

Principal Component Analysis (PCA) and Multi-Dimensional Scaling (MDS)

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- **PCA and MDS techniques are ways to visualize this multi-dimensional data in 2D**

● PCA:

- Find the vector through the data that explains the most variance. This is the first principal component

- Find the vector that explains the most remaining variance. This is the second principal component.

- repeat...

● MDS

- Project from multiple dimensions onto 1 or 2 dimensions in a way that preserves distances present in multi-dimensional space

- (Board examples)

- (3D example)

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population structure

- Project SNPs in reduced dimensional space.
- Clumps of individuals represent population structure

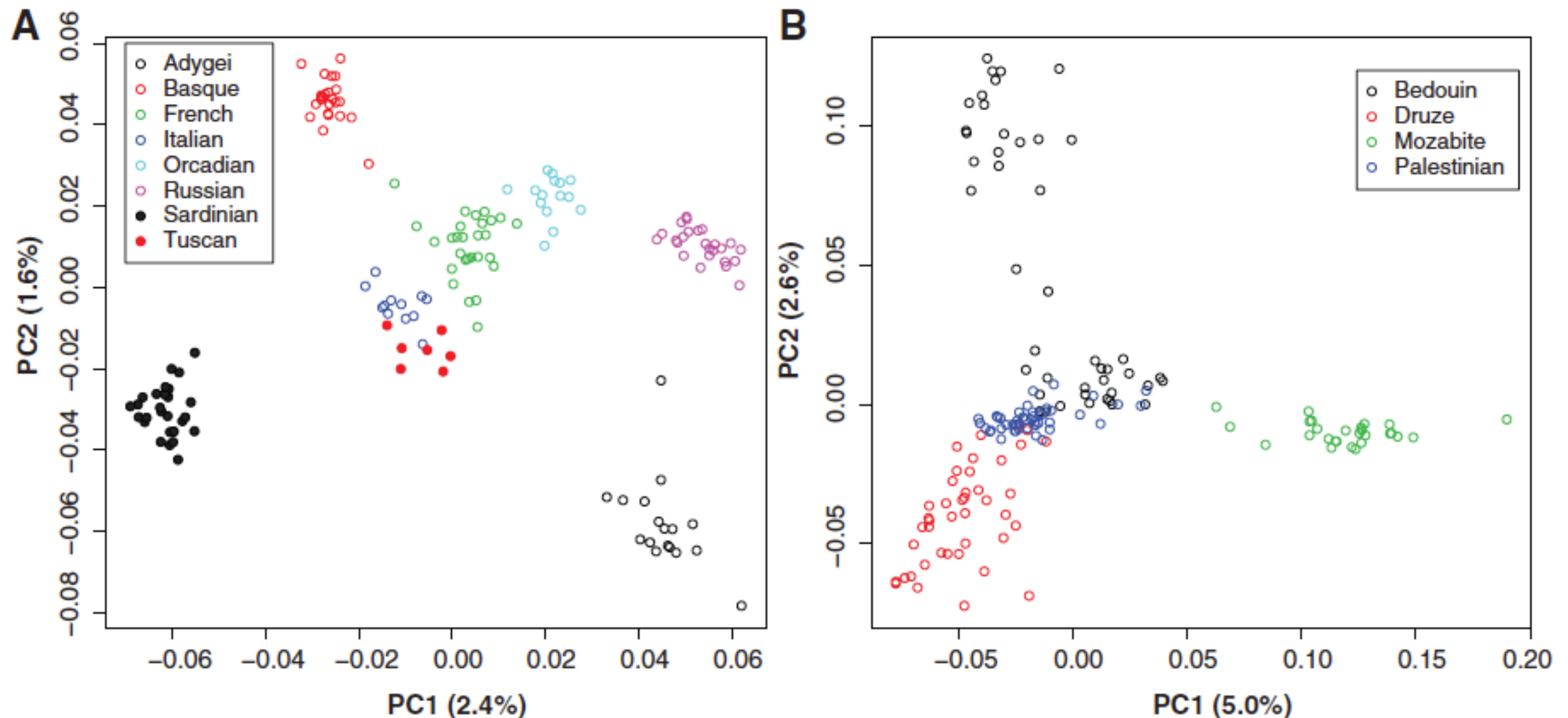


Fig. 2. Fine-scale population structure principal component analyses in two geographic regions, using all autosomal SNPs. **(A)** Europe. **(B)** The Middle East.