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Diversity of infestation and foraging strategies in bark beetles.

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Bark beetles are considered major disturbance agent in forest ecosystems worlwide, able to efficiently exploit frequently nutrient poor, often ephemeral resources, to reproduce, develop and disseminate. This success is due to the large diversity of infestation strategies used by the different species. Hence, variations can be observed at the different life stages - from tree infestation by adults, ranging from mass attack to solitary colonization, to larval feeding, where highly aggregative behaviours deeply constrast with strong individual avoidance . These changes are observed at both the outer surface of the trees through the pattern and density of the attacks, and under surface of the bark where larvae feed collectively in chambers, or individually in tunnels. Between these extreme behaviours and patterns, there is a gradient in aggregative tendencies, or even qualitative shifts in behaviours during its life history, leading to even more intermediate collective patterns. All these patterns are species-specific, and it is hypothesized that the variations in individual behaviours (aggregative tendencies) and the subsequent change in collective patterns are linked to the feeding resources (quality, availability). For instance, larval aggregative behaviours and collective larval chambers are observed in species attacking healthy trees, the cohesion of the group being hypothesized to facilitate both feeding and counteracting the defensive response of the tree (resin, chemistry). Until recently, this topic in bark beetle ecology has received scarce attention, despite being a promising model to investigate the link between transition from solitary to collective patterns and resource quality and availability. Here we will illustrate this topic with our experimental insight on larval foraging patterns and aggregative behaviours in species that represent the extremes of both aggregation tendencies and cavity patterns.