Pierids, Hosts & Parasitoids

Francie Chew, Roy Van Driesche, Dave Wagner, Dick Casagrande

Cotesia glomerata

Pieris napi oleracea

Cotesia rubecula

Cardamine diphylla

Cardamine pratensis

Alliaria petiolata

Acknowledgments

Rachel Steward (Tufts)
Margaret Keeler (Tufts)
J. Michael Reed (Tufts)
Suzanne Shapira (Tufts)
Tegan Morton (Tufts)

Tufts Inst. Envt.
Summer Scholars (Tufts)
Arabis Fund (Tufts)

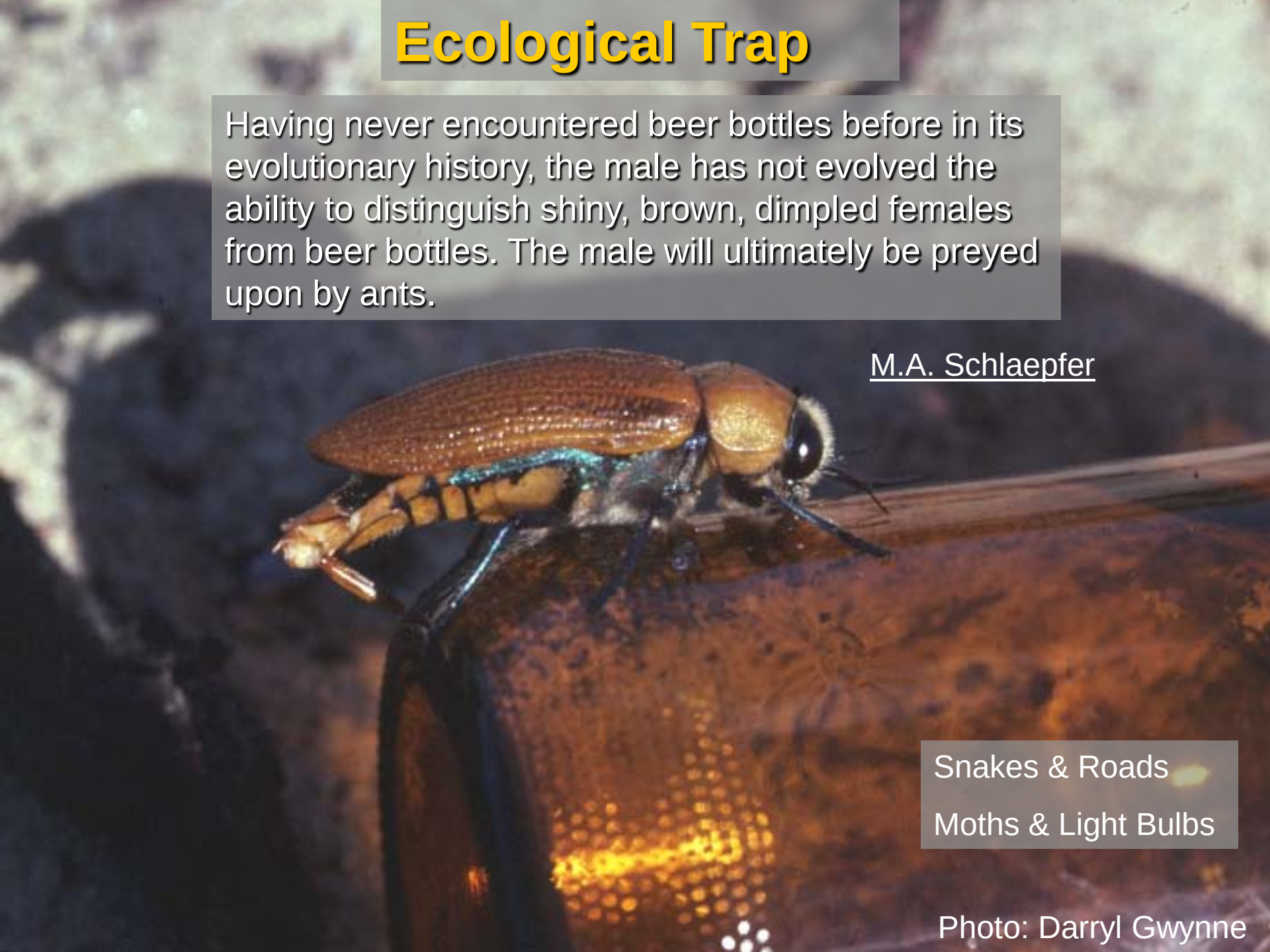
Elena Olsen (Cornell)
Lisa Tewksbury (URI)
Ryan Vasquez (URI)
Norman Rubenstein (EPA)

Jessican Benson (UMass)
Meghan Hurlihy (UMass)

Mike Nelson (MA-NHESP)

Ecological Trap

Having never encountered beer bottles before in its evolutionary history, the male has not evolved the ability to distinguish shiny, brown, dimpled females from beer bottles. The male will ultimately be preyed upon by ants.



M.A. Schlaepfer

Snakes & Roads

Moths & Light Bulbs

Photo: Darryl Gwynne

Some insects adapt to new hosts

Colorado potato beetle: *Solanum rostratum* to *S. tuberosum* about 1859 (Casagrande 1985)


Monarch ovipositing on milkweed
Photo: Joe Kunkel

Monarch ovipositing on black swallow-wort

Monarchs lay ~ 25% eggs
on Black Swallow-wort in RI

Justification for biocontrol of swallow-wort

Eumolpus asclepiadeus

Abrostola asclepiadis

Hypena opulenta

Pieris napi oleracea: toothwort and garlic mustard

Candidate agents

Ceutorhynchus scrobicollis

Root and Crown feeder

Ceutorhynchus alliariae and *C. roberti*

Stem borers

http://www.invasiveplants.net

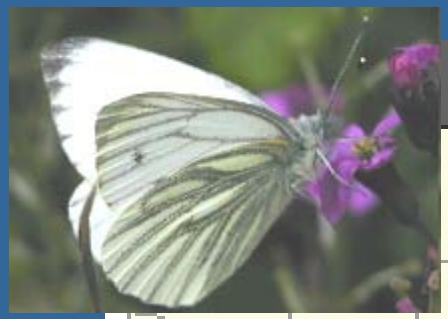
Intelligent Design

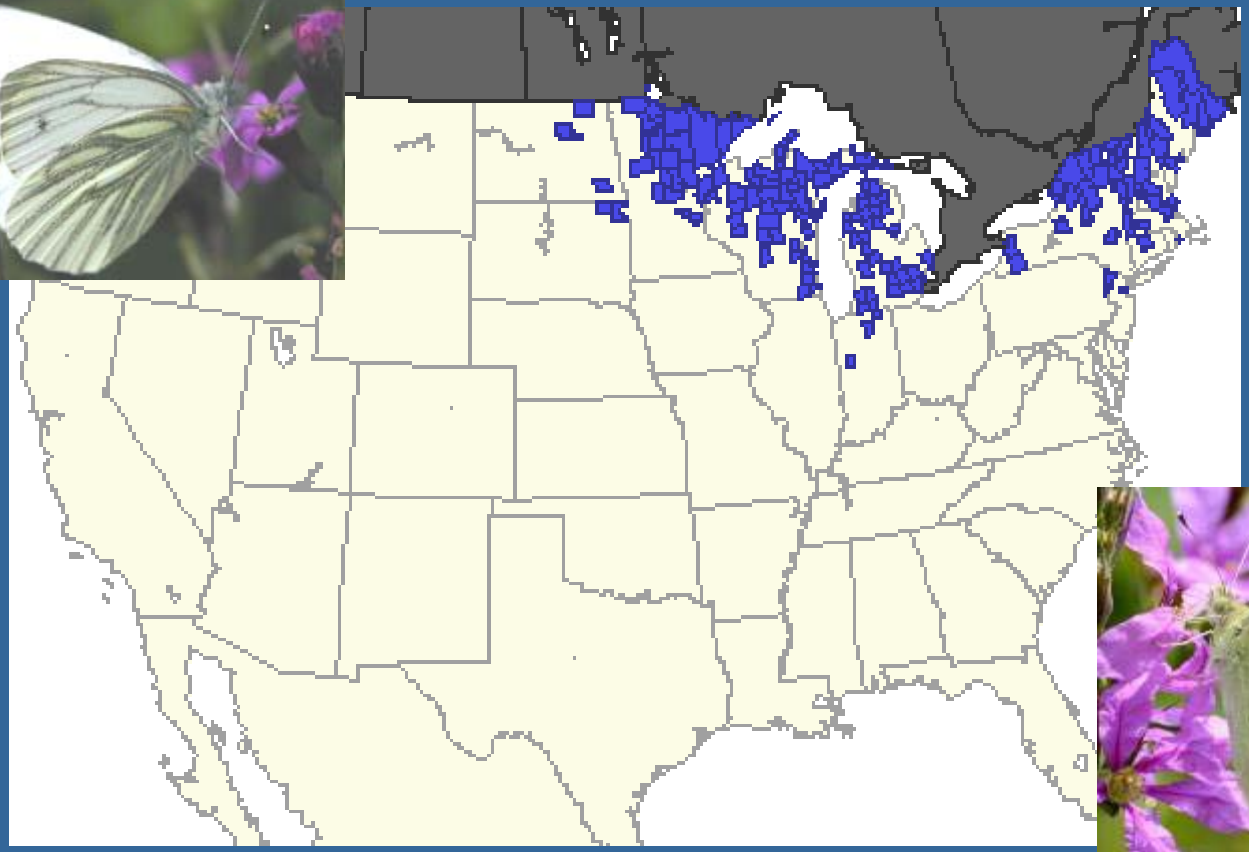
Turning native insects into biological control agents

- Add freeze-dried non-host foliage to artificial diet
- Select for several generations

(Monarchs – no diet, Pierids – don’t mate)

Documented records for *P. oleracea* (Opler et al. 2006)





Historically, *P. oleracea* was relatively common in New England and found throughout New York, where it occurred on many cruciferous host plants, mostly growing in full sun, disturbed habitats. However, following the accidental introduction of the imported cabbageworm, *P. rapae* near Quebec City, Quebec about 1860, the distribution, effective host range, and abundance of *P. oleracea* has greatly diminished (Chew 1981).

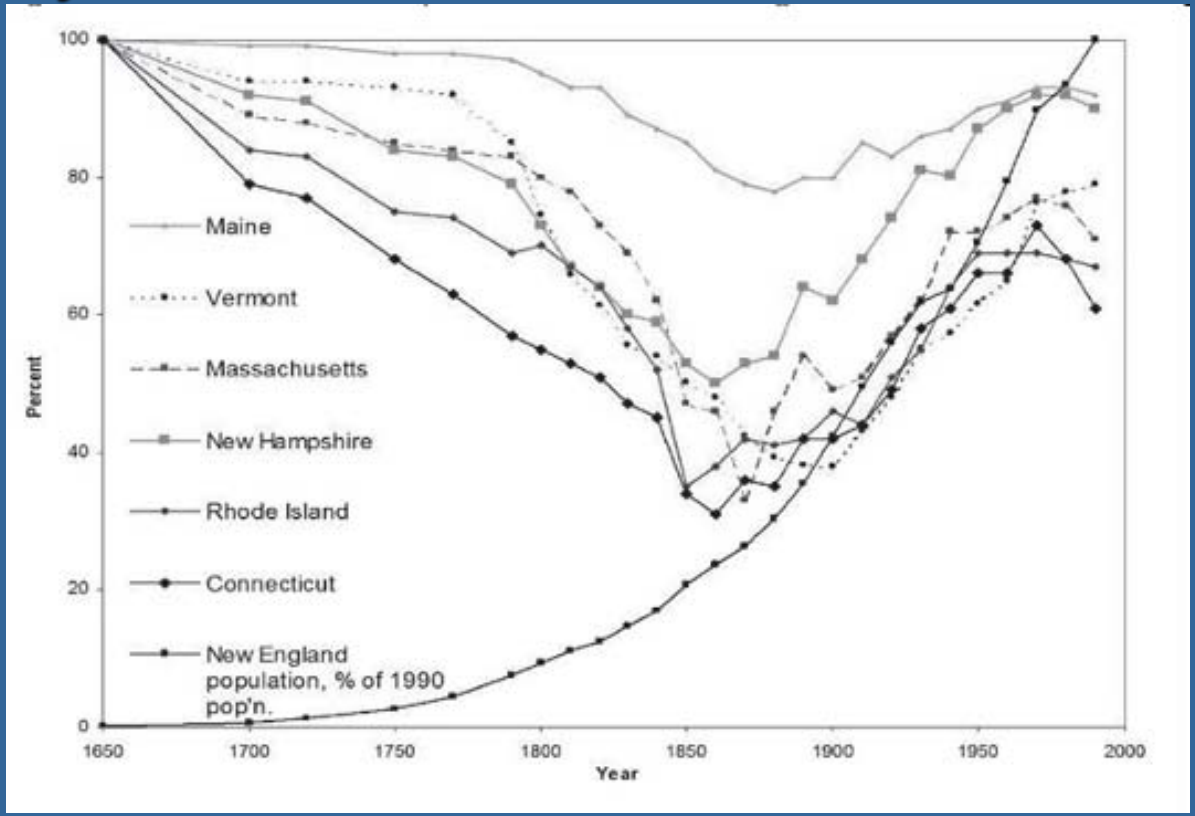
Loss of *Pieris napi oleracea*

Not due to competition with *P. rapae*

Cotesia glomerata ~ 1880

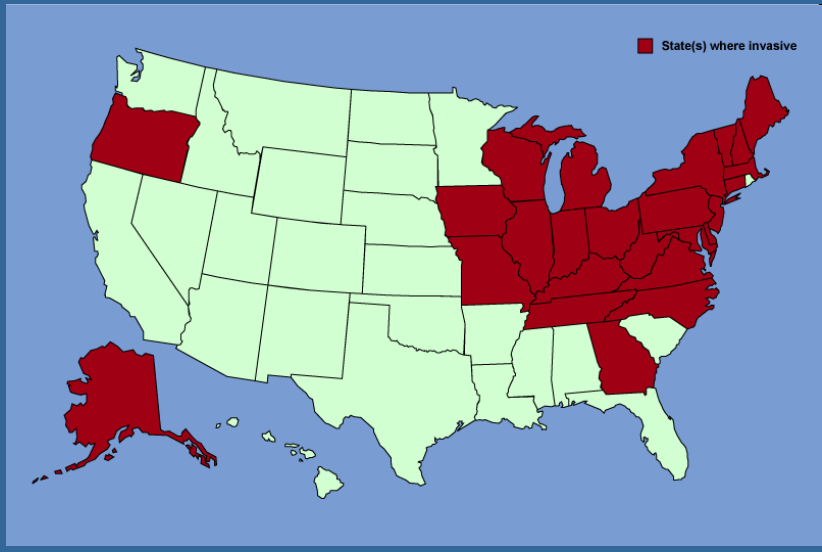
Host plant availability

Garlic mustard



Forest Cover and Population Trends – D. Foster

Garlic mustard was first recorded in the United States about 1868, from Long Island, New York. It was likely introduced by settlers for food or medicinal purposes.



biennial

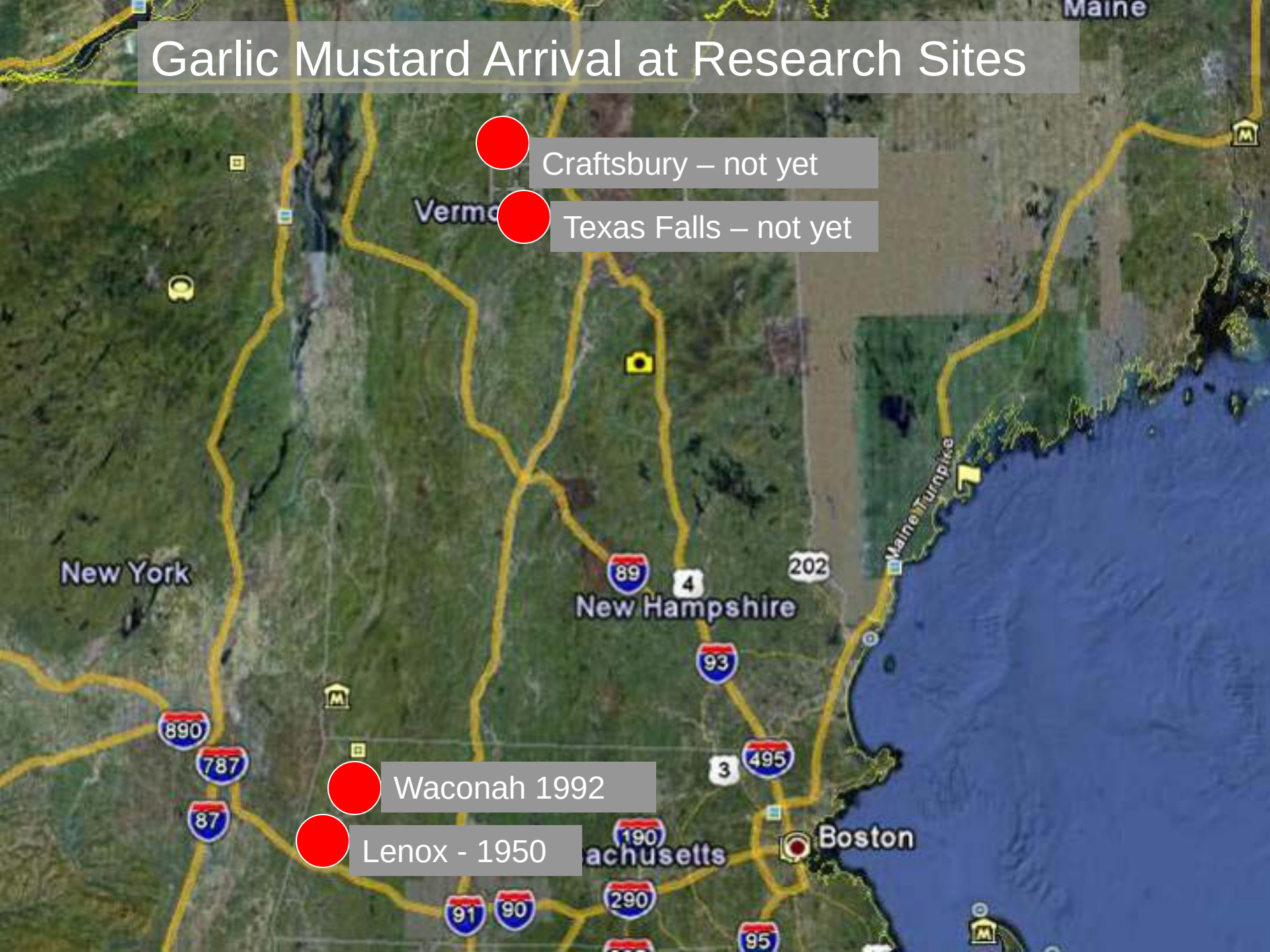
•Adults readily oviposit on garlic mustard.

•First instar larvae are strongly inhibited from feeding by alliarinocide. (Renwick et al. 2001)

•Later-instar larvae are inhibited by an isovitexin glucoside. (Haribal and Renwick 1998)

• (Deer repelled by cyanide)

Photo: V. Nuzzo


Garlic Mustard Arrival at Research Sites
Craftsbury – not yet
Texas Falls – not yet
Waconah 1992
Lenox - 1950
Maine
New York
New Hampshire
Boston
Maine Turnpike
achusetts
89
4
202
93
890
787
87
3
495
190
290
91
90
95

Craftsbury, Vermont

532 ft

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Lenox, Massachusetts

Housatonic River


Hutchinson Ln
Sewer Plant Rd
Roaring Brook Rd
1900 ft
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