

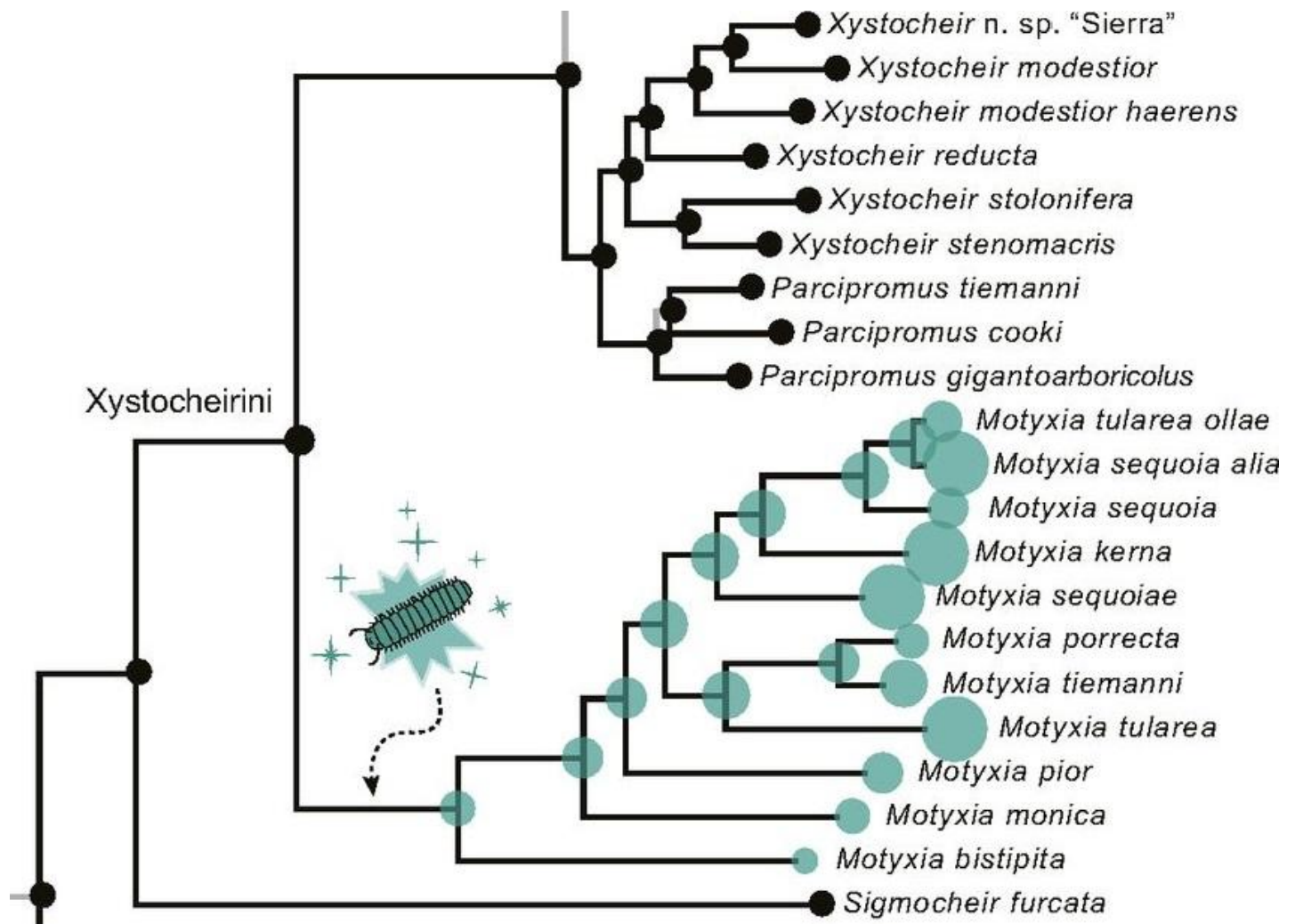
Bioluminescence in Nocturnal Millipedes (*Motyxia*)

In the Sierra Nevada Mountains of California, bioluminescent millipedes exist in eight nocturnal species of the genus *Motyxia*. The function of luminescence in *Motyxia* remains uncertain.

The essential question scientists are trying to answer is:

Did luminescence evolve multiple times or just once?

The figure below shows the phylogenetic tree of millipede taxa¹.



¹ Marek et al. (2011) Bioluminescent aposematism in millipedes. *Current Biology*, 21, R680-R681. [\[Open access\]](#)

Essential Question: Did bioluminescence evolve multiple times or just once in bioluminescent millipedes?



Your Claim:

Your Evidence

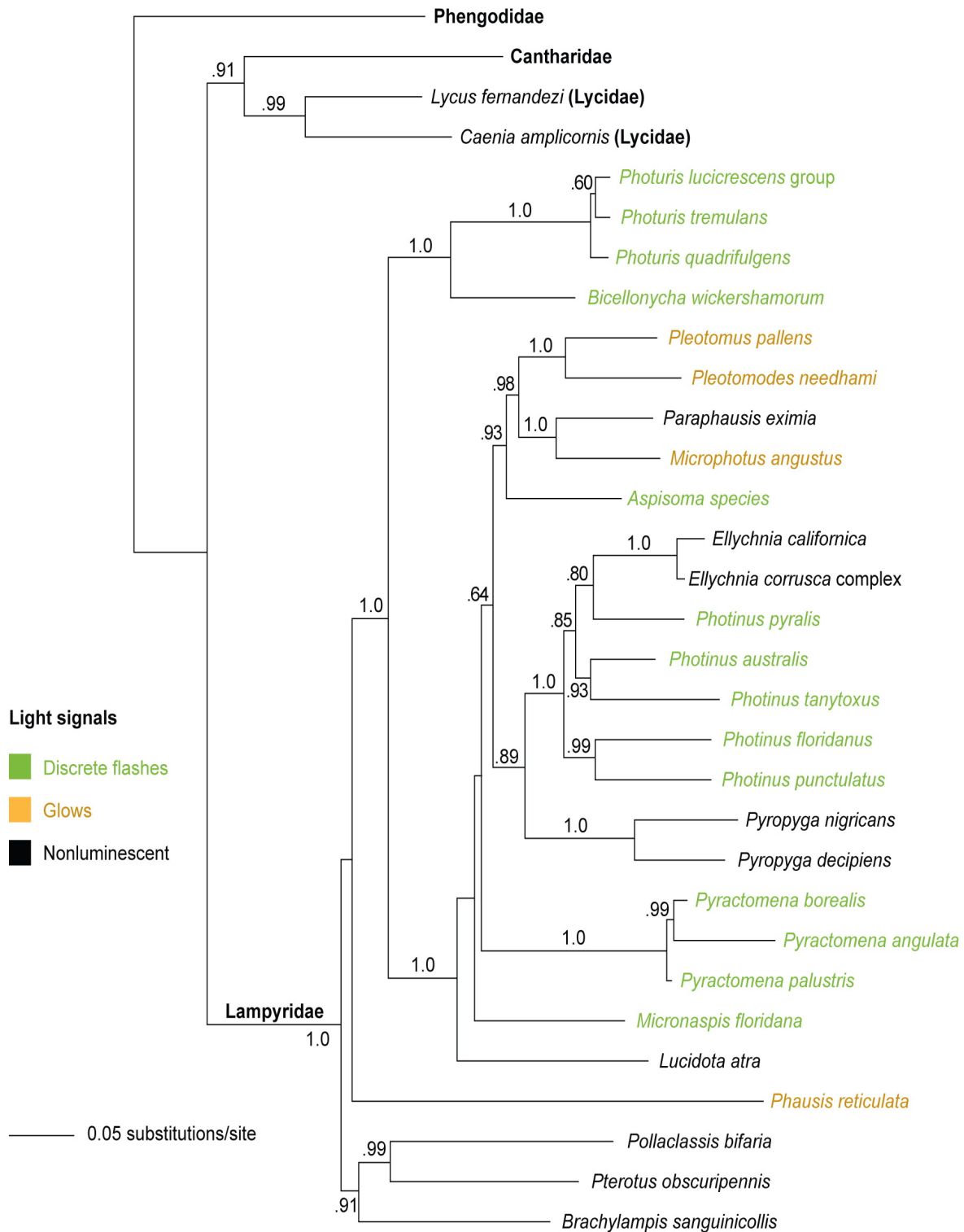
Is this an example of convergent evolution or of a descended adaptation from a direct common ancestor? Can it be both? Defend your position with evidence.

Make a **prediction** of one evolutionary advantage bioluminescence might serve in these nocturnal millipedes

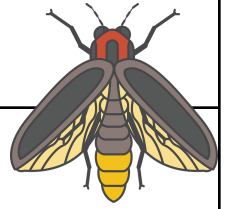
Place an arrow on the tree either showing a single origin or multiple origin for bioluminescence.

Bioluminescence in Fireflies - Fireflies (Coleoptera: Lampyridae) are one of the most common bioluminescent organisms in North America. One suggested benefit of firefly flashing is sexual selection by females. One drawback to this is predatory fireflies will prey on males who flash too predictably or too long.

The essential question is: *Did bioluminescence evolve multiple times or just once in fireflies?*



Essential Question: Did luminescence evolve multiple times or just once in fireflies?



Your Claim:

Your Evidence

Is this an example of convergent evolution or of a descended adaptation from a direct common ancestor? Can it be both? Defend your position with evidence.

Make a **prediction** of one evolutionary advantage bioluminescence might serve in these fireflies. s

***Place an arrow** on the tree either showing a single origin or multiple origin for bioluminescence.