

**Supporting Information – Appendix S1.** Geographic information collected for each locality, and local and broad scale predictors considered in the analyses. n/a= not applicable.

Mammola *et al.* Disentangling the contribution of local versus broad scale environmental drivers of continental beta diversity patterns in subterranean spider communities.

Variable name	Description	Type of variable	Analyzed	Reason for exclusion
Locality name	Name of the cave/subterranean locality	Geographic descriptor	n/a	n/a
Cadaster code	Speleological cadastre number of the cave, if available	Geographic descriptor	n/a	n/a
Toponym	Geographic information about the locality (e.g. name of the city, hamlet, mountain massif in which the locality occur)	Geographic descriptor	n/a	n/a
x	Longitude in WSG84 decimal degrees	Geographic descriptor	n/a	n/a
y	Latitude in WSG84 decimal degrees	Geographic descriptor	n/a	n/a
Approximation of coordinates	Error associated with the x and y coordinates	Geographic descriptor	n/a	n/a
Cave development	Total development of the cave in meters	Local scale predictor	yes	–
Elevation	Altitude of the main cave entrance in meters	Local scale predictor	no	Collinear with mean annual temperature
Prevalent drop	Total positive minus total negative drop	Local scale predictor	yes	–
N° of entrances	The number of known entrances	Local scale predictor	yes	–
Main entrance size	A numeric estimation (i.e. base x height) of the dimension of the main entrance in meters	Local scale predictor	yes	–
Entrance habitat	Categorical: either forest, shrubs, grass, rocky, urbanized, agricultural	Local scale predictor	no	Collinear with mean annual temperature
Presence of a subterranean river	Categorical: if the cave is active (yes) or not active (no). An active cave is a cave which has a stream flowing in it.	Local scale predictor	no	Unbalance between the levels of the factor
Type of cave	Categorical: either karst (karst caves, doline, etc.), tectonic (talus caves, cracks, faults, etc.), volcanic (volcanic caves, lava tubes, etc.), ice (ice caves), ialine (ialine caves), artificial (e.g. mine, mineshafts, military bunkers, railways, subterranean blockhouses, cellars, etc.)	Local scale predictor	no	Collinear with Karst area and unbalance between the levels of the factor
Geological substrate	Categorical: The lithotype/geological substrate of the cave	Local scale predictor	no	Collinear with Karst area and unbalance between the levels of the factor
Touristic use	Categorical: if the cave is open to general tourists (yes) or not (no)	Local scale predictor	no	Unbalance between the levels of the factor
Geographic distance	Geographic distance between sites, calculated using the x and y coordinates	Broad scale predictor	yes	–
Karst area	Area of the karst patch in which the cave occurs in square kilometers	Broad scale predictor	yes	–
Cumulative precipitation	Sum of annual precipitations in millimeters	Broad scale predictor	yes	–
Distance from the LGM glacier	Distance from the nearest last glacial maximum (LGM) glacier margin	Broad scale predictor	yes	–
Mean annual temperature	Mean annual temperature in decimal degrees	Broad scale predictor	yes	–
Annual range of temperature	Annual range of temperature in decimal degrees	Broad scale predictor	yes	–
Solar radiation	Solar radiation at the surface ( $\text{kJ m}^{-2} \text{day}^{-1}$ )	Broad scale predictor	no	Collinear with mean annual temperature