



# NEW RECORD OF *ANISOPTEROMALUS CALANDRAE* (HOWARD, 1881) (HYMENOPTERA : CHALCIDOIDEA : PTEROMALIDAE) AS PARASITOID OF THE CIGARETTE BEETLE, *LASIODERMA SERRICORNE* (F.) (COLEOPTERA : ANOBIIDAE) IN IRAQ

Shaymaa Hameed AL-Obaidy\*, Samar Muthanna Shahrabani and Awatif Abdul-Fatah Hamodi

Department of Plant Protection, College of Agricultural Engineering Sciences, University of Baghdad, Iraq.

## Abstract

The *Anisopteromalus calandrae* (Hymenoptera : Chalcidoidea: Pteromalidae) record as anew parasitoid of the Cigarette Beetle, *Lasioderma serricorne* (F.) (Coleoptera : Anobiidae) in Iraq. This parasitoid was observed in July 2018. It was a larval, solitary, ectoparasitoid and may be a promising agent for the integrated pest management of stored product insect pests. Main identification to the morphological characters have been given for this research.

**Key words :** *Anisopteromalus calandrae*, *Lasioderma serricorne*, Iraq, parasitoid.

## Introduction

Cigarette beetle *Lasioderma serricorne* (F.) (Coleoptera : Anobiidae) is a cosmopolitan stored product pest (Rees, 2004; Imai and Harada, 2006; Kim *et al.*, 2003). This insect found in dry fruits, animal foods, nuts, grain, products, stored-tobacco (Cabrera, 2007; Papadopoulou and Buchelos, 2002). In this study, the insect found in bread yeast *Saccharomyces cerevisiae* with the parasitoid *Anisopteromalus calandrae*, which described and identified by the third author.

The parasitoid *Anisopteromalus calandrae* is a solitary, ectoparasitoid that parasitic on many stored-product beetles like *Sitophilus zeamais* (Williams and Floyd, 1971; Arbogast and Mullen, 1990). *S. oryzae* (Lucas and Riudavets, 2002; Press, 1992; Riudavets and Lucas, 2000), *S. granaries* (Hansen and Steenberg, 2007), *Callosobruchus maculatus* (Ngamo *et al.*, 2007), *Rhizopertha dominica* (Ahmed, 1996; Menon *et al.*, 2002), *Stegobium paniceum*, *Tribolium castaneum* and *Oryzaephilus surinamensis* (Sureshan, 2003). It has been recorded as bio-control agent on *Callosobruchus chinensis* and *C. maculatus* (Devi, 1996; Ngamo *et al.*, 2007). Here, we report it as a parasitoid of *Lasioderma*

*serricorne* (F.) larva for the first time on bread yeast in Iraq.

## Materials and Methods

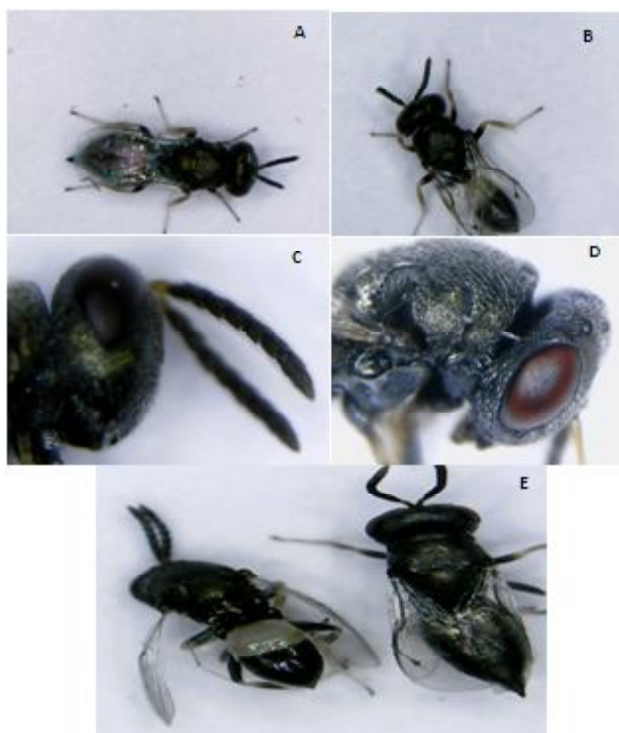
Bread yeast *Saccharomyces cerevisiae* samples were collected in a glass container to study the life cycle of Cigarette Beetle *Lasioderma serricorne* (F.), which found incidental in Home stored product (Unpublicized Data) in Baghdad 2017, after a months of pest rearing the parasitoid *Anisopteromalus calandrae* Appeared in July 2018.

The parasitoid were collected with the help of a mouth aspirator, and send to the third author to Identification and Description using Digital Microscope (40–1000X magnification) with the help of Key by Boucek and Heydon (1997), Rasplus (1988) and Sureshan (2010).

## Results and Discussion

**Described the adult female insects:** General color is black or dark, small in size 3.6 -3.9 mm in length. Antenna dark expected segments 1,2,3 and Basal forth as yellow in color, also the base of femur and top of tibia, all tarsi as yellow in color (fig. 1-A).

\***Author for correspondence :** E-mail: shayma.hameed@coagri.uobaghdad.edu.iq



**Fig. 1** : External morphology of *Anisopteromalus calandrae*. A : adult female, B : adult male, C : Head and Antenna. D : Compound eyes, E : Abdomen of female and male.

**Head:** Transverse in shape, 0.72 mm length, compound eye dark – reddish in color and 1.7 mm length oval in shape the outer margin pale bright and 1.15 mm length. Maxillary palp with 3 segments black in color (fig. 1-C, D).

**Thorax :** 1.46 mm in length, 1.16 mm in width near top, black in color. For wing pale length 2.3 mm. the microtrichia black. The Radial vein and Radial cell near inner margin is dark (fig. 1-A,B,E).

**Legs:** Short, black except femur and base of tibia and all tarsi is yellow carried pair of black claws (fig. 1-A, B).

**Abdomen:** 1.72 mm in length, 1.02 mm in width . The ovipositor short and split.

The adult male insects Resemble with female in color but different by a measurement in length, and there is a white-yellowish color at 3-4 segments of abdomen. mail abdomen smaller than female in size (fig. 1-E).

In conclusion, the *Anisopteromalus calandrae* a new record in Iraq as parasitoid on the Cigarette beetle *Lasioderma serricornne* (F.) and study the life cycle and some biological parameters necessary to using this natural enemy in IPM programs.

## References

- Ahmed, K. S. (1996). Studies on the ectoparasitoid *Anisopteromalus calandrae* How. (Hymenoptera : Pteromalidae) as a biological control agent against the lesser grain borer, *Rhyzopertha dominica* (Fab.) in Saudi Arabia. *J. Stored Prod. Res.*, **32** : 137–40.
- Arbogast, R.T. and M. A. Mullen (1990). Interaction of maize weevil (Coleoptera: Curculionidae) and parasitoid *Anisopteromalus calandrae* (Hymenoptera: Pteromalidae) in a small bulk of stored corn. *J. Econ. Entomol.*, **83** : 2462–2468.
- Boucek, Z. and S. I. Heydon (1997). Pteromalidae. p. 541-692: Gibson GAP, Huber J T and Woolley J B. Annotated Keys to the generating of Nearctic Chalcidoidea (Hymenoptera). Ottawa: N.R.C. Research Press.
- Cabrera, B. J. (2001-2007). Cigarette beetle, *Lasioderma serricornne* (F.) (Insecta: Coleoptera : Anobiidae) , University of Florida. ([http://creatures.ifas.ufl.edu/urban/stored/cigarette\\_beetle.htm](http://creatures.ifas.ufl.edu/urban/stored/cigarette_beetle.htm)).
- Devi, N. (1996). Occurrence of parasitoid, *Anisopteromalus Ruschka* (Howard) on bruchid, *Callosobruchus chinensis* Linn. Infesting gram (*Cicer arietinum* L.). *J. Entomol. Res.*, **20** (1) : 87-88.
- Hansen, L. S. and T. Steenberg (2007). Combining larval parasitoids and an entomopathogenic fungus for biological control of *Sitophilus granarius* (Coleoptera: Curculionidae) in stored grain. *Biol. Contr.*, **40** : 237–242.
- Imai, T. and H. Harada (2006). Low-temperature as an alternative to fumigation to disinfest stored tobacco of the cigarette beetle, *Lasioderma serricornne* (F.) (Coleoptera: Anobiidae). *Appl. Entomol. Zool.*, **41**(1):87-91.
- Kim, S., C. Park, M. H. Ohm, H. C. Cho and Y. J. Ahn (2003). Contact and fumigant activity of aromatic plant extracts and essential oils against *Lasioderma serricornne* (Coleoptera: Anobiidae). *J. Stored Prod. Res.*, **39**:11–19.
- Lucas, E. and J. Riudavets (2002). Biological and mechanical control of *Sitophilus oryzae* (Coleoptera: Curculionidae) in rice. *J. Stored Prod. Res.*, **38**:293–304.
- Menon, A., P. W. Flinn and B. A. Dover (2002). Influence of temperature on the functional response of *Anisopteromalus calandrae* (Hymenoptera: Pteromalidae), a parasitoid of *Rhyzopertha dominica* (Coleoptera: Bostrichidae). *J. Stored Prod. Res.*, **38** : 463–469.
- Ngamo, T. S. L., H. Kouninki, Y. D. Ladang, M. B. Ngassoum, P. M. Mapongmestsem and T. Hance (2007). Potential of *Anisopteromalus calandrae* (Hymenoptera : Pteromalidae) as biocontrol agent of *Callosobruchus maculatus* (F.) (Coleoptera [sic]: Bruchidae). *Afr. J. Agric. Res.*, **2**: 168–172.
- PAPADOPOULOU, S. C. and C. T. BUCHELOS (2002). Definition of the flight period of *Lasioderma serricornne* (F.) in stored tobacco. *J. Pest Sci.*, **75**(3) : 81-83.
- Press, J. W. (1992). Comparative penetration efficacy in wheat

- between the weevil parasitoids *Anisopteromalus calandrae* and *Choetospila elegans* (Hymenoptera : Pteromalidae). *J. Entomol. Sci.*, **27** : 154–157.
- Rasplus, J. Y. (1988). Description de deux nouvelles du genre *Anisopteromalus* especes Rutschka. Clé des especes Afrotropical (Hym. Pteromalidae). *Bull. Soc. Entomol. France*, **93** : 119-127.
- Rees, D. (2004). *Insects of Stored Products*. CSIRO Publishing, Collinwood, Australia.
- Riudavets, J. and E. Lucas (2000). Biological control of *Sitophilus oryzae* (Coleoptera: Curculionidae) in rice and combined effects with a polishing process. In: *Integrated Protection of Stored Products, IOBC Bulletin*, **23 (10)** : 143–148.
- Sureshan, P. M. (2003). Pteromalinae (Pteromalidae: Chalcidoidea: Hymenoptera) of Indian Subcontinent. *Rec. Zool. Surv. India. Occ. Paper*, **205**: 1-170. (Published by the Director, Zool. Surv. India).
- Sureshan, P. M. (2010). A new species of *Anisopteromalus rutschka* (Hymenoptera: Chalcidoidea: Pteromalidae) from Sri Lanka. *Journal of Threatened Taxa*, **2(9)** : 1144-1146.
- Williams, R. N. and E. H. Floyd (1971). Effect of two parasitoids, *Anisopteromalus calandrae* and *Choetospilaelegans*, upon populations of maize weevil under laboratory and natural conditions. *J Econ Entomol.*, **64** : 1407–1408.