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NTS NEWSLETTER

PUBLISHED BY THE NON-TRADITIONAL SPECIES CLUB AT THE UNIVERSITY OF ILLINOIS

WHAT'S INSIDE?

“TRICK OR TREAT?” SAID THE VIPER
BY: SAMANTHA JOHNSON

Vipers are a family of venomous snakes belonging to the family Viperidae. This family of snakes includes many of Illinois’ venomous snakes such as the copperhead (*Agkistrodon contortrix*), cottonmouth water moccasin (*Agkistrodon piscivorus*), timber rattlesnake (*Crotalus horridus*), and eastern massasauga (*Sistrurus catenatus*). Vipers are typically an ambush species which means they need to get within striking distance of their food. This can be difficult with many vipers camouflage not always being enough. Therefore, many species take it to another level in convincing their food to come to them.

Many vipers have evolved to morph their tail into something their prey will think of as food. In Iran, the spider-tailed horned viper (*Pseudocerastes urarachnoides*) has become one of the ultimate convincers. Their tail, when first discovered as a species in 1968, was marked as a congenital deformity due to that being the first siting and globally vipers identified by containing a rattle. However, in 2006 the description was found false when a group of researchers camped in the remote Zagros Mountains of western Iran to observe the spider-tailed horned viper’s behavior.

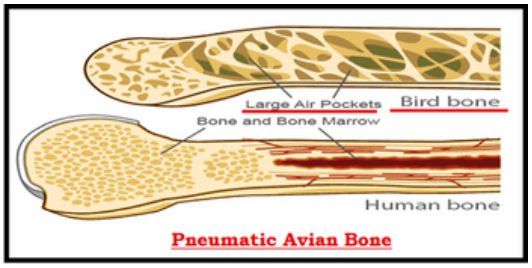
Within a few days, they discovered the purpose of the tail “deformity” and captured photographic evidence of it being a lure. Their tail mimicked a crawling spider that would fool birds and small mammals. The tail is not developed in the same way as a classic rattlesnake’s tail with vertebrae fused closely to the tail and new keratin segments appearing as the snake sheds. Instead, the spider-tailed horned viper’s vertebrae are normal, their lure of a tail is shaped with elongated scales, and the end of the tail is soft non-scaley skin. The lure is highly effective in luring prey, but only against migratory birds as the locals have caught into their tricks.

AVIAN SKELETAL ANATOMY
BY: MARG BEDNAREK

Bird skeletons have several adaptations that allow for flight, and these are important to keep in mind when seeing avian patients in clinic. Most notably, the avian skeleton is very light and can be delicate. Avian bones are less dense than mammals, making them lighter. Some bones are pneumatized, meaning they are filled with air and connect to the air sacs.

Non-pneumatic avian bone

The humerus and femur are commonly pneumatic bones, but can also include the coracoids, keel, cervical and thoracic vertebrae. Some species also have extensively pneumatized skull bones, such as Amazon parrots and owls. When considering fracture repairs and placement of IO catheters, it is important to know which bones are pneumatized in a specific species. Fractured pneumatized bones risk infection traveling to the air sacs and respiratory system. Injecting fluid into these bones can cause fluid in the lungs and may be fatal.



Pneumatic avian bone vs mammal bone

To allow additional support for flight, some bones are fused. Examples include the vertebrae, carpometacarpus (major and minor metacarpal bones), tibiotarsus (tibia and tarsus bones), and tarsometatarsus (tarsal and metatarsal bones). Keep this in mind when looking at radiographs of avian patients!

The sternum is large and concave in flighted birds with a bony ridge, called a keel, in the middle. Pectoral muscles, which are responsible for the downstroke during flight, lay over the sternum. Birds such as ostriches and penguins do not have a keel, and this is one of the reasons they are unable to fly.

Prominent keel of a flighted bird

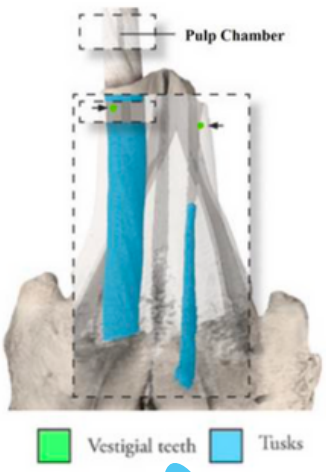
These are just a few evolutionary adaptations bird skeletons have to allow flight. Stay tuned for the next newsletter to learn about avian soft tissue anatomy!

THE TUSKS OF THE UNICORNS OF THE SEA
BY: MADISON KASBAUM

Beneath the roaring Arctic Ocean lives a majestic animal many believe to be a myth, the narwhal (*Monodon monoceros*). Some even consider the species at risk of extinction due to little sighting, but the species is labeled as 'threatened' but of 'least concern' with over 120,000 roaming deep waters. Other than its distinctive appearance and a catchy tune attributed to the species, much is not commonly known about narwhals. One discovery about the species is confirmed: their magical horn protruding from their head is actually not a horn at all; it is a tusk!

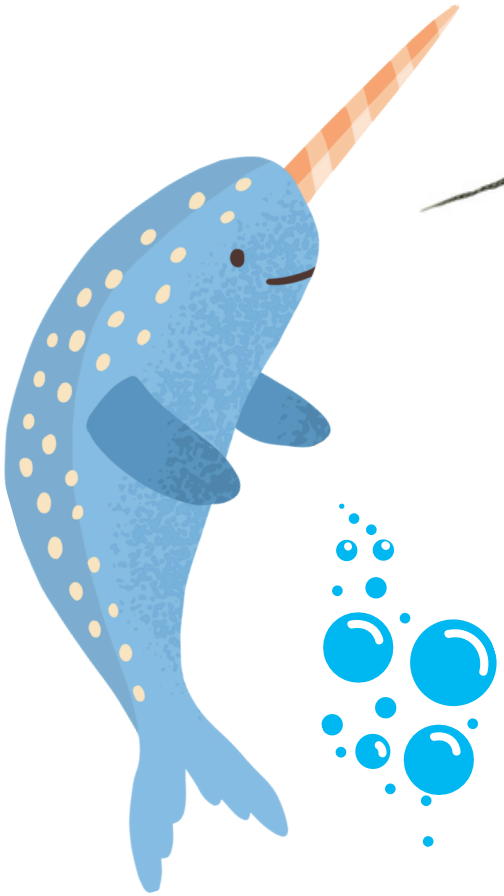
The Anatomy

As a generalized definition, a tusk is an elongated tooth that typically protrudes from a closed mouth. Narwhal's tusks are horizontally embedded in the upper jaw, and usually only one of the two tusks erupts through the maxillary bone and the upper lip. During development, narwhals' vestigial teeth are located behind their prospective tusks on the maxillary bone. This arrangement allows the tusks to move backward, passing the vestigial teeth to grow outward, reversing its placement with the vestigial teeth. The nondominant tusk stays embedded in the maxilla, while the dominant causes the rest of the dental layout to become asymmetrical towards the side of the dominant tusk (usually the left). The outermost layer of the tusk consists of rigid cementum and grows in a left handed helical pattern (a two- fold left rotational twisting). The mid layer of the tusk contains a thick layer of dentin that forms in rings, similar to a tree trunk. The innermost region of the male tusk has a pulp chamber that continues through to the tip, while the female's embedded tusks have little to no chamber at all. The male tusk also has tubule orifices through the cementum that may allow narwhals to have a higher sensory capability of their marine environment.

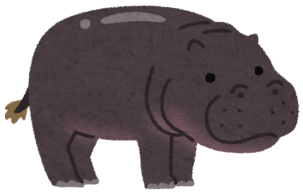


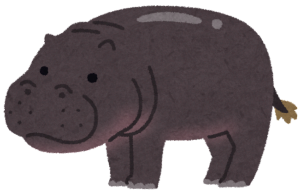
The Function

Narwhal tusks are sexual dimorphic traits that differentiate males from the non-tusked females of the species. It is rare for females to develop protruding tusks, though not impossible. The length of the tusk also correlates with the male's body length. The size of a male tusk is a determining factor for female narwhals' sexual selection of a mate. Besides male hierarchy, there is much speculation on the tusk's purpose, whether for conjuring rainbows, sensory, thermoregulation, or defense mechanisms for the species. From behavioral observations, narwhals use their tusks for communication and as weapons during male disputes. One of the most notable behaviors is "tusking," where two or more males would aggressively rub their tusks together to determine fighting ability. Blatant aggressive behaviors are uncommon due to this "tusking" method to avoid fatal battles with stronger opponents. During these altercations, the tusks are not for impaling but more as a bludgeoning impact, and it is not uncommon to see head scars and broken tusks as a result of this.



TAKING THE INTERNET BY STORM: MOO DENG
BY: OLIVIA BONCOSKY





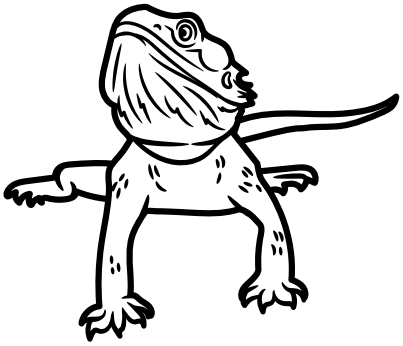
In July of this year, the Khao Kheow Open Zoo welcomed their newest member to the hippopotamus community: Moo Deng. Moo Deng has become the internet's newest sensation, and there is an endless stream of pictures hitting social media by the minute. This hippo may be small, but she packs a lot of personality! She is known for her tendency to "scream" at her caretakers in many of her photographs. Her amusing behaviors and cute, plump stature have won over the hearts of people across the world.

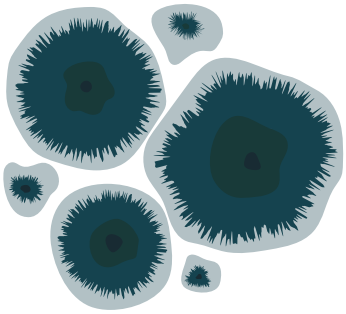
The birth of Moo Deng also marks an advancement in leading the Pygmy hippopotamus away from endangerment. In 2015, the IUCN listed the species on their Red List of Endangered Species and it is still listed as a decreasing population today. The most recent study indicated that there are likely as few as 2,500 Pygmy hippopotamuses left in the wild. The species is native to areas of West Africa, however, mining and logging practices have drastically impacted their habitat. As a result, many organizations have come together to develop conservation and captive breeding programs to try to prevent further decreases.

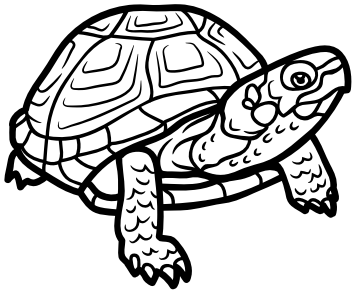
With Moo Deng's new stardom, we can hope that attention will be drawn to the struggles of her wild relatives and remind the world of the importance of caring for our endangered species. This baby hippo is more than just a funny internet trend, but representative of the future of the Pygmy hippopotamus.

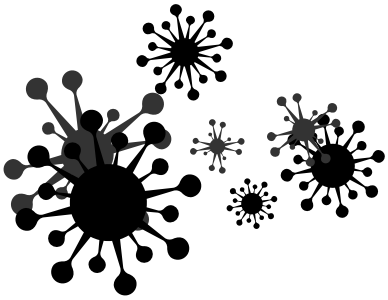
Pictured: Moo Deng (translated "Bouncy Pork") and her mother.

ILLINI TAKE OVER TORONTO
BY: SARAH HOLLANDER









Hey NTS! I'm writing to you from Toronto, Ontario, Canada. Several of us on the E-Board are at the AAZV/EAZWV Joint Conference, which brings together zoo and wildlife veterinarians from around the world. The American Association of Zoo Veterinarians and the European Association of Zoo and Wildlife Veterinarians have individual annual conferences, but get together every three years to collaborate on improving the field of zoological medicine and share recent research. It's a great opportunity for student researchers to present their projects - on the first day, Jacob Dalen presented his research on Nannizziomycosis in bearded dragons and Marg Bednarek presented her research on herpesviruses in IL chelonians! This conference is also a great opportunity for networking and learning about post-graduate opportunities like rotating internships, specialty internships, and residencies, as well as meeting other veterinary students with the same passions and goals.

One of the favorite events of the week was "Zoo Day" which was held this year at the Toronto Zoo. We had the opportunity to explore the zoo after it was closed to the public, and we could sign up for behind-the-scenes tours of the greenhouses and veterinary hospital as well as animal encounters with species like giraffe and white rhinos.

Interested in coming next year? It IS a sacrifice to miss a day (or several) of classes, but I thought it was worth it!

Future AAZV Conference Dates:
August 23-29, 2025 in Kansas City, MO
October 17-23, 2026 in Oklahoma City, OK

The Next Joint AAZV/EAZWV Conference:
Fall 2027 in Munich, Germany

More information at aazv.org

CITATIONS

ARTICLE 2

- HTTPS://LAFEBER.COM/VET/AVIAN-ANATOMY-BASICS/
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