Spatial synchrony in forest insect outbreaks: Why is it so ubiquitous?

Andrew Liebhold, Ottar Bjørnstad, Johnson Derek, Christelle Robinet

ABSTRACTS CD
& Author's List

"Celebrating Entomology: Contributions to Modern Science"

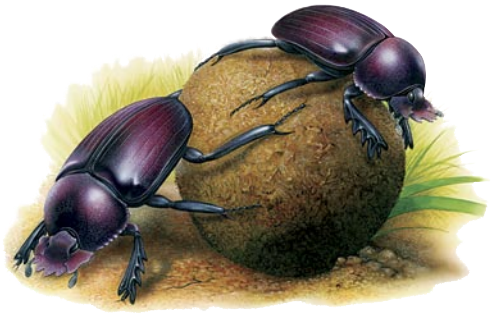
MENU

AUTHORS LIST
Click to open the list, then press CTRL+F and type a keyword to search; then Click on Abstract No. to open

INSTALL PDF READER

INSTRUCTIONS
Use Advanced Search and find keywords inside Abstracts on this CD

EXIT



ICE • Durban • 2008

ICE 2008

XXIII International Congress of Entomology

6 - 12 July, 2008: International Convention Centre, Durban

Spatial synchrony in forest insect outbreaks: Why is it so ubiquitous?

Andrew Liebhold[1], Ottar Bjørnstad[2], Derek Johnson[3], Christelle Robinet-Makdoud[4]

[1]US Forest Service Northern Research Station, Morgantown, WV, United States, [2]Department of Entomology, Pennsylvania State University, University Park, PA, United States, [3]Department of Biology, University of Louisiana at Lafayette, Lafayette, LA, United States, [4]INRA, UR633 Zoologie Forestière, Orléans, France

Spatial synchrony refers to the coincident temporal variability in the abundance of geographically disjunct populations and is a characteristic of virtually all species of forest insects. For those forest insects that occasionally reach epidemic densities, it is the characteristic of spatial synchrony that determines their pest status because outbreaks occurring synchronously over large areas are likely to result in more substantial ecosystem and sociological impacts. Spatial synchrony can result from 1) dispersal of individuals among populations, 2) synchronous trophic (e.g., parasitism) effects and 3) synchronous stochastic (e.g., weather) effects. Unfortunately it is often difficult to identify the relative contribution of these mechanisms and synchrony observed in real populations is likely the result of several mechanisms. Temporal variability in weather is universally synchronous and this is a plausible explanation of the ultimate ubiquity of synchronous population dynamics. However, understanding synchronous dynamics requires identifying both the factors contributing to synchrony as well as those processes that desynchronize populations. These latter processes are poorly understood but geographical variation in density dependence and nonlinear dynamics are both probably important. In this paper many of these issues are explored using the gypsy moth, *Lymantria dispar*, in North America as a model system.