

632.7

Q4

1997

**SURVEY AND IDENTIFICATION OF NATURAL
ENEMIES ASSOCIATED WITH CROP PESTS
IN MULTIPLE CROPPING SYSTEM**

THESIS

MARIA LUISA C. QUIBAEL

**Department Of Crop Protection
DON SEVERINO AGRICULTURAL COLLEGE
Indang, Cavite**

April 1997

~~S~~URVEY AND IDENTIFICATION OF NATURAL
ENEMIES ASSOCIATED WITH CROP PESTS
IN MULTIPLE CROPPING SYSTEM

Undergraduate Thesis
Presented to the Faculty of the
Don Severino Agricultural College
Indang, Cavite

In Partial Fulfillment
of the Requirement for the Degree of
Bachelor of Science in Agriculture
(Major in Crop Protection)

MARIA LUISA C. QUIBAEL
April 1997

ABSTRACT

QUIBAEL, MA. LUISA C. "Survey and Identification of Natural Enemies Associated with Crop Pests in Coffee-Based Farming System". Thesis, BSA, Crop Protection, Entomology, Department of Crop Protection, School of Agriculture, Forestry, Environment and Natural Resources, Don Severino Agricultural College, Indang, Cavite, April 1997.

Thesis Adviser: Dr. Josefina R. Rint

A survey was conducted at the four coffee-based modules of the Sanayan sa Kakayahang Agrikultura (SAKA) from September 1996 to February 1997. This study aimed to collect and identify the natural enemies associated with the crop pests in coffee-based farming system and to determine the level of infestation of naturally occurring bio-control agents on major pests of crops in coffee-based farming systems.

The common natural enemies associated with different crops in coffee-based farming system were as follows: coffee - *Micraspis* sp, black coccinellid, *Rhyzobius* sp, *Argiope catennulata*, *Araneus inustus*, praying mantis, and unidentified pupal parasite; Banana - *Oxyopes javanus*, *Araneus inustus*, *Brachymeria* sp, and unidentified egg parasite, Guayabano - praying mantis, *Araneus inustus*, and *Nephila maculata*; Lychee - *Phidippus* sp, *Araneus inustus* and praying mantis; Lanzones - *Micraspis* sp, and *Phidippus* sp; Coconut - earwig, *Nephila maculata*; Black pepper - *Argiope catennulata*, *Phidippus* sp and *Araneus inustus*.

These natural enemies where present in the field in various times of the year. They were observed to be associated with crop pests such as: coffee leaffolder, tussock moth, hemispherical scale, whitelouse scale, mealybug, flea beetle, whitefly, guayabano moth, leafhoppers, and common cutworm.

A total of thirteen (13) arthropods were recorded as natural enemies associated with crop pests in coffee-based farming systems. Three belonged to order Coleoptera, 3 to Hymenoptera, 1 to Mantodea, 5 to Araneae and 1 to Dermaptera.

TABLE OF CONTENTS

	Page
BIOGRAPHICAL SKETCH.	iii
ACKNOWLEDGMENT.. . . .	iv
ABSTRACT.	vi
LIST OF TABLES.	ix
LIST OF FIGURES.	x
LIST OF APPENDICES.	xii
INTRODUCTION.	1
Importance of the Study.	3
Objectives of the Study.	4
Time and Place of the Study.	4
Limitation of the study.	4
REVIEW OF RELATED LITERATURE.	5
METHODOLOGY.	11
DISCUSSION OF RESULTS.	15
Brief Description of Natural Enemies.	16
Comparative Occurrence of Natural Enemies on Different Crops in Coffee-Based Farming System.	64
Level of Infestation of Naturally Occurring Bio-Con Agents on Major Pests of Crops in Coffee-Based Farming System.	67
SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATION	71
Summary.	71
Conclusion.	72

Implication.	73
Recommendation.	73
BIBLIOGRAPHY.	74

LIST OF TABLES

Table		Page
1	Level of Infestation of Naturally Occurring Bio-Con Agents on Major Pests of Crops in Coffee-Based Farming System	70

LIST OF FIGURES

Figure		Page
1	Picture showing adult coccinellid beetle, <i>Micraspis</i> sp (<i>Coccinellidae</i> ; <i>Coleoptera</i>)..	17
2	Population build-up of <i>Micraspis</i> and its host hemispherical scale on coffee.	18
3	Population build-up of <i>Micraspis</i> and its host, white louse scale in lanzones.	20
4	Picture showing adult of scale eating ladybird <i>Rhyzobius</i> sp (<i>Coccinellidae</i> <i>Coleoptera</i>)..	21
5	Population build-up of scale eating ladybird and its host, hemispherical scale, in coffee.	22
6	Picture showing adult black coccinellid unidentified species (<i>Coleoptera</i> ; <i>Coccinellidae</i>)..	23
7	Population build-up of black coccinellid and its host, hemispherical scale, in coffee.	25
8	Picture showing adult pupal parasitoid unidentified species (<i>Hymenoptera</i>)..	26
9	Population build-up of unidentified pupal parasitoid and its host, coffee leaffolder, in coffee.	27
10	Picture showing adult praying mantis unidentified species (<i>Mantodea</i>)..	28
11	Population build-up of praying mantis and its hosts, coffee leaffolder and tussock moth in coffee.	29
12	Population build-up of praying mantis and its host, common cutworm and leafhoppers, in lychee.	31

13	Population build-up of praying mantis and its host, guayabano moth, in guayabano. . .	32
14	Picture showing adult orb-spider <i>Argiope catenulata</i> (Araneidae, Araneae). . .	33
15	Population build-up of orb-weaving spider and its hosts, leaffolder, tussock moth and flea beetle, in coffee.	35
16	Population build-up of orb-weaving spiders and its host, whitefly, on black pepper. .	36
17	Picture showing adult lynx spider <i>Oxyopes javanus</i> (Oxyopidae; Araneae). . .	37
18	Population build-up of lynx spider and its host, whitefly, on coffee.	38
19	Population build-up of lynx spider and its host, banana leafroller, on banana. . .	39
20	Picture showing adult jumping spider <i>Phidippus</i> sp. (Salticidae, Araneae). . . .	41
21	Population build-up of jumping spiders and its hosts, flea beetle, leafhoppers, and leaffolder, on lychee.	42
22	Population build-up of jumping spider and its hosts, flea beetle and whitefly on black pepper.	43
23	Population build-up of jumping spider on lanzones.	44
24	Picture showing adult melon spider <i>Araneus inustus</i> (Araneidae; Araneae). . . .	46
25	Population build-up of melon spider and its host, whitefly, on coffee.	47
26	Population build-up of melon spider, on banana.	48
27	Population build-up of melon spider and its hosts, flea beetle and leafhoppers, on lychee.	49
28	Population build-up of melon spider, on guayabano.	50

29	Population build-up of melon spider and its host, whitefly, on black pepper. . . .	51
30	Picture showing adult chalcid wasp <i>Brachymeria</i> sp. (Chalcididae; Hymenoptera).	53
31	Population build-up of chalcid wasp and its host, banana leafroller, on banana.	54
32	Picture showing adult parasitoid wasp (unidentified species; Hymenoptera). . . .	55
33	Population build-up of unidentified parasitoid wasp and its host, egg of banana leafroller, on banana.	57
34	Picture showing adult earwig (Unidentified species; Dermaptera).	58
35	Population build-up of earwig on coconut. . .	59
36	Picture showing adult of golden orb-weaving spider <i>Nephila maculata</i> (Araneidae, Araneae).	60
37	Population build-up of golden orb-weaving spiders, on coconut.	62
38	Population build-up of golden orb-weaving spider, on guayabano.	63
39	Seasonal abundance of natural enemies associated with crop pests in coffee-based farming system.	64

LIST OF APPENDICES

Appendix	Page
1 Natural enemies associated with coffee.	76
2a Natural enemies associated with banana.	77
2b Level of parasitism of unidentified egg parasitoid on banana leafroller.	78
2c Level of parasitism of chalcid wasp on banana leafroller, in banana.	78
3 Natural enemies associated with lychee.	79
4 Natural enemies associated with guayabano.	80
5 Natural enemies associated with coconut	81
6 Natural enemies associated with black pepper.	82
7 Natural enemies associated with lanzones.	83
8a Level of predation of <i>Micraspis</i> sp on hemispherical scale.. . . .	84
8b Level of predation of <i>Micraspis</i> sp. on gray mealy bug.. . . .	84
8c Level of predation of <i>Micraspis</i> sp on whitelouse scale	84
9 Level of parasitism of unidentified pupal parasitoid on coffee leaffolder.. . . .	85
10 Level of predation of black coccinellid on hemispherical scale.. . . .	86

SURVEY AND IDENTIFICATION OF NATURAL ENEMIES ASSOCIATED WITH CROP PESTS IN MULTIPLE CROPPING SYSTEM¹—

MARIA LUISA C. QUIBAEL

¹—Thesis manuscript presented to the Faculty of the Department of Crop Protection, School of Agriculture, Don Severino Agricultural College, Indang, Cavite in partial fulfillment of the requirements for graduation with the degree of Bachelor of Science in Agriculture (major in Crop Protection). With contribution No. CP 96-97-088-007. Prepared under the supervision of Dr. Josefina R. Rint.

INTRODUCTION

Crop diversification does not necessarily mean that the crops are free from insect pest infestation. The leaves, stems and fruits of the crops are destroyed by pests, resulting to reduced quantity and low quality of harvest crops. Farmers find a way of controlling insect pests through the application of toxic pesticides. This pesticide application, however, is hazardous to men, animals and entire environment. The continuous application of toxic pesticides in controlling major crop pests tends to destroy natural balance and consequently, produces more problem. Where there is abuse and improper