

LIFE Platform Meeting: Amphibian and Reptile Conservation (ARC)

Challenges and Opportunities in Europe

Santander, Spain - 22-24 May 2024



USING THE PAST TO MANAGE FOR THE FUTURE: A CASE STUDY WITH THE HERMANN'S TORTOISE (*Chersine hermanni*)

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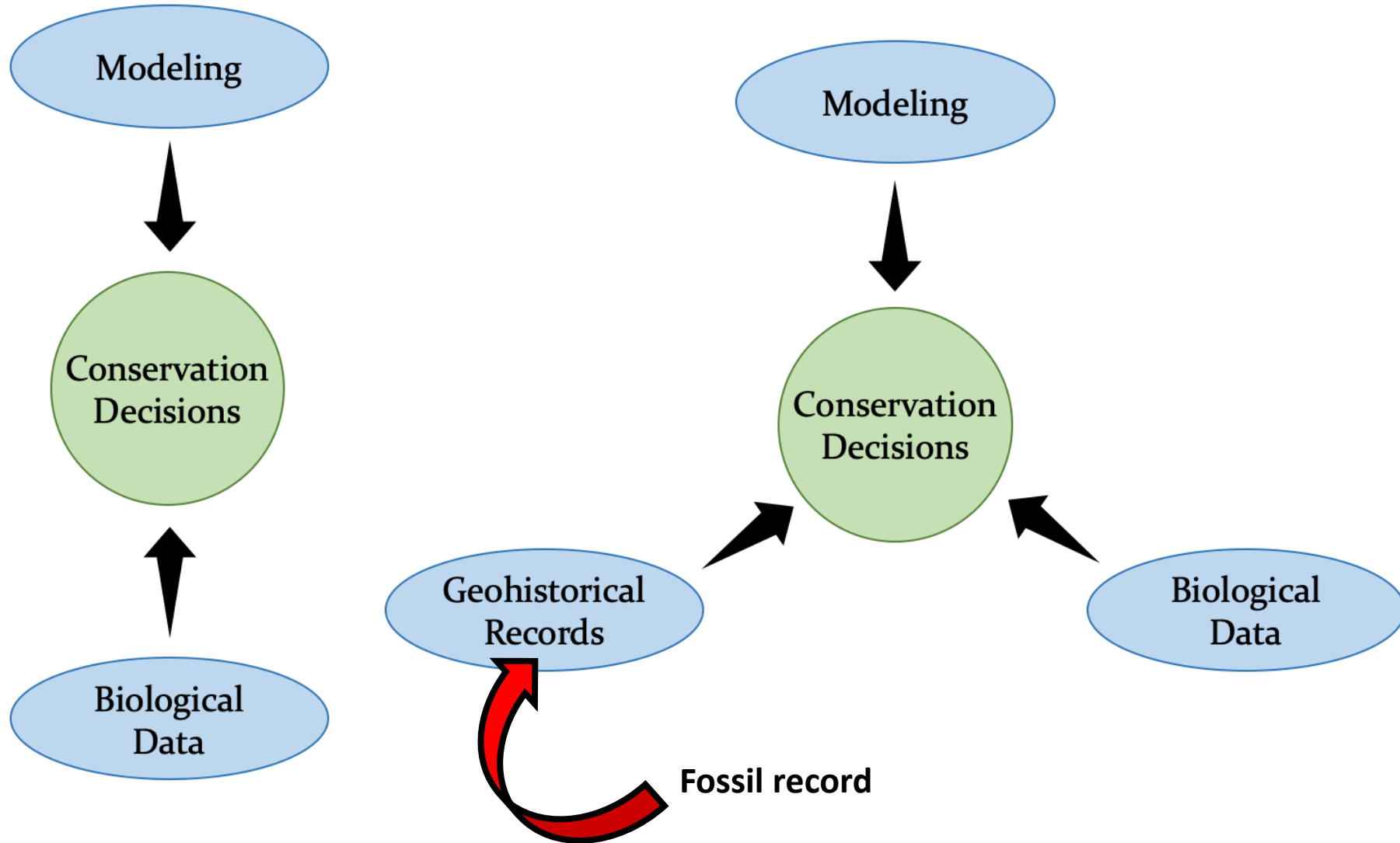


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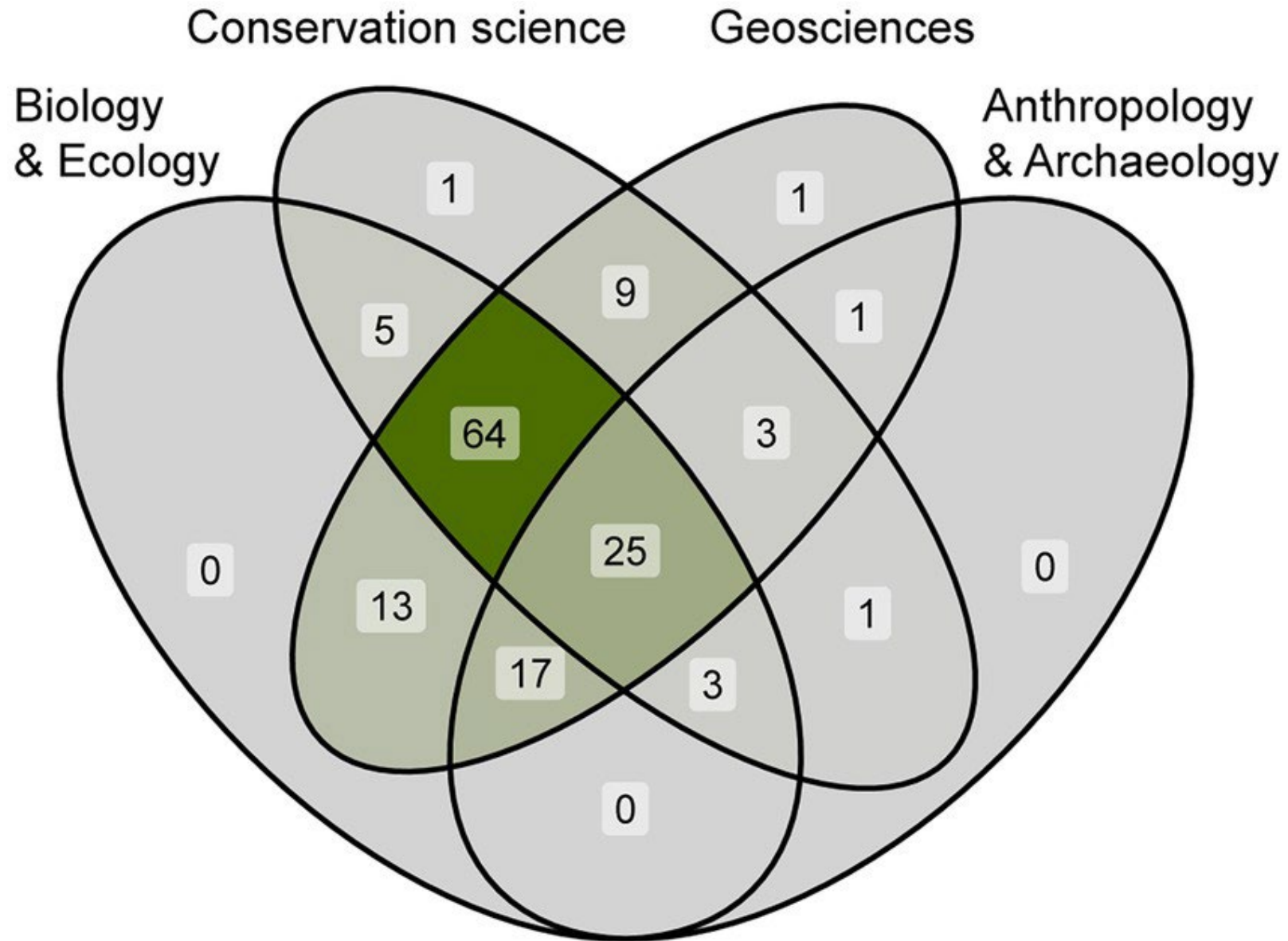
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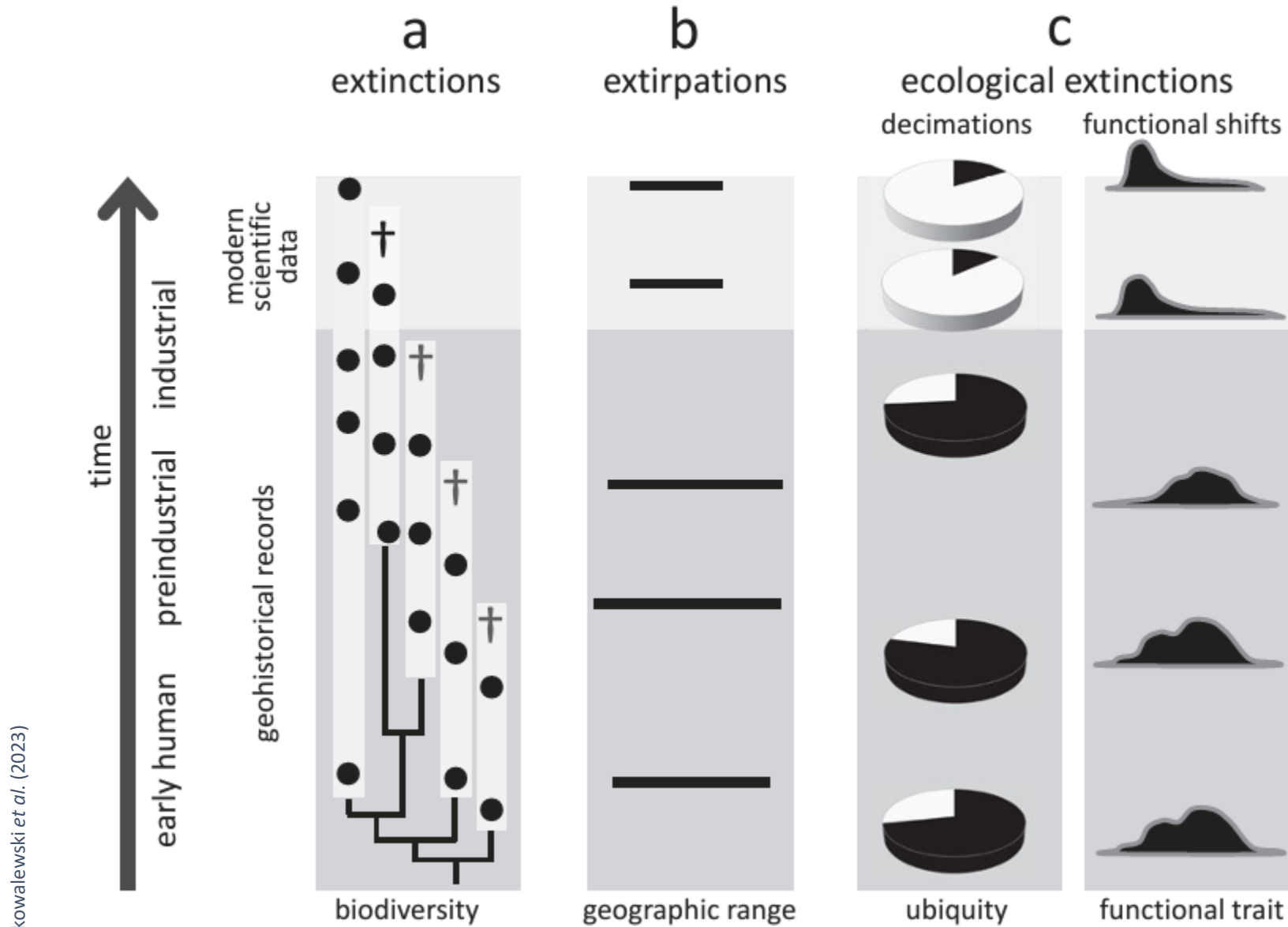
Conservation Palaeobiology



Conservation Palaeobiology



Conservation Palaeobiology



Conservation Palaeobiology: undetected extinctions

a
extinctions

[Sci Adv.](#) 2021 May; 7(21): eabg2111.

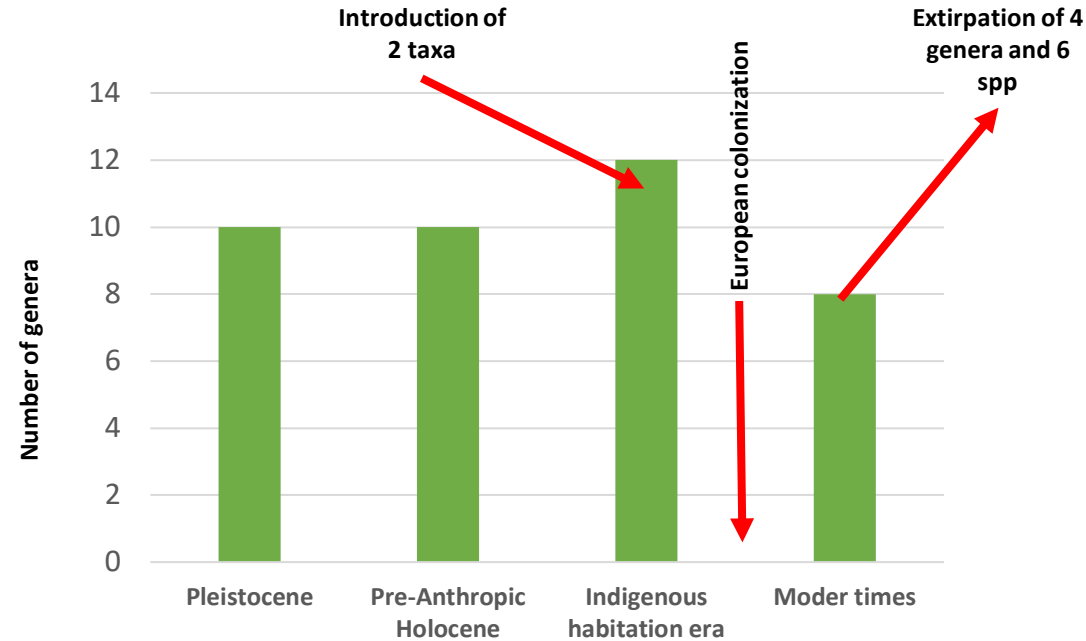
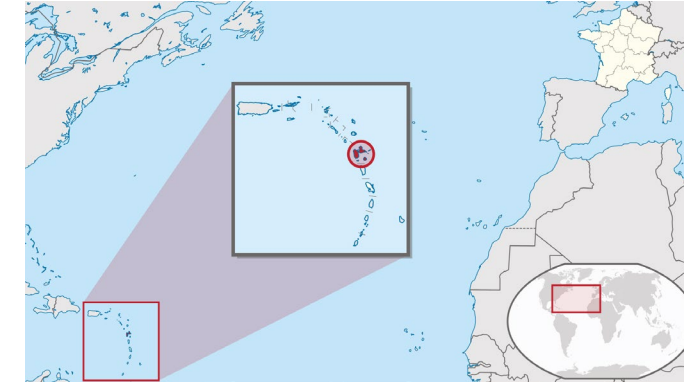
PMCID: PMC8133755

Published online 2021 May 19. doi: [10.1126/sciadv.abg2111](https://doi.org/10.1126/sciadv.abg2111)

PMID: [34138736](https://pubmed.ncbi.nlm.nih.gov/34138736/)

Large-scale reptile extinctions following European colonization of the Guadeloupe Islands

[Corentin Bochaton](#),^{1,2,3,4,*} [Emmanuel Paradis](#),⁵ [Salvador Bailon](#),² [Sandrine Grouard](#),² [Ivan Ineich](#),³ [Arnaud Lenoble](#),⁴ [Olivier Lorvelec](#),⁶ [Anne Tresset](#),^{2,†} and [Nicole Boivin](#)^{1,7,8,9,*}



Conservation Palaeobiology: extirpations

b
extirpations

Squamates, rodents, and birds from Holocene deposits of the Illa Grossa Island (Columbretes Islands, Castellón, Spain): an unexpected diverse assemblage

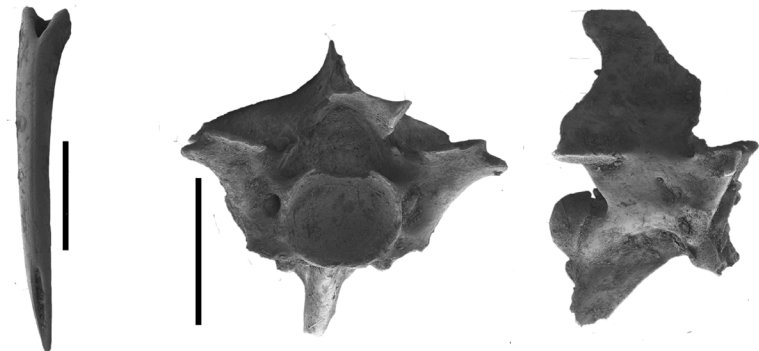
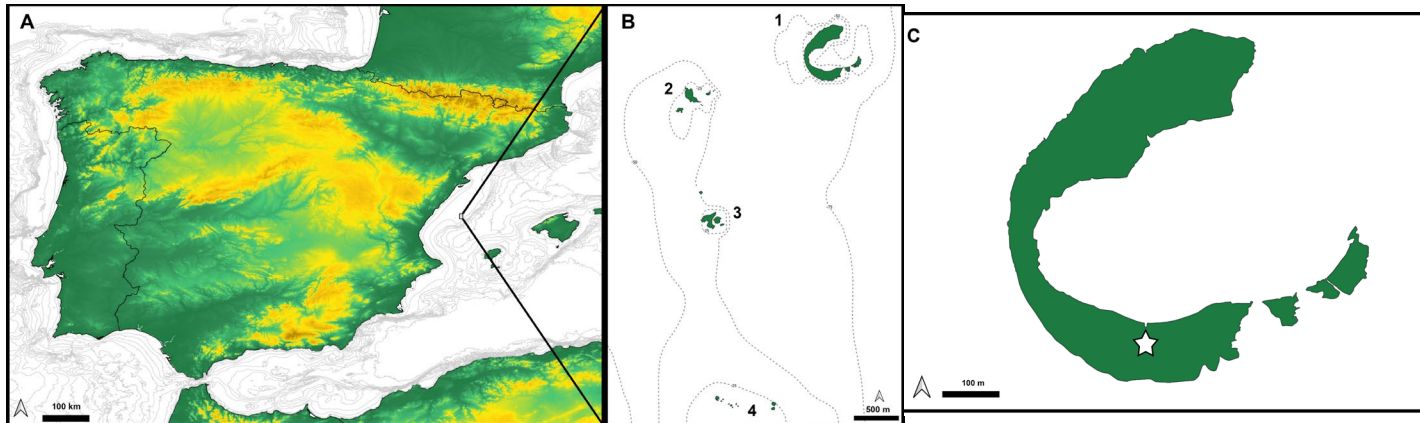
Rafael MARQUINA-BLASCO, Ana FAGOAGA, Vicente D. CRESPO, Alberto MARTÍNEZ-ORTÍ, Salvador BAILON, Antonio SÁNCHEZ-MARCO, Daniel GRACIA-MONFERRER, Carlos de SANTISTEBAN & Francisco Javier RUIZ-SÁNCHEZ

COMPTES RENDUS PALEVOL 22 (18) - PAGES 409-438



COLT: 2780-2724 cal BP et 2600-2492 cal BP

- High densities of snakes: Ophiusa, Colubraria.
- 1856-1859: construction of the lighthouse.
- Erradication campaign: direct persecution, introduction of predators and burnt of the vegetation.
- Last record: 27th April 1876
- Viper or colubrid?
- MNCN's individual from Illa Grossa?

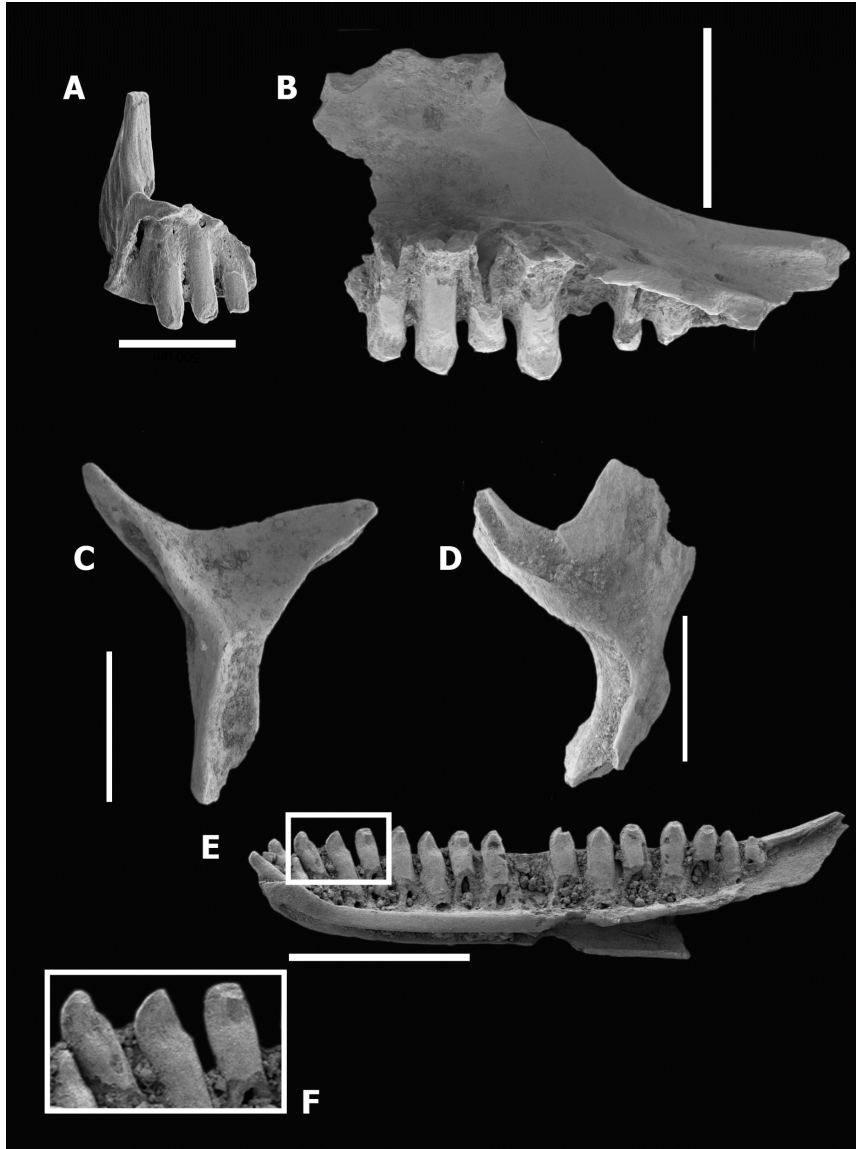


MNCN-CSIC

geographic range

Conservation Palaeobiology: extirpations

b
extirpations



COLT: 2780-2724 cal BP et 2600-2492 cal BP

Chalcides bedriagai
cf. *Podarcis* sp.
Vipera cf. *latastei*

→ *Podarcis liolepis atratus*



Definition of a baseline for
the herpetological
community

Marquina-Biasco et al. (2023)

Conservation Palaeobiology: extirpations

b
extirpations



geographic range

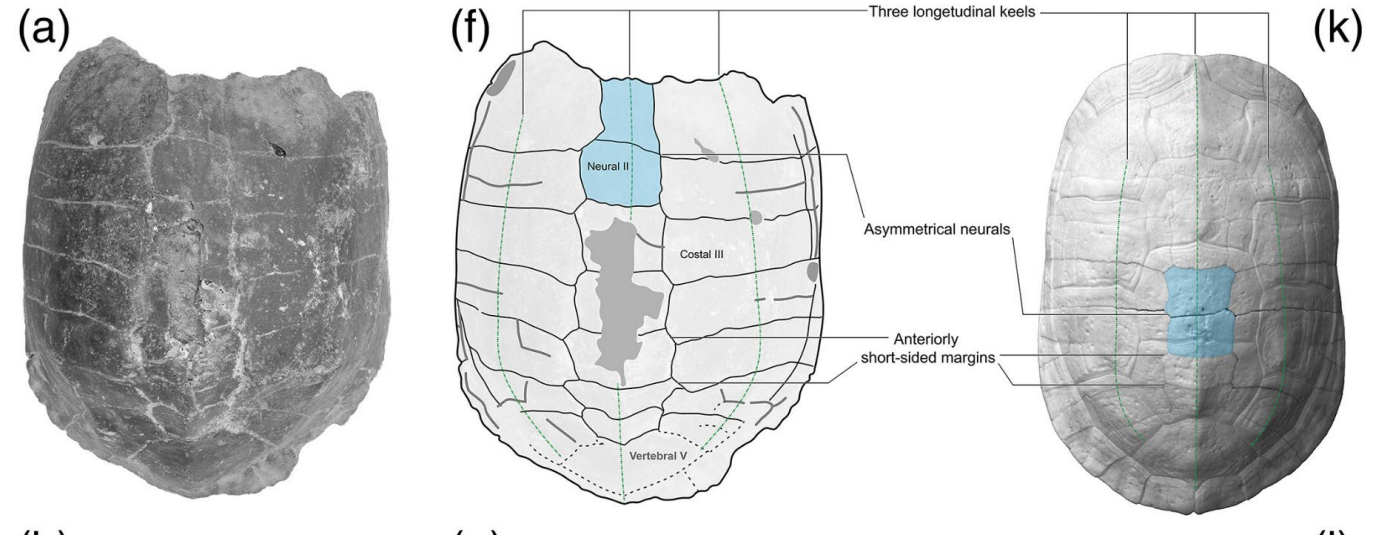


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Taxonomic revision of *Chinemys pani* (Testudines: Geoemydidae) from the Pleistocene of Taiwan and its implications of conservation paleobiology

Yi-Lu Liaw, Cheng-Hsiu Tsai ✉

First published: 01 October 2022 | <https://doi.org/10.1002/ar.25082> | Citations: 2

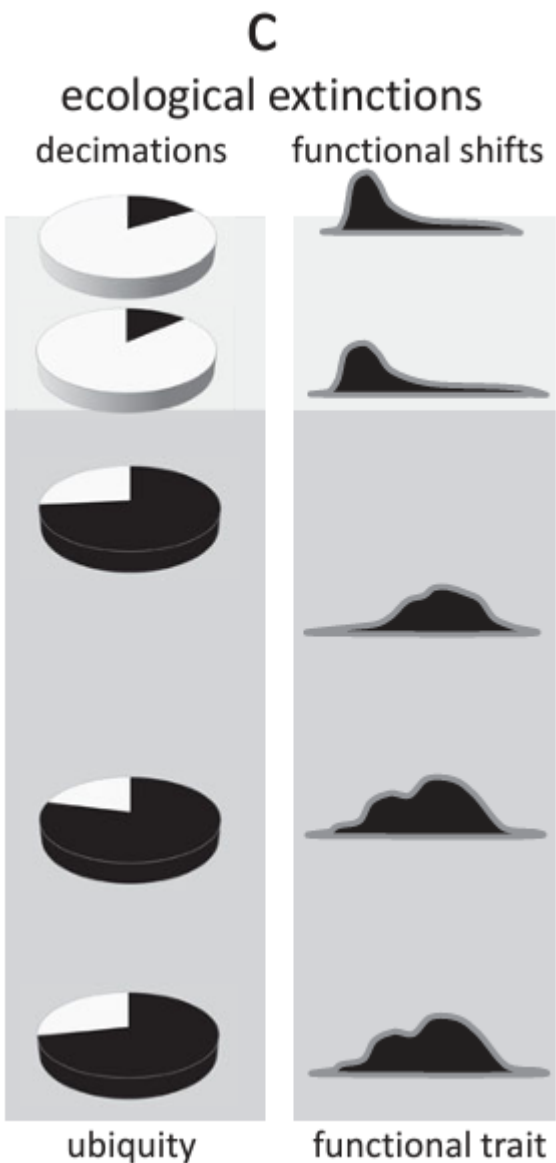


Mauremys reevesii is
autochthonous from Taiwan

Conservation Palaeobiology: changes in the ecological functions

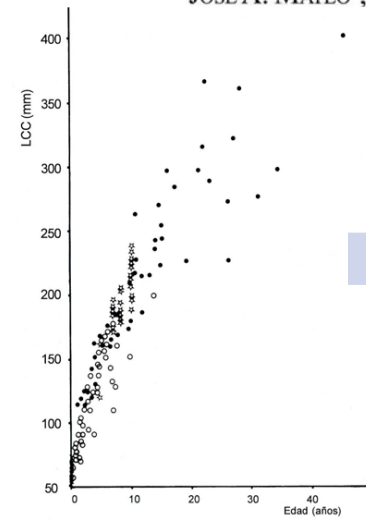
Monogr. Herpetol. (1999) 4: 10 pp.

7

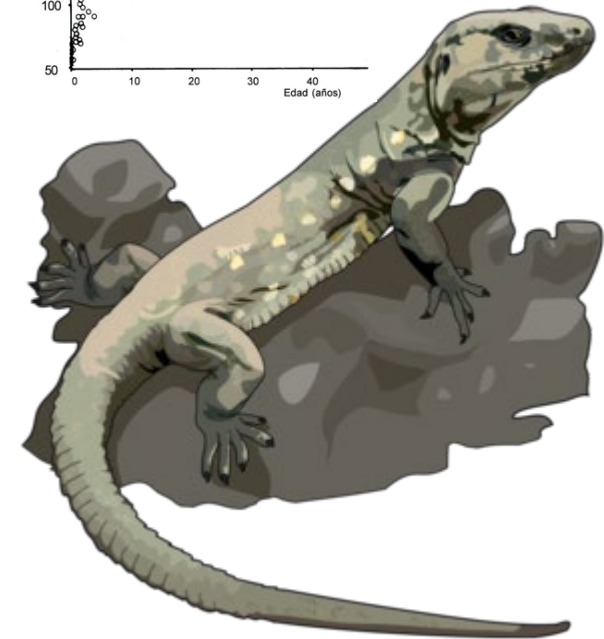
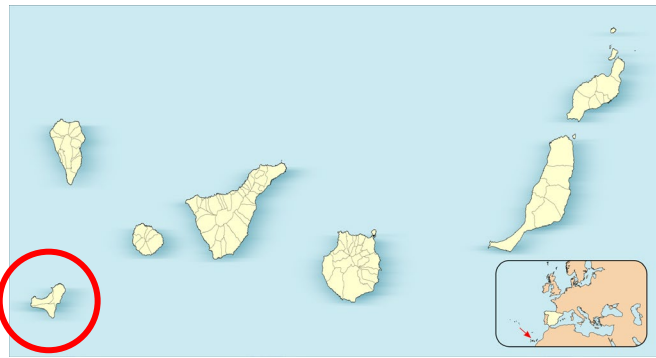


¿Cuántas especies del género *Gallotia* había en la isla de El Hierro?

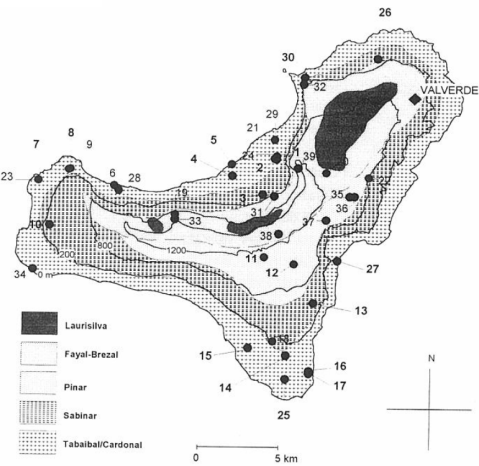
JOSÉ A. MATEO¹, LUÍS F. LÓPEZ-JURADO² & MARCOS GARCÍA-MÁRQUEZ³



	Pre-XV century	1995-97
Max LCC (mm)	>430	~200



DISTRIBUCIÓN GEOGRÁFICA DEL LAGARTO GIGANTE DE EL HIERRO (*Gallotia simonyi*) EN EL CUATERNARIO: APLICACIÓN DE LOS DATOS PALEONTOLÓGICOS PARA LA CONSERVACIÓN DE LAS ESPECIES



Carolina CASTILLO¹, Juan J. COELLO² y Esther MARTÍN GONZÁLEZ¹

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Thermic and xeric ecosystems

Conservation Palaeobiology: DSMs

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DOI: 10.1111/jbi.14092

RESEARCH ARTICLE

Journal of
Biogeography



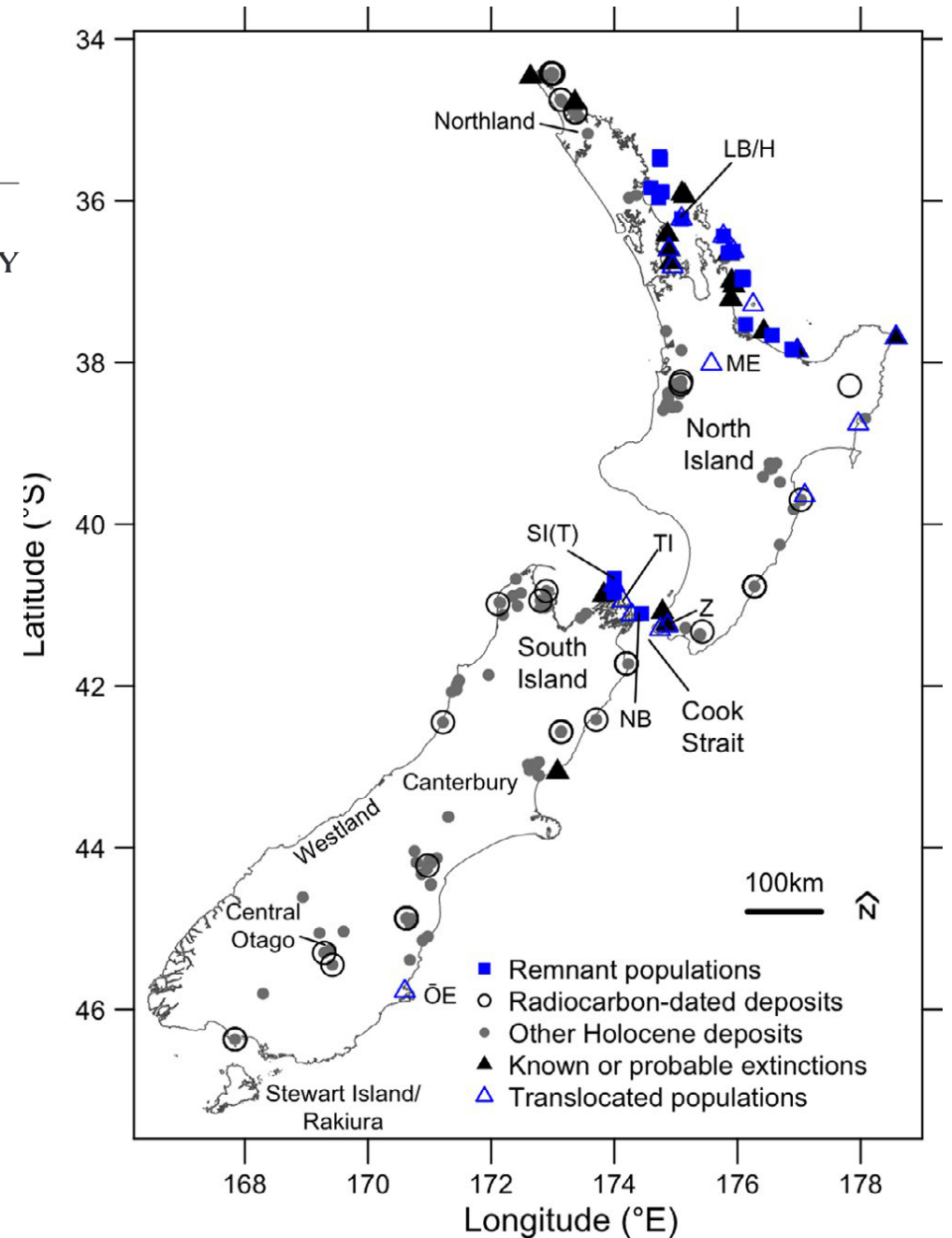
WILEY

Using Holocene fossils to model the future: Distribution of climate suitability for tuatara, the last rhynchocephalian

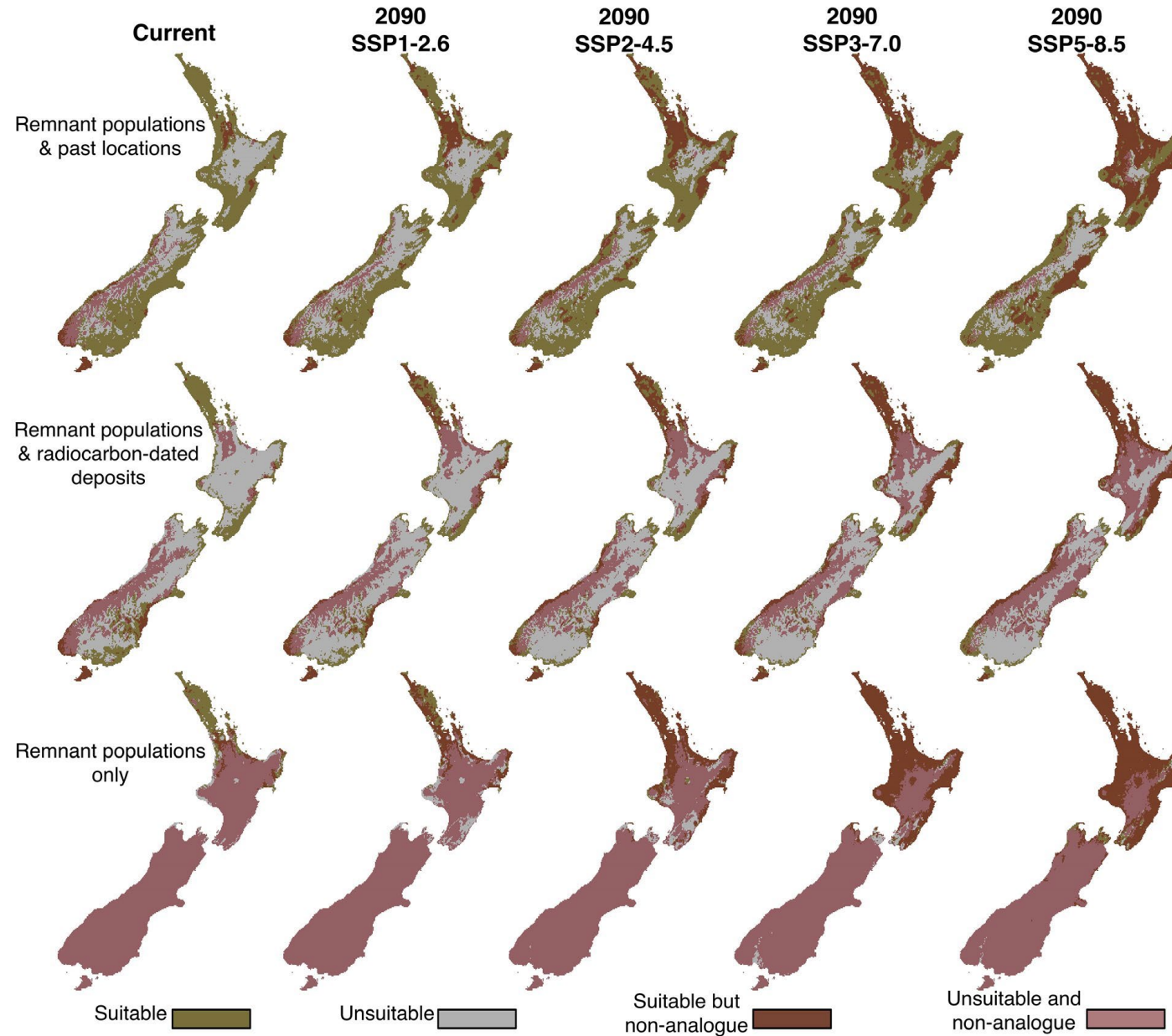
Scott Jarvie^{1,2,3} | Trevor H. Worthy⁴ | Frédéric Saltré^{5,6} | R. Paul Scofield⁷ | Philip J. Seddon¹ | Alison Cree¹



Sphenodon punctatus



Conservation Palaeobiology: DSMs



Jarvis et al. (2021)



MS21-164. “Spatiotemporal dynamics of the Hermann’s Tortoise (*Chersine hermanni*) during the Pleistocene and early Holocene in mainland Europe: Implications for its conservation”.

Ayudas Margarita Salas para la formación de doctores jóvenes. Estas ayudas son financiadas por el Ministerio de Universidades y se enmarcan en el instrumento Europeo de Recuperación (Next Generation EU) dentro del PRTR: Plan de Recuperación, Transformación y Resiliencia: "Modernización y digitalización del sistema educativo"



GOBIERNO
DE ESPAÑA

MINISTERIO
DE UNIVERSIDADES



Financiado por la
Unión Europea
NextGenerationEU



Plan de Recuperación,
Transformación y Resiliencia

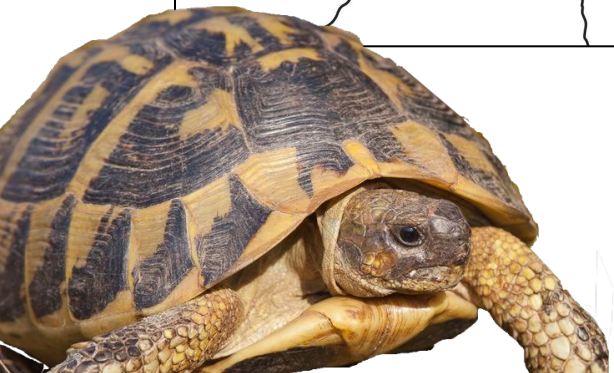
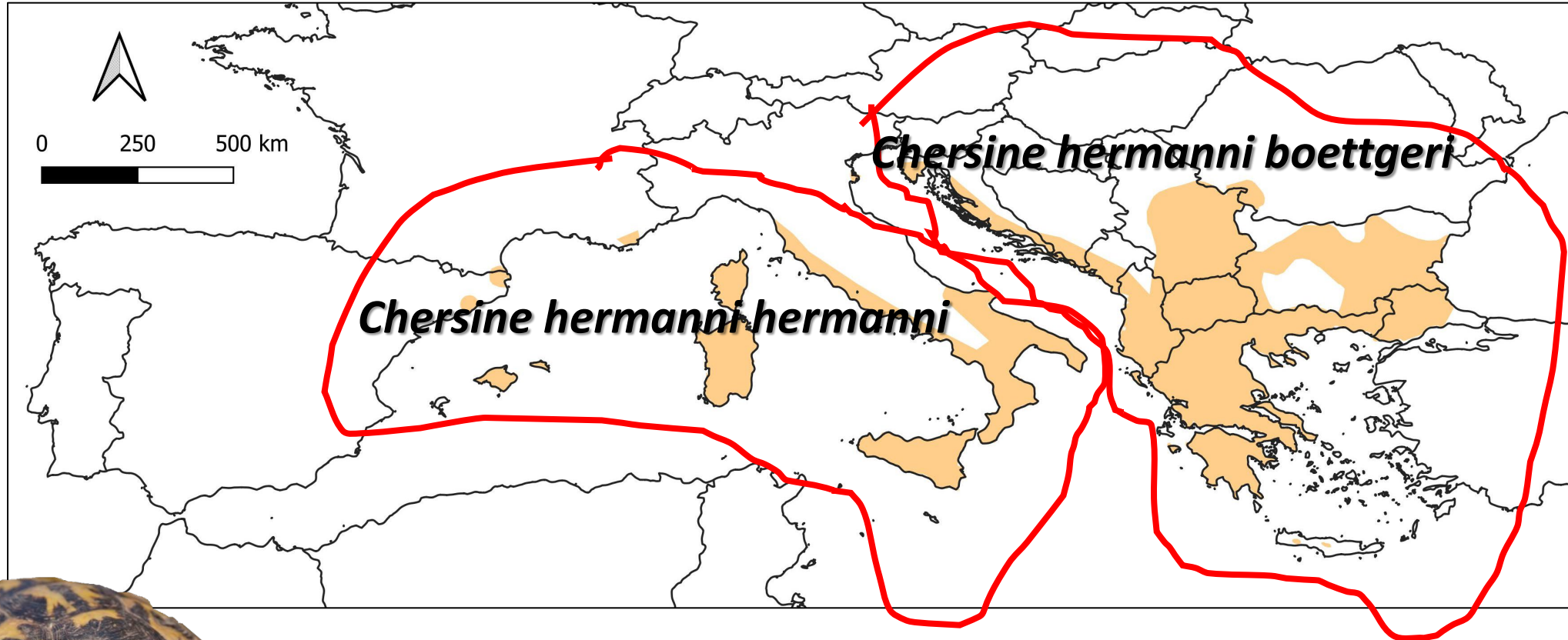


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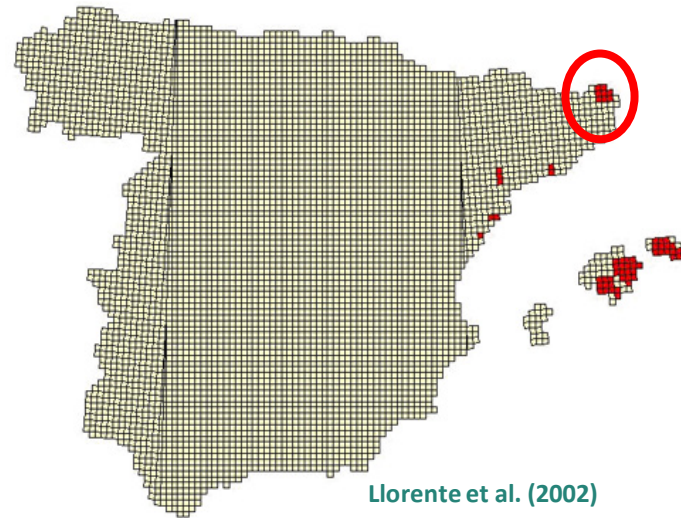


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Hermann's tortoise- *Chersine hermanni* (Gmelin, 1789)



Hermann's tortoise- *Chersine hermanni* (Gmelin, 1789)



Organismo	Catalogación
UICN (Mundial)	NT
UICN (Mundial; <i>C. h. hermanni</i>)	EN
UICN (España)	EN
Unión Europea	Anexo II (DH)
España	EN
Cataluña	EN
Comunidad Valenciana	EN

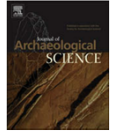
Journal of Archaeological Science 36 (2009) 1152–1162



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journal homepage: <http://www.elsevier.com/locate/jas>



The Quaternary fossil record of the genus *Testudo* in the Iberian Peninsula. Archaeological implications and diachronic distribution in the western Mediterranean

Juan Vicente Morales Pérez^a, Alfred Sanchis Serra^{b,*}



Fig. 9. Distribution of archaeological sites with presence of *Testudo hermanni* between ca. 125 and 30 ky BP.



Fig. 10. Distribution of archaeological sites with presence of *Testudo hermanni* between ca. 30 and 10 ky BP.



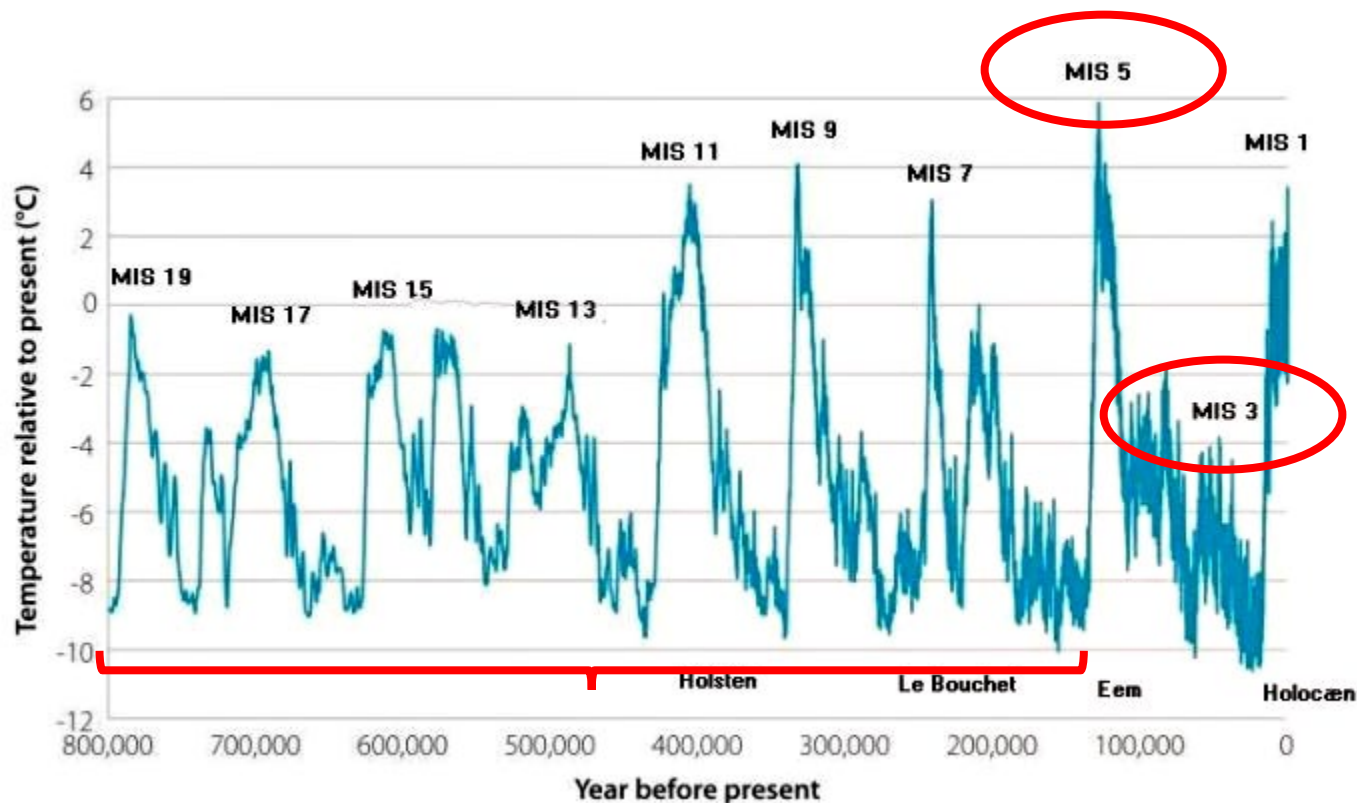
Fig. 11. Distribution of archaeological sites with presence of *Testudo hermanni* between ca. 10 and 3 ky BP.



Fig. 12. Distribution of archaeological sites with presence of *Testudo hermanni* between ca. III-I millennium BP.

Why?

Climate change?



Why in other European countries the species is recorded in younger chronologies

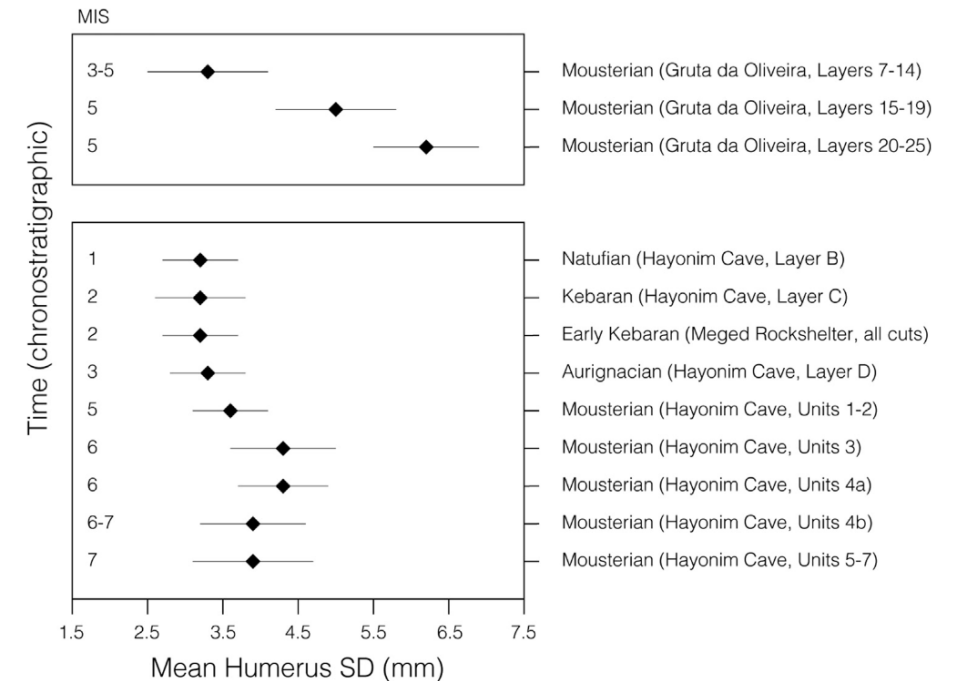


Human overhunting?

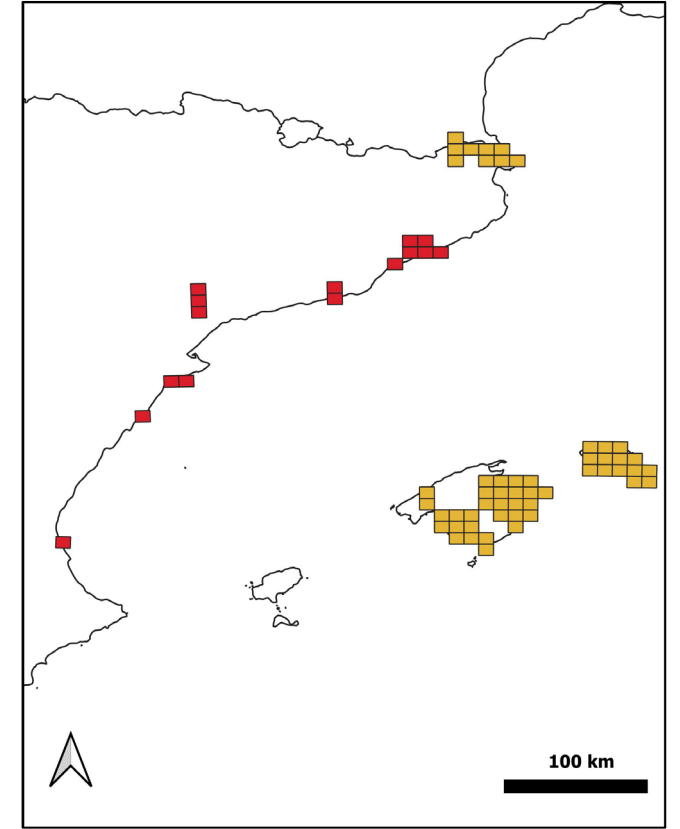
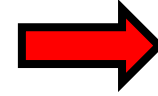
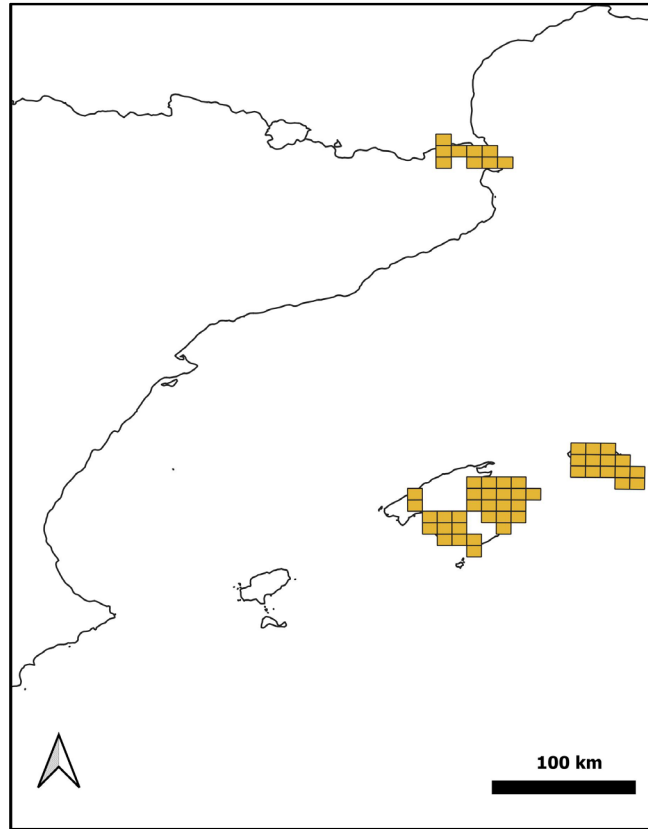


The consumption of tortoise among Last Interglacial Iberian Neanderthals

Mariana Nabais^{a,*}, João Zilhão^{b,c,d}



**Endangered and protected
Retraction distribution area
“Rich” fossil record**



Is its modern niche consistent with that recorded during the Quaternary, or did the species have a much broader realized climatic niche than it does today?

Database

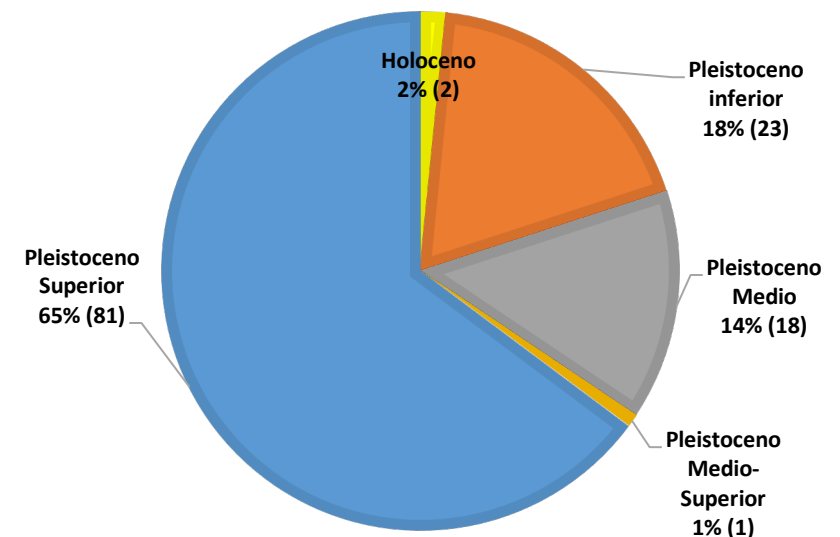
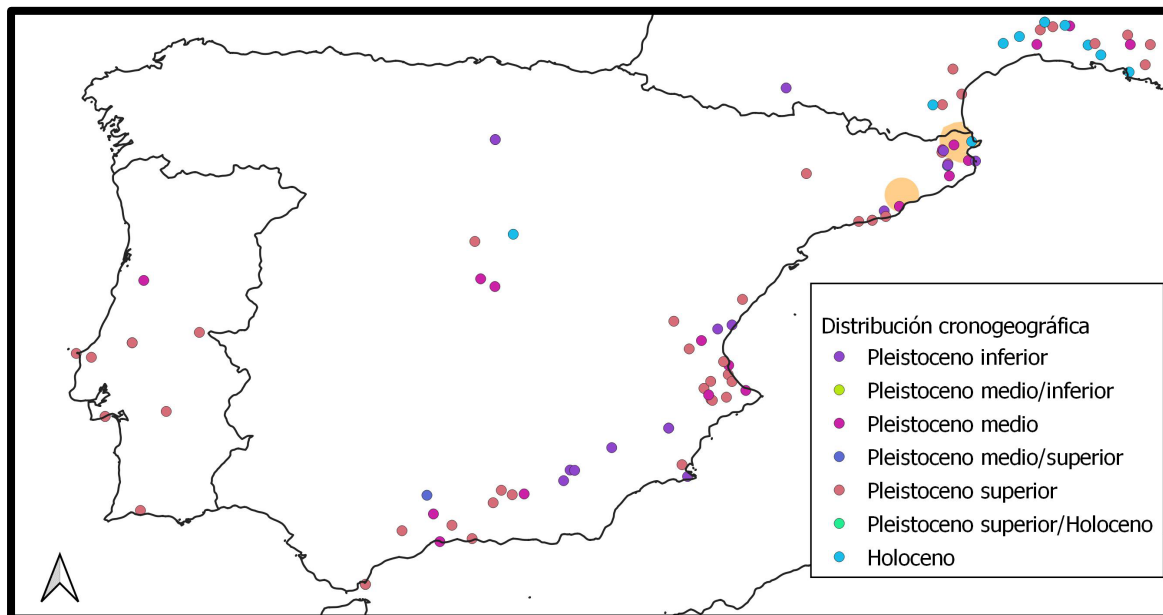
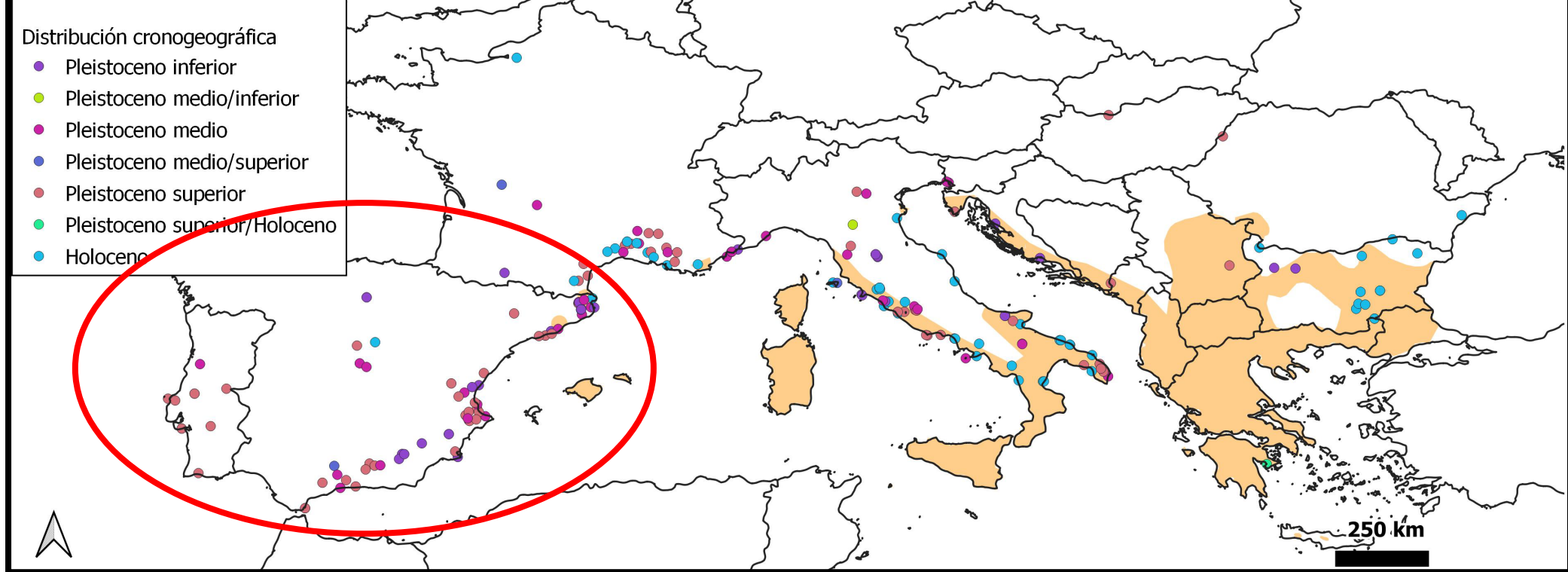


1	Name	Código	Época	Datación	Localidad	Provincia	País	Huso	X_UTM	Y_UTM	Taxón	Presencia ant.	Cronocult.	Referencias	Microm.	Ref Microm	Herpe	Ref herpeto
3	Abri del Pastor III	APA III	no Superior		Alcoi	Alicante	Spain	30S	718065	4287735	<i>Chersine hermanni</i>	Sí	Musteriense	Sanchis et al., 2015	No		No	
4	Abri del Pastor IVa	APA IVa	no Superior		Alcoi	Alicante	Spain	30S	718065	4287735	<i>Chersine hermanni</i>	Sí	Musteriense	Sanchis et al., 2015	No		No	
5	Abri del Pastor IVb	APA IVb	no Superior	48 ± 5	Alcoi	Alicante	Spain	30S	718065	4287735	<i>Chersine hermanni</i>	Sí	Musteriense	Sanchis et al., 2015	No		No	
6	Abri del Pastor IVc	APA IVc	no Superior		Alcoi	Alicante	Spain	30S	718065	4287735	<i>Chersine hermanni</i>	Sí	Musteriense	Sanchis et al., 2015	No		No	
7	Abri del Pastor IVd	APA IVd	no Superior	63 ± 5	Alcoi	Alicante	Spain	30S	718065	4287735	<i>Chersine hermanni</i>	Sí	Musteriense	Sanchis et al., 2015	Sí	Connolly et al (2019)	Sí	Connolly et al (2019)
8	Abri de la Quebrada IV	AQU	no Superior	a BP (OxA-24855)	Chelva	Valencia	Spain	30S	670039	4408203	<i>Chersine hermanni</i>	Sí	Palaolithic	Real et al. (2019)		Sí	Irmo & Guillem (2015)	No

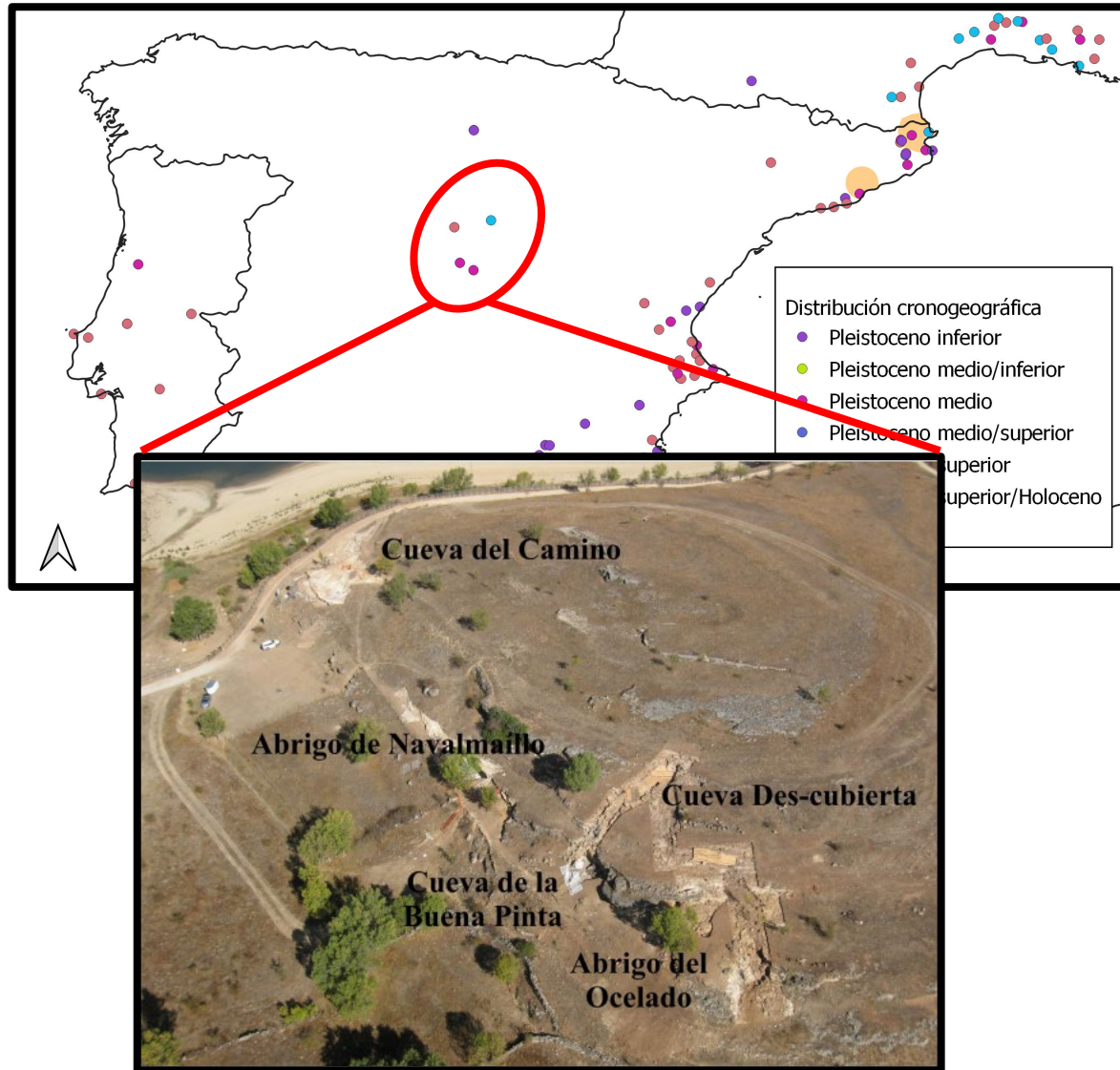
311 sites with Testudinidae



278 taxa related with *Chersine hermanni*



Calvero de la Higuera Archaeological Complex



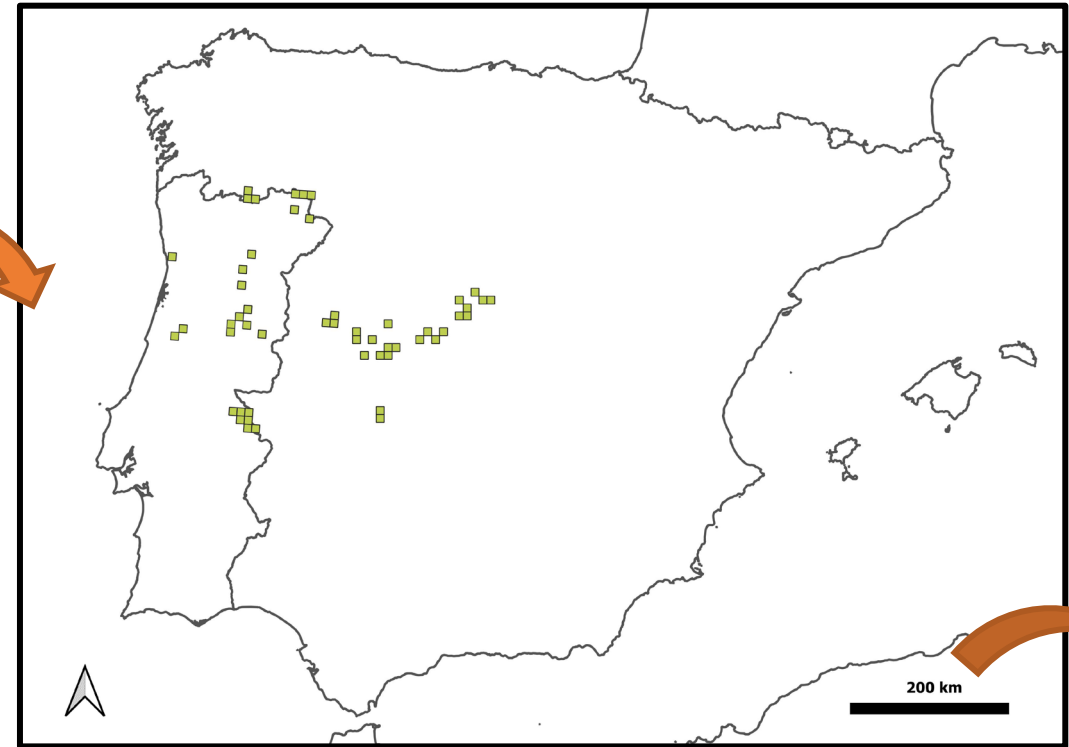
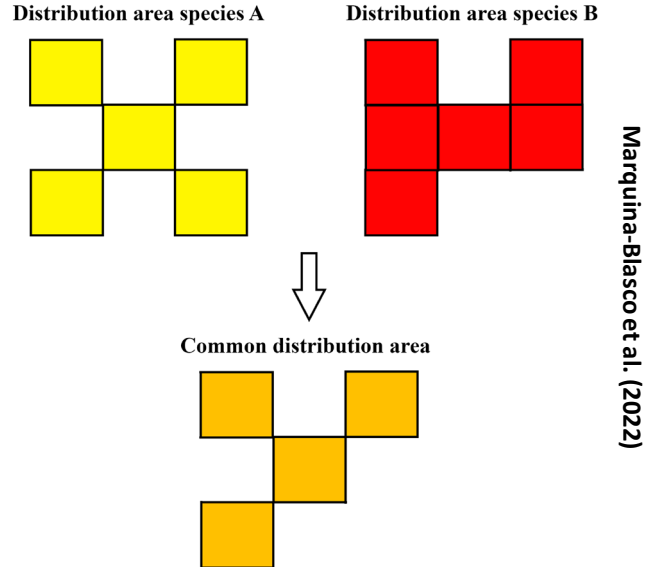
Mario Torquemada (MAR)

Altitude ~1.100 m

Currently:

- **Spain: 210 m** (Soler & Martínez-Silvestre, 2014)
- **France: 780 m** (Couturier et al., 2014)
- **Sicily: 850 m** (Mazzotti, 2004)
- **Balkans: 1300** (Bertolero et al., 2011)

Calvero de la Higuera Archaeological Complex: Navalmaíllo site (~110-74 ky)

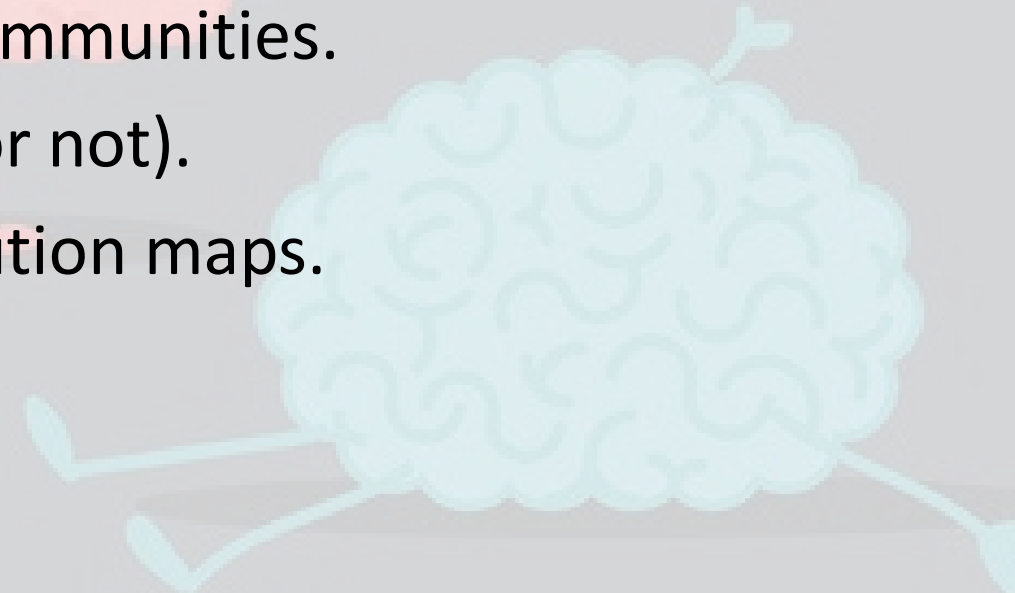
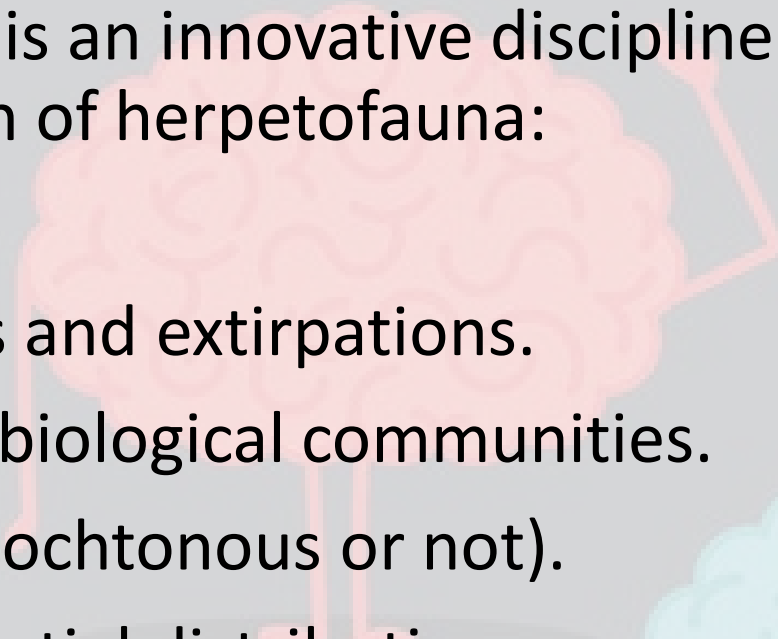


	Navalmaíllo site	Serra d'Albera	Δ
Mean Annual Temperature	12.15	14.14	-1.99
Mean Annual Precipitation	888.73	611.28	+277.45

Main conclusions

The conservation palaeobiology is an innovative discipline with interesting applications for the conservation of herpetofauna:

- Detection of recent extinctions and extirpations.
- Establishment of baselines for biological communities.
- Definition of species' status (autochthonous or not).
- Definition of more robust potential distribution maps.
- Modelling responses to climate change.



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MANY THANKS FOR YOUR ATTENTION!!!

(and remember the fossil record is cool!!!)

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