

The Effect of Springtail (*Collembola sp.*) Presence on Isopod (*P. laevis*) Colony Growth at Different Initial Densities

Madison Karram

Supervisor: Dr. Joseph Travis

Hypothesis

Terrestrial isopod population growth will be more successful in the presence of springtails, with greater population numbers, and larger adult body sizes.

Background

- In terrarium keeping hobby, it is suggested that terrestrial isopods be kept with springtails, but research is sparse research supporting this claim. To investigate this, the impacts of springtail presence on isopod colony growth and success was observed.
- Isopod populations depend on the number and size of reproductive females available for mating, and the quality and quantity of their offspring is seen to be associated with their diet and intraspecific competition.
- Therefore, better soil conditions mediated the presence of springtails could allow isopods less competition and a more habitable environments. Therefore encouraging healthy offspring that mature into more large reproductive females, creating the possibility of better isopod colony growth in the presence of springtails.
- Here I focused on the terrestrial isopod *Porcellio laevis*, or ‘dairy cow’; a large non-conglobating isopod species in high humidity soil. *P. laevis* feeds primarily on decaying wood and leaf litter.
- The springtail species were white temperate springtails, *Collembola sp.*, which are prolific microarthropods soil decomposers and feed primarily on fungi.

Experimental Aims

1 **Census isopod population increase in the presence or absence of springtails at starting population densities of 5 or 15 individuals during a 3 month period.**

2 **Measure isopod adult body sizes in both conditions and identify relationships with population growth and springtail presence.**

3 **Identify microbial and fungal communities present in the soil in the presence and absence of springtails.**



Figure 1. *Porcellio laevis* (dairy cow) isopod individuals, juvenile to adult sizes. Juveniles develop the spotting pattern as they mature.

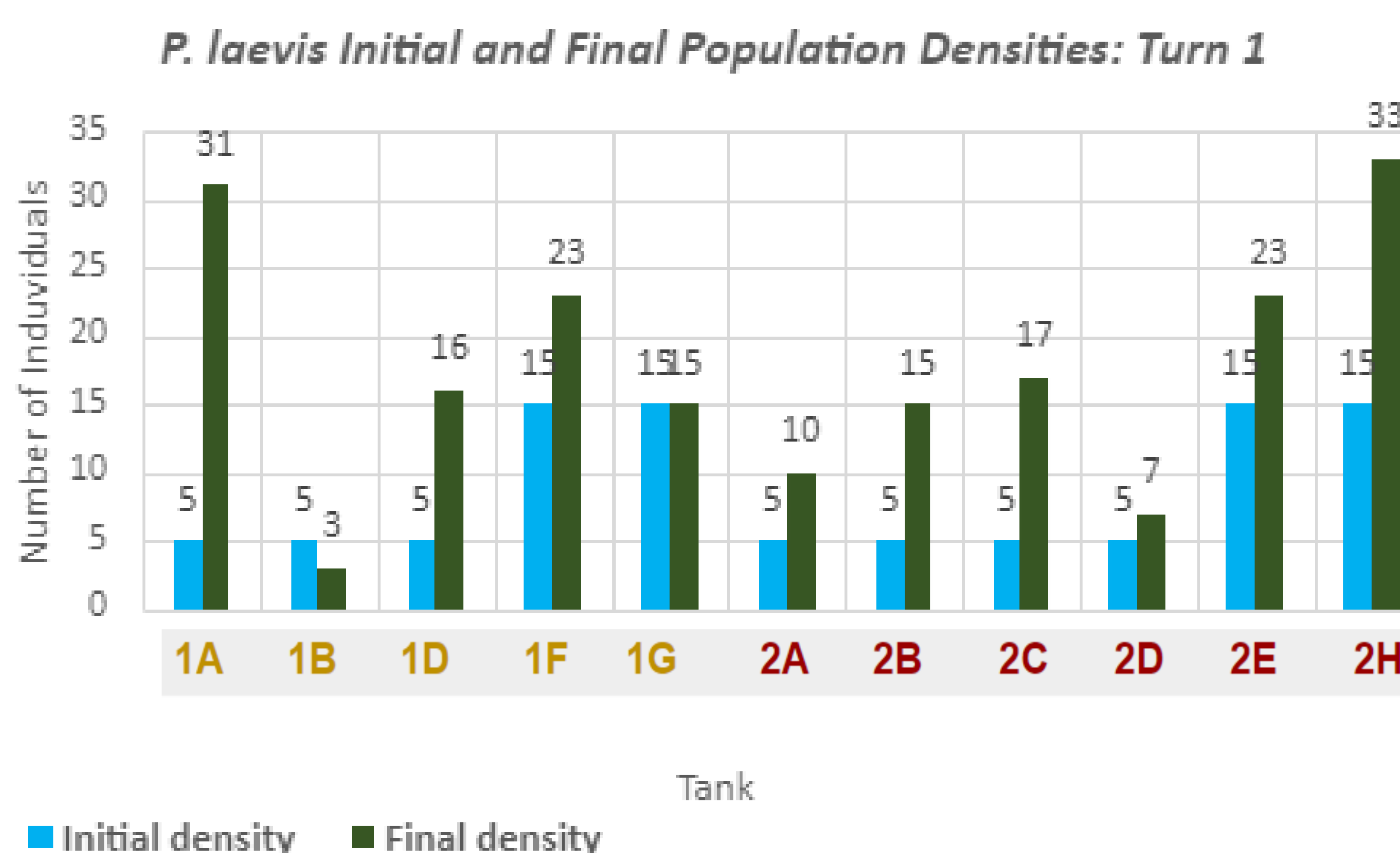


Figure 2. Graph displaying *P. laevis* census values in experiment's first turn, over a three month period. Blue bars represent initial density values, and green bars represent final average density values per tank. X-axis tank label color indicates springtail presence: yellow = without springtails, red = with springtails.

Approach

- Two turns of this experiment are being conducted in 3 month time frames, the first being last semester, and the second turn is ongoing currently.
- 8 tanks were set up in each condition, with or without springtails; and within the springtail conditions the tanks were divided into 5 or 15 starting isopod individuals of varying ages.
- Isopod adult body sizes were measured in centimeters at the beginning and end of each turn.
- A census of each tank's isopod populations were taken every two weeks using a scooping and counting method at random, to get an average amount of juveniles and adults per tank.
- The isopods sprayed automatically by a system daily, they were also fed weekly and supplemented with calcium powder bi-weekly.

Continuing Results

- Through the results collected from the first turn of the experiment, slightly higher average census values were seen when springtails were present, at both population densities.
- There were no significant differences in adult isopod body size measurements between both conditions or initial densities.
- In this turn, a few tanks in each condition were unsuccessful, and therefore caused some outliers. The second turn will provide more data with a larger census sample size for statistical analyses for the final report.

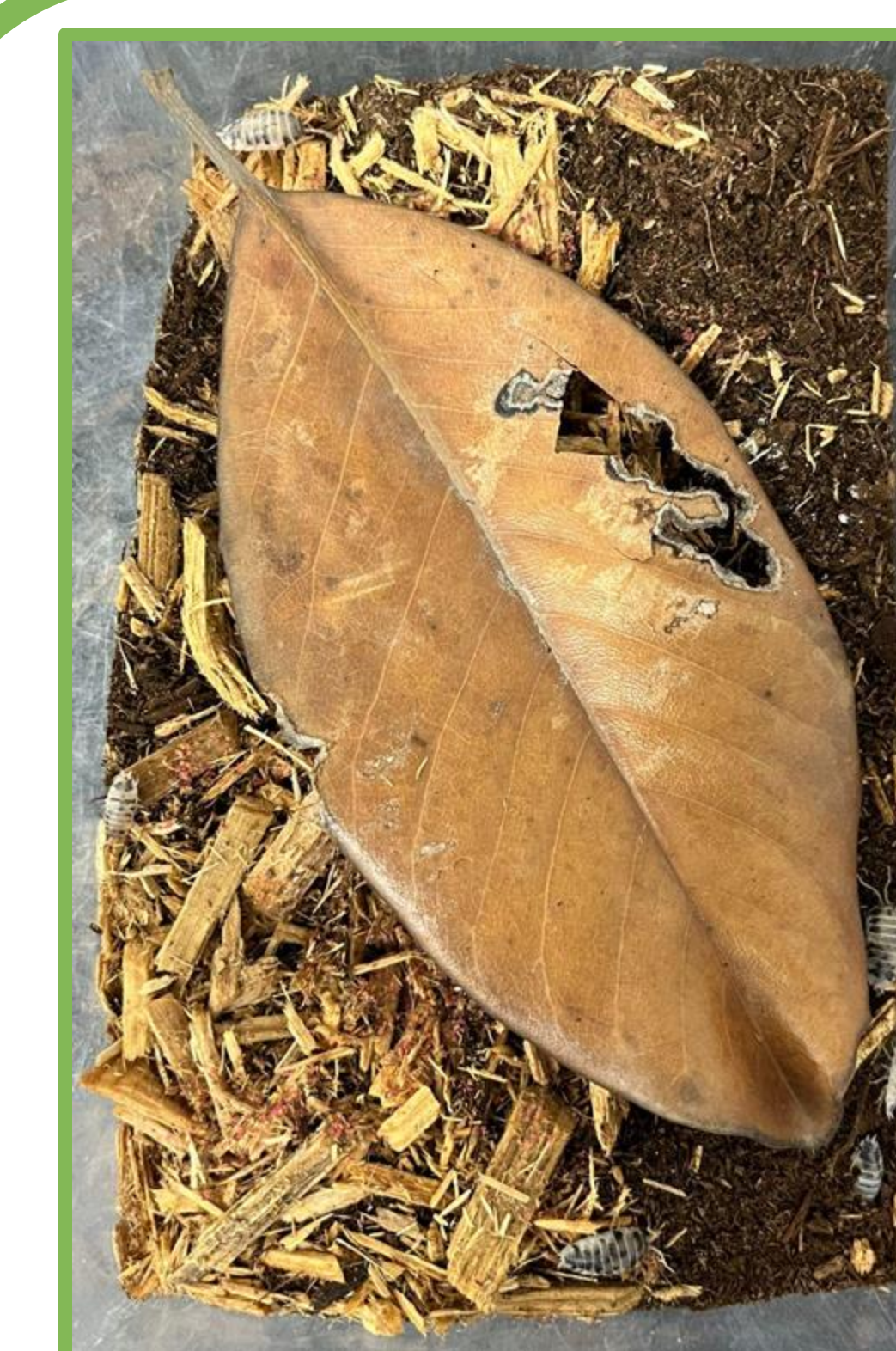


Figure 3. Experimental isopod tank setup: about 2 inches of soil, forest floor mulch, and leaf litter. The isopods will feed on leaf litter present.

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