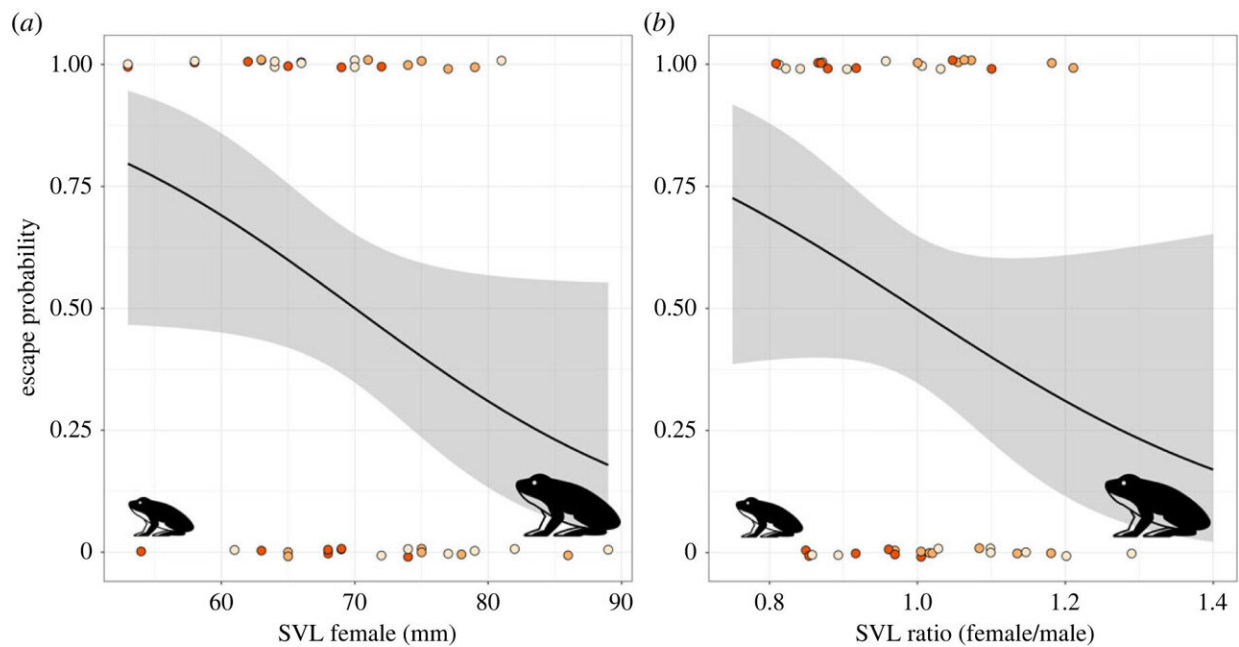


# Female common frogs fake death to get rid of males

October 11 2023, by Gesine Steiner



(a) Escape probability of female common frogs during avoidance behavior as a function of female body size (SVL), or (b) the female-to-male SVL ratio. Dots represent individual females and their respective avoidance behavior, light orange = rotating, orange = rotating and calling, red = rotating, calling and tonic immobility. Dots are jittered for better visibility. Credit: *Royal Society Open Science* (2023). DOI: 10.1098/rsos.230742

A new study shows that, contrary to previous assumptions, female common frogs can reject males and have developed a variety of mate

avoidance behaviors to do so. The research was led by Carolin Dittrich and Mark-Oliver Rödel from the Museum für Naturkunde in Berlin and was published in the open access journal [Royal Society Open Science](#).

Explosive breeding species are frogs or toads with a very short reproductive period. Breeding is usually limited to a few days to two weeks in [early spring](#). During this time hundreds to thousands of animals gather at a pond. The females must grow older to breed and are often unable to breed every year, but the males still gather at the pond every year. Thus, the males outnumber the females by a large margin and compete for the rarer sex.

The males are not choosy and will cling to anything that moves with great vigor. If another male is caught, he will give a "release-call" to indicate the mistake to the grabbing male. It was previously thought that the females in these spawning aggregations could not defend themselves against male coercion. It is not uncommon for many [males](#) to cling to a single female, forming a "mating ball." The female often dies in the process. Dittrich and Rödel have now shown that females do know how to defend themselves using very different behaviors.

The most common [behavior](#) used by females to escape the male's grip was to turn around her axis. The researchers also observed females uttering two different calls: a deeper, lower-frequency "grunt" that mimics the male's "release" call, and a higher-frequency "squeak."

The meaning of the latter is so far unclear. The final and most astonishing behavior was tonic immobility, commonly known as feigning death, in which females stiffly extend their arms and legs away from their bodies and remain immobile until the male releases them.

"Tonic immobility in the context of mating is exceptional and very rarely observed. I know of only a few studies that have found tonic immobility

associated with mating, for example in spiders or dragonflies. It is generally assumed that this strategy is used as a last resort to avoid predation," says Dittrich.

Rödel adds, "We therefore suspect that this defensive behavior has evolved to protect the female from the formation of 'mating balls,' which can often lead to the death of the female. Calling allows females to show that they are not ready to mate, and if this is of no use, stressed [females](#) can fall into tonic [immobility](#)."

Dittrich says, "Our study shows impressively that even very common and well-studied native species can still hold big surprises."

**More information:** Carolin Dittrich et al, Drop dead! Female mate avoidance in an explosively breeding frog, *Royal Society Open Science* (2023). [DOI: 10.1098/rsos.230742](https://doi.org/10.1098/rsos.230742)

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