I have included 10 articles in this topic summary.

Topic Summary:

Snail mating involves an active partner (typically male or a hermaphrodite playing the male sex role) and a passive partner (typically female or a hermaphrodite playing the female sex role) (Cardoso et al., 2007; Dillen et al., 2010; Ng & Williams, 2014; Saltin et al., 2013). The active partner searches for a passive partner and then it initiates mating (Dillen et al., 2010; Saltin et al., 2013). There are three stages of snail mating: 1) active partner only follows the mucous trail of their chosen passive partner, 2) shell mounting (active partner climbs onto passive partner's shell to claim it) and 3) copulation (Nakadera & Koene, 2013; Ng & Williams, 2014; Saltin et al., 2013).

Land and water snails (gonochoristic and hermaphroditic) may select their mating partners based on size preferences (Chaine & Angeloni, 2005). Size of mating partners may be important to snails; however, the explanations behind this are still debatable. Researchers interested in understanding snail size preferences in their mates observed and compared the shell sizes (height, volume, or length) between two mating partners and recorded mating durations. Researchers have found two main mating behaviors based on size observed across several snail species. Three snail species that were observed supported that active partners select relatively larger passive mates (Cardoso et al., 2007; Dillen et al., 2010; Saltin et al., 2013). Three other snail species observed supported that active partners choose mates of relatively the same size (i.e., size-assortative mating) (Kimura et al., 2015; Ng & Williams, 2014; Yu & Wang, 2013). Two species have even been observed to adopt both mating behaviors; however, had a stronger preference for one of the behaviors (Kimura et al., 2015; Ng & Williams, 2014). Additionally, there was evidence of three species that selected mates irrespective of size (Baur, 1992; Chaine & Angeloni, 2005; Koene et al., 2007). This indicates that there is no clear mating pattern based on size observed in snails.

It has been speculated that land snails are generally less choosy than water snails since they are susceptible to more risks such as desiccation and predation from their particular environment during mate searching (Baur, 1992). Therefore, it is possible that active land snails are less choosy because they try to mate quickly to decrease risks rather than invest a lot of resources and time into searching for the most optimal mate (Baur, 1992).

An influence on this behavior is evolution. Some snail species might prefer relatively larger mates because size positively correlates with fecundity and more sperm storage (Cardoso et al., 2007; Chaine & Angeloni, 2005; Dillen et al., 2010; Kimura et al., 2015; Koene et al., 2007; Ng & Williams, 2014; Saltin et al. 2013). Many studies confirmed that larger females and hermaphrodites produce more eggs than their smaller counterparts (Dillen et al., 2010; Kimura et al., 2015; Koene et al., 2007). Therefore, some snail species may have evolved to select relatively larger mates to maximize their reproductive success. However, this mechanism behind choosing larger mates remains to be definitive. In other snail species that adopt size-assortative mating, they might have evolved to prefer mates of a similar size to themselves due to mechanical constraints. For example, in *Radix logotis*, smaller individuals had shorter copulatory organs (Yu & Wang, 2013). This made it challenging for smaller individuals to

inseminate significantly larger individuals; therefore, smaller *Radix logotis* may select similar-sized mates for successful copulations (Kimura et al., 2015; Koene et al., 2007; Yu & Wang, 2013). Similarly, in *Bradybaena pellucida*, there was evidence that mating is possible between individuals that significantly differed in size; however, the researchers presumed that mechanical constraints such as length of copulatory organs impeded efficient copulation between two different-sized individuals (Kimura et al., 2015). Therefore, this constraint could explain why *B. pellucida* prefer size-assortative mating (Kimura et al., 2015). Although there is evidence that vast size differences between two individuals can hinder mating due to mechanical constraints, it remains inconclusive if this is the driving force for size-assortative mating (Yu & Wang, 2013).

Through reviewing these ten articles, future research includes finding definitive mechanisms for why some snail species prefer relatively larger mates while others adopt size-assortative mating or seemingly choose mates irrespective of size.

Word count: 699

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