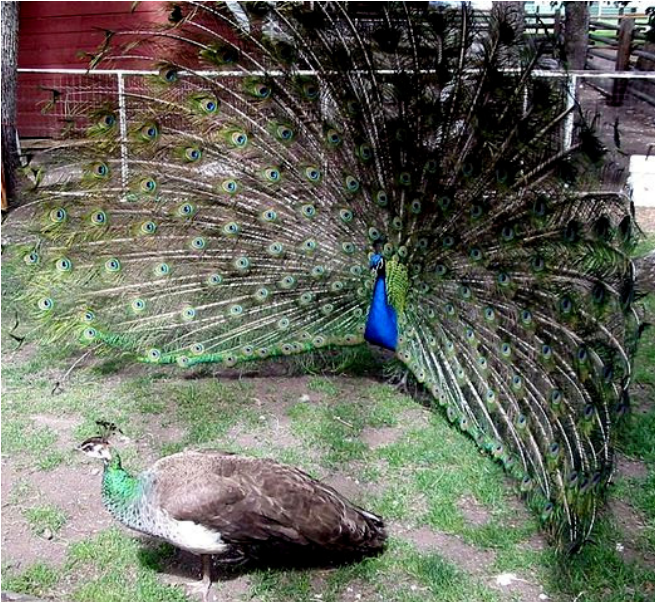


Can we easily distinguish male and female protoceratops?

27 May 2015, by Leonardo Maiorino



Peacock (back) and peahen (front), in a classic example of sexual dimorphism. Credit: Darkros

hypothesized males and [females](#) of hadrosaurs (Parasaurolophus or Lambeosaurus) were later shown to be species separated in time and in space. Variation in the number of chevron bones (wishbone-shaped bones under the tail vertebrae) in Tyrannosaurus, previously attributed to sex differences between males and females, are instead the product of non-sexual variation.

Ceratopsians, popularly known as "horned dinosaurs", represent another group for which paleontologists have inferred sexual dimorphism. Protoceratops andrewsi is a well know ceratopsian from the Late Cretaceous of the Gobi Desert, Mongolia, discovered almost a century ago during the American Museum Expeditions of the 1920s. Protoceratops is a small (

Anatomical and behavioral differences distinguish males and females in many extant and extinct animals. For instance, male peacocks have a large and flashy tail, whereas females are smaller and less brightly colored. Male lions have a mane and are larger than females. Red deer male sport antlers, lacking in females. This phenomenon is called sexual dimorphism and represents a product of sexual selection. It represents a key factor in the success of breeding within many species, as originally stated by Darwin, and mate choice.

Despite obvious sexual dimorphism in some modern animals, sexual dimorphism is hard to identify in [extinct organisms](#) such as dinosaurs, often due to a very small sample size. Having a few fossil skulls with different morphologies (crest or horns) and relating them to sexual differences thus appears quite hasty. For instance,

APA citation: Can we easily distinguish male and female protoceratops? (2015, May 27) retrieved 20 November 2019 from <https://phys.org/news/2015-05-easily-distinguish-male-female-protoceratops.html>

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