Journal of Zankoy Sulaimani, (JZS) Part A Dec.2001 , Vol. 4 (2) 69 - 78

گۆڤاری زانکۆی سلێمانی بیسەمبەر ٢٠٠١ بەرگ ٤ (٢) بەشی A لاپەرە ٦٩ – ٧٨

Sheep and Goats nasal Myiasis By Oestrus Ovis In The Sulaimani Province Of Kurdistan Region-Iraq

Dr. Jalal M. Shareef
Coll. Of Veterinary. Med, Medicine University of Sulaimani, Kurdistan Region - Iraq

Abstract

The heads of 2897 sheep, 1006 goats, and 1827 cattle from the local abattoir (Sulaimani-Kurdistan-Iraq) were examined for larvae of Oestrus ovis in January to December 1999. The larvae were diagnosed morphologically under a dissecting microscope, and were measured and preserved in 10% formal saline.

The prevalence of O.ovis in sheep was 20.96% and in goats was 13.6 per cent. The monthly infestation rate for sheep varied from 5.06% in March to 56.12% in September, but in goats varied from 2% in February to 66.6% in March. Up to 13 and 6 larvae were collected from individual sheep and goats consecutively. The mean larval burden per sheep and goat positive case over the year was 1.98 and 1.40 respectively.

Different size and color of O.ovis larvae per single animal were observed throughout the year, which might be due to the presence of more than one generation of O.ovis adult fly in the region or due to rotation of animals in different areas or pastures during transportation and marketing. O.ovis larvae were present in sheep and goats 12 and 10 months successively per year. In the present study O.ovis larvae were not found in the heads of cattle.

Since this parasite is produce one of the important anthropozoonotic diseases which effects both man and animals, surveillance and monitoring of larval infection have been recommended in order to establish seasonal incidence of O.ovis infestation and predicting it's outbreaks in the region, to protect man and animals.

Keywords:- O.ovis, parasitology,sheep.

Introduction

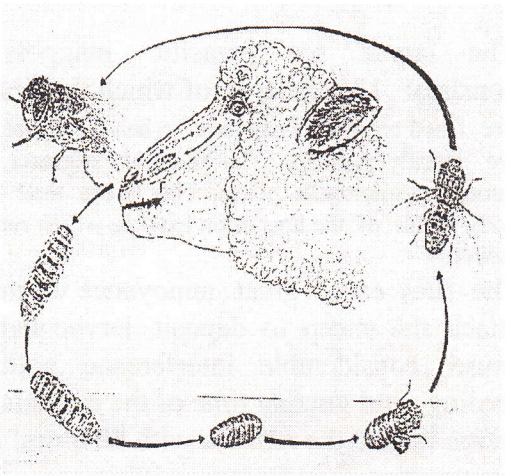
Nasal myiasis is the infestation of the nasal cavities and frontal sinuses by larvae of *Oestrus ovis* female fly (sheep nasal bot fly), which is a stout, grayish brown fly covered with short hairs. Adult *O. ovis* have black pits dorsally between the eyes on the fronts and black tubercles among the yellow hairs (1). It belongs to the *Family Oestridae* and the *genus Oestrus*. The adults have rudimentary mouth parts and do not feed.

The larvae are parasitic maggots and consistof 12 segments, of which the first two are fused together. They have no head, but oral hooks are usually present . The posterior stigmata opens through semicircular plates. The larvae feed on the body fluids of the host or on exudate which surround them (2).

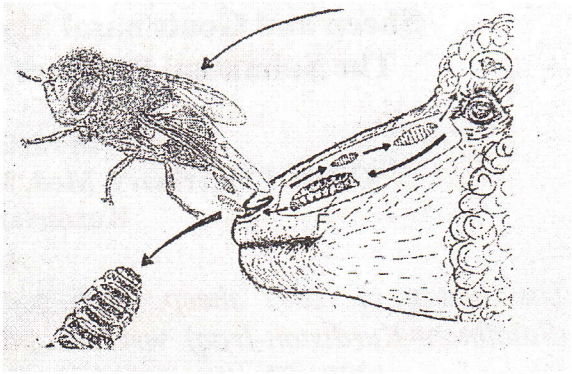
The flies cause great annoyance when they attack the sheep to deposit larvae and may cause considerable interference with the feeding and grazing time of the animals , the larvae irritate the mucosa with their oral

hooks and ventral spines, erosion of the bones of the skull and injury to the brain may occur, nasal discharge which is frequently tinged with fine streaks of blood and paroxysms of sneezing accompany migration of the larger larvae (3). The animals stop feeding and become restless. They shake their heads or press their noses against the ground, small groups of sheep gather and face the center of a circle, heads down and close together. They grind their teeth and lose their appetite , so that emaciation commonly occurs and death is not unusual in severe cases. It is possible that the parasite may also have a toxic influence, probably secondary bacterial invasion is the cause of death (4).

Female flies deposit living larvae in or near the nostrils of the host, these crawl upwards and enter the sinuses. The larvae complete their development in about 2-10 months and when mature drop or are sneezed out. Entering the ground and burrow down a few inches and pupate, the adults emerge in 3-6 weeks, depending on the environmental conditions. Mating soon occurs , and the females begin to deposit larvae. The life cycle is shown in Fig:1 (5).



(Fig. 1-A) The life cycle of O.*ovis* fly inside the head and under the ground.



(Fig.1-B) The life cycle O.ovis larvae in the cavity and frontal sinus.

The larvae of *O. ovis* are well known parasite in the nasal cavities and paranasal sinuses of sheep and rarely in goats, and have also been found in the blesbock and in Egypt in the camel (4, 6, 7), and in Spain canine infestation has also been reported (8, 9).

The prevalence of this parasite has been reported in many countries like South Africa (10,11), France (12), Egypt (6, 7), Libya (13), Ethiopia (14), Netherlands (15), Germany (16), and Namibia (17, 18).

However myiasis is a subject of veterinary and medical importance, since many cases have been reported regarding human nasal infestation in Spain (19, 20), U.K (21), Egypt (7), and also human ocular myiasis in India (22, 23), Egypt (7, 24), U.K (25), U.S.A (26, 27), Germany (28, 29, 30), France (31), Newzeland (32), Jordan (33), Spain (34, 35), Kuwait (36), Saudi Arabia (37), Djibouti (38), Hawaii (39), and Thailand (40).

O. ovis has been one of the most widely distributed parasites in many countries, including the Mediterranean basin, but it has not been reported in the Kurdistan region so far, except a preliminary report published by the author in 1980(41).

The aim of the present work was to determine the presence of *O. ovis* in the region and to highlight its importance as one of the anthropozoonotic. The aim has also

included the study of prevalence rate and mean larval burden per animal positive case monthly, during a 12 month period. Concerning control and reducing the infection , some suggestions have been recommended, including more investigation in naturally and experimentally infected animals.

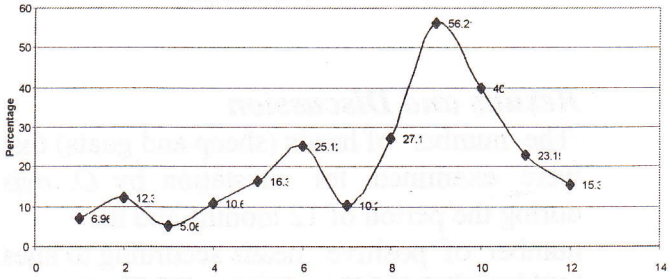
Materials And Methods

From January to December 1999, heads of 2897 sheep, 1006 goats and 1827 cattle obtained from a local abattoir (Sulaimani-Kurdistan-Iraq)were examined daily, for infestation by larvae of *O. ovis* . i.e at the same day of collection over the year, except Mondays and Fridays, the abattoir's day off per week. The heads of sheep and goats were categorized into adults and under one year old (Table 1 and 2), but cattle heads were considered as a single group.

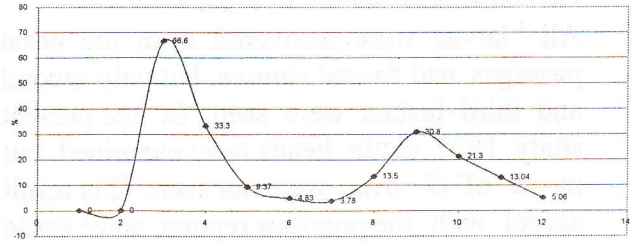
Specific taxonomic diagnosis of *O.ovis* larvae was determined on the basis of morphological characteristics (4), the age was determined by the observation of color and size, since initially they are small clear-white larvae, about 2 mm long, as they mature, they become cream-colored then darken and finally show a dark or black band on the dorsal surface of each segment (3). The full-grown larva is about 3 cm. long, tapering anteriorly and ending with a flat surface posteriorly. The larvae possesses large black oral hooks, ventral spines and black remarkable plates on the posterior surface of the caudal segment as seen by use of dissecting microscopy.

The collected larvae from each head were washed in a small sieve under tap water and examined morphologically, using the dissecting microscope. The number of the larvae in each head, color, length and number of segments were recorded then the larvae were preserved in 10% formal saline in a glass container, which was labeled with a serial number.

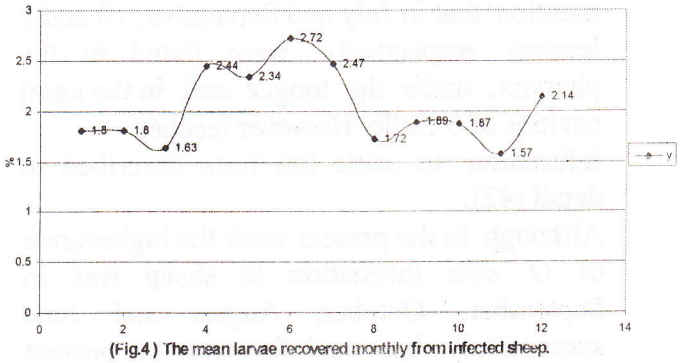
A schematic diagram is presented to demonstrate the life cycle of *O.ovis* in Fig.1 (5). Tables and graphics regarding collected data, results and conclusions are presented (Table 1 and 2) and (Fig. 2, 3, 4, 5).



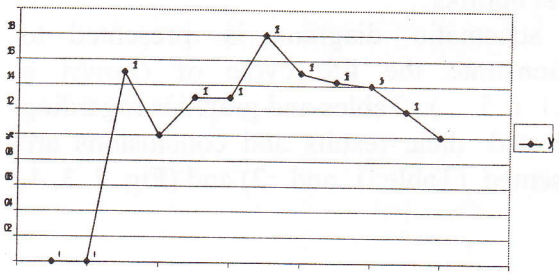
(Fig2) The percentage of infected sheep monthly.



(Fig .3)The percentage of infected goats monthly.



(Fig.4) The mean larvae recovered monthly from infected sheep.



(Fig.5) The mean larvae recovered from infected goats.

Results and Discussion

The number of heads (sheep and goats) that were examined for infestation by *O. ovis* during the period of 12 months and the number of positive heads according to ages beside other data are presented in Table 1 and 2. The monthly prevalence rate and the monthly mean of larval burden per positive case during 12 months in sheep and goats have also been shown in Fig 2 - 5.

All larvae were recovered from the nasal passages and frontal sinuses, but only second and third instars were seen. In the present study 1827 cattle heads were examined, but larvae of *O. ovis* were not seen. This result agrees with the previous reports, since cattle were not among the probably susceptible animals like sheep, goats, camel, blesbock (2) and canine (8, 9). It is worthwhile to mention that in July and September, 10 and 1 leeches respectively were found in the pharynx, under the tongue and in the nasal cavities of 5 cattle. However leeches infestation in cattle has been described in detail (42).

Although in the present work the highest rate of *O. ovis* infestation in sheep was in September, October, August and June successively, but the infestation was present along the year (Fig. 2). In goats the highest rate of infestation was in March, April, September, and October consecutively, infestation was also present throughout the year except January and February (Fig.3).

The monthly mean of larval burden per positive case in sheep and goats are presented in Fig.4 and Fig. 5 respectively. A significant variation can be observed between the sheep and goats regarding the rate of infestation and the larval mean per month. This variation between sheep and goats probably is related to variation in their dwelling, environment or temperature, since goats are usually raised in mountainous areas and feed on forest leaves, while sheep live on plains and feed on pastures. Nevertheless mountains have greater altitude and have a cooler climate, so the activity of *O. ovis* fly in these areas are different (12).

In South Africa the larvae were present only from January to July (10) whereas in southwest France the infestation was from April to November, Since the flies were not active in winter and during the hottest months of summer (12). This can be explained by the variation in season's months in each country and the influence of the temperature on fly's activity.

In southwest France, *O. ovis* infestation was present in 65% of the adult sheep heads (12), while in South Africa infestations were present in 96% of the ewes and 92% of the lambs above the age of 3 weeks (11). In an investigation of *O. ovis* myiasis in Libyan sheep and goats, they reported the prevalence of 22.6% and 18.4% in sheep and goats successively (13). In the present study infestations were recorded in 20.96% of the sheep, and 13.6% of the goats regardless of the age (Table 1 and 2).

	sheep (adult)					sheep (under one year age)					sheep (Total)				
	No.	No.of +	infected%	No. of Larvae	larvae mean	No.	No.of +	infected%	No. of Larvae	larvae mean	No.	No.of +	infected%	No. of Larvae	larvae mean
Jan	158	11	6.96	20	1.8	0	0	0	0	0	158	11	6.96	20	1.8
Feb	80	12	15	24	2	50	4	8	5	1.25	130	16	12.3	29	1.8
Mar	107	11	10.28	18	1.6	110	0	0	0	0	217	11	5.06	18	1.63
Apr	218	23	10.5	59	2.56	16	2	12.5	2	1	234	25	10.6	61	2.44
May	17	2	11.76	7	3.5	216	36	16.66	82	2.27	233	38	16.3	89	2.34
Jun	27	11	40.7	37	3.36	172	39	22.67	99	2.5	199	50	25.12	136	2.72
Jul	32	9	28.1	13	1.4	193	14	7.25	44	3.1	225	23	10.2	57	2.47
Aug	39	17	43.58	33	1.94	175	41	23.42	67	1.63	214	58	27.1	100	1.72
Sep	144	46	31.9	96	2.08	185	60	32.4	105	1.75	329	106	56.21	201	1.89
Oct	118	48	40.6	108	2.25	202	80	39.6	132	1.65	320	128	40	240	1.87
Nov	218	55	25.2	88	1.6	114	22	19.2	33	1.5	332	77	23.19	121	1.57
Dec	171	30	17.5	65	2.16	135	17	12.59	36	2.11	306	47	15.3	101	2.14
	1329	275	20.60%	568	2.06	1568	315	20.08%	605	1.92	2897	590	20.96%	1173	1.98

(Table: 1) The percentage of infected sheep and the larvae mean monthly throughout the year

	goats (adult)					goats (under one year age)					goats (Total)				
	No.	No.of +	infected%	No. of Larvae	larvae mean	No.	No.of +	infected%	No. of Larvae	larvae mean	No.	No.of +	infected%	No. of Larvae	larvae mean
Jan	17	0	0	0	0	0	0	0	0	0	17	0	0	0	0
Feb	6	0	0	0	0	0	0	0	0	0	6	0	0	0	0
Mar	6	4	66.6	6	1.5	0	0	0	0	0	6	4	66.6	6	1.5
Apr	3	1	33.3	1	1	0	0	0	0	0	3	1	33.3	1	1
May	32	3	9.37	4	1.3	0	0	0	0	0	32	3	9.37	4	1.3
Jun	41	1	2.43	2	2	83	5	6.02	6	1.2	124	6	4.83	8	1.3
Jul	43	1	2.32	1	1	89	4	4.49	8	2	132	5	3.78	9	1.8
Aug	44	4	9.09	8	2	178	26	14.6	37	1.42	222	30	13.5	45	1.5
Sep	63	24	38.09	35	1.45	57	13	22.8	18	1.38	120	37	30.8	53	1.43
Oct	123	21	17.07	29	1.38	27	11	40.74	16	1.45	150	32	21.3	45	1.4
Nov	106	15	14.1	18	1.2	9	0	0	0	0	115	15	13.04	18	1.2
Dec	35	3	8.57	3	1	44	1	2.27	1	1	79	4	5.06	4	1
	519	77	14.80%	107	1.3	487	60	18.32	86	1.43	1006	137	13.60%	193	1.4

(Table: 2) The percentage of infected goats and the larvae mean monthly throughout the year.

It is worthy to point out that the above investigation in Libya was done during 5 months only (July to November) while our work was performed in 12 months, including different seasons and temperatures, so it can be concluded that the infestation in Sulaimani was higher than that of Libya and lower than that of South Africa and southwest France, considering the fact that all sheep and goats in the Sulaimani province were treated twice with either Closantel 5% or Ivermectin in 1998 and 1999 , through a national campaign for antihelmenthic (43). These drugs usually kill the *O. ovis* larvae as well as other parasites.

The climatic changes and drought of 1999 in the Kurdistan region may also have influenced *O. ovis* infestation , possibly the infestation of sheep and goats by this parasite has been affected by the climatic conditions and soil temperature (17, 18).

In this study up to 13 and 6 larvae were collected from individual sheep and goats respectively, while in Libyan sheep and goats up to 14 and 11 larvae were collected consecutively (13).

The monthly prevalence rate in Sulaimani sheep and goats varied from 5.06% in March to 56.2% in September and 2% in February to 66.6% in March respectively (Fig. 2 and 3). In southwest France the monthly prevalence rate of *O. ovis* in sheep varied from 44% in April to 88.2% in November. The same study has showed that the mean larval burden per positive case over the year was 24.8, whereas our study showed 1.98 and 1.40 per positive case of sheep and goats over the year successively (Table 1 and 2). This may be also explained by the climatic variation in both region, and other mentioned factors above.

Finding larvae of variable size and color in the same animal or same group has indicated the presence of more than one generation of adult fly each year or due to different dwelling, ages or animal rotation in different pastures, since slaughtered animals in the abattoir had not been obtained from a single farm or same age (3, 4).

In southwest France three generations of *O. ovis* each year have been reported (12). It is worthy to mention that human myiasis has been seen several times in Sulaimani. A number of local residents particularly in the rural districts are familiar with oral, nasal or ocular myiasis without identification of the causative species so far (personal observation). Shepherds are said to be especially susceptible to myiasis by *O. ovis* and it may cause serious trouble (2). The larvae may penetrate the human conjunctiva and produce a painful conjunctivitis. When the flies discharge their larvae into the human nose or mouth, a painful myiasis of the nose and throat occur (44).

In infected animals if the brain is injured , clinical signs such as a high-stepping gait (false gid) and incoordination may mimic infection with *Coenurus cerebralis* (45). Hence sheep bot nasal fly infestation can be considered as one of the anthropozoonotics diseases, which may attack man and animal to deposit their larvae and cause a pathogenic condition known as myasis. In human the finding and removal of the larvae results in immediate cessation of pain and cure (44).

Fortunately many effective drugs are available which can be used for treatment and prophylaxis against larval stages of *O. ovis* in sheep and goats such as ivermectin which is administered orally for both nematode and arthropod endoparasite (46, 47).

The study of natural and experimental infestations has provided information

concerning the evolution of the disease and its pathophysiology (48).

It is of interest to determine the fly's activities periods in the region and throughout the year, since the development of a monitoring system is certainly important to contribute in the eradication scheme of *O. ovis* in the region. The monitoring of larval infection may establish significant measures for seasonal incidence of *O. ovis* infestation in the region.

In 1998 in Namibia, a project was developed to support a program to warn farmers about the likelihood of infestation of small-stock by this parasite, depending on climatic conditions and soil temperature data from Meteosat Satellite images (17). A model was also developed for predicting outbreaks of *O. ovis* throughout the main sheep farming areas of Namibia, by the establishment of relevant isothermal maps for the entire sheep farming (18).

Finally it is worthy to remember that the pathological affects of this troublesome parasite for both man and animal should not be underestimated due to the fact that owners and veterinarians in the region are used to seeing this infestation . So the research should be continued and more work is a requisite for the region to establish a map or calendar for surveillance and monitoring *O.ovis* fly activites over the year , regarding climatic variations in different districts in Kurdistan.

Frequent and regular campaigns are required from Veterinary Service authorities and FAO (Food and Agriculture Organization) in the region for treatment and protection of sheep and goats from *O. ovis* flies during different seasons of the year.

Acknowledgments

Thanks are due to Dr.Nahla M. Saeed of the College Of Veterinary Medicine- University Of Sulaimani for technical assistance. I am especially grateful to Rasol A. Khider and Sarkawt A. Khider at the Sulaimani abattoir, for dissecting the heads.

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لەمەڕ و بزنی ناو چەی سلێمانی / کوردستان / عێراق (*Oestrus ovis*) بلاوبونەوەی پزوو یان پامێزە

دکتور . جلال مجید شریف

بەشی مایکروبایۆلۆجی/ کۆلیجی پزیشکیی ڤیتیرنەری / زانکۆی سلیمانی / هەریمی کوردستان / عیراق

پوختە

لە ماوەی ١٢ مانگ دا (کانونی دووەم تا کانونی یەکەمی ١٩٩٩ لە قەسابخانەیەکی سلیمانی _ کوردستان _ عیراق ، ٢٨٩٧ سەری مەر، ١٠٠٦ سەری بزن و ١٨٢٧ سەری رەشە وولاخ (گا و مانگا و گویرەکە) پشکینران بۆ کرمۆکەی ***Oestrus ovis*** .

کرمۆکەکان لە ژیر میکرۆسکۆپی تویکاریدا و بەمۆی تیبینی مۆرفۆلۆجی ە وە دەست نیشان کران و لە پاشدا ئەژمێردران و لە ١٠٪ فورمال سەلاین دا ئەپاریزدران.

لە ئەنجامدا دەرکەوت کە بلاوبونەوەی ***O. ovis*** لە سالیکدا بەم جۆرەبوو : لە مەر ٢٠,٩٦٪ و لە بزن ١٣,٦٪.

لەم تویژینەوەیەدا ریژەی مانگانەی تووشبونی مەر بە کرمۆکەی ***O. ovis*** ،بەدریژای سال جیاواز بوون، بۆنمونە مانگی مارت ٥,٠٦٪ ، ئەیلول ٥٦,٢١٪ ، هەروەها لە بزن مانگی شوبات ٢٪ بەلام مانگی مارت ٦٦,٦٪.زۆرترین ژمارەی کرمۆکە لە یەک مەری تووش بوو گەیشتە ١٣ دانە بەلام لە بزن لە ٦ دانە زیاتر نەبوو.تیکرا ژمارەی کرمۆکە لە یەک سەر مەر ی تووش بوو لە سالیکدا یان یەک سەر بزنی تـووش بـوو یـەک لـە دوای یـەک بـەم جۆرەبوو: ١,٩٨ و ١,٤٠.زۆر جار کرمۆکەی تەمەن جیاواز لە یەک سەردا تیبینی دە کرا، ئەگونجیت ئەمە بە هۆی هەبوونی زیاتر لـە نەوەیـەک میشـی ***O. ovis*** بوبیت لە ناوچەکەدا، یان بەهۆی گۆرینی جیگا و لەوەرگای ئاژەلە سەربراوەکانەوە بووبیت .

کرمۆکەی ***O. ovis*** بەدریژایی سال لە سەرە مەردا ئەبینرا بەلام لە بزن تەنها لە ١٠ مانگ دا بینرا. لەم تویژینەوەیەدا کرمۆکەی ناوبراو لەسەری رەشەوولاخدا نەبینرا. لەنجامی ئەم تویژینەوەیەدا دژواری ***O. ovis*** بـۆ مـرۆڤ و ئـاژەل بـە ئاشکرا دەرکـەوت ، هـەروەها گرنگی و پیویسـتی ئاشکراکردنی وەرزی زۆربوون و بلاوبونەوەی میشی ***O. ovis*** لەناوچەکەدا.

نتشارالنغف الأنفي (*Oestrus ovis*) في الأغنام و الماعز فى المنطقة السليمانية / كردستان- العراق

دكتور . جلال مجيد شريف

فرع المايكروبايولوجي/ كلية الطب البيطري /جامعة السليمانية / اقليم كردستان / العراق

الخلاصة

خلال فترة ١٢ شهر أي (كانون الثانى لغاية كانون الأول /١٩٩٩) و فى أحدى المجازر المحلية فى مدينة السليمانية –كردستان–العراق، تم فحص رأس ٢٨٩٧ غنم، ١٠٠٦ ماعز، ١٨٢٧ بقر. و كان الهدف من الفحص أيجاد يرقات ***Oestrus ovis*** ثم دراسة شكلها الخارجي وتشخيصها تحت المجهر، كذلك تسجيل عدد اليرقات فى كل رأس مصاب و حفظها في محلول ١٠٪ فورمال سلاين .

أظهرت النتائج نسب أنتشار ***O. ovis*** خلال السنة في الأغنام ٢٠,٩٦٪ و فى الماعز ١٣,٦٪. كانت نسب الأصابات الشهرية بهذه اليرقات للأغنام متغيرة و تتراوح بين ٥,٠٦٪ فى شهر مارت الى ٥٦,٢١ ٪ في شهر أيلول، كذلك في الماعز تتراوح بين ٢٪ في شهر شباط الى ٦, ٦٦٪ في شهر مارت.

كان أكبر عدد موجود من اليرقات في رأس واحد للغنم ١٣ يرقة، أما في الماعز فكان أكبر عدد لايتجاوز ٦ يرقات فقط، كان معدل عدد اليرقات خلال السنة لرأس واحد من الغنم المصاب و الماعز المصاب ١,٩٨ و ١,٤٠ على التوالي.

وجد خلال هذا البحث يرقات مختلفة الأعمار داخل رأس واحد، و ربما تدل هذه على تواجد أكثر من جيل واحد من ذبابة ***O. ovis*** في المنطقة أوقد تكون بسبب تغيير المرعى و المكان خلال عملية التسويق أو التسمين و ذلك قبل تقديم الحيوانات للذبح.أظهرت النتـائج وجـود يرقـات ***O. ovis*** في الأغنام خلال جميع أشهر السنة، أما فى الماعز فكان خلال عشرة أشهر فقط. لم تظهر في هذا البحث أية أصابات ***O. ovis*** في الأبقار.

يمكن أستنتاج خطورة ***O. ovis*** للأنسان و الحيوان كذلك ضرورة تحديد مواسم التكاثر و الأنتشار لذبابة ***O.ovis*** و مراقبة نشاطها في المنطقة بغية وضع خطة لحماية الأنسان و الحيوان من يرقات هذه الذباب

Received 1/4/2000 . Accepted 16/8/2000. .

وەرگیرا لە ١ / ٤ / ٢٠٠٠دا. پەسەند کرا لـە ١٦ / ٨ / ٢٠٠٠دا