APIMONDIA SCANDINAVIA 2025
SWEDEN | DENMARK | NORWAY

PP-552 [Pollination and Bee Flora]

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BIODLARNA

Unmanaged wild bees and managed honey bees do not share pollen resources: investigation on interspecific trophic competition in three National Parks

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INTRODUCTION

Clade Anthophila is in severe decline worldwide since several years[1]. In this context, expanding the knowledge of interspecific dynamics among bee species for a conservation action plan in protected areas aimed to counteract Apoidea decline is of fundamental importance.

National Parks play a pivotal role:
- Conservation of pollinators
- Promotion of typical products

METHODS

ITALY

2 SAMPLING SESSIONS:
Late summer and Autumn
1 h /session

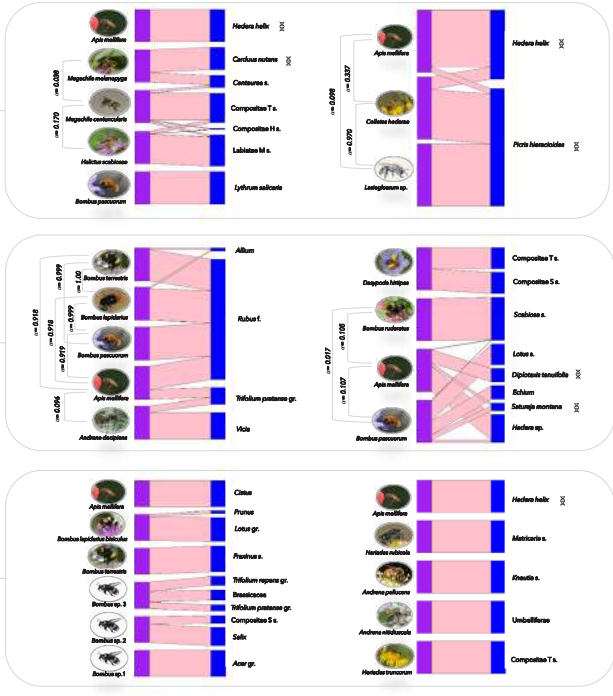
Pollen trap on one hive

5-10 individuals of wild bees

Pianka index[2]: niche overlap

$$\alpha jk = \frac{\sum_i^n Pij * Pik}{\sqrt{\sum_i^n Pij^2 \ \sum_i^n Pik^2}}$$

RESULTS



The pollen networks of bees sampled in the Foreste Casentinesi, Maiella and Abruzzo, Lazio and Molise National Parks in summer and in autumn, 2021. The lower bar width indicates the relative abundance (%) of pollen grains gathered per plant taxa across bee species (upper bar); (α= Pianka Index; s: shape; gr: group).
⋈ = plant species identified through DNA metabarcoding analysis

SCAN ME

CONCLUSION

Wild bee species are sustained by different pollen pastures from those of honey bees. The low sharing of resources could be due to the natural trend occurring in natural populations, where species tend to minimize competitive overlap by a niche differentiation or by a niche complementarity, as a result of a co-evolution between wild bees and managed honey bees. National Parks play fundamental role in the protection of animal and plant species and conservation plans should focus on evaluating honeybee densities towards less intensive, more traditional, and sustainable beekeeping and on habitats protection to promote survival and reproduction of wild bee populations.

DIPARTIMENTO DI SCIENZE VETERINARIE

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Unmanaged wild bees and managed honey bees do not share pollen resources: investigation on interspecific trophic competition in three Italian National Parks

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Clade Anthophila, which is fundamental for the maintenance of healthy ecosystems and for the contribution in providing economic benefits to human society, is in severe decline worldwide since several years. In this context, expanding the knowledge of interspecific dynamics occurring among bee species for a conservation action plan in protected areas aimed to counteract Apoidea decline is of fundamental importance. A modest body of literature reports that honey bee density and some beekeeping activities could negatively impact wild bee populations, mostly through competition for trophic resource. In this study the interspecific trophic competition was investigated trough the still little exploited approach of the palynological analysis combined with metabarcoding analysis of pollen gathered by both managed honey bees and unmanaged wild bees in three Italian national parks. Out of a total of 20 captured and identified wild bee species (for a total of 31 individuals), 13 are not reported in any checklist of the entomofauna of the national parks investigated in this study. Despite the small sample size, the entire trophic network was highly specialised (H2'=0.933) and results obtained in this investigation suggest that locally wild bee species are sustained by different pollen resources from those of honey bees. A weak sharing of resources only between honey bees and Bombus pascuorum and Bombus terrestris was found. In natural populations species tend to minimize competitive overlap by a niche differentiation or by a niche complementarity, as a result of a co-evolution between wild bees and managed honey bees. An alternative hypothesis supporting the presence of trophic repartitioning is that the pollen breakdown could be the consequence of a local ongoing interspecific trophic competition, which leads species to differentiate their diets. National parks play fundamental role in the protection of animal and plant species, and conservation plans should focus on evaluating honeybee densities towards less intensive, a more traditional and sustainable beekeeping and on habitats protection to promote survival and reproduction of wild bee populations.