

# Reoccurrence of Old-World Screwworm in Coexisting with First Record of Lumpy Skin Disease in Cattle in Babel /Iraq: Clinical and Therapeutic Trial

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## Abstract

The study was designed to confirm the reoccurrence of old world screw worm in Babel province / Iraq concurrently with new recorded lumpy skin disease in addition to therapeutic trial with commercial oils of colocynth and turmeric. The results showed that the infestation rate with skin myiasis caused by *C. bezziana* was 37.84% and the prevalence in females (47.66%) was higher than in males (29.72%). The highest infestation site was lesions of lumpy skin disease (31.57%) followed by vagina (20.17%) , umbilicus (14.04%) , teeth (12.71%) and eyes (11.4%).In other hand the results of therapeutic trial revealed that the percentages of larvicidal activity of colocynth and turmeric oils were increased with time and concentration and there were approach 100% during 90 minutes ,while all larvae were completely dead at 120 minutes in different concentration used in present study.

**Keywords:** *Chysomia bezziana*, herbal insecticide, colocynth, turmeric oils, bovine LSD

## Introduction

Cattle are very necessary to the economies of many developing countries of the world including Iraq which reared for many purpose. Babel governorate is for the most part known for its enormous number of cattle which raised by the rural farmers in small herds. Myiasis is one of major problem for animal production and it is cause severe economic losses through hide damage ,reduced weight gain, loss of fertility ,and decrease milk yield in addition to mortality due to wound infection (Kahn et al 2010). The Old World screwworm (*Chysomia bezziana*) distributed statically in Southeast Asia, the Indian subcontinent and much of tropical and sub-Saharan Africa (Hall et al 2001), while it has non established distribution in some Middle East countries including Kuwait ,Oman ,Iran and Iraq (Abass G. and Abdull 2006).In contrast to last decade ,many outbreaks of myiasis were reported in Mid-Euphrates province during first 4 years after first recorded of *C. bezziana* in Iraq in September 1996 (Al-Taweel et al 1998). Most flies are

develop resistance to organophosphorus insecticides which prompting some researchers to find an alternative treatment (Scott et al 200). The present study was designed to confirm the re occurrence of old world screw worm in Babel province / Iraq concurrently with new recorded lumpy skin disease in addition to therapeutic trial with commercial oils of colocynth and turmeric.

## Materials and methods

### Study area and animals

The study was carried out in Babel province - Iraq from March to November 2015 during the first recorded outbreak of lumpy skin disease in middle of Iraq. Four hundred and seventy-three heads of cattle examined clinically for skin myiasis ,50 larvae were collected and preserved in 75% ethyl alcohol and send to university of Baghdad -Iraq natural history research center and museum for confirmation.

### Crude oils

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The crude oils of colocynth and turmeric were purchased from local herbal store with stock purity of 90%, each oil was diluted with olive oil to 50% and 25 immediately before larvicidal activity bioassay.

### Larvicidal activity bioassay

The larvicidal activity assay was performed according to method mentioned by Brady (1966 ) with some modification ,briefly by placing 20 larvae in each Petri dishes containing 1 ml of colocynth oil in concentrations mentioned above and in the same way in Petri dishes containing turmeric and mixed colocynth - turmeric oils in same concentrations , the same number of larvae placed in two additional dishes :one of them contain olive oil as a negative control and the another containing asuntol as a positive control , all petri dishes incubate in 37C and observed hourly for six hours . Every larva didn't response to touching with small paint brush considered

as dead. The experiment replicated 5 times.

### Statistical analysis

Detected mortality was adjusted using Abbott's formula (Abbott,1987). All obtained data were analyzed using one-way ANOVA (SPSS version 20), to determine statistic differences  $P < 0.05$  was used.

### Results

The parasite was identified and confirmed as *C. bezziana* according to the document issued by the University of Baghdad / Iraq natural history research and museum (no. 341, date 5/4/2015). The results showed that 179 out of 473 examined animals were infested with skin myiasis caused by *C. bezziana* in the percentage rate of 37.84% and the prevalence in females (47.66%) was higher than in males (29.72%) , table 1 revealed the percentages of infestation during months of study.

**Table 1.** reveal the infestation percentage of examined animals during study period

Months	Males			females		
	examined	infested	percentage	examined	infested	percentage
March	25	13	52	18	10	55.55
April	21	12	57.14	23	16	69.56
May	28	6	21.42	27	13	48.14
June	25	8	32	24	11	45.83
July	26	7	26.92	24	9	37.5b
August	22	3	13.63	14	6	42.85
September	24	13	54.16	12	8	66.67
October	28	12	42.85	28	16	57.14
November	31	3	9.67	25	14	56
	29	0	0	19	2	10.52
Total	259	77	29.72	214	102	47.66

According to site of infestation, the highest infestation site was lesions of lumpy skin disease (31.57%) followed by vagina (20.17%), umbilicus (14.04%), teeth (12.71%) and eyes (11.4%) as presented in table 2.

**Table 2.** reveal the incidence of skin myiasis according to infestation sites (#205 lesion)

Infested site	No. of cases	Percentage%
LSD lesion	72	31.57
Vagina	46	20.17
Teeth	29	12.71
Eye	26	11.4
Umbilicus	32	14.03

**Table 3.** reveal larvicidal activity of colocynth and turmeric oils

Time(mints.) Oil conce.	30	60	90	120
colocynth 100%	40	66.67	100	100
colocynth 50%	40	40	100	100
colocynth 25%	25	30	90	100
turmeric 100%	30	44.44	100	100
turmeric %50	30	40	100	100
turmeric %25	25	30	65	100
Mixed 100%	100	100	100	100
Mixed 50%	100	100	100	100
Mixed 25%	80	100	100	100

The results of therapeutic trial presented in table 3, the percentages of larvicidal activity of colocynth and turmeric oils were increased with time and concentration

and there were approach 100% during 90 minutes except population treated with 25% which completely dead at 120 minutes. The larvae populations treated the mixture of both oils were killed at 30 minutes in the concentration of 100% and 50 % , while all larvae were killed at 60 minutes when treated with 25%.

### Discussion

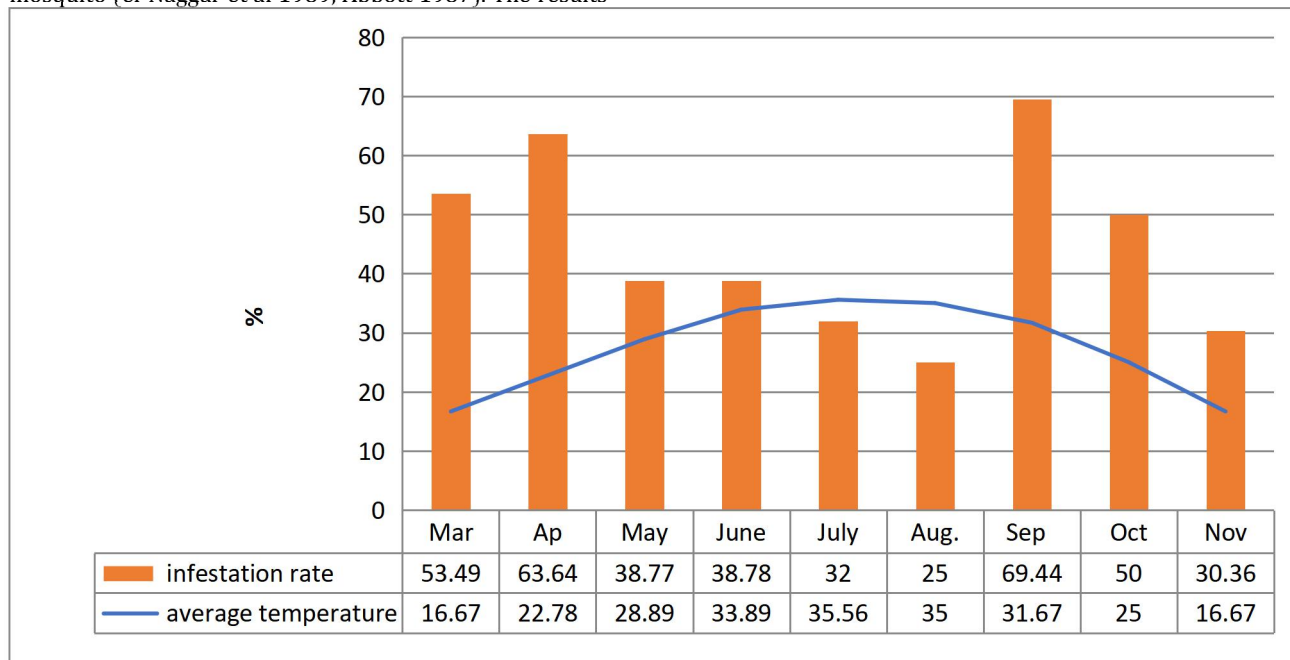
In last decades the OWS introduced to many countries but it failed to established due to unsuitable environmental conditions (Siddigi et al 2005) .In the first outbreak of old world fly *C. bezziana* in Iraq during 1996 , the prevalence in Babylon was34.1% ( Ayad et al 1998) ,this prevalence rate was in close to prevalence recorded in present study .Also in present results the high prevalence rates were in April ,May ,September and October these results were in close to findings of (Abass G. and Abdull 2006; Al-Jowary 2000) and with some variations may be due to ecological changes in Iraq environment related to change in plant covers , refreshing of marshlands , rainfall level changes and others, figure 1 demonstrate the relationship between average of ambient temperature and infestation rate throughout study period.

The lumpy skin disease (LSD) was first recorded in Iraq by AL-Rammahi and Jassim (2015) in 2015 , the high infestation rate of LSD lesions with OWS reported in present study supporting the conclusion of Tageldin et al (2014) whose warning that co-existence of LSD and myiasis may cause serious economic losses in Oman. The chemical control of skin myiasis with insecticides has hazardous to man and animals health in addition to bioaccumulation. Therefore, the bioinsecticides particularly those from plant origin are newly considered eco-friendly replacements to chemical insecticides (Scott

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et al 2000). Many authors succeed to demonstrate the larvicidal activity of some herbal oils including colocynth and turmeric oils particularly against cockroaches, honeybee, house fly, cotton leaf worm, bed bug, and mosquito (el-Naggar et al 1989, Abbott 1987). The results

of therapeutic trial presented in table 3 indicated that the larvicidal activity of colocynth and turmeric oils depending on time and concentration, while the mixture of both oils resulted in the highest larval mortality rate



### References

- Kahn CM 2010 The Merck veterinary manual 10th ed. Whitehouse Station, NJ: Merck and Co; *Chrysomya bezziana* : 822-3.
- Hall M J R, Edge W, Testa J, Adams Z J O and Ready P D 2001. Old World screwworm fly, *Chrysomya bezziana* occurs as two geographical races. Medical and Veterinary Entomology volume 15: 1–11.
- Abass G and Abdull K 2006. Epidemiological Study of Screwworm Infection in Babylon and Al-Qadisiya Governorates. Al-Qadisiya Journal of Veterinary Medicine Sciences volume 5(1):32-37.
- Ayad A, Al-Taweel M. Al-Izzi A J and Fadhil A J 1988 Incidence of old world screw worm fly, *CHRYSOMYA BEZZIANA* in Iraq. FAO/IAEA Int. Conf. on Area-Wide B-VIII Control of Insect Pests, Penang, May 28 to June 2, 1998.
- Scott J G, Alefantis TG, Kaufman PE, Rutz, DA 2000 Insecticide resistance in house flies from caged-layer poultry facilities. Pest Management Science volume 56: 147-153.
- Brady UE 1966 A technique of continuous exposure for determining resistance of house flies to insecticides. J. Economic Entomology volume 59 issue3:764-765.
- Siddigi A, AL Jowary, AL Izzi S M, Hopkins J M J, HALL R and Slingenbergh J 2005 Seasonality of Old World screwworm myiasis in the Mesopotamia valley in Iraq, Medical and Veterinary Entomology volume 19: 140–150.
- Al-Jowary S A K 2000 Study of the effects of some environmental factors on the biology of the Old World Screw-worm Fly *Chrysomya bezziana* Villeneuve (Diptera: Calliphoridae). MSc Thesis College of Education for Women University of Baghdad, Baghdad (In Arabic).
- AL-Rammahi H and Jassim A 2015 Epidemiological and diagnostic study of first lumpy skin disease outbreak in southern Baghdad district, AARJMD volume 1 issue 30 :196-205.
- Tageldin M H , Wallace D B , Gerdes G H , Putterill J F,
- Greyling R R , Phosiwa M N , Al Busaidy R M and Al Ismaaily S I 2014 Lumpy skin disease of cattle: an emerging problem in the Sultanate of Oman, Trop Anim Health Prod. Volume 46 issue 1: 241–246.
- el-Naggar M E, Abdel-Sattar M M , Mosallam SS 1989 Toxicity of colocynithin and hydrated colocynithin from alcoholic extract of *Citrullus colocynthis* pulp. J Egypt Soc Parasitology volume 19 issue 1:179–185.
- Abbott W S 1987 A method of computing the effectiveness of an insecticide. J Am. Mosq. Control Assoc. volume 3 issue 2 :302-303