

Functioning of Rothamsted Light Traps and their use for Collecting Insect Species

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ABSTRACT

An attempt to collect specimens for taxonomical studies was made using Rothamsted light traps. Captured insect species were listed. This report includes 6 orders, 31 families and 94 insect species, of which 11 were identified as to generic name only.

INTRODUCTION

Many light traps have been developed to improve catching efficiency (2,4). The successful use of these traps has encouraged their extensive use in collecting good specimens of insects for survey and taxonomical studies, (1,3,5,8,9,14).

The Rothamsted light trap is one of the recent advanced traps and was first used in the Rothamsted Insect Survey in Britain (10,11,12).

The present study is an attempt to detect the efficiency of the Rothamsted light trap for taxonomical studies as a prerequisite for future detailed taxonomical and population studies.

MATERIALS AND METHODS

Two Rothamsted light traps were set in two different localities in the farm of the Faculty of Agriculture in Tripoli. One of the localities contained varied vegetation, such as shade and fruit trees, as well as field and vegetable crops. The area is close to an animal farm. The other locality had vegetable crops, ornamental plants, shade and fruit trees.

These traps were operative from 6 o'clock in the evening until 8 o'clock in the morning. Normal light was obtained from a 500 watt clear-glass tungsten lamp. Samples were obtained twice a week for a period of 1 year.

The insects were separated according to order. Specimens were sent for identification to the Commonwealth Institute of Entomology, London, England.

RESULTS AND DISCUSSION

The following is a list of insect species collected by the Rothamsted light traps in the above mentioned localities:

Order Orthoptera

Family Gryllidae

Modicogryllus palmatorum (Krauss)

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Family Gryllotalpidae

Gryllotalpa africana P.deB.

Order Hemiptera

Family Coreidae

Euthetus sebulicola Lindberg*Liorhyssus hyalinus* (Fabricius)*Nariscus* sp.

Family Cydnidae

Sehirus melanopterus (H. S.)*Macroscytus brunneus* (F.)

Family Lygaeidae

Cosmopleurus fulvipes (Dallas)*Dieuches* sp. nr. *conspicuus* Eyles*Nysius ericae* (Schilling)*Remaudiereana* sp.

Family Miridae

Calocoris porphyropterus Reuter*Creontiades pallidus* (Rambur)*Eurystylus bellevoyei* (Reuter)*Nesidiocoris tenuis* (Reuter)*Orthotylus* sp.*Pleuroxonotus* sp. ? nr. *longicornis* (Reuter)*Taylorilygus pallidulus* (Blanchard)*Trigonotylus ruficornis* (Geoffroy)

Family Pentatomidae

Mecidea lindbergi Wagner*Acrosternum millierei* (M. & R.)

Family Reduviidae

Oncocephalus pilicornis (H. S.)*Reduvius tabidus* Klug

Family Cicadellidae

Aconurella prolixa (Lethierry)*Asymmetrasca decedens* (Paoli)*Austroagallia sinuata* (M. & R.)*Balclutha* sp.*Balclutha frontalis* (Ferrari)*Balclutha hortensis* Lindberg*Balclutha saltuella* (Kbm.)*Cicadulella pallida* (Haupt)*Cicadulina bipunctata* (Melichar) *bipunctella* (Matsumura)*Empoasca* sp.*Empoasca decipiens* Paoli*Empoasca tullgreni* Ribaut*Euscelidius variegatus* (Kbm.)*Exitianus taeniaticeps* (Kirchbaum)*Grypotes staurus* Ivanoff*Hecalus* sp.*Hecalus paykulli* Stål*Jacobiasca lybica* (de Berg)*Neoaliturus opacipennis* (Lethierry)*Opsius tigrisipes* (Lethierry)*Orosius cellulosa* (Lindberg)

- Psammotettix striatus* (L.)
- Synophropsis lauri* Horváth
- Tamaricella complicata* Dworakowska
- Thamnotettix inscriptus* Haupt
- Family Cicadidae
 - Cicada* sp.
- Family Delphacidae
 - Pseudaraeopus* sp.? *lethierryi* (M. & R.)
- Family Dictyopharidae
 - Dictyophara* sp.

Order Neuroptera

The species that belong to the families: Chrysopidae, Myrmeleontidae and Hemerobiidae, were previously reported by the author (6) and were also collected in this study.

Order Coleoptera

- Family Carabidae
 - Harpalus tenebrosus* Dej.
- Family Coccinellidae
 - Chilocorus bipustulatus* (L.)
 - Chilocorus similis* Ross
 - Lindorus lophanthae* Bsd.
- Family Paussidae
 - Paussus thomsoni* Reiche
- Family Scarabaeidae
 - Sub-family Aphodiinae
 - Aphodius hydrochoeris* (F.)
 - Aphodius lividus* (Ol.)
 - Sub-family Melolonthinae
 - Pachydema* sp.
 - Pachydema* sp. nr. *tarsalis* Rtt.
 - Sub-family Ochodaeinae
 - Ochodaeus harterti* Rtt.
 - Sub-family Rutelinae
 - Anomala* sp.
- Family Tenebrionidae
 - Anemia sardoa* Gén
- Family Trogidae
 - Glaresis handlirschi* Rtt.

Order Hymenoptera

- Family Braconidae
 - Meteorus rubens* (Nees)
 - Disophrys* sp. nr. *lutea* Brullé
 - Zele Chlorophthalma* Nees
- Family Formicidae
 - Dorylus* sp.
- Family Ichneumonidae
 - Lemophagus* sp. probably sp. n.

Order Lepidoptera

Family Geometridae

Eucrotes indigenata de Villers*Rhometra sacraria* L.

Family Lymantriidae

Beeria innotata Walk.

Family Noctuidae

Agrotis segetum Schiff.*Agrotis spinifera* Hb.*Agrotis ypsilon* Rott.*Autographa circumplexa* L.*Autographa gamma* L.*Autographa ni* Hbn.*Diachrysa orichalcea* F.*Earias insulana* Boisd.*Grammodes stolidus* F.*Heliothis armigera* Boddie*Mythimna unipuncta* Haw.*Spodoptera exigua* (Hb.)*Spodoptera littoralis* Vietta

Family Pyralidae

Anoylolomia innornata Stdgr.*Nomophila noctuella* (D. & S.)*Palpita unionalis* Hb.*Udea ferrugalis* Hb.*Uresphila limbalis* (D. & S.)

Family Sphingidae

Hyles euphorbiae L. ssp. *mauritanica* Stdgr.*Hyles lineata* F. ssp. *livornica* Esper

Family Plutellidae

Plutella maculipennis Curtis

Family Tortricidae

Cacoecimorpha pronubana Hb.

In the present study, the Rothamsted light trap proved to be more efficient than the simple trap previously located in the same area (6,7).

Most of the species obtained in the simple light trap by Hessein (6) and Hessein and Kraim (7) were also collected by the Rothamsted light trap during the present study, but in a higher quality and number. This included individuals from the orders of Orthoptera, Hemiptera, Neuroptera, Coleoptera, Diptera and Hymenoptera. Many unidentified species of earwigs, moths, beetles, flies and mosquitoes were collected in addition to adults of the olive fruit fly *Dacus oleae* Omel.

The closed system of the Rothamsted light trap (Fig. 1) resulted in large catches of insects. The reasonable distance between the light source and the killing bottle protected the fragility of specimens.

The large catches of fine specimens increased the chance of correct identification, and the quality of specimens, allowed most of them to be identified up to species level. More species were recorded in this trap, especially in the case of family Cicadellidae. Large numbers of fine specimens of moths were also obtained.

This trap, in spite of success shown in the present study, needs to be compared to other kinds of trap, with different illuminations, under local conditions. Taylor and French (13) reported a comparison between the functions of the Rothamsted tungsten-lamp traps, and the Robinson mercury-vapour traps. They stated that when these two

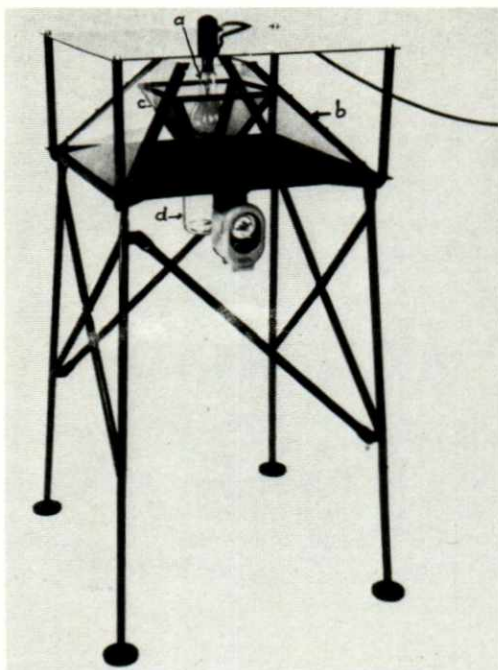


Fig. 1. Rothamsted light trap; a. Illumination source; b. Outside converted glass funnel, c. Inside glass funnel; d. Killing bottle.

traps were placed in similar localities in the Rothamsted Experimental Farm in England, the Rothamsted traps collected smaller catches, and fewer moth species, but gave more consistent samples than the Robinson traps. They gave samples that were remarkably similar in total numbers of individuals and species, and also in the diversity of all the families.

It is interesting to note that the traps used in this study can be considered as an efficient means of control, in addition to their suitability for valuable taxonomic studies.

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LITERATURE CITED

1. Acuff, V. R. 1976. Trap biases influencing mosquito collecting. *Mosquito News*. 36(2): 173-176.
2. El-Saadany, G. 1974. A new light trap for controlling lepidopterous insect pests in Egypt. *Zeit. Ang. Entomol.* 77: 136-141.
3. Floore, T. G., R. L. Robertson, M. C. Ganyard and H. C. Ellis. 1976. A blacklight trap surveillance of adult Lepidoptera in three North Carolina tobacco belts. *Jour. of the Georgia Entmol. Soc.* 11(2): 131-177.
4. Frost, S. W. 1952. Light traps for insect collections, survey and control. *Pennsylvania Bull.* 550, Agric. Expt. Sta. State Coll.

5. Garcia-Aldrete, A. N. and D. J. Pletsch. 1976. Fauna of mosquitoes (Diptera: Culicidae) in the tourist zone of Ixtapa, Guerrero. *Folia Entomologica Mexicana* 34: 71-83.
6. Hessein, N. A. 1978. A survey of biological control agents in Tripoli, S.P.L.A.J. *Libyan Jour. of Agric.* 7: 119-123.
7. Hessein, N. A. and A. M. Kraim. 1975. Insect species caught by a light trap in Tripoli, Libya. *Libyan Jour. of Agric.* 4: 113-115.
8. Nasr, E. S. A. and N. H. Nazmi. 1977. Identification and abundance of species of the tribe Agrotini by using light traps. *Agric. Res. Rev.* 53(1): 35-42.
9. Roberston, I. A. D. 1977. Records of insects taken at light traps, in Tanzania. *Miscell. Rept. Center for Overseas Pest Research* 30. 8 pp.
10. Taylor, L. R. 1968. The Rothamsted Insect Survey. *Natr. Sci. Sch.* 6: 2-9.
11. Taylor, L. R. 1973. Monitor surveying for migrant insect pests. *Outl. Agric.* 7: 109-116.
12. Taylor L. R. and R. A. French. 1973. Rothamsted Insect Survey: Fourth report. *Rep. Rothamsted Exp. Stn. Pt. 2:* 182-211.
13. Taylor, L. R. and R. A. French. 1974. Effect of light trap design and illumination on samples of moths in an English Woodland. *Bull. Entomol. Res.* 63: 583-594.
14. Taylor, L. R., R. A. French and J. Bowden. 1976. Rothamsted Insect Survey, Seventh Annual Summary. *Rep. Rothamsted Exp. Stn. Pt. 2:* 97-128.

استخدام مصائد روشامستيد الضوئية فى جمع أنواع من الحشرات

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نوال أحمد حسين

المستخلص

تمت محاولة لجمع عينات حشرية باستعمال المصائد روشامستيد الضوئية لغرض الدراسات التقسيمية . عملت قائمة بأنواع الحشرات التى تم صيدها . يشمل هذا التقرير مجموع ٩٦ نوع من الحشرات منهم احدى عشر تم تعريفهم للجنس فقط ، علما بأنهم يتبعون احدى وثلاثين عائله وست رتب .