

Ecography

ECOG-00155

Arnan, X., Cerdá, X., Rodrigo, A. and Retana, J. 2013.
Response of ant functional composition to fire. –
Ecography 36: xxx–xxx.

Supplementary material

Appendix 1. Characterization of plant structure in unburned and burned areas of the different vegetation types that have been considered in this study. Values correspond to the mean±SE. Abbreviations: Ab%UB-Ab%B, difference between the abundance values (%) of the main tree or shrub species found in the unburned and burned areas.

Vegetation type	A%UB – Ab%B	% herbaceous cover		% shrub cover		% tree cover	
		Unburned	Burned	Unburned	Burned	Unburned	Burned
Shrublands dominated by seeders	7.9±8.2	77.3±1.9	79.3±5.2	54.5±9.2	40.4±10.2	3.5±1.7	0.6±0.2
Shrublands dominated by resprouters	8.5±7.4	62.9±20.6	73.5±15.1	61.4±9.1	51.5±18.8	20.3±20.1	4.5±4.2
<i>P. halepensis</i> forests with tree understory	52.1±10.9	67.7±3.7	70.2±16.4	58.5±4.2	60±1.3	76.2±9.9	0.1±0.1
<i>P. halepensis</i> forests without tree understory	30.9±11.4	62.0±15.2	75.9±8.5	42.3±10.6	49.5±13.1	61.4±18.9	0.3±0.2
<i>P. nigra</i> forests	65.2±6.6	77.9±10.5	77.4±2.7	42.5±2.4	41.1±7.3	79.7±1.4	1.2±0.2
<i>Q. ilex</i> forests	56.4±12.5	44.0±12.5	63.5±7.9	24±9.7	59.8±19.6	88.7±9.4	12.5±6.2
<i>Q. suber</i> forests	16.2±4.2	45.2±8.5	40.5±5.4	45.8±5.0	80.0±1.5	75.3±14.0	37.4±8.3
<i>F. sylvatica</i> forest	91.4	22.0±4.9	64.8±3.0	11.0±4.8	79.8±5.5	94.8±3.2	4.4±1.1

Appendix 2. A list describing the literature sources and online databases from where the functional trait data were obtained.

Colony size

AntBlog 2011. <http://www.antblog.co.uk/>

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Espadaler, X., Retana, J. and Cerdá, X. 1990. The caste system of *Camponotus foreli* Emery (Hymenoptera: Formicidae). *Sociobiology* 17: 299-312.

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Steiner, F.M., Schlick-Steiner, B.C., Konrad, H., Linksvayer, T.A., Quek, S.P., Christian, E., Stauffer, C. and Buschinger, A. 2006. Phylogeny and evolutionary history of queen polymorphic *Myrmecina* ants (Hymenoptera: Formicidae). *European Journal of Entomology* 103: 619-626.

Torossian, C. 1960. La biologie de *Dolichoderus quadripunctatus*. *Insectes Sociaux* 7: 383-391.

Torossian, C. 1967. Recherches sur la biologie et l'éthologie de *Dolichoderus quadripunctatus* (Hym. Form. Dolichoderidae). I. Étude des populations dans leur milieu naturel. *Insectes Sociaux* 14: 102-122.

World of ants 2011. <http://www.world-of-ants.com/>

Number of queens

Anan, X., Cerdá, X. and Retana, J. 2012. Distinctive life traits and distribution along environmental gradients of dominant and subordinate Mediterranean ant species. *Oecologia* 170: 489-500.

Bernard, F. 1968. Les fourmis d'Europe occidentale et septentrionale. Masson et Cie Éditeurs, Paris.

Boomsma, J.J., Brouwer, A.H. and van Loon, A.J. 1990. A new polygynous *Lasius* species (Hymenoptera: Formicidae) from Central Europe. II. Allozymatic confirmation of species status and social structure. *Insectes Sociaux* 37: 363-375.

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Keller, L. 1998. Queen lifespan and colony characteristics in ants and termites. *Insectes Sociaux* 45: 235-246.

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Zweden J.S. van, Dreier, S. and d'Etterre, P. 2009. Disentangling environmental and heritable nestmate recognition cues in a carpenter ant. Journal of Insect Physiology 55: 159–164

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Trontti, K., Aron, S. and Sundstrom, L. 2005. Inbreeding and kinship in the ant *Plagiolepis pygmaea*. Molecular Ecology 14: 2007–2015

Worker size and worker polymorphism

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Diurnality

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Retana, J., Cerdá, X., Cavia, V., Arnal, J. and Company, D. 1989. La comunidad de hormigas del Boalar de Jaca (Huesca). *Lucas Mallada* 1: 133-150.

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Diet

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Retana, J., Cerdá, X., Cavia, V., Arnal, J. and Company, D. 1989. La comunidad de hormigas del Boalar de Jaca (Huesca). *Lucas Mallada* 1: 133-150.

Ratio queen/worker size

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Cagniant, H. and Espadaler, X. 1997. Les *Leptothorax*, *Epimyрма* et *Chalepoxenus* du Maroc (Hymenoptera: Formicidae). Clé et catalogue des espèces. *Annales de la Société Entomologique de France* 33: 259-284.

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Colony foundation type

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Appendix 3. The Spearman rank correlation coefficients between the trait average and dissimilarity of each functional trait and for both the abundance and the occurrence datasets. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; in bold, $r > 0.7$.

Trait	Data type	Abundance	Occurrence
Colony size	Quantitative	-0.46**	-0.21
Number of queens	Ordinal	0.90***	0.95***
Number of nests	Ordinal	0.97***	0.99***
Worker size	Quantitative	0.67***	0.77***
Worker polymorphism	Quantitative	0.09	0.38*
Diurnality	Binary	0.91***	1.00***
Dominance	Binary	0.69***	0.92***
Diet – Seed-eating	Fuzzy-coded	0.94***	0.92***
Diet – Insect-eating	Fuzzy-coded	0.21	-0.37*
Diet – Liquid food-eating	Fuzzy-coded	-0.55***	-0.27*
Ratio queen/worker size	Quantitative	0.10	-0.00
Colony foundation type	Ordinal	-0.90***	-1.00***

Appendix 6. Spearman rank correlations coefficients (r) between pairs of measurements of trait community composition (either trait average or dissimilarity) depending on the consideration of abundance or occurrence data, and all species (community traits), only dominant species (Dominant traits) and only rare species (Rare traits). Significant correlations with $r > 0.7$ are in bold. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$. Abbreviations: CS, colony size; NQ, number of queens; NN, number of nests; WS, worker size; WP, worker polymorphism; Diurn., Diurnality; Dom., dominance; pSeeds, proportion of seeds in diet; pInsects, proportion of insects in diet; pLF, proportion of liquid food in diet; RQWS, Ratio queen /worker size; CFT, colony foundation type; SS, Social structure; RE, Resource exploitation; Rep., Reproduction.

Social structure traits

SS-FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.91***		-0.03	
All-occurrence		-0.16		0.94***
Dominants-abundance			-0.21	
Dominants-occurrence				-0.10

CS-average	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.97***		0.20	
All-occurrence		0.36**		0.86***
Dominants-abundance			0.07	
Dominants-occurrence				0.03

CS-FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.73***		0.02	
All-occurrence		0.36*		0.56***
Dominants-abundance			-0.15	
Dominants-occurrence				-0.05

NQ-FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.90***		0.20	
All-occurrence		0.14		0.88***
Dominants-abundance			-0.01	
Dominants-occurrence				-0.27

NN-average	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.93***		0.01	
All-occurrence		0.20		0.91***
Dominants-abundance			-0.21	
Dominants-occurrence				-0.11

Resource exploitation traits

RE-FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.97***		0.44**	
All-occurrence		0.94***		0.86**
Dominants-abundance			0.44**	
Dominants-occurrence				0.74***

WS-average	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.99***		0.32**	
All-occurrence		0.80***		0.75**
Dominants-abundance			0.31*	
Dominants-occurrence				0.28

WS-FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.99***		0.42**	
All-occurrence		0.87***		0.65**
Dominants-abundance	-		0.41**	
Dominants-occurrence		-		0.37*

WP-average	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.96***		0.50***	
All-occurrence		0.52***		0.81***
Dominants-abundance	-		0.35*	
Dominants-occurrence		-		0.22

WP-FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.94***		-0.01	
All-occurrence		0.69***		0.66***
Dominants-abundance	-		0.06	
Dominants-occurrence		-		0.48***

Diurn.-FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.99***		0.09	
All-occurrence		0.63***		0.83***
Dominants-abundance			0.07	
Dominants-occurrence				0.16

Dom.-FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.95***		0.09	
All-occurrence		-0.05		0.76***
Dominants-abundance			0.10	
Dominants-occurrence				0.31*

pSeeds - FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.98***		0.22	
All-occurrence		0.90***		0.55**
Dominants-abundance			0.15	
Dominants-occurrence				0.27

pInsects	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.99***		0.34*	
All-occurrence		0.57***		0.85***
Dominants-abundance			0.29	
Dominants-occurrence				0.11

pInsects - FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.97***		0.36*	
All-occurrence		0.84***		0.77***
Dominants-abundance			0.32*	
Dominants-occurrence				0.42**

pLF	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.99***		0.43**	
All-occurrence		0.64***		0.87***
Dominants-abundance			0.36*	
Dominants-occurrence				0.27

pLF - FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.98***		0.30*	
All-occurrence		0.68***		0.72***
Dominants-abundance			0.24	
Dominants-occurrence				0.18

Reproduction

Rep - FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.73***		0.41**	
All-occurrence		0.04		0.93***
Dominants-abundance			0.13	
Dominants-occurrence				-0.23

RQWS - average	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.95***		0.25	
All-occurrence		0.25		0.73***
Dominants-abundance			0.13	
Dominants-occurrence				-0.22

RQWS - FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.83***		-0.05	
All-occurrence		0.51***		0.59***
Dominants-abundance			0.15	
Dominants-occurrence				0.14

CFT - FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.76***		0.43**	
All-occurrence		0.12		0.97***
Dominants-abundance			0.07	
Dominants-occurrence				-0.06

Overall functional diversity

FD	Dominants-abundance	Dominants-occurrence	Rares-abundance	Rares-occurrence
All-abundance	0.95***		0.40**	
All-occurrence		0.79***		0.96***
Dominants-abundance			0.38*	
Dominants-occurrence				0.68***