

# Non-native Plants Support Fewer Arthropods than Natives Across North America

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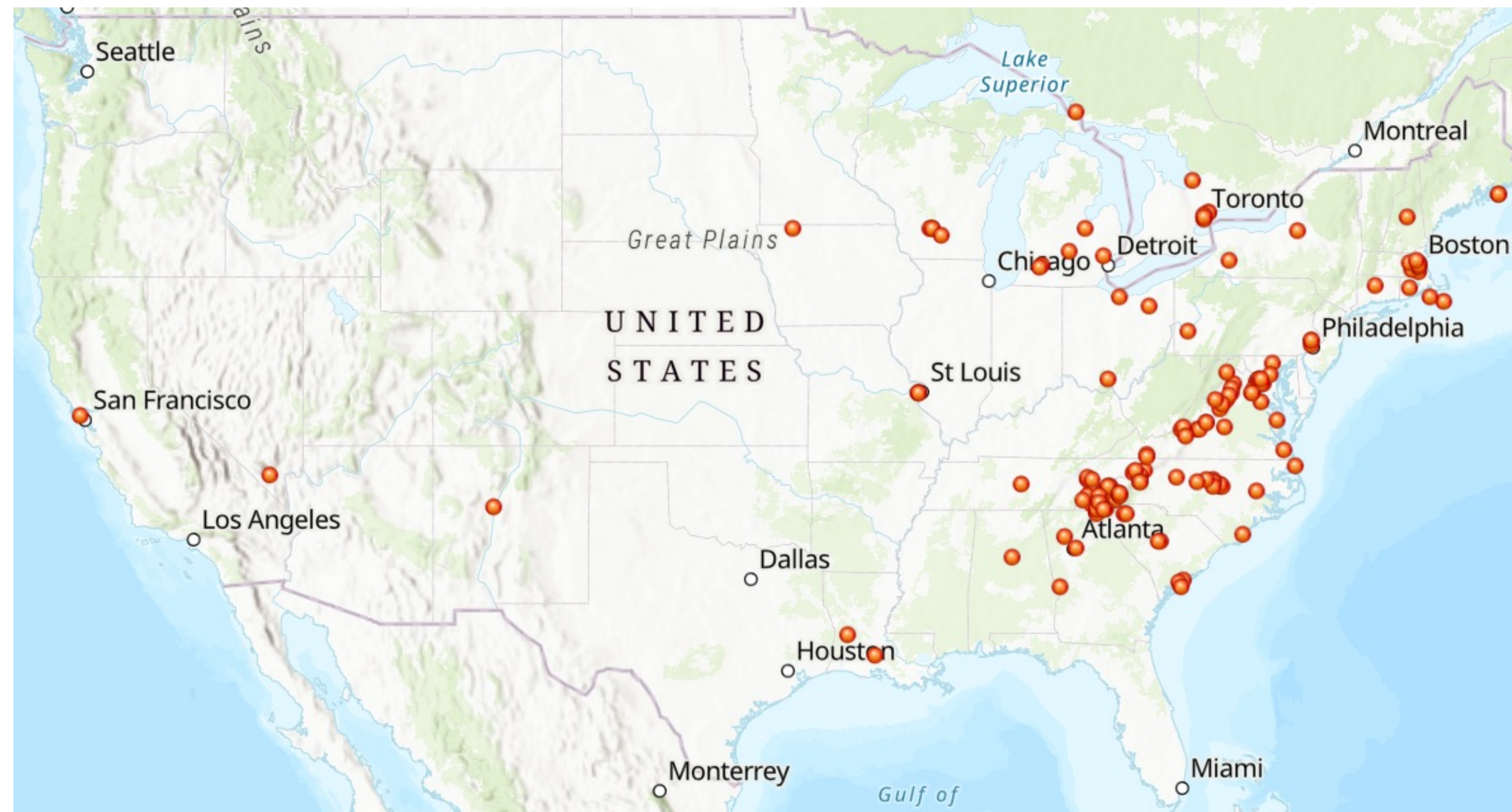


Figure 1. A map of active *Caterpillars Count!* sites

## Introduction

- The enemy release hypothesis states that non-native plants will increase in abundance and distribution in a new area as there are no natural predators<sup>1</sup>
- So, non-native plants would support fewer arthropods compared to native plants with natural predators
- When comparing four arthropod groups who use plants in a variety of ways ranging from using them for their vegetative structure, as food, or hunting grounds:
  - Caterpillars are expected to be affected the most by non-native plants<sup>2</sup>
  - True bugs and beetles would be moderately affected<sup>3</sup>
  - Spiders are expected to be weakly affected<sup>4</sup>



Figure 2. American dagger caterpillar found on a red maple in a *Caterpillars Count!* survey

## Methodology

- *Caterpillars Count!* is a citizen science dataset centered on the East Coast in which standardized arthropod surveys are done on woody vegetation
- Beat sheet and visual foliage surveys are conducted as comparable results for density, biomass, and occurrence are found<sup>5</sup>
- Tallamy & Shropshire (2009) was used to classify plants as native or non-native and to identify the number of Lepidoptera genera on a plant<sup>6</sup>

## Results

- Caterpillars, beetles, and spiders followed the trend but a notably stronger affect on true bugs and weaker affect on beetles occurred
- Density and percent occurrence compared to genera-level Lepidoptera richness found more caterpillars supported per branch

## Conclusion

- Unexpected trends might be due to:
  - Evolutionary history which indicates that the longer a plant is in a place the more likely arthropods will evolve to use it<sup>7</sup>
  - Geographic range of plants and arthropods are affected by temperature and precipitation and is scale-dependent<sup>8</sup>
  - Non-natives are being used as ornamentals and urbanization causes the heat island effect, impermeable surfaces, and more<sup>9, 10</sup>
- All supporting a less diverse, complex food web<sup>11</sup>

All species (native, n = 212; alien, n = 19)

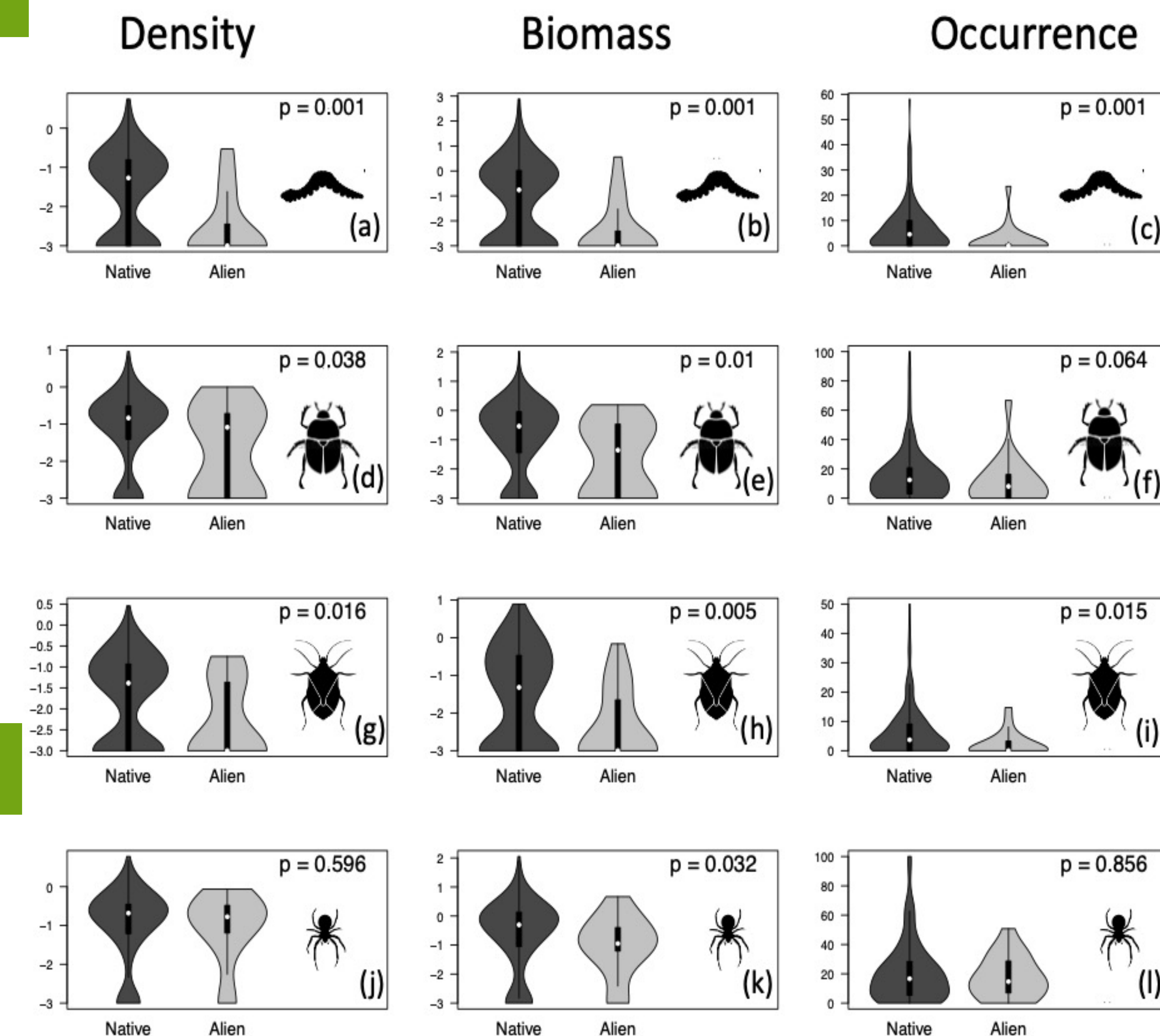


Figure 3. The average density (a, d, g, j), biomass (b, e, h, k), and occurrence (c, f, i, l) of caterpillars (a, b, c), beetles (d, e, f), true bugs (g, h, i) and spiders (j, k, l) compared between native (dark gray) and alien (light gray) all plant species

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