Assessment of genetic diversity and adaptation of oat (*Avena sativa* L.) collected from North Africa and Central Europe

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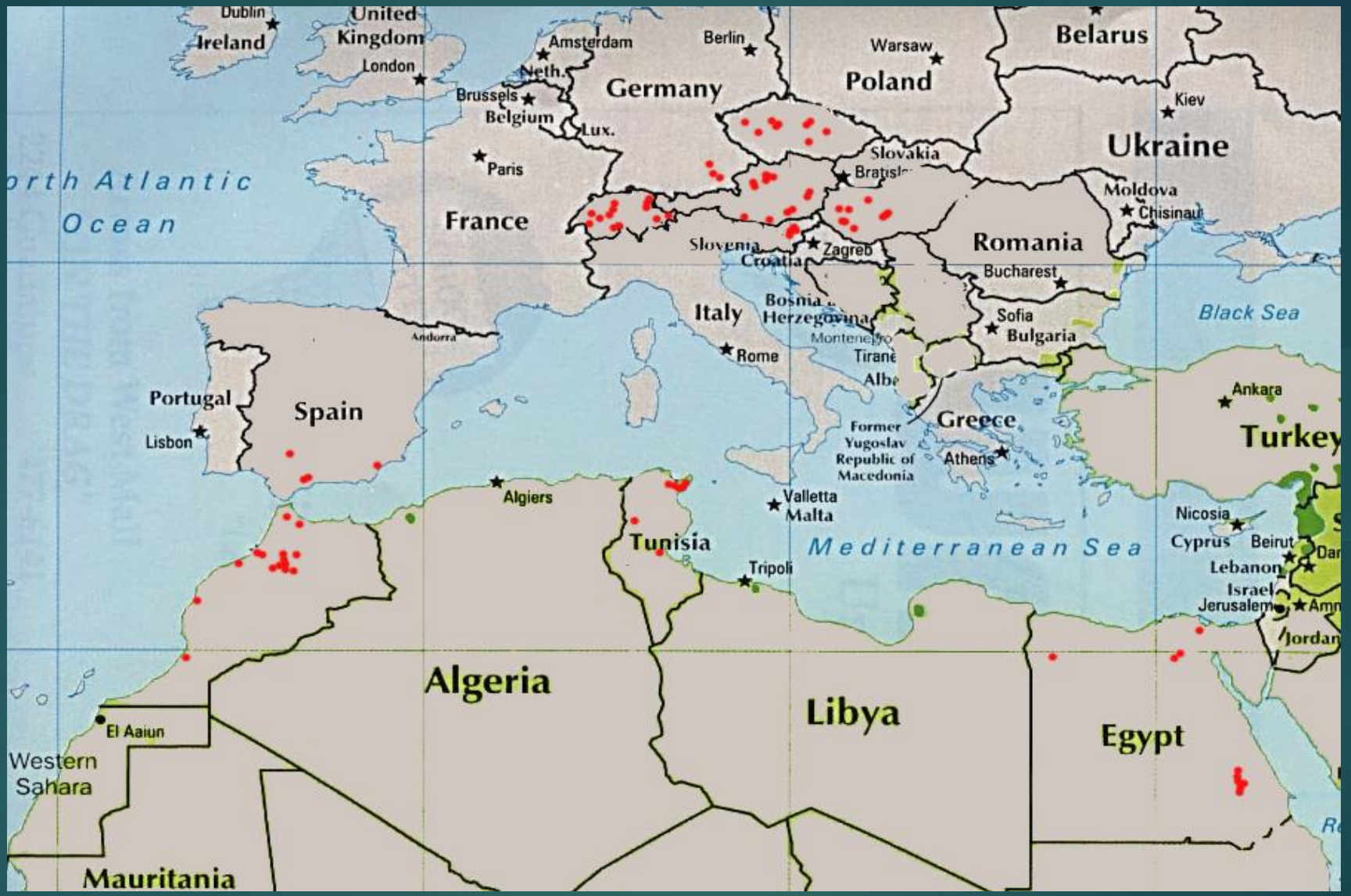


Fig 1. Locality of 116 accessions collected along the Mediterranean coast.

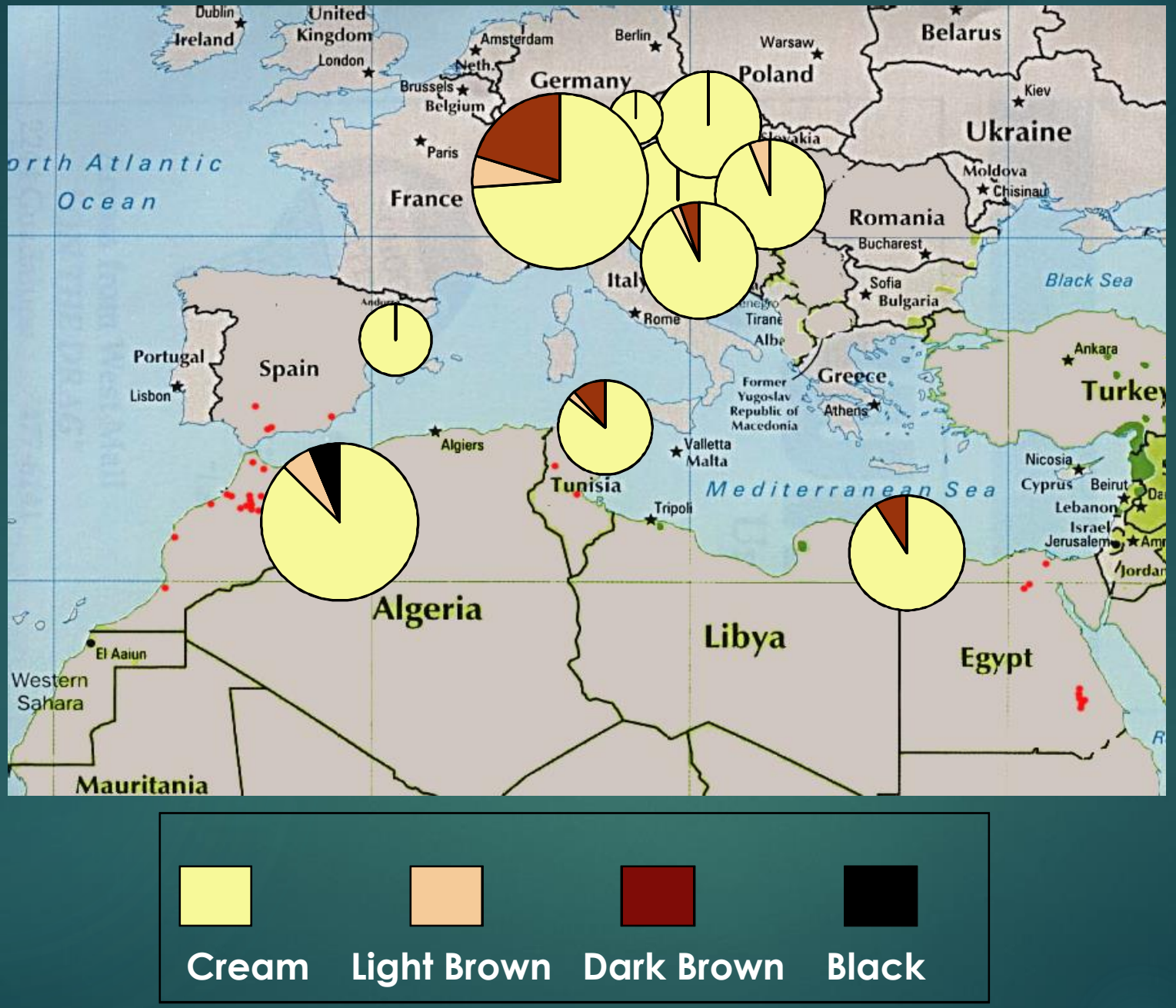


Fig. 5. Distribution of lemma color types of oat accessions in North Africa and Central Europe

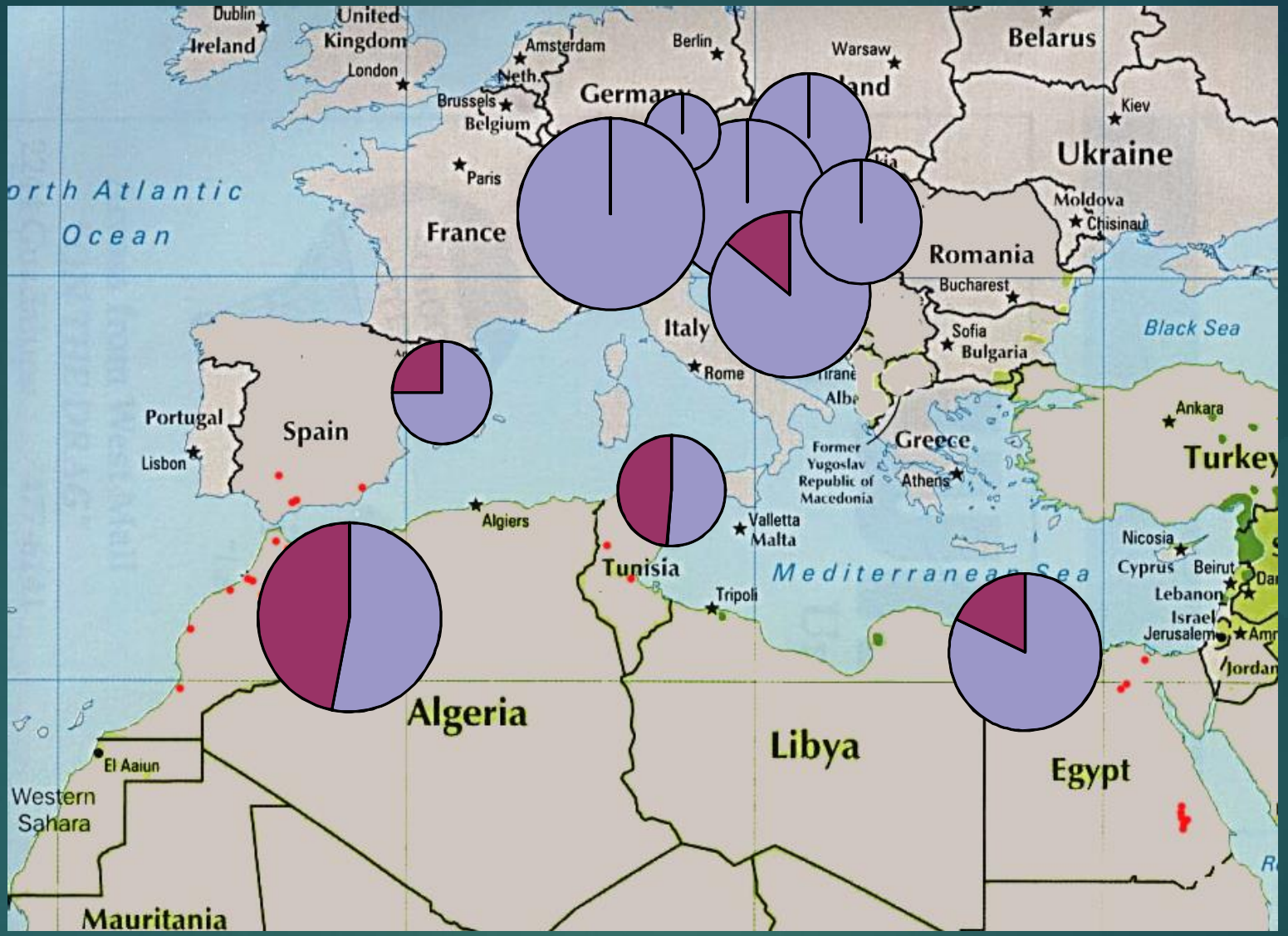


Fig. 6. Distribution of hairiness of the node in oats of North Africa and Central Europe.

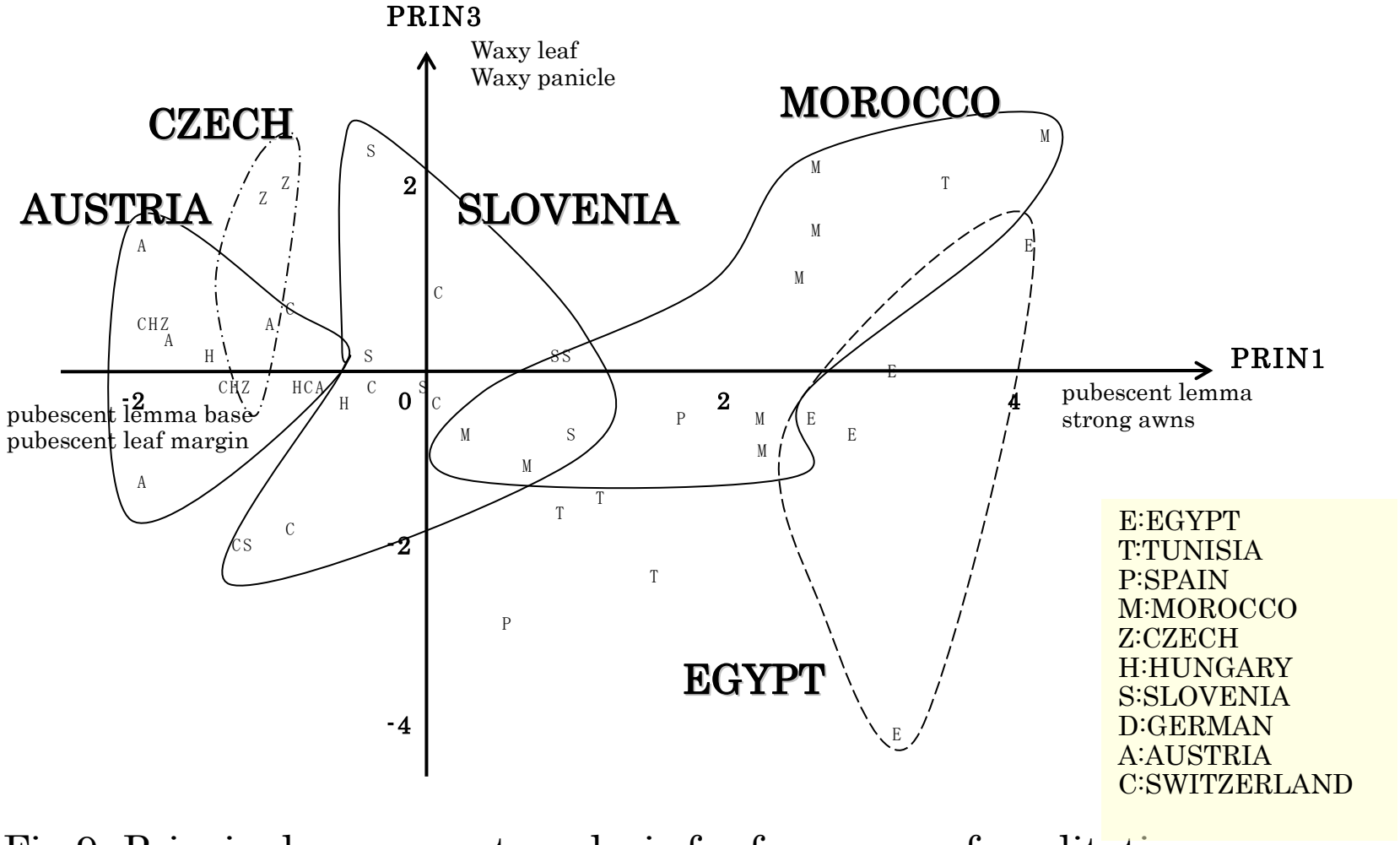
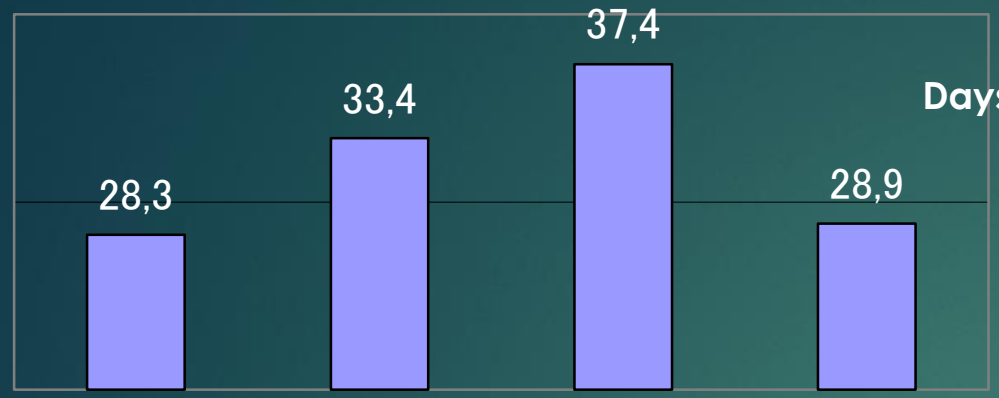


Fig.9. Principal component analysis for frequency of qualitative characters on the Mediterranean Coast.

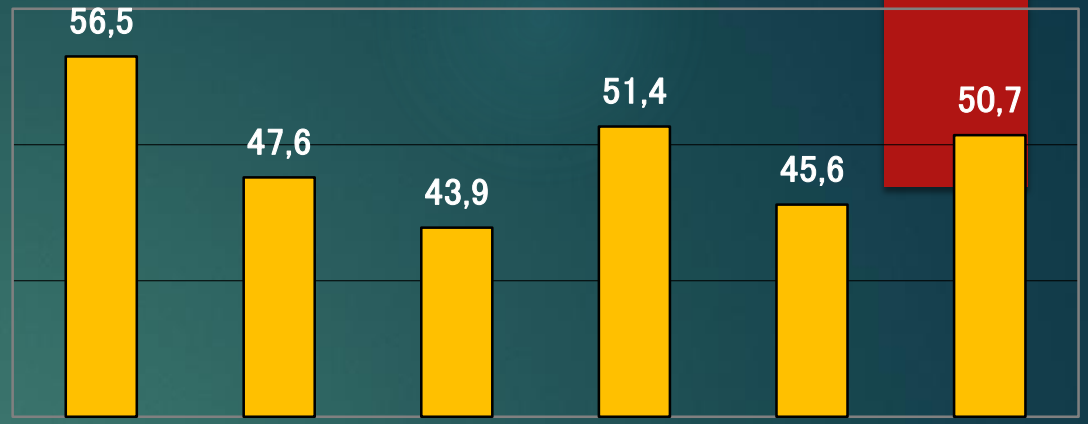
Conclusion 1

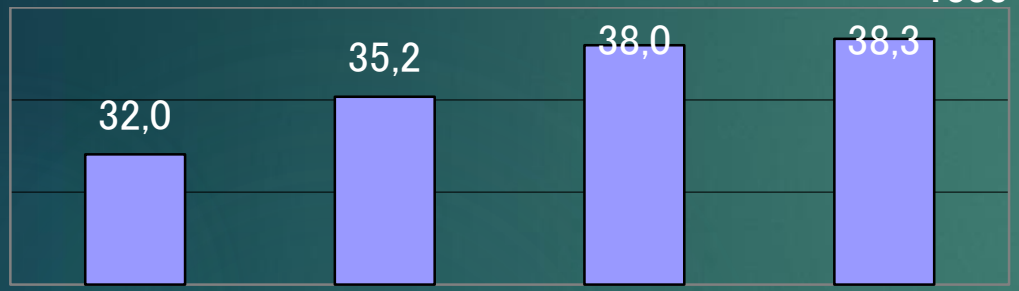
1.Accessions in Switzerland showed the highest frequency of colored dark brown lemma (0.20). A cline exists showing a north to south distribution of hairiness of the node.

2.Fifteen accessions of North African oats showed pubescence out of 38 accessions. Merely two Slovenian oat accessions showed pubescence out of a total of 72 European accessions.

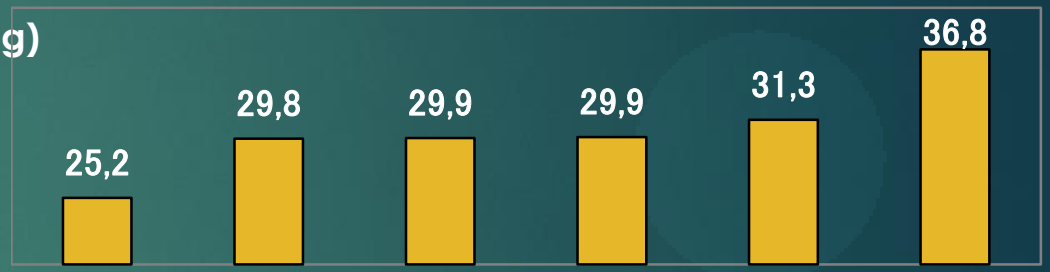


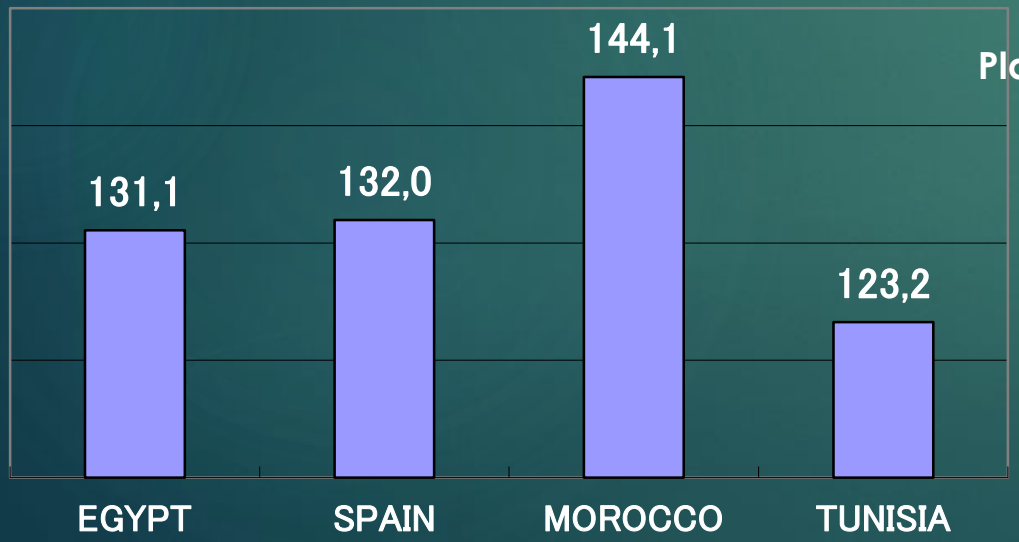
Days to heading



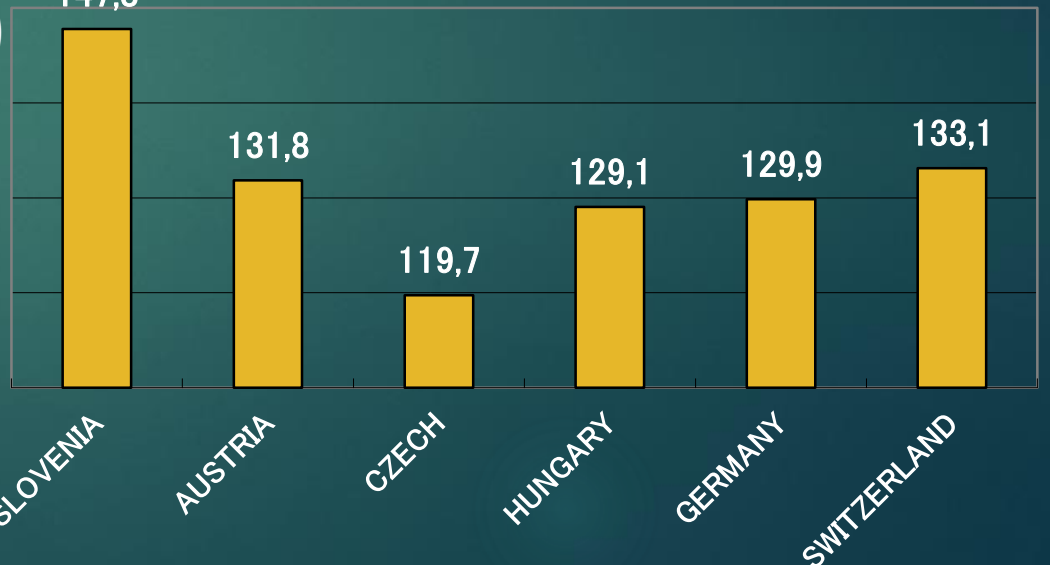


1000-grain-weight (g)





Plant Height (cm)



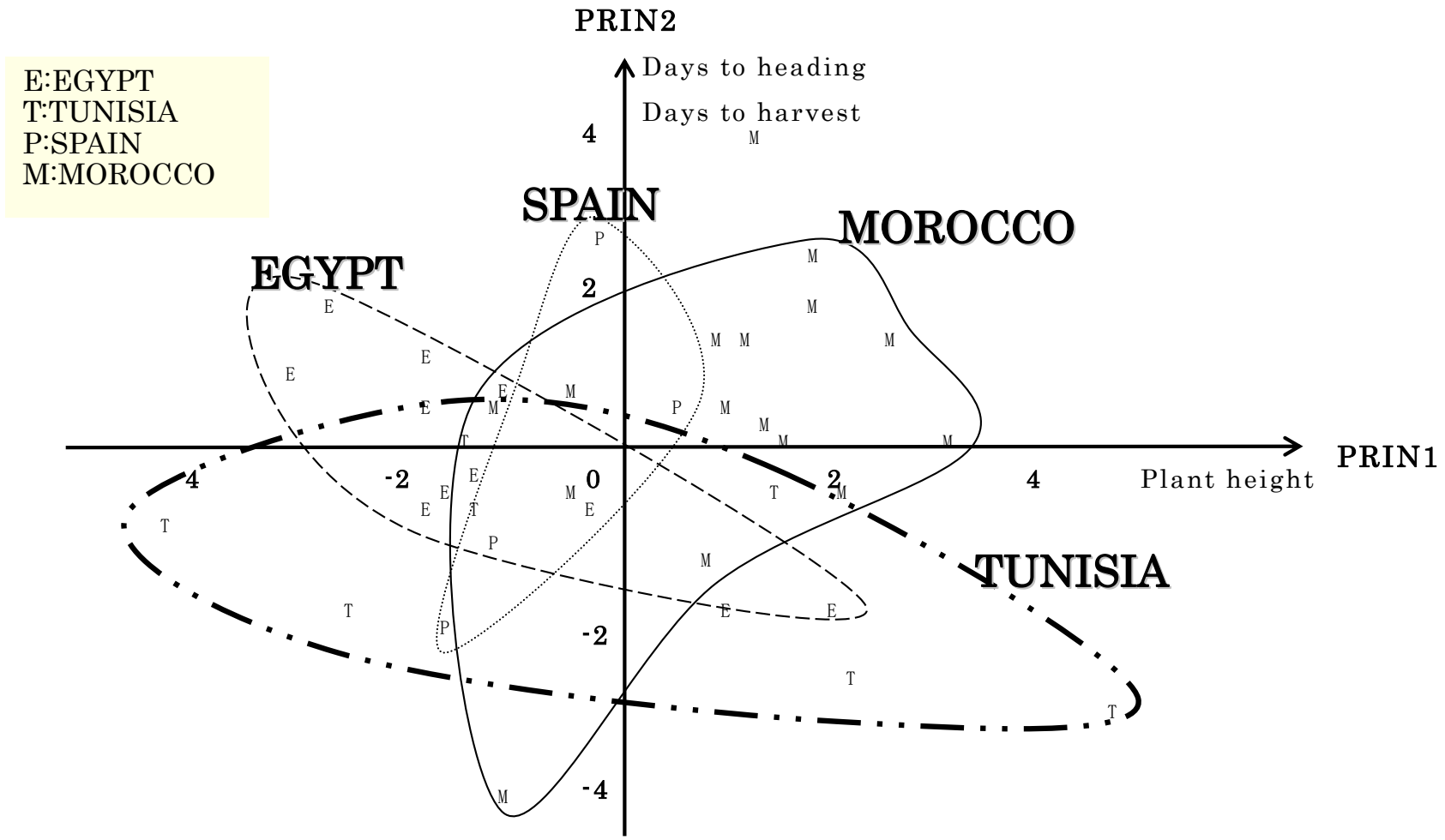


Fig.7. Principal component analysis for quantitative characters in the North African oats.

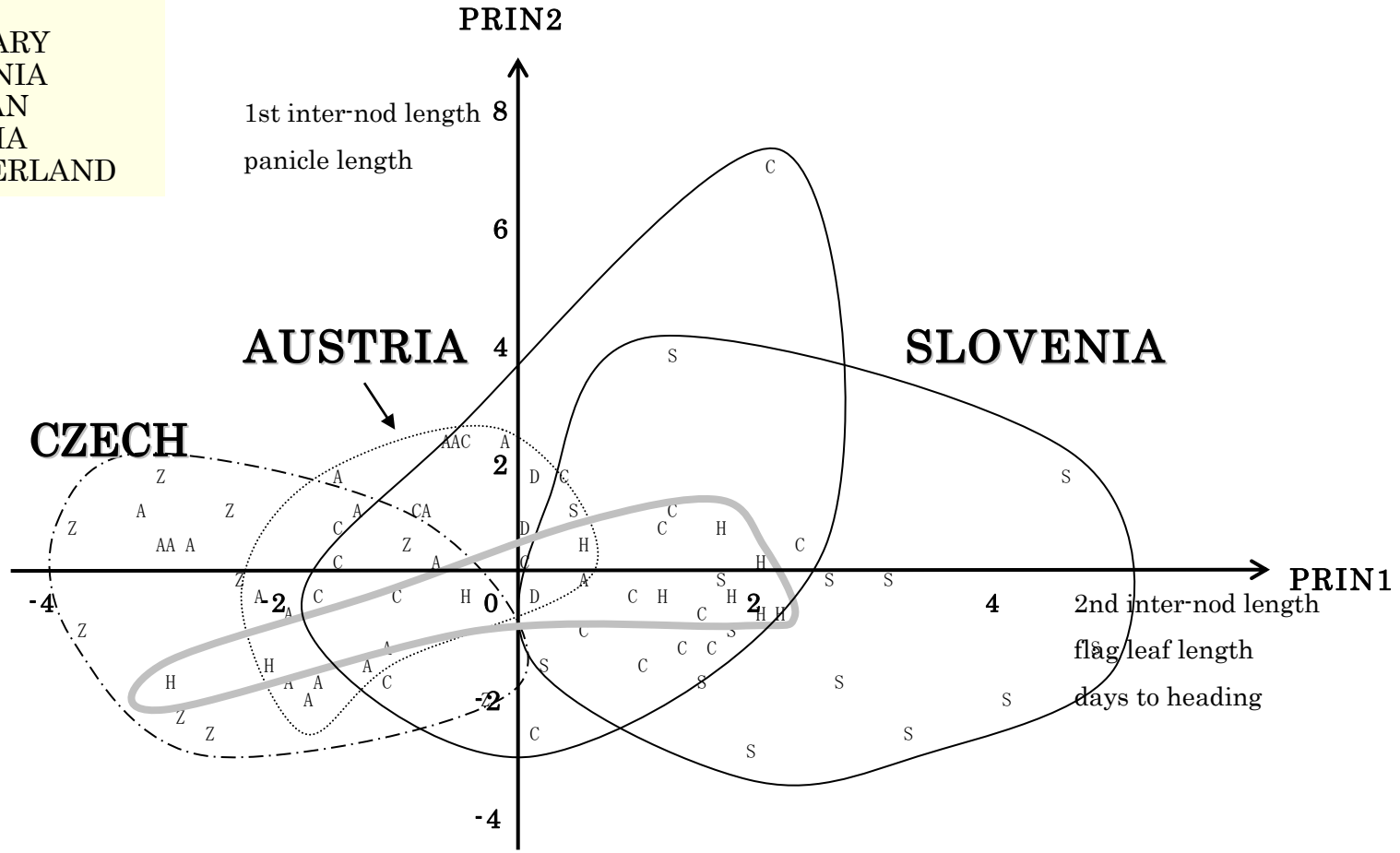


Fig.8. Principal component analysis for quantitative characters in the Central European oats.

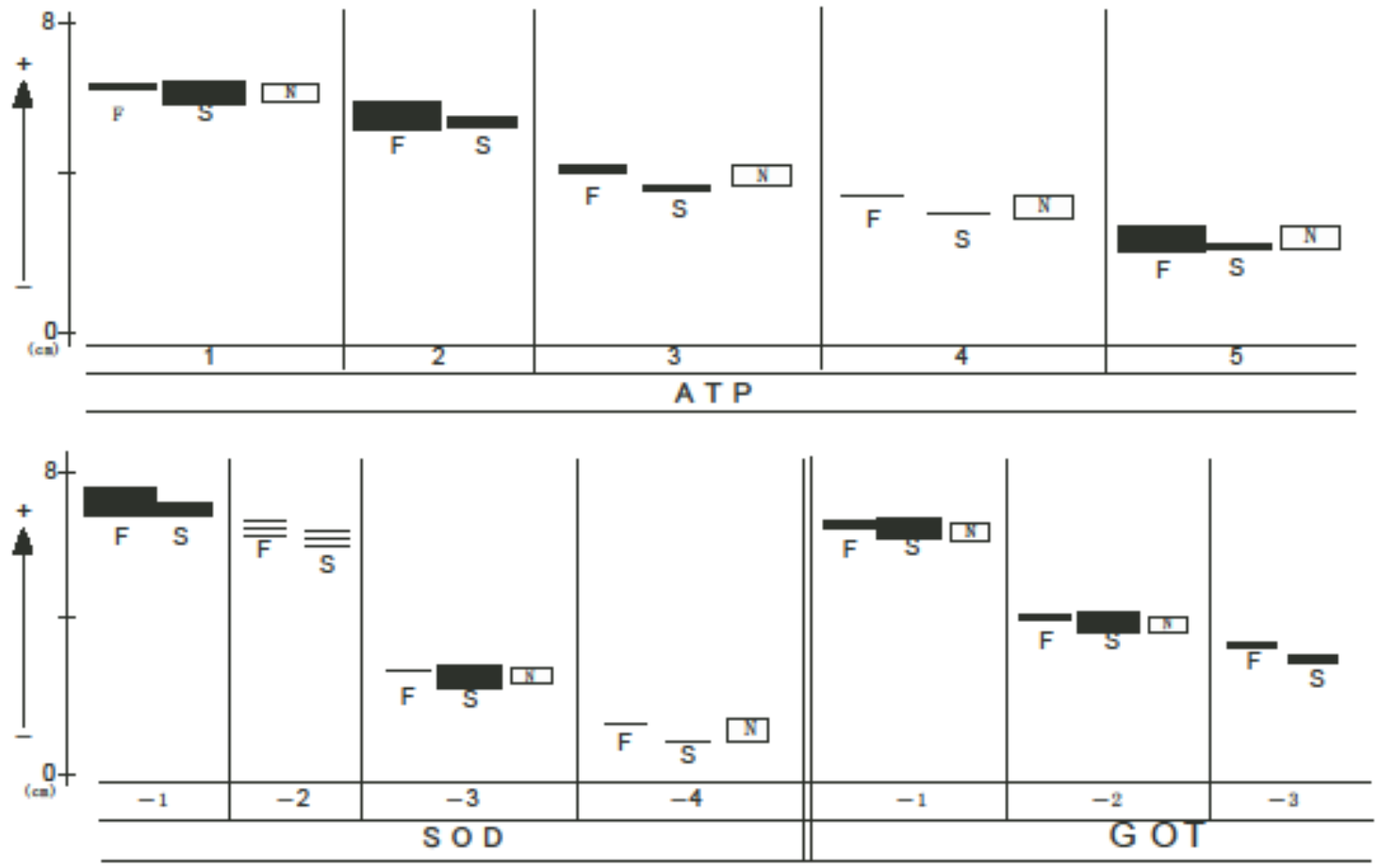


Fig.10. Banding pattern and their allelic designations for the polymorphic loci observed in the Mediterranean Cost oats.
Character under band refers to the variant at that allozyme locus..

Table 6. Genetic diversity at 34 isozyme loci of oats in the North African and Central European countries

Country		No. of populations	Mean no. of	Percent of	Mean heterozygosity per locus		
Name	Code		alleles per locus	variable loci	Direct count	Biased	Unbiased
Egypt	E	11	2.15	82.35	0.011	0.376	0.394
Tunisia	T	7	1.97	73.53	0.004	0.308	0.331
Spain	P	4	1.91	73.53	0	0.353	0.403
Morocco	M	16	2.09	73.53	0.002	0.315	0.325
Czech	Z	10	1.56	41.18	0	0.17	0.179
Hungary	H	10	1.53	47.06	0	0.179	0.189
Slovenia	S	14	1.76	61.76	0	0.231	0.240
Germany	D	3	1.59	58.82	0	0.261	0.314
Austria	A	19	1.76	58.82	0	0.273	0.281
Switzerland	C	22	2.06	79.41	0.001	0.242	0.248

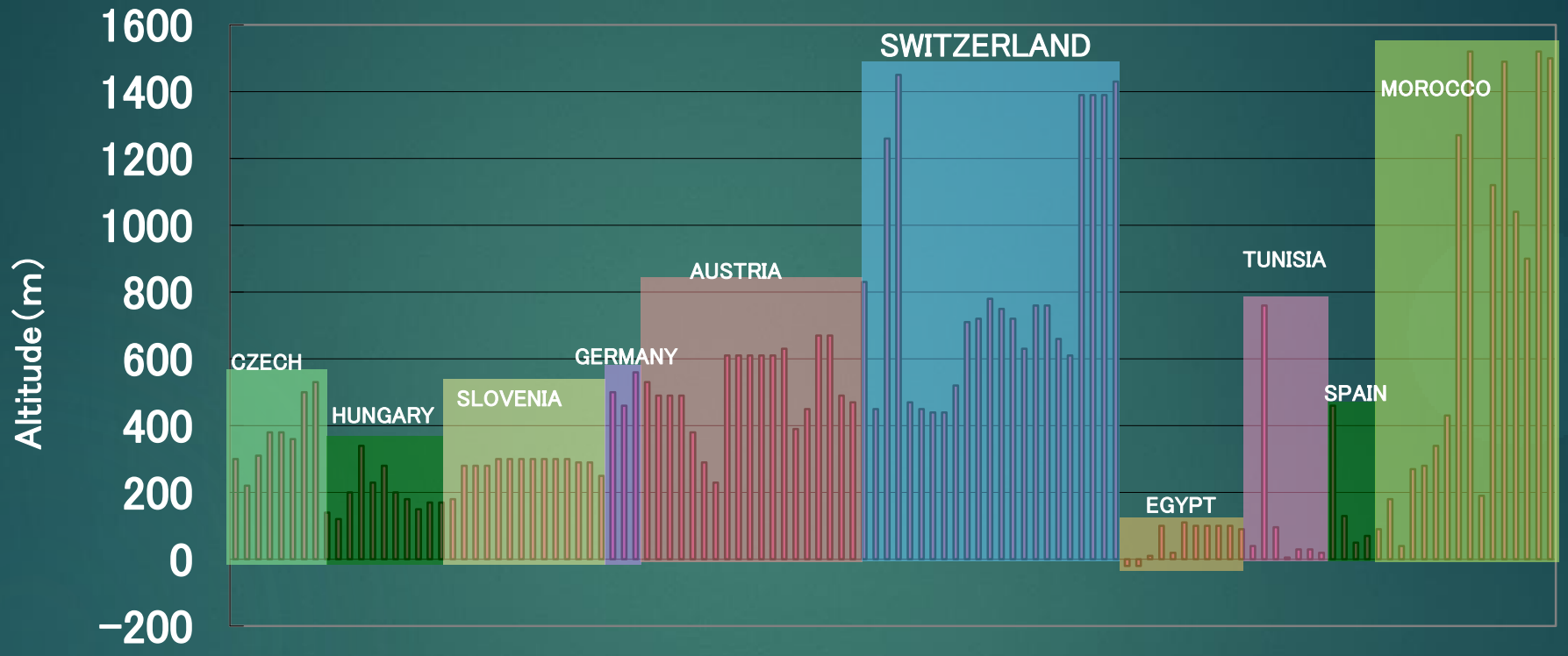


Fig.2. Altitude of the 116 accessions in North Africa and Central Europe

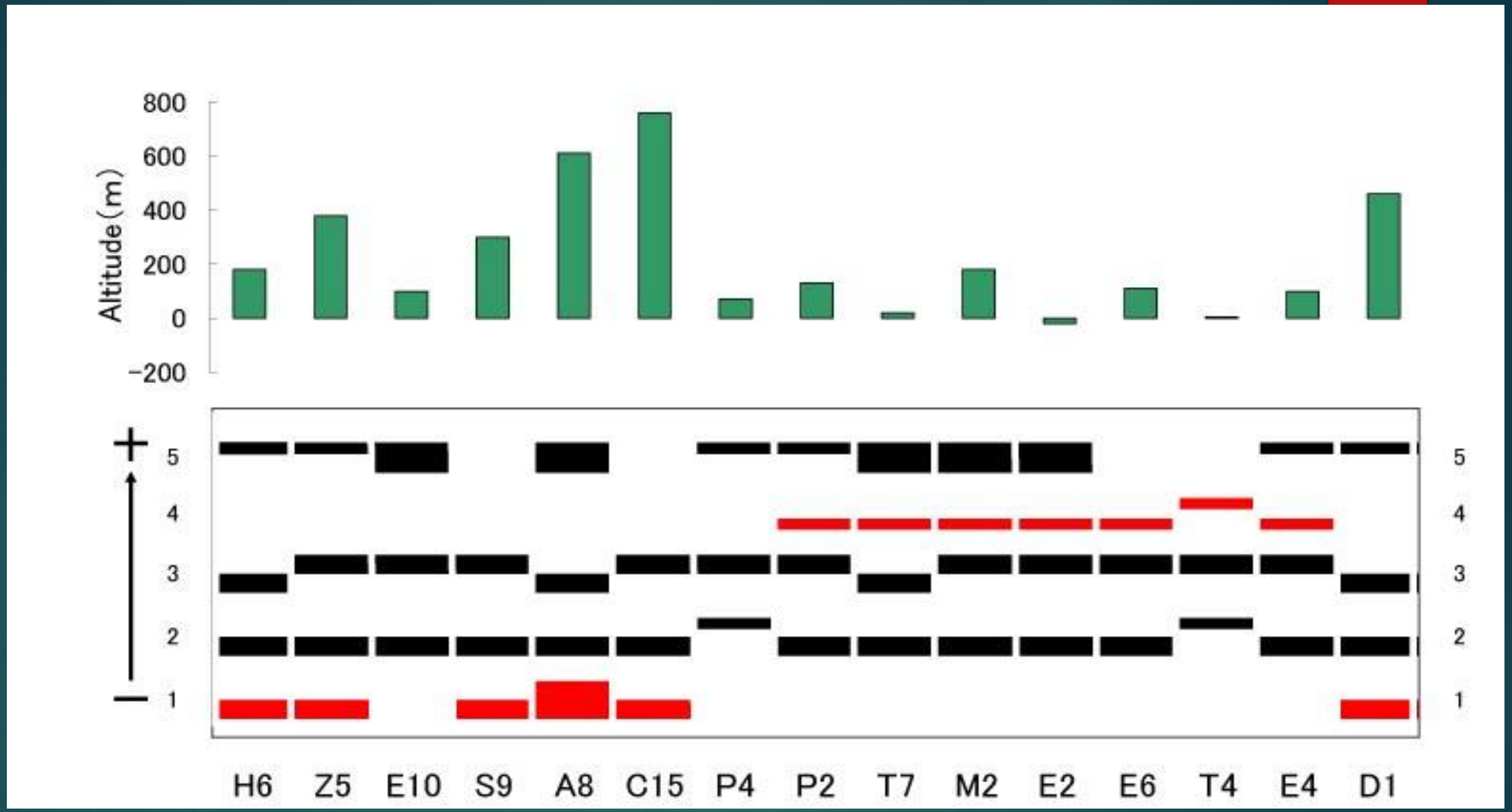


Fig.11. Correlation between ATP banding patterns and the altitudes of accessions.

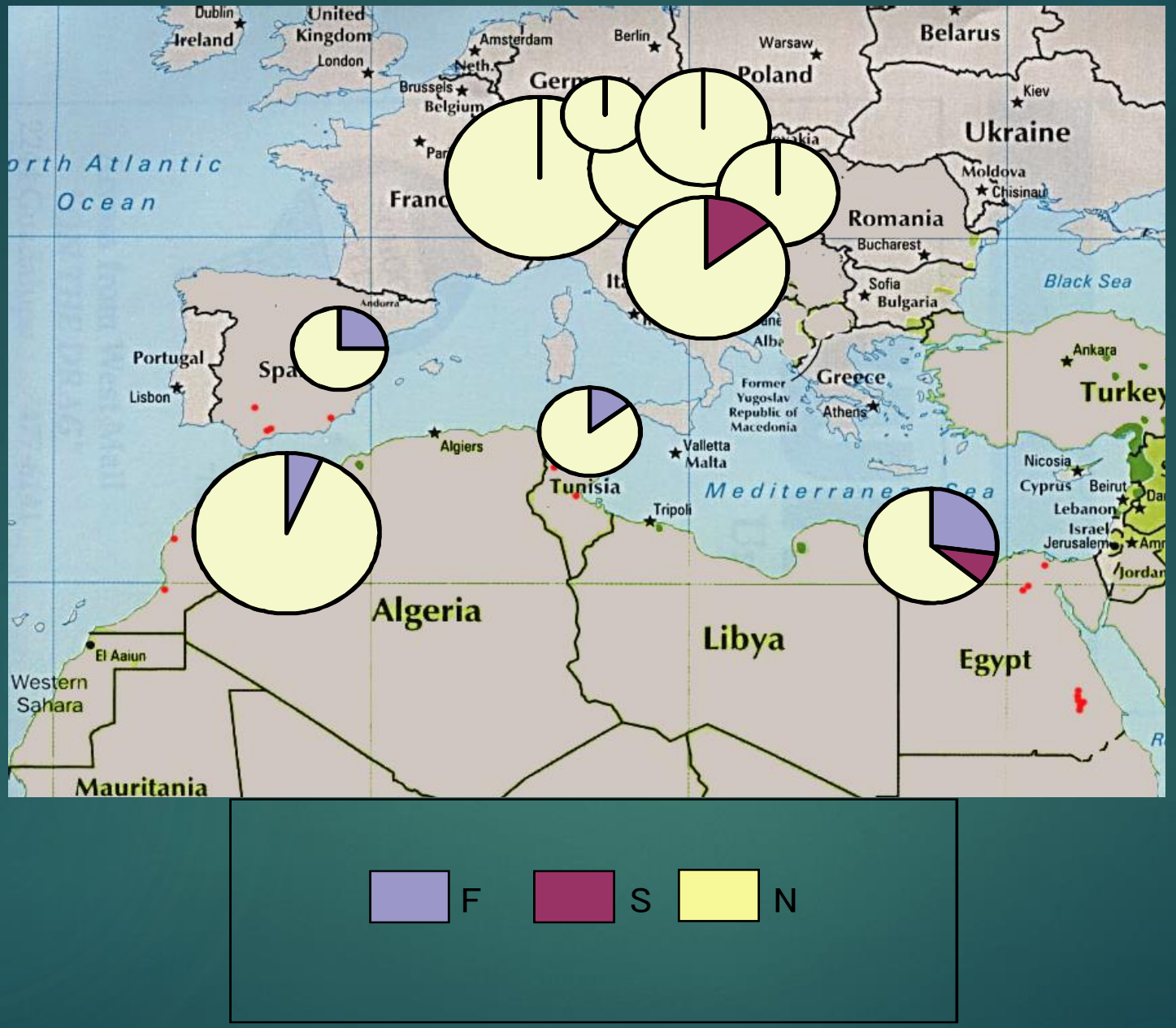


Fig. 12 Distribution of ATP-4 allele at the ATP locus of common oat accessions along the Mediterranean coast.

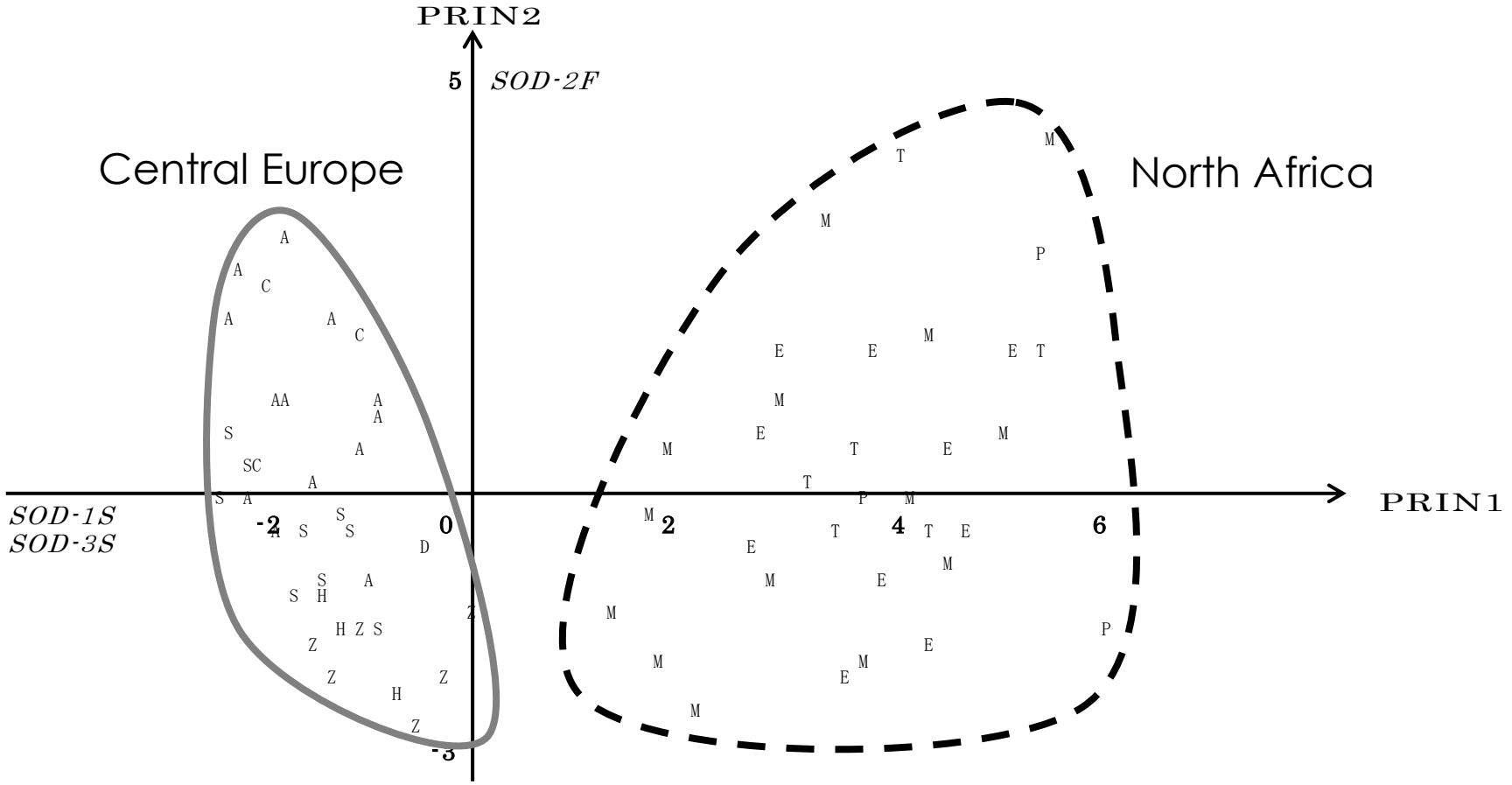


Fig.13. Principal component analysis for frequency of 24 isozyme alleles on the Mediterranean Coast oats.

Z:CZECH H:HUNGARY S:SLOVENIA D:GERMAN A:AUSTRIA C:SWITAERLAND
E:EGYPT T:TUNISIA P:SPAIN M:MOROCCO

Conclusion 2

- PCP analysis was conducted using morphological traits and isozyme allelic frequencies for clarifying the relationship among oat accessions in the North African, Central European, and Mediterranean coastal regions.
- The difference in isozyme allelic frequency between North African and Central European accessions indicated that oat varieties of both countries developed separately along the Mediterranean coast.