

Diagnostic and epidemiologic Study of fat tail scorpion (*Androctonus crassicauda*) in Mid -Euphrates region / Iraq

دراسة تشخيصية وبائية للعقرب سميك الذنب (*Androctonus crassicauda*)
في منطقة الفرات الأوسط /العراق

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Abstract

This study was conducted in specific areas in the province of Babil ,Najaf and Al-Qadissiyya in Iraq during the period of March 2010 to November 2010 in search of scorpions on the presence of a thick tail scorpion (*Androctonus crassicauda*) in addition to studying of stinging of scorpions in same areas.

The results showed that the proportions of fat tail scorpion presence in some areas of in Babil , Najaf and Al-Qadissiyya were 45.91% ,16.73% and 37.37% respectively. Based on months of year found that the highest prevalence of scorpions was significantly ($P \leq 0.05$) observed in July(33.07%), while the lowest($P \leq 0.05$) in April (2.33%) with no observation of any scorpion in March and October, with marked prevalent of juvenile scorpion in July.

The data obtained from questionnaire in infested area showed that the scorpionism with *A. crassicauda* was 76% ,the incidence rates in men ,women and children were 28.57% ,58.44% and 12.98% respectively. The affection rates of different parts of body were vary significantly ,the recorded ratios in upper limbs ,lower limbs ,body and head & neck were 53.24% ,35.06% ,10.38% and 1.29% respectively.

الخلاصة

أجريت الدراسة في مناطق محددة في محافظات بابل والنجف والديوانية في العراق للفترة من آذار ٢٠١٠ ولغاية تشرين الثاني ٢٠١٠ بحثاً عن تواجد العقارب سميقة الذنب بالإضافة إلى دراسة لدغات العقارب في نفس المناطق. أظهرت النتائج إن نسب تواجد العقارب سميقة الذنب في بعض مناطق بابل و النجف والديوانية كانت ٤٥.٩١ % و ١٦.٧٣ % و ٣٧.٣٧ % على التوالي . وبالاعتماد على أشهر السنة وجد إن أعلى نسبة ($p \leq 0.05$) لتواجد العقارب كانت في شهر تموز (٣٣.٠٧%) بينما سجلت أقل نسبة ($P \leq 0.05$) في شهر نيسان (٢.٣٣%) مع عدم تسجيل أي وجود للعقارب في شهري آذار وتشرين الثاني، كما سجلت زيادة لافتة لنسبة وجود العقارب الفتية في شهر تموز . إن نسبة اللدغ بالعقارب قيد الدراسة هي ٧٦% وإن معدل تعرض الرجال و النساء والأطفال ٢٨.٥٧% و ٥٨.٤٤% و ١٢.٩٨% على التوالي مع فرق معنوي بمستوى ($p \leq 0.05$) في نسب حدوث اللدغ في أجزاء الجسم، فكانت نسب لدغ الأطراف العليا و الأطراف السفلى و الرأس -العنق هي ٣٥.٠٦% و ١٠.٣٨% و ٥٣.٢٤% و ١.٢٩% على التوالي .

Introduction

Scorpions are classified as arachnids, which have a wide geographic distribution from tropical to temperate regions(1). Scorpions a nocturnal arthropods, hide under objects in day time and start to wandering on surface at dusk and night to prey other insects (2).Among 1500 classified scorpions ,only 50 considered as venomous species . *Androctonus crassicauda* is the most dangerous scorpion in middle east and north Africa (3,4).The venom of this species is neurotoxin with fatal or paralytic effects(5).Little data available about the scorpionism in mid-Euphrates provinces of Iraq, therefore the present study was designed to evaluate the occurrence of fat tail scorpion in these provinces and humans envenomation by this species.

Materials and Methods

The study was carried out in 3 governorates of Mid-Euphrates region-Iraq from 1March to 1 November 2010.From each governorate ,3 districts in addition to city center were selected to performed present study as following:

- Babil : City center ,Western Hamza ,Qassim and Mahawel.
- Najaf : City center ,Hyaderia ,Abassiyia and Meshkab.
- Al-Qadissiyia : City center , Shamyia ,Nuffer and Eastern Hamza.

Collection and preservation of scorpions

The fat tail scorpion were collected from infested areas with assistance of local professional hunters. During daytime ,the scorpions were searched under objects (bricks, wood, flagstone ,trees...etc.),while at dusk and night the searching done in aid of spot torch and U/V lights source. Either dead and live specimens were placed in plastic container containing 76% ethanol and stored until morphological examination.

Identification ,Sexing and Biometry of scorpions

All collected specimens were morphologically identified and sexed under stereo microscope according to keys mentioned by (6)and(7).Total body length (from the anterior edge of the prosoma to the end of the telson) of collected scorpions was measured by means of a digital caliper (measuring range: 0-150 mm), and scorpions were weighed using a digital balance .

Questionnaire study

Questionnaire study was performed in infested areas ,where the information about presence of scorpions ,color ,site of sting and date of sting were collected from 120 families (10/district) and the same data were collected from 30 healthcare employers (10/ governorate) .

All obtained data were analyzed by T-test with aid of excel 2007 software.

Results

The body's color of all collected specimens varies from black to dark brown with yellowish of pectins ,chelicerae ,end of legs and ventral surface, figure (1).The average of body's length and weight were 8.53 cm(range:6.8 -9.7 cm) and 3.83 gm (range:2.14 to 4.28) respectively. Out of 257 collected specimens,132 (51.36%) were females and the rest 125(48.64%) were males .



Figure (1) an adult *Androctonus crassicauda*

Abundance of fat tail scorpion

During entire study period,257 scorpion were collected (live vs. dead),the number (percentage) of collected scorpion from Babil, Najaf and Al-Qadissiyia were 118(45.91%) ,43(16.73%) and 96(37.35%) respectively. Table (1) demonstrate the abundance of fat tail scorpions in different districts of 3 studied governorates.

According to months of study, the highest abundance was in July (33.07%),while the lowest was in April(2.33%) with no observation of any scorpion in March and October, table (2) . The juvenile scorpion was highly prevalent in July(29 out of 85) ,while only 2 juvenile scorpions collected at April, figure (2) reveal the prevalence of juvenile and adult scorpions during the different moths of present study.

Table(1) :the numbers of collected scorpions from different Governorate's districts.

governorate		Adult		Juvenile		Total
		Alive	Died	Alive	Dead	
Babil	Center	4	-	1	2	7
	W.Hamza	21	8	13	3	45
	Qassim	19	9	15	4	47
	Mahawel	8	3	4	4	19
Najaf	Center	6	3	2	1	12
	Abassyia	8	2	4	1	15
	Meshkab	6	3	2	1	12
	Hyderia	2	2	1	-	4
Al-Qadissiy	Center	9	13	5	2	29
	Shamyia	4	1	2	3	10
	Nuffer	20	6	4	5	35
	E.Hamza	12	3	4	3	22

Table (2): the numbers of collected scorpions during different months of study.

	Babil		Najaf		Al-Qadissiyia		total
	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	
March	-	-	-	-	-	-	-
April	1	-	-	-	3	2	6
May	17	4	9	3	10	3	46
June	22	3	7	2	12	13	59
July	19	18	11	4	26	7	85
August	13	13	3	2	11	3	45
September	-	8	1	1	6	-	16
October	-	-	-	-	-	-	-

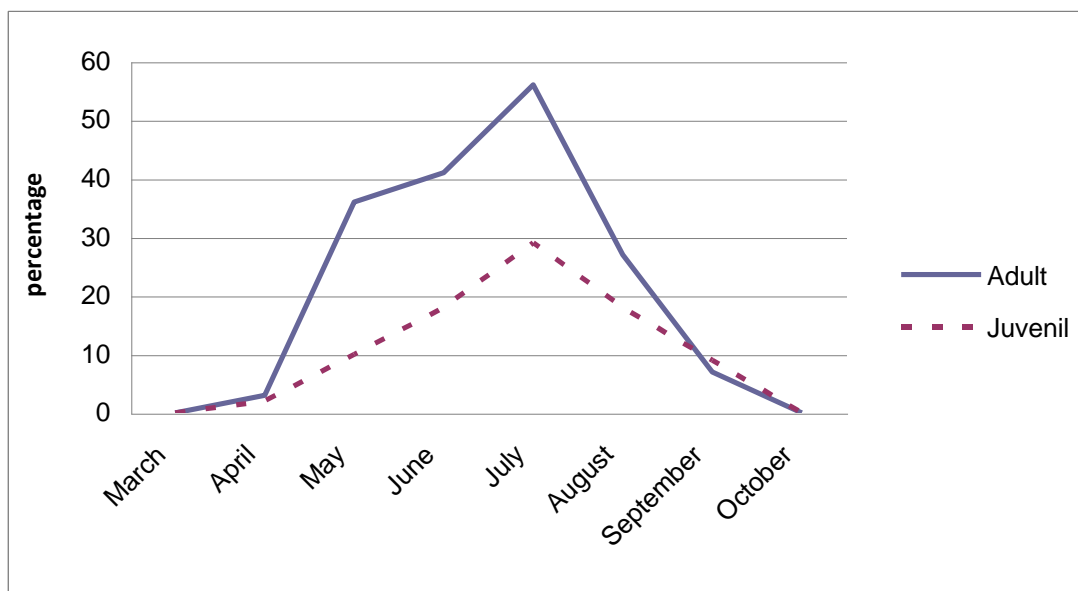


Figure (2): the abundance of adult and juvenile scorpion.

Scorpionism

The families questionnaire results showed that 25 out of 120 families were exposed to scorpionism in prevalent rate 20.83%.The number of cases caused by black scorpions was higher significantly ($P \leq 0.05$) than others 19(76%) while it were 2(8%) and 4(16%) in yellow scorpions and un noted scorpion respectively as shown in figure 3 .

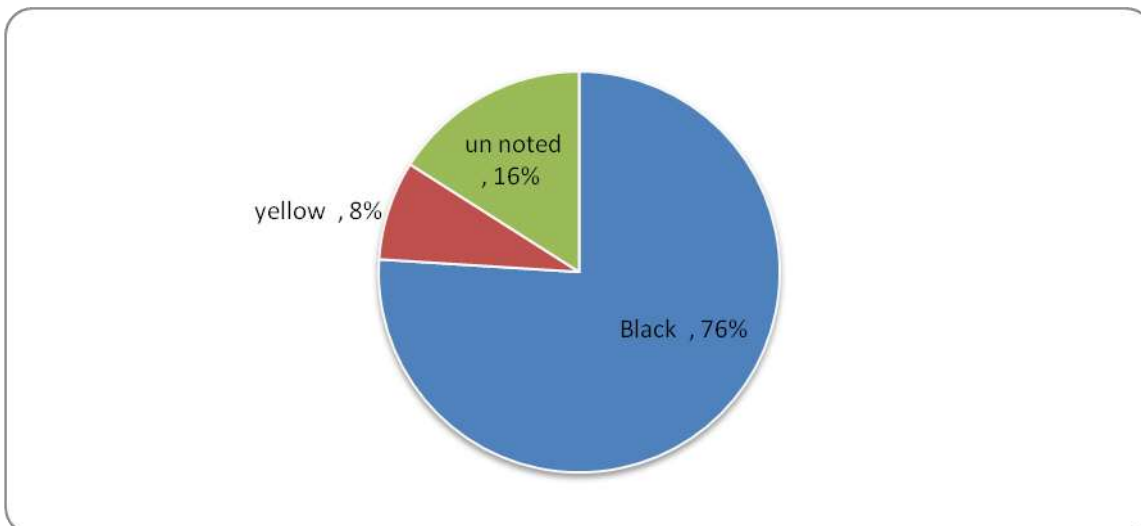


Figure (3) : the percentage of scorpionism according to scorpion's color .

Out of 77 scorpionism cases (25 families in infested areas and 52 hospitalized cases),the victims categories were men ,women and children in incidence rate 28.57% ,58.44% and 12.98% respectively ,as demonstrated in figure (4).

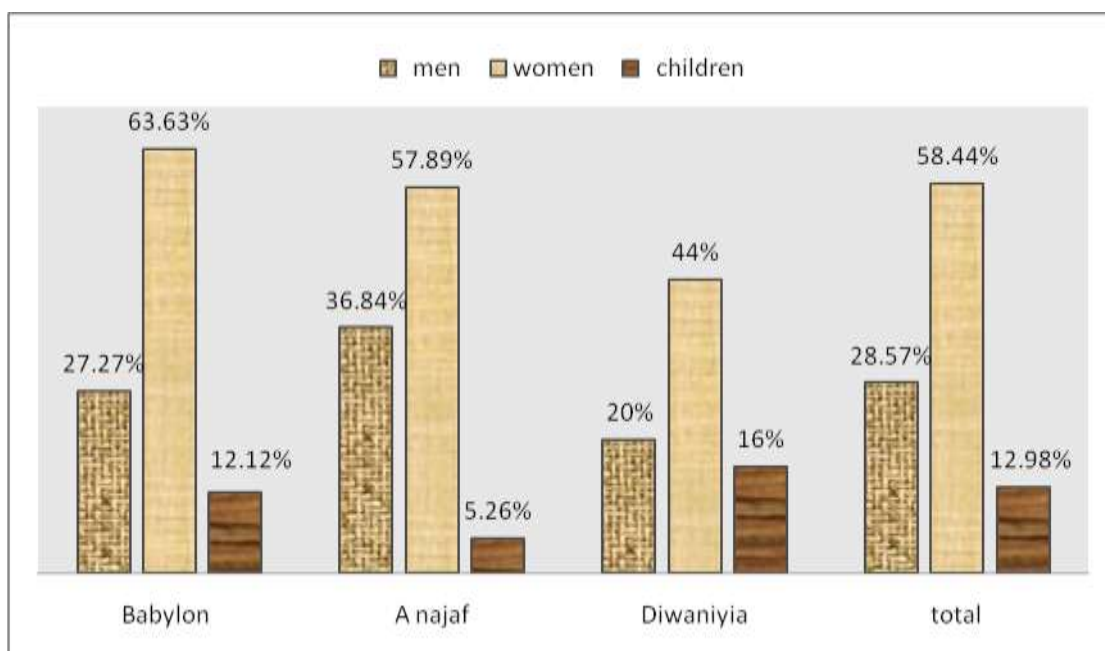


Figure (4) : the incidence rate of scorpionism in men , women and children.

Figure (5) revealed the relationship between patient categories and site of stinging ,the highest incidence of stinging was recorded in upper limbs ($P \leq 0.05$) 53.24% followed by lower limbs ,body and head & neck in percentage rate 35.06% ,10.38% and 1.29% respectively.

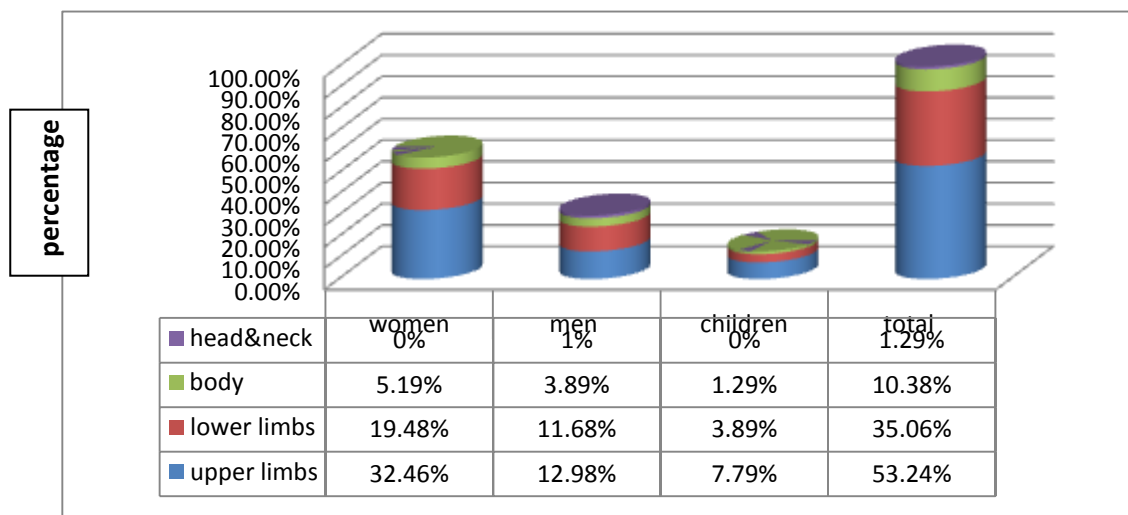


Figure (5): the incidence of scorpionism according to site of stinging.

Discussion

The present was carried out in Mid-Euphrates districts in Iraq to confirm the presence of fat tail scorpion and its role in scorpionism. The *A. crassicauda* is easily recognizable due to their morphological features (6).The physical description ,biometry and gender dominancy of collected specimens were in close to finding of other authors(2 , 8 , 9). Furthermore ,the results revealed that the *A. crassicauda* was common in the 3 studied governorates ,many surveys showed the high distribution of these scorpions in Iraq ,Turkey ,Azerbaijan ,Iran, Jordan and Saudi Arabia (10, 11).

In many countries such as Turkey, Brazil ,Saudi Arabia ,Egypt and Morocco the scorpion activity was recorded in most hotter summer months (12 , 13 , 3 , 14 , 15 , 16).In present study also the highest prevalent rate was recorded in July when the temperature was 40-45C° .

The analysis of data obtained from questionnaire revealed the high percentage of scorpionism caused by black scorpion compared with yellow and unnoted scorpion's color, same results were found in Turkey(9). The present study also revealed that the incidence of scorpionism was higher in women and followed by men and children ,these findings were in agreement with some authors whose reported that the scorpion stings were seen mostly in females in Turkey (9) and Zimbabwe(17) ,while the same data were in disagreement with other authors in Egypt (3),Saudi Arabia (12),Argentina (13) and Brazil(16),the reason of difference may be due to male- female distribution in each population.

Many studies showed that the percentage of scorpion stinging in extremities were higher than other body's sites, the recorded ratios were 89% ,86%,83% and 85% in Turkey(9) ,Saudi Arabia (12) ,Argentina (13)and Egypt(3) respectively, while in present study the ratios were 53.24% and 35.06% respectively. Ozkan(9) explain the high ratio of scorpion sting in extremities to be due to the socio-economic factors such as walking with bare foot, putting on shoes without pre-shaking ,hand searching ,lifting up stones and waiving hands during sleep or resting to move away scorpions.

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