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Supplementary Information for

To us insectometers, it is clear that insect decline in our Costa Rican tropics is real, so let's be kind to the survivors.

Daniel H. Janzen
Winnie Hallwachs

Daniel H. Janzen
Email: djanzen@sas.upenn.edu

This PDF file includes:

Figures S1 to S4
SI References



Fig. S1. Normal mass of aestivating dry forest female *Polistes instabilis* (Vespidae), an open-face, communal nesting, predator of caterpillars in the adjacent ACG lowlands during the rainy season, self-parked in the cool and moist “refrigerator” of the dry season clouds on Volcán Cacao (Fig. 2, ref. 1). This mass is under the roof of a rustic dormitory in the Cacao Biological Station at 1100 m elevation. The natural site is in hollow trees as in the holes in the tree trunk in the upper left. On the right is a *Polistes* in this mass being preyed on by *Eciton* army ants that are part of the ant fauna that is newly invading upward (2-3) into these upper-elevation drying and warming, shrinking cloud forests (photo lower right: Brad Zlotnick, 25 January, 2011; other two, DHJ). The consequence of the shrinking of the “refrigerator” and predation on the wasps is that fewer dry season aestivating wasps annually return to the lowlands to be part of the 6-month rainy season food webs (e.g., 1-3). The warming of the refrigerator also leads to steady uphill immigration of ecological kinds of species of lower elevations such as army ants (*Eciton* spp.), leaf-cutter ants (*Atta cephalotes*), and cicadas (Homoptera). These climate change biomonitors are predators, parasites, and degraders (if you can read them) with which the previously colder and wetter cloud forest biota has not had to contend, be they insects, ground-nesting vertebrates or plants (e.g., 1-3).



Fig. S2. Left: The same light trap and lights as in Fig. 3, on 28 May 1995, eleven years later, still capturing univoltine *Manduca dilucida* (five with their distinctive paired white shoulder patches, on the right side of the sheet) in the vicinity of the long-tailed *Copiopteryx semiramis* male, which is centered among the four yellow multivoltine *Eacles* that appear to be *E. imperialis* of the Eastern USA, but are another species 5% different in their DNA barcodes. This undescribed species of *Eacles*, an extreme generalist as a caterpillar (4), has persisted to date in ACG dry forest and rain forest (on the ground in Fig. 5), along with *Hylesia lineata* (Saturniidae), another extreme generalist (5), as climate change has intensified.

Right: The same light trap and lights as Fig. 3, but on 23 May 2007, 23 years later, with the same high density of adult moths. The cinnamon-brown, large Saturniidae are *Schausiella santarosensis*--a monophagous univoltine species whose caterpillars totally defoliated the huge *Hymenaea courbaril* (Fabaceae) trees in old growth forest in 2005-2007, and has now almost entirely disappeared, presumably because of the ever-intensifying dry season as part of climate change.

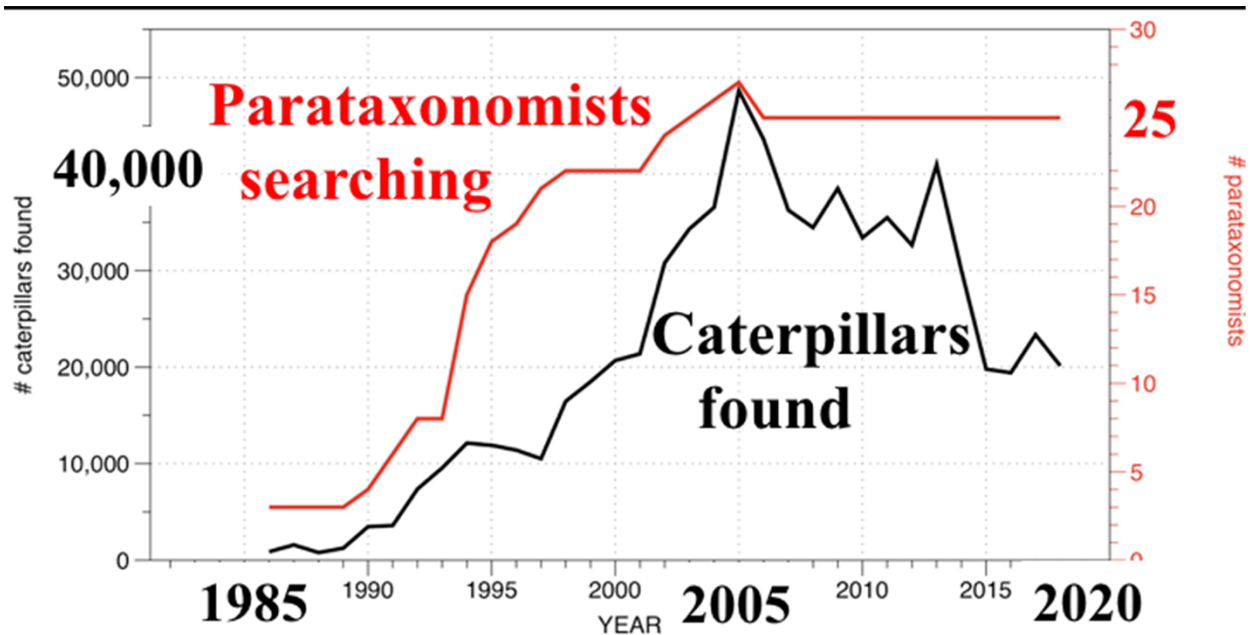


Fig. S3. While extracting these data points from the master caterpillar rearing database for all of ACG (6-7), we asked all parataxonomists (n=25) to give their impressions of caterpillar density. Dinia Martínez' reply is characteristic of all of their replies. Dinia has collected and reared 8,840 wild rain forest caterpillars between 2009 and 2019, and is an outstanding searcher and identifier in ACG rain forest. "With respect to caterpillars found, what my colleagues have found is 'yes'. There is a severe decline. The common species have disappeared. On various occasions we have returned from the forest without a caterpillar". (translation, 17 November 2019). From 2005 onward, as graphed, the same number of caterpillar-searching parataxonomists were finding progressively fewer individual caterpillars. This is an indirect measure of the decline in searching success that insect-eating vertebrates are undoubtedly encountering.

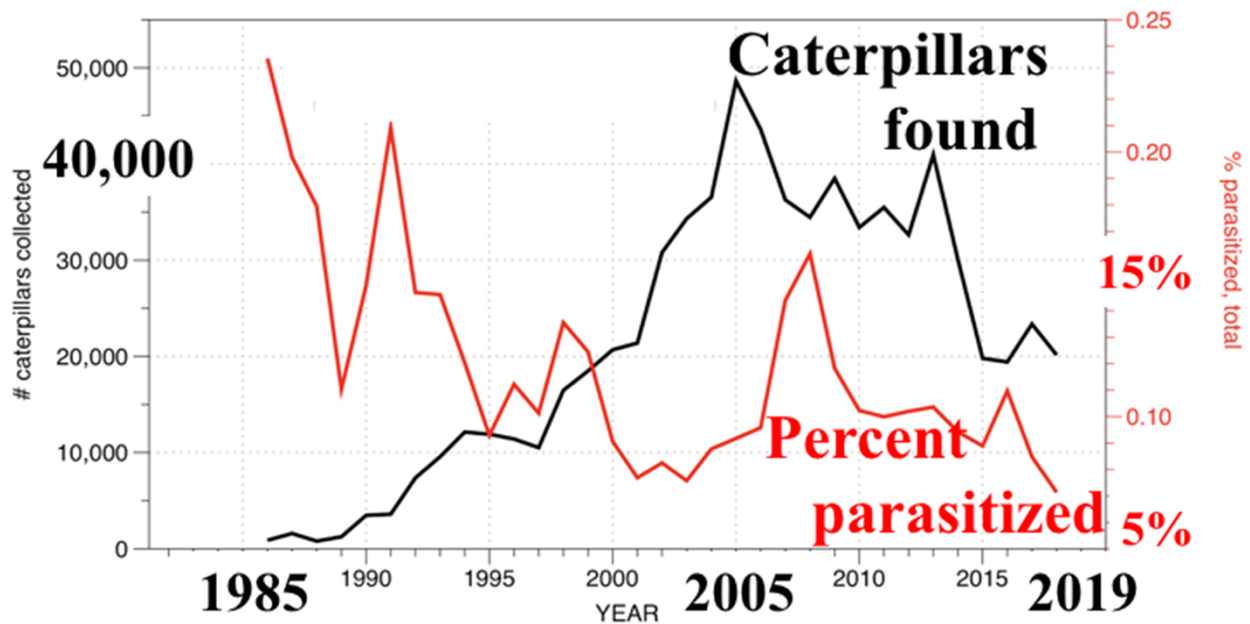


Fig. S4. Percent wild-caught caterpillars parasitized at the time of finding the caterpillar, as measured by eventual eclosion of surviving parasites (parasitoid). These parasites are flies (Diptera: Tachinidae) and wasps (Hymenoptera, primarily Braconidae, Ichneumonidae, and Eulophidae). Hyperparasites are excluded from the count but not the inventory. The high percent in the 1985-2000 period reflects the overall trend, but the peak in 2009 is inexplicable, awaiting further analysis at the species level and probably due to an unusually intense parasite-host event.

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