

## SUNN PEST SPECIES AND ITS HIBERNATION SITES IN DIYALA GOVERNORATE / IRAQ

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### ABSTRACT

This study was conducted in Diyala governorate/Iraq during wintering period of the sunn pest from Dec. 2016 to Feb. 2017. Three species of sunn pest was diagnostic. These species are *Eurygaster integriceps* (Puoton, 1881), *E. testudinaria* (Geoffroy, 1785) and *E. maura* (Len.1758). *E. maura* was new species recorded to Iraq funna *E. integriceps* is The most abundance of the three species hibernated in the fields of the four region of Diyala governorate. The results showed that the three species of genus *Eurygaster* which diagnostic in Diyala governorate were overwintered as an adults under bushes ,dead leaves, weed ,date palm leaf base .The heights total number of adults(68,56,51 and 44adults/5m<sup>2</sup>) was found under cogon grass(*Imperata cylindrican* L.), Bermuda grass(*Cyndo dactylon* L.),Grape tree(*Vitis vinifera* L.)and Eucalyptus tree(*Eucalyptus* spp.) respectively. Higher densities were recorded in Muqadiyah (200), Balad rooz (193), Kalas (113) and decreased to( 65) adults in Khanakin. Found that the higher percentage for species *E. integriceps* then followed *E. testudinaria* finally the species *E. maura* in all region in Diyala governorate.

**Key word :** *Eurygaster maura* ,*Eurygaster testudinaria* ,hibernated ,diagnostic, overwintered  
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انواع حشرة السونه ومناطق تشتيتها في محافظة ديالى /العراق

رضا صكب الجوراني

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باحث

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المستخلص

اجريت دراسة في محافظة ديالى/ العراق خلال فترة تشتية حشرة السونه من كانون الاول 2016 الى شباط 2017. شخصت ثلاث انواع من حشرة السونه هي (*Eurygaster integriceps* (Put.1881)، *E. testudinaria* (Geof.1785)، و(*E. maura*(Len.1758)، والنوع الاخير يعد تسجيل جديد للعراق. وجدت الانواع الثلاثة مشتية تحت اوراق الاشجار، الادغال، وتحت قواعد سعف النخيل. اكبر عدد للبالغات المشتية (68,51,56,68) بالغة /م<sup>5</sup> تحت ادغال الحلفا (*Imperata cylindrican* Len.)، نبات الثيل(*Cyndo dactylon* Len.)، الاوراق المتساقطة العنب (*Vitis vinifera* Len.) والاوراق المتساقطة لأشجار اليوكالبتوز (*Eucalyptus. spp*) على التوالي أعلى كثافة عددية للبالغات المشتية سجلت في منطقة المقدادية وبلغت (200) بالغة بينما منطقة بلد روز سجلت (193) بالغة ومنطقة الخالص سجلت (113) بالغة وسجل في منطقة خانقين اقل عدد (65) بالغة. وجد ان اعلا نسبة مئوية للتواجد كان النوع *E. integriceps* ثم يليه النوع *E. testudinaria*. وأخيراً النوع *E. maura* في جميع مناطق المدروسة في محافظة ديالى.

الكلمات المفتاحية: *Eurygaster testudinaria*، *Eurygaster maura*، التشخيص، التشتية

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## INTRODUCTION

Bread wheat is an important food crop on the world level .The main problem in Iraq in the deficit in the wheat production (13).Wheat infected with many pest both in the field and storage lead to economic losses (5,2). Wheat bug (*Euregaster* spp.)(Hemiptera: scutelleridae) , are the most serious pest of wheat and barley in the wide area of the Near and Middle East West Asia and many of the new independent states of center Asia and Eastern and south Europe and north Africa (15,16,18). The genus *Eurygaster* spp (Laporte,1833) includes 19 species ,four of them are grain pastes. *E. integriceps* (Puton), *E.maura* (Linnaeus, 1758) , *E. testudinaria* (Geoffroy,1785) and *E.austriaca* (Schrank ,1776) (11,12) . These species caused yield losses about 20-30% for barley and 50-90% for wheat (9). Yield loss is a result of pest feeding by sucking nutrients from leaves ,stems ,and grains which inject enzymes on it that degraded gluten proteins ,and then reduced the quality of flours made from damaged wheat grains.(7,14).Sunn pest *Eurygaster integriceps* Puton ,was first recorded in north of Iraq in 1920(Ridha,1959) and then spread to most cereal field (wheat and barley)in Erbil ,Dohok,Nainawa and Sulaimanya (8). The infestation map of this pest was changes dramatically from 1980-2000,and colonized wheat and barley field grown in irrigated regions at most central and middle Euphrates governorates such as Salahaldin, Baghdad, Diyala , AL- Anbar and Babil (10).A new sunn pest species *Eurygaster testiudinaria* (geoffroy)was recorded for the first time at the middle Euphrates region of Iraq on wheat and barley fields (3,4).Several sunn pest outbreak was occurred in the middle Euphrates governorates of Iraq ,and many aerial spraying of broad- spectrum insecticides were done by the Ministry of Agriculture (Personal communication and internal reports). This research is an attempt to answer the question that raised by many researcher ,How this pest was dispersal and colonized many fields of wheat and barley in Diyala governorate, especially with outbreaks that occurred in many past years ,and the species of the genus *Eurygaster* and their hibernation sites.

## MATERIAL AND METHODS

The study was conducted in Diyala governorate/Iraq during wintering period of the sunn pest from Dece. 2016 to Feb. 2017.The governorate was divided four region according to their importance and production of wheat and barley crop .These regions are :Muqdadiyah , Kalas, Balad- rooz and Khanakin .The fields of wheat and barely were targeted as well as nearby highlands ,orchards, house hold and weeds. Sampled areas were scouted. with the assistance of a square meter and randomly selected 5 location .the wintered adults was keep in plastic tubs and all information was recorded directly .Many specimen were prepared and sent to Natural History Museum Unive. Of Baghdad and anther to Dr. A.Abdal Fattah for diagnostic purpose.

## RESULTS AND DISCUSSION

***Eurygaster* species:** Three species of sunn pest was diagnostic. These species are *Eurygaster integriceps* (Puoton, 1881), *E. testudinaria* (Geoffroy, 1785) and *E. maura* (len.1758).*E .maura* was new species recorded to Iraq funna .*E. integriceps* is The most abundance of the three species hibernated in the fields of the four region of Diyala governorate . *E. .testudinaria* which recorded previously in Najef ,Diwaniya and Karbala (4) and may be dispersal to anther governorates throughout the past year especially with the expanded of area cultivated by wheat and barley as well as introduced a new verities of these crops. *E. maura* was found with *E. integriceps* in wheat fields and at higher altitudes in the aestivation and hibernation sites in many region in Iran (19).In general *E. maura* was dispersal to fields of wheat and barley in Diyala governorate from this Iranian regional. This result confirmed that wheat and barley fields in Diyala governorate was infected with the same species that diagnostic in thes study .The most common sunn pest species have been shown in the dormancy location (Gara mountain) in north of Iraq was *E. integriceps*, the percentage of its appearance was 79.70% followed by *Dolycoris baccarum* L.and the *Carpocoris fuscispinus* Boh. And *Aelia acuminata* L. which estimated at (18.85,1.47 and 0.98) % respectively(1).

**Hibernation sites**

The results showed that the three species of genus *Eurygaster* which diagnostic in Diyala governorate were overwinter as an adults under bushes ,dead leaves, weed ,date palm leaf base (Table1).The heights total number of adults(68,56,51 and 44adults/5m<sup>2</sup>) was found under Blady grass(*Imperata cylindrical* L.) ,Bermuda grass(*Cyndo dactylon* L.),Grape tree(*Vitis vinifera* L.)and Eucalyptus tree(*Eucalyptus* spp.)respectively . Yildirim et,al 2007recorded two species *E. maura* and *E.austriaca* lives from autumn to spring under leaves of oak ,*Pinus* spp,*thymus* spp, *Acantholiman* spp and *Astragalus* spp . Higher densities were recorded in Muqdadiyah (200), Balad-rooz (193), Kalas (113) and decreased to (65) adults in Khanakin . Because wheat fields in both Muqdadiyah and Balad -Rooz are larger than the area of agriculture and surrounded by orchards, This is because the area cultivated in Khanakin with wheat crop is few and far from orchards. Field observation and research data confirmed the hibernation of

sunn pest *E. integriceps* under date plam leaf base, bland weeds and rice hay in Diwaniya and Najaf governorates during winter and early spring (10).Sunn pest *E. integriceps* in north of Iraq hides under many plants for summer aestivation and winter hibernation and its number in Siffin Mountain ranged fore 284-331 adults/10m<sup>2</sup> with an average 301.6 adult/10m<sup>2</sup> .This variation in sites of hibernation may be explain the tolerant of this species to wide range of temperature or anew biotype that adapted to higher temperature (especially in summer )in the middle of Iraq(6). The average population of sunn pest were (51.00and 44.46)insect/5m<sup>2</sup> at the end of October and the beginning of November respectively(1). The reason for the existence of these species in the orchards, fields and jungles plant is to protect themselves from the high temperature in the summer(aestivation) and decline in winter (hibernation) and the absence of mountain areas in the province of Diyala, it leads to these areas

**Table1:No. of sunn adult and locale hibernation**

No.	Commune name	Scientific name	Number of adult of sunn /5m <sup>2</sup>				Total
			Muqdadiyah	Kalas	Khanakin	Balad rooz	
.1	Blady grass	<i>Imperata cylindrical L</i>	21	16	11	20	68
.2	Date palm	<i>Phoenix dactylifera</i>	18	6		9	33
.3	Pomegranate tree	<i>Punica granatum</i>	15	9		10	34
.4	Grape tree	<i>Vitis vinifera</i>	16	12	5	18	51
.5	Apple tree	<i>Malusa communis</i>	4	7	8	10	29
.6	Pear tree	<i>Pyrus communis</i>	10	7	5	8	30
.7	Apricot tree	<i>Prunus armeniaca</i>	9	4	6	6	25
.8	Peach tree	<i>Prunus persica</i>	7	5	6	7	25
.9	Eucalyptus tree	<i>Eucalyptus communas</i>	16	4	6	18	44
.10	Poplar tree	<i>Populus euphratica</i>	10	3		8	21
.11	Tamaeix tree	<i>Tamarixspp.</i>	9	3	5	12	29
.12	Dadonea shrubbery	<i>Dadonea viscosa</i>	9	5	3	9	26
.13	Myrtus shrubbery	<i>Myrtus communis</i>	12	8		11	31
.14	Bermuda grass	<i>.Cyndo dactylon L</i>	12	9	10	25	56
.15	Weed in groves citrus	Many species	14	7		12	33
.16	Weed in groves .Pomegranate	Many species	18	8		10	36
.17	Total		200	113	65	193	571

**Percentage of the species in different region**

The highest percentage of *Eurygaster integriceps* was found in Balad rooz, Muqdadiyah, Kalas and Khanakin (54.9,54.5,79.3)% respectively The *E.*

*testudinaria* was the same in the same areas (40.8,45.5,20.7,11)% respectively, While the *E. maura* was only found in the Balad Rose region with 13.3% present

**Tbale 2.Percentage of the three species Of sunn pest in different region of Diyala governorate**

Region	Percentage% of the species		
	<i>Eurygaster integriceps</i>	<i>Eurygaster testudinaria</i>	<i>Eurygaster maura</i>
Balad rooz	%54.9	%40.8	%13.3
Muqdadiyah	%54.5	%45.5	0
Kalas	%79.3	%20.7	0
Kanakin	%89	%11	0

**REFERENCES**

1. Abdullah,S.I. and L.H.A ALDoske. 2010 .The first survey of the dormancy locations of the sunn pest *Eurygaster integriceps* Put. in Dohuk province .J.K.A.S.(1)2:1-8
2. Abdullah,L.M .and M .Z Raouf. 2005. .Evaluation of infestation degree by hairy grain beetle *Trogoderma granarium* Eve.) (Coleoptera :Dermestidea) for two wheat varieties during 1-6 months of storage of 2002. Iraqi Journal of Agriculture Sciences (36)5:125-130
3. Abdul- Razak Z . and H. F. Alrubeai 2011. Identification of New Sunn Pest Species, *Eurygaster testudinaria* Geoffroy with Studies of Its Biology and Ecology at the Middle Euphrates Region of Iraq. pp:13
4. Abdul- Razak Z. and H. F. Alrubeai 2011. Efficiency of pest *Eurygaster Testudinaria* (Geoffroy) Egg Prastoids in Najaf Government. Egyptian Journal of Biological Pest Control.21(2): 361-368
5. AL-Chalabi,F.T. and H.S.AL-Agidi,. 2010. Weed competition and its impact on growth characters of some wheat cultivars. Iraqi Journal of Agricultur of Sciences (41) 2:53-63
6. Amin,A.B., A.J. Mohammed and H.S AL-Assadi. 2007 .Population Density of Sunn Pest During Hibernation and Aestivation in Northern Iraq .Parker,B.M.,Margaret S.,Mustapha EL B.H.andSafaa G.K.(Eds)sunn pest management:ADecade of progress 1994-2004.pp: 448
7. Critchely B.R. 1998 Literature review of sunn pest *Eurygaster integriceps* Puton. (Heteroptera ; Scutelleridae).Crop Prot. (17): 271-287
8. EL-Haidary H., A.N. Nouman and M. K. Abad 1960. Sunn Pest Technical Buiitetin. No.6 Directory of Research and General Agricultural Projects Iraq.(in Arabic).pp:16
9. Gul, A., A .CAUMA and D.Mithat 2006. Sunn pest control policies and effect of sunn pest damage on wheat quality and price in Turkey. Quality and Quantity( 40): 469-480.
10. Hama, N.N., Z.A. Stephan, M.A. Ali and M.L. Aboud. 2007. Sunn Pest Status in Iraq. Parker,B.M.,Margaret S.,Mustapha EL B.H.andSafaa G.K.(Eds)sunn pest management:ADecade of progress 1994-2004.pp:448.
11. Javahery, M. 1996.Sunn Pest of Wheat and Barley in Islamic Republic of Iran (Chemical and Cultural Methods of Control .Sunn Pest and Their Control in the New Est. .edited by R.H.Miller and J.G.Morse plant production ,(FAO)Rom(1996) pp:11
12. Javahery, M. 1995. A technical Review of Sunn Pests (Heteroptera Pentatomoidea) with special reference to *Eurygaster integriceps* Puton. FAO/RNE Publ. Priv. pp:80.
13. Kadam,M.S. and A.S. AL-Hani, 2011.An estimation of supply response for bread wheat in Iraq for the Period 1991-2002. Iraqi Journal of Agriculture Sciences.(42)5:74-80
14. Lodos N.1986.Turkey Entomology ii.general applied and funistik. Ege University Faculty of Agriculture Publication Izmir ;no;429, E. U. Mat. Bornova, Izmir. pp: 591
15. Radjabi G.H. 2000. Ecology of Cereals Sunn Pest in Iran .Agricultural Research, Education and Extension Rganization Tehran ,Iran pp:343
16. Reynolds, M. P., J. Pietragalla, and H. J. Braun, 2008 .International Symposium on Wheat Potential: Challenges to International Wheat Breeding, Mexico,CIMMYT.pp:197

17. Ridha,O. 1959. Sunn Pest .Iraq Agriculture ,Bulletin. Ministry of Agriculture (in Arabic). pp:49-68
18. Sanaey,N. and T.N Mirak,. 2012.Wheat resistance to the adult insect of sunn pest *Eurigaster integriceps* Put .Americana Journal of Agriculture and Biological Sciences. (7)1;56-60
19. Schaefar, C. W. and A. R. Panizzi 2000. Heteroptera of Economic importance .CRC Press.pp:852
20. Yildirim,A.F.,E.Kinaci and M. (Elmali) Uysal. 2007.Sunn Pest Over Wintering Sites Parasitoids and Effects on Cereal Lines and Varieties. Parkar ,B. M. ,Margaret S.,Mustapha EL B.H.andSafaa G.K.(Eds)sunn pest management:ADecade of progress 1994-2004.pp:448.