Supplementary Materials

Table S1. Output of K-means clustering analysis of the Upland and Lowland river types based on the environmental variables performed in SPSS.

Cluster Membership			
Case number	Site Id	Cluster	Distance
1	CO1	1	136.961
2	CO2	1	105.348
3	CO3	1	31.619
4	SE1	2	413.491
5	SE2	2	417.849
6	SE3	2	417.123
7	TE1	2	402.765
8	TE2	2	415.496
9	TE3	2	429.534

Table S2. Data on the Stressor variables for each sampling site surveyed in the study according to different disturbance groups, rivers and river types.

River type	Disturbance group	River	Site	Stressor variables					
				Riparian			Land use		
				Riparian vegetation cover (%)	Average width of riparian cover (m)		Urban (%)	Cropland and intensive grassland (%)	Shrublands and natural woodlands (%)
Upland	Disturbed	Ter	TE1	20.18	50.79		9.97	55.03	27.48
			TE2	37.80	90.75		1.92	12.07	63.61
		Segre	SE1	35.92	70.32		5.54	60.09	22.81
			SE2	41.09	76.10		0.24	25.67	61.88
	Less disturbed	Ter	TE3	57.03	98.77		0	2.10	79.26
		Segre	SE3	49.22	161.99		0	37.86	56.74
Lowland	Disturbed	Congost	CO1	9.85	39.17		28.68	33.17	31.11
	Less disturbed		CO2	31.38	60.26		28.02	16.52	47.04
			CO3	31.83	64.69		10.38	42.35	37.49

Table S3. Output of K-means clustering analysis of the Disturbed and Less disturbed sites of Upland type based on the pressure variables (stressors) performed in SPSS.

Cluster Membership			
Case number	Site Id	Cluster	Distance
1	SE1	1	30.561
2	SE2	1	23.818
3	SE3	2	38.222
4	TE1	1	34.903
5	TE2	1	38.011
6	TE3	2	38.222

Table S4. Output of K-means clustering analysis of the Disturbed and Less disturbed sites of Lowland type based on the pressure variables (stressors) performed in SPSS.

Cluster Membership			
Case number	Site Id	Cluster	Distance
1	CO1	1	0
2	CO2	2	16.503
3	CO3	2	16.503

Table S5. Functional traits used in the study.

Functional traits	Definition	Ant species	References
Ecological			
Arboreal species	Species that nest in trees and/or are related to vegetation cover	*C. scutellaris, D. quadripunctatus, L. emarginatus, T. nylanderi*	[79]
Open-habitat species	Species that occur preferably in open habitats	*A. senilis, C. cruentatus, C. sylvaticus, F. cunicularia, H. eduardi, L. alienus, L. emarginatus, L. niger, M. barbarus, M. structor, M. schencki, M. specioides, M. spinosior, T. madeirense*	[69]
Closed-habitat species	Species that occur preferably in closed habitats	*A. subterranea, D. quadripunctatus, M. rubra, T. nylanderi*	[69,80]
Cold climate specialists	Species specialized in cold climates	*D. quadripunctatus, L. alienus, L. emarginatus, L. niger*	[55]
Hot climate specialists	Species specialized in hot climates	*C. cruentatus, C. sylvaticus, M. barbarus, M. structor*	[55]
Cryptics	Species with specific niche requirements and cryptic habitats	*A. subterranea, T. nylanderi*	[55]
Life-history			
Diet			
Seed harvesters	Species that collect seeds as part of their diet	*A. senilis, M. barbarus, M. structor*	[67-68, 79,81-82]
Sugar feeders	Species that feed on sugary exudates, such as honeydew	*C. cruentatus, C. sylvaticus, C. scutellaris, D. quadripunctatus, F. cunicularia, L. alienus, L. emarginatus, L. niger, M. rubra, M. schencki, M. specioides, P. pygmaea, T. madeirense, T. nylanderi*	[67-68, 79,81-82]
Opportunists	Species that take advantage of a wide range of resources	*A. senilis, F. cunicularia, T. madeirense, T. caespitum*	[55,83]
Generalists	Species that feed on everything from plant material, sugars and dead arthropods	*C. scutellaris, M. rubra, M. schencki, M. specioides, M. spinosior, P. pallidula, P. pygmaea*	[55]
Specialist predators	Species specialized in preying on arthropods	*H. eduardi*	[55]
Behavioral			
Dominants	Species that are at the top of dominance hierarchies	*C. cruentatus, C. sylvaticus, C. scutellaris, L. alienus, L. emarginatus, L. niger, M. barbarus, M. rubra, M. specioides, M. spinosior, P. pallidula, T. madeirense, T. caespitum*	[67,78, 84-85]
Diurnal species	Species with diurnal foraging habits	*A. senilis, A. subterranea, C. scutellaris, D. quadripunctatus, F. cunicularia, L. alienus, M. barbarus, M. structor, M. rubra, M. specioides, M. spinosior, P. pygmaea, T. madeirense, T. nylanderi, T. caespitum*	[79,84,86-87]
Nocturnal/ crepuscular species	Species with nocturnal or crepuscular foraging habits	*C. cruentatus, C. sylvaticus, L. emarginatus, L. niger, M. schencki, P. pallidula*	[67-68,79,81,84,86-89]
Morphological			

Larger ants	Species that measure in average more than 4 mm of body length	*A. senilis, A. subterranea, C. cruentatus, C. scutellaris, F. cunicularia, M. barbarus, M. structor, M. rubra, M. schencki, M. specioides, M. spinosior*	[69]

Table S6. Ant potential metrics tested in the present work.

Ant candidate metrics	Calculation (units)
Ant foraging activity	Number of worker individuals (no.)
Observed species richness	Number of observed ant species (no.)
Dominants	[Number of dominant species/ Observed species richness] x 100 (%)
Seed harvesters	[Number of dominant species/ Observed species richness] x 100 (%)
Sugar feeders	[Number of seed harvesters species/ Observed species richness] x 100 (%)
Arboreal species	[Number of arboreal species/ Observed species richness] x 100 (%)
Open-habitat species	[Number of open-habitat species/ Observed species richness] x 100 (%)
Closed-habitat species	[Number of closed-habitat species/ Observed species richness] x 100 (%)
Larger ants	[Number of ant species larger than 4 mm in average of body length/ Observed species richness] x 100 (%)
Diurnal species	[Number of diurnal species/ Observed species richness] x 100 (%)
Nocturnal/ crepuscular species	[Number of nocturnal or crepuscular species/ Observed species richness] x 100 (%)
Specialist predators (SP)	[Number of specialist predator species/ Observed species richness] x 100 (%)
Cold climate specialist (CCS)	[Number of cold climate specialist species/ Observed species richness] x 100 (%)
Hot climate specialist (HCS)	[Number of hot climate specialist species/ Observed species richness] x 100 (%)
Cryptics (C)	[Number of cryptic species/ Observed species richness] x 100 (%)
Opportunists (O)	[Number of opportunist species/ Observed species richness] x 100 (%)
Generalists (G)	[Number of generalist species/ Observed species richness] x 100 (%)
Specialist predators + Cryptics	[Number of specialist predator and cryptic species/ Observed species richness] x 100 (%)
Opportunists + Generalists	[Number of opportunist and generalist species/ Observed species richness] x 100 (%)
Functional richness	[Number of functional groups (SP, CCS, HCS, C, O, G)/ Total functional groups (SP, CCS, HCS, C, O, G)] x 100 (%)
Aphaenogaster senilis foraging activity	Number of *A. senilis* worker individuals recorded/ total number of worker individuals (no.)
Aphaenogaster subterranea foraging activity	Number of *A. subterranea* worker individuals recorded/ total number of worker individuals (no.)
Camponotus cruentatus foraging activity	Number of *C. cruentatus* worker individuals recorded/ total number of worker individuals (no.)
Camponotus sylvaticus foraging activity	Number of *C. sylvaticus* worker individuals recorded/ total number of worker individuals (no.)
Crematogaster scutellaris foraging activity	Number of *C. scutellaris* worker individuals recorded/ total number of worker individuals (no.)
Dolichoderus quadripunctatus foraging activity	Number of *D. quadripunctatus* worker individuals recorded/ total number of worker individuals (no.)
Formica cunicularia foraging activity	Number of *F. cunicularia* worker individuals recorded/ total number of worker individuals (no.)
Hypoponera eduardi foraging activity	Number of *H. eduardi* worker individuals recorded/ total number of worker individuals (no.)
Lasius alienus foraging activity	Number of *L. alienus* worker individuals recorded/ total number of worker individuals (no.)
Lasius emarginatus foraging activity	Number of *L. emarginatus* worker individuals recorded/ total number of worker individuals (no.)
Lasius niger foraging activity	Number of *L. niger* worker individuals recorded/ total number of worker individuals (no.)
Messor barbarus foraging activity	Number of *M. barbarus* worker individuals recorded/ total number of worker individuals (no.)
Messor structor foraging activity	Number of *M. structor* worker individuals recorded/ total number of worker individuals (no.)
Myrmica rubra foraging activity	Number of *M. rubra* worker individuals recorded/ total number of worker individuals (no.)
Myrmica shencki foraging activity	Number of *M. shencki* worker individuals recorded/ total number of worker individuals (no.)
Myrmica specioides foraging activity	Number of *M. specioides* worker individuals recorded/ total number of worker individuals (no.)
Myrmica spinosior foraging activity	Number of *M. spinosior* worker individuals recorded/ total number of worker individuals (no.)
Pheidole pallidula foraging activity	Number of *P. pallidula* worker individuals recorded/ total number of worker individuals (no.)
Plagiolepis pygmaea foraging activity	Number of *P. pygmaea* worker individuals recorded/ total number of worker individuals (no.)
Tapinoma madeirense foraging activity	Number of *T. madeirense* worker individuals recorded/ total number of worker individuals (no.)
Temnothorax nylanderi foraging activity	Number of *T. nylanderi* worker individuals recorded/ total number of worker individuals (no.)
Tetramorium caespitum foraging activity	Number of *T. caespitum* worker individuals recorded/ total number of worker individuals (no.)

Table S7. Ant species recorded at the Catalonian river basins, with additional information on the overall frequency of occurrence (percentage of pitfalls at a site where a species was detected). The number of sites surveyed are shown.

Subfamily	Frequency of occurrence (%)			
	Upland type (N=6)		Lowland type (N=3)	
Ant species	Disturbed (N=4)	Less disturbed (N=2)	Disturbed (N=1)	Less disturbed (N=2)
Dolichoderinae				
Dolichoderus quadripunctatus	3			
Tapinoma madeirense	3			6
Formicinae				
Camponotus cruentatus				6
Camponotus sylvaticus			11	
Formica cunicularia	14			

	C1	C2	C3	C4	C5
Lasius alienus	6				
Lasius emarginatus					11
Lasius niger	25	39			17
Plagiolepis pygmaea				22	11
Myrmicinae					
Aphaenogaster senilis				100	39
Aphaenogaster subterranea					11
Crematogaster scutellaris					
Messor barbarus				22	
Messor structor					17
Myrmica rubra	39	94			6
Myrmica shencki	3				
Myrmica specioides	6				
Myrmica spinosior	6				
Pheidole pallidula					33
Temnothorax nylanderi		28			
Tetramorium caespitum	22			11	22
Ponerinae					
Hypoponera eduardi		6			6