

ECOLOGICAL STUDIES ON INSECT SPECIES  
DIVERSITIES AND PRODUCTIVITIES IN THE HIGHLAND  
AGRICULTURAL ECOSYSTEMS OF PAPUA NEW GUINEA. A  
PROGRESS REPORT FOR THE YEAR 1982

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REPORTS PARTIAL RESULTS OF THE FIELD SURVEY (1982) IN  
PAPUA NEW GUINEA

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AND PRODUCTIVITIES IN THE HIGHLAND AGRICULTURAL  
ECOSYSTEMS OF PAPUA NEW GUINEA. A PROGRESS  
REPORT FOR THE YEAR 1982\***

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In early summer of 1981, Dr. J. L. Gressitt, Director, Wau Ecology Institute, Wau, Papua New Guinea and I agreed to develop a joint project on economic insects for Papua New Guinea as one of researches by the Grant-in-Aid for Overseas Scientific Survey, Ministry of Education, Science and Culture (Japan). It was later entitled "Ecological studies on insect species diversities and productivities in the highland agricultural ecosystems of Papua New Guinea", and the field survey was planned to commence on July 12, 1982. Our proposal to the Institute of Papua New Guinea Studies was approved in February 1982.

Very unfortunately, however, Dr. and Mrs. J. L. Gressitt passed away in a plane crash in south China on April 26, 1982. We were very saddened to learn of their death. Subsequently, the participants to the project were re-organized, as follows :

Japan

Dr. Yoshihiro Hirashima (Principal investigator), Professor of Entomology, Kyushu University, Fukuoka.

Dr. Rokuro Kano, Professor of Medical Zoology, Tokyo Medical and Dental University, Tokyo.

Dr. Shinsaku Kimoto, Professor of Biology, Kurume University, Kurume.

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Dr. Satoshi Shinonaga, Associate Professor of Medical Zoology, Tokyo Medical and Dental University, Tokyo.

Dr. Osamu Tadauchi, Research Associate of Entomology, Kyushu University, Fukuoka.

#### Papua New Guinea

Dr. J. W. Ismay, Entomology Section, Department of Primary Industry, Konedobu.

Dr. G. A. Samuelson, Department of Entomology, B. P. Bishop Museum, Hawaii (and Wau Ecology Institute, Wau, Papua New Guinea).

Prof. Kano did not join the field survey in 1982. Dr. Kintaro Baba, Director, Kurokawa Hospital, Kurokawa, Niigata Prefecture, Japan joined with the survey as one of co-investigators for the first 10 days. Dr. Baba was also one of good friends of the late Dr. Gressitt.

### Itinerary

After arrival of Drs. Baba, Kimoto, Shinonaga, Tadauchi and Hirashima at Port Moresby on July 12, 1982, the following locations in Morobe Province, Eastern Highlands Province, Shimbu (Chimbu) Province, Western Highlands Province, Southern Highlands Province and Central Province were visited and field studies on economic and non-economic insects were made.

**Wau and Mt. Kaindi**, July 14-26

**Lae**, July 27

**Goroka**, July 28-29

**Keglsugl and Mt. Wilhelm**, July 30 – August 2

**Kundiawa**, August 3

**Baiyer River**, August 4-8

**Mt. Hagen**, August 9

**Tambul and Mt. Giluwe**, August 10-11

**Mt. Hagen (Kuk)**, August 12 -13

**Goroka**, August 14

**Lae**, August 15

**Wau, Mt. Kaindi and Bulolo**, August 16-20

**Port Moresby** (and **Sogeri**, etc.), August 21 27

### Report

The object of the survey was to study the economic and non-economic insects in Papua New Guinea, especially in the Highlands. The party travelled as widely as possible in order to cover as many different habitats and garden types as possible. At Keglsugl and Tambul the upper limits of cul-

tivation were observed and frost damage was seen, especially to sweet potatoes in Tambul.

Work was concentrated on the groups best known to the specialists: Drs. Ismay and Shinonaga, Diptera, especially Chloropidae and Muscidae and other flies of agricultural and medical importance; Drs. Samuelson and Kimoto, Coleoptera, especially Chrysomelidae; Drs. Hirashima and Tadauchi, Hymenoptera, especially bees and ants. Other groups of insects were also collected. Moths and other insects were collected at light in Wau. One disadvantage of the travelling was that it was impossible to rear through early stages of many insects, particularly of Lepidoptera and their natural enemies.

Diptera received special attention with two specialists. Dr. Ismay made extensive collections and observations on Chloropidae and other economic insects. Chloropidae were abundant below 2,000 m. However, Dr. Ismay collected an interesting new *Dicraeus* at Lake Piunde, 3,600 m (Mt. Wilhelm), which is a pest of pasture and may represent a Palaearctic element in the PNG fauna. In this issue of *Esakia*, Dr. Ismay reports 8 new species of *Dicraeus*, which is recorded from PNG for the first time. Tephritidae were found in small numbers but occurred up to high altitudes (3,600 m). Platystomatidae were not common but some of the material collected is expected to represent new species.

At Kuk cardamon and ginger plants were examined for pests. Dr. Ismay observed borings probably due to the pyralid *Dichocrocis punctiferalis*, and also removed fly larvae from partly rotten pseudostems. The latter is a probably undescribed species of *Rhodesiella* (Chloropidae), the third chloropid genus to be reared from cardamon.

Dr. Shinonaga primarily concentrated on Muscidae and other flies of medical importance. He found many interesting species at higher altitudes. Animal dung placed in forest attracted many species. Calliphoridae were generally uncommon due to the dry conditions. Sepsidae were found in low numbers. In this issue of *Esakia*, Drs. Shinonaga and Kano report 11 new species of *Helina* (Muscidae) collected from mountain streams in the forests.

Chrysomelidae received special attention with two specialists. This group of some 4,000 species is very important to Papua New Guinea agriculture. Dr. Samuelson concentrated on Hispinae in continuation of the late Dr. J. L. Gressitt's work but his major interest is Alticinae. Dr. Samuelson is preparing a Pacific Insects monograph on the subject. In this issue of *Esakia*, Dr. Samuelson reports 9 species of plant associated Alticinae from the Mt. Wilhelm area, 8 of which are new species.

Dr. Kimoto concentrated on Cassidinae, particularly on sweet potato. He found many interesting species. The taxonomic position of *Arsipoda tenimberensis*, a common Chrysomelid pest of kaukau (sweet potato), is in need of study as there are further species in Papua New Guinea. In this issue of *Esakia*, Dr.

Kimoto reports, in collaboration with Drs. Ismay and Samuelson, 25 species of leaf-beetles associated with important crops such as cardamon, gingers, legumes, aibika, maize, sugar cane, pumpkin and sweet potato and wild species of *Ipomoea*. In general Chrysomelidae were common and numerous species were found on their cultivated and wild plants.

Dr. Baba collected many interesting species including *Enicocephalus*, a bug probably unknown from Papua New Guinea.

Dr. Tadauchi and I found many interesting species of bees and ants. Species of *Nomia* were proved to be the pollinator of the vermifuge chrysanthemum, *Pyrethrum*, on the hill (2,450 m) between Tambul and Mt. Hagen. We paid special attention to *Palaeorhiza*, an interesting genus of bees centered in New Guinea in its distribution and speciation, and collected many new species. Two new species of *Prosopisteroides*, a subgenus of *Hylaeus* endemic to New Guinea, are described in this issue of *Esakia*. Ants were abundant below 2,300 m. Many species and individuals of arboreal ants were collected on a big tree of *Eucalyptus* just fell down, very fortunately, in front of our party at a village near Sogeri.

In general the survey was successful. It was also useful in that Japanese specialists could be directed to problem areas in the field and the specialist's requirements could be made known to field entomologists of Department of Primary Industry, PNG. It is clear that a great deal of taxonomic work remains to be done. Identified specimens from this survey will be returned to the Central Reference Insect Collection at Konedobu from Japan.

#### Acknowledgement

We are grateful to Dr. J. W. Ismay and Dr. G. A. Samuelson for their participation and kind help. Without their assistance the good results of the survey could not be obtained.

We are also grateful to DPI entomologists, Dr. J. E. van S. Greve, Konedobu, Dr. B. M. Thistleton, Kuk, and Dr. H. Roberts, Bulolo, and Mr. and Mrs. R. Mackay, Baiyer River Birds of Paradise Sanctuary and Mr. M. Gunther, Kuk for their cooperation and hospitality.

Our grateful thanks are also due to the late Dr. J. L. Gressitt, Director, Dr. A. Allison, Associate Director, and Mr. Harry Sakulas, Deputy Director, of Wau Ecology Institute, for their interests in our project and kind co-operation. They offered us excellent facilities at Wau.

The Institute of Papua New Guinea Studies and Mr. Navu Kwapena, First Assistant Director, Wildlife Division, Boroko kindly permitted our survey.

Finally but not least, we thank the Ministry of Education, Science and Culture of Japanese Government for the grant.