

Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (Second Year)

Subject: Zoology

Paper Code: ZOC 103

Paper Title: Anatomy of Animal Body Systems

Unit: 01

Module Name: Epidermal hard derivatives- Digital cornifications

Module No:10

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Notes

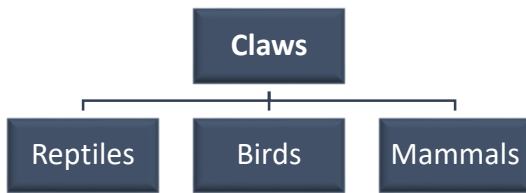
Digital cornifications

The formation of the horny layer of skin or horny skin structures as claws, nails, and hooves. The function of these structures is to cover the tips of the digits of all reptiles, birds and mammals. This process of digital cornification is rare in amphibians except in South African toad- *Xenopus laevis* in which the first three digits of the feet have cornified endings like the claws. In case of spade footed toads such as *Scaphiopus* and *Pelabatus*, a cornified area is found on the underside of the foot with which these toads dig the earth.

Process

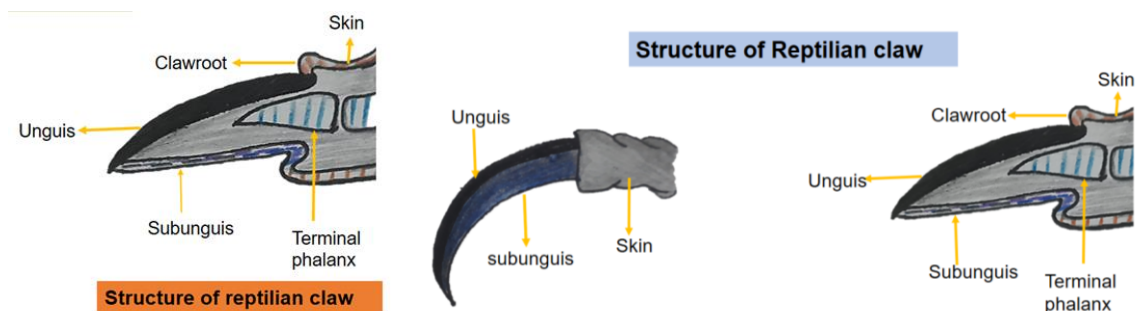
All digital cornifications grow parallel to the surface of the skin and comprises of two plates i.e. a dorsal plate and a ventral plate. The Dorsal plate is also known as Unguis or compact horn or nail plate whereas the ventral plate is also known as Subunguis or Sole horn or Sole plate.

1. CLAWS



a) REPTILIAN CLAWS

Reptilian claw covers the terminal part of the digit supported internally by the **terminal phalanx**. **Unguis** is a Long plate of keratin, sharply curved. It encloses always the smaller **SUBUNGUIS** between the edges. At the base of the claw epidermis is invaginated to form the **Claw root**. *Stratum germinativum* continuously produces new layers of cells that become keratinized and lead to the growth of claws.



b) CLAWS IN BIRDS

Birds comprises of typical reptilian claws over their feet. The only exception is *Opisthocomus* bird in which the claws are found over the digits of the wing in the young and later they disappear.

c) MAMMALIAN CLAWS

In herbivore mammals like Rabbit the claws are shorter than those of the reptiles and consists of a reduced subunguis because a considerable part of the underside is occupied by the fleshy **pad or ball** of the digit with which the subunguis is continuous. Carnivore mammals like cats and tigers consist of retractile claws.



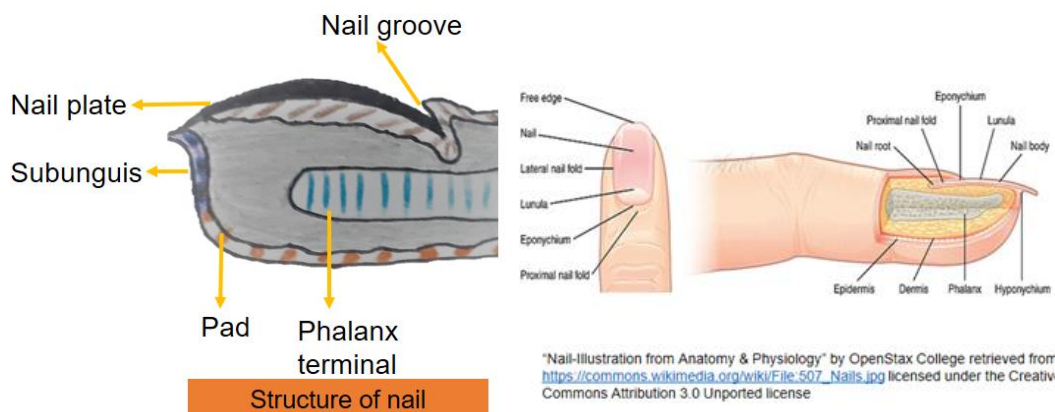
Structure of Mammalian claw

2. NAILS

Nails are characteristics of Primates. Eg. Man.

The structure of the nail consists of the following parts:

- **Unguis/Nail plate** is broad and flattened and composed of **Stratum Lucidum**.
- **Subunguis** is very much reduced and is represented by a narrow strip of less modified epidermis below the edge of the unguis. The dermis of nail-bed underlying the unguis is highly vascularised and makes the colour of the nail appear pinkish.
- At the base of the nail epidermis is invaginated and supplies materials for the growth of the nail and this epidermal invagination is called the **Nail Groove/ Sulcus Unguis**. Part of the nail in the groove is known as **Nail root**.
- A thin, whitish somewhat broken tough fold of skin known as the **Eponyrium** lies at the base of the nail, this is the **Stratum corneum** derived from the skin of nail groove.
- Nail bed is less vascular near the base producing a whitish moon or **Lunula**.



"Nail-Illustration from Anatomy & Physiology" by OpenStax College retrieved from https://commons.wikimedia.org/wiki/File:507_Nails.jpg licensed under the Creative Commons Attribution 3.0 Unported license

3. HOOVES

Hooves are characteristics of horse, cow, sheep, pig, giraffe, and Rhinoceros. No part of the digit touches the ground.

Structure of hoof

- **Unguis** is large and the animal actually walks over it. The **Subunguis** is carried under the unguis. **Fleshy pad/ Torus** of the digit lies behind the hoof and is called the **Frog**.

