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Subtle structures with not-so-subtle functions: A data set of arthropod constructs and their host plants

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Abstract

The construction of shelters on plants by arthropods might influence other organisms via changes in colonization, community richness, species composition and functionality. Arthropods, including beetles, caterpillars, sawflies, spiders, and wasps often interact with host plants via the construction of shelters, building a variety of structures such as leaf ties, tents, rolls, and bags; leaf and stem galls, and hollowed out stems. Such constructs might have both

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an adaptive value in terms of protection (i.e., serve as shelters) but may also exert a strong influence on terrestrial community diversity in the engineered and neighboring hosts via colonization by secondary occupants. While different traits of the host plant (e.g., physical, chemical and architectural features) may affect the potential for ecosystem engineering by insects, such effects have been, to a certain degree, overlooked. Further analyses of how plant traits affect the occurrence of shelters may thus enrich our understanding of the organizing principles of plant-based communities. This data set includes more than a thousand unique records of ecosystem engineering by arthropods, in the form of structures built on plants. All records have been published in the literature, and span both natural structures (90.6% of the records) and structures artificially created by researchers (9% of the records). The data were gathered between 1932 and 2021, across more than 50 countries and several ecosystems, ranging from polar to tropical zones. Besides data on host plants and engineers, we aggregated data on the type of constructs and the identity of inquilines using these structures. This data set highlights the importance of these subtle structures for the organization of terrestrial arthropod communities, enabling hypotheses testing in ecological studies addressing ecosystem engineering and facilitation mediated by constructs. There are no copyright restrictions and please cite this paper when using the data in publications.

Keywords: arthropods, caterpillars, ecosystem engineering, inquilines, insects, leaf galls, leaf rolls, leaf tents, leaf ties, plant constructs, shelters

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