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**FIELD OBSERVATIONS ON BUFFALOE'S MANGE  
IN ASSIUT GOVERNORATE-EGYPT**  
(With 7 Tables and 4 Figures)

By  
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المشاهدات الحقلية لجرب الجاموس بمحافظة أسيوط - مصر

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فى هذا البحث تم وصف الأعراض الاكلينيكية لجرب الجاموس فى عدد ٩٢ حالة مصابه بطفيل السوربتمس بوفيس. أوضح البحث أنه ليس هناك اختلاف معنوى بين نسبة الاصابه بهذا الطفيل فى الاناث (١٣ ، ٤%) عنها فى الذكور (٤ ، ٠٥%) ولكن وجد أن نسبة الاصابه بالجرب فى الجاموس تزداد تدريجياً حتى عمر سنتين وبعد ذلك تقل النسبه مع زيادة عمر الحيوانات وأقل نسبه للاصابه سجلت فى الجاموس أكبر من عمر ٦ سنوات. أوضح البحث أيضاً عدم وجود اختلاف معنوى بين نسبة الاصابه فى الجاموس فى قرى شمال محافظة أسيوط وجنوبها وحسب طبيعته الأرض وجد اختلاف معنوى جوهري بين نسبة الاصابه بطفيل الجرب فى الجاموس بالمناطق شبه الصحراوييه (٤٧ ، ٦%) عن المناطق الزراعيه (٥١ ، ١%) ووجد أيضاً أن أعلى نسبة للاصابه بالمرض سجلت فى الجاموس كانت فى فصلى الشتاء والخريف وأقل نسبة للاصابه كانت فى فصل الصيف. وقد أتضح من المحاوله العلاجييه التى أجريت على بعض الحيوانات المصابه ان عقار إيفوميك ١ ، ٠% (Ivermectin) كان ذو تأثير فعال وأكثر عملياً خاصة فى الاصابه الشديده والاعداد الكبيرخلافاً لذلك كان العلاج الموضعى بمرهم الكبريت أكثر اقتصاداً خاصة فى الاصابات الخفيفه والحالات الفرديه.

### SUMMARY

During the period of investigation, 92 cases of the clinically examined buffaloes (2237) showed signs of mange due *Psoroptes bovis* infection. The clinical signs of the infected buffaloes were described. There was no significant variation ( $p > 0.05$ ) between female (4.13 %) and Males (4.05 %) buffaloes. The percentage of infection with buffaloes' psoroptic mange was increased with increasing the age of animals till two years old. Thereafter this

percentage was decreased with increasing the age of animals. The minimum percentage of infection was recorded among buffaloes over six years old. From ecological point of view, there was no significant variation ( $p > 0.05$ ) in the percentages of infection with psoroptic mange in buffaloes, which bred in the southern or the northern villages of Assiut Governorate. According to the nature of land, the percentage of infection with psoroptic mange of buffaloes, which bred in semi-desert villages was highly significantly increased ( $p < 0.01$ ) than those of buffaloes, which bred in cultivated villages. The maximum percentage of infection with the disease was noticed during the winter and autumn seasons. Conversely, the percentage of infection was minimum during the summer season. Ivermectin was effective, of easily administration and practicable particularly in heavily infected cases and in the large numbers. Otherwise application of sulphur ointment on the affected areas is considered more and more economical in comparison with Ivermectin. The psoroptic mange of buffaloes is probably considered as "adaptational disease" depends on the environmental factors that enhancing the infection.

*Key words: Buffaloes-Mange-Clinical-Ecdogical-Therapy.*

## INTRODUCTION

Mange is one of the commonest parasitic diseases of the domestic animals causing unpleasant appearance of the infected cases that interfere to animal commerce with low price, decrease in milk yield particularly in cases had cosmopolitan infection, and reduction in weight gain in comparison with healthy cases. Furthermore, the zoonotic importance of mange disease should not be neglected (Salem, 1986 and Chakrabarti *et al.*, 1981).

Although the total population density of buffaloes in Assiut Governorate is significantly higher than cows' population (Annual Report of the Veterinary Authorities, 1994), the applied research work on mange in cows is more documented (Mourad and Ahmed, 1986) than buffaloes that apparently still brief. However, psoroptic mite either alone or coupled with sarcoptic mite in a small group of buffaloes (41 cases) showed skin lesions with a history of pruritis and itching was recorded in Assiut by Ismail and Amer (1976). Apparently no sufficient data concerning the effectiveness of climatic weather of Assiut and the ecological nature of that Governorate on buffaloes' mange where the general outlines of the weather of Assiut are fairly different from other Governorates (Meteorological Station of the Faculty of Agriculture, Assiut University).

The fundamental goal of the following work was to record some field observations on buffaloes naturally infected with mite infection in some villages of Assiut Governorate within 23 months' investigation starting July 1993 to May 1995.

## **MATERIAL and METHODS**

### **Animals:**

During the period of investigation, a total number of 2237 buffaloes was clinically examined for apparent signs of mange. These animals were divided into two major groups viz private cases (1747) and buffaloes station for milk and meat production (Bani-Sanad Buffaloes' farm). The later was putted under observation during the period of investigation (1 or 2 visits/month) for detection of any skin lesions. Sex and ages of the positive cases were recorded and tabulated in Tables 3 and 4 respectively.

### **Collection of the samples and detection of mites' technique:**

Skin scrapings from the affected parts of the clinically suspected cases were taken and subjected to mites examination by using digestion-concentration technique according to the methods described by Coles (1980).

### **Geographical distribution:**

The observed private cases were geographically distributed in 10 different villages located in the southern and northern regions of Assiut Governorate (Tables, 5 & 6). From ecological point of view these villages were classified according to the nature of the land into cultivated and semi-desert lands as shown in Tables 5 & 7.

### **Seasonal influence and climatic temperature:**

During the period of investigation, the average climatic temperature of Assiut Governorate was monthly collected from the Meteorological Station of the Faculty of Agriculture, Assiut University, and the average climatic temperature per each season was calculated and tabulated in Table 1.

### **Management and nutritional condition:**

Role of management on the distribution of buffaloes' mange was encountered and described.

### **Therapeutic trials:**

Twenty infected cases were subjected to therapeutic trials with 10 % micronized sulphur ointment\* (topical application twice weekly for a month) according to the methods described by Salem (1986). Another 20 positive cases<sup>+</sup> were treated by using Ivermectin\*\*1.0 % w/v (two doses of 200 µg/kg BW were sub/cut injected with two weeks apart).

## **RESULTS**

During the period of investigation, 122 cases of the totally examined buffaloes showed the characteristic clinical signs of mange (suspected cases). Ninety-two (4.11 %) of the suspected cases yielded mite parasite (*Psoroptes bovis*) by microscopical examination (Table, 2).

### **Clinical findings:**

The main clinical signs were small, slightly rose, semi-circular reddish papules of about 2-5 mm in diameter surrounded by erythematous areas (Fig.3). These papules were touchable and some of them oozed serum like fluid or blood, which coagulated forming crusts and thereafter brownish scabs were developed. The chronic cases showed alopecia with dried, thickened and fissured skin, which had corrugated appearance. No systemic reactions were observed in the positive cases with exception of 8 cases had - general weakness with emaciation and their rumen were approximately atonic (one per seven minutes). However, the body temperature, pulse and respiration rates were within normal range. The whole body of these cases was apparently infected (cosmopolitan infection)

### **From epizootiological point of view:**

Results of sex and age susceptibilities, geographical distribution of the infected private cases at the different villages of Assiut were tabulated in Tables 3, 4, & 5 respectively.

Results of seasonal influence on buffaloe's psoroptic mange were summarized in Fig. 2 & 3.

### **Therapeutic trials:**

The therapeutic trials with Ivermectin were highly effective with good clinical improvement and the percentage of recovery reached 100 %. The percentage was 80 % (16 out of 20 cases) with sulphur ointment application.

\* El-Nasr Pharmaceutical Chemical Company, Cairo

+ three cases of them were suffered from cosmopolitan infection

\*\* Ivomec --Merck Sharp & Dohme Research Laboratories, Rahway, New Jersey, USA

**Statistical analysis:**

Statistical analysis was carried out according to the methods described by Milton and Tsokos (1993)

**Table 1:** Showing the average climatic temperature.

Season	Temperature
Autumn and Winter	18 ± 3.4 °C
Spring and Summer	34 ± 5.6 °C

**Table 2:** Percent of infection among the examined buffaloes.

Nr. Of the examined buffaloes	Nr. Of the clinically suspected cases	Nr. of the positive cases	% of infection
2237	122	92	4.11 (75.41 %)*

\* = the number between parenthesis is the percent of infection among the suspected cases.

**Table 3:** Sex susceptibility

Sex	Nr. of the examined buffaloes	Nr. of the positive cases	% of infection
Females	1743	72	4.13
Males	494	20	4.05
Total	2237	92	4.11

$\chi^2$  Females • Males = 0.006 ( $p > 0.05$ )

**Table 4:** Age susceptibility

Age	Nr. of the examined buffaloes	Nr. of the positive cases	% of infection
< 6 months	286	5	1.75
6 - 12 months	166	5	3.01
1 - 2 years	231	15	6.49
2 - 4 years	654	37	5.66
4 - 6 years	744	28	3.76
> 6 years	156	2	1.28

**Table 5:** Geographical distribution of the infected private buffaloes.

Village	Nature of land	Nr. of the examined buffaloes	Nr. of the positive cases	% of infection
<b><i>A-Southern villages</i></b>				
El-Ghanaiem	Semi-desert	418	34	8.13
El-Bewiet	Semi-desert	232	12	5.17
Mousha	Cultivated	125	4	3.20
El-Massoud	Cultivated	90	3	3.33
El-Nakhila	Cultivated	25	1	4.00
El-Wa'adela	Cultivated	161	5	3.16
<b>Total A</b>		<b>1051</b>	<b>59</b>	<b>5.61</b>
<b><i>B-Northern villages</i></b>				
Meier	Semi-desert	205	13	6.34
El-Faiema	Semi-desert	320	17	5.31
Bani-Maged	Cultivated	105	2	1.90
Bani-Mahamadiate	Cultivated	66	1	1.51
<b>Total B</b>		<b>696</b>	<b>33</b>	<b>4.74</b>
<b>Total A+B</b>		<b>1747</b>	<b>92</b>	<b>5.27</b>

**Table 6:** Percent of infection of buffaloes' psoroptic mange in the Southern and Northern villages.

Location of village	Nr. of the examined buffaloes	Number of the positive cases	% of infection
Southern villages	1051	59	5.61
Northern villages	696	33	4.74
<b>TOTAL</b>	<b>1747</b>	<b>92</b>	<b>5.27</b>

$X^2$  value (southern • northern villages) = 0.8 (p > 0.05)

**Table 7:** Percent of infection of buffaloes' psoroptic mange in the semi-desert and cultivated areas.

Nature of the land	Nr. of the examined buffaloes	Nr. of the positive cases	% of infection
Semi-desert areas	1175	76	6.47
Cultivated areas	572	16	2.80
TOTAL	1747	92	5.25

$X^2$  value (semi-desert • cultivated areas) = 38.82 (p < 0.01)\*\*

### DISCUSSION

In the present work, Table 1 showed that the percent of infection of buffaloes with mange in different localities of Assiut Governorate was highly significantly lower (p < 0.05) than the obtained results by Zayed (1985) and Hassan (1991) who reported that the percent of infection with parasitic mange in buffaloes were 61.30 % and 13.15 % in Cairo and Sharkia Governorates, respectively. Such variation may be related to ecological and climatological variations. On the other hand, the obtained results (Table 1) revealed that the percent of infection of buffaloes' mange was also significantly lower than those reported by Mourad and Ahmed (1986) who reported that 25 % of the total examined buffaloes (260) in Assiut Governorate were positive to mite infection. Such variation may be due to that survey on buffaloes' mange reported by Mourad and Ahmed (1986) was restricted to two private farms only (El-Shamia and El-Ekal-Baharie) and did not include the rural cases in the different villages of Assiut Governorate.

Results of the microscopical examinations of the collected samples of the clinically diseased buffaloes with signs of mange (Table 1) showed that *Psoroptes bovis* was the only detected mite in the present work. Similar result was recorded by Salem (1986) who reported that psoroptes species was the only isolated mite from the infected buffaloes. Conversely, Chakrabarti *et al.* (1981) concluded that buffaloes were only affected with sarcoptes mite.

Table 1 also showed that 24.59 % of the suspected cases had characteristic clinical signs of mange, however detection of mites by using digestion-concentration technique was negative in these cases. This probably related to the prior treatment of the clinically affected cases by the owners in Assiut's villages who oftenly used old medicament such as old (burnt) engine oil on the affected areas of the animal's body leading to escaping the mite to the surrounding areas.

Concerning sex susceptibility, the obtained results listed in Table 3 revealed that there was no significant differences ( $p > 0.05$ ) in the percentage of infection with mange in both females and males. This may indicate that the psoroptic mange of buffaloes is non sex-linked disease. However, Maske and Ruprah (1981) reported that the females' buffaloes had lesser percentage of mange infection than males because females were usually taken better care than males. Conversely Salem (1986) recorded that the percentage of infection with psoroptic mite in female's buffaloes (13.7 %) was highest than males (5.2 %).

Regarding age susceptibility, Table 3 showed that the percentage of infection with psoroptic mange of buffaloes increased with increasing the age of animal till 1-2 years, thereafter this percentage decreased gradually by further increasing in the age of animal. The gradual decrease of the percentage of infection of the disease in the buffaloes reached 1-2 years or more may be attributed to a build up of acquired immunity. Similar picture could not be traced in the available literature. However, Stromberg *et al* (1986) reported that cattle infected with psoroptic mite formulate a humoral immune response to psoroptes mite antigen and cattle with acquired resistance had lesser dense *Psoroptes ovis* population. On the other side, the percentage of infection with psoroptic mange in buffalo-calves around six months old was low (1.75 %). This probably related to the greater attention for young calves than adults.

Table 6 revealed that there was no significant ( $p > 0.05$ ) variation in the percentage of infection with psoroptic mange in buffaloes that bred in the southern and the northern villages of Assiut Governorate. According to the nature of the land, these villages were ecologically classified into two types namely semi-desert and cultivated areas. The obtained results showed that the percentage of infection with buffaloes' psoroptic mange was significantly higher ( $P < 0.01$ ) in semi-desert areas than in the cultivated (irrigated) areas (Table 7). The possible reason for such variation was unclear, but it is worthy to report that, according to the history taking, feeding of buffaloes in the semi-desert villages depends mainly on roughage (rice and wheat straw) with little amount concentrates (mal-nutrition). In contrast, feeding in the cultivated villages depend basically on green fodder. Mal-nutrition was one of the principle predisposing factors for mange infection (Hassan, 1991).

Fig. (1) indicated that the psoroptic mange infection of buffaloes was more prevalent during the winter and autumn seasons where the average climatic temperature was turned arround on 18°C. Conversely the percentage of infection was low during the spring and summer seasons where the average climatic temperature was  $34 \pm 5^\circ\text{C}$ . This may reveal that the activity of



psoroptic mite increased in the cool-temperature seasons rather than hot ones. Such account was supported experimentally by Maske and Ruprah (1981a) who reported that, there was a highly significant positive correlation between the temperature and the average survival period of psoroptic mites, indicating thereby that 20°C was the optimum temperature for the maximum survival of mites and any significant deviation from this temperature adversely affects the period of survival. Generally, in the present work, Fig. 2 showed that 66.3 % of the infected buffaloes with psoroptic mange in Assiut Governorate were observed during the autumn and winter seasons.

In the present work, all positive cases with psoroptic mite infection were restricted only to the private buffaloes and no positive cases were found in Bani-Sanad farm station during the period of investigation. This may prove the outstanding role of hygienic measures in this farm including good nutrition and wallowing of the farmed buffaloes in Ibraheimia canal for about 3 hours daily during hot-temperature months (summer seasons), in control of that disease.

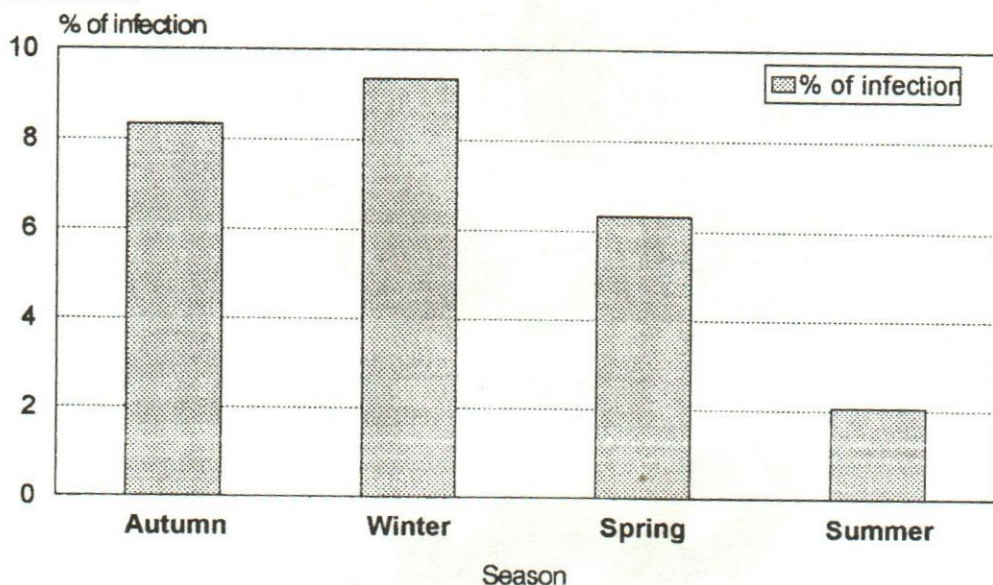
Concerning the therapeutic trials, it is suggested that treatment of mange in buffaloes with Ivermectin was highly effective with good clinical improvement, simple and easily administration as well as practical particularly in heavily infected cases (cosmopolitan infection) and in the large numbers. Otherwise application of sulphur ointment on the affected areas is considered more and more economic (cheapest) in comparison with Ivermectin.

Consequently, the psoroptic mange of buffaloes is probably considered as "adaptational disease" depends on the environmental factors that enhancing the infection.

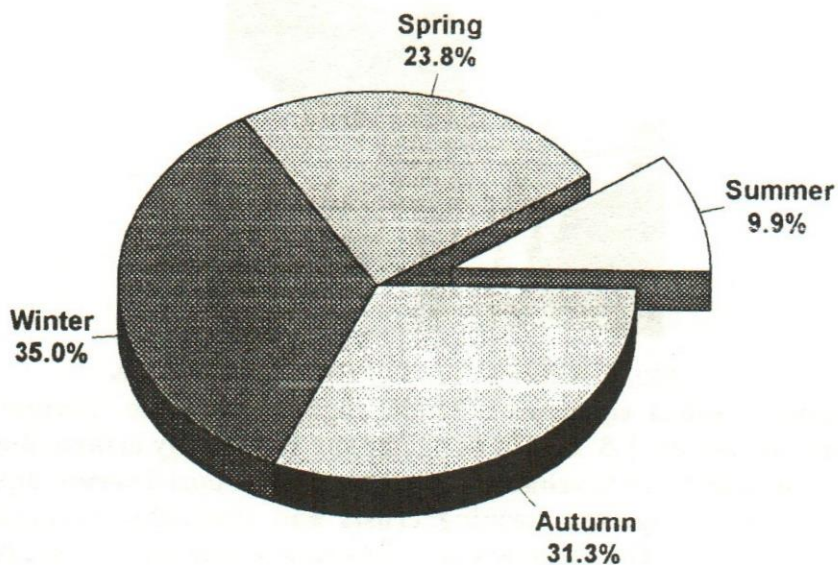
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**Fig. 1: Seasonal influence on the prevalence of psoroptic mange of buffaloes.**



**Fig. 2: Showing that 66.3 % of infections with psoroptic mange in buffaloes were observed during the autumn and winter seasons.**





**Fig. 3: Psoroptes bovis**



**Fig. 4: Clinical signs of Buffaloes, Mange.**

The main clinical signs were small, slightly rose, semi-circular reddish papules of about 2-5 mm in diameter surrounded by erthematous areas. These papules were touchable and some of them oozed serum like fluid or blood, which coagulated forming crusts and thereafter brownish scabs were developed. The chronic cases showed alopecia with dried, thickened and fissured skin.