be a recurring phenomenon in certain populations. Additional field observations are needed to determine the adaptive significance, if any, of this phenomenon.

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***NECTURUS MACULOSUS* (Common Mudpuppy). LARVAL GUARDING.** Larval defense and attendance of eggs and young by adults is a widespread behavior among salamanders (Petranka 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington, D.C. 587 pp.). During salamander surveys in the Licking River watershed, Rowan Co., Kentucky, USA (precise locality withheld due to conservation conerns), we observed two separate instances of adult *N. maculosus* attending broods of larvae at different stages of development between 1045 h and 1150 h on 11 September 2013. Both aggregations were found by lifting large flat rocks in a stream approximately one meter in depth. The first adult *N. maculosus* (22 cm SVL) was in attendance of at least 32 larvae ranging from 4–5 cm in total length and the second adult *N. maculosus* (19 cm SVL) was in attendance of at least 25 larvae approximately 3–4 cm in total length. When initially uncovered, both females were coiled around a tightly aggregated group of larvae at the center of the space under the cover rock. Remnants of hatched eggs were evident on the underside of the rock concealing the smaller larvae, but were not detected under the other rock.

Adult *Necturus* have been reported to attend and guard clutches of eggs on the undersides of submerged flat rocks through hatching (Bishop 1941. New York State Mus. Bull. 324:13–65), but to our knowledge this is the first reported instance of larval attending in this species. We feel confident in describing these observations as larval attending rather than recently hatched nest guarding behavior because Bishop (1941, *op. cit.*) described *Necturus* hatchlings as measuring between 2.1–2.5 cm total length and our observed larvae were larger at approximately 3–5 cm total length. Breeding season and date of oviposition vary across the range of *N. maculosus*. Because larvae were found in September in this part of the range, copulation in central Kentucky may occur in the spring and eggs may be deposited in early to mid- summer. Larval *Necturus* may face strong predation pressures from fish, crayfish, invertebrates, and conspecifics, and the expression of larval attendance phenotypes in this species may be more prevalent in portions of the range where egg hatching coincides with low water levels and higher predator densities.

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***NOTOPHTHALMUS VIRIDESCENS* (Eastern Newt). SPERM MOTILITY.** Amphibian sperm have received considerable attention in recent years because of the possibility of conserving genetic information and the propagation of threatened taxa. However, our understanding of sperm physiology in amphibians is rather limited, even on sperm in taxa that have been investigated for the explicit purpose of understanding sperm physiology.

Sperm transport and activation in male *N. viridescens* were studied in detail by Hardy and Dent (1986a. J. Exp. Zool. 240:385–396; 1986b. J. Morphol. 190:259–270). They reported that sperm were immotile in the Wolffian ducts and motile in the periphery of the spermatophore cap (also confirmed in Ambystomatidae and other salamandrids; Russel et al. 1981. Tiss. Cell. 13:609–621; Zalisko et al. 1984. Copeia 1984:739–747). Thus, activation of newt sperm must take place during, or immediately preceding, spermatophore formation. Hardy and Dent (1986a, *op. cit.*) concluded exposure of the spermatophore to pond water (hypoosmotic shock) was the initiating factor for axoneme activation and that sperm motility alone did not account for sperm reaching the simple spermathecae in female *N. viridescens* because sperm in natural inseminations traveled as far as 5 mm in less than 2 minutes. This distance could not possibly be traversed by sperm activated by hypoosmotic shock (Hardy and Dent 1986a, *op. cit.*). Thus, another mechanism modulating sperm swimming speed (or degree of activation) must be present.

While testing hypotheses on the function of secretions from the sexual collecting ducts of *N. viridescens* (see Siegel et al. 2012. J. Herpetol. 46:136–144), we observed an interesting finding: sperm are motile in the Wolffian ducts of *N. viridescens*. This finding contradicts the previous findings of Hardy and Dent (1986a, *op. cit.*). We examined freshly excised sperm from the Wolffian ducts of ten male *N. viridescens* captured on 05 November 2011 from Crawford Co., Missouri (37.94774°N, 91.16793°W; WGS 84). Specimens were euthanized with a lethal dose of MS-222 before sperm excision. We can only conclude that the error by Hardy and Dent (1986a, *op. cit.*) was due to examining desiccated sperm at the periphery of their sperm preparations.

Sperm in the Wolffian ducts of *N. viridescens* are motile, at least during November, in specimens collected from Missouri. Interestingly, Hardy and Dent (1986a, *op. cit.*) also collected salamanders in November. Historic studies on other salamander taxa also noted motility of sperm from the Wolffian ducts; e.g., Smith (1907. Contr. Zool. Lab. Univ. Michigan 109:5–39) stated in reference to sperm from the Wolffian ducts of *Cryptobranchus allegheniensis*, "the spermatozoa were motile; the motion of the shaft is slow as compared with other forms, but that of the undulating membrane is rapid." Smith (1907, *op. cit.*) noted that sperm remained motile longer in seminal fluid mixed with water (4 h) than in water alone (15 min), indicating that pure water might actually have an inhibiting effect on sperm motility. Smith (1907, *op. cit.*) also noted that sperm were not motile from the Wolffian ducts outside of the mating season. Moreover, it has long been suggested that the male excurrent ducts are the sites for maturation of salamander sperm (McLaughlin and Humphries 1978. J. Morphol. 158:73–90; Matsuda 1986. Gam. Res. 14:209–214), and it appears that this maturation includes activation of the axoneme in *N. viridescens*. From a study on *Ambystoma texanum* (Russell et al. 1981, *op. cit.*), sperm activation apparently takes place in the distal portion of the Wolffian ducts, as whorls of motile sperm were described. Sperm were not active more proximally. Furthermore, it has also been proposed that secretory activity of the Wolffian duct epithelium may act to sustain sperm motility while stored (Zalisko and Larsen 1988. Scan. Micro. 2:1089–1095).

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SUPPLEMENTARY MATERIAL: For a video of sperm excised directly from the Wolffian ducts of *Notophthalmus viridescens*, contact D. Siegel (dsiegel@semo.edu). In the video, motility of the entire mass of sperm and many sperm tails is obvious.