

# Effect of Sex and Size on Dispersal Potential of the Common Woodlouse, *Armadillidium vulgare*

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## INTRODUCTION

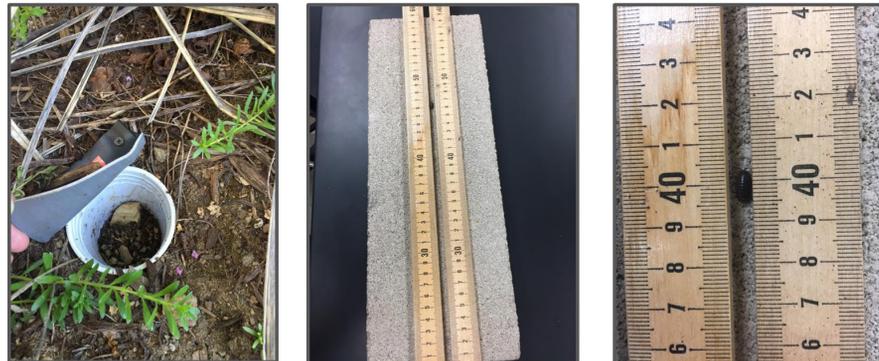
The species *Armadillidium vulgare*, commonly known as pill-bugs or roly-polys, are a common sight on the Grossmont College campus. They live in shady and/or moist soil especially under mulch and leaf litter (1). However, the campus landscaping patches are broken up into a highly fragmented landscape by the concrete sidewalks, pathways and buildings. We are interested in determining if the woodlice exist as a structured metapopulation or as a single-well mixed population.

This poster reports on our first project, estimating dispersal potential by measuring walking speed. We also wanted to know if demographic factors, such as sex or size, influenced walking speed so that individuals might differentially disperse.

## METHODS

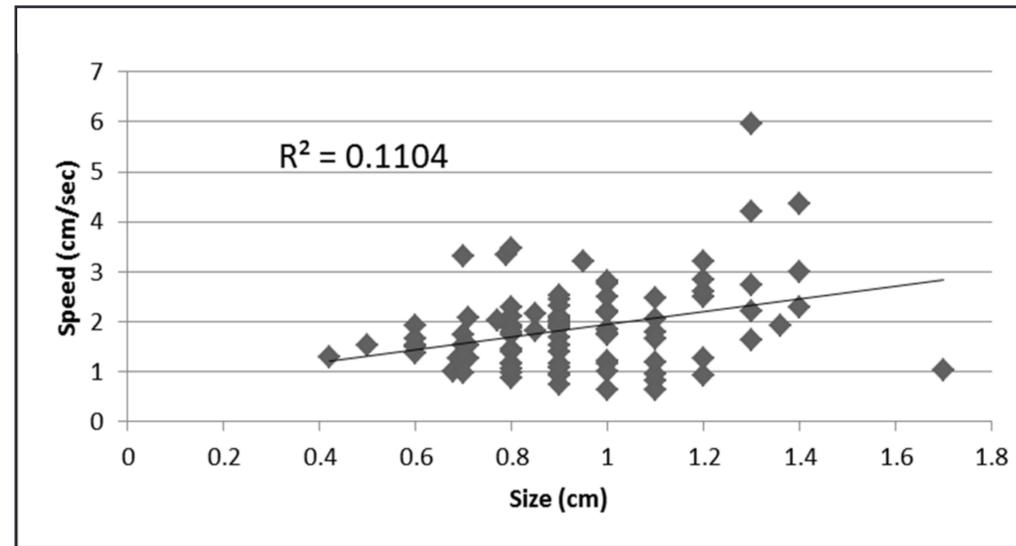
Woodlice were collected using pitfall traps at two locations on campus, because sufficient individuals to perform the experiment were not collected at one site. A total of 97 individuals were collected, sexed and measured. Each individual was placed between two meter sticks laid parallel and about 5 mm apart on a concrete paver. The time it took to walk 10 cm was timed by three different people, each at a replicate "raceway" setup. Most woodlice start to walk when placed next to a vertical surface, but if they did not, they were gently nudged with a paint brush until they did. All measurements were taken at room temperature.

The fastest of the three replicate measurements was used for each individual. The data were analyzed in R using a Two-Way Analysis of Covariance, with Sex and Location as the two factors and Size as the covariate.



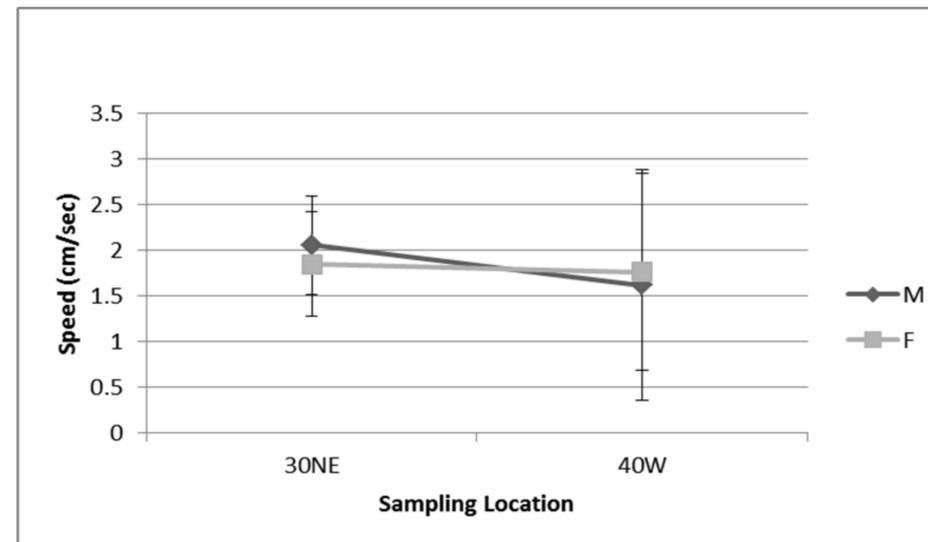
**Figure 1. Methods.** Left panel—Pitfall traps used to collect woodlice. Center panel—Concrete paver and two wooden meter sticks set up in raceway configuration. Right panel: Close up of woodlouse walking between the two meter sticks. Photos: N. Garcia

## RESULTS



**Figure 2. Effect of Size on Speed**

The average size of woodlice was  $0.93 \text{ cm} \pm 0.23 \text{ cm}$  (one standard deviation). The average speed was  $1.55 \text{ cm/s} \pm 2.78$ .



**Figure 3. Effect of Sex and Location on Speed**

There was no significant effect of sex on speed ( $p = 0.463$ ). There was a significant effect of location on speed ( $p = 0.021$ ) but there was no significant interaction between sex and location ( $p = 0.185$ ).



**Figure 4.** Google Earth map of the Grossmont College campus in El Cajon, CA. Sampling locations are indicated in yellow. The scale bar indicates 600m.

## CONCLUSIONS

- The average rate of walking was 1.55 cm/s.
- There was no significant effect of sex on speed. There was a small but significant effect of size on speed and of location on speed, but no interaction.
- Since the Grossmont College campus is approximately 600 m across, a determined roly poly could cross campus in less than 11 hours.
- Based on dispersal potential, the population on campus could be well-mixed rather than a metapopulation.

## ACKNOWLEDGEMENTS

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## LITERATURE CITED

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2. Hornung, E. (2011) Evolutionary adaptation of oniscidean isopods to terrestrial life: structure, physiology and behavior. **Terrestrial Arthropod Reviews** 4:95–130.