A Case for Caterpillars

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Gardens contain friends and foes. Often gardeners may not fully understand the long-term benefits of a perceived threat. One organism that usually walks, or rather crawls, along that fine line is the caterpillar.

Photo credit: Carol Kagan

Monarch Caterpillars. Photo credit: Mandy Smith

Gardeners know that, in general, caterpillars are beneficial. After caterpillars metamorphose into butterflies or moths (Lepidoptera), caterpillars become important pollinators for many different plants. Nevertheless, a few chewed leaves can send us into a tailspin of focused determination to eradicate the fiend. Our plants are precious since we have cultivated and tended, planned, and pruned, and given hours of energy to see the plants grow and thrive. If however, one could simply pause and remember the greater benefits that caterpillars can provide to not just the plants, but to the garden ecosystem and beyond, they will be seen as friends, not foes.

There are an estimated 14,000 species of butterflies and moths just in North America. The diversity of these species is astounding, though the average gardener may not encounter even one-hundredth of these species. Many butterfly and moth caterpillars have coevolved with plants. Coevolution involves reciprocity--which means that an evolutionary change occurs between pairs of species as they interact with one another. That is to say that many caterpillars have evolved to be solely dependent on certain habitats and even a genera or species of plant. The most notable example is the monarch caterpillar whose food source is the milkweed (*Asclepias* spp.). Due to the monarch's unique specialization, it has become the poster child for creating pollinator habitats in gardens and landscapes. Since a few defoliated milkweed plants do not make us cringe or take up defense, why can't it be the same with other caterpillars?

Creating a diverse garden, prioritizing native species in particular, will provide essential habitat for caterpillars and ensure a system of checks and balances. Diversity in plants means a diversity in overall species, including those that prey on caterpillars. Caterpillars with their flexible and thin exoskeletons are packets of protein and the mainstay of a bird's diet, especially the diet of nesting birds. Doug Tallamy, entomologist and author, offers myriad

ways that caterpillars are the ideal food source for birds, including a source of carotenoids. Caterpillars contain twice as many carotenoids as other insects. Carotenoids stimulate the immune system, serve as antioxidants, and more. In Tallamy's *Nature's Best Hope: A New Approach to Conservation that Starts in Your Yard*, he cites field researchers who have conducted studies on nestlings and caterpillars. In a 1961 study, Richard Brewer counted the caterpillars brought by Carolina chickadees to their nests. On average, over the course of a 16-day nesting period, 6,000 to 9,000 caterpillars were brought to one nest. Then, those parents will continue to feed the fledglings for up to 21 days after leaving the nest. Bring in a diversity of plants, places for nests, and the gardener can easily have a winged guard to oversee any "pests" in their garden.

What to plant? When Tallamy talks about the keystone plants, the top three genera on the list are *Quercus* (oak), *Prunus* (cherry), and *Salix* (willow). These are the plants that support and sustain multiple species of caterpillars. Of course, many gardeners cannot or do not have the space to plant just tree and shrub species. Luckily, there are resources to find out if your plantings will support caterpillars. Resources include the Native Plants Database at the Lady Bird Johnson Wildflower Center, guides from Penn State Extension, and those like the *Caterpillars of Eastern North America* by David L. Wagner. Of course, adding in a few small trees and shrubs will support and shelter your feathered friends.

Enhanced biodiversity also contributes to ideal habitat for beneficial insects, including those that are predaceous and parasitoidal. This is part of intentional biological control, which also includes reducing or eliminating pesticides. Beneficial insects prey upon many insect pests, including the soft-bodied caterpillars. However, these beneficial species also require other food sources, such as nectar and pollen, at other stages in their life cycles. Thus, by providing pollinator plants for those butterflies and moths, one ensures a beneficial insect-friendly habitat as well.

Again, native species are important to prioritize; but if you are only growing food for your family, as in vegetables and herbs, then you may still be able to support an ideal habitat for beneficial insects. Herbs found in the mint family (Lamiaceae) and carrot family (Apiaceae) have proved to support parasitic wasps. Herbs to include in your garden are oregano, thyme, lemon balm, rosemary, dill, fennel, and cilantro. It is worth remembering that many herbs and vegetables are host plants for caterpillars. In Jessica Walliser's book *Plant Partners : Science-Based Companion Planting Strategies for the Vegetable Garden*, she details some of the ideal plants to install for enhancing biological control. The beneficial insects in your garden will have a source of easy protein or host for their eggs with the caterpillars, have enough pollen and nectar for energy, which will then allow them to eliminate the other pests on your plants.

To think of the garden as an ecosystem is a benefit to the plants that you cultivate. We sometimes have a narrow focus of the plant or its relationship to other plants. Looking beyond that scope, we have the ability to allow the plants to be a vital food source, as nature intended. They will attract friends and foes. Caterpillars may seem like foes at first but will turn into beneficial pollinators or become meals for a brood of birds and predatory insects. The relationships between the plant and caterpillars can be the foundation of an enhanced biodiversity for the garden.