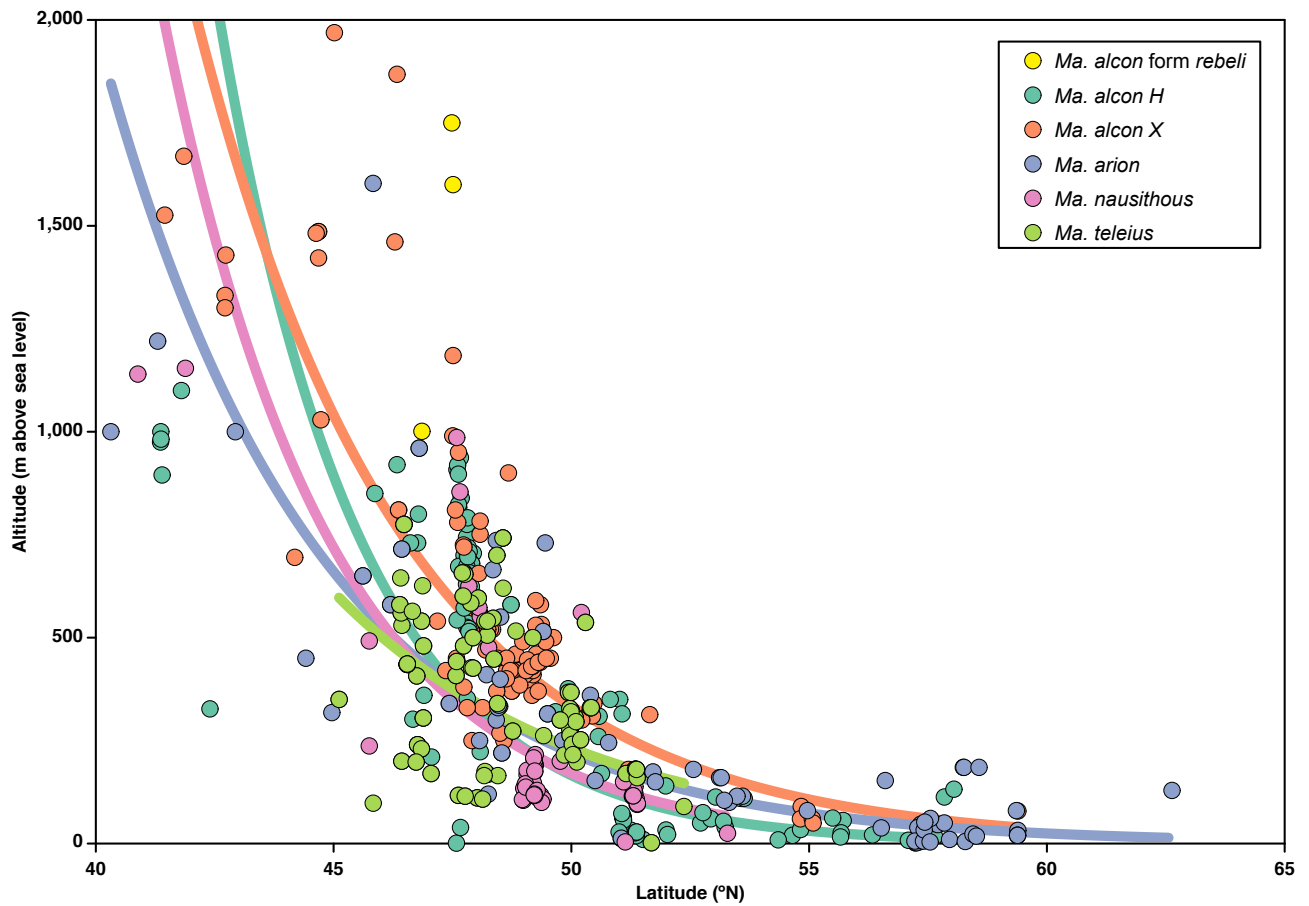
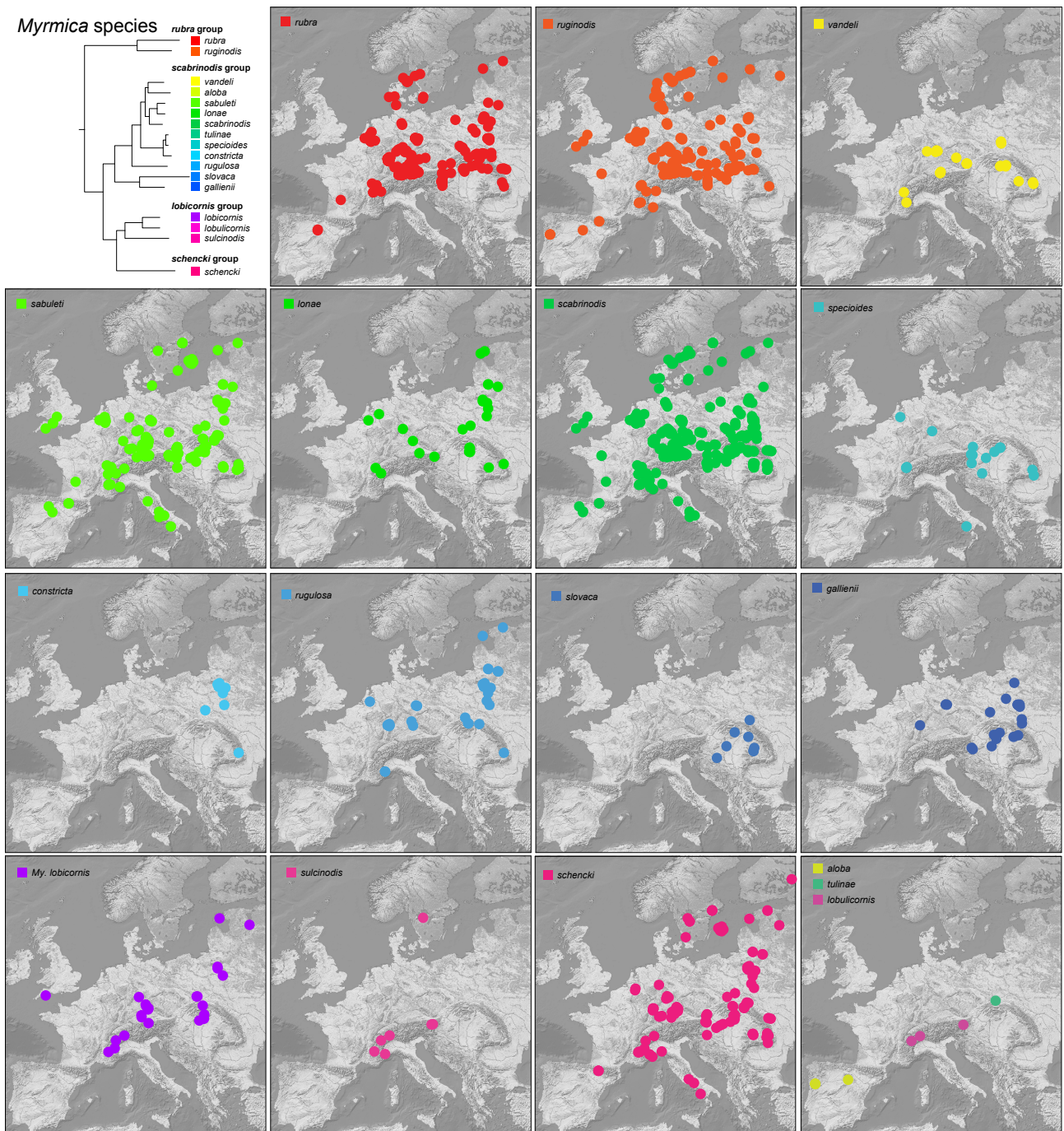


**Figure S1. Distribution of sampling sites from the database compared with the recent distribution of *Maculinea*.** Sites in our database supporting each of the five main divisions of *Maculinea* are shown in the left hand column, with the known European distribution as given in [1] in the central column, and the distribution from the LepiDiv web site (<http://www.ufz.de/european-butterflies/index.php?en=42605>) from December 2017 in the right hand column. Note that what we refer to as *Maculinea alcon X* was generally known as *Maculinea rebeli* in the past, but is not now considered a separate species[2-4], so only one distribution map is given by the LepiDiv site.

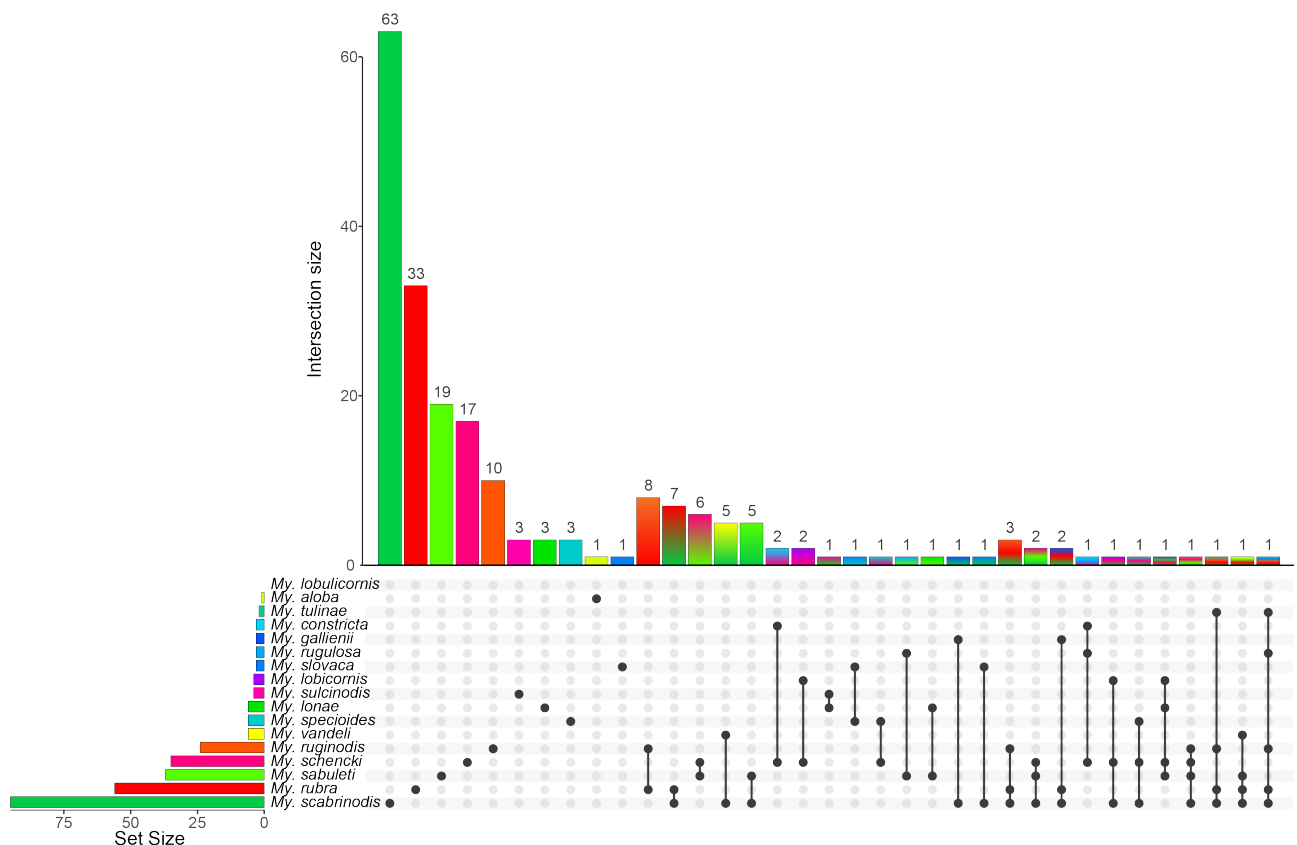


**Figure S2. Relationship between latitude and altitude for the *Maculinea* sample sites.** The known or estimated altitude of each sample site in our database is plotted against the latitude of the site. Points are coloured according to the *Maculinea* that each site supports. Fitted regression lines based on a linear relationship between latitude and the logarithm of altitude are shown in the same colours for all *Maculinea* except the putative *Maculinea alcon form rebeli*.



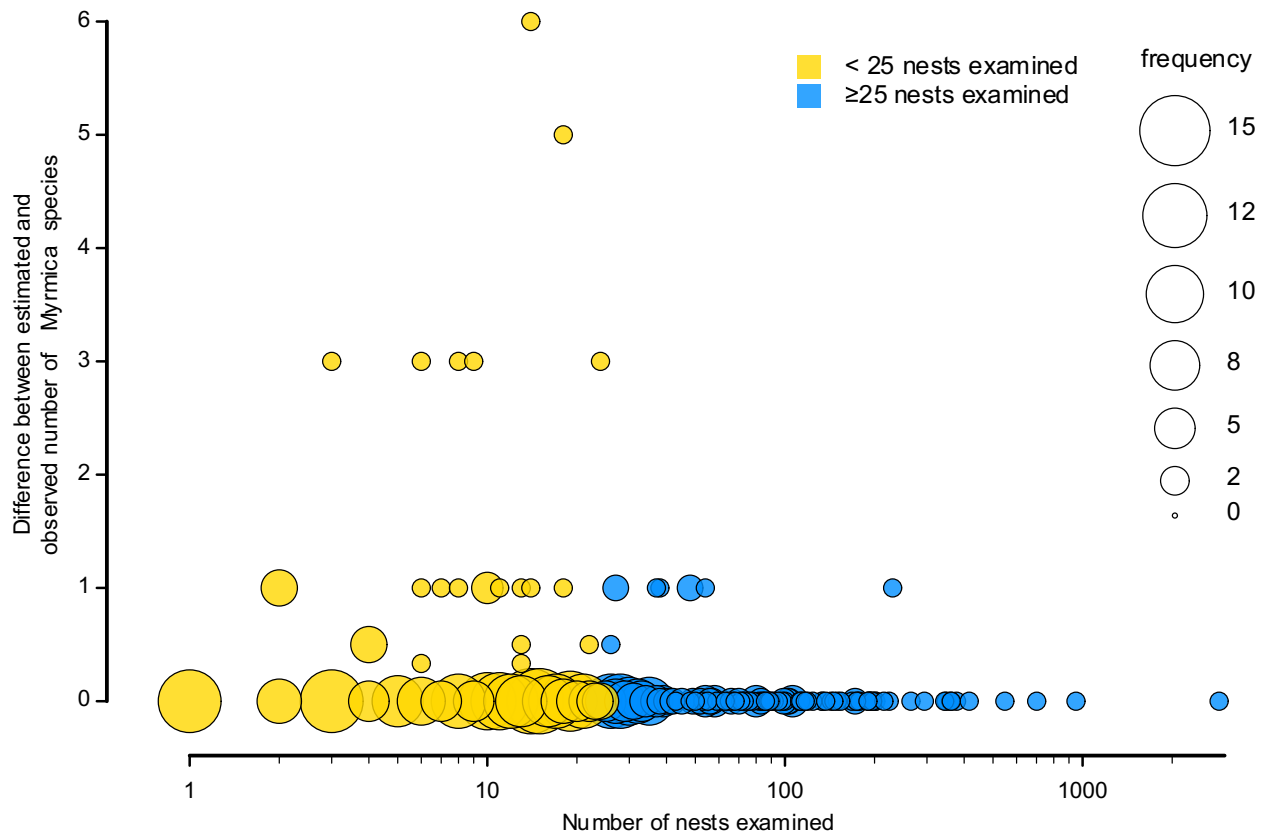


**Figure S3. Distribution of the seventeen species of *Myrmica* ant found on the *Maculinea* sampling sites across Europe.** The top left panel shows the inferred phylogenetic relationships between the seventeen *Myrmica* species found on *Maculinea* sites across Europe, based on [5]. The phylogenetic positions of *Myrmica* species not included in that study are inferred based on [6]. Species groups within the genus *Myrmica* follow [7], and species are colour-coded to represent their phylogenetic position. Each additional panel shows the distribution of a single *Myrmica* species on the *Maculinea* sample sites in our database, coloured according to the first panel, except the last panel where the distributions of three geographically restricted species are shown on the same map.



**Figure S4. Summary of the occurrence and co-occurrence of *Myrmica* hosts across the *Maculinea* sample sites.** UpSet [9] showing the intersecting sets of host *Myrmica* species across all *Maculinea* for our database. The set of observations is the combination of *Myrmica* species recorded as hosts (i.e. whose nests were found to contain overwintered larvae or pupae) for each *Maculinea* on each site. The first ten, coloured, vertical columns represent the sites on which *Maculinea* were found in the nests of a single *Myrmica* species, followed by those sites at which more than one species of *Myrmica* was recorded as a host for the same *Maculinea*. Note that the sum of the total number of intersections exceeds the total number of sites on which host ants were recorded, since each *Maculinea* was treated separately for sites on which several *Maculinea* co-occurred (manuscript figure 1). *Myrmica lobulicornis* was not recorded as a host ant on any site.





**Figure S5. Bubble chart showing sampling adequacy of the *Myrmica* community on *Maculinea* sample sites as a function of the number of *Myrmica* nests examined.** The x-axis shows the number of nests examined (if baits were used to assess the *Myrmica* community, then it is assumed that each bait that attracted *Myrmica* workers represented a separate nest of that species). The y-axis shows the difference between the estimated richness of the *Myrmica* community based on the robust version of the Chao-1 statistic [8] and the observed community of *Myrmica* species. The area of each symbol is proportional to the logarithm of the number of sites that showed each combination of sample size and sampling adequacy. Above 24 nests examined (points coloured blue), the maximum difference between the estimated and observed *Myrmica* community is no more than a single species, and 95% of sites (189 out of 199) show complete agreement between estimated and observed *Myrmica* species richness. These are the sites that were subsequently used for the comparison of *Myrmica* communities.

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