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The gall midge, *Spurgia esulae* Gagne (Diptera: Cecidomyiidae): Notes on biology and impacts of hymenopteran predators

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Life history characteristics of *Spurgia esulae*, including gall counts, immature counts, adult emergence, fecundity, and occurrence of a hymenopteran predator are examined. Experiments in 1993 are in progress and data presented are initial evaluations and are not the final results.

Gall counts were taken on 0.6m^2 quadrats randomly located within study plots. Three plots, reflecting habitat differences, were sampled periodically. Counts of immature midges were made on harvested galls by removing each leaf individually and recording the number of immatures. Adult midge emergence was recorded in the lab from harvested galls placed in vials containing water and held in cylindrical emergence. Predator activity and counts were made during dissections of galls and during observations of midge emergence. Female midges, collected from emergence chambers, were dissected to determine fecundity.

Gall counts were grouped according to first and second generation with additional counts reported strictly by date. Mean, 1992, first generation gall counts were 0.4, 0.12, 6.5 per 0.6m^2 within plots I, II, and III respectively. Mean, second generation gall counts were 1.0, 0.51, 18.0 per 0.6m^2 within the three plots, respectively. After the second generation peak, gall counts declined over time. No galls were observed on or after September 28, 1992. Mean, 1993, first generation gall counts for plots I, II, III are .68, .30, and 14.4 per 0.6m^2 respectively.

Counts of immatures averaged 6.7 per gall for the first generation and 5.4 per gall for the second generation in 1992. Increases in immatures per gall for the first and second generation, 11.0 and 26.7 respectively, have occurred in 1993.

Adult emergence in 1992 for the first and second generations averaged 4.2 and 2.2 adults per gall. Adult emergence for 1993 averaged 8.8 adults per gall. Adult females, dissected to determine fecundity, averaged 107.8 and 104.3 eggs for the first and second generation in 1992. First generation females averaged 100.8 eggs in 1993. *Zatropis nigroaeneus* Ashmead (Hymenoptera: Pteromalidae) was present in 6.8% of the galls in the first generation and 57.8% of the galls in the second generation in 1992. The occurrence

of *Z. nigroaeneus* was greatly reduced in 1993, with 0% occurrence in the first generation and 12% in the second generation.