

Dynamics of Eusocial Mole-Rats

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What is Eusociality?

- ▶ Species lives in a colony with a division of labour between working and reproduction.
- ▶ Working includes tasks such as gathering food, protecting the colony, expanding the colony and feeding the young.
- ▶ The most well-known eusocial species are insects, however there two species of eusocial mole rat.

Naked Mole-Rats

- ▶ Naked mole-rats have a single queen in each colony of around 20-300 members.
- ▶ They live for up to 30 years, with the probability of death seemingly unaffected by age.

The Model

- ▶ Discrete time stochastic model where each time step is a quarter of a year.
- ▶ Population split into three parts: queens, workers and juveniles.
- ▶ Queens reproduce, workers gather resources, juveniles mature into workers.
- ▶ If there are insufficient resources, members of the colony die.
- ▶ If the queen dies, a worker assumes the role of queen.