

BIOMA: Berkala Ilmiah BiologiAvailable online: <https://ejournal.undip.ac.id/index.php/bioma/index>**Histological description of wild boar (*Sus scrofa*) skin from Timor Island****Flaviana D.P. Wada¹, Ingrid T. Maha^{2*}, Heny Nitbani², Yustinus O.P. Wuhan³,
Filphin A. Amalo², Yulfia N. Selan²**¹ Study Program of Veterinary Medicine, University of Nusa Cendana, Kupang² Department of Anatomy, Physiology, Pharmacology, and Biochemistry, University of Nusa Cendana, Kupang³ Department of Clinics, Reproduction, and Pathology, University of Nusa Cendana, Kupang**ABSTRACT**

The purpose of this study was to examine the histological structure of wild boar skin. This research used three wild boar samples from Timor Island, aged five to six months, with skin collected from the lumbo dorsalis, abdominal ventralis, and dorsal interscapularis regions of each animal. Sampling, specimen preparation, and Hematoxylin-Eosin (HE) staining were conducted at the Laboratory of Anatomy, Physiology, Pharmacology, and Biochemistry (AFFB), Faculty of Veterinary Medicine, Nusa Cendana University. The results showed that wild boar skin is composed of three layers: the epidermis, dermis, and hypodermis. The epidermis consists of four layers: stratum basale, stratum spinosum, stratum granulosum, and stratum corneum. The dermis includes the dermal papilla and reticular dermis, composed of dense connective tissue containing collagen and elastic fibers. In this layer, primary hair follicles, sebaceous glands, arrector pili muscles, and blood vessels were observed. The hypodermis is composed of loose connective tissue with abundant fat cells, where secondary hair follicles and sudoriferous glands were found.

Keywords: wild boar; histology; skin**1. INTRODUCTION**

Wild boars are wildlife species distributed across nearly all Indonesian islands. Their habitats range from semi-deserts, temperate forests, grasslands, to tropical forests (Albert & Nurdin, 2014). In terms of dietary habits, wild boars are omnivores with a highly varied diet, including fruits, leaves, tubers, reptiles, and even animal carcasses (Winarno & Harianto, 2018).

Wild boars exhibit behaviors such as wallowing in mud, which serves several purposes: protecting the body from flies, regulating body temperature, cleansing ectoparasites, treating skin wounds, and acting as a sexual behavior. Due to their wild habitat, wild boars often act as carriers of diseases. They may become infected by consuming carcasses or waste, or through contact with other infected wild animals. In East Nusa Tenggara (NTT), people often hunt wild boars for consumption or to keep as livestock, increasing the risk of disease transmission to humans and other animals. One of the body's first lines of defense against disease is the skin.

2. MATERIAL AND METHODS

This study used skin samples from three wild boars obtained from Camplong Village. Samples were taken from the lumbo dorsalis, abdominal ventralis, and dorsal interscapularis regions, with dimensions of 1x1x1 cm. The wild boars were brought to the Veterinary Medicine Laboratory at Nusa Cendana University, where they were slaughtered and skin samples collected. The samples were then placed in small containers containing 10% neutral buffered formalin (NBF), followed by histological slide preparation and Hematoxylin-Eosin (HE) staining.

3. RESULTS AND DISCUSSION**3.1 Histological Structure of Wild Boar (*Sus scrofa*) Skin**

The histological structure of wild boar (*Sus scrofa*) skin consists of three layers: the epidermis, the dermis, and the subcutaneous layer beneath the dermis, also known as the hypodermis (Figure 1). This finding is consistent with reports by Apriani et al. (2017) in Landrace pigs, Kurniawati et al. (2020) in dogs, and Razvi et al. (2015) in goats.

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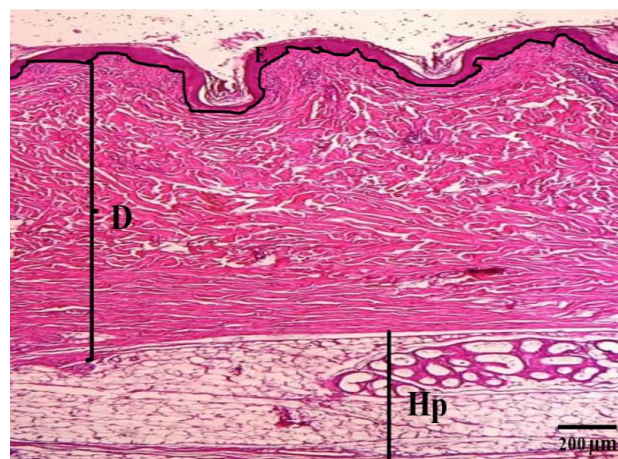


Figure 1. Structure of wild boar (*Sus scrofa*) skin.
E: Epidermis, D: Dermis, Hp: Hypodermis. Staining: Hematoxylin-Eosin (HE).

In the *regio lumbo dorsalis*, *abdominal ventralis*, and *dorsal interscapularis* regions, the epidermis consists of four layers: *stratum corneum*, *stratum granulosum*, *stratum spinosum*, and *stratum basale* (Figure 2). This is in accordance with Apriani et al. (2017) in Landrace pigs. The *stratum basale* is the deepest layer, located adjacent to the dermis and composed of a single layer of cells. It contains keratinocytes—epithelial cells undergoing keratinization that form a waterproof barrier and protective shield—and melanocytes, which act as a UV radiation barrier. The *stratum spinosum* consists of more rounded cells with central nuclei and a higher number of cell layers compared to the *stratum basale* and *granulosum*. This aligns with Putri (2015), who noted multiple cell layers in the *stratum spinosum*, compared to only 1–3 layers in the *basale* and *granulosum*. The *stratum granulosum* lies above the *stratum spinosum* and consists of flattened, elongated cells arranged in one layer. This matches observations by Maneenooch et al. (2018) in Apriani et al. (2017), stating that the *granulosum* in pigs typically consists of 1–2 cell layers. The *stratum corneum* is the outermost layer, made up of flat, anucleated dead cells.

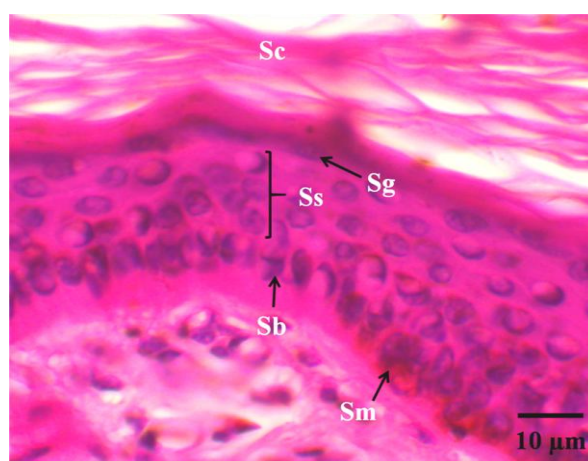


Figure 2. Histology of the wild boar (*Sus scrofa*) epidermis.
Sc: Stratum corneum, Sg: Stratum granulosum, Ss: Stratum spinosum, Sb: Stratum basale. Staining: HE.

The dermis is composed of two continuous layers with no clear boundary: the dermal papilla, directly beneath the *stratum basale*, and the reticular dermis, which borders the hypodermis (Figure 3). Both layers are made of loose connective tissue containing collagen and elastic fibers. The reticular dermis contains thicker collagen and elastic fibers than the papillary layer, as also reported by Apriani et al. (2017). Collagen fibers contribute to skin strength, while elastic fibers provide elasticity and flexibility (Purnama and Astuti, 2023). The reticular dermis also contains primary hair follicles, *sebaceous* glands, *arrector pili* muscles, and blood vessels, consistent with Apriani et al. (2017), Kurniawati et al. (2020), and Razvi et al. (2015).

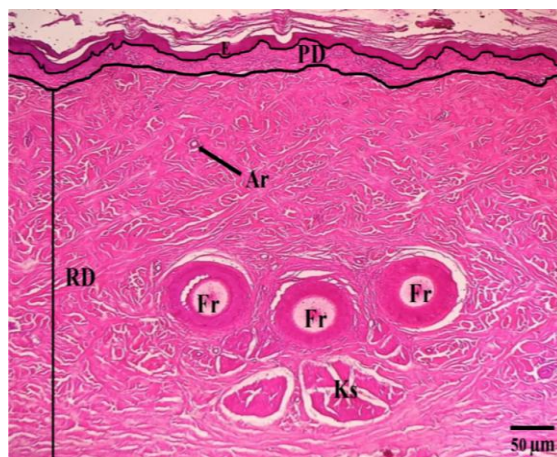


Figure 3. Histology of the wild boar (*Sus scrofa*) dermis.

E: Epidermis, PD: Dermal papilla, RD: Reticular dermis, Fr: Hair follicle, Ap: Arrector pili muscle, Ar: Artery. Staining: HE.

Hair follicles are invaginations of the epidermis into the dermis and hypodermis and are classified into two types: Primary hair follicles, larger in size, surrounded by *sebaceous* glands and *arrector pili* muscles. Secondary hair follicles, smaller, associated with *sudoriferous* glands and *arrector pili* muscles (Sinaga et al., 2012). In all three regions examined, round and upright primary hair follicles were observed, with *arrector pili* muscles and *sebaceous* glands distributed around them. Round, upright follicles were seen in the *lumbo dorsalis* and *abdominal ventralis*, while slightly oval follicles were found in the dorsal interscapularis. According to Sinaga et al. (2012), circular follicles produce straight hair, oval ones produce wavy hair, and flattened follicles produce curly hair. *Arrector pili* muscles, made of smooth muscle tissue, are attached to hair follicles and are responsible for piloerection (goosebumps) (Torkamani et al., 2014). *Sebaceous* glands secrete *sebum*, which moisturizes the skin and prevents dryness. These glands were most abundant in the lumbo dorsalis region, consistent with findings by Apriani et al. (2017). Additionally, arterial blood vessels were observed in the dermis (Figure 4), playing an essential role in supplying oxygen and nutrients to all skin layers.

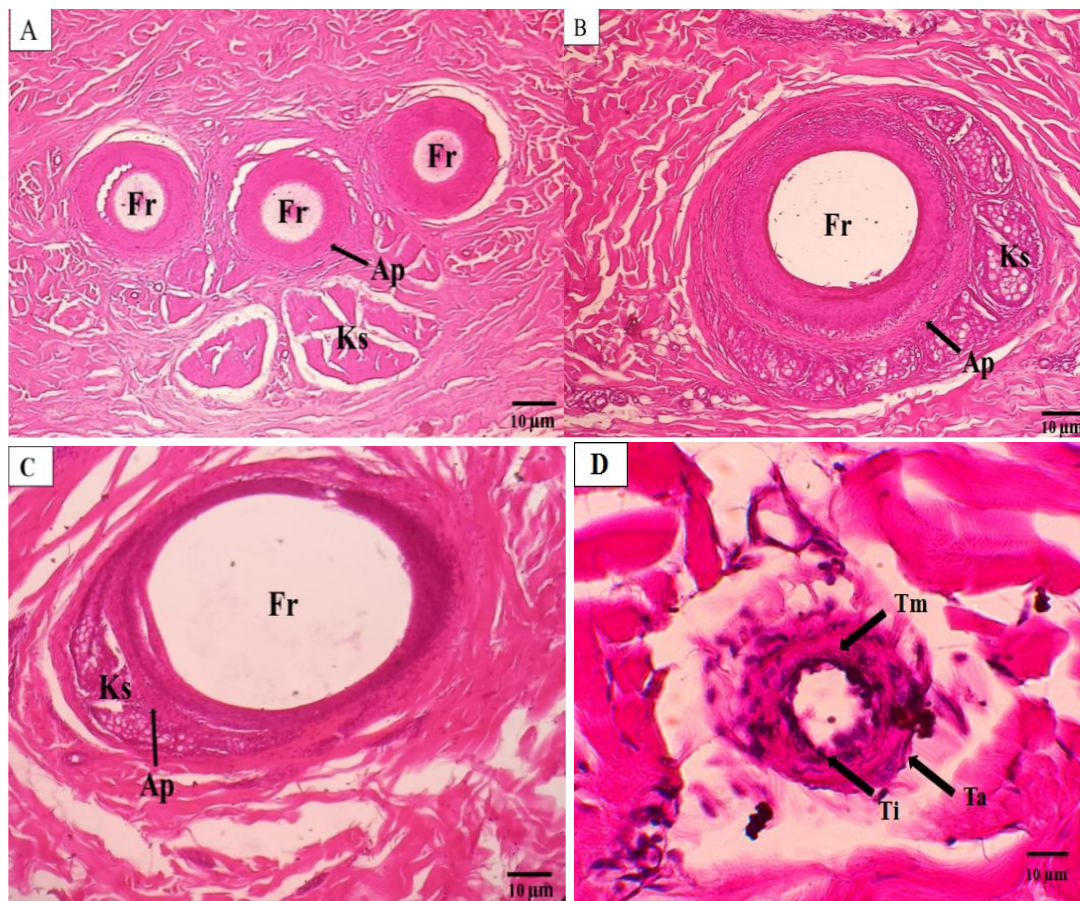


Figure 4. Histology of the wild boar (*Sus scrofa*) dermis.

Fr: Hair follicle, Ks: Sebaceous gland, Ap: Arrector pili muscle, Ar: Artery, A: Lumbo dorsalis region, B: Abdominal ventralis region, C: Dorsal interscapularis region, D: Artery, Ti: Tunica intima, Tm: Tunica media, Ta: Tunica adventitia. Staining: HE.

The hypodermis or subcutaneous layer lies beneath the reticular dermis and consists of looser connective tissue with abundant fat cells. Fat in the hypodermis plays a vital role in thermoregulation and provides protection against external mechanical forces (Putri, 2015). Secondary hair follicles and *sudoriferous* glands were observed in this layer across all three regions (*lumbo dorsalis*, *abdominal ventralis*, and *dorsal interscapularis*) (Figure 5).. *Sudoriferous* glands, specifically of the apocrine type, were identified and are responsible for sweat production, which aids in thermoregulation.

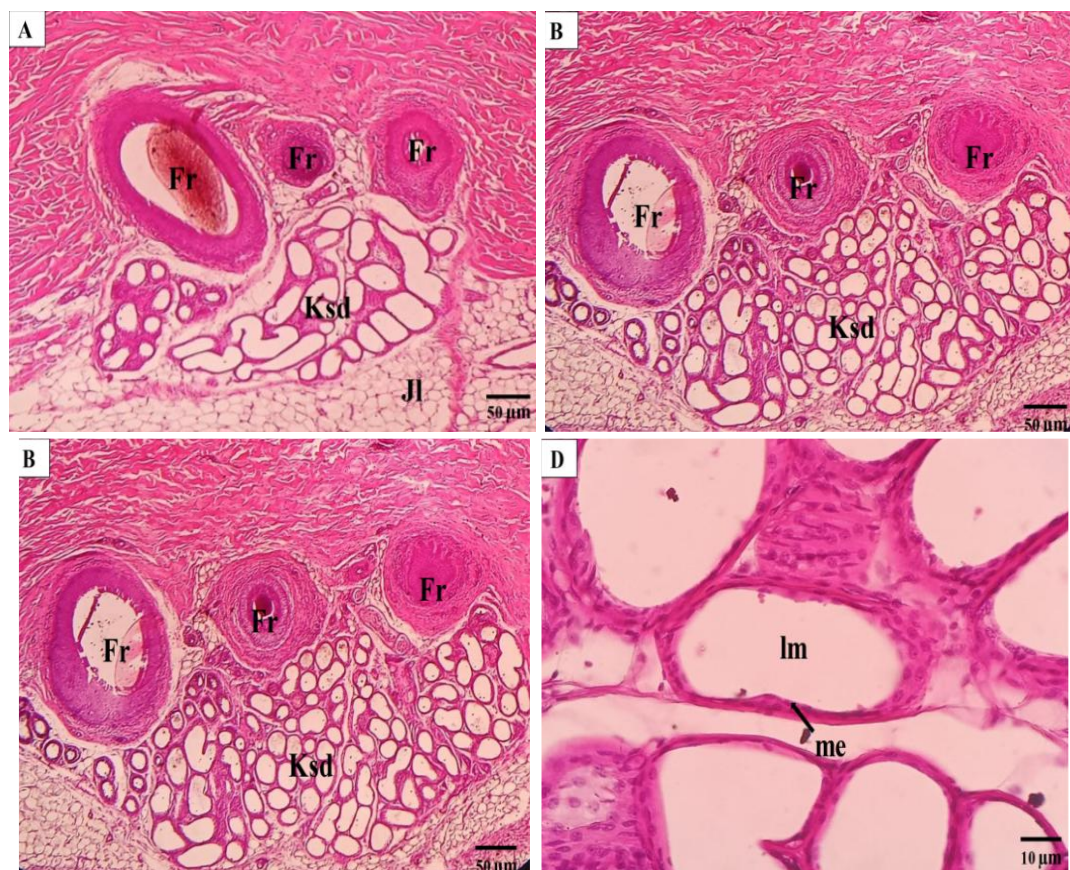


Figure 5. Histology of the wild boar (*Sus scrofa*) hypodermis.

A: Lumbo dorsalis, B: Abdominal ventralis, C: Dorsal interscapularis, Jl: Adipose tissue, D: Sudoriferous gland, Fr: Hair follicle, Ksd: Sudoriferous gland. Staining: HE.

4. CONCLUSION

Based on the results of this study, it can be concluded that the histological structure of wild boar (*Sus scrofa*) skin in the *lumbo dorsalis*, *abdominal ventralis*, and *dorsal interscapularis* regions consists of three layers: the epidermis, dermis, and hypodermis.

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