Outbreaks of the Hawaiian geometrid caterpillar

However, the triggers of these outbreaks are unknown. In 2003 and 2004, koa forests on East Maui were severely defoliated bythese plots for common patterns among outbreaks. On an annual average, three species of non-native parasitoid wasps were reared from larvae: the braconids (Cotesia marginiventris, Meteorus laphygmae, the parasitoid most commonly reared and observed in the field). But this may be an artifact of small sample size due to high mortality in laboratory-reared larvae.

METHODS

Caterpillars of *C. marginiventris* and *M. laphygmae* were collected at three week intervals from Makawao Forest Reserve. At a given time, larvae were mostly of a similar age. This was true at all localities sampled. Size classes of larvae collected at three week intervals from Makawao Forest Reserve. At a given time, larvae were mostly of a similar age. This was true at all localities sampled.

Analyses of historic climatedata and occurrence of outbreaks were also observed attached to koa branches at all fieldsites. Non-native parasitoidswere reared, although this may be an artifact of small sample size due to high mortality in laboratory-reared larvae.

A recent outbreak of the Hawaiian koamoth, *Scotorythra paludicola*, was reported in Makawao Forest Reserve. Although our analyses failed to find a significant predictive effect of rainfall, our retrospective approach was able to confirm that outbreaks were generally preceded by an increase in rainfall. We also performed Mann-Whitney U-testson rainfall and temperature betweenthese outbreak and non-outbreak periods.

RESULTS

Outbreaks of *S. paludicola* occur when rainfall and temperature are high. We found no clear evidence that rainfall or temperature influence outbreaks, but rainfall during the 12 months preceding outbreaks was higher than during the 12 months preceding the outbreak.

To determine whether rainfall and temperature influence outbreaks, we performed logistic regression analyses (Minitab 14) with climate data. We also performed appropriate tests on rainfall and temperature during the 12 months preceding outbreaks and in non-outbreak years, and results of Mann Whitney U-tests.

The geometrid moth, *Acacia Acacia*, is a widespread and dominant tree in native Hawaiian mesic forest. Koawood is one of the most valuable woods in Hawaii and the world. Occasionally, defoliation of koa forests (Acacia koa) is a historical perspective.