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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 palmetorum (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 tigripes (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 Géné
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
Eucrostes indigenata de Villers
Rhodometra sacraria L.
Family Lymantriidae
Beeria innotata Walk.
Family Noctuidae
Agrotis segetum Schiff.
Agrotis spinifera Hb.
Agrotis ypsilon Rott.
Autographa circumphlexa L.
Autographa gamma L.
Autographa ni Hbn.
Diachrysia orichalcea F.
Earias insulana Boisd.
Grammodes stolida 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, bettles, 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

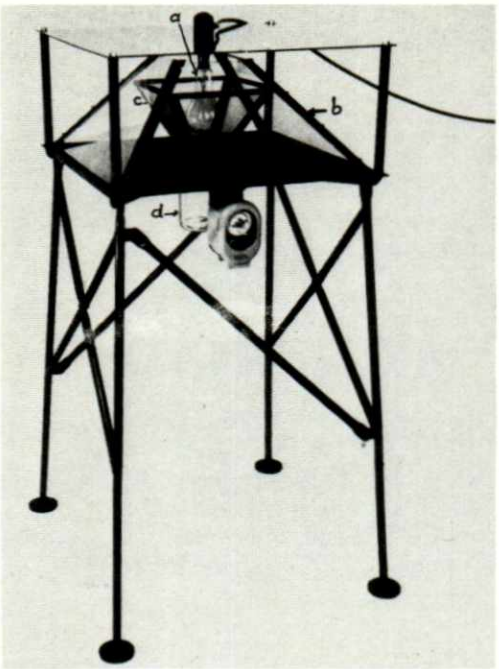

Fig. 1. Rothamsted light trap; a. Illumination source; b. Outside converted glass funnel, c. Inside glass funnel; d. Killing bottle.

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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استخدام مصائد روثهامستيد الضوئيه فى جمع أنواع من الحشرات

نوال أحمد حسين

المستخلص

تمت محاولة لجمع عينات حشريه باستعمال المصائد روثهامستيد الضوئيه 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 .