Codebook for Forest caterpillar data 2008-11 for QAC
(Michael Singer lab, Biology Dept.)

Description of the methods and data

These data came from a manipulative field experiment conducted over 4 years. The experimental manipulation was an exclusion of birds (and possibly other large predators) from tree branches to determine the effect of bird predation on caterpillars eating those trees. Birds were excluded from tree branches (1-3 m high) of 8 tree species by covering the branches with nylon netting (bagged); control branches were uncovered (unbagged) and located on the same individual tree or on a nearby tree of the same species. These treatments were set up during May of each year, and caterpillars were subsequently collected from those branches in two 3-week time blocks (block 1, first 3 weeks of June; block 2, fourth week in June and first two weeks of July). All caterpillars greater in length than approximately 1 cm were collected from the experimental branches (each branch sampled once per time block) in the temporal order in which the experiment was set up. Each of three field sites was sampled once during each week, and each site was sampled each week. Upon collection from its host tree, each caterpillar was transported to the laboratory and fed leaves of the same tree species upon which it was collected. These collections helped us determine the species identity of each caterpillar. This dataset consists of the caterpillars we could identify with confidence, thus allowing us to relate traits of those species to their risk of bird predation. A separate dataset of traits of each caterpillar species is also available.

For more information and published examples of how these data have been used, see:

Lichter-Marck, I.H., M. Wylde, E. Aaron, J.C. Oliver, and M.S. Singer. In press. The struggle for safety: effectiveness of caterpillar defenses against bird predation. Oikos. Preprint available.

Singer, M.S., I.H. Lichter-Marck, T.E. Farkas, E. Aaron, K.D. Whitney, and K.A. Mooney. 2014. Herbivore diet breadth mediates the cascading effects of carnivores in food webs. Proceedings of the National Academy of Sciences USA 111: 9521-9526.

Singer, M.S., T.E. Farkas, C. Skorik, and K.A. Mooney. 2012. Tri-trophic interactions at a community level: effects of host-plant species quality on bird predation of caterpillars. The American Naturalist 179: 363-374.

Codes:
year = year of sample

date = specific date of field sample

site = field site of the sample. C = Cockaponset State Forest, Haddam, CT; H = Hurd State Park, East Hampton, CT; M = Miller's Pond State Park, Durham, CT.

host2 = abbreviated common names of tree species in the experiment. RM = red maple (*Acer rubrum*), BI = black or sweet birch (*Betula lenta*), HI = hickory (*Carya* spp.), BE = American beech (*Fagus grandifolia*), WH = witch hazel (*Hamamelis virginiana*), BC = black cherry (*Prunus serotina*), WO = white oak (*Quercus alba*), RO = red oak (*Quercus rubra*).

hostid = unique identification code of each host tree sampled on a particular date. This is useful in case you want to know which caterpillars were sampled from the same tree. Note that these identification codes are unique for a particular date, but not otherwise. The same code at a particular site in different years does not necessarily refer to the same individual tree.

birdtreatment = experimental treatment. Bird exclusion = bagged, control = unbagged.

Numberlvs = the number of leaves on the experimental branch sampled for caterpillars. This useful for calculating the density of caterpillars on a branch.

Avglvarealf_cm2 = the arithmetic mean (average) area (in square centimeters) of an individual leaf of each tree species. These values were obtained from a large set of leaves sampled from 2004 to 2009 from each tree species and measured with a device called a leaf areameter.

Totallvarea_m2 = the total amount of leaf area (in square meters) of the experimental branch. This value is the product of numberlvs and avglvarea, divided by 10,000 to convert it to square meters. This conversion was done to make the numbers more manageable and intuitive.

cat_sizecm = the length in centimeters of each caterpillar on the day of collection. Not all caterpillars were measured.

ID = unique identification code of each caterpillar collected in each year. This code is unique for a particular year, but not between years.

cat_species = scientific name of the caterpillar species.