

## Phylogenetically conserved courtship signalling in web-building spiders

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Courtship can serve many functions, including the provision of information on species identity, mating status and mate quality. Web-building spiders are an excellent model system for understanding how courtship communication systems evolve, as much of their communication occurs within a clearly defined boundary - the web. However, web-building spiders have very poor vision, and so female spiders cannot visually discriminate a potential mate in the web from potential prey. As a result, a female may attack males when they enter her web. We have identified a vibratory signal (the 'shudder') that reduces female aggressive predatory responses during courtship. Evidence indicates that these shudder signals are phylogenetically conserved, but to date we are unsure of the degree of conservation. This is particularly important to discover, as courtship communication is often a species isolation mechanism. We tested whether courtship shudders can function across family-level boundaries. Results indicate that while shudders are conserved, some identification information also appears to be encoded within these vibrations. We compared the structure of shudder vibrations across web-building spiders, and found several key components that likely to delineate male vibrations from prey vibrations in the web. We also examined the relationship between male courtship characteristics and measures of female aggression (e.g. sexual cannibalism). These results provide insight into the selection pressures facing the evolution of communication systems in web-building spiders.

