

HISTOARCHITECTURE OF EPIDERMIS OF SNAKE

H.P. Narkhede, V.P. Suryawanshi, O.N. Ladukar,
R.D. Suryawanshi, Neeta Ladukar and V.D. Shankhpal

Nagpur Veterinary College,MAFSU,Seminary Hills Nagpur 440006 (M.S.)

ABSTRACT

The epidermis of snake showed three distinct layers, β cell, mesos and α cell layers. β cell layer and α cell layer located externally and internally respectively. The mesos layer located between β and α cell layer showed bilayer structure and consisted of 2-3 layers of nucleated cells. The basal cells of mesos layer are large may be indicative of renewal phase in snake.

KEY WORDS : Histoarchitecture, snake , epidermis

INTRODUCTION

Reptilian skin is of special interest for several reason. First, reptiles live successively in a wide variety of conditions, ranging from aquatic to xeric terrestrial habitats. Second, some reptiles exhibit periodic losses of epidermal layer associated with synchronized pattern of pan-body. These losses are unique and quite distinct from renewal of epidermis in other vertebrates (Baden and Maderson, 1970, Maderson *et.al.*, 1998). Third, reptilian skin is an important pathway of transepidermal water loss (TEWL). Some snakes show plasticity for enhancing resistance to TEWL under conditions of water stress (Kattan and Lillywhite, 1989). Literature on histological structure of skin of snake is meager. Therefore to assess the functional role of epidermis of snake in water balance,(on the basis of histological observations) present study was undertaken.

MATERIALS AND METHODS

Two Checkered keelback snakes died due to road accident were brought to Department of Anatomy, Nagpur Veterinary College, Nagpur (Fig. 1). Samples of skin from dorsolateral region of snake were collected. Tissue samples were fixed in neutral buffered formalin for 24 hours and then processed for paraffin blocks. Sections of 6 μ were cut and stained with Ehrlich's hematoxylin and eosin as per Singh and Sulochana (1978).

RESULTS AND DISCUSSION

The skin of reptile is an important route for osmotic and evaporative water exchange as in many vertebrates (Lillywhite and Manderson, 1982). The permeability of skin to the water varies considerably by environment, variation in skin resistance and snake species (Dmi'el, 1998). The epidermis of snake consisted of stratified epithelium and showed three distinct layers containing nucleated cells namely β , mesos and α layers. Outer one was β layer consisted of two rows of keratinized nucleated cells and appeared to be separated from underlying layer. Individual cell boundaries were distinct. Middle mesos layer showed well organized two rows of flattened thin cells. The cytoplasm and nuclei were darkly stained. The permeability of water is controlled by mesos layer due to increased cell layer and organized bilayer structure. As the mesos layer is well physically protected between β layer and α layer, no desquamation could occur by desmosomal degradation within mesos layer. Below the mesos layer was α layer consisted of 2 rows of distinct nucleated cells. These cells

were cuboidal to low columnar with well stained nuclei and cytoplasm. The basal cells were large and attached to basement membrane. The presence of mitotic activity in these cells may be indicative of an early renewal phase in snake (Fig. 2 and 3). These observations are similar to that reported by Tu *et.al.*(2002). The α layer shows lamellar structure similar to that of avian stratum corneum (Menon and Menon, 2000). The skin permeability barrier is considered important for water balance and potentially influences the behaviour of snake.

Fig. 2 Microphotograph of skin of Checkered keelback snake showing three distinct layers of epidermis -

- (a) β layer with nucleated cells
 - (b) Mesos layer with bilayer structure in intercellular space
 - (c) α layer
- (H & E 200 X)

Fig. 3 Microphotograph of skin of Checkered keelback snake showing -

- (a) β layer
 - (b) Mesos layer
 - (c) α layer
 - (d) Collagen fibers in dermis
- (H & E 400 X)

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