

## Uncovering the role of the ilio-sacral joint in frogs

October 10 2018, by Bob Yirka



Lithobates sylvaticus found in southern Quebec. Credit: Wikipedia/CC BY 3.0

A trio of researchers, two with the Royal Veterinary College, the other



the University of Portsmouth, has found evidence that suggests that the ilio-sacral joint in frogs evolved after they started jumping. In their paper published in the journal *Biology Letters*, Christopher Richards, Enrico Eberhard and Amber Collings describe their study of the joint and what they found.

Jumping <u>frogs</u> have an ilio-sacral joint in their pelvis that works like a hinge when they engage in jumping. It allows them to sit comfortably bent over while in a crouched position and to straighten their backs completely when jumping. Despite previous studies of frog anatomy, it has not been clear just how much of an impact the ilio-sacral joint has on a frog's ability to jump. In this new effort, the researchers in the U.K. designed experiments to clear up the mystery.

To learn more about how the ilio-sacral joint works in frogs, the researchers filmed several specimens using a high-speed camera as they went through their jumping motions. The team then created a computer simulation that showed how the joint works while in action. Doing so allowed the team to tweak conditions to learn more about how the frog actually uses its joint under different circumstances.

The simulations showed that the joint was not actually necessary for jumping—the frog's powerful legs ensured strong leaping regardless of whether it had an ilio-sacral joint. But such a joint did give them much more directional control. The muscles and tendons near the joint allowed the frog to fine-tune its jumping direction as it shot into the air.

The researchers suggest that because the joint is not actually necessary for jumping, it is likely that it developed after the frogs started jumping—not concurrently. They also note that prior <u>work</u> by others studying frog fossils suggests that the ilio-sacral joint in frogs evolved independently in thousands of species. They further suggest that their findings could have implications for engineers designing prosthetics,



perhaps offering clues on how to design arms that have higher precision when reaching for objects, for example.

**More information:** Christopher T. Richards et al. The dynamic role of the ilio-sacral joint in jumping frogs, *Biology Letters* (2018). <u>DOI:</u> <u>10.1098/rsbl.2018.0367</u>

## © 2018 Phys.org

Citation: Uncovering the role of the ilio-sacral joint in frogs (2018, October 10) retrieved 28 April 2024 from <u>https://phys.org/news/2018-10-uncovering-role-ilio-sacral-joint-frogs.html</u>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.