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NATURAL HISTORY NOTE

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Observation of nuclear-follower foraging behaviour between a snapping turtle *Chelydra serpentina* and a smallmouth bass *Micropterus dolomieu*

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Nuclear-following behaviour is described as an interaction among aquatic animals where one 'nuclear' species forages on the benthos by disturbing substrate and one or more other 'follower' species follows for the purposes of consuming prey that are purposely or incidentally displaced by the nuclear species (Lukoschek & McCormic, 2002). Although this phenomenon has commonly been described in marine species (Lukoschek & McCormic, 2002; Krajewski, 2009) few observations appear to have been published involving freshwater turtles. Platt & Rainwater (2021) observed instances of nuclear following behaviour among spiny softshell turtles *Apalone spinifera*, largemouth bass *Micopterus salmoides* and sunfish *Lempomis* spp. Herein, I describe an observation of nuclear-following behaviour between a snapping turtle *Chelydra serpentina* and a smallmouth bass *Micropterus dolomieu* in eastern Pennsylvania, USA.

On 3 July 2024 at approximately 15:00 h, I observed a behavioural interaction consistent with nuclear-following behaviour between an adult *C. serpentina* (estimated carapace length 30 cm) and an adult *M. dolomieu* (estimated total length 30 cm) in the North Branch Susquehanna River in the village of Mifflinville, Columbia County Pennsylvania, USA (41° 02'06.1" N, 76° 18'38.5" W). While bicycling across a bridge spanning the river at this location, I stopped to view the river and noticed the *C. serpentina* in the river directly below the bridge in a shallow sand/gravel bar submerged in approximately 30 cm of water. I observed the turtle for approximately five minutes, and during this entire time it slowly probed the benthos with its mouth, stirring up sediment in the process, apparently foraging for an unidentified food source (possibly aquatic molluscs, which are common in the North Branch Susquehanna River and are a known food source for *C. serpentina*; Ernst & Lovich, 2009; Dillon et al., 2019). While engaged in this behaviour, a single adult *M. dolomieu* closely followed the turtle during the entire duration of this observation, and consistently appeared to consume small aquatic organisms displaced by the turtle's disturbance of the substrate (possibly crayfish, a typical dietary item for *M. dolomieu* in Pennsylvania; Stauffer et al., 2016). The turtle did not interact aggressively with the bass and appeared undisturbed by its presence. Both species moved together along the substrate approximately 10 m during the course of this observation, before both became obscured from my view as they moved underneath the bridge.

To the best of my knowledge, this observation appears to be the first report of nuclear-following behaviour between *C. serpentina* and *M. dolomieu* and may be the first report of this phenomenon in *C. serpentina*. This observation, along with those published for *Apalone spinifera* by Platt & Rainwater (2021) may suggest that nuclear following behaviour is more common among freshwater turtles and centrarchid fishes than was previously realised and warrants further study.

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REFERENCES

Dillon Jr, R.T., Ashton, M.J., Reeves, W.K., Smith, T.P., Stewart, T.W. & Watson, B.T. (2019). *The Freshwater Gastropods of North America, Volume 1: Atlantic Drainages Georgia through Pennsylvania*. Freshwater Gastropods of North America Press, Charleston, South Carolina. x + 199 pp.

Ernst, C.H. & Lovich, J.E. (2009). *Turtles of the United States and Canada, 2nd Edition*. The Johns Hopkins University Press, Baltimore, Maryland. xii + 827 pp.

Krajewski, J.P. (2009). How do follower reef fishes find nuclear fishes? *Environmental Biology of Fishes* 86: 379–387.

Lukoschek, V. & McCormick, M.I. (2002). A review of multi-species foraging associations in fishes and their ecological significance. *Proceedings 9th International Coral Reef Symposium* 9: 467–474.

Platt, S.G. & Rainwater, T.R. (2021). Observations of a nuclear-follower foraging association between Spiny Softshell Turtles (*Apalone spinifera*) and fish in an urban drainage canal in Louisiana. *Southeastern Naturalist* 20: N108–N114.

Stauffer Jr, J.R., Criswell, R.W. & Fischer, D.P. (2016). *The Fishes of Pennsylvania*. Cichlid Press, El Paso, Texas. 556 pp.

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