SEASONAL GROUP BEHAVIOR OF ADULT *JADERA HAEMATOLOMA* (HEMIPTERA: RHOPALIDAE) IN CENTRAL FLORIDA FOLLOWING HOST SEED EXHAUSTION

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*Jadera haematoloma* Herrich-Schäffer (Hemiptera: Rhopalidae) is a specialist seed predator on Sapindales (Sapindaceae) and is common throughout North and Central America (Carroll & Loye 1987). In North-Central Florida *J. haematoloma* occurs on the recently-acquired host, the Goldenrain tree (*Koelreuteria* sp. Laxmann). *Koelreuteria* trees produce tens of thousands of seeds in the canopy on floral rods after flowering in early fall. By mid-fall, seeds fall to the ground and are fed upon by *J. haematoloma* until the seed base is exhausted in early summer (Carroll & Loye 1987; Carroll 1988). Though dispersal morphs are common in other host populations of *J. haematoloma*, they are not favored in *Koelreuteria* populations due to the synchronous exploitation of *Koelreuteria* sp. seeds among host plants. Instead, non-reproductive diapause in adults follows seed exhaustion (Carroll et al. 2003). During this period from May to Sep 2009, I observed adults forming dense, physically-touching groups in the canopy following the exhaustion of seeds. My goal was to determine the demographic composition of these groups and identify where they occur in time as well as their position within and among host trees.

I observed individuals foraging on seeds on the ground around host trees in large aggregations through late May and early Jun in the northwest Gainesville area (Alachua County, FL) in the manner described by previous investigators (Carroll & Loye 1987). Following seed exhaustion and a noticeable decline in the density of individuals on the ground, I completed an exhaustive survey of the canopy and surrounding ground area of 12 large *Koelreuteria* trees using binoculars and a spotting scope to view higher ground area of 12 large trees. I recorded the branch position, compass position relative to trunk, height, radius from the trunk, and number of participating insects for each observed group; a picture was taken to verify counts and each group was assigned a number. One quarter of the number of groups was randomly selected based on a random numbers table and then destructively sampled using a bag net at each tree. Sex ratios within groups were estimated for each tree from the collected group(s). Statistical analyses were conducted with JMP (SAS institute 2008).

In total, 46 groups were observed. Fewer than 20 individuals were observed on the trunk or ground of any given tree during sampling. Trees contained between 0 and 17 groups within the canopy (mean = 4.6). The proportion of terminal branches with florescence rods (a proxy for seed productivity) reliably predicted the total number of individuals found on a tree (ANOVA, df = 45, $F = 37.29, P = 0.0005$) and the number of groups within a tree (ANOVA, df = 8, $F = 7.14, P = 0.0319$). Three trees without insects were excluded from the following analyses of group location and participation. Group positions were biased towards more terminal branches as described by Strahler and Botanical branch ordering systems (Strahler 1957; Wilson 1966, Fig 2). Number of branch meet-ups from most terminal branches (Strahler) was biased towards terminal branches, but position was not biased in the number of branch meet-ups from the trunk (Botanical). This is contrary to the expectation that groups are more likely to occur in positions on the tree which are more abundant, which would bias the number of groups both towards most terminal branches, and branches furthest from the trunk, as more positions are available at the exterior of the crown. These data show that bugs are distributed in terminal sites regardless of where terminal sites occur within the crown. The distribution of aggregations in the crown closely corresponds to where floral rods are produced within the crown (Fig 2).

Groups varied in size from 10 individuals to just over 300 (mean = 79.4, median = 63, 75% quartile = 85.5, 25% quartile = 37.5, SD = 68.71, SE = 10.24, $n = 45$) with individuals often positioned on top of one another. Group size did not change with height from ground or compass direction. All groups observed in the canopy occurred...
Fig. 1. Group of adult *Jadera haematoloma* in the canopy of a host Goldenrain tree (*Koelreuteria* sp.), Alachua County, FL, Jul 2009. Inset: Adult and nymphs of *J. haematoloma* from Mar 2009.
SUMMARY

Summer-diapausing adult *Jadera haematoloma* (Hemiptera: Rhopalidae) were observed forming non-mating stationary groups in the canopy of host trees following exhaustion of host seeds on the ground. Group position was biased towards the terminal leaves throughout the crown, corresponding to where flowers are produced. Groups dispersed within a week of the onset of host flowering.

REFERENCES CITED


