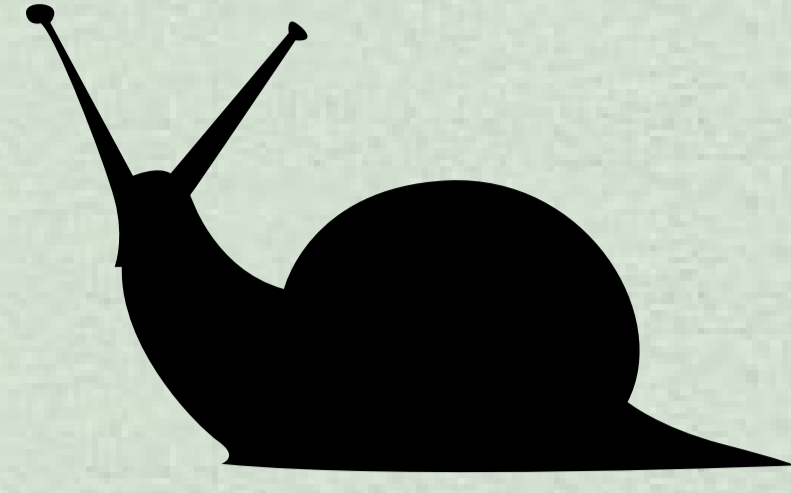
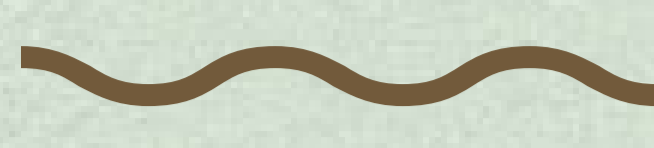
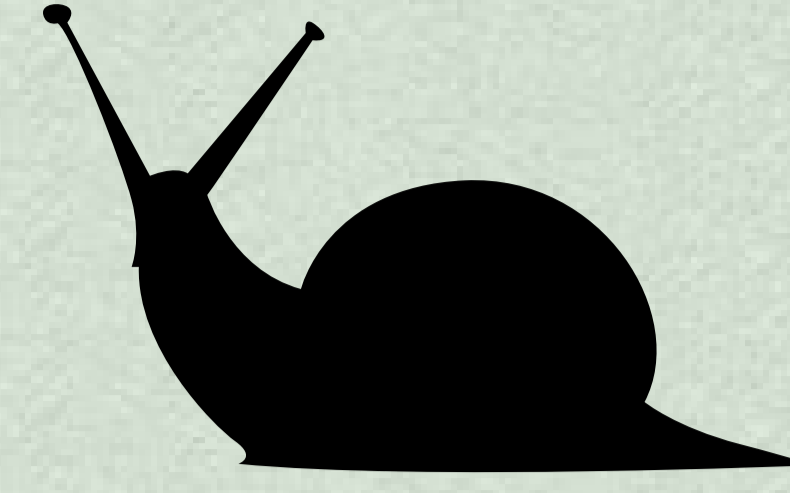


# Snails: Does size matter?



What makes snail mating so unique?  
 What do snails look for in mates in terms of size?  
 Do all snail species have the same size preferences for mates?



## Snail mating - background

- Snail mating involves an active partner and a passive partner
  - The active partner (usually male or plays the male sex role in hermaphrodites) searches for a passive partner (usually female or plays the female role in hermaphrodites) and initiates mating<sup>1,2,3,4</sup>
- Snail mating often consists of three main stages:
  - **Follow mucous trail:** active partner only follows the mucous trail left behind by their chosen mate<sup>4,5</sup>
  - **Shell mounting:** active partner climbs onto shell of their chosen passive partner to claim them<sup>4,5</sup>
  - **Copulation:** passive partner receives and stores the sperm donated by the active partner<sup>4,5</sup>



"*Arianta arbustorum* (fi. Lehtokotilo, sv. Fläcklundsnačka, no. Krattsnegl)" by talaakso is licensed under [CC BY-SA 2.0](#)



"@\_ .gif" by marc kjerland is licensed under [CC BY-SA 2.0](#)

## Size and mate selection

- Size has generally been considered to be an important trait in snail mate selection<sup>1,2,3,6,7</sup>
- Active partners can be choosy of passive partners based on their size<sup>1,2,3,6,7</sup>
- Size preference has been evidenced to vary among snail species<sup>1,2,3,4,5,6,7</sup>
- Some species seemingly do not have mate size preferences<sup>8,9,10</sup>

## Choosy for larger mates

- Snail species such as *Littoraria flava* (gonochoristic marine snail) and *Succinea putris* (gonochoristic land snail) prefer relatively larger mates<sup>1,2</sup>
- There has been ample evidence that size positively correlates with fecundity (more reproduction), more egg production, and higher sperm storage<sup>1,2,6,9,10</sup>
  - Individuals may choose relatively larger mates to increase their own reproductive success<sup>1,2,3,4,6,9,10</sup>



"*Succinea putris*" by Ryszard I is licensed under [CC BY-NC 2.0](#)



"Two Snails by the River" by rhyttinen is licensed under [CC BY 2.0](#)

## Size-assortative mating

- Size-assortative mating: a mating pattern where mates are of similar size to one another<sup>3</sup>
- Snail species such as *Radix lagotis* (hermaphroditic pond snail), *Littoraria arduiniana* (gonochoristic mangrove/water snail), and *Bradybaena pellucida* (hermaphroditic land snail) prefer mates of similar sizes to themselves<sup>3,6,7</sup>
- Size-assortative mating might be adopted to avoid/reduce mechanical and physical constraints<sup>8,9</sup>
  - Shorter copulatory organs were found in some smaller individuals<sup>8</sup>
  - Shorter copulatory organs may impede efficient and successful copulations with larger mates<sup>8</sup>
  - Might be more efficient to stick with a similar-sized mate to maximize copulation success<sup>7,8,9</sup>

## Size doesn't matter

- Snail species such as *Bulla gouldiana* (hermaphroditic marine snail), *Lymnaea stagnalis* (hermaphroditic pond snail), and *Arianta arbustorum* (hermaphroditic land snail) do not select mates based on size<sup>8,9,10</sup>
- Either size does not matter, mating is random, or there is another trait that influences mate preferences<sup>8,9,10</sup>
- Baur (1992) proposed that land snails (ex. *Arianta arbustorum*) mate randomly to decrease risks of predation and desiccation during mate searching<sup>9</sup>



"Cloudy Bubble Snail - *Bulla gouldiana*" by Robin Agarwal (ANudibranchMom on iNaturalist) is licensed under [CC BY-NC 2.0](#)

## Why do different snail species have specific size preferences?

- There's no clear pattern nor explanation for why snail species choose mates the way that they do
  - ex. marine/water snails have provided examples for both choosy for larger mates and size-assortative mating
- Baur (1992) suggested that land snails are prone to more risks in their environment compared to water snails (ex. more predation and desiccation)<sup>9</sup>
  - Land snails could be less choosy and choose the most convenient mate rather than the most optimal one to reduce risks<sup>9</sup>
  - Newer studies have observed that water snail species can also adopt random mating/mate selection irrespective of size
- Future approaches: finding definitive mechanisms to explain these mating behaviors<sup>6,10</sup>

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