Lizards “wave their arms” and move their tail to monitor predators

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Abstract: Tail undulation or vibration and waving of both forelegs (often called “hand waving”) are two of the displays commonly used by lizards. Researchers interpreted these displays as having various anti-predator functions. According to one suggestion (the predator-monitoring hypothesis, Magnusson 1996) lizard’s tail and hand waving may serve as a stimulus for predators to attack by creating a movement illusion while the lizard is sedentary and able to detect a predator. So far, this hypothesis has not been tested. We observed 94 *Acanthodactylus schreiberi* in Mediterranean coastal dunes and recorded 1385 arm waving cases and 1382 tail displays that were performed while no predator was nearby. We concentrated on the cases with no predators in order to determine whether these displays are consistent with the distinctive predictions of the predator-monitoring hypothesis. Lizards’ arm waving and tail display were highly associated. As predicted by the predator-monitoring hypothesis, arm waving was highly associated also with movement: most of the arm-waving cases were conducted by the lizards in short pauses while moving or a few seconds before starting to move. Furthermore, arm waving and tail displays were related to predation risk: individuals that use more risky foraging (i.e., juveniles and individuals in active dunes) performed tail display and/or arm waving more frequently than individuals that use safer foraging. Both the timing of the arm display and its high association with tail display and with risky foraging support the hypothesis that under the circumstance observed, the display is used to monitor potential predators.