

DIPARTIMENTO
DI BIOLOGIA AMBIENTALE



SAPIENZA
UNIVERSITÀ DI ROMA

Palynological evidence of Holocene climate variability in Italy

Donatella Magri



Climate variability in Italy during the last two millennia – Italy 2k

1-2-December 2014

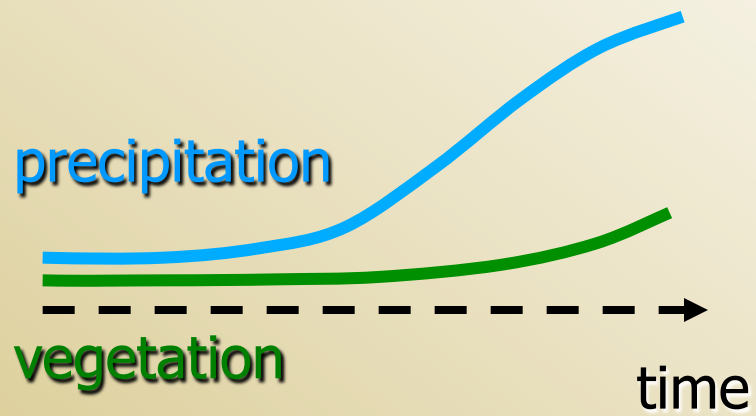
Interpreting pollen records

Assumptions in pollen analysis:

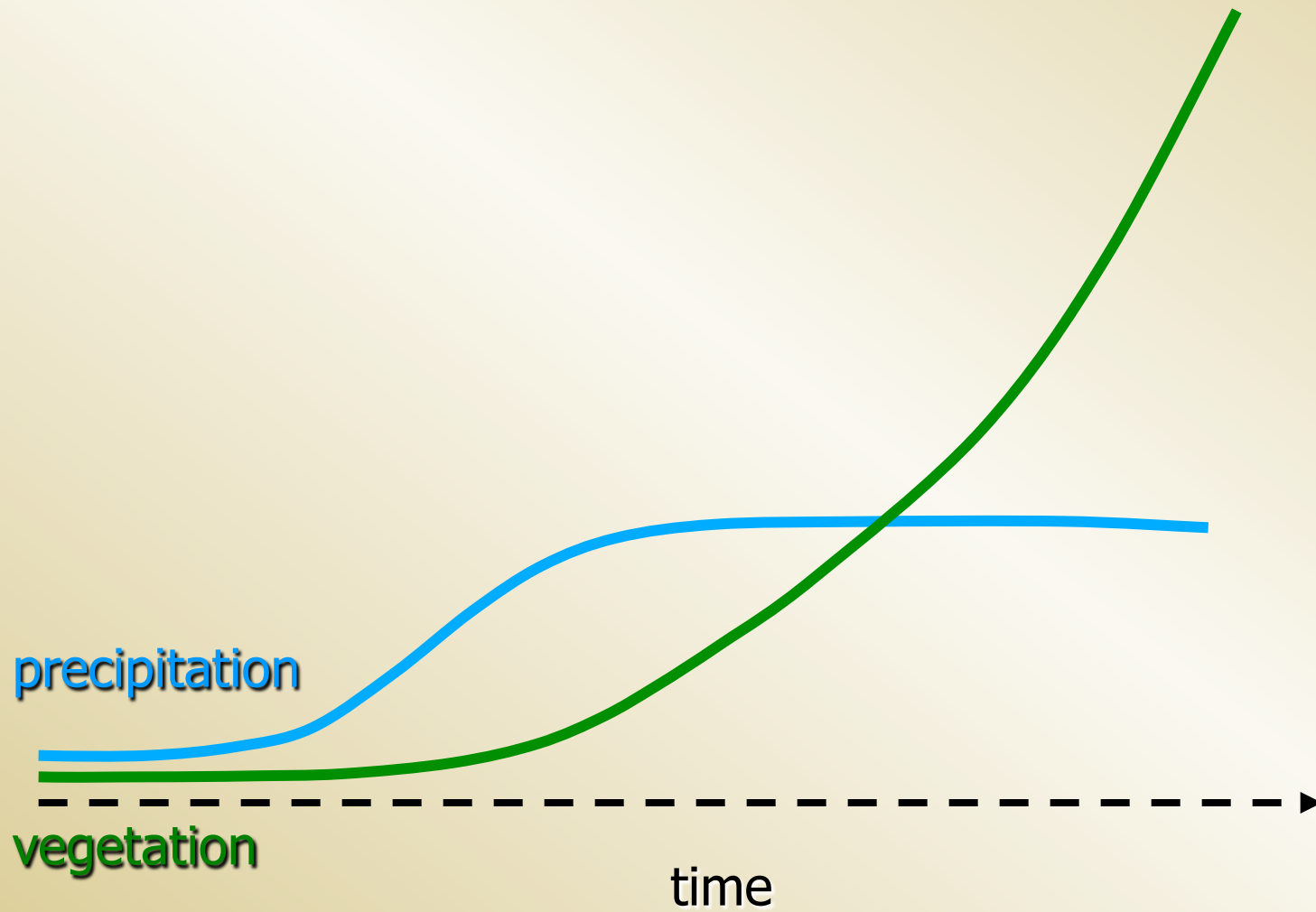
1. pollen records represent past vegetational changes
2. past vegetation changes reflect past climate changes

- Plant population dynamics
- Plant diseases
- Fire
- Human activity

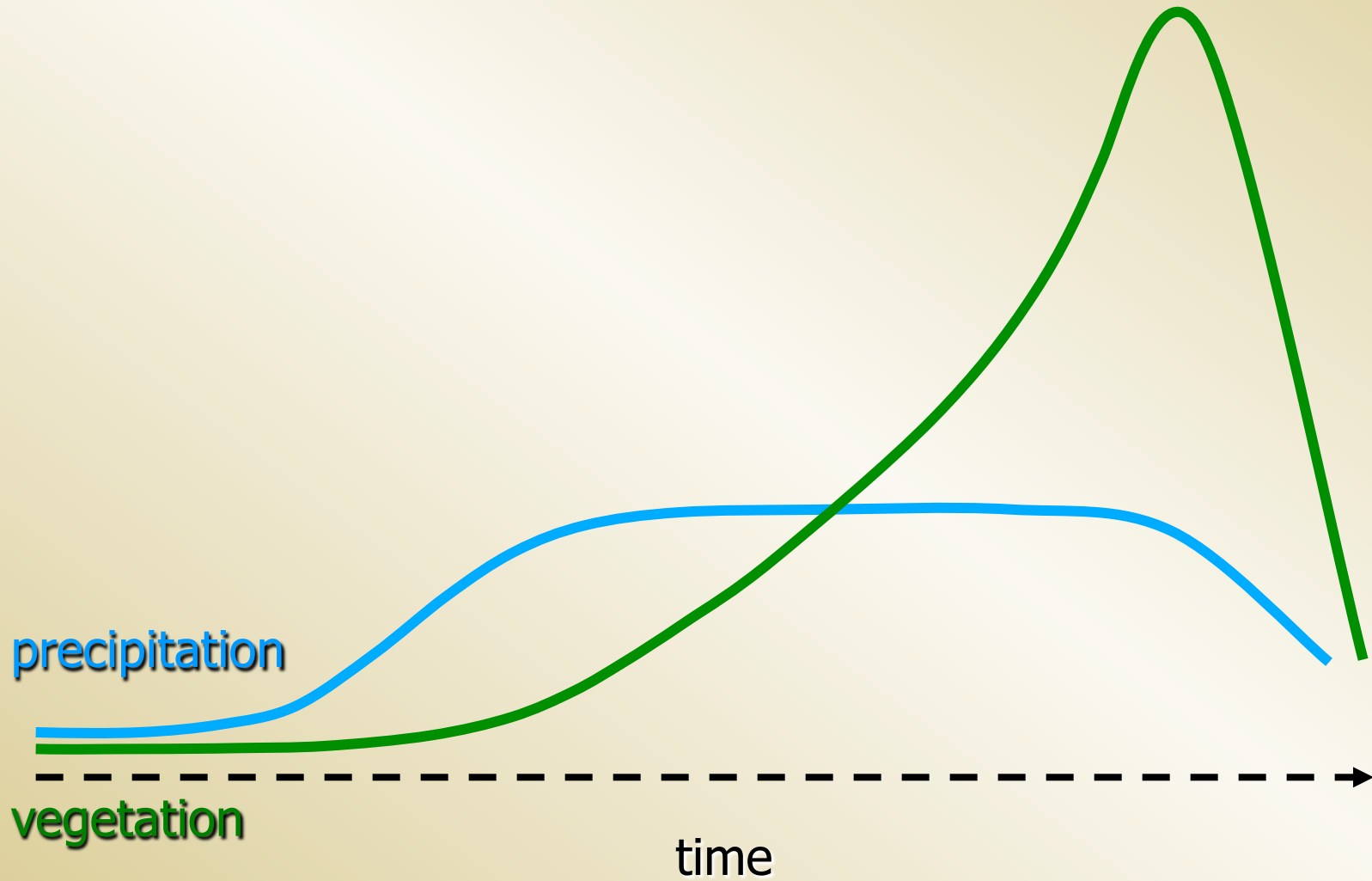
Interpreting pollen records



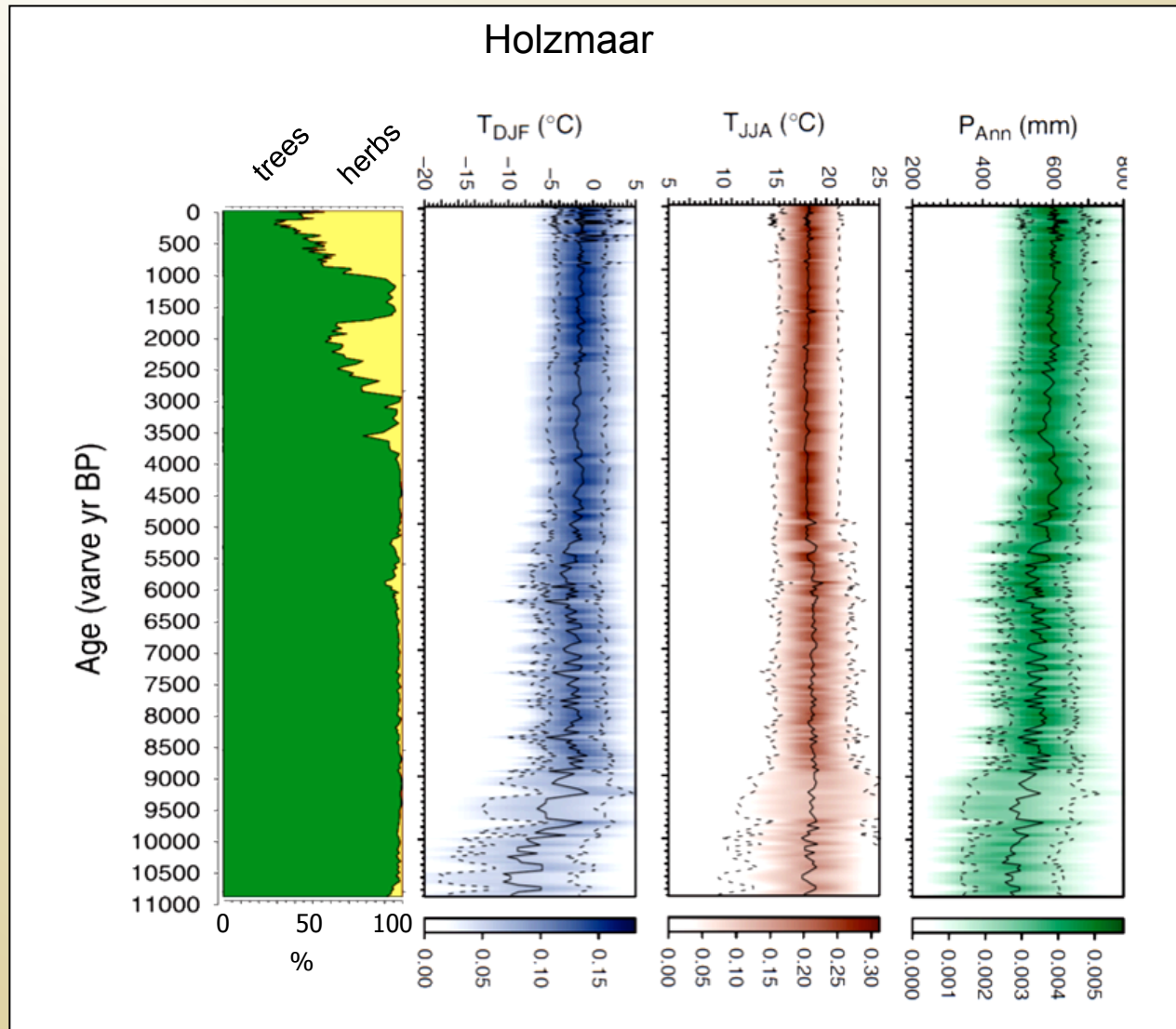
Interpreting pollen records



Interpreting pollen records



Palaeoclimate reconstructions



Pollen maps



Review of Palaeobotany and Palynology xxx (2014) xxx–xxx



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



Holocene dynamics of tree taxa populations in Italy

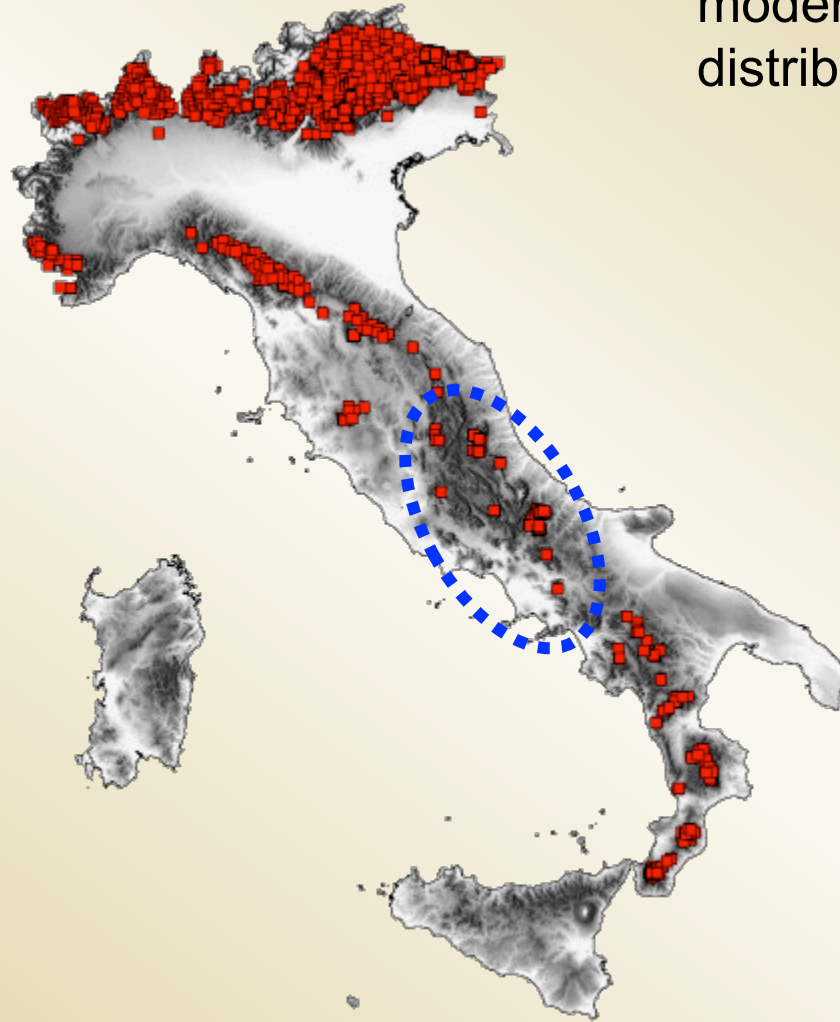
Donatella Magri^a, Emiliano Agrillo^a, Federico Di Rita^{a,*}, Giulia Furlanetto^b, Roberta Pini^b,
Cesare Ravazzi^b, Francesco Spada^a

^a Department of Environmental Biology, Sapienza University, Piazzale Aldo Moro, 5, 00185 Roma, Italy

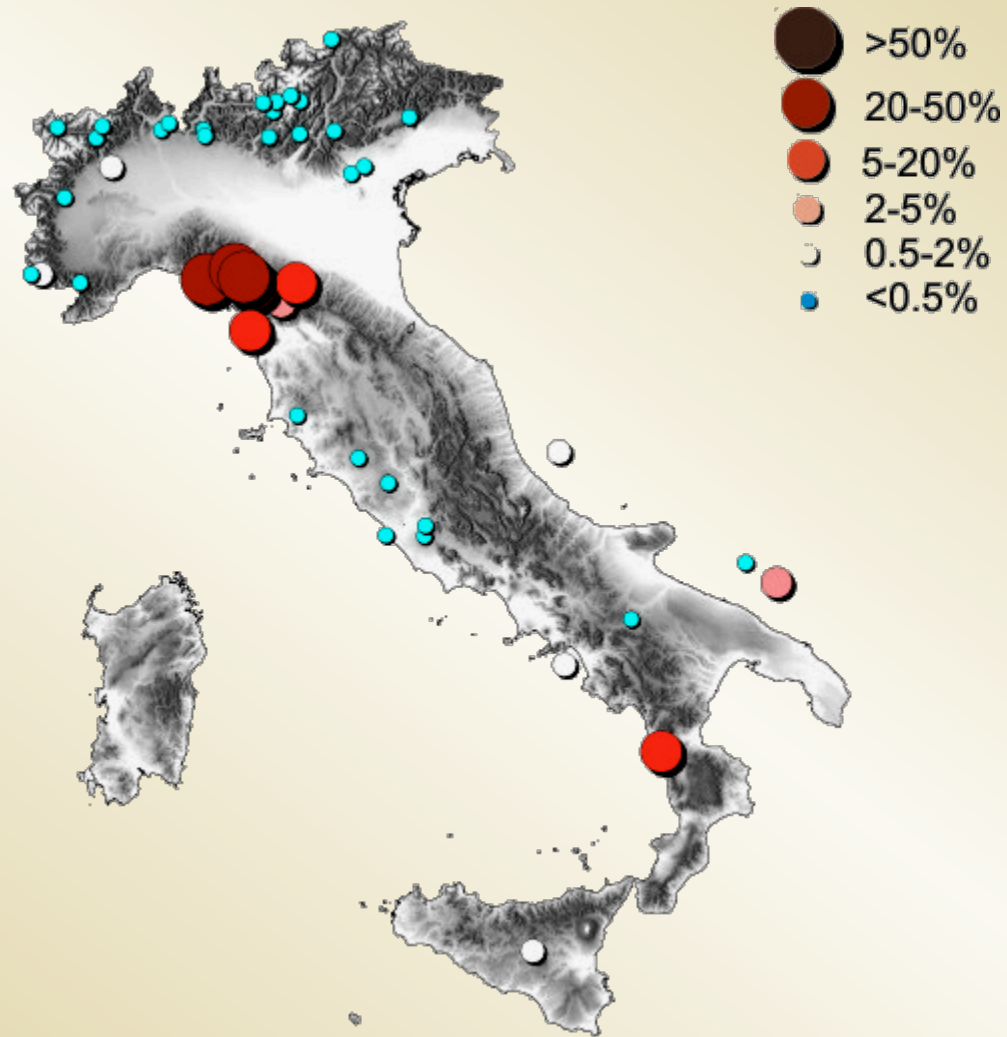
^b CNR - Institute for the Dynamics of Environmental Processes, Laboratory of Palynology and Palaeoecology, Piazza della Scienza 1, 20126 Milano, Italy

Abies

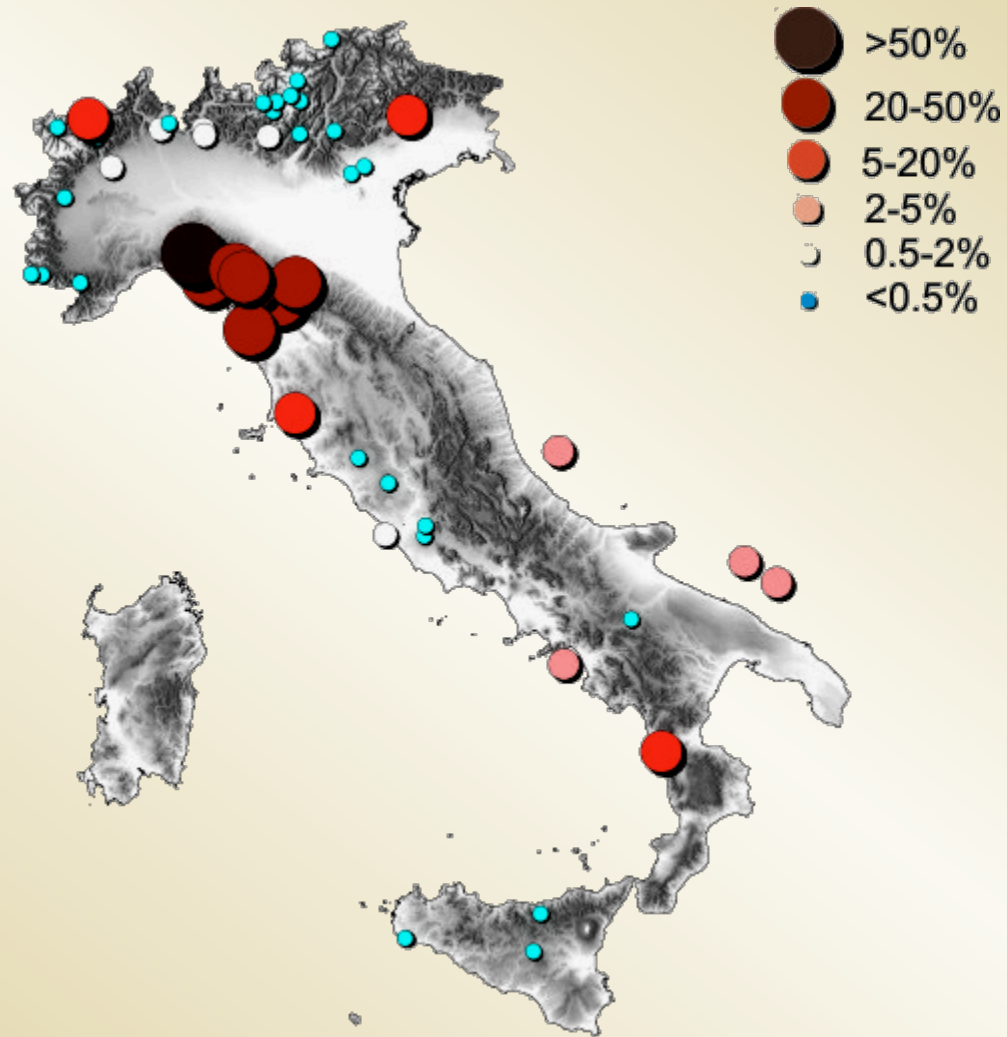
modern
distribution



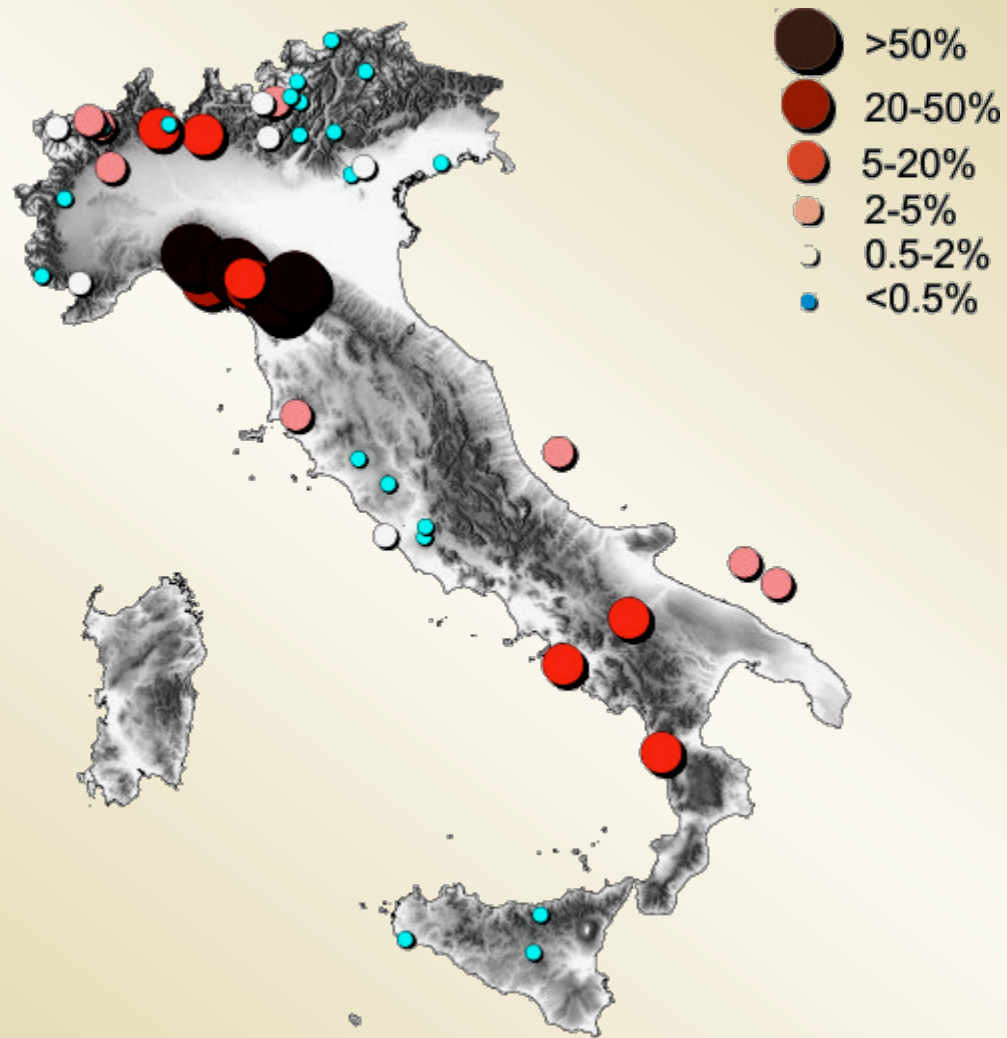
Abies - 11 ka cal BP



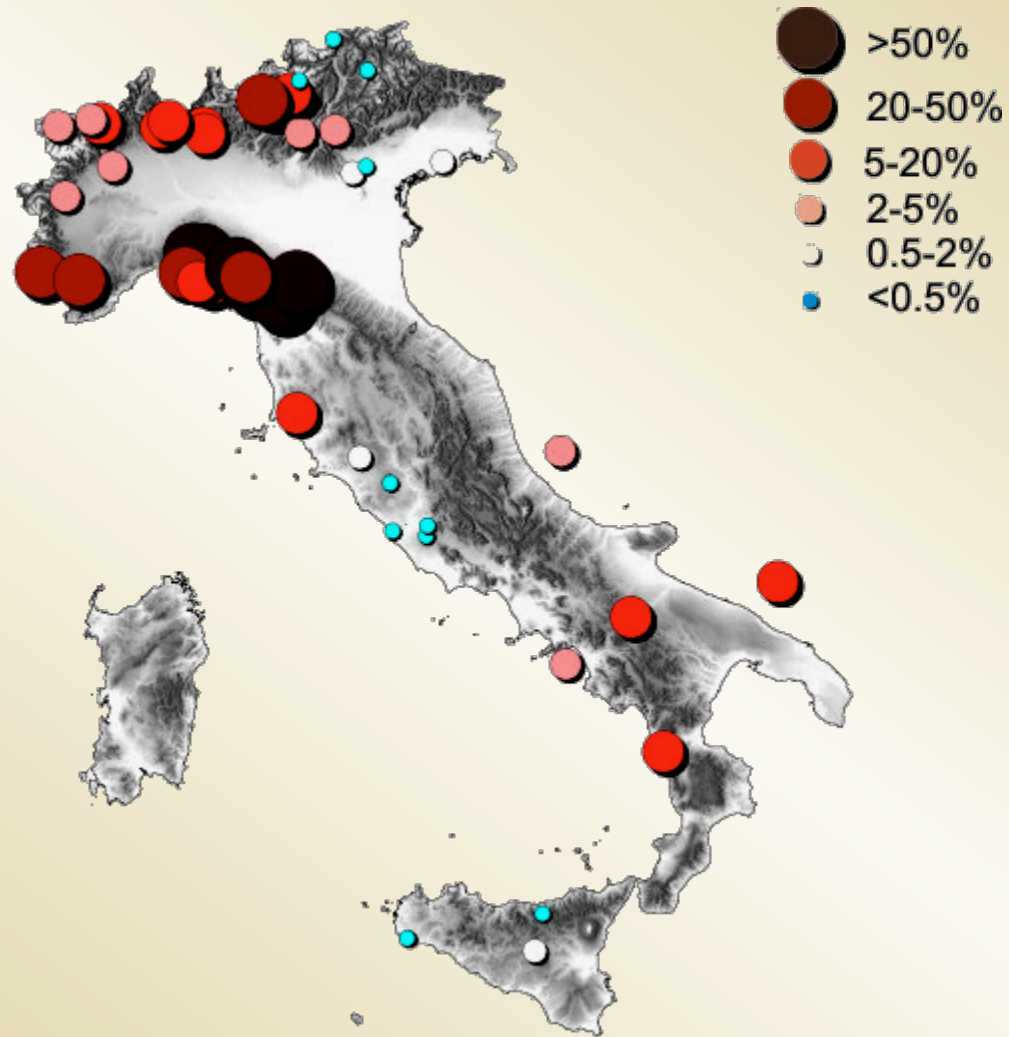
Abies - 10 ka cal BP



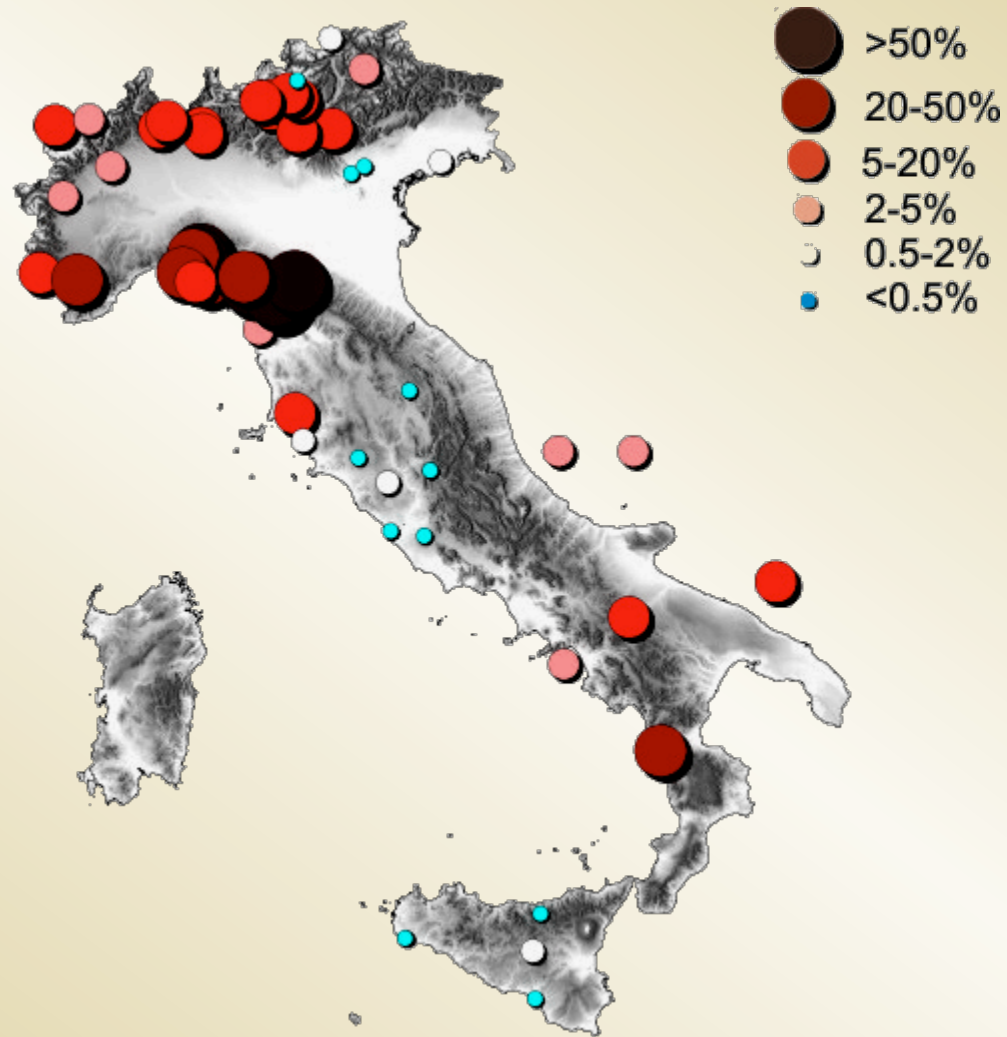
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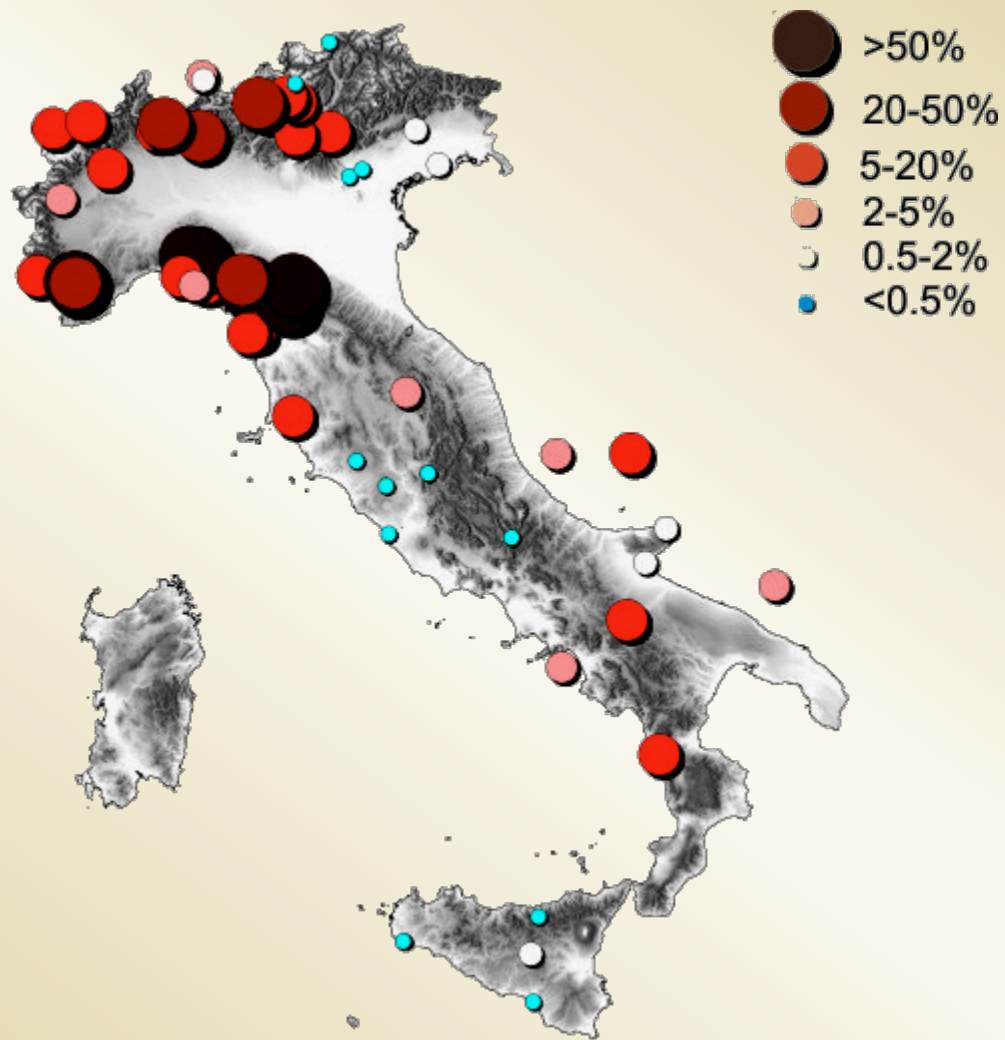
Abies - 8 ka cal BP



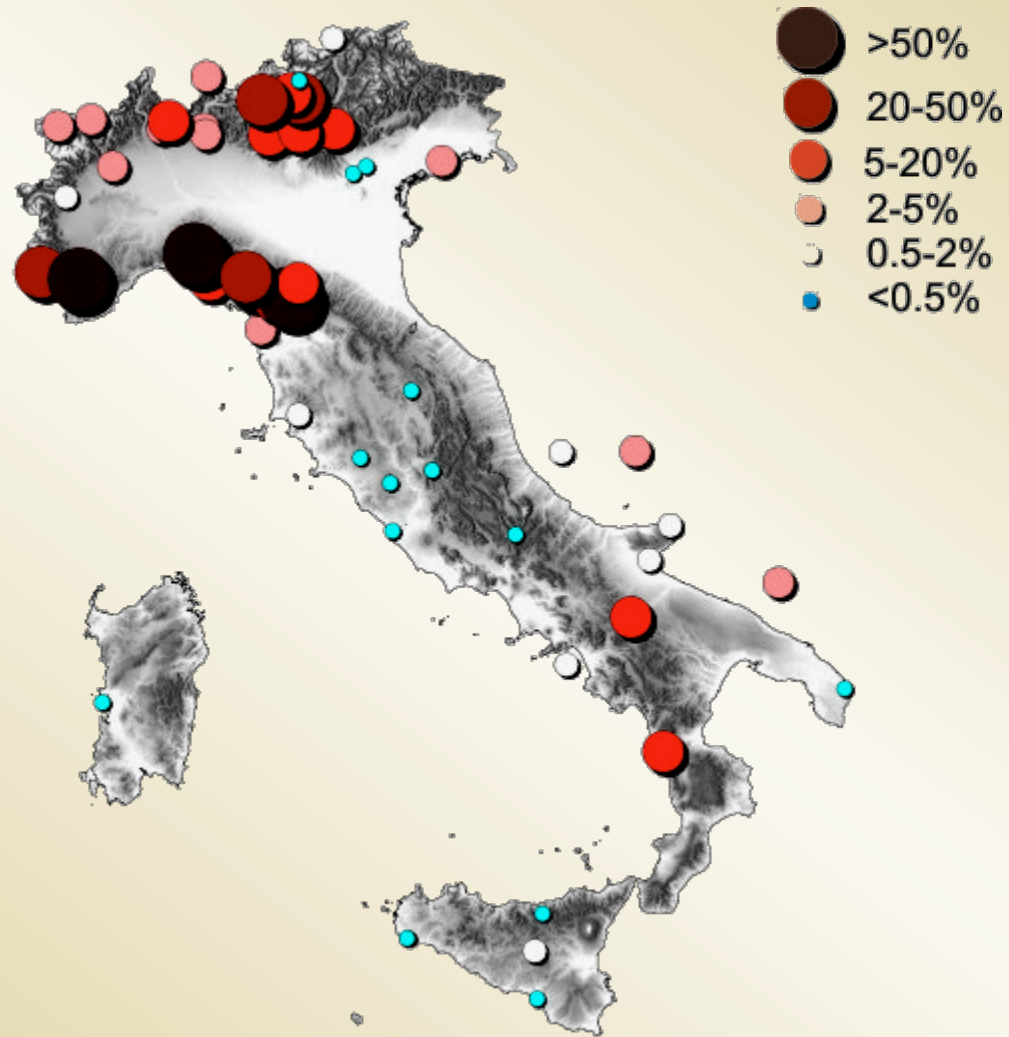
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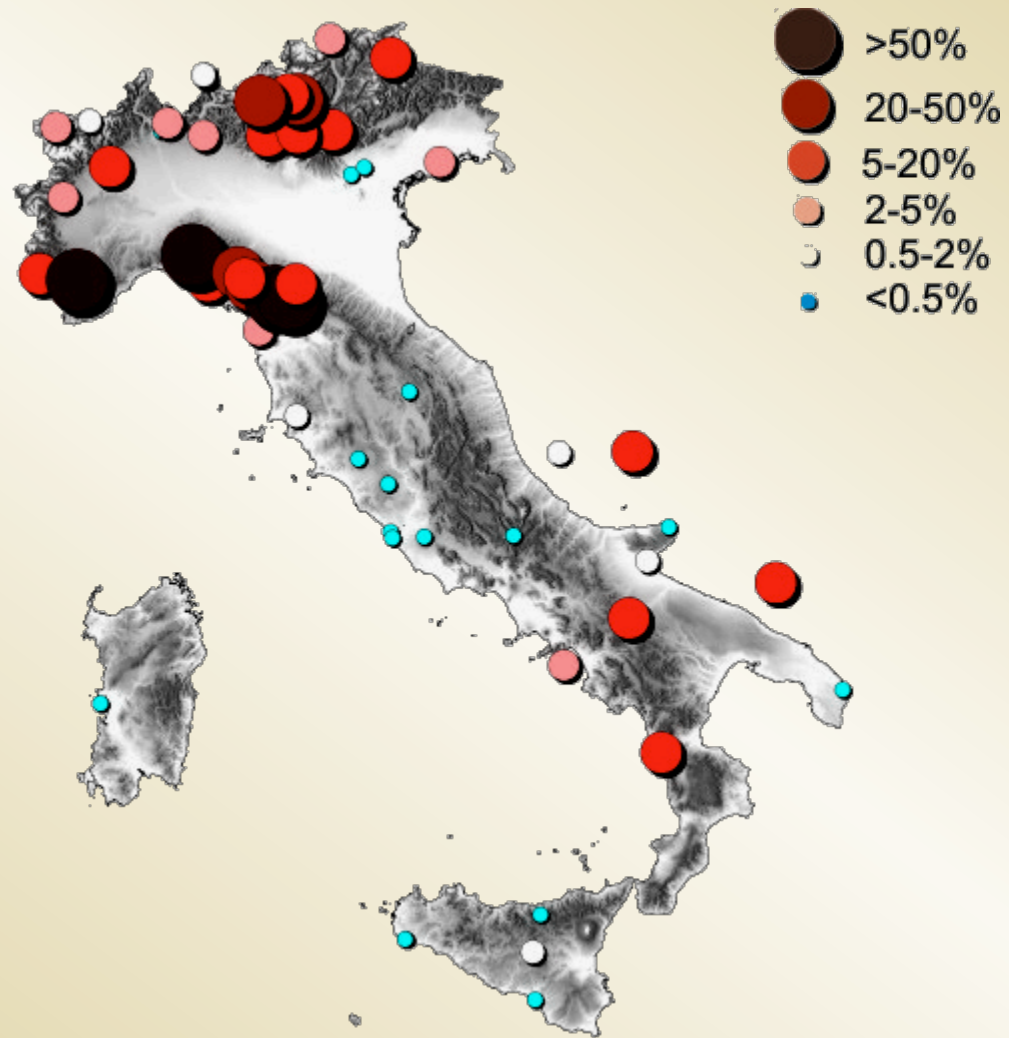
Abies - 6 ka cal BP



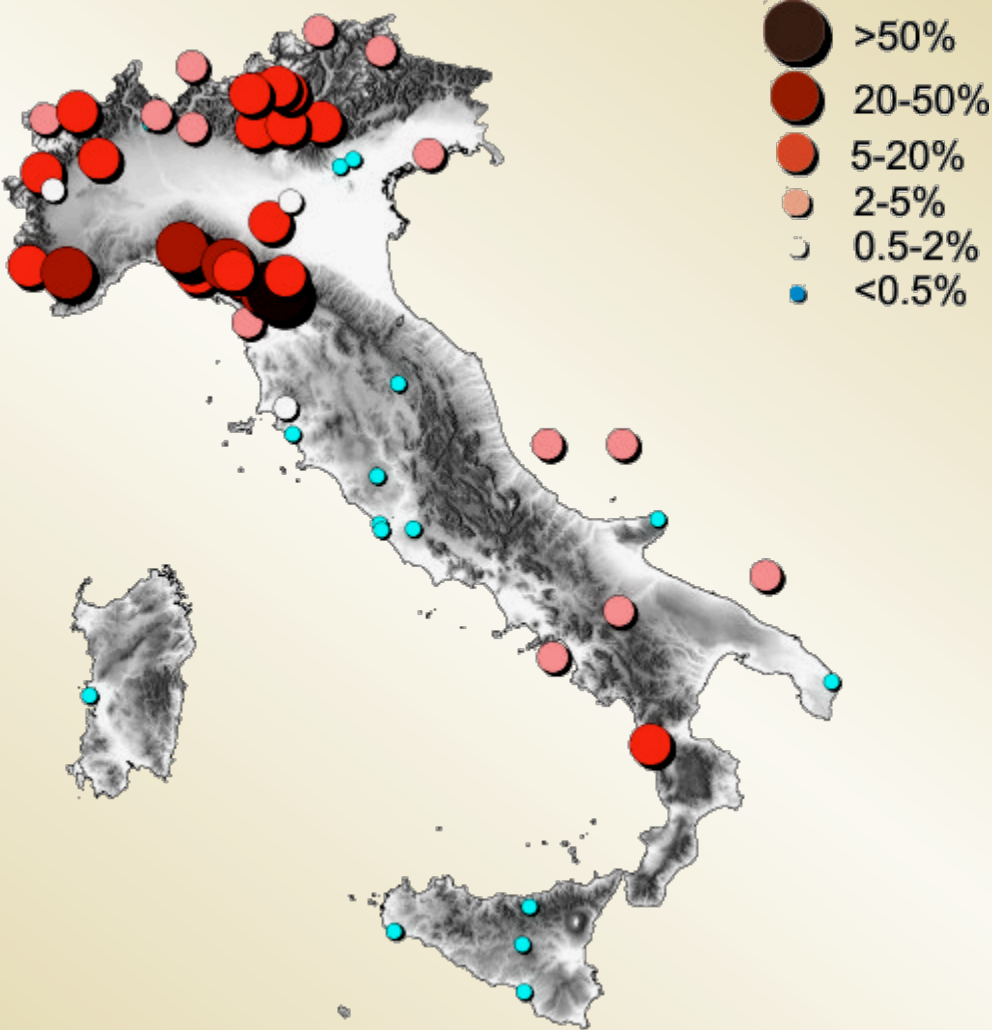
Abies - 5 ka cal BP



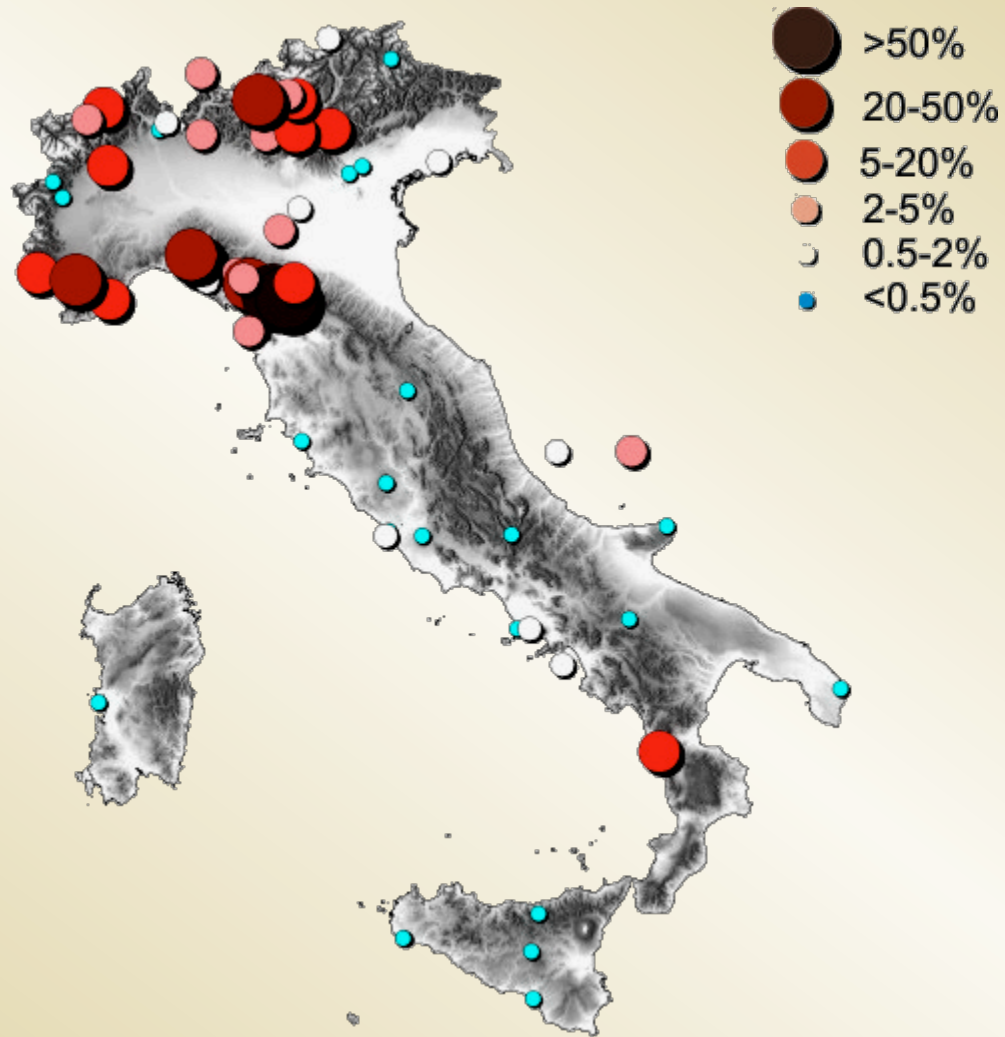
Abies - 4 ka cal BP



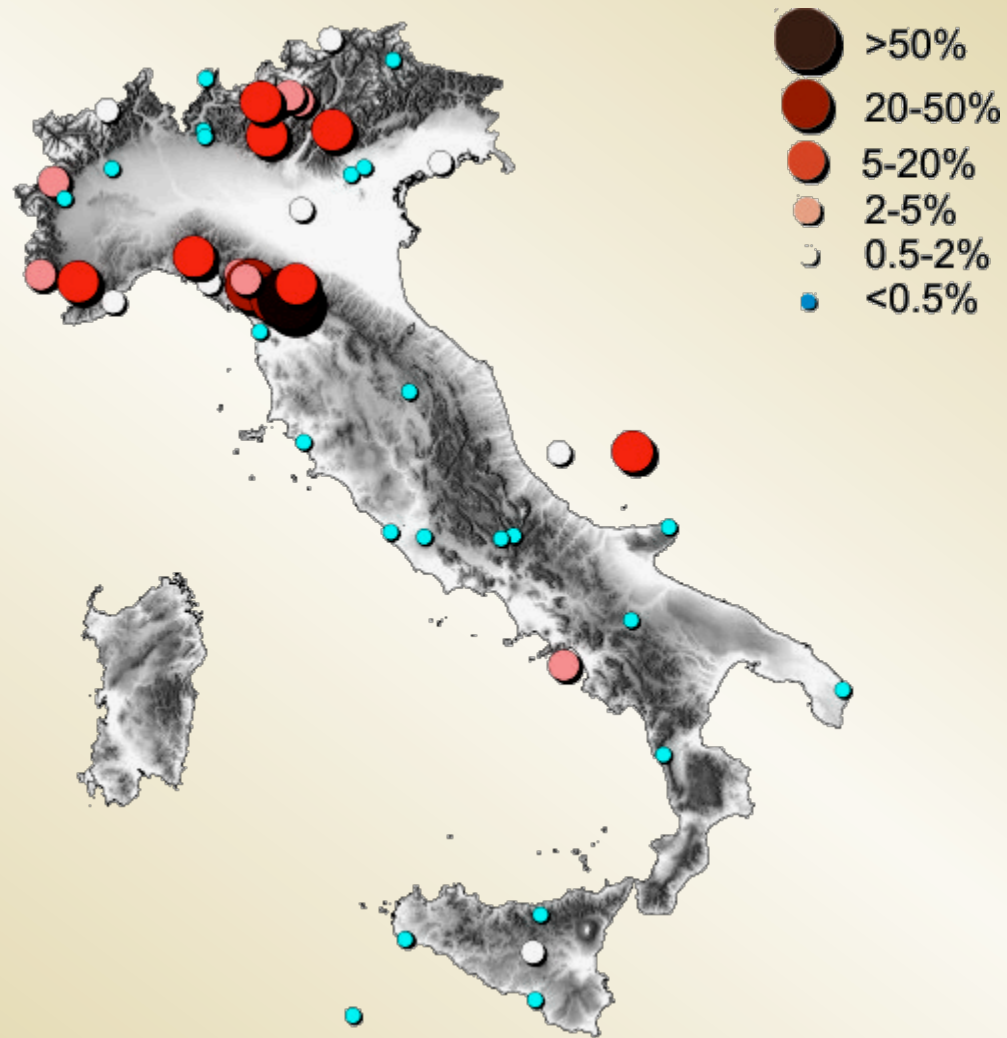
Abies - 3 ka cal BP



Abies - 2 ka cal BP



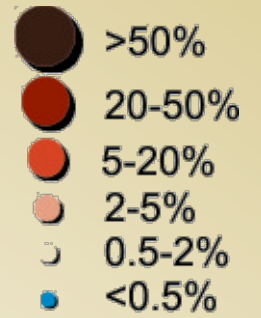
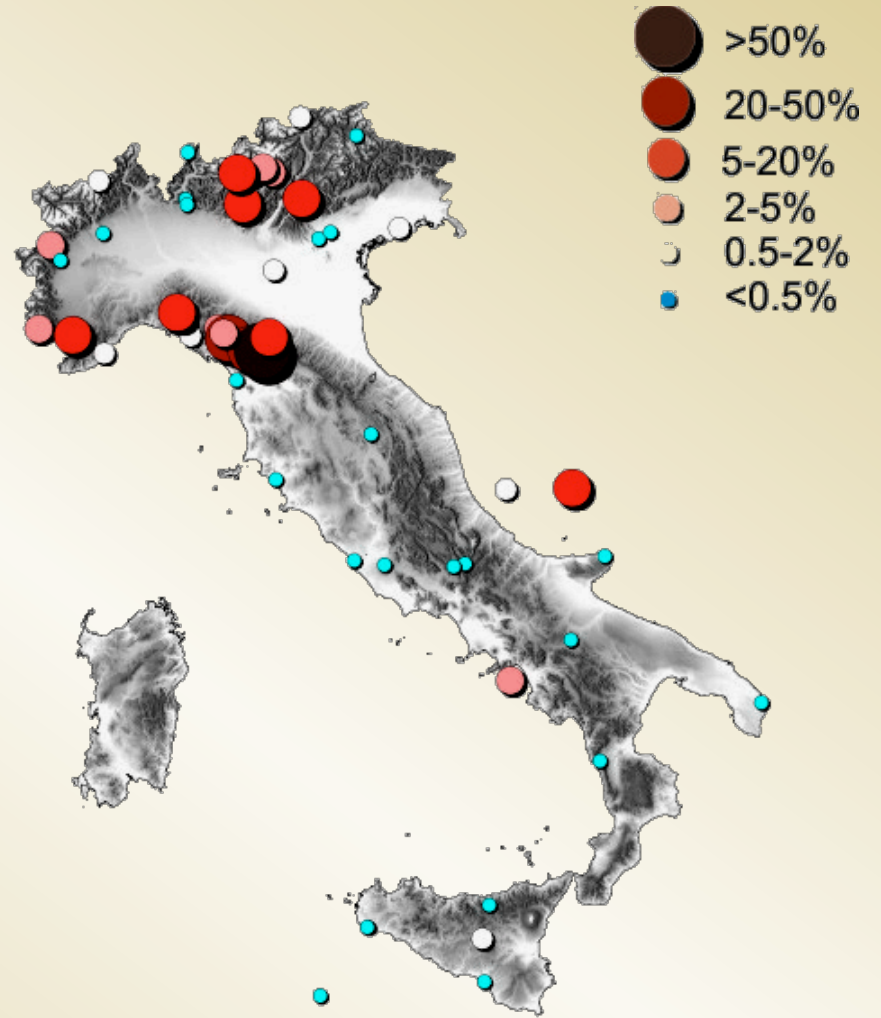
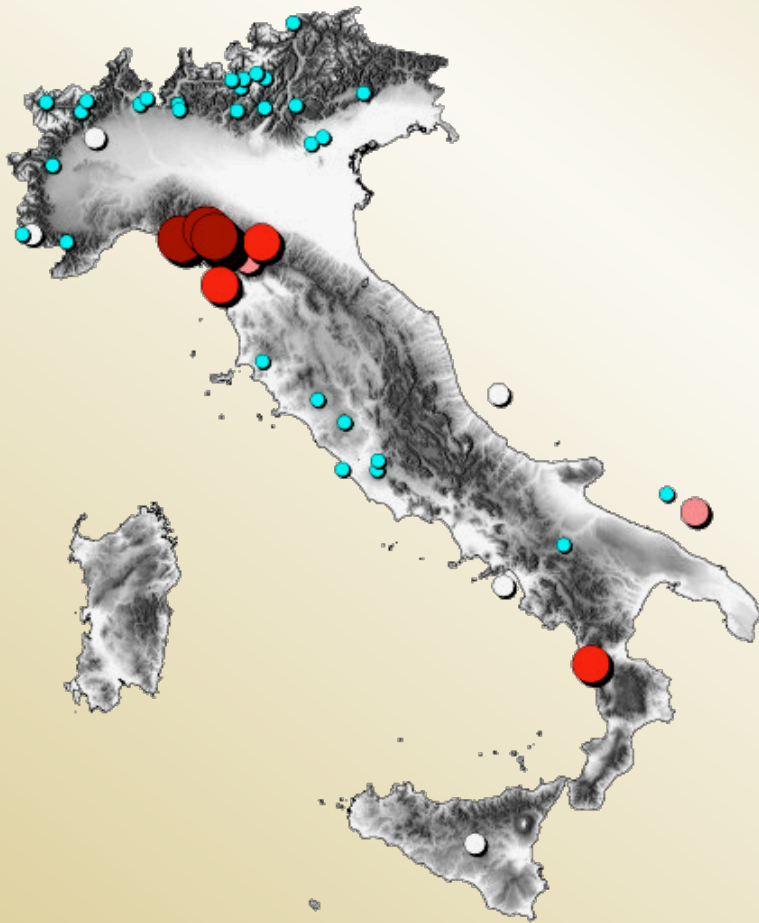
Abies - 1 ka cal BP



11 ka

Abies

1 ka



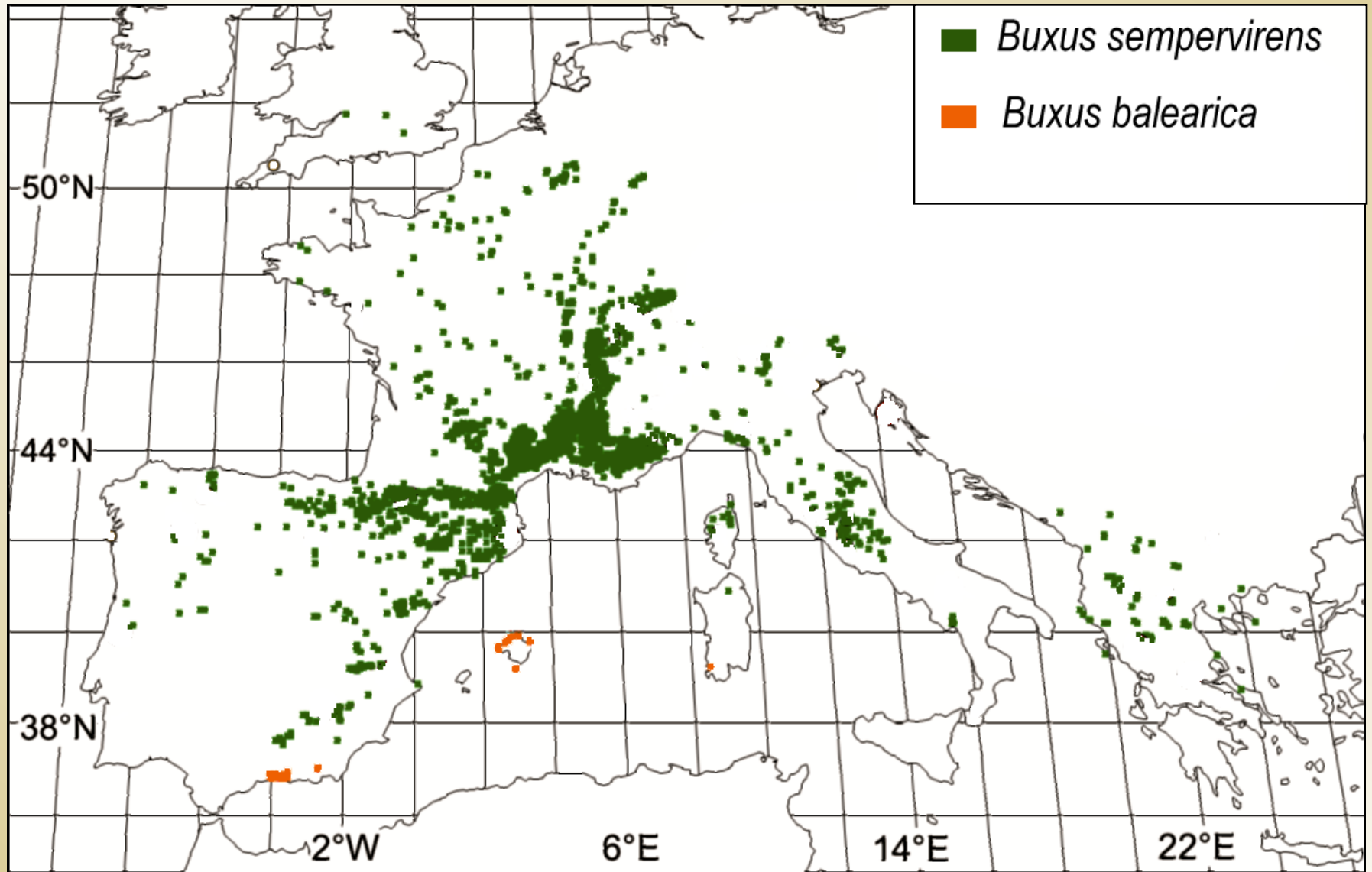
Buxus sempervirens L.



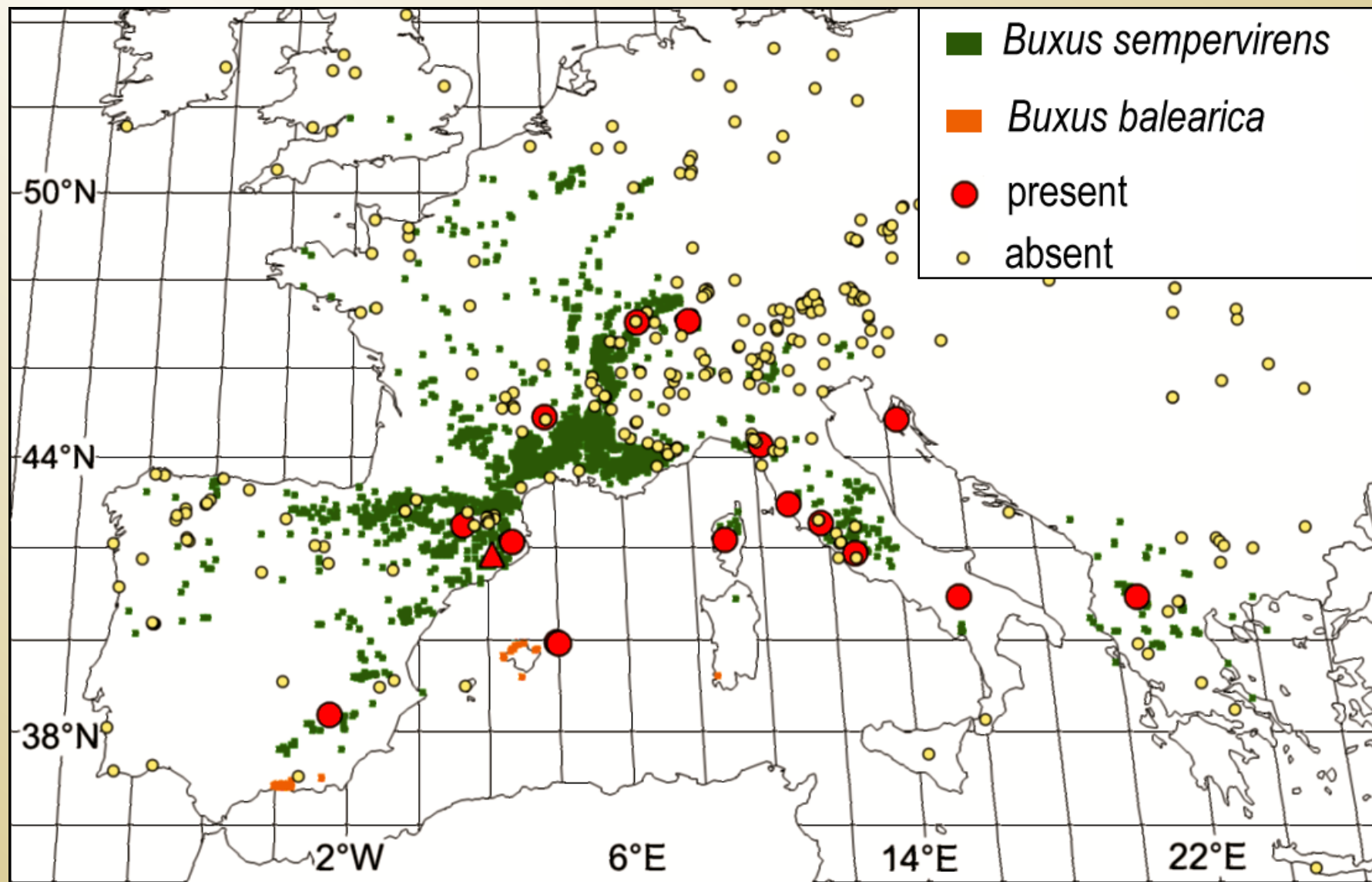
Buxus sempervirens L.



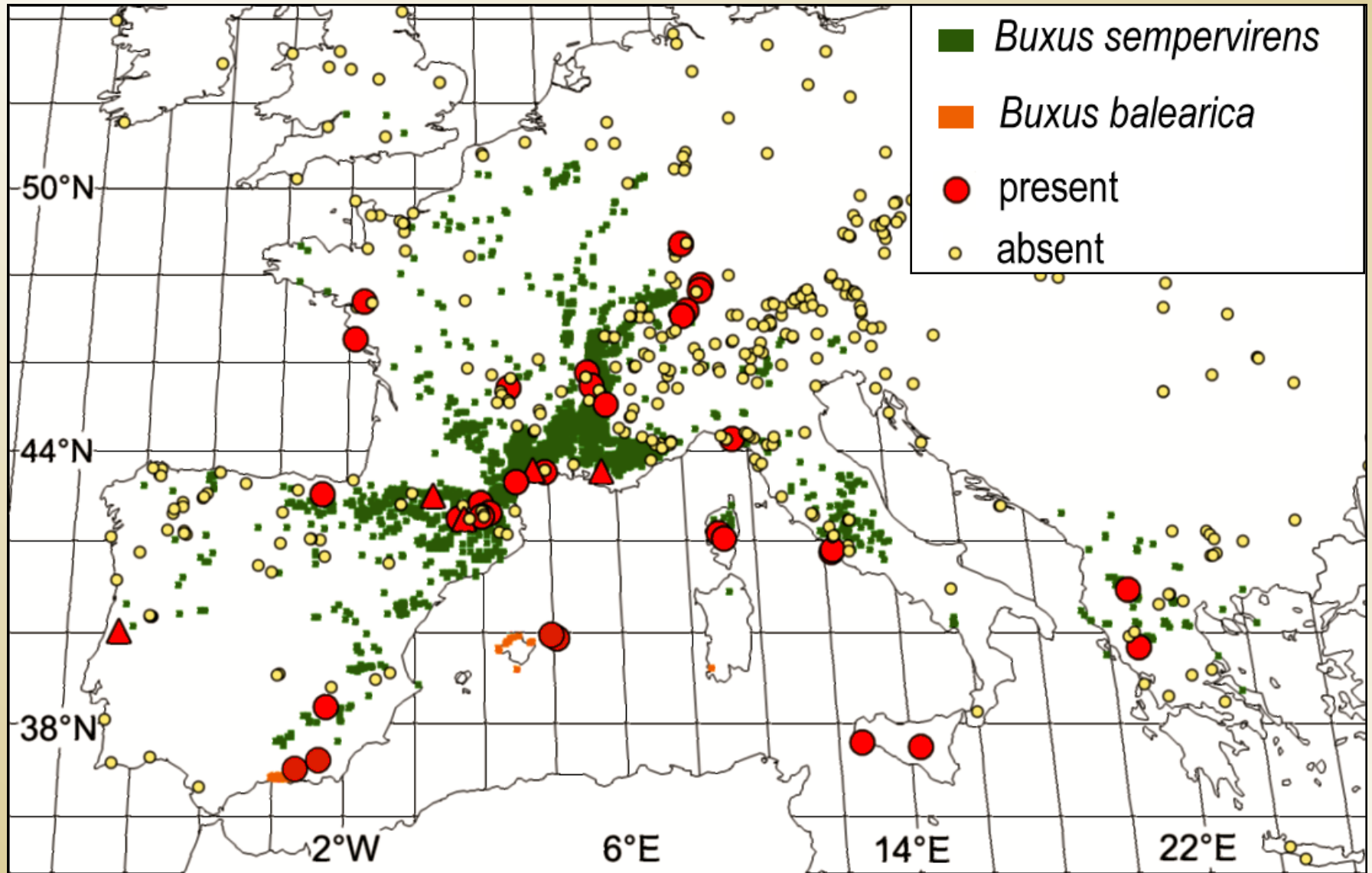
modern distribution



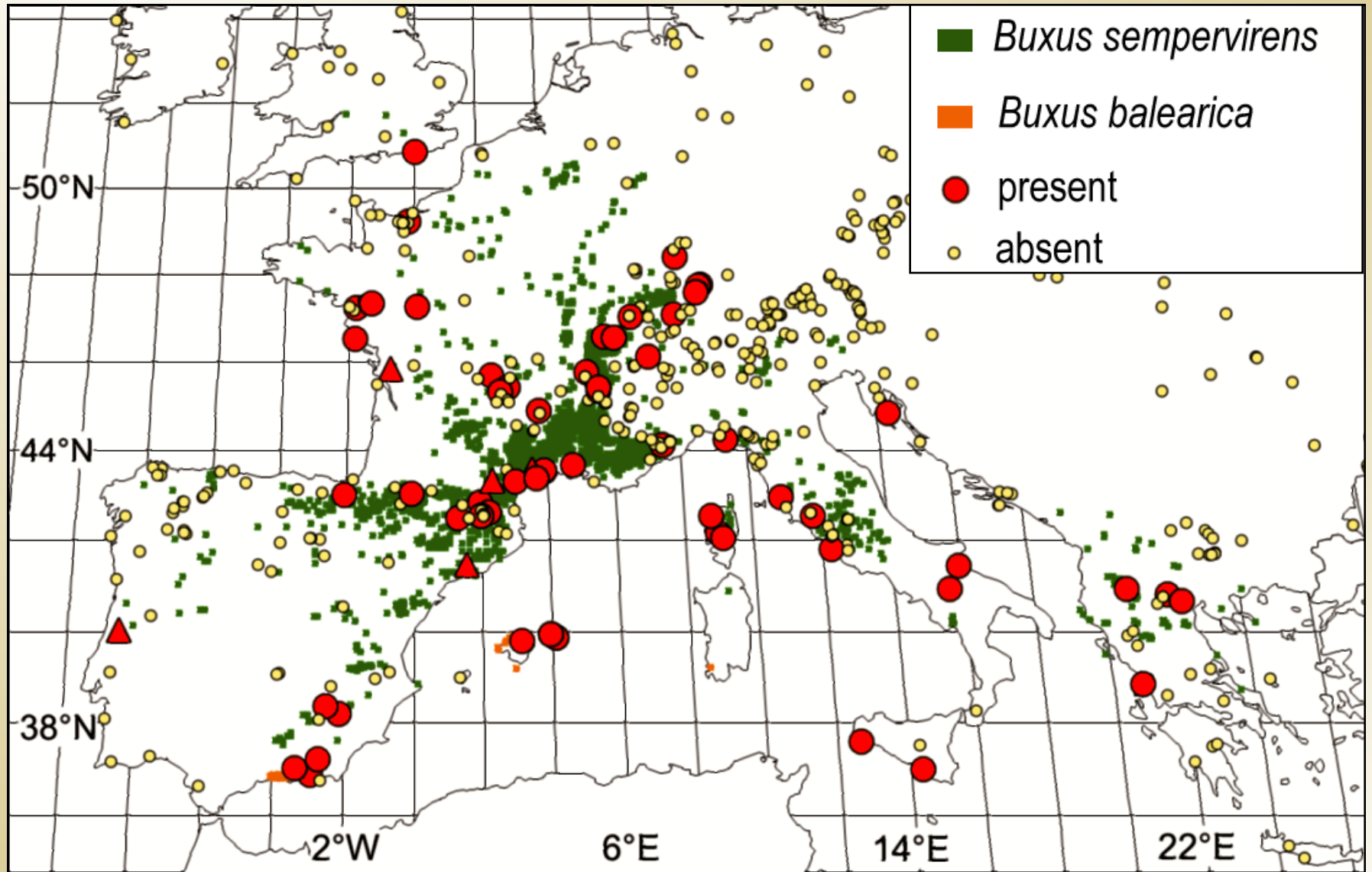
12-10 ka cal BP



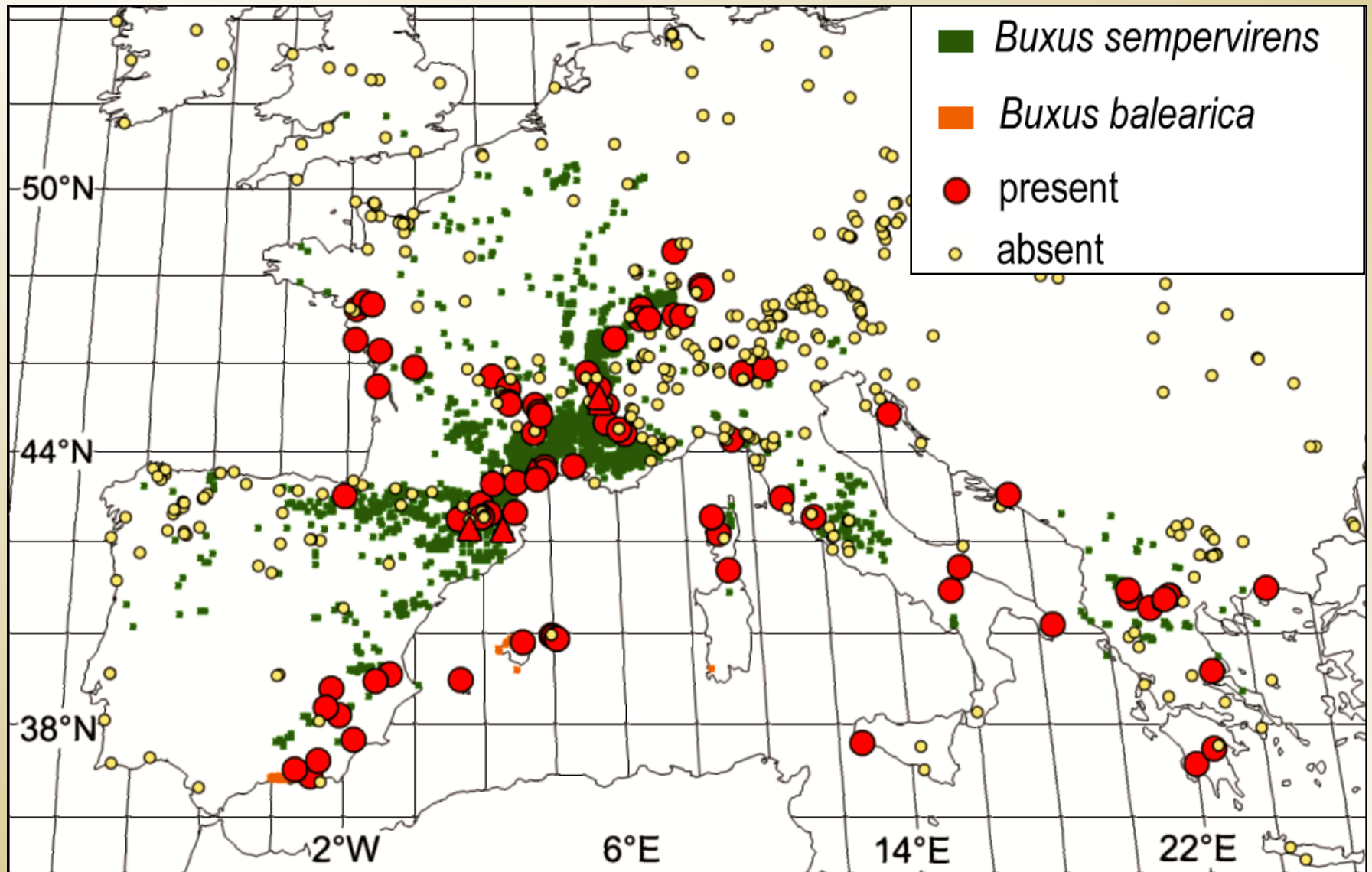
10-8 ka cal BP



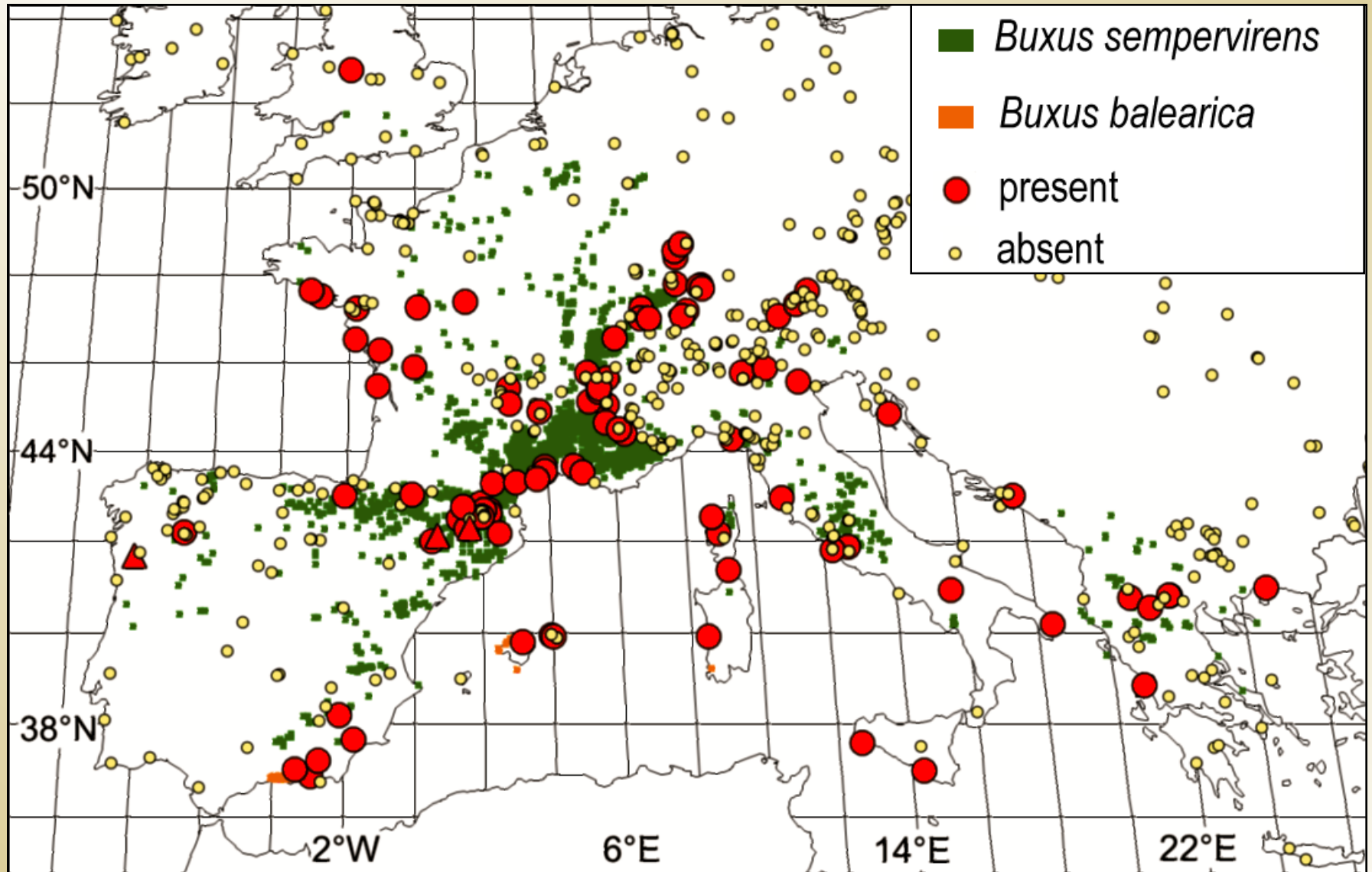
8-6 ka cal BP



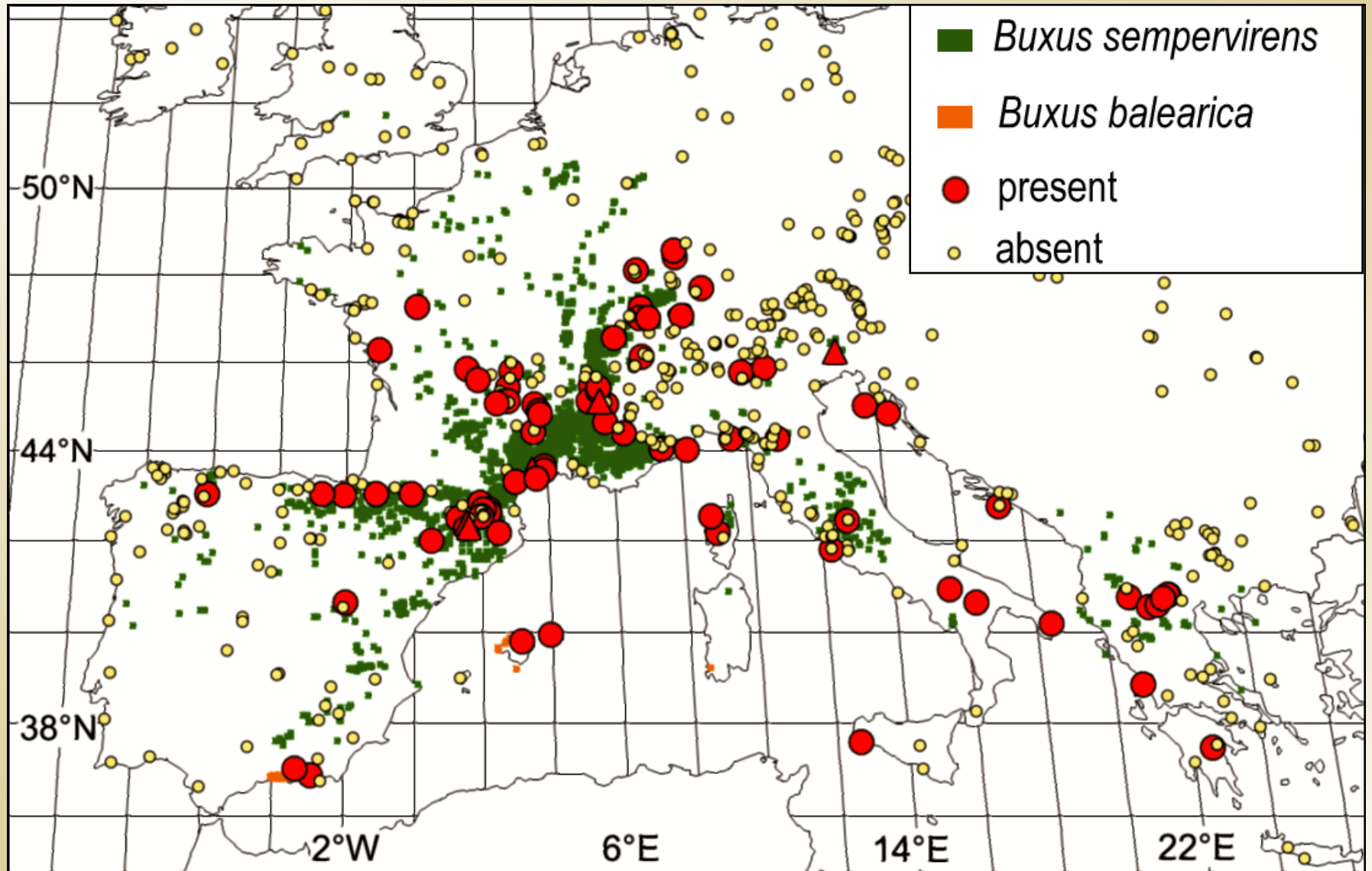
6-4 ka cal BP



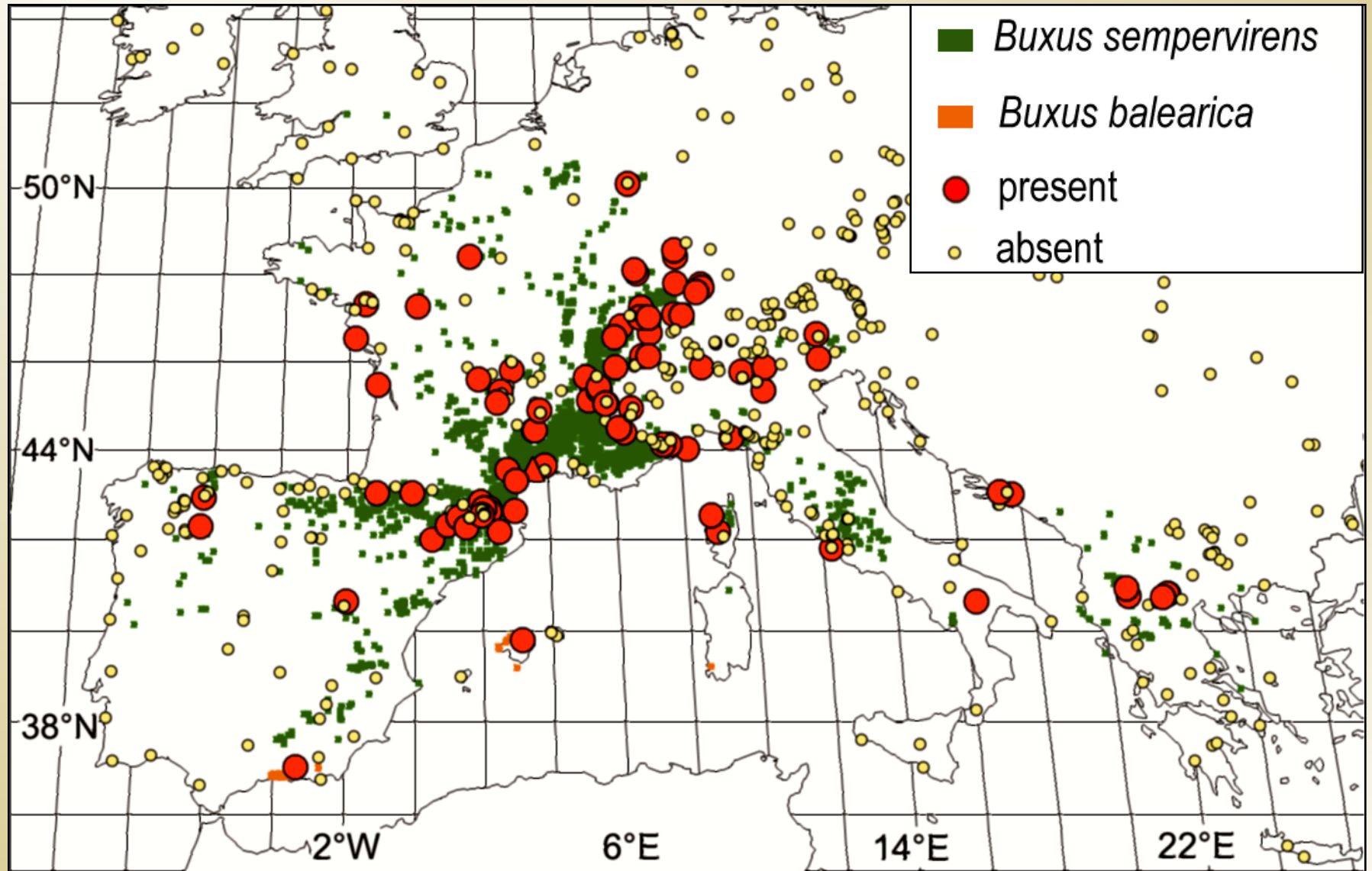
4-2 ka cal BP



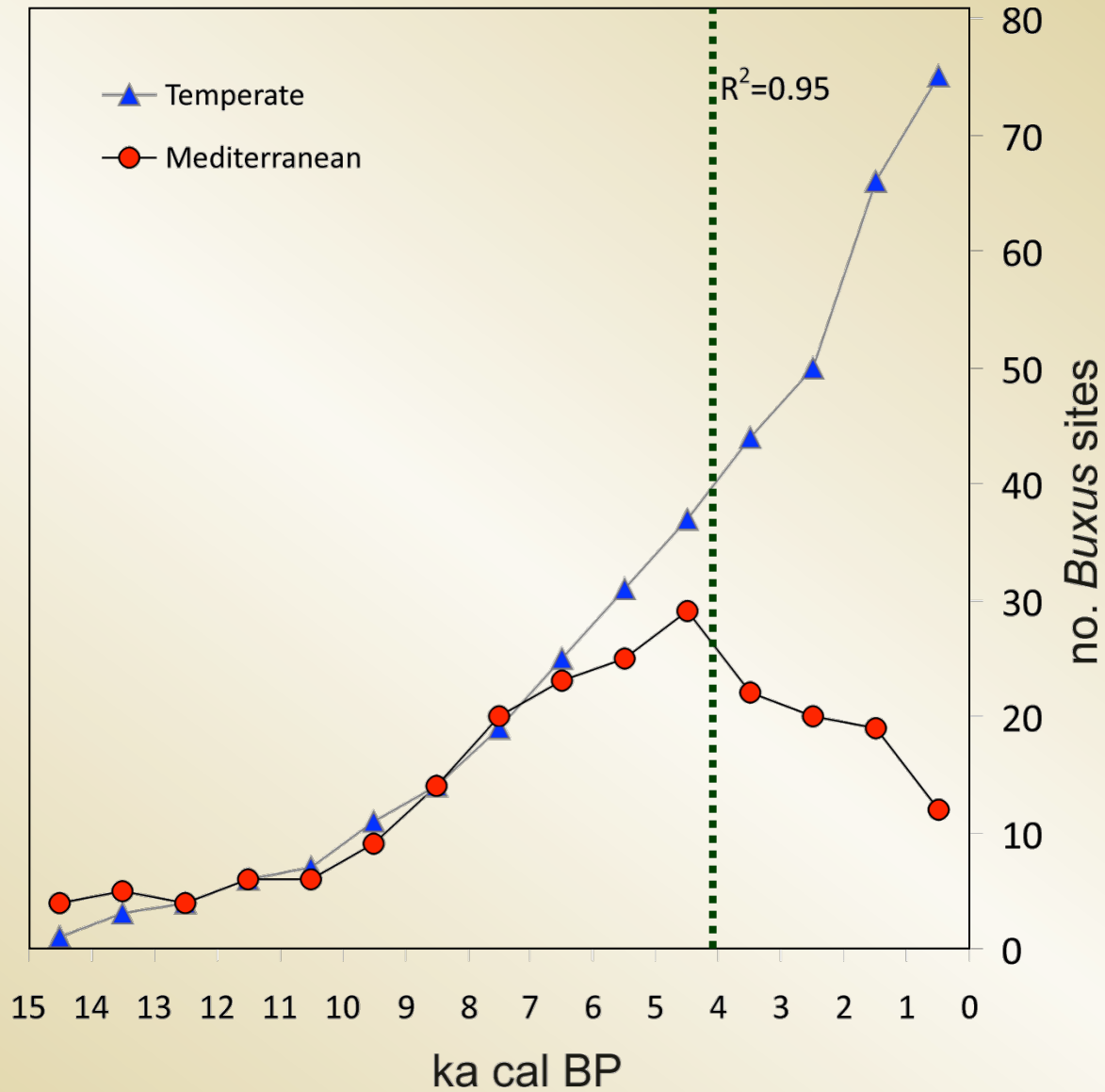
2-1 ka cal BP



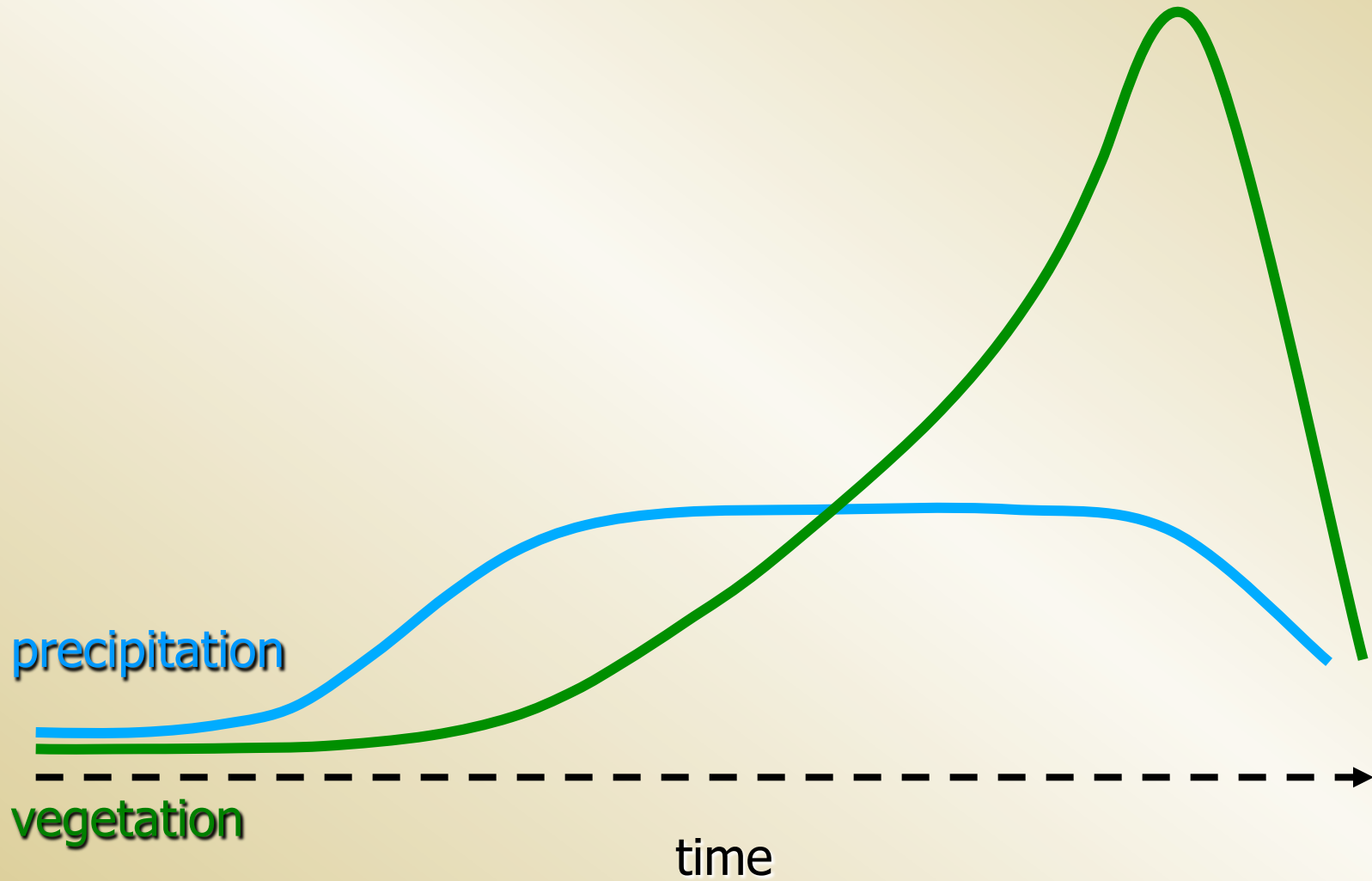
1-0 ka cal BP



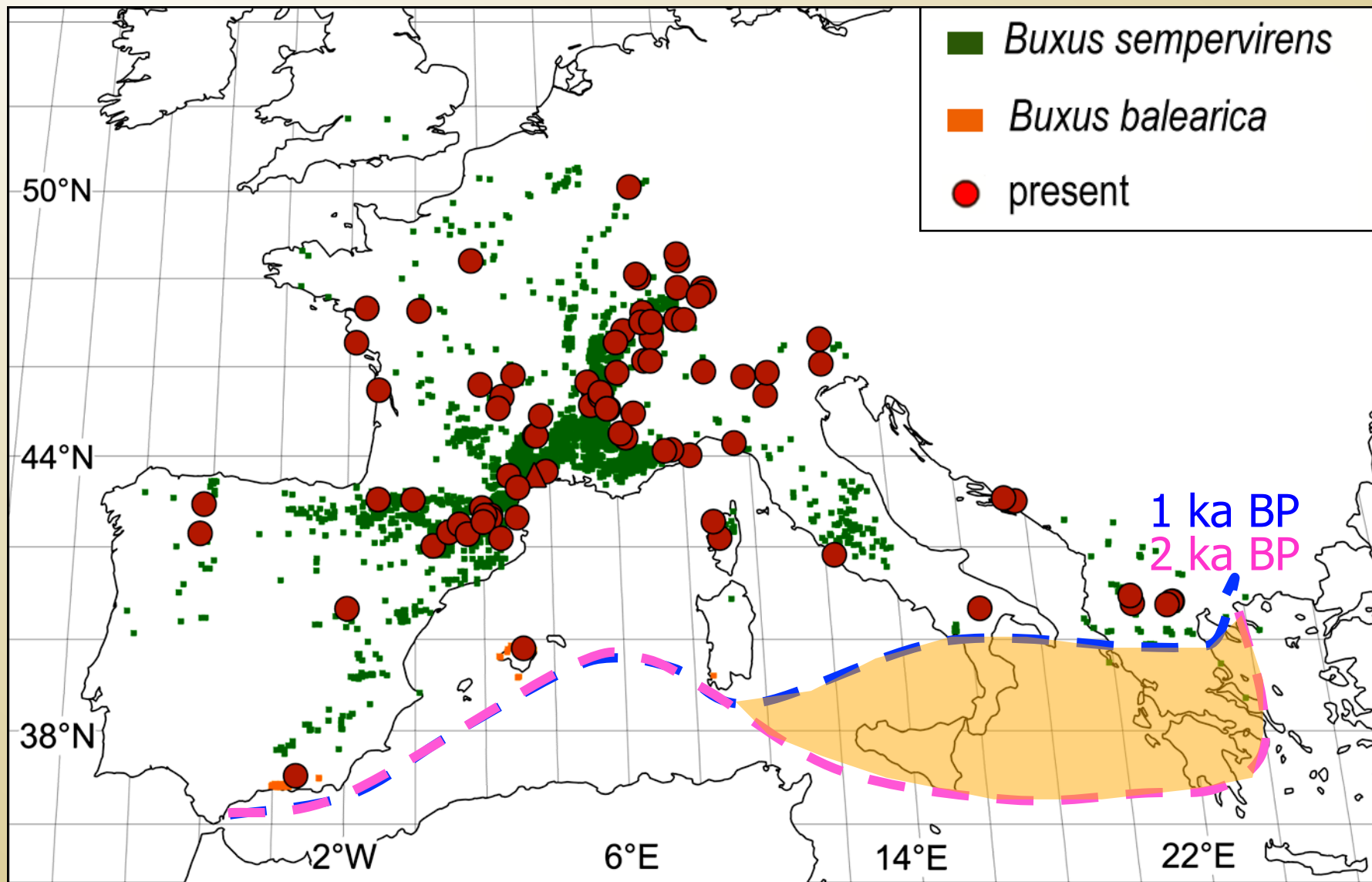
Postglacial population dynamics of *Buxus* in Europe



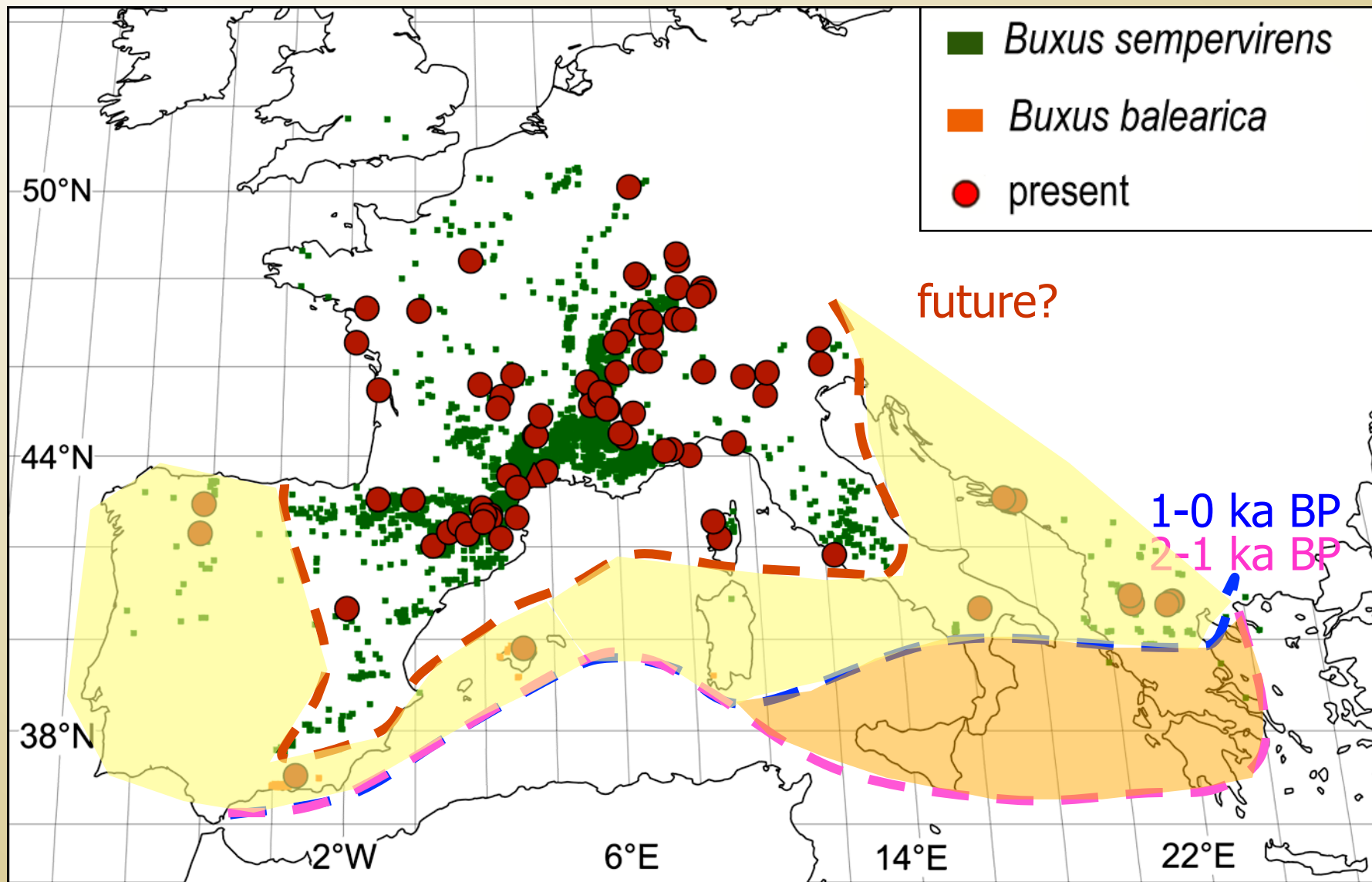
Interpreting pollen records



Disappearance of *Buxus* from southern Europe



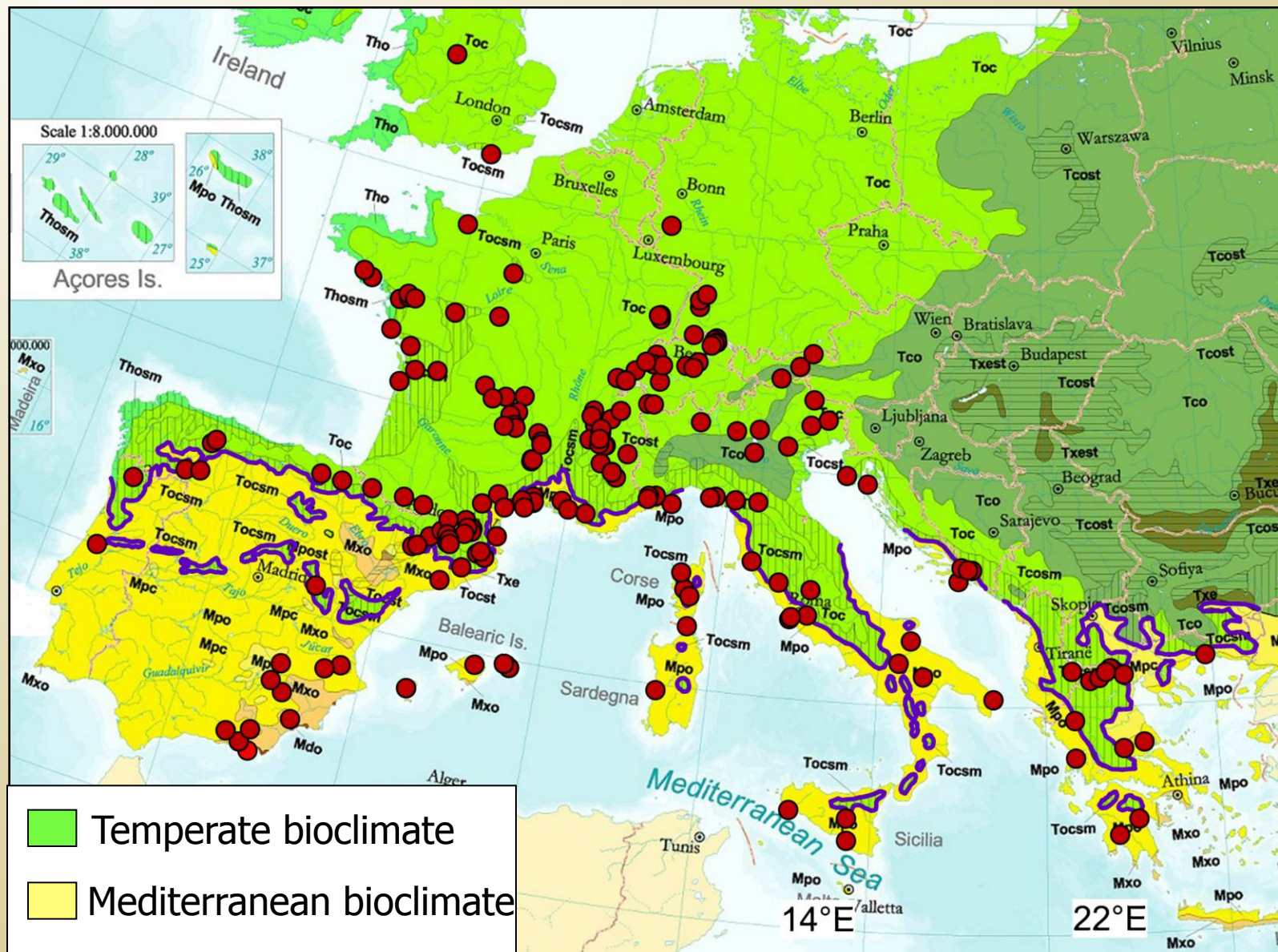
Disappearance of *Buxus* from southern Europe



Conclusions

- the geographical analysis of vegetation changes is fundamental if we want to reach a better understanding of past climate changes
- climatic factors can affect large geographical areas all at the same time and/or may progressively involve new territories following geographical gradients
- the sensitivity of vegetation to climate changes is higher at the distribution margins of species and low in the centre of the distribution
- the accuracy of results and interpretations increase if we consider all the available records to reconstruct complex patterns of past vegetation and climate changes
- valuable results may be obtained comparing recent vegetation trends to older records, in order to disentangle the effects of human impact and climate changes

Location of postglacial *Buxus* populations in Europe



(Di Domenico et al., 2012)