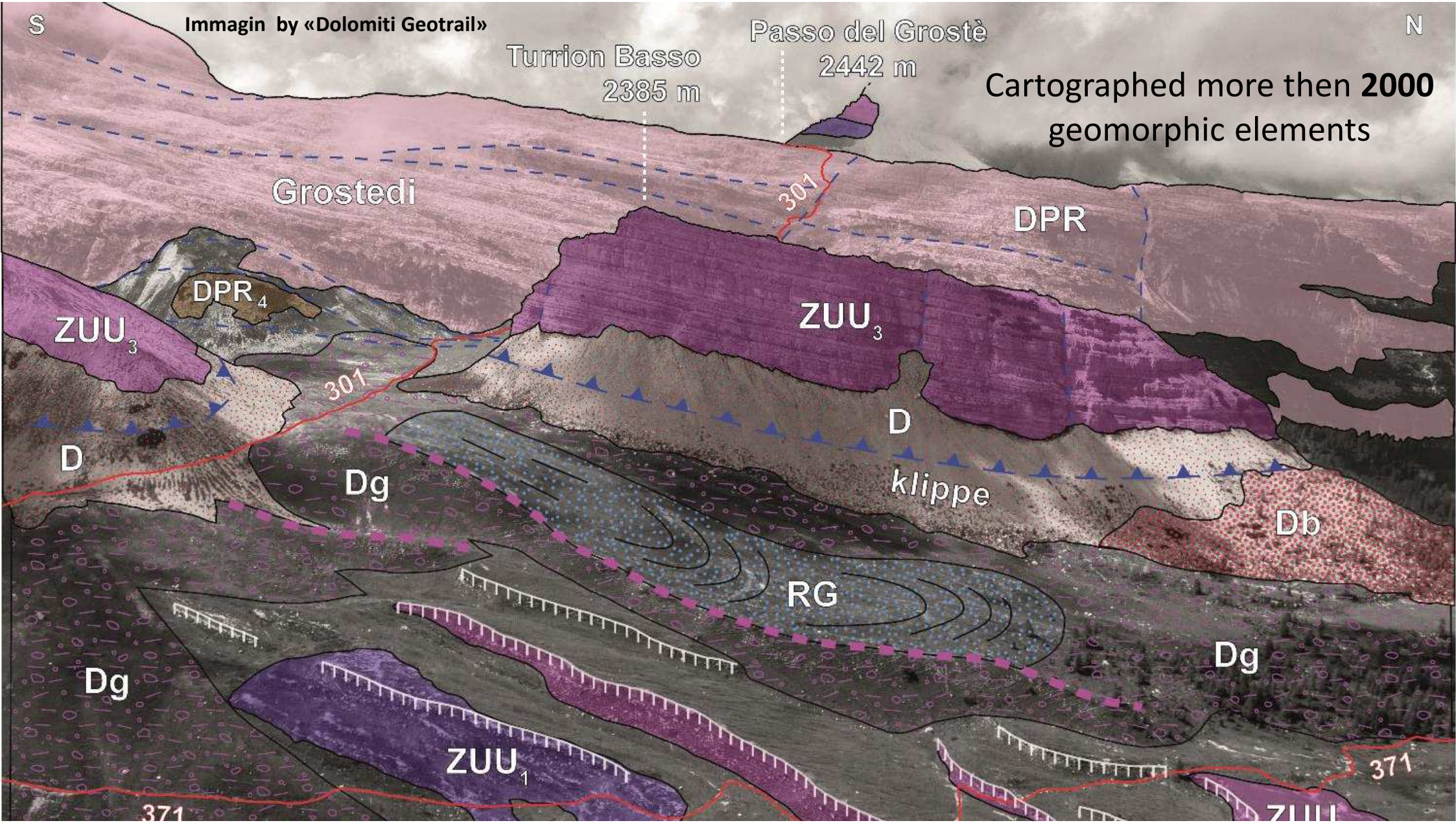
Geomorphic mapping (UNIPV e UNIPD)

- Prof. Alberto Carton;
- Prof. Roberto Seppi;
- Dott. Thomas Zanoner;

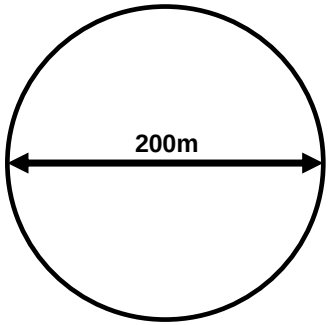
Geologic and geomorphic base

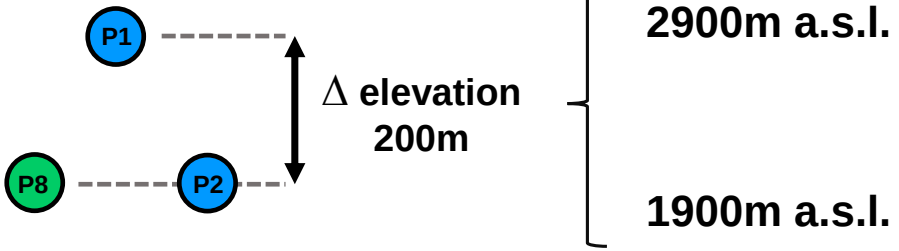
Geomorphic mapping (UNIPV e UNIPD)

- **Prof. Alberto Carton;**
- **Prof. Roberto Seppi;**
- **Dott. Thomas Zanoner;**

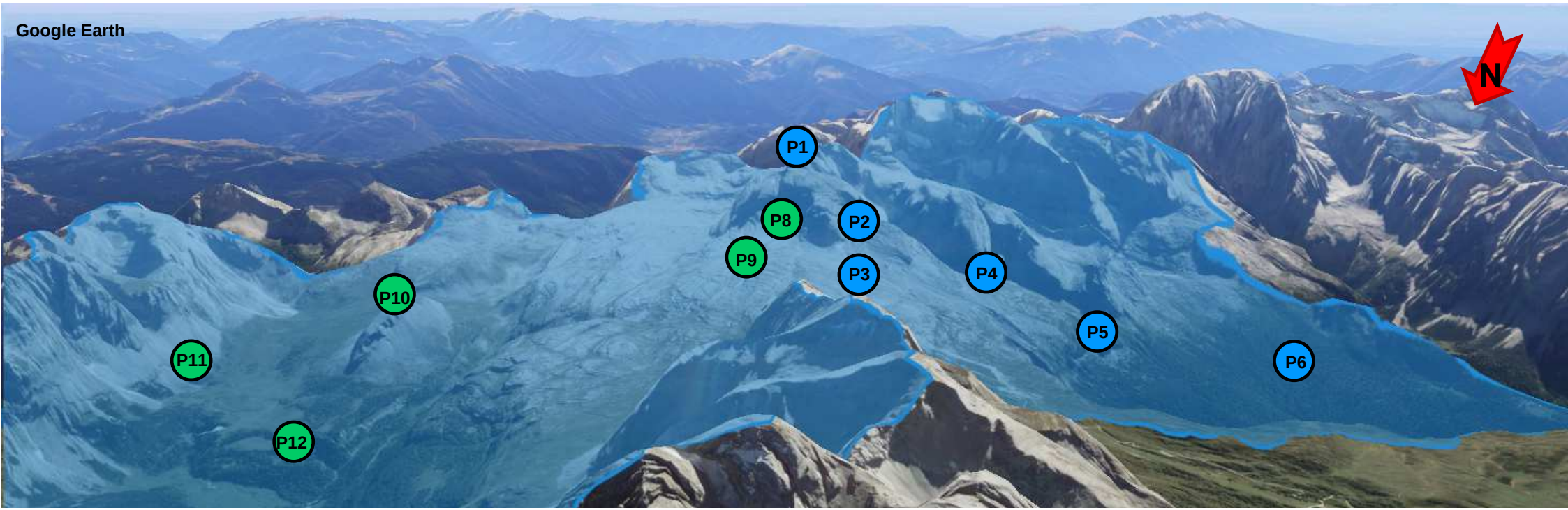

S
Immagin by «Dolomiti Geotrail»
Turrion Basso
2385 m
Passo del Grostè
2442 m
N
Cartographed more then **2000** geomorphic elements
Grostedi
301
DPR
DPR4
ZUU3
ZUU3
301
D
D
Dg
klippe
Db
RG
Dg
Dg
ZUU1
371
371
ZUU

Survay areas: 11 plots





Abiotic and biotic variables



Survay topics

Geology and geomorphology
UNIPD and UNIPV

Soil
bacteria, fungi, stroctur
UNIPD

Temperature & humidity
PNAB and UNISS

Lichens
UNIBO

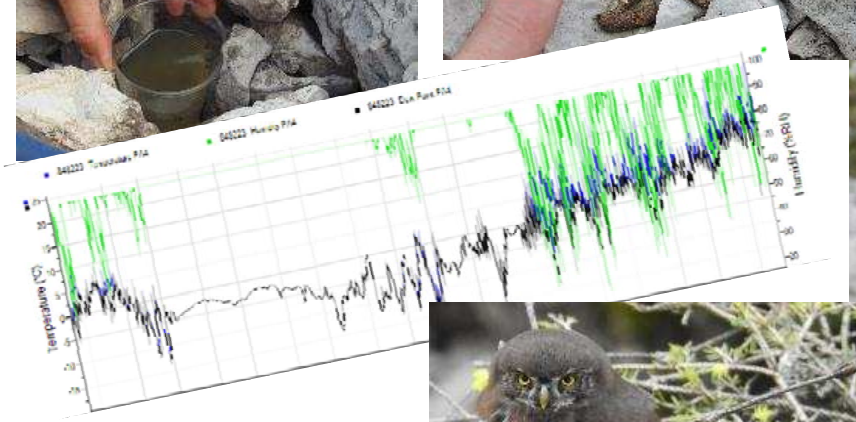
Vegetation
FMCR

Mammals
included bats and small mammals
PNAB and UNISS

Birds
PNAB and UNISS

Invertebrates
carabid beetles, spiders, chironomids
MUSE
butterfly and moths
Mr. Timossi

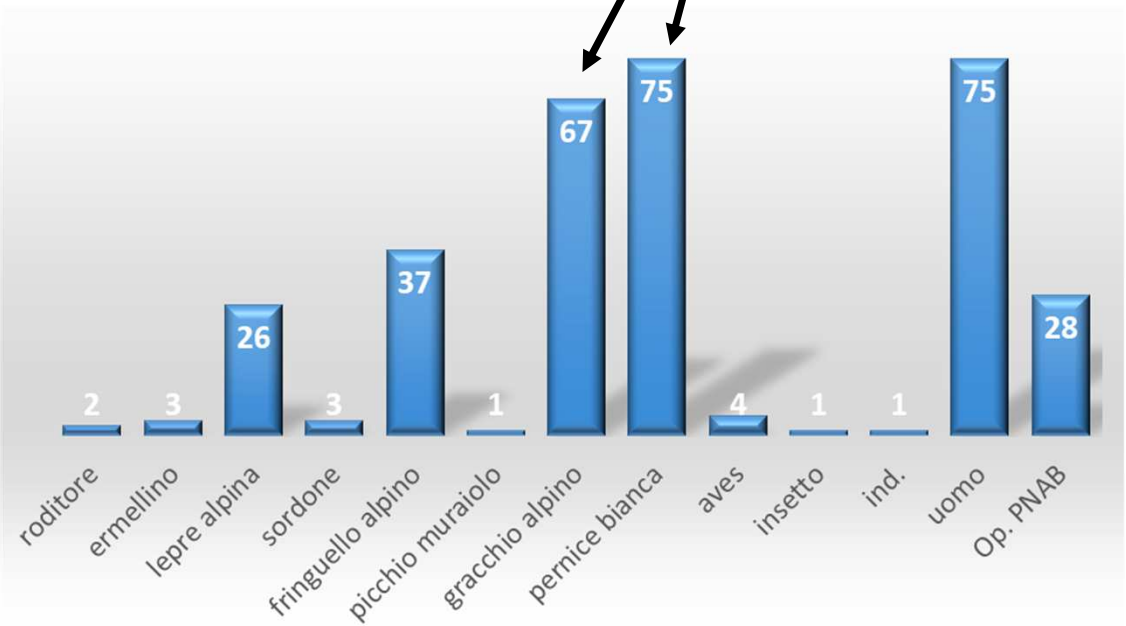
Survay topics and techniques



Survay topics and techniques

Camera trapping on Cima Grostè 2900m a.s.l.

- 4 camera traps → 3072 trap hours (21 july –22 august)
- min. 8 species contacted vs. 2 species contacted with traditional survays



Habemus specie

Zootaxa 5128 (3): 435–443
https://www.mapress.com/zt/

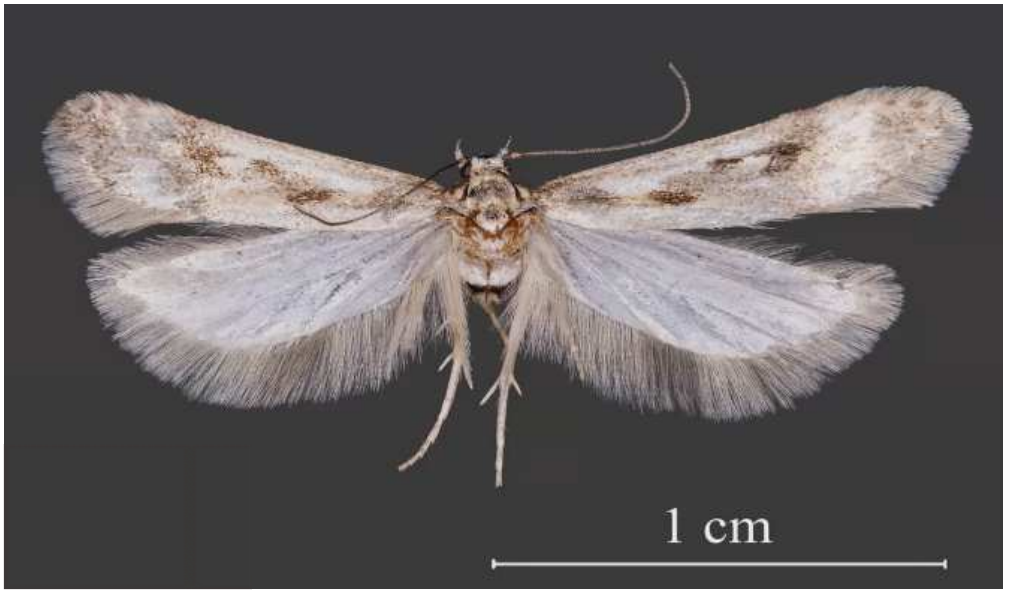
Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

https://doi.org/10.11646/zootaxa.5128.3.8
http://zoobank.org/urn:lsid:zoobank.org:pub:1FA3A341-D190-497A-AD27-A1F0057BC08D

Sattleria enrosadira sp. nov., a new cryptic, high alpine species from Northern Italy revealed by DNA barcodes and morphology (Lepidoptera, Gelechiidae)

GIOVANNI TIMOSSI[1*] & PETER HUEMER[2]



BioMiti in numbers and collected data

- 2024 is the **7th year** of project;
- **3847 ha** study area;
- **11** survay areas;
- altitudinal gradient **1315m a 3148m** a.s.l.;
- **3** types of bedrock;
- **2067** cartographed geomorphic elements;
- more then **1.000.000** data about air and soil temperature and humidity;
- **30 soil samples** analyzed, **10,000** species of **bacteria** and **1,045** species of **fungi** identified;
- **55 phytosociological** surveys with **339** taxa (species and subspecies), of which **100 bryophytes** identified;
- **55 pit-fall** traps positioned for the monitoring of invertebrates;
- **935 carabid beetles** (22 species) and **1883 spiders** captured;
- **361 birds** contacts of **32** specie;
- **352** indices of **vertebrate** fauna presence;
- **227 hours** of bat monitoring, **998 bat passes** detected;
- approximately **10,000 trap** hours for live capture of small mammals;
- **155 captures** of **83 individuals** (5 species) of **small mammals**;
- **251** camera trap **events**;
- **6** bachelor's thesis and master's thesis;
- **3** scientific articles;
- **2** Workshop.

Specific Goals

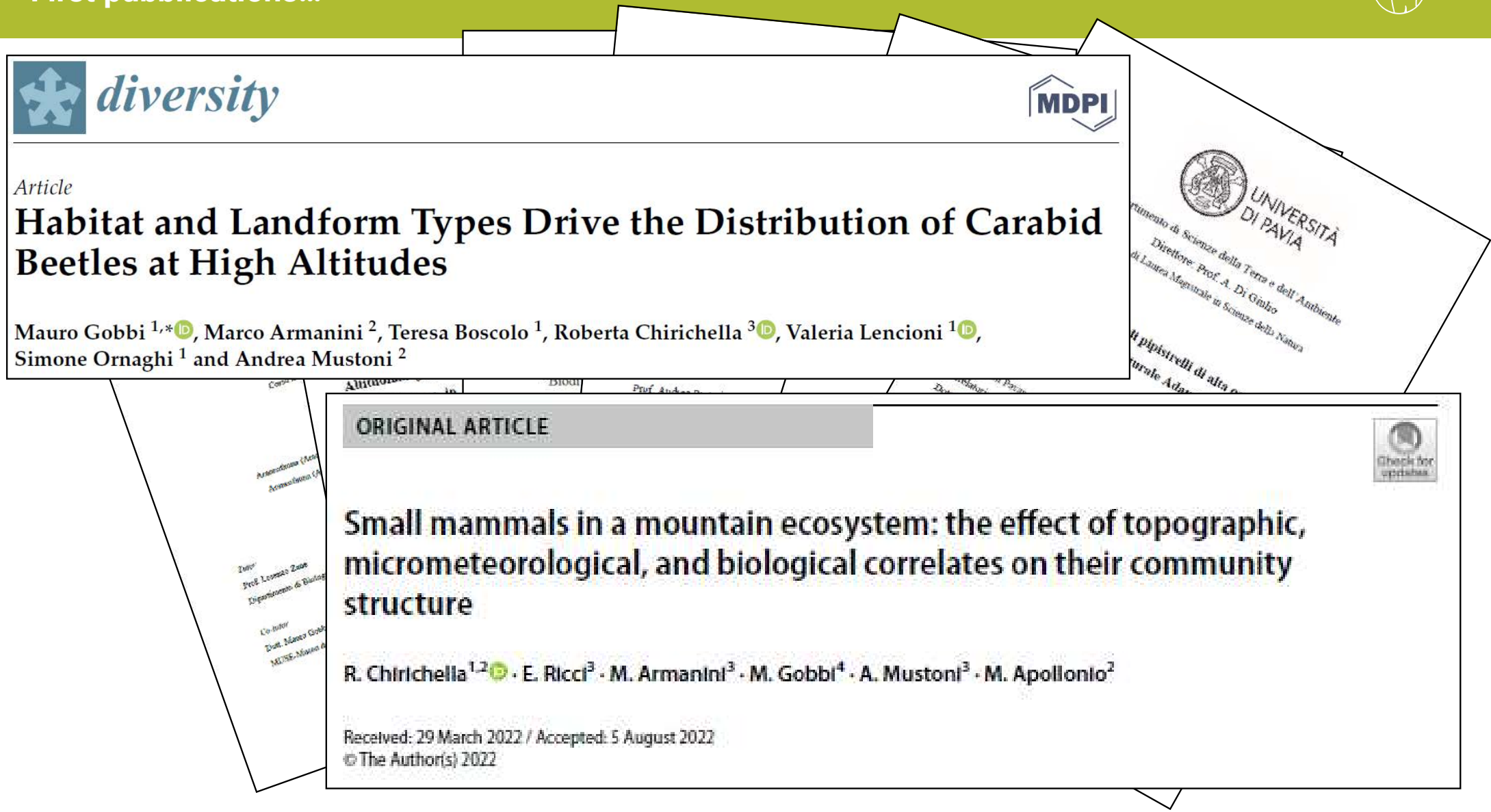
Obtaining descriptive data of high-altitude ecosystems

Providing useful insights for Environmental Education

Identifying the most effective conservation measures for the most at-risk environments

From scientific research to environmental education

First pubblications…



diversity

MDPI

Article

Habitat and Landform Types Drive the Distribution of Carabid Beetles at High Altitudes

Mauro Gobbi [1,*], Marco Armanini [2], Teresa Boscolo [1], Roberta Chirichella [3], Valeria Lencioni [1], Simone Ornaghi [1] and Andrea Mustoni [2]

UNIVERSITÀ DI PAVIA

ORIGINAL ARTICLE

Small mammals in a mountain ecosystem: the effect of topographic, micrometeorological, and biological correlates on their community structure

R. Chirichella[1,2] · E. Ricci[3] · M. Armanini[3] · M. Gobbi[4] · A. Mustoni[3] · M. Apollonio[2]

Received: 29 March 2022 / Accepted: 5 August 2022

Thanks…

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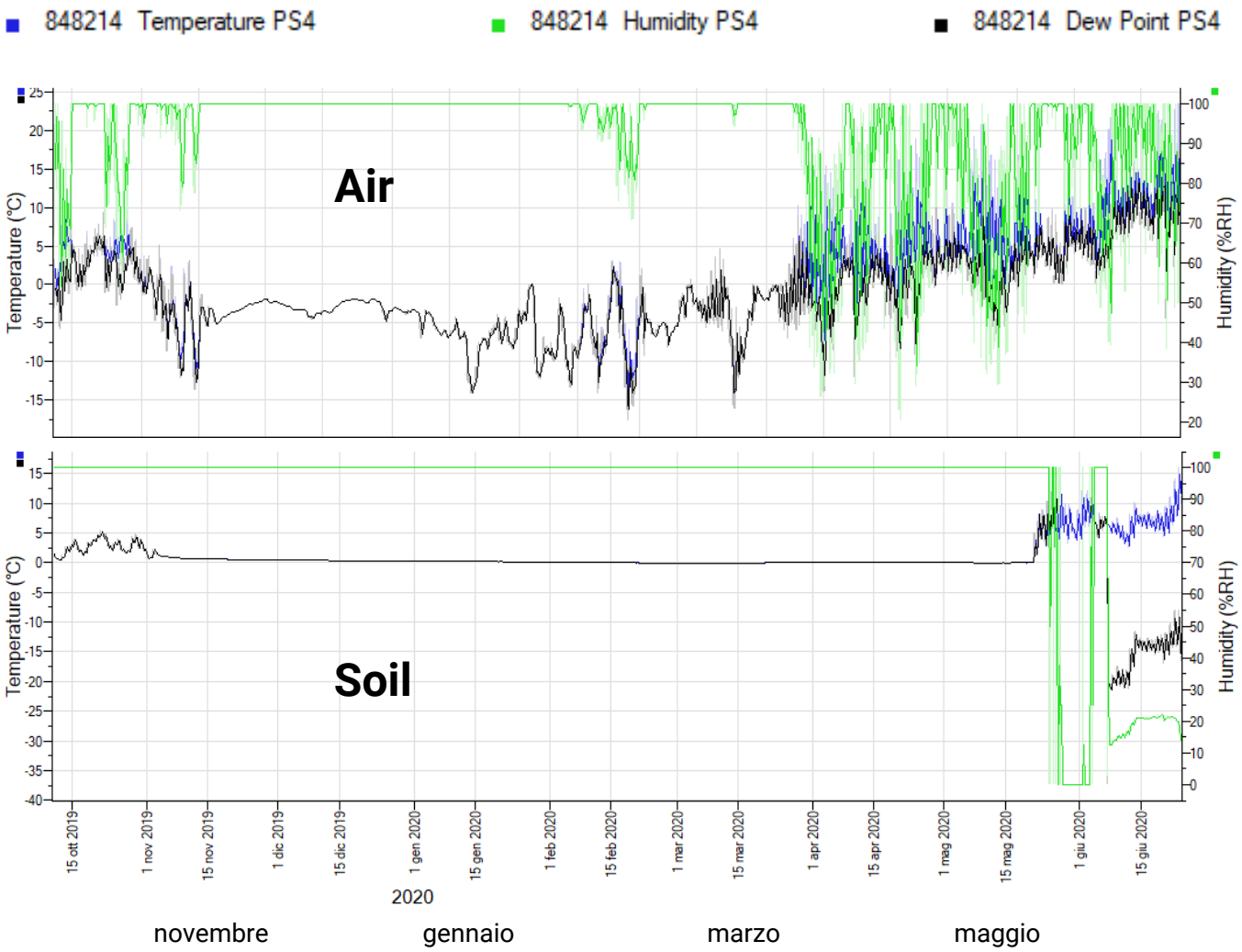
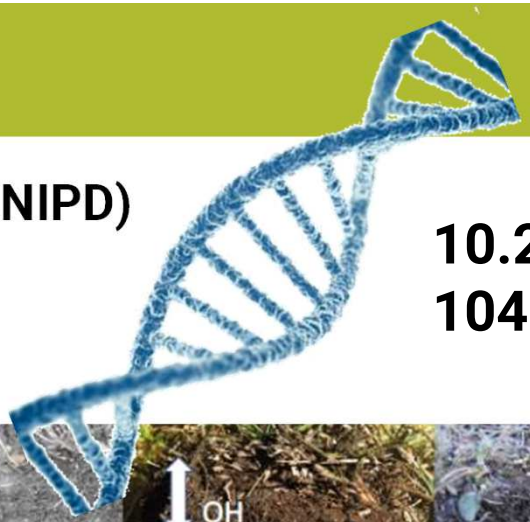
Temperature and humidity

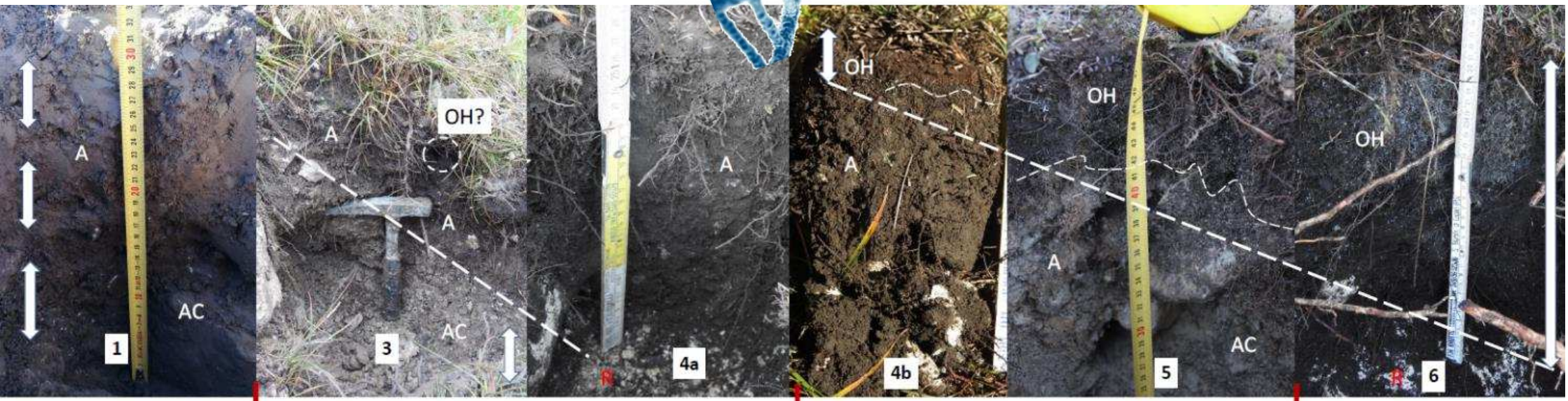


Campionamento e analisi dei suoli (UNIPD)

- **Prof. Zanella**
- **Prof. Squartini**



10.297 bacteria species
1045 fungi species



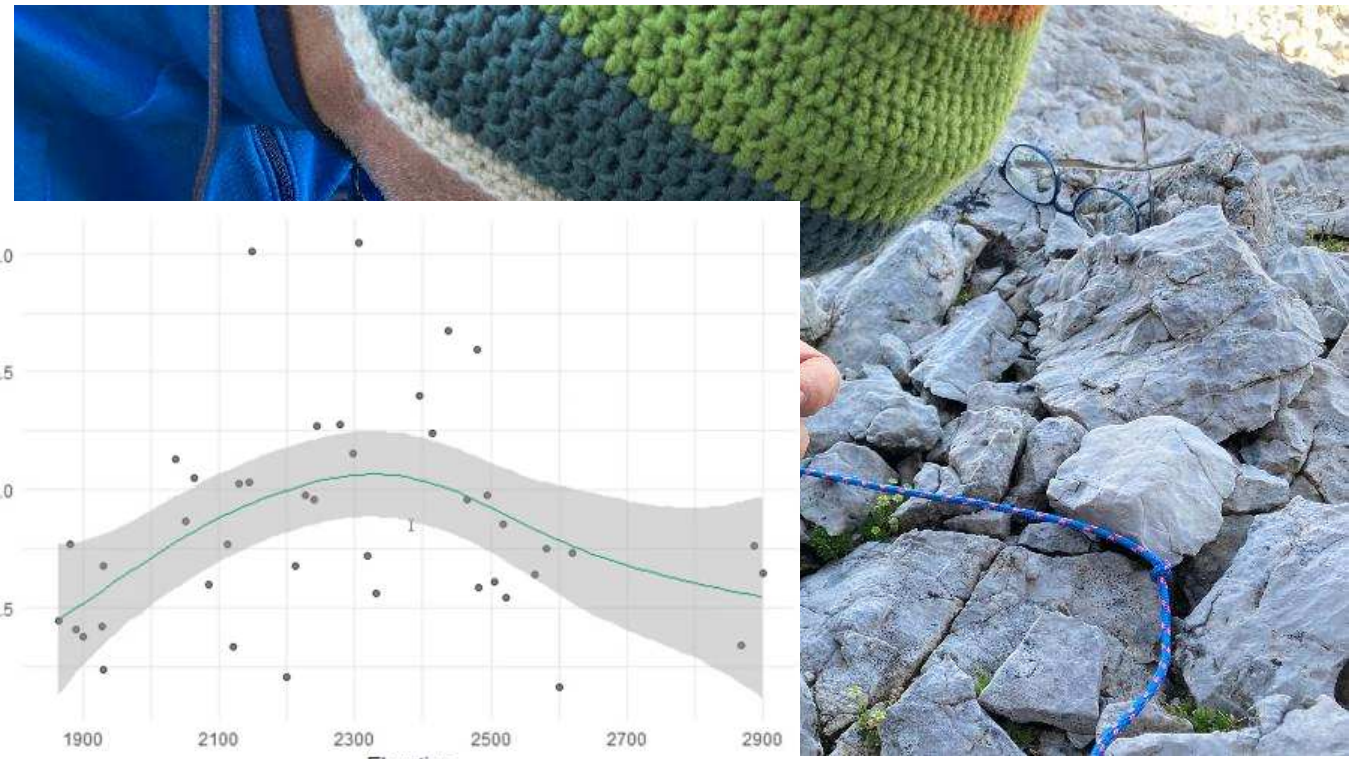
	?		Rhizo Mull		Mull			Amphi		Amphi		Tangel	
Soil horizons:	A-AC				rhA-A-C			zoOH-A-AC		zoOH-A-AC		zoOH-szoOH-R	
Soil T°	3	4	5	6	7	8	9	8	8	8	8	8	°C
ALTI	2900	2800	2700	2600	2500	2400	2300	2200	2100	2000	1900	1900	m

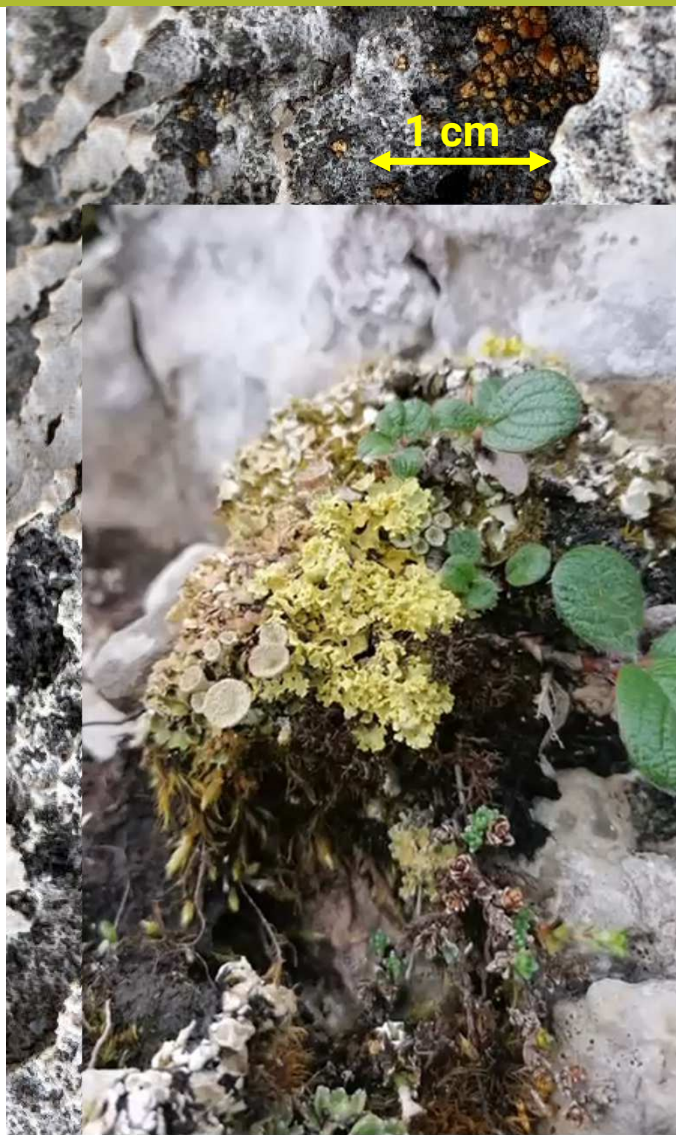
La componente biotica: tutto ciò che è Vivo

Lichens suvay (UNIBO) - summer 2022

- **Prof. Juri Nascimbene**
- **Dott.ssa Luana Francesconi**
- **Dott.ssa Chiara Pistocchi**

40 species
(work in progress)





Nebria germari

- Marcuzzi (1956);
- Bernasconi et al (2019)

fino ’50

1950 m s.l.m.

- Brandmayr & Zetto Brandmayr (1988)
- MUSE Entomological Collection
- Bernasconi et al (2019)
- Marcuzzi’s collection (NHM of Genova)

2200 m s.l.m.

fino ’80

- Gobbi et al (*in prep.*)

2017

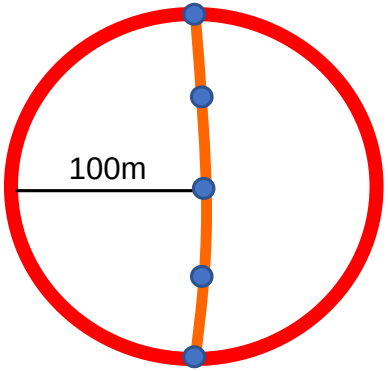
>2300 m s.l.m.

2019

>2500 m s.l.m.

Vertebrati: monitoraggio lungo transetti

➡ 91 specie target lungo transetti (200m per plot)



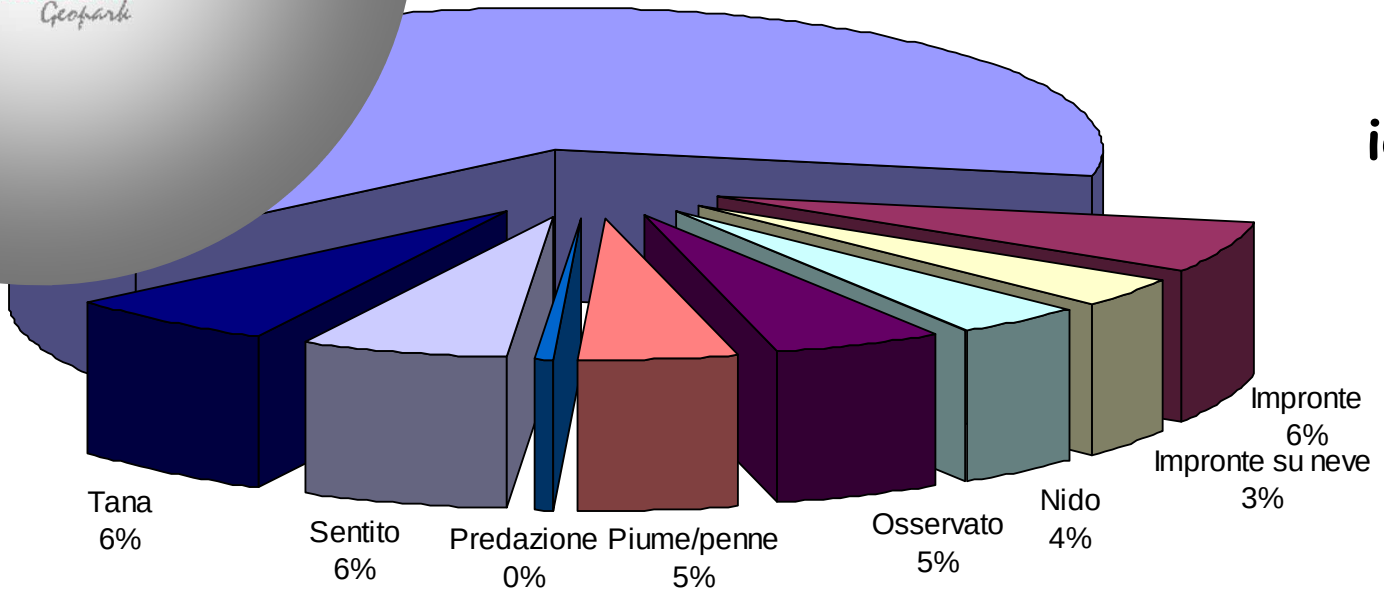
Transetto che collega le 5 pitfall

Materializzato su campo

800mq monitorati, circa il 2,56%

Indici rimossi ad ogni sessione

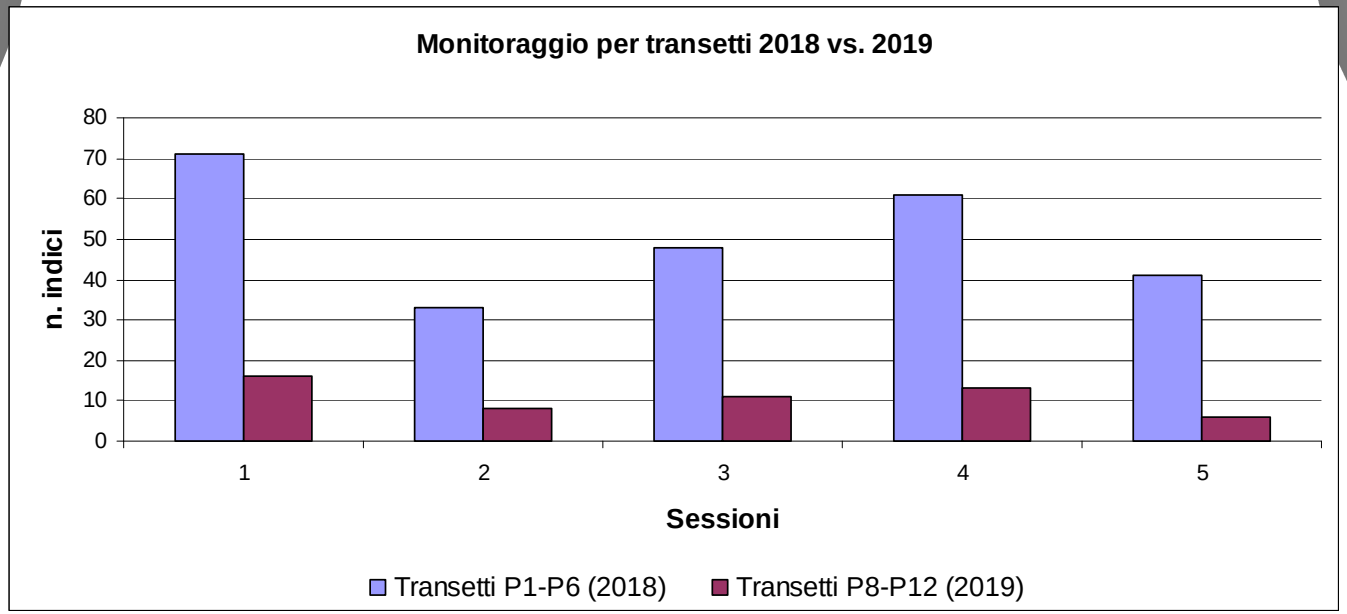
Vertebrati: monitoraggio lungo transetti



Fatte: identificative di mammiferi e galliformi

Monitoraggio lungo transetti 2018 vs. 2019

Non è stato considerato il P1 "Cima Grostè" !!!!



2018 Vallesinella

- 216 indici
- 22 sepcie/generi
- I.K.A.= 45

Pascolo? Esposizione? Habitat?

2019 Val di Tovel

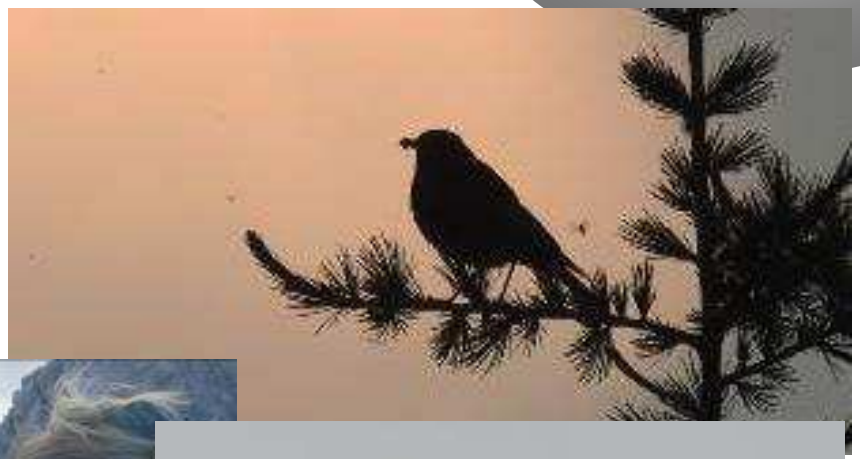
- 53 indici
- 19 specie/generi
- I.K.A. = 11

Uccelli: monitoraggio al canto

Ogni 20 giorni → Prima attività della sessione

20min
dalle 8.00
alle 8.20

Coppia di operatori al centro del plot

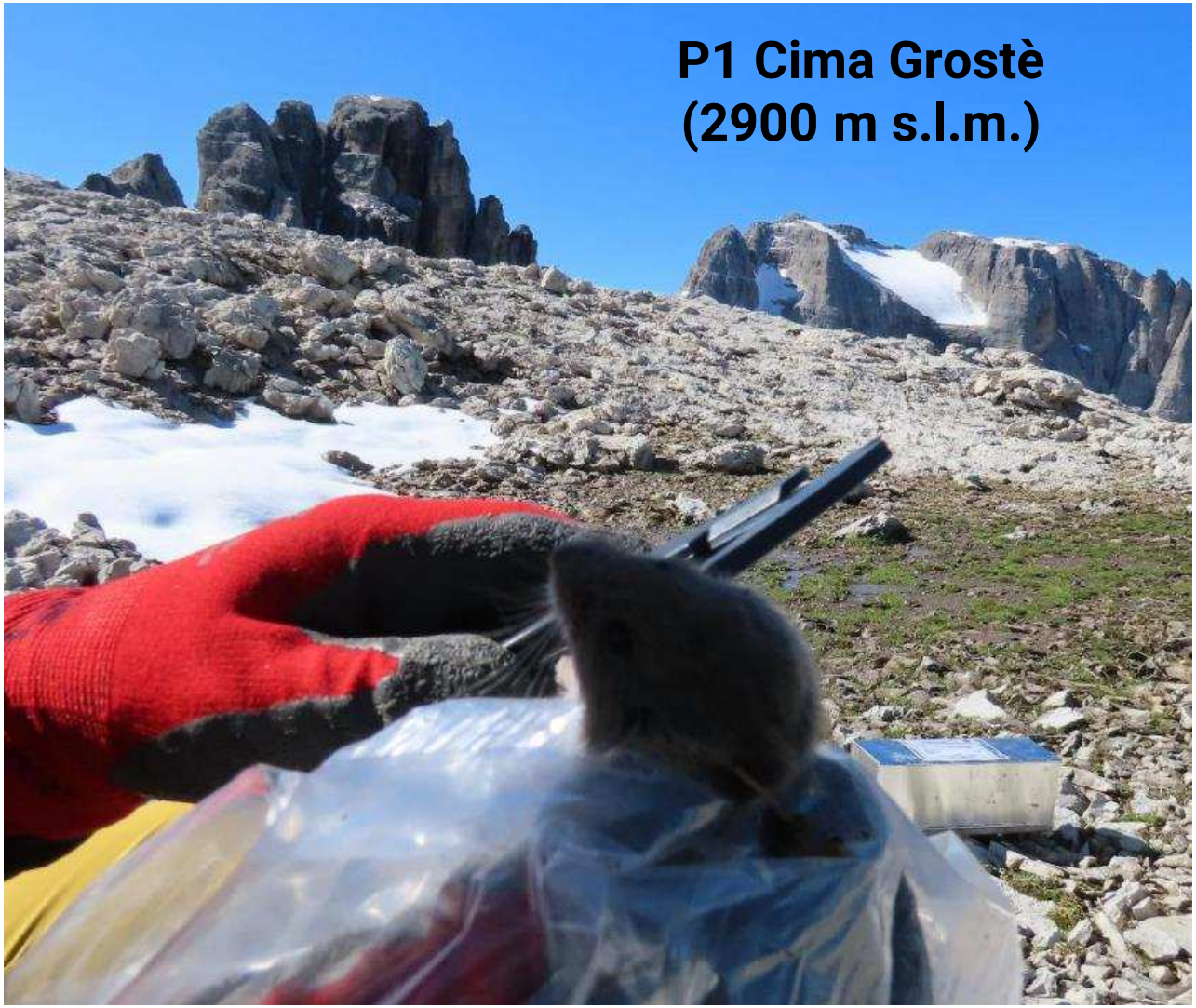



Catture a vivo
di piccoli mammiferi
(2020-2022)
PNAB e UNISS

La componente biotica: tutto ciò che è Vivo

155 catture di **83** individui di **5** specie

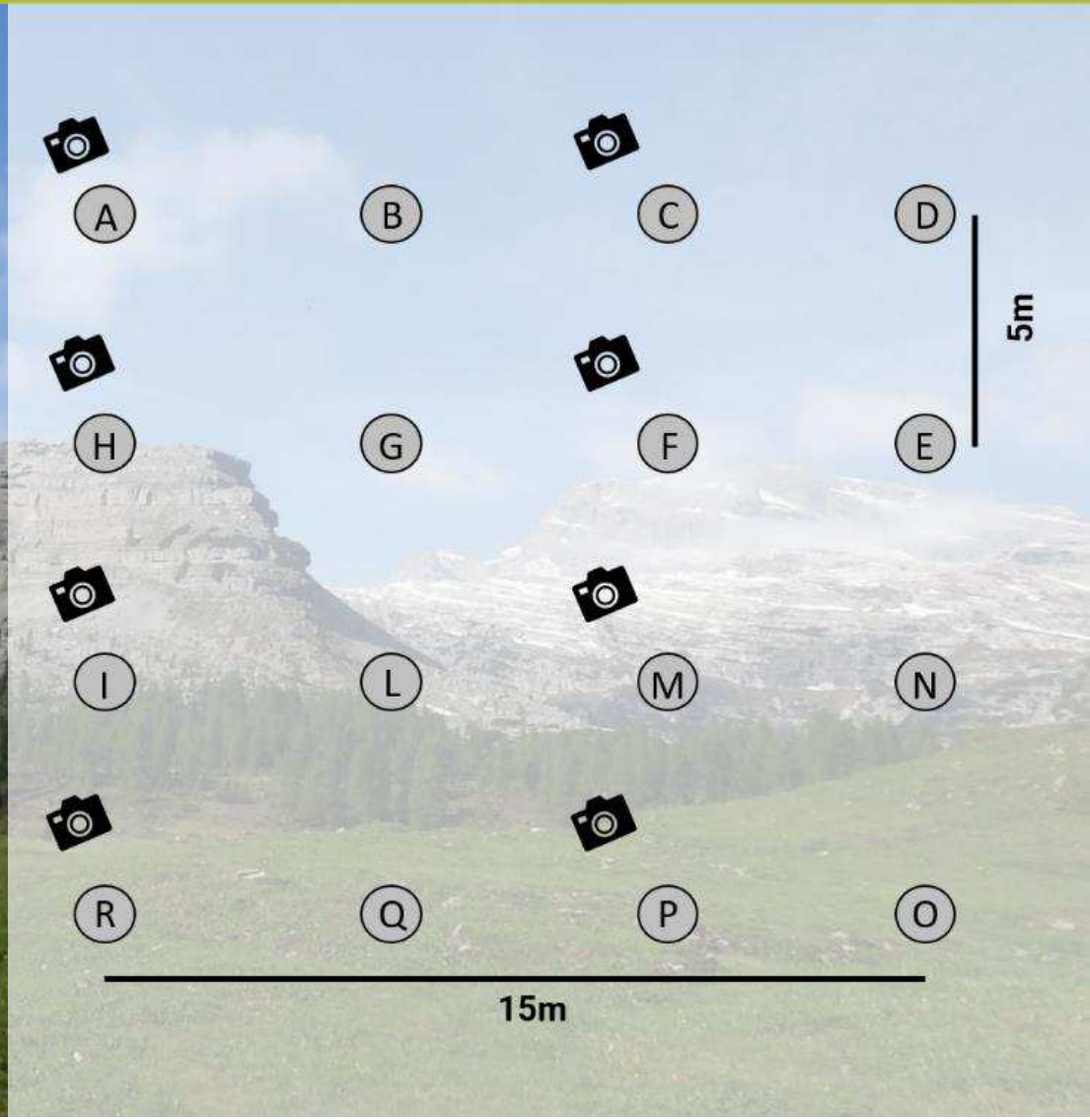
- **<u>Arvicola delle nevi</u> → relitto glaciale**
- **Arvicola campestre**
- **Arvicola rossastra**
- **Arvicola terricola**
- **Toporagno del Vallese**



La componente biotica: tutto ciò che è Vivo

11 griglie da 16 trappole

- **lettiera**
- **esca** (cornflakes, mela, frutta secca, pancetta, semi di girasole)



Metodi e materiali

- Scheda di rilevamento
- Bilancia
- Calibro per biometrie
- Rasoio per marcatura
- Macchina fotografica
- Materiale vario (guanti, esca, ecc.)

SCHEDA BIOMETRIE
PICCOLI MAMMIFERI

ID animale | Marca | Specie

Data

Ricattura

Giorno 1 2 3 4 | Mattino | Sera | Rilevatori

Replica n. | Stazione (plot) | Nodo griglia

Peso | Classe d'età: Giovane | Sub-adulto | Adulto | Indeterminato

SESSO
♂: Non riproduttivo | Testicoli addominali | Testicoli scrotali
♀: Non riproduttiva | Vagina chiusa | Vagina aperta | Tappo vaginale | Capezzoli evidenti | Gravida
?: Indeterminato

BIOMETRIE

Testa-corpo (TC)	mm
Coda (C)	mm
Piede posteriore (PP)	mm
Padiglione auricolare (PA)	mm
Distanza uro-genitale (UG)	mm

CODICI MARCATURA

A AB BC CD DE EF
B AC BD CE DF
C AD BE CF
D AE BF
E AF
F
ABC ACE BCD BEF
ABD ACF BCE CDE
ABE ADE BCF CDF
ABF ADF BDE CEF
ACD AEF BDF DEF

Parassiti

Dove	Zecche			Altro		
	-	+	++	-	+	++
Coda						
Genitali						
Piede p.						
Piede a.						
Orecchie						
Altro						

Foto da:
a:

Progetto BioMiti 2020-2022: Catture piccoli mammiferi

Catture Vallesinella 2020

Plot 1 - Plot 6

Totale catture: 97 (50 individui di 5 specie)

Community Ecology
https://doi.org/10.1007/s42974-022-00104-8

ORIGINAL ARTICLE

Check for updates

Small mammals in a mountain ecosystem: the effect of topographic, micrometeorological, and biological correlates on their community structure

R. Chirichella[1,2] · E. Ricci[3] · M. Armanini[3] · M. Gobbi[4] · A. Mustoni[3] · M. Apollonio[2]

Received: 29 March 2022 / Accepted: 5 August 2022

Progetto BioMiti 2020-2022: Catture piccoli mammiferi

Catture Val di Tovel 2021

Plot 12 - Plot 8

- **avvicinamenti lunghi**
- **scarsa copertura telefonica**
- **mancanza di personale**

Anno in cui si è registrata un'abbondante presenza di piccoli mammiferi

Monitoraggio fallito
eseguite solo 3 sessioni di cattura

	Quota (m s.l.m.)	Data S1	Data S2	N. catture tot	Ricatture	Individui determinati	Decessi
Plot 9	2500	12-15 lug.	-	5	1	4	0
Plot 10	2300	5-8 lug.	27-30 lug.	12	4	11	1

Topo selvatico e dal collo giallo

Arvicola delle nevi

? Composizione specifica variabile di anno in anno...

Progetto BioMiti 2020-2022: Catture piccoli mammiferi

Catture Val di Tovel 2022

Plot 12 - Plot 8 + Plot 1

Totale catture: 58 (33 individui di 4 specie)

7 catture indeterminati

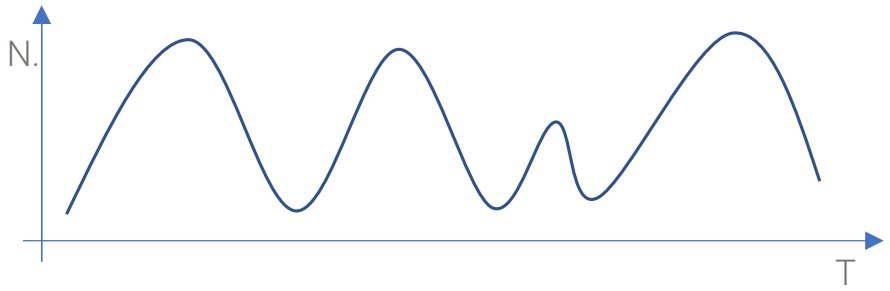
4 decessi

PLOT	n. catture	n. individui	n. specie	n. A.camp	n. A.Ross.ra	n. A.nevi	n. ind
1	1	1	1			1	-
8	7	2	1			2	-
9	19	7 (8?)	2	-	1	6	1
10	4	4	?	-	-	-	4
11	13	9	3	1	1	5	2
12	14	10	3	1	7	2(topor	-

(P8 e P9 4 repliche)

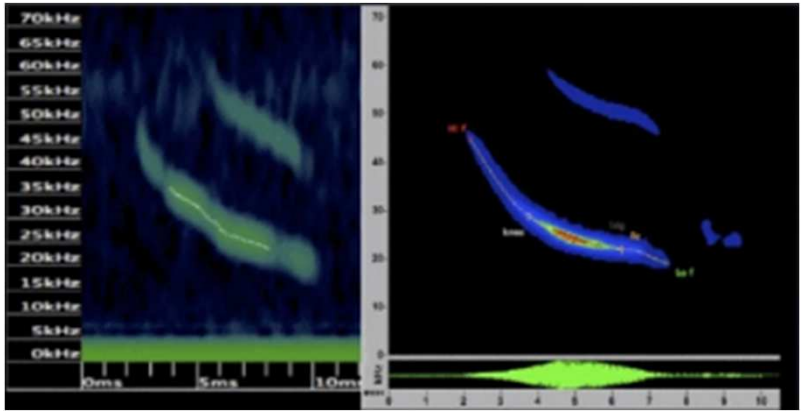
Circa la metà delle catture del 2020

Rapporto catture/individui simile al 2020



I chirotteri (PNAB e UNISS)

998 passaggi
di chirotteri rilevati
-
9 specie

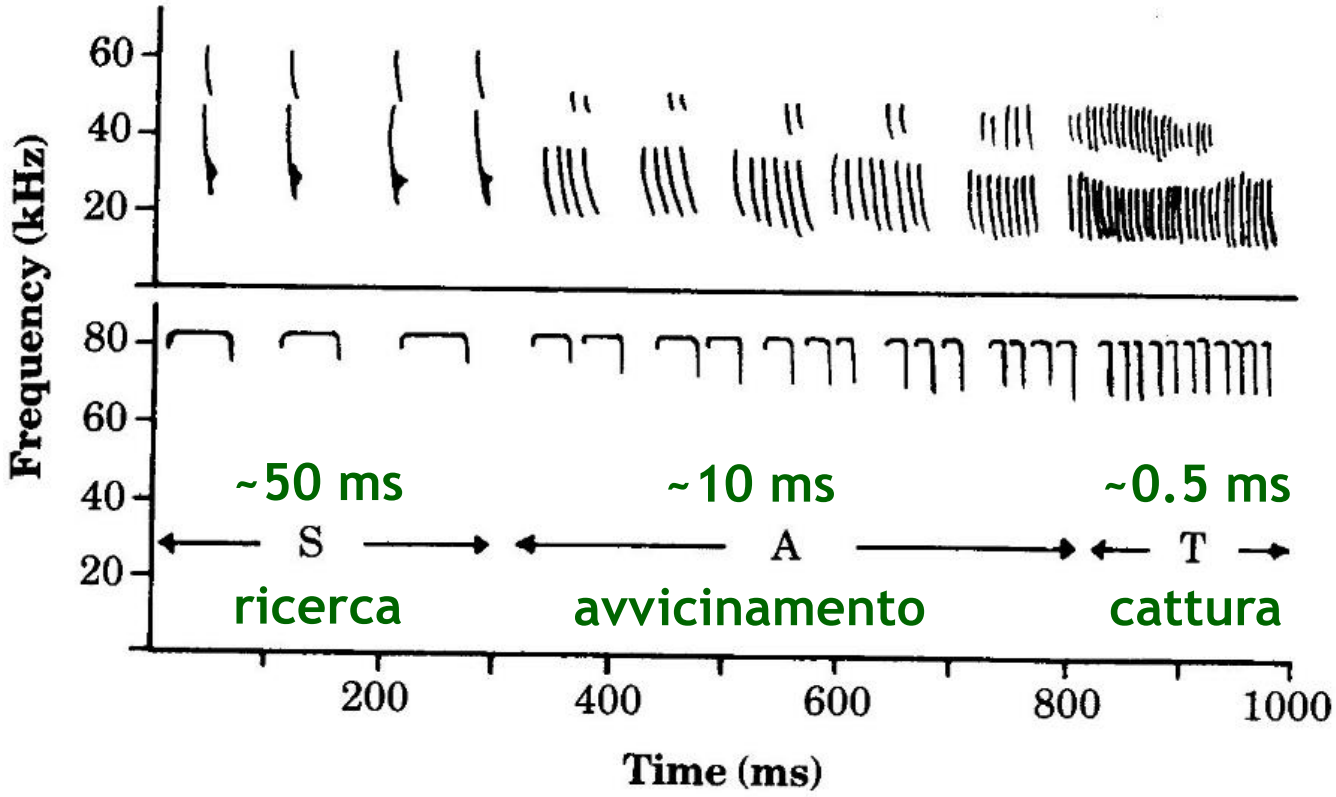


SPECIE	PLOT				
	2	3	4	5	6
Barbastella barbastellus					x
Eptesicus nilssonii	x	x	x		x
Eptesicus serotinus			x	x	x
Myotis nattereri					x
Nyctalus leisleri	x	x	x	x	x
Pipistrellus kuhli					x
Pipistrellus pipistrellus				x	x
Pipistrellus pygmaeus					x
Vespertilio murinus				x	x
N° specie	**2**	**2**	**3**	**4**	**9**

Oltre alle specie elencate in tabella sono state contattati altri individui per i quali si ha soltanto un riferimento del genere:

- plot 6: ***Myotis*** sp, ***Plecotus*** sp.;
- plot 5: ***Myotis*** sp.

La fase di ricerca della preda nelle diverse modalità di emissione: “estreme” FM e CF



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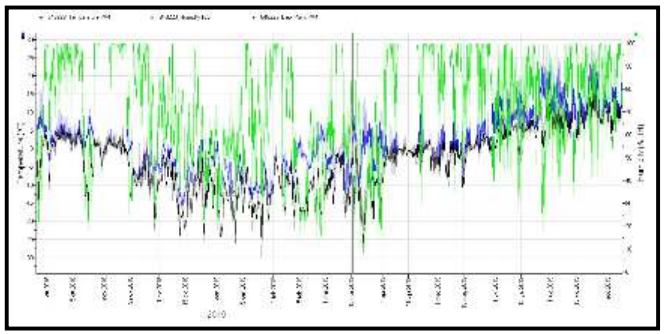
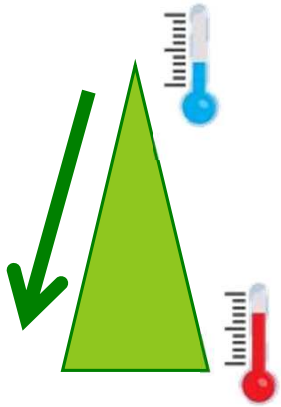


In tutti i monitoraggi svolti il range di temperatura oscilla tra 8 e 11 °C



Sviluppi futuri:

Chirotteri 2019-2020

Monitoraggio per punti d'ascolto (10 plot)

Quali relazioni con la comunità di lepidotteri?

PROPOSTA 2

Tabella 3.1: tempo di campionamento svolto mediante i due tipi di strumentazione.

Anno	2019					2020				
Plot	2	3	4	5	6	8	9	10	11	12
Ore di campionamento con Wildlife SM4BAT-FS	02:00	03:09	03:27	0	03:00	41:42	27:53	85:48	21:16	19:42
Ore di campionamento con Pettersson D-240X	03:13	04:30	0	05:49	04:30	0	0	0	0	1:30
Ore totali di campionamento [hh:mm]	05:13	07:39	03:27	05:49	07:30	41:42	27:53	85:48	21:16	21:12

La componente biotica: tutto ciò che è Vivo

Fauna invertebrata terrestre (MUSE) - estate 2018 e 2019

- **Dott. Mauro Gobbi → Coleotteri carabidi**
- **Dott. Ivan Petri → Aracnidi**

5 pitfall/plot

935 coleotteri carabidi e
1883 aracnidi

Vegetazional suvay (Museo Civico di Rovereto) - summer 2020 e 2021

- **Dott. Filippo Prosser**
- **Dott. Alessio Bertolli**
- **Dott.ssa Giulia Tomasi**
- **Sig. Marco Merli**

339 species and subspecies

Altitudinal record for
Gentiana brentae at 2900 m s.l.m.