Epidemiological, Clinical and Laboratory study of Canine Dermatophytosis in Baghdad Governorate, Iraq

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Summary

The aim of the present study was to isolate and identify of the pathogenic fungi of canine dermatophytosis in Baghdad governorate Iraq, also study the epidemiology and describe the clinical signs of dermatophytosis, from January 2018 till December 2018. Out of 653 dogs 165 (25.3%) were with dermatomycoses and 103 (62.42%) dogs with dermatophytosis. The mycological diagnosis were conducted by direct microscopy and by culture the specimens on each sabouraud dextrose agar supplemented with chloramphenicol and cyclohxemide and dermatophytes test media. The identified dermatophytes were represented Microsporum sp.(80.6%) appeared Microsporum canis (87.9%); M. audounii (8.4%);M. gypseum (3. 6 %) and Trichophyton spp (19.4%) in which divided between Trichophyton ruburum (60.0 %) and T. terrestre (40.0%). Microsporum canis and Trichophyton ruburum were the most common species isolated (87.9%),(60.0 %) respectively. The overall prevalence of dermatomycosis and dermatophytosis from various parts region of Baghdad city were Al Karkh district (32.0%), (64.6%) and Al Rusafa district (22.4%), (60.4%) respectively. Moreover, a higher percentage of infection in young age 55 of 84 (65.47%) and lower infection in old age 8 of 18 (44.44%) with significant difference at P< 0.05. The effect of breeds on the prevalence of canine mycosis show high percentage of infection in German shepherd dog (47.96%) and lower infection in Bulldog breed (10.63%) as well as, high prevalence of dermatophytosis recorded in Rottweiler (100%), Pomeranian (83.3%) and lower prevalence (40.0 %) in each of Boxer and local dog breed. The relation of hair coat showed significantly high percentage of infection in long hair dogs (69.0%) than short hair coat (48.0%). There were no significant difference between the sex and habitat but, recorded a high (%) in shelters habitat (67.19%) and low (%) in plantation habitat (56.25%). The prevalence of infection was showed no signficantly high percentage of infection in cold climate winter (67.74%) in which low temperature and high humidity while low percentage of infection in dry climate autumn (44.4%). In addition the effect of season on the prevalence of dermatophytosis recognized by a higher (%) of infection in cold weather, winter (67.74%) and lower infection in dry weather, autumn (50.0%). Other dermatomycosis isolated were Chrysosporium Nannizziopsis dermatitidis (9.1%); Malassezia pacydermatis (7.9 %) and saprobe fungi from domestic dogs represented by Alternaria alternate (21.4%); Aspergillus spp (60.7%); Aspergillus flavus (25.9%); Aspergillus fumigatus (28.2%); Aspergillus niger (23.5 %); Aspergillus nidulans (22.4 %); Penicillium sp. (4.3%); Curvularia sp (3.6%) and Rhizopus sp (2.1%).

Keywords: Epidemiology, Canine Dermatophytosis , Fungus.

Introduction

Dermatophytosis is one of the most common cutaneous disease conditions distrbuted all over the world; which is share the ability to utilize keratin as a nutrient substrate and infection of the stratum corneum of the epidermis and keratinized tissues such as skin, hair and nails of humans and animals (1 and 2). Cutaneous fungal infections can be caused by dermatophytes, yeasts, and non-dermatophyte molds. Dermatophytes are molds belonging to the three genera of imperfect fungi including Microsporum, Trichophyton, and Epidermophyton. The most frequently dermatophytes infection in dogs are Microsporum spp. and Trichophyton spp (2).

Typical dermatophytic lesions are discrete, circular with areas of hair loss, particularly on the head, ears or extremities of the paws. The hairs surrounding affected areas appear broken few studies show a higher prevalence of dermatophytes (2 and 3). Transmission of dermatophytosis is dependent on the current health status of the dogs and cats, stress factors, number of spores, hygienic status and possibly genetic predisposition (4). The prevalence of dermatophytoses varies according to climate, temperature, relative humidity and precipitation in different geographical regions, as well as the natural reservoirs (3).

The relatively low survey study on the isolation of dermatophytes from dogs and cats with suspected lesions of dermatophytosis have been reported in different countries by researchers (5).

In Iraq, studies on the prevalence of dermatophytosis in dogs are rare (6-8). The presence of a great variety of saprobe fungi in dogs and cats with superficial lesions are considered belonging to skin microbiota (4). These are also implicated in mycoses especially, when the dogs and cats are debilitated by a chronic disease; steroids therapy; prolonged antibiotic treatment or immune depressing conditions. Therefore, saprobe fungi can proliferate and elicit an infection, but their role was not enough emphasized (4 and 9). The 'gold standard' diagnostic techniques for identification of dermatophytosis involve direct microscopic examination of clinical specimens followed by in vitro isolation and identification(10).

In recent years, the people have become increasingly interested in dogs and cats breeding; also lack of studies on fungal infections in dogs and the emergence of many cases of dermatmycosis infections have incremented. Consequently it is essential to view the perspectives and insight of prevalence of dermatophyte fungal infection in Baghdad city, Iraq. With refering to factor, the relation of dogs sex, age, coat, habit, breed and seasonal effect on dermatophyte infection

Materials and Methods

The study was carried out for one year from, January 2018 till December 2018 (Winter, Spring, Summer and Autumn) in a domestic dogs at Baghdad governorate . A number of 170 domesticated dogs with dermatomycosis lesions sent to laboratory of clinical pathology in Faculty of Veterinary Medicine of Diyala University were evaluated for the presence of dermatophytes. The results were correlated to the breed, age, coat, habit, seasonal effect and clinical conditions in order to understand the disrubition of these fungi among pet dogs.

The skin of all infected domestic dogs was examined clinically by inspection and palpation to determine skin lesion which appeared as alopecia, crust, scales, nodules, pustules and inflammation. The shape, size, position, distribution and time of the appearance of skin lesions as well as the age, breed, sex of the dogs were also recorded .

The samples of skin scraping and hair were collected from the periphery of the lesion after cleaning with 70% ethyl alcohol in sterile falcons. Samples were collected from infected animal's suffering from lesions suggesting ring worm infections (Circumscribed areas of hair loss filled with raised white scales on head, neck or all over the body) .

Direct Microscopic Examination Using KOH (20%) : One or two drops of 20% KOH (potassium hydroxide) were placed on a microscopic slide mixed with skin scraping from infected area for 10 minutes, the slide was gently passed through a low flame and covered by cover slip. The specimen was examined for the presence of arthrospores and hyphae under low 10 X and high power 40 X a light microscope with reduce light according to (11 and 12). The hyphae are observed under the microscope invading the hair and producing arthrospores which arranged in three types of hair invasion, known as ectothrix, endothrix and ecto-endotherix arrangement of arthrospores. In ectothrix invasion, the arthrospores are observed on the surface of the hair, and in endothrix invasion within the hair, whereas, in ecto-endotherix invasion the spores are found within and out the hair(11).

Part of the scraping hair samples by sterile thumb forceps or tweezers were inoculated by gently imprinting them onto the surface of 11 cm Petri dishes containing Sabouraud dextrose agar (with chloramphenicol 0.5% and

actidione 0.5%). The Petri dishes were incubated upside down in an oven at 28 C and examined daily for three weeks. After three weeks the colonies in the medium were macroscopically and microscopically examined and identified to species level as dermatophytes. On the other hand, dermatophyte test medium (DTM) was used to isolate dermatophyte from a contaminated or mixed growth with other fungus and bacteria. DTM selectively inhibits bacteria and other contaminant fungi while encouraging the growth of dermatophytes. Dermatophytes produce an alkaline reaction through oxidative deaminaiton. While most others which were capable of growing on DTM produce acid reaction (12).

Identification of Dermatophytes

The identification was based on morphology of colonies appearance, pigment production and the micro morphology of the macro and microconidia produced. Cultures were examined at 5 or 7 days intervals from the onset as described by (11 and 12). The identification of saprobe fungi species was possible only for this genus, by following macro and microscopic evaluations of the primary cultures(4 and 11).

Results and Discussion

Clinical examination of domestic dogs suffering from skin lesion characterized clinically by focal and multifocal alopecia,

(Table,1). Typical lesions consist of 13-cm diameter, discrete focal areas of fine scale crust, stubble hair, in different area of body dogs typically on the face, head, ears, back, abdomen, feet and fore and hind limbs, folliculitis, pustules, hypopigmentation, erythema, pruritus(Fig I and 2). On the other hand, the study show mixed infection dermetophytes and demodexosis infestation in some cases of skin lesion represented pruritus, general alopecia, pustules, oozing of blood watery materiel by squeezing, and bad condition, which was diagnosed by a direct microscopic examination Moreover, complementary examination as wood lamps to dogs suffering from skin lesion will fluoresce a characteristic apple green colour which was positive to dermatophytes sp specially Microsporium canis and M. audounii (Fig.3)..

Table ,1: Clinical signs of dogs infected by dermatophytes and non dermatophytes sp.

Clinical signs	No. Of skin lesion	(%) + ve for dermatophytes	No. of (%) + ve non dermatophytes
Circular or patchy alopecia	140	93 (66.4 %)	47 (33.6 %)
Crusts,	146	103 (70.5 %)	43 (29.5 %)
Scales	146	103 (70.5 %)	43 (29.5 %)
Hyperpigmentation (black patch)	2	2 (100 %)	0 (0.0 %)
Pruritus	120	65 (54.2 %)	55 (45.8 %)
Pustules	84	34 (40.5 %)	50 (59.5%)
Erythematous	78	40 (51.3 %)	38 (48.7 %)
lesion localizty			
-Tail;	88	45 (51.1 %)	43 (48.9 %)
-Paws	20	10 (50.0 %)	10 (50.0 %)
-Face;	78	50 (64.1 %)	28 (35.9 %)
-Pinnae	82	61 (74.4 %)	21 (25.6 %)
-Forelimbs (shoulder)	100	60 (60.0 %)	40 (40.0 %)
-Hind limbs, groin or trunk;	102	66 (64.7 %)	36 (35.3 %)
-Back;	146	105 (71.9 %)	41 (28.1 %)
-Interdigitalis	12	7 (58.3 %)	5 (41.7 %)
Multifocal patchy alopecia	15	10 (66.7 %)	5 (33.3 %)

No.= Number , C. = cases ,P. = Positive , Derma. = Dermatophytes , S.L. = skin lesion

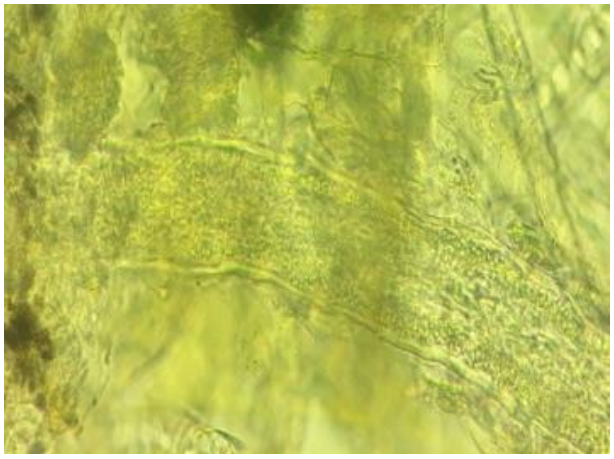
Figure, 1: Localize circular patch alopecia, crust, scales and pruritus in groin (lateral side of thigh) of Buggy dog, infected by dermatophytes

Figure, 2: Multi focal patch alopecia, all the body, crust, hyperkeratosis, scales and pruritus in Boxer dog, 1.5 year old infected by dermatophytes

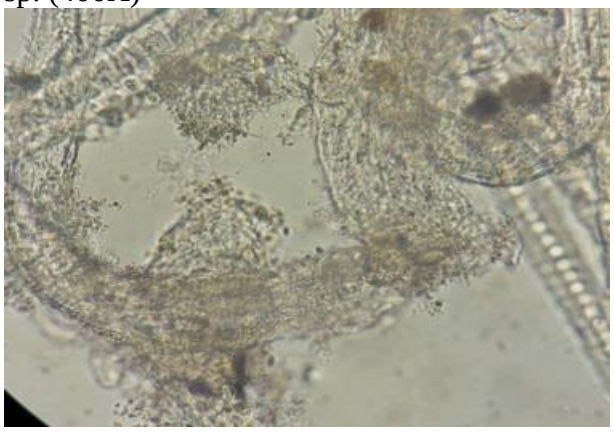
Figure, 3: Positive wood lamps examination apple green colour, localize patch alopecia on the back of a Husky dog, 6 months old infected by dermatophytosis (Microsporum canis)

The infected dogs showed different types of arthrosporse arranged: ectothrix (Microsporum canis and Microsporum audouonii), endothrix (Trichophyton terrestre and Trichophyton ruburum) and ecto-endotherix(Microsporium gypseum) as in (Fig.4-7).

Figure,4: Ectothreix arrangement of arthrospors (Invasion outside of hair shaft) of German Shepherd dog infected by Microsporium canis (400X)



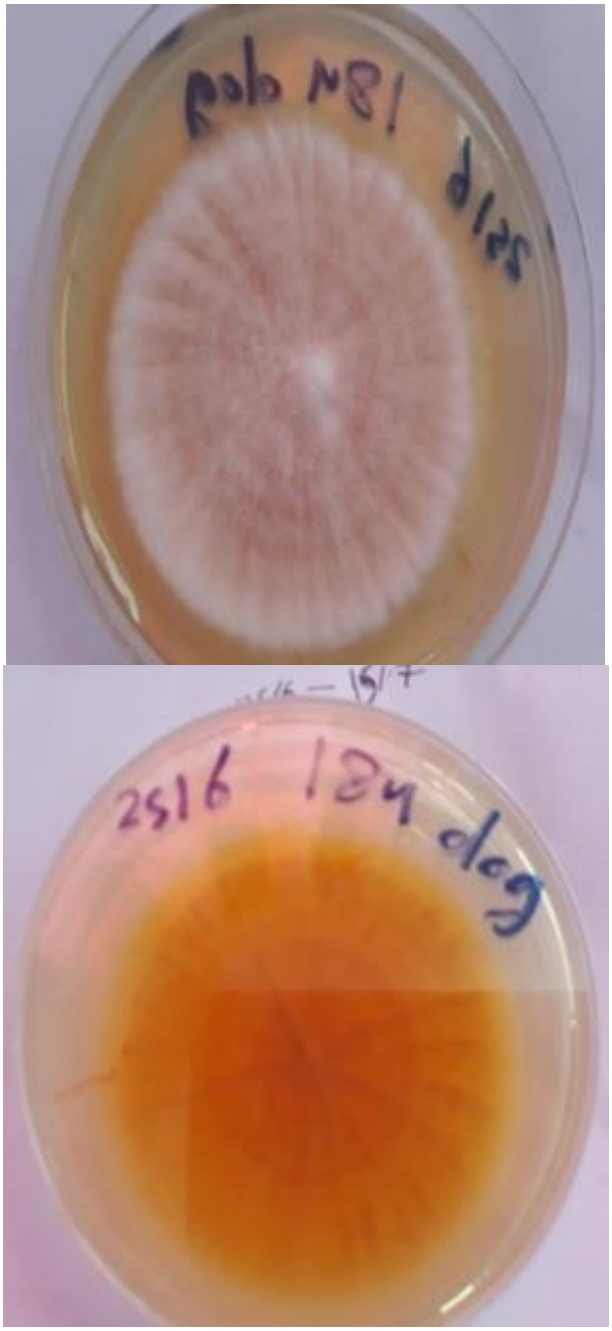
Figure, 5: Endothreix arrangement of arthorspors (Invasion inside of hair shift) which have a large arthorspors in chains on the hair surface of dog infected by Trichophyton sp. (400X)



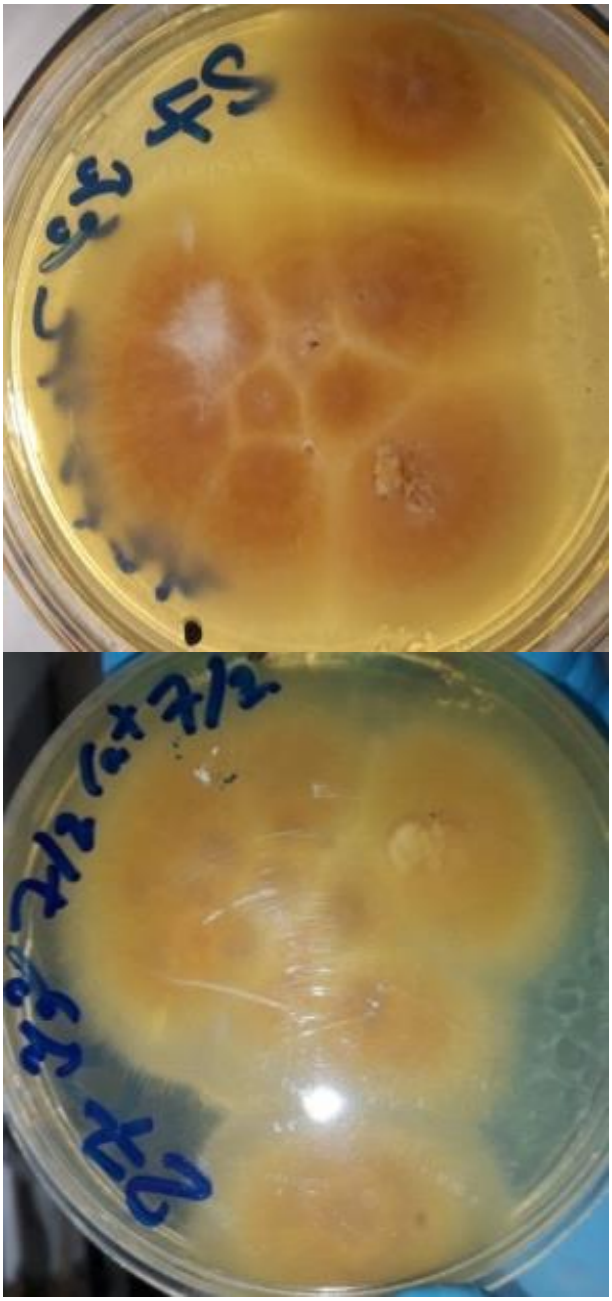
Figure, 6: Ecto-endotherix arrangement of arthorspors (medium to large size spores) Invasion forming sheath around and within hair shift of Belgian dog infected by dermatophytosis Microsporium gypseum (400X).

Figure,7: Ectotherix arrangement of arthorspors (Invasion outside of hair shaft) medium to large size spores in hair of German shepherd dog infected by dermatophytosis Microsporium audouonii (400X) .

Morphology of M. canis on sabouraud dextrose agar characterized by white, soft and fluffy in the center with yellow or golden yellow border closely spaced radial grooves also became white all the top with age 3-4 weeks as in (Fig. 8). Microsporium audouonii colonies were rather flat and spreading with a radiating margin with a greyish-white to tan to beige colouration with the reverse a salmon colour to rose-brown.as in (Fig.9). Nevertheless, morphology M. canis , M. gypseum, M. audounii , Trichophyton ruburum and T. terrestre characterized by white, soft and fluffy in the center dark red on the revers closely spaced radial grooves also became white all the top with age 3-4 weeks and converted the colour of DTM from orange to red colour as in (Fig. 10). On the other hand, macroscopic colony of Trichopyton rubrum is downy to cottony in texture with fine white aerial mycelium at the surface. The overall surface is white, sometimes becoming rose on ageing and the reverse is typically tend to bring out the reddish-brown to yellow colours as in (Fig.11). While the morphology of Chrysosporium Nannizziopsis dermatitidis on sabouraud dextrose agar characterized by white, soft and fluffy in the center (Top view) and yellow to brown and darker in center (reverse view) as in (Fig.12).

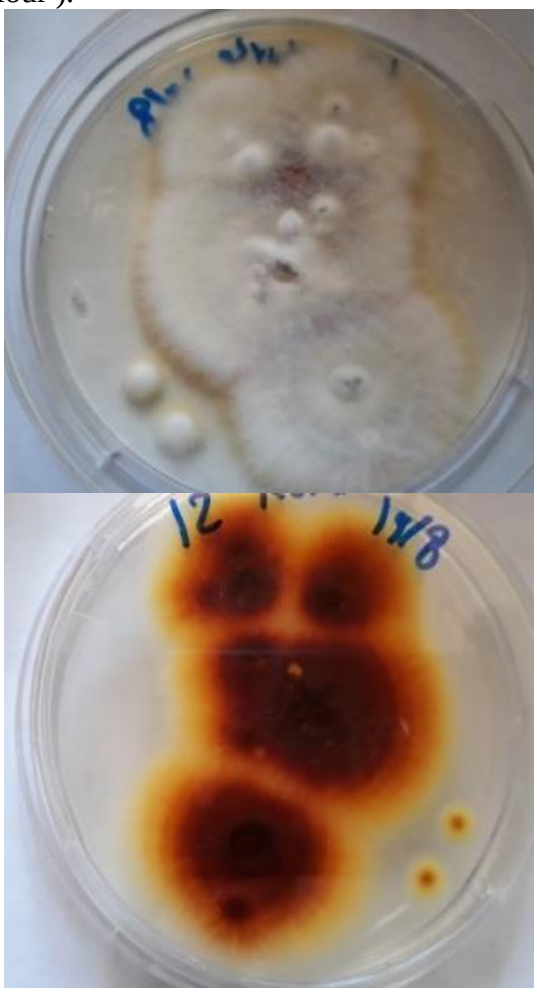


Figure,8: Morphology of M. canis on Sabouraud glucose agar characterized by white, soft and fluffy in the center with yellow or golden yellow border closely spaced radial grooves also became white all the top with age 3 4- weeks.

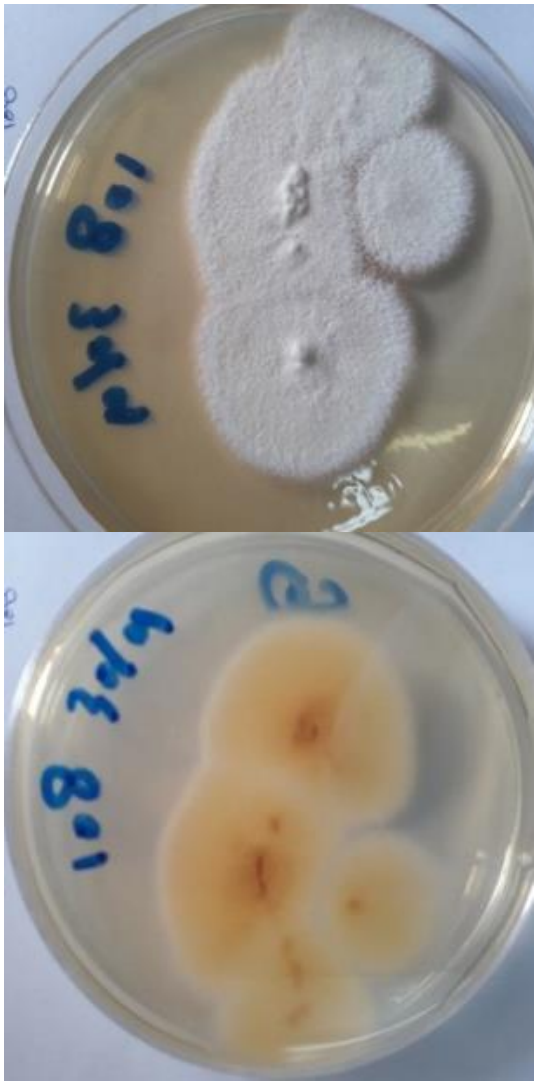


Figure,9: Microsporium audouonii colonies were rather flat and spreading with a radiating margin with a greyish-white to tan to beige colouration with the reverse a salmon colour to rose-brown.

Figure,10:M. canis on DTM agar characterized by white, soft and fluffy in the center with red colour of agar (converted from orange to red colour).



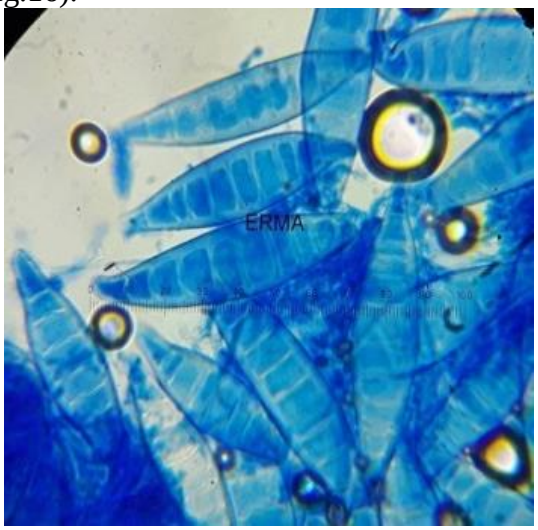
Figure, 11: Top view, macroscopic colony of Trichopyton rubrum is downy to cottony in texture with fine white aerial mycelium at the surface. The overall surface is white, sometimes becoming rose on ageing. The reverse, is typically tend to bring out the reddish-brown to yellow colour.



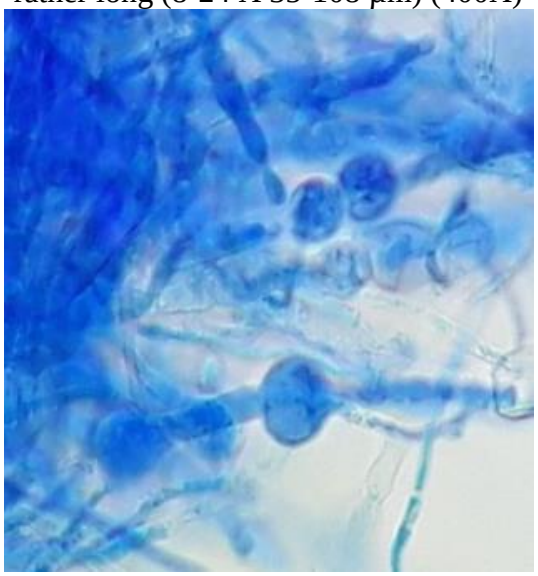
Figure, 12: Top view, macroscopic morphology of Chrysosporium on on Sabouraud glucose agar characterized by white, soft and fluffy in the center and reverse view showed a yellow to colour and darker in center.

Mormphology of Microsporum canis macroconidia showing rough surface with knob-like end or boat like and sepeteted 9 -13 segments with rather long (8-24 X 35-108 µm) with microconidia along the length of the hyphae (Fig.13). Morphology of M.audouinii - starting the formation of racquet hyphae which appear somewhat like a tennis racquet, narrower on one end and wider-round on the opposite end with chlamydospore in between the run of a hyphal element and Pectinate hyphae ,comb-like structure of hyphae (Fig.14). Whenever, Trichophyton rubrum typical microconidaia which are clavate (club shaped) to pyriform (tear-drop shaped), solitary, sessile alongside undifferentiated

hyphae (Fig.15). Furethemore, Nannizziopsis dermatitidis Teardrop or clavate (black arrow) shaped conidia attached to septate hyphae via delicate, (fertile hyphae and conidia) as in (Fig.16).

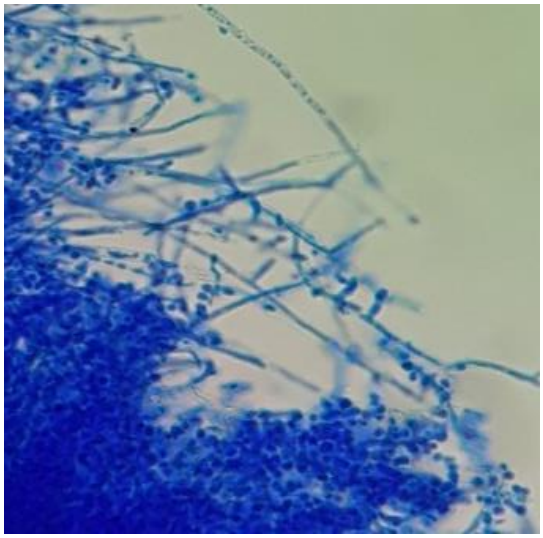


Figure, 13: Microsporum canis macroconidia showing rough surface with knob-like end or boat like and sepeteted 9 -13 segments with rather long (8-24 X 35-108 µm) (400X)

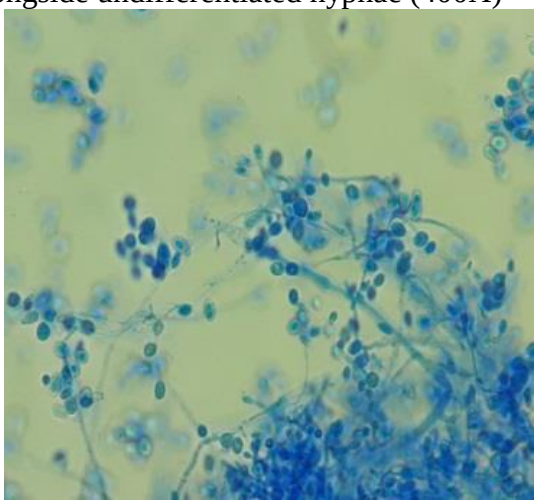


Figure, 14:M. audouinii - starting the formation of racquet hyphae which appear somewhat like a tennis racquet with chlamydospore in between the run of a hyphal element (400X).

The frequent and distribution dermatophytes species and associated saprophytic fungal isolated from domestic dogs listed in (Table,2). In addition, the present research recorded and isolated mixed infection or more than an innate cause in some dogs that were suffering from skin lesions (Table,2).



Figure, 15: Trichophyton rubrum typical microconidaia which are clavate (club shaped) to pyriform (tear-drop shaped), solitary, sessile alongside undifferentiated hyphae (400X)



Figure, 16: Nannizziopsis dermatitidis Teardrop or clavate (black arrow) shaped conidia attached to septate hyphae via delicate, (fertile hyphae and conidia) (400X)

The percentage of infection by dermatophytosis and dermatomycosis were (62.42%) and (38.2%). During one year the total dermatophytosis and dermatomycosis from various region of Baghdad city (64.6%), (35.4%) respectively in Al Karkh district and (60.4%), (39.6%) respectively in Al Rusafa district as in (Table,3). No significant $P< 0.05$ difference among sex varation in dogs infected by dermatophytosis (Table, 4). Moreover, young age (1-12 months) dogs showed high infection whereas, such not decreased significanty $P< 0.05$ in old age (3 and 7 years), (Table, 5).

The relation of hair coat pet dogs with prevalence of dermatophytosis showed a significantly high rate of infection in long hair coat (69.0%) than short hair coat dogs (48.0%) as in (Table,6). Also the relation of habitat with prevalence of infection show no significant difference high rate of infection in shelters habitat (67.19%) and low rate of infection in plantation habitat (56.25%), (Table,7).

The effect of breeds on the prevalence of canine mycosis show no significantly high percentage of infection in German shepherd dog (47.96%) and lower infection in Bulldog breed (10.63%) as well as, high prevalence of dermatophytosis recorded in Rottweiler (100%), Pomeranian (83.3%) dog breed and lower prevalence (40.0 %) in each of Boxer and local dog breed (Table,8).

The prevalence of infection was showed no signficantly P< 0.05 high percentage of infection in cold climate winter (67.74%) and low percentage of infection in dry climate autumn (44.4%), (Table,9).

Table, 2: Frequent and distribution dermatophytes species and associated saprophytic fungal isolated from domestic dogs.

Organisms		(%) of infection
Dermatophytes species	*Microsporum canis* *Microsporum audounii* *Microsporum gypseum*	73 (87.9%) 7 (8.4 %) 3 (3. 6 %)
	Total	83 (80.6%)
	Trichophyton ruburum *Trichphyton terrestre*	12 (60.0 %) 8 (40.0 %)
	Total	20 (19.4%)
Chrysosporium specise 15 of 165 cases of skin lesions	*Nannizziopsis dermatitidis*	15 (9.1 %)
Non dermatophytes species **140 of 165 cases of skin lesions (84.8%)**		
11 of 140 case of skin lesions	*Malassezia pacydermatis*	11 (7.9%)
30 of 140 cases of skin lesion **15 dogs are infected by *Alternaria* and 15 dogs infected by dermatophytes and *Alternaria alternata***	*Alternaria alternata*	30 (21.4%) (15 M.I with R.)
85 of 140 cases of skin lesions **23 dogs are infected by *Aspergillus sp* and 62 dogs are infected by dermatophytes and *Aspergillus sp***	*Aspergillus sp* *Aspergillus flavus* *Aspergillus fumigatus* *Aspergillus niger* *Aspergillus nidulans*	85 (60.7%) (62 M.I with R.) 22 (25.9 %) 24 (28.2 %) 20 (23.5 %) 19 (22.4 %)
6 of 140 case of skin lesion **3 dogs are infected by *Penicillium sp* and 3 dogs infected by dermatophytes and *Penicillium sp.***	*Penicillium sp.*	6 (4.3%) (3 M.I with R.)
5 of 140 cases of skin lesions **2 dogs are infected by *Curvularia sp.* and 3 dogs infected by dermatophytes and *Curvularia sp.***	*Curvularia sp.*	5 (3.6%) (3 M.I with R.)
3 of 140 cases of skin lesions	*Rhizopus sp*	3 (2.1%)
M.I = Mixed infection , R= Ringworm		

Table, 3: Percentage of canine dermatomycosis and dermatophytosis infection in area of study.

Area	Total No.	+Ve for skin lesion	+Ve for dermatophytosis	+Ve for dermatomycosis
Al Karkh district	203	65	42 (64.6%)	23 (35.4%)
Al Rusafa district	450	101	61 (60.4%)	40 (39.6%)
Total	653	165 (25.3%)	103 (62.42%)	63 (38.2%)
X^2= 3.838, P- value = 0.050 , P < 0.05 , SD				

No significant P< 0.05 difference among sex varation in dogs infected by dermatophytosis (Table5-).

Table , 4:Prevalence of dermatophytosis in relation to the sex of domestic dogs.

Sex	Total No.	+Ve for skin lesion	+Ve for dermatophytosis
Male	421	95 (22.56%)	59 (62.11%)
Female	232	70 (30.17 %)	44 (62.85%)
Total	653	165 (25.3%)	103 (62.42%)
X^2= 0.01, P- value = 0.92 , P < 0.05 , NSD			

Table,5: Prevalence of dermatophytosis in relation to the age of animals.

Age	Total No.	+Ve for skin lesion	+Ve for dermatophytosis
1 months to 12 months (Young age)	227	84 (37.0%)	55 (65.47%)
1 – 2 years (Adult age)	242	63 (26.0%)	40 (63.49%)
3 –7 years (Old age)	184	18 (9.78 %)	8 (44.44%)
Total	653	165	103 (62.42%)
X^2= 2.85, P- value = 0.24 , P < 0.05 , NSD			

Table , 6: Prevalence of dermatophytosis in relation to the coat of domestic dogs

Coat	Total No.	+Ve for skin lesion	+Ve for dermatophytosis
Short hair	293	52 (17.75%)	25 (48.0%)
Long hair	360	113 (31.39 %)	78 (69.0%)
Total	653	165 (25.27%)	103 (62.42%)
X^2= 6.66, P- value = 0.009 , P < 0.05 , SD			

Table, 7: Prevalence of dermatophytosis in relation to the Habitat of domestic dog

Habitat	Total No.	+Ve for skin lesion	+Ve for dermatophytosis
Household	231	53 (22.94%)	33 (62.26%)
Shelters	130	64 (49.23%)	43 (67.19%)
Plantation	292	48 (16.43%)	27 (56.25%)
Total	653	165 (25.27%)	103 (62.42%)
X2= 1.4, P- value = 0.49 , P < 0.05 , NSD			

Table,8: Prevalence of dermatophytosis in relation to the breeds of domestic dogs .

Breeds of dogs	Total No.	+Ve for skin lesion	+Ve for dermatophytosis
German shepherd	**115**	**53 (46.1%)**	**36 (67.9%)**
Bulldog	**12**	**5 (41.7 %)**	**3 (60.0%)**
Rottweiler	**10**	**2 (20 %)**	**2 (100.0%)**
Husky	**77**	**11 (14.3 %)**	**6 (54.5%)**
Belgian	**90**	**10 (11.1%)**	**8 (80.0%)**
Pointer	**20**	**2 (10.0 %)**	**2 (100.0%)**
Wolf dog	**10**	**3 (30.0 %)**	**2 (66.7%)**
Pomeranian	**30**	**6 (20.0 %)**	**5 (83.3%)**
Boxer	**50**	**10 (20.0 %)**	**4 (40.0%)**
Cone Corso	**8**	**5 (62.5%)**	**3 (60.0%)**
Terrier	**100**	**31 (31.0 %)**	**20 (64.5%)**
Local	**84**	**20 (23.8 %)**	**8 (40.0%)**
Cross	**47**	**7 (14.9 %)**	**4 (57.1%)**
X^2= 2.85, P- value = 0.24 , P < 0.05 , NSD			

Table, 9: Prevalence of canine dermatophytosis and dermatomycosis in relation to the seasons of year.

Seasons	Total No.	+Ve for skin lesion	+Ve for dermatophytosis	+Ve for dermatomycosis
Winter (Dec.-Jan.-Feb.)	244	62	42 (67.74%)	20 (32.3%)
Spring (Mar.-Apr.-May)	159	45	29 (64.44%)	16 (35.6%)
Summer (Jun. Jul.-Aug.)	136	30	18 (60.0%)	12 (40.0%)
Autumn (Sep.-Oct.-Nov.)	115	28	14 (50.0%)	14 (50.0%)
X2 = 2.744	P- value = 0.433	P< 0.05	NSD	

The frequency of the clinical signs and prevalence of dermatophytoses depends upon the extent of host immune response, the temperature, humidity, predisposing conditions and the presence of natural reservoirs of infection (13 and 14). The most common lesion is the one characterized as a focal or multifocal patch of alopecia including circular lesions with erythema, hair loss with clear demarcation line, crust, hyperpigmentation, scales and broken hairs at the periphery, which extend centrifugally and may heal centrally typically on the face, ears, head and forelimbs. These finding was reported previosuly with (13, 15, 16 and 17).

The M. canis was the most frequently dermatophyte isolated from pet dogs followed by T. ruburum, M. audounii and the less was Trichophyton terrestre this also recordede in previous studies (11 and 18).

The epidemiology of dermatophytes in dogs is relatively low, usually ranging between 4.0% and 15.0 % in different countries of the world such as Iran (4), Italy (19) and Brazil (20).

In Iraq, little information is available concerning the epidemiological and identification of dermatophytes isolated from domestic dogs (6-8). These data are un accordance with the results obtained in our survey which are represented by higher percentage canine dermatophytoses in different regions of Baghdad city. These finding can explain by to the variation allegedly occurs due to difference in temperature, climate, relative humidity and precipitation among the geographical regions where the surveys were executed; in addition, to lack of epidemiological studies of dermatophytes previously of dogs and pollution of the environment in Iraq.

Infection by dermatophytes is directly dependent on age therefore, younger dogs (1-12 month) appear to be susceptible to dermatophytoses more than adult (1-3 years) and old age dogs (more than 3years) this result is agreement with result of other authors (4. 21 and 22) they were found that the prevalence of this infection in cats and dogs less than a year old was more than twice that in older animals as well as, there is no apparent sex predisposition effect on infection (19 and 22).

Nevertheless, the relation of infection with dog coat and breed such as, Rottweiler (100%), Pomeranian (83.3%), German shepherd and terrier dog breed had a statistically significant higher prevalence of dermatophytoses, mainly caused by M. canis, T. ruburum M.audounii than Boxer and local breed (40.0%). This could be explained by qualitative and/or quantitative differences in non-specific cutaneous defenses, sebum sweat gland and long hair coat. These finding in accordance with result of researchers (14 and 22)..

Taking into account that the cages where dogs were housed have been previously inhabited by dogs with skin mycosis, we assume that the contact with surface contaminated with M. canis spores was the natural route of this dermatophyte infection. Therefore, the higher prevalence of dermatophytes isolated from dogs were housed in shelter and plantation habitat compared with housed dogs.

Moreover, a higher percentage of infection in winter (67.74%) and lower infection in Autumn (50.0%) can be explained by

alteration in prevalence rates is due to low temperatures and high humidity in winter or low temperatures is favor the germination of spores of dermatophytes contrary to what we recorded in the autumn and summer where the hot and dry climate also effect of year season, climate, temperature, humidity on the prevalence of infection this agreed with (18).

Isolation of Chrysosporium Nannizziopsis dermatitidis from some domestic dogs were housed in shelter and plantation habitat can be explained that the cages where dogs were housed have been previously inhabited by snake, hedge hogs which are a potential source of spores transmission to dogs also agreed with (23).

The occurrence of a great variety of saprobe fungi in dogs with superficial lesions beside dermatophytes such as Malassezia pacydermatis (7.9 %) Alternaria alternate (21.4%), Aspergillus spp (60.7%), Penicillium sp. (4.3%) and Curvularia sp (%3.6)

Could be explain by the environmental contamination provided constant exposure to a large source of organisms which contributed to the eventual relapse of the infection .

These finding are agreement with result of (3 and 9) they were showed that these fungi are commonly found in soil, air, plants and on other materials, which are in a constant contact with animals and can proliferate and elicit an infection. In conclusions Microsporum canis and M. audounii and Trichophyton ruburum are the main dermatophyte detected in this research also, Nannizziopsis dermatitidis is superfacial mycosis infected dogs not only snakes and rodents characterized clinically by erythema, loss of hair, crust and scales. In addtion the presence of a great variety of saprobe fungi in dogs with superficial lesions. Furthermore, the prevalence of canine dermatophytosis is effected by some factors represented by age, breed, coat, habitat and season of years.

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دراسة وبائية وسريرية ومختبرية لداء الفُطار الجلدي الكلبي في محافظة بغداد، العراق

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الخلاصة

ان الهدف من هذه الدراسة هو عزل وتشخيص الفطريات الممرضة لداء الفطار الجلدي الكلبي في محافظة بغداد ، دراسة وبائية ووصف العلامات السريرية والصورة المختبرية لداء الفطار الجلدي، من يناير 2018 حتى ديسمبر 2018. من أصل 653 كلب وبحالات مرضية مختلفة فقط 165 (25.3%) من الكلاب كانت مصابة بفطريات جلدية و 103 (62.42 ٪) من الكلاب مصابة بداء الفطار الجلدي .تم تشخيص الفطريات بواسطة الفحص المجهري المباشر وبواسطة زرع العينات على وسط أجار السابرويد الدكستروز مع إضافة الكلورامفينيكول وسيكلوهيكسيميد ووسط الديرماتوفايد (DTM). كانت نسبة الفطار الجلدي المشخص في مسحنا الوبائي ب 103 من 165 حالة من داء الفطار الجلدي (62.4 ٪) تمثلت ب صنف البُوَيغاءُ 83 من 103 (80.6 ٪). ظهرت البُوَيغاءُ الكَلْبِيَّة 73 (87.9%) ،البُوَيغاءُ الأودوِينِيَّة 7 (8.4%) ، البُوَيغاءُ الحِبسية 3(6.3%) و الشَّعْرَوِيَّةُ 20 من 103 (19.4 ٪) التي تنقسم بين الشَّعْرَوِيَّةُ الحَمْراء12 (60.0%) و الشعروية التريستري . 8 (40.0%) ان عزلات البُوَيغاءُ الكَلْبِيَّة و الشَّعْرَوِيَّةُ الحَمْراء من أكثر الأنواع شيوعاً وبنسبة (87.9٪)، (60.0٪) على التوالي. ان معدل انتشار الإصابة بالفطريات الجلدية وداء الفطار الجلدي الكلبي بمناطق مختلفة من مدينة بغداد كانت بجانب منطقة الكرخ (64.6%) ،(32.0%) و جانب منطقة الرصافة (60.4%)،(22.4%) على التوالي. علاوة على ذلك، سجلت اعلى نسبة مئوية للإصابة في الاعمار الصغيرة بواقع 55 من 84 (65.47 ٪) واقل نسبة للإصابة في الاعمار الكبيرة بواقع 8 من 18 (44.44 ٪) وبفروق معنوية P<0.05.

ان تأثير السلالات على انتشار الآفات الجلدية اظهرت نسبة عالية من الاصابة في كلاب الراعي الألماني 53 من 115 (47.96 ٪) واقل نسبة للإصابة في كلاب سلالة البلدغ 5 من 12 (10.63 ٪) وكذلك الحال، سجلت اعلى نسبة انتشار لداء الفطار الجلدي في سلالة الروتويلر (100 ٪) ، البوم بريان (83.3 ٪) واقل معدل انتشار (40.0 ٪) في كل من سلالة نوع البوكسر والكلاب المحلية. اظهرت علاقة كسوة الحيوان مع نسبة انتشار داء الفطار الجلدي للكلاب المنزلية ارتفاع بنسبة الاصابة للكلاب ذوات الشعر الطويل 78 من 113 (69.0 ٪) مقارنة بالكلاب ذوات الشعر القصيربواقع 25 من 52 (48.0%) مع وجود اختلاف معنوي. لم تظهر الدراسة وجود اختلاف معنوي بين الجنس وماؤى الحيوان، ولكن سجلت نسبة عالية 43 من 64 (67.19%) بالكلاب التي تعيش بالملاجئ واقل نسبة اصابة بالتي تعيش بالمشاتل 27 من 48 (56.25 ٪). بلغت نسبة انتشار الاصابة في فصل الشتاء 67.74%)) حيث درجات الحرارة المنخفضة والرطوبة العالية واقل نسبة للاصابة بفصل الخريف الجاف (50.0%). أما الفطريات الجلدية الأخرى المعزولة كانت كالاتي ذَهَبِيَّةُ الأَبْواغ Chrysosporium Nannizziopsis dermatitidis 15من 165 (9.1%) المَلاَسيزِيَّة الباكيديرماتية Malassezia pacydermatis 11من 140 (9.7%) والفطريات الرمية من الكلاب المستأنسة تمثلت بالاتي النَّوباءُ المُتَناوِبَة Alternaria alternata 30 من 140 (21.4 ٪) ،الرشاشيات تمثلت بالرَّشَّاشِيَّةُ الصَّفْراء Aspergillus flavus 22 (25.9%)، الرَّشَّاشِيَّةُ الدَّخْناء Aspergillus fumigatus 24 (28.2%) الرَّشَّاشِيَّةُ السَّوداء Aspergillus niger 20 (23.5%) الرَّشَّاشِيَّةُ المُعَشِّشَة Aspergillus nidulans 19 (22.4%)، المِكْنَسِيَّة Penicillium 6 من 140 (4.3%)، الشيفة Curvularia sp 5 (3.6%)والرَّازِبَة Rhizopus3 (2.1%)..

الكلمات المفتاحية: الوبائية، لداء الفُطار الجلدي الكلبي، الفطريات.