Pathological Studies On The Prevalence Of Skin Infections Of Camel In Sharkia Governorate

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ABSTRACT

The current study was carried out on one hundred and sixty camels suffering from skin infections by bacteria, fungi and virus during the period from May,2003 to May,2004 in Sharkia governorate (Zagazig and Belbis abattoirs). The highest infection (91 Camels) was caused by bacteria, followed by 61 cases of ring worm (Trichophyton spp), and 8 cases of pox. The most prevalent types of bacteria, which caused determatitis, were Streptococcus spp. and Staphylococcus aurus (ulcerative dermatitis), Corynebacterium pyogens and Staphylococcus aureus (suppurtive dermatitis), Corynebacterium Pseudo tuberculosis (serofibrinous dermatitis), and Staphylococcus aurreus (chronic dermatitis). The obtained results revealed that the different microbial agents caused severe lesions in the skin of camels in Sharkia Governoate.

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INTRODUCTION

Camels represent a major source of animals for meat and milk particularly for the nomadic people in the deserts.

The skin of the camels is of a high economic value as it is used for the manufacture of shoes and mats besides their hair, which is used in clothing industries. Moreover, the skin protects the internal organs (cutaneous barrier) against a variety of diseases and always reflects the health condition.

The literature reported a little information on camel diseases compared with the other species of animals. This may be due to the fact that. camel production is usually practiced system in remote areas with harsh living condition that makes such studies difficult and expensive execute.

Camels are susceptible to many infectious diseases, some of which have been investigated extensively because they also affect other species of farm animals. Such diseases include trypanosomiasis, anthrax, hemorrhagic septicemia, brucellosis, mange, ringworm and pox *(1,2)*. Pox and pox-like diseases of camels are a group of exanthematous skin - conditions which have recently emerged as being of an increasing economic importance. They may be caused by three distinct viruses: Orthopovirus cameli; (camel pox), parapoxvirus (camel contagious ecthyma) and papillomavirus (camel papillomavirus infection), *(3)*.

Trichophyton (ringworm) was reported to affect the Arabian camel by many authors *(4-6)*. The affected skin showed round, circumscribed, scaly, hairless patches on the head, neck, shoulders and flanks. Microscopically, caseous necrosis, granulomas ,hyphae and spores were seen. Sporotrichosis, mixed infection of Dermatophilus congolensis and Microsporum gypseum and others were also recorded *(7)*.

Bacteria was considered among the most serious agents which cause different types of dermatitis, as primary or secondary to other causative agents as virus and parasites, *(6)*.

The most prevalent bacteria, affecting the skin, were Corynebacterium pseudotuberclusis (Coryn. pseud.), Corynebacterium pyogens (Coryn. pyogens), Streptococcus spp., and Staphylococcus aurus (Staph. aurus), *(8,9)*.

The aim of this work was to study the lesions induced by isolated bacteria, virus and fungi affecting skin of camel.

MATERIAL AND METHODS

The study was carried in Sharkia governorate (Zagazig and Bilbis abattoirs)

during the period from May 2003 to May 2004. One hundred and sixty camels (4-10 years old) out of 1000 camels showed skin abnormalities. Specimens, from the affected skin, were subjected to pathological, bacteriological and mycotic examinations.

I- Pathological Examination

Specimens from the collected skin lesions were fixed in 10 % neutral buffered formalin solution. Five-microns thick paraffin sections were prepared and stained with hematoxylin and eosin (H&E.) and PAS for microscopical examination *(10).*

II- Bacteriological examination:

The affected skin lesions were cleaned by gauze moisted with 70 % alcohol and sterile swabs were taken. The collected swabs were immersed into brain heart infusion broth supplemented with 7 % inactivated horse serum and incubated for 24-48 hours at 37 °C. Each broth tube was centrifuged and the sediment was plated into the brain heart infusion agar plates with 10 % sheep blood agar. The growing clonies were identified morphologically and biochemically according to *(11).*

III- Mycotic examination:

Specimens were aseptically collected for mycological isolation and culture on Sabouraud's agar (oxoid). The inoculated plates were incubated at room temperature for 5-7 days and examined daily. Smears were prepared from mycotic growth stained with gram stain examined microscopically according to *(12).*

RESULTS AND DISCUSSION

The most prevalent bacterial isolates from the skin lesions were mixed infection: of Streptococcus spp and Staph. aureus (15.625 %), Corynibacterium pseudotuberculosis and Staph. aurus (6.875 %) or pure Corynebacterium psedotuberculosis (30 %), besides Coryn. pyogens and staph. aureus (4.375 %). Similar finding were described by *(9)* who recorded that the most prevalent bacterial agents, affecting the skin of camels in Sharkia governorate were Corynibacterium pseudotuberculosis and Corynibacterium pseudotuberculosis associated with Streptoccus spp. (11.27 %). While *(8)* mentioned that the Coryn. pyogens was the most prevalent agent affecting the skin of camels in Assiut province or associated with Strept. Spp and Staph. aureus. Other skin diseases recorded in our results were camelbox (5 %) and ringworm (38.125 %). *(13)* found that 25 % of the young camels suffered from ringworm; but *(6)* recorded a similar ratio in camels with pox (Table)

Table : The result of microbiological agent isolated from infected cases.

Total No.	Ulcerative dermatitis		Suppurative dermatitis		Serofibrinous Dermatitis		Chronic Dermatitis		Ring warn		Camel pox	
	Staph. aurens + Streptcoccus spp		Coryn. Pygen. + Staph. aurus		Coryn. pseud.		Coryn. Pseud. + Staph. aurus		Trichophyton spp		Virus	
	No	%	No	%	No	%	No	%	No	%	No	%
160	25	15.63	11	6.9	48	30	7	4.4	61	38.1	8	5

A) Bacterial skin diseases

Ulcerative dermatitis (25 infected camels):

Streptococcus spp. and Staphylococcus aureus were isolated.

Pathological findings:

Macroscopically, the skin was deeply ulcerated and bloody fluid oozed from the lower edges of the ulcers. Microscopically, focal necrosis and ulcerations were surrounded by congested capillaries, fibrinous exudate and round cell infiltrations (Fig1). The dermis, of some cases, was heavily infiltrated with neutrophils besides congested capillaries. Other cases showed healing by substitution besides re-epithelization. Our results are in agreement with *(6).* The previous lesions were attributed to the exotoxins produced by the bacteria *(j14,15).*

suppurative dermatitis (11 infected camels):

Corynebacterium pyogens and Staphylococcus aureus were isolated.

The pathological findings:

Macroscopically, the skin was thickened. The cut surface oozed non-granular, yellowish pus. Microscopically, the epidermis was focally replaced by homogenous basophilic material surrounded by a zone of hemorrhage and fibrinous exudate (Fig. 3). The epidermis and underline dermis showed deep necrosis, surrounded by congested capillaries, fibrinous exudate and infiltrated by round cells (Fig. 4&5). The dermis showed congested blood vessels with leukocytic infiltration mainly neutrophils. *(6)* found circumscribed areas of liquifactive necrosis surrounded by disintegrating and living neutrophils. Neutrophilic infiltrations occurred as a defense reaction against infection with pyogenie bacteria *(15).* Our results are in a partial agreement with *(16)* who mentioned that Coryn. pyogens, Staph. aureus and Strept. spp. were the causative pathogenic bacteria of the skin abscesses in camels. *(17,18)* reported that Coryn. pyogens produces dissolving toxic and hemolytic activities, and its infection, in farm animals, was rather of an endogenous origin as a result of activating latent infection.

Murad et al., (19) mentioned that the external parasites as ticks and mites would lead to severe itching and skin iujures. Skin abscesses in camel may be a attributed to rubbing of the camel against rough objects leading to skin abrasions which facilitate the entrance of the pyogenic organisms present in the soil.

serofibrinous dermatitis (48 infected camels):

Corynibacterium pseudotuberculosis was isolated.

The pathological findings:

Macroscopically, the skin was thickened with a loss of its normal appearance. The cut surface oozed watery exudate with whitish threads of fibrinous material. Microscopically, eosinophilic homogenous material was widely distributed and separated the collagen of the dermis (Fig.6). Round cells moderately infiltrated among the arterial plexus the dermis (Fig.7). The dermal blood vessels were congested. *(6)* found similar lesions; but the granular material was mixed with fibrin. *(20)* reported that Coryn. pseudotuberculosis was soil-born infection, since the organism could survive in the soil for sometime.

Chronic dermatitis: (7 infected camels):

Corynibacterium pseudo tuberculosis and Staphylococcus aurus were isolated

The pathological finding:

Macroscopically, the skin was thickened with hard and dry scabs. Microscopically, the epidermis was thickened by hyperkeratosis and acanthosis (Fig.8). The dermis, in some cases contained keratinized mass, represented by compressed and keratinized epithelial cells (Fig.9). The wall of some arterioles was thickened with round cell infiltration (arteritis) and its lumen was almost obliterate (Fig.10). The round cells were mainly lymphocytes and macrophages. Focal dermal calcinosis was represented by

basophilic irregular granular masses (dystrophic calcification). Such areas were surrounded by fibrous connective tissue (Fig.11). Our previous results may be due to the persistent bacterial infection, associated with persistant skin-affection by ticks or contamination of the ticks themselves, in addition to the ability of the pyogenic bacteria particularly staph . aureus, to invade deeply *(14).*

B) The Mycotic skin diseases

Ringworm (61 infected camels):

Trichophyton spp. was isolated

The Pathologic findings.

Macroscopically, circumscribed, oval or round grayish alopecic areas (2-4cm) were seen on the head, neck and extremities (Fig.12). Microscopically, the skin was thickened by acanthosis and hyperkeratosis besides infiltration of the dermis by round cells. Mycotic hyphea were invading the hair shafts with spors surrounding the hair – shafts (ectothrix) in the presence of dermal round cell infiltration (Figs. 13 &14).

The previous lesions resulted by invasion of the skin by the conidia through an abrasion, germinate and hyphae begin to grow in the epidermal cells the hypae invade the hair follicles and enter the cortex by dissolving the keratin by secretion of keratinaze enzyme. The hyphae and conidia are carried to the surface by growing hair which often breaks off leading to alopecia. The hyphae grows equally in all direction so finally round or oval areas were seen with or without crusts *(22,5).*

The invasion of the skin by the hyphae resulted in a continuous irritation of the epidermal cell layers leading to hyperkeratosis and acanthosis *(15).*

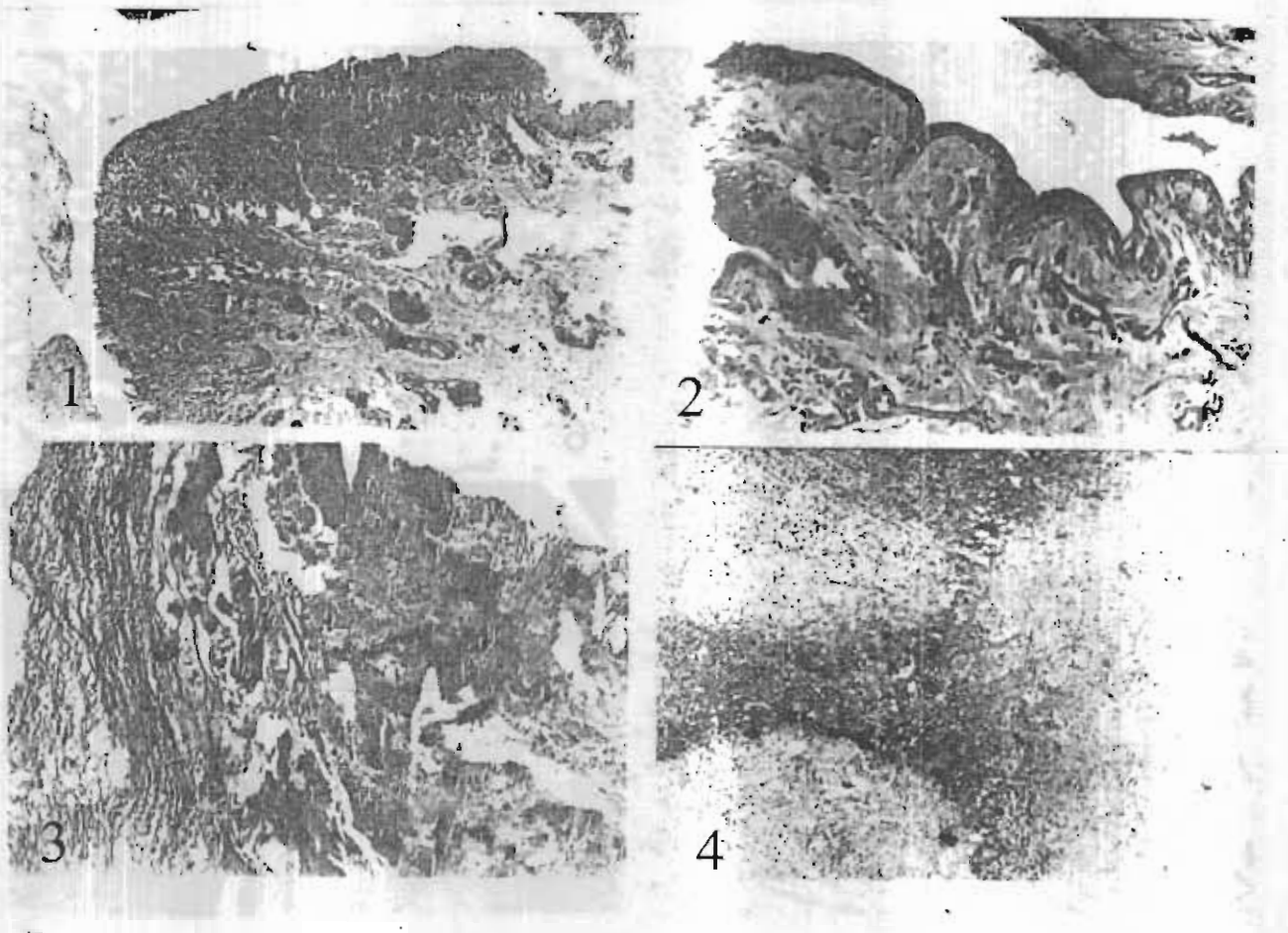
C) Viral skin diseases

Camel pox (8 camels):

The camel pox virus was recognized.

The Pathological finding:

Macroscopically, papules, vesicles, pustules and ulcers with brown crusts were seen on the lips nostrils and thighs with or without edema around the lips (Fig.15). Microscopically, proliferation of the stratum spinosum (acanthosis) was seen. Some epidermal cells showed vacuolar degeneration. Intracytoplasmic eosinophilic inclusion bodies were observed in the epidermal cell layers (Fig. 16). The dermis showed congested blood vessels with leukocytic infiltration, mainly lymphocytes. The lesions, recorded in our results, began as, papules, vesicles and pustules which may ruptured leading to ulcer-formation which dried forming a brown crust scabs *(22).*



Figs. (1 & 2), Ulcerative dermatitis:

Fig. (1): Necrosis and loss of the epidermis and underlying, surrounded by congested capillaries, fibrinous exudate and round cell infiltration. H & E., X 150.

Fig. (2): Re-epithelization with healing by substitution. H& E., X 300.

Figs. (3 - 5), Suppurative dermatitis

Fig. (3): Homogenous basophilic material focally replacing the epidermis and surrounded by a zone, of hemorrhage and fibrinous exudate. H & E., X 150.

Fig. (4): Deep necrosis surrounded by congested capillaries, fibrinous exudate and infiltrated with round cells. H & E., X 150.

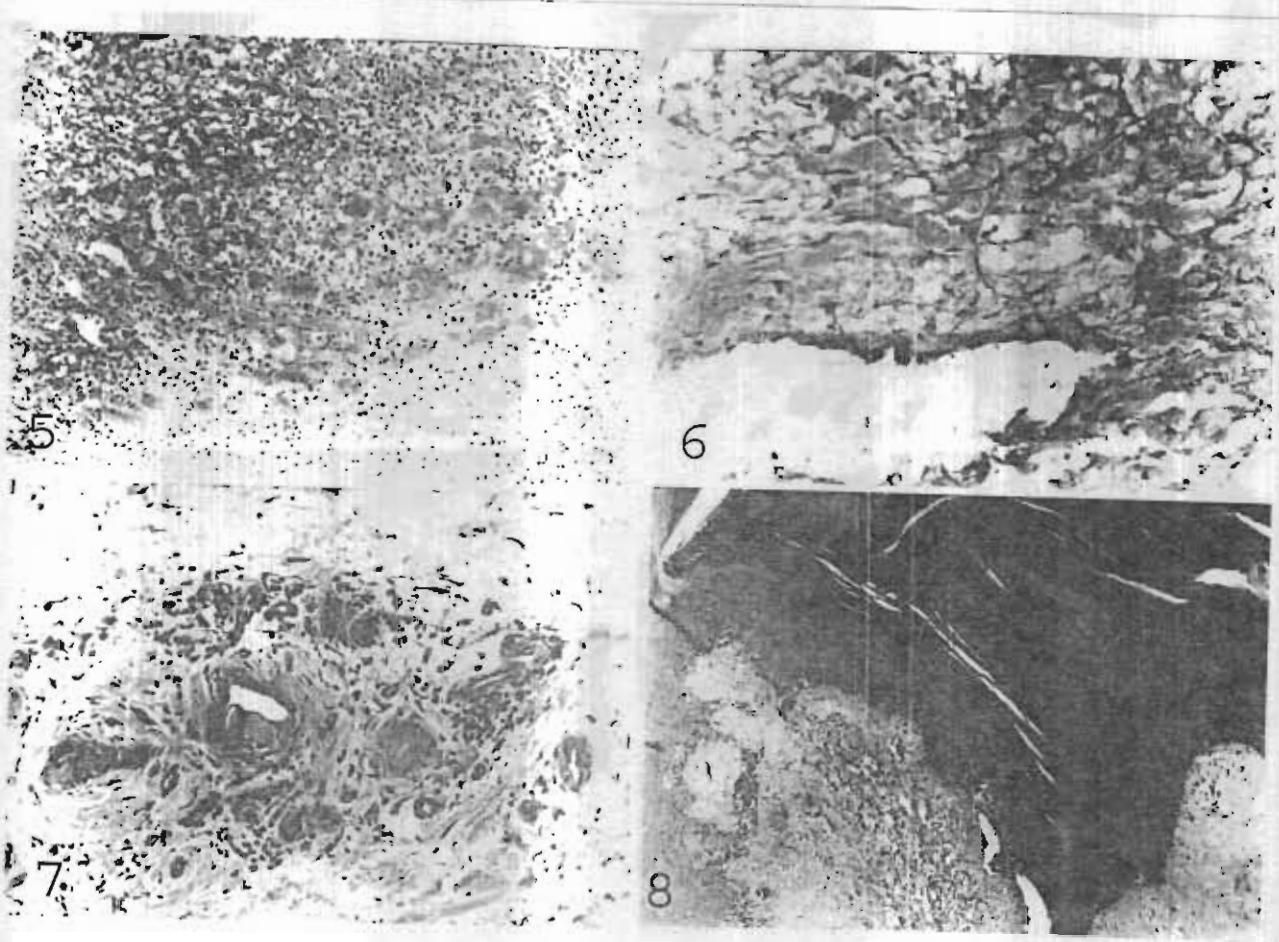


Fig. (5) : A high power for Fig. (4) to show the pus, debris and leukocytes . H & E X 600

Figs. (6 & 7) Serofibrinous dermatitis:

Fig. (6): Granular eosinophilic material, separating the collagen fibers of the dermis. H & E., x 600.

Fig. (7): Few round cell infiltration among the arterial plexus. H & E., x 600.

Figs. (8 - 11) Chronic dermatitis:

Fig. (8): Hyperkeratosis and acanthosis are evident. H & E., x 300.

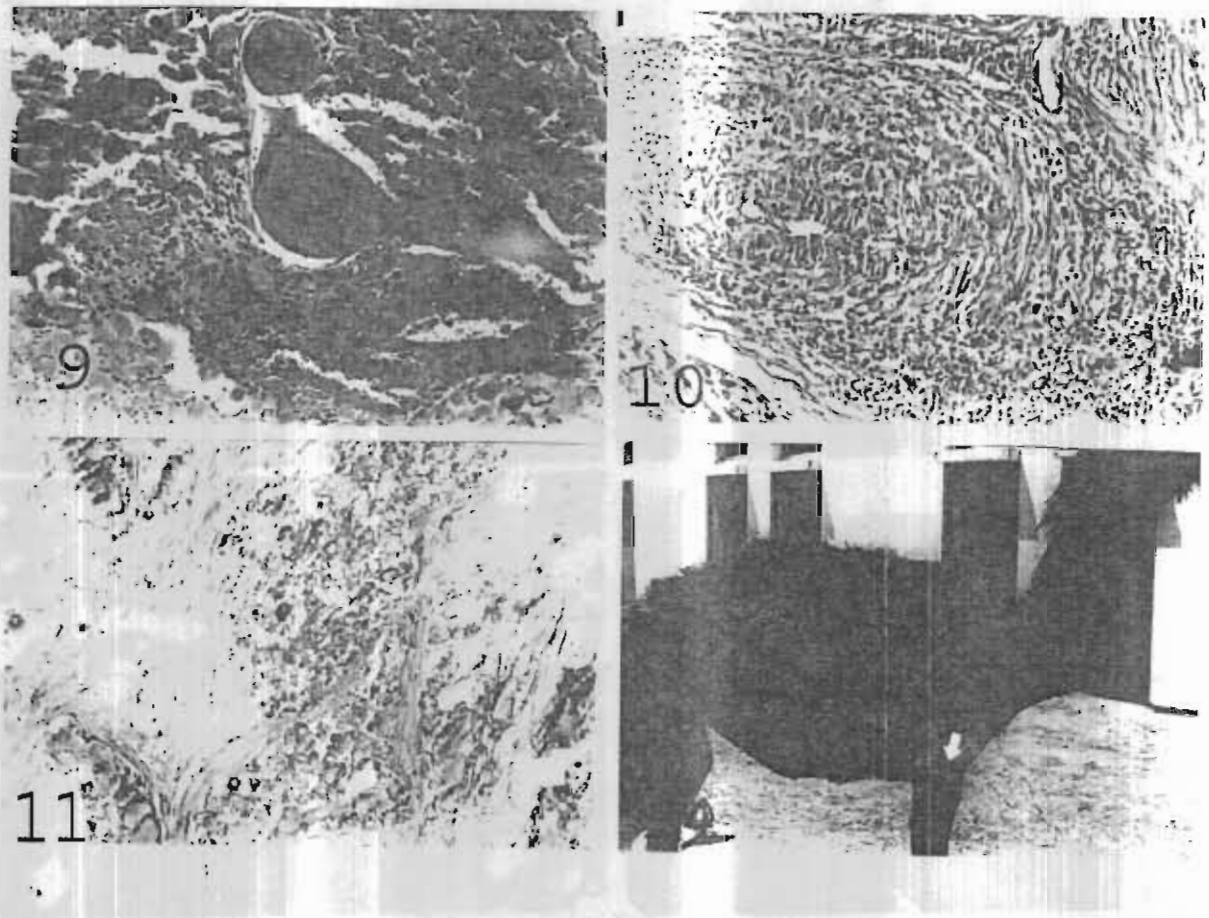


Fig. (9): The dermis shows hyalinized masses represented by compressed keratinized epithelial cells. H & E., x 600.

Fig. (10): Dermis showing arteritis where the wall is thickened by round cells, and the lumen is almost obliterated. H & E., x 600.

Fig. (11): Dermal calcinosis represented by irregular basophilic masses. H & E., x 300.

Figs. (12 – 14), Mycotic dermatitis:

Fig. (12): Ringworm, circumscribed alopecia on the forelimb. (arrow).

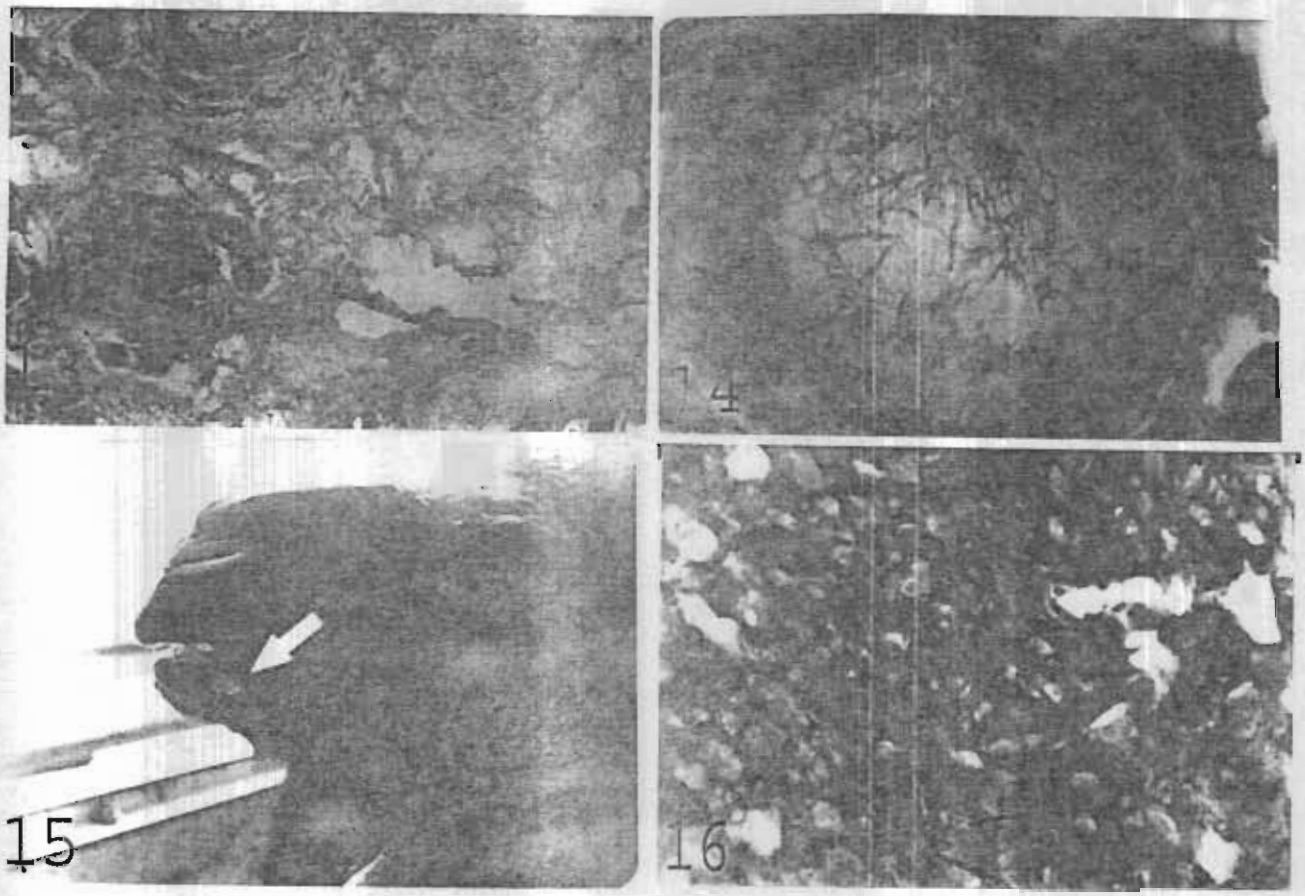


Fig. (13): Ringworm, focal mycotic dermatitis represented by invaded hair-follicles by the mycelia and spores. PAS, x 300.

Fig. (14): Ringworm, a high power of Fig. (13) to, show the hyphae in hair- shaft. PAS, x 1200.

Figs. (15 & 16), Viral dermatitis

Fig. (15): Pox, brown crust at the lower jaw.

Fig. (16): Pox, intracytoplasmic eosinophilic inclusion bodies (arrows). H & E., x 1200.

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الملخص العربى

دراسات باثولوجية على معدل إصابات الجلد الميكروبية فى الجمال بمحافظة الشرقية

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معهد بحوث صحة الحيوان فرع الزقازيق وبنها

تم إجراء هذا البحث على عدد ١٦٠ جمل مصاب بإصابات مختلفة فى الجلد فى بعض مجازر محافظة الشرقية (الزقازيق وبلبيس) وذلك فى الفترة ما بين مايو ٢٠٠٣ إلى مايو ٢٠٠٤ وتم أخذ عينات من مكان الإصابة لإجراء الفحوصات الباثولوجية والبكتريولوجيه والفطرية وأثبتت النتائج أن أعلى إصابة كانت نتيجة العدوى البكتيرية ٩١ جمل تليها الإصابة الفطرية (السعفة) فى ٦١ جمل بينما كانت الإصابة الفيروسية (جدرى الجمال) فى عدد ٨ جمال فقط. وتم تقسيم الإصابات الجلدية الناتجة عن العدوى البكتيرية حسب نوع البكتريا المعزولة إلى التهاب الجلد التقرحى تم عزل (الميكروب العنقودى الذهبى مختلط بالميكروب السبحى) والتهاب الجلدى التقيحى وتم عزل (ميكروب الكورينى الصديدى مختلط بالميكروب العنقودى الذهبى) والتهاب الجلدى المصلى الليفينى وتم عزل (ميكروب الكورينى الكاذب منفردا) والتهاب الجلد المزمن تم عزل (ميكروب الكورينى الكاذب مختلطا بالميكروب العنقودى الذهبى).

أظهرت نتائج البحث أن الإصابات الميكروبية المختلفة لجلد الجمال تحدث تغيرات باثولوجية تؤثر على الشكل العام للجلد والحالة الصحية للجمال مما يؤثر على الناحية الاقتصادية.