



Plant diversity loss forces shift in ecological strategies for wild bees

Insights from historical time series at a country-wide scale

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Wild bee decline

- Intensification of agriculture and urbanization

↳ overall loss of biodiversity in the Belgian countryside including floral resources

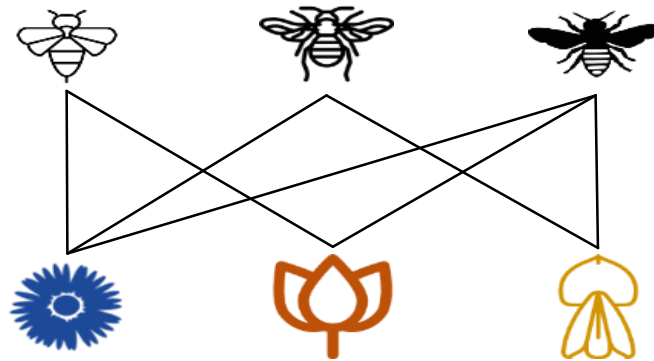
What are the impacts of a century of plant diversity loss on wild bee diversity and ecological strategies?



HANCE *et al.*, 2010; LECLERCQ *et al.*, 1980

Network analysis approach

- To investigate species composition, their interactions and dynamics over time
- To relate network patterns to ecological processes.



Schematic bipartite bee-plant interaction network.

Historical database

- Plant species visited at sampling time for ~ 50,000 identified specimens since 1900
- Three time periods => three bipartite binary networks

Network dimensions by historical period.

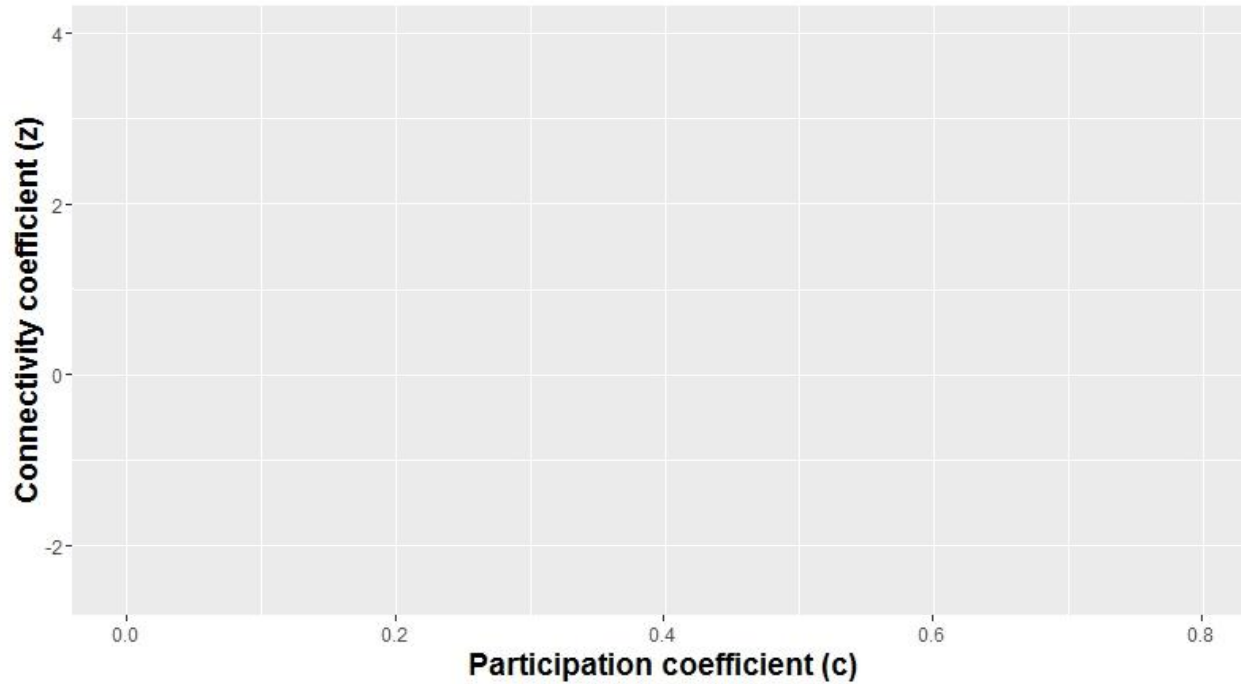
	< 1950	1950-1990	> 1990
Number of links	257	1181	967
Number of bee species	111	176	149
Number of plant species	123	384	248

- Indices to characterize the network topology (connectance, mean number of links, modularity, nestedness, H2fun, d2fun,...) and the ecological roles of bees (participation (c) and connectivity (z) coefficients).

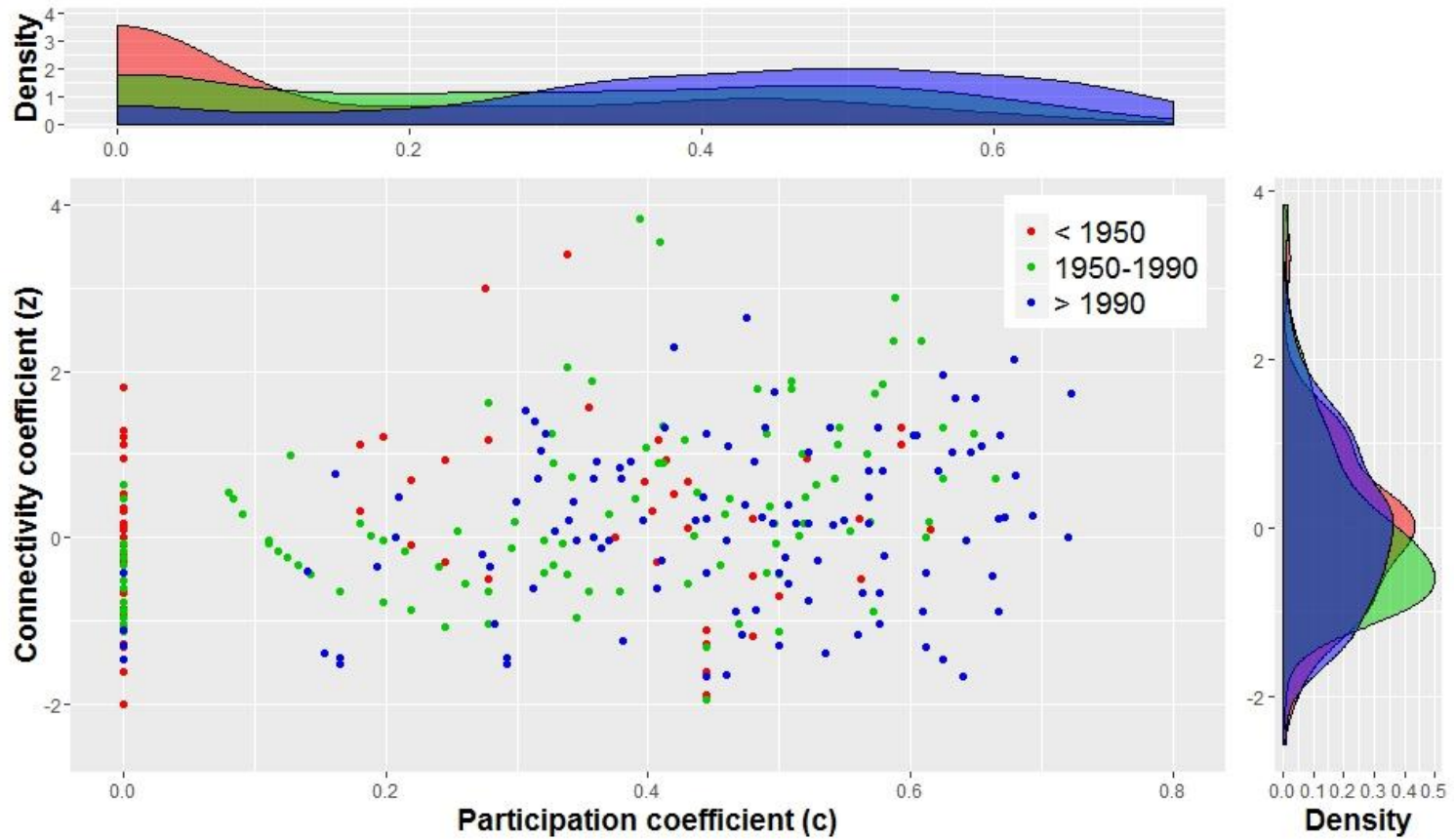
Towards a loss of bee species specialization

- Loss of very specialist bee species
- Shift to more generalist species

	< 1950	1950-1990	> 1990
Connectance	0.02	0.02	0.03
Mean number of links of bee species	2	7	7
Mean number of links of plant species	2	3	4
Nestedness	2.68	14.15	16.63
Modularity	0.66	0.33	0.31
Mean participation coefficient	0.18	0.27	0.44
Mean connectivity coefficient	0.00	0.00	0.00




GUIMERA & AMARAL, 2005; OLESEN *et al.*, 2007



- More generalists may led to more stability and resilience
- Interest of
 - compiling opportunistic naturalist databases
 - systematically informing the host plants on which species are observed.





Thank you for your attention

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