Tracing the origin of US BMSBs

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BMSB: an invasive pest in the US

- Native range: China, Taiwan, Korea and Japan
- Invasion to the US: Allentown, PA in 1996; now in 39 states
- Damages: serious loss in agriculture, residential nuisance, erosion of local biodiversity
- Control: insecticide application
US BMSBs

- Where did they come from?
- How many introductions?
- What’s the likely size of founding population?
- How about the genetic diversity in the US?
Samples

East Asia: CN (7), KR (1), JP (1); $N = 5-21$

US: 10 states; $N = 2-12$
Genetic analysis – mtDNA sequences

- Cytochrome c oxidase II (COII)
- 12S ribosomal RNA to control region (12S/CR)
- Cytochrome c oxidase I (COI)
Haplotype distribution

Red & orange haplotype frequency in BJCN: 1/6 and 1/3
Relationship among populations
Inference from Nested Clade Analysis (NCA):

- Restricted gene flow but with some long distance dispersal
- BJCN+XZCN+NJCN as the distributional center in China
Genetic diversity

Native: 43 haps in 77 bugs
US: 2 haps in 55 bugs
Summary

• Significant genetic differentiation in natives
• High genetic diversity in East Asia versus extremely low diversity in the US
• US BMSB originated from Beijing area, China
• Single introduction with small population size matches the invasion to the US
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Questions?