

MEDITERATRI project

– understanding the effect of pesticides on non-target invertebrates through trophic interactions in Mediterranean agriculture

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Background

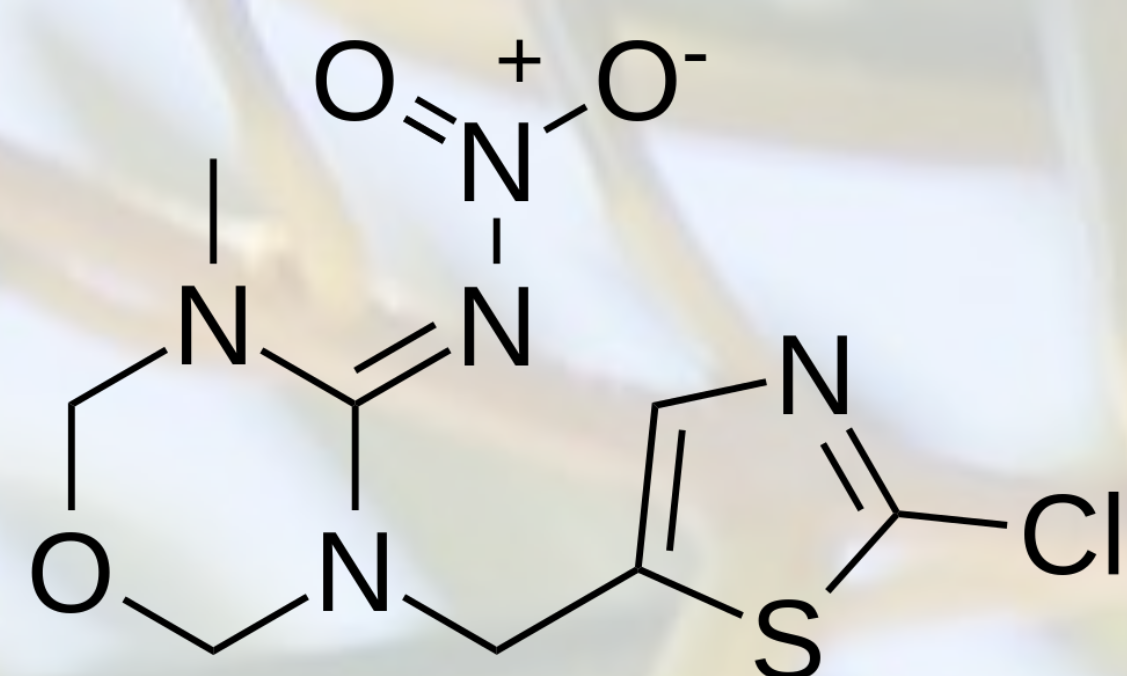


Figure 1. Chemical structure of thiamethoxam, neonicotinoid commonly used on some of the sampling sites

For the last twenty years, neonicotinoids have been the most used insecticides in the world and latest studies have shown the harmful effects on non-target organisms (insects, birds, earthworms etc.). On the other hand, copper (Cu) has a long history of plant protection, especially in Mediterranean agriculture (e.g. in vineyards) and still, its effect on beneficial organisms through trophic interactions and their role in ecosystem service have not been studied. Due to high biodiversity of terrestrial invertebrates, as well as complex trophic interactions, it is difficult to predict all possible negative effects of applied pesticides on non-target organism, e.g. on species useful in the biological control such as predatory invertebrates (e.g. ground beetles, spiders and centipedes).



Aims

- to ascertain how the application of used pesticides affects beneficial organisms and their service to healthy ecosystem (in pest control, soil fertility etc.)

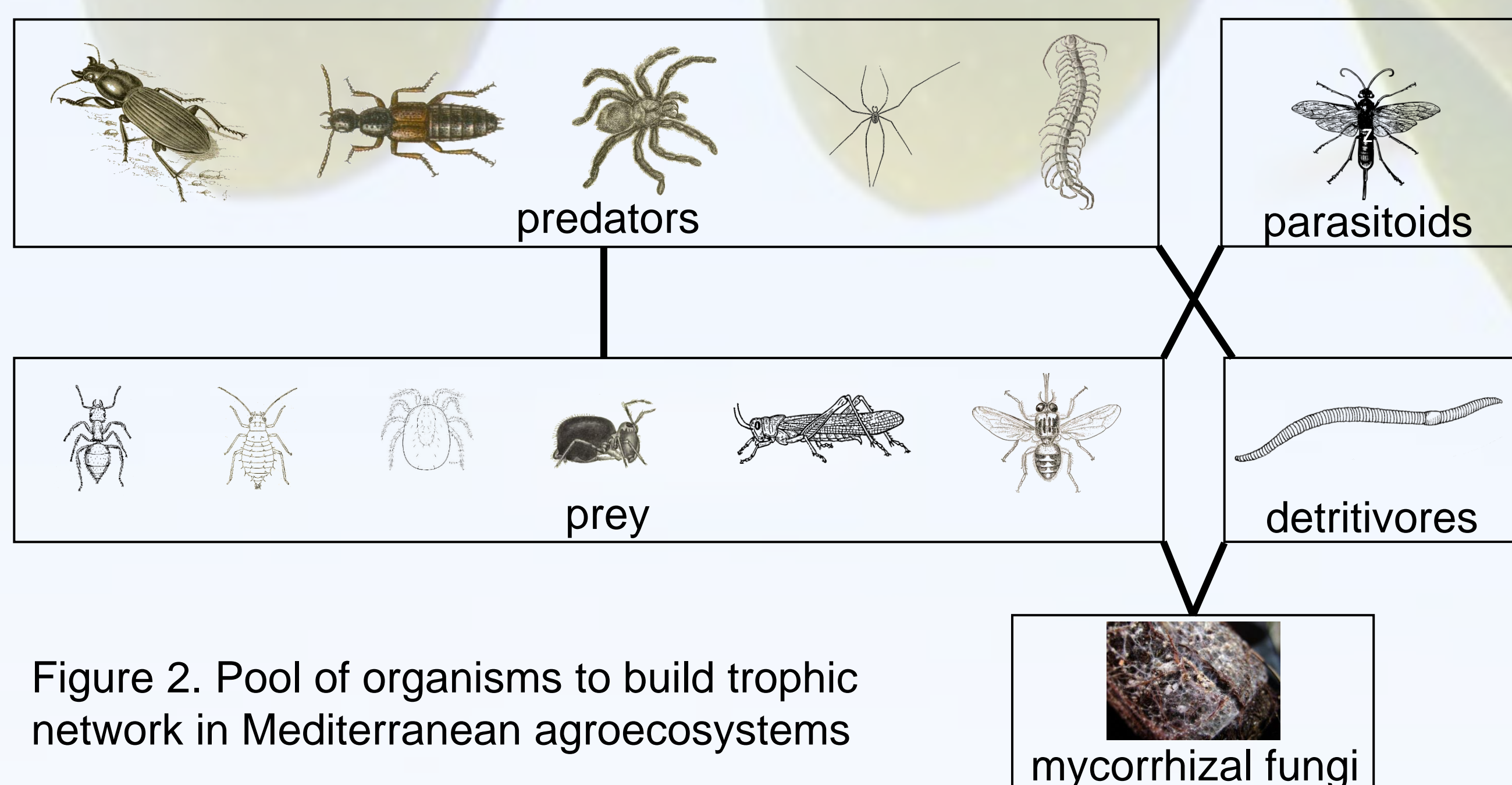


Figure 2. Pool of organisms to build trophic network in Mediterranean agroecosystems

- to specify potential vectors for transfer of pesticides through food webs and their direct influence on the survival and diversity of predators and prey
- to suggest a management that will suit beneficiaries and beneficial organisms and promote ecologically sustainable agriculture

Expected results

- to build trophic network of predators, prey and mycorrhizal fungi using metabarcoding analyses in vineyards and olive groves
- to specify link between agricultural management type and conservation of beneficial fauna in Mediterranean agroecosystems
- to improve knowledge of the sustainability of invertebrate predators as key groups in the integrated and ecological protection of plants in agriculture



Site selection

Mediterranean agricultural ecosystems: vineyards and olive groves in Zadar County, where both pesticides are used in an integrated and ecological agriculture, and in a natural habitat.



Figure 3. Sampling sites: olive orchard (left) and vineyard (right)

Methods

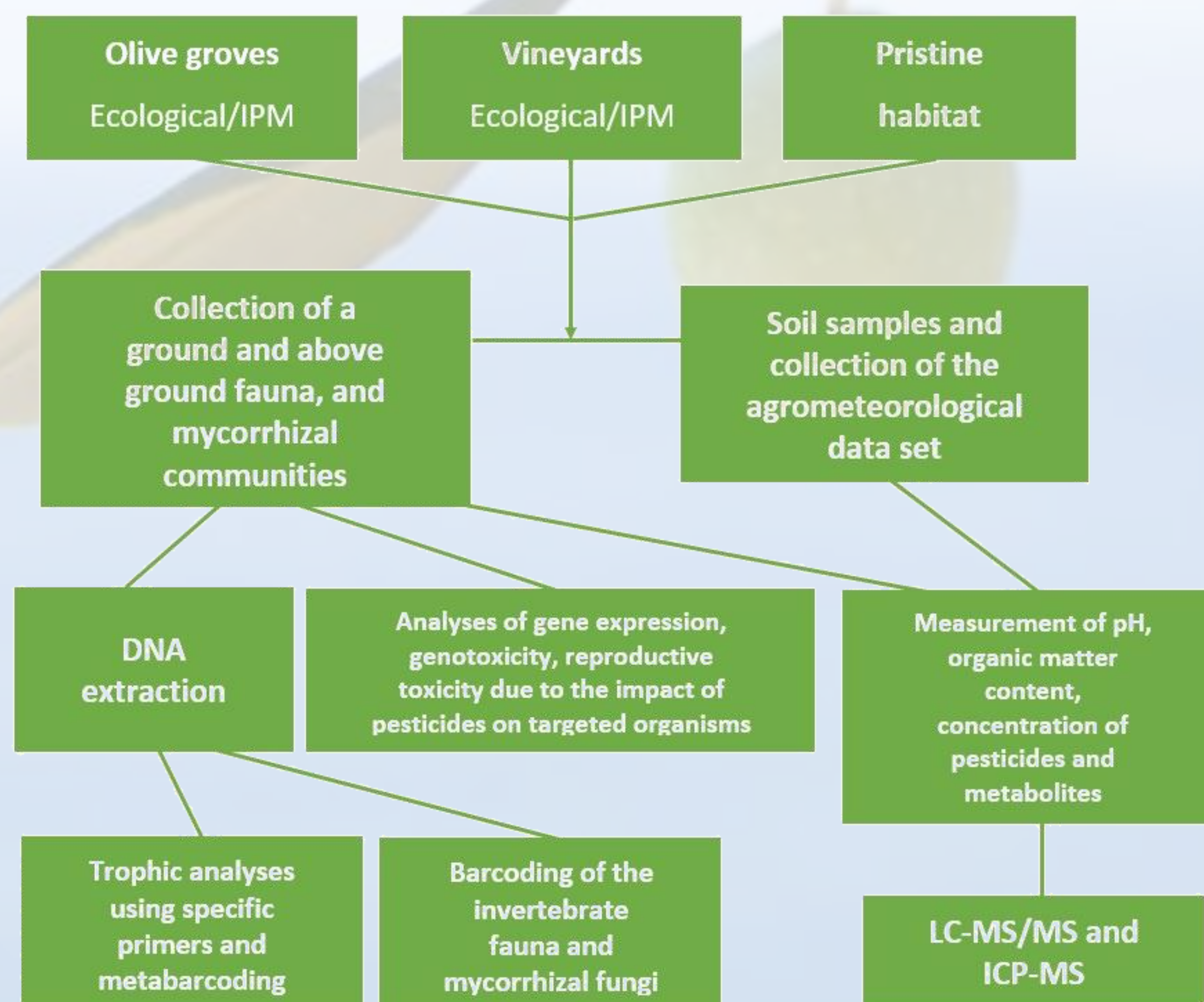


Figure 4. Sampling of invertebrates – use of pitfall traps (left) and aggregate (right)



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