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Insect Pests of Rice in Laos

G. J. W. Dean

Entomology Department,

Rothamsted Experimental Station,

Harpenden, Hertfordshire, UK.

Summary. The insect species feeding on rice in Laos were investigated during 1973–75. Populations were usually small but the most common species were *Patanga succincta* (L.), *Leptocorisa* spp. and *Nezara viridula* (L.) on the upland rice; *Oxya* and *Euscyrtus* spp. in the seedbeds and *Chilo polychrysus* (Meyr.), *C. suppressalis* Wlk. and *Sesamia inferens* (Wlk.) in the transplanted paddy rice of the lowlands. The natural enemies of these species were recorded.

Introduction

About 60% of land-locked Laos (236,000 km^2) is under forest, and the 80% which is mountainous in the north and east is occupied by hill tribes practising a migratory slash and burn agriculture based on upland rice. The ethnic Lao, forming two thirds of the *c.*3.2 million people, are concentrated mainly on the remaining 20% of land which is relatively flat, alluvial plain along the Mekong river, where they farm rain-flooded paddy rice at subsistence level. The insect fauna is possibly more similar to that of Thailand than to the countries to the north and east because of the similar regional conditions.

The climate ranges from tropical lowlands to temperate highlands. Over Laos, the Intertropical Convergence Zone (ITCZ) moves northwards in March–April, ahead of the S.W. monsoon and the approaching rainy season, and returns southwards in October–November after the end of the rains in September. However, tropical cyclones in the South China Sea may influence the flow of this monsoon to produce either very dry or very wet weather. This climate, together with little irrigation, restricts Laos to a single crop of mainly local rice varieties each year, while generally acidic (pH <5) and infertile soils limit most other crops to the small areas of better soils along the rivers. Thus, the absence of multiple cropping, the poor availability of alternate hosts, and the dominance of possibly more resistant local plant varieties, probably decrease the likelihood of large insect populations in Laos.

This paper is a report of data collected in 1973–75 during an initial investigation of Lao agricultural problems and the organisation and training of a plant protection team. This work was supported by the Ministry of Overseas Development.

Most of the field work was based on the main local variety of paddy rice, Sanpaton, at the Salakam Rice Variety Testing Station, 16 km south of Vientiane, and on four small areas of farmers' fields nearby. The fields are flooded by the rains during the main cropping season of July to early November, but irrigation at these five sites enabled a much smaller crop to be grown between January and May, and for surveys to be made in most months of the year except June and December 1974. The small seedbeds were sown densely in January and June–July, and about six weeks later the seedlings were transplanted into the paddy fields, three to five seedlings forming each of the hills spaced about 25 cm apart. The experimental fields at Salakam received standard fertilizer and weeding treatments whereas the farmers' fields did not and were often severely infested with weeds. Sevin and BHC were regularly applied to the improved IR varieties used in one study on stem borers without any apparent effect (Dean, 1976) but the local varieties were not sprayed.

In each of the survey areas, three fields of Sanpaton planted on the same date about 1 km apart were chosen. Five 1 m^2 quadrats were spaced across each field and all the tillers were examined for pests and pest damage every

two weeks after transplanting. As few insects were found, the data were combined to give mean numbers per month. Sweep net samples (25 sweeps/field) were also collected every two weeks from the seedbeds and transplanted rice to supplement the quadrat surveys. In addition, 150 tillers each of IR22, Sanpaton and upland rice were collected randomly every two weeks during August–October 1974, and the species of stem borer larvae found in the stems were compared with the adults seen on the plants during the quadrat surveys.

In 1974, a Rothamsted light trap (Williams, 1948) was sited, through necessity, on a cassava farm about 5 km from Salakam, and operated every day from 1800–0600 h. Although it was moved at the end of December to within 20 m of paddy rice at Salakam, local problems limited its use to between 1830 and 2130 h for only two to six nights per week in 1975, and not at all in June–July or after mid-November. Most data were plotted as weekly means of each species caught against week number (Lewis and Taylor, 1968). However, variations in the larger numbers of Cicadellidae, and the effect of decreasing catches due to a full moon, were smoothed by presenting the results as four-weekly running means commencing with the new moon on 22 February 1974.

Results and discussion

Insects collected on rice

Most of the important species found on paddy rice in Laos during 1973–75 (Appendix 1) had been reported before in S.E. Asia (Grist and Lever, 1969; Pathak, 1975). There were some anomalies due to misidentification, for example, *Mythimna unipuncta* (Haw.) (FAO, 1971) probably refers to *M. separata* (Wlk.) (J. D. Bradley, personal communication), and the use of synonyms, but there were a few unexplained discrepancies. For example, the rice skippers reported to be *Parnara guttata* Bremer & Grey in Laos (FAO, 1971) and Hong Kong (Thornton *et al.*, 1975) have been identified recently in both Laos and Thailand as *P. naso* F. Similarly, *Dicladispa similis* Weise was identified in this study, whereas *D. boutani* Weise was recorded earlier in Laos (FAO, 1971) and *D. armigera* (Ol.) has been reported in Thailand (Thailand, 1971), and Laos, Vietnam and Cambodia (Grist and Lever, 1969). Furthermore, important pests in neighbouring countries (Hanson, 1963 a, b; Grist and Lever, 1969; Pathak, 1975; Thailand, 1971) which were rarely or never found on rice in Laos during 1973–75 were the leaf-eating caterpillars of *Nymphula* and *Mythimna* spp. and the stem-sucking bug, *Blissus gibbus* (F.).

The insects collected on upland rice (Appendix 2) were, with minor exceptions, the same as those from paddy rice but their relative abundance often varied. *Patanga succincta* (L.) was occasionally very common on upland rice surrounded by bush, especially when maize was grown nearby, but was scarce on paddy rice where there were more of the smaller grasshoppers (*Oxya* and *Euscyrtus* spp.). Similarly the rice bug (*Leptocorisa* spp.) and green vegetable bug (*Nezara viridula* (L.)) were usually more frequent on the rice in the uplands than in the lowlands.

Plant-boring insects

The rice gallmidge (*Pachydiplosis oryzae* (Wood-Mason)) and the rice hispa (*Dicladispa similis*), often serious pests in Thailand, Vietnam and Cambodia (Grist and Lever, 1969; Thailand, 1971), and the whorl maggot (*Hydrellia philippina* Ferino) were only occasionally found in the quadrat surveys in Laos in 1973–75. There were, however, more lepidopterous stem borers.

Adult stem borers were recorded on the plants mainly from August 1973 to May 1974 after their egg masses became commonest (Fig. 1). In contrast, tillers infested and damaged by their larvae (dead hearts and white heads) occurred in most months from October 1973 to September 1974 and in January–March 1975, but crop losses were almost certainly small.

Adults of *Tryporyza incertulas* (Wlk.) and *Chilo polychrysus* (Meyr.) were seen on rice more often than *Chilo suppressalis* Wlk., and *Sesamia inferens* (Wlk.) (Table 1). During the same period, there were more larvae of *C. polychrysus* and *C. suppressalis* in the stems of the improved variety IR22 whereas more *C. polychrysus* and *S. inferens* were found in Sanpaton. As in Vietnam (Grist and Lever, 1969), *S. inferens* was the most important species attacking upland rice. According to Thailand, Ministry of Agriculture (1971), the larvae of *C. polychrysus* attack the younger plants most frequently while *S. inferens* damage the older plants.

The most commonly reported pest in S.E. Asia is *T. incertulas* (Grist and Lever, 1969; Hanson, 1963 a, b; Thornton *et al.*, 1975), but unlike other species of stem borer it does not have any authenticated alternate hosts and remains within the rice crop during the day. Thus, it is probably more readily seen than other possibly more abundant species hiding in the grasses around the small paddy fields. This hypothesis, however, was not wholly supported by the results obtained from the light trap, but each species may have a different reaction to light. A few stem

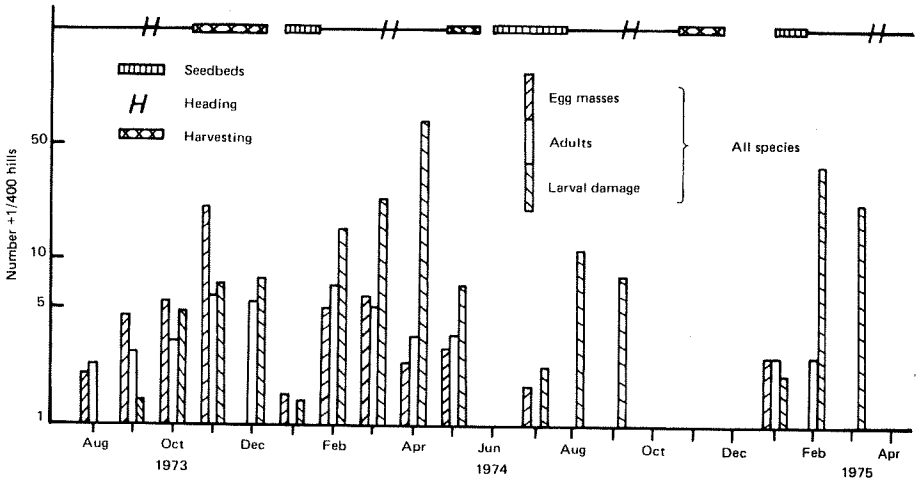

Fig. 1. Mean monthly abundance of stem borers and their damage to tillers in quadrat surveys during 1973–75.

TABLE 1. RELATIVE NUMBERS OF EACH STEM BORER SPECIES IN AUGUST–OCTOBER 1974

	Tryporyza incertulas	*Sesamia inferens*	*Chilo polychrysus*	*Chilo suppressalis*
Larvae in the stems				
Paddy rice – IR22	12	16	130	119
– Sanpaton	10	65	87	13
Upland rice	6	59	2	0
Adults on the tillers	125	10	82	17

borers were caught during 1974, mostly during the monsoon from mid-April to mid-October, but the larger numbers appearing in 1975, after the trap was moved, showed that the proportions of each species were not quite the same as those found during the field surveys (Fig. 2). Although *T. incertulas* was again the commonest species throughout the year together with *C. suppressalis*, very few *C. polychrysus* and *S. inferens* were trapped and only then from late January to the end of March. The results showed, however, that as in Thailand where there can be eight to ten generations each year (Thailand, 1971) stem borers are active in Laos throughout the year, whereas further north in Asia they overwinter in stubble.

Plant-sucking insects

Although several species of Cicadellidae and Delphacidae can be serious pests of rice in S.E. Asia (Grist and Lever, 1969) few were found during the quadrat surveys in Laos. The brown planthopper (*Nilaparvata lugens* (Stål.)) and green leafhopper (mainly *Nephotettix nigropictus* (Stål) and *N. virescens* (Dist.)) appeared only during the monsoon, August to November 1973 and May to September 1974 (Fig. 3). However, these species were found in almost every sweep net catch made throughout the year, and significantly more of them infested improved IR varieties which were fertilized than neighbouring local varieties which were not (Dean, 1976). The zigzag leafhopper (*Recilia dorsalis* (Motsch.)) and the white rice leafhopper (*Cicadella spectra* (Dist.)) were seen only in the sweep net catches made in the seedbeds.

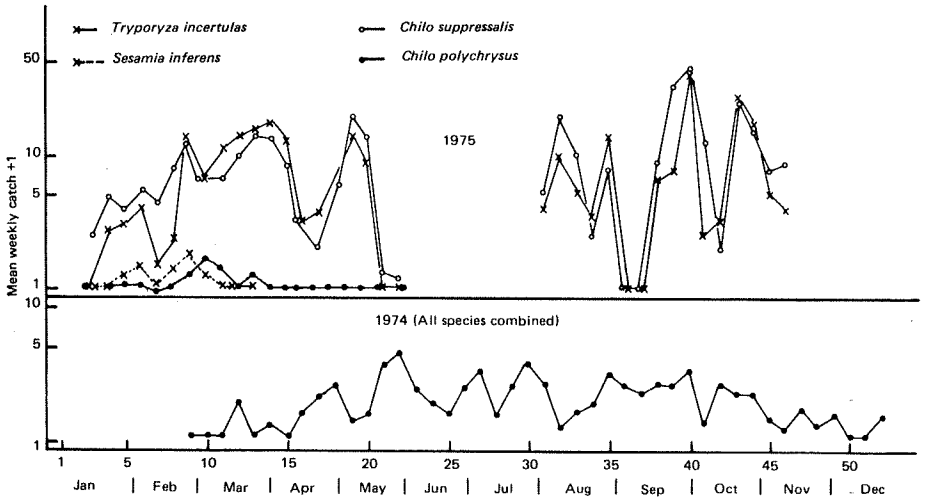

Fig. 2. Mean weekly numbers of stem borers caught in a Rothamsted light trap during 1974–75.

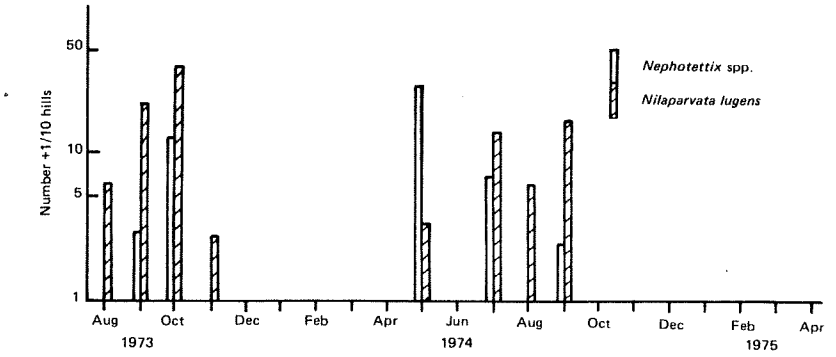

Fig. 3. Mean monthly abundance of *Nephotettix* spp. and *Nilaparvata lugens* in quadrat surveys during 1973–75.

Only small numbers of *Nephotettix* spp., *C. spectra* and *R. dorsalis* were caught by the light trap in Laos during the winter months (December–March), but they were common during the warmer months of April–May, July and September–October, 1974–75 (Fig. 4). Although relatively few *N. lugens* were trapped in either Laos or Thailand (Thailand, 1971), possibly because it is crepuscular at take-off (Okubo and Kisimoto, 1971), its migrants were often caught, with those of *Sogatella furcifera* (Horv.), in Japan probably after migrating eastwards with depressions from central China (Kisimoto, 1976). Bowden (1973) and Bowden and Gibbs (1973) have pointed out the possible importance of the ITCZ in the migration of insects, and in particular the grass-feeding Homoptera. In

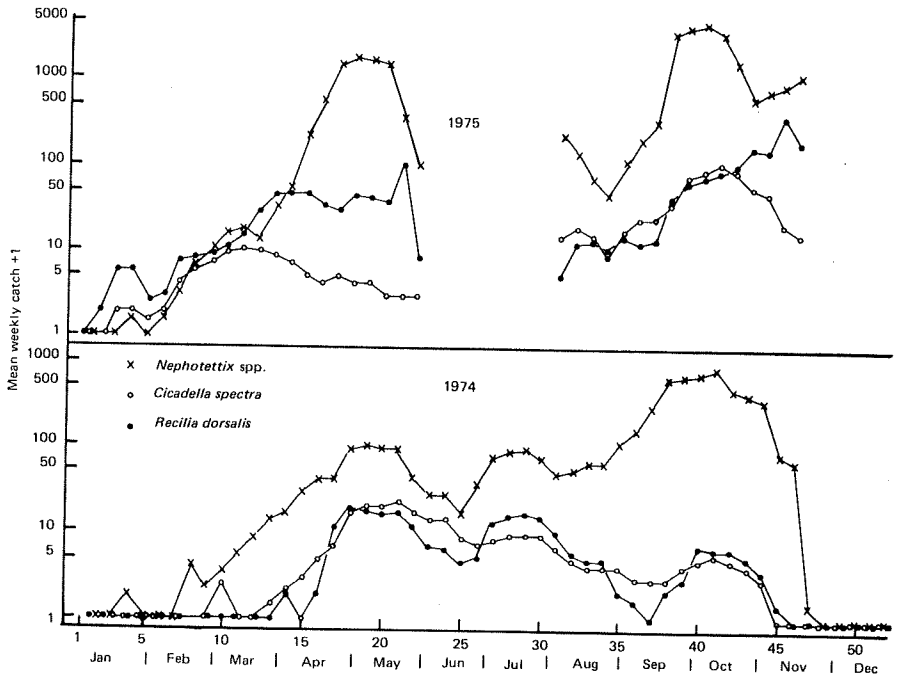

Fig. 4. Mean weekly numbers of *Cicadella spectra, Recilia dorsalis* and *Nephotettix* spp. caught in a Rothamsted light trap during 1974–75.

Laos, therefore, the first peak of leafhopper abundance (April–May) in the light trap could have been due to the arrival of migrants with the ITCZ from the south where the first rains and new plant growth had already begun. Similarly, the peak in September–October followed by the virtual disappearance of these species over the next few weeks could have been due to migrants produced locally, or in areas to the north, moving southwards with the retreating ITCZ at the end of the monsoon.

The cosmopolitan *N. viridula* was also rarely seen in the quadrat surveys of lowland rice, and only from October 1973 to May 1974 and in October–November 1974 on the older growth stages (Fig. 5), while few were caught in the light trap. However, it is a common pest in Vietnam (Hanson, 1963 a, b) and on upland rice in Laos during the monsoon, and has several generations a year on many other plants (Dean, 1976). According to Bowden (1973), *N. viridula* in Ghana migrates in relation to the movements of the ITCZ, but the data in Laos were insufficient to show whether a comparable situation exists there.

Leptocorisa spp. cause significant damage in some areas of Thailand every year (Thailand, 1971), but the few found during the quadrat surveys of paddy rice in Laos occurred mainly after heading in September–November and March–April (Fig. 5). In 1974–75, however, they were often abundant on upland rice from growth stage 5 onwards. Only small numbers of *Leptocorisa* spp. were caught in the light trap in 1974, but more appeared in 1975, especially between March and May (Fig. 6). The trap data for 1975 were consistent with the hypothesis of Bowden (1973) whereby *Leptocorisa* spp. may migrate from the south on the ITCZ before the developing S.W. monsoon.

Other plant-sucking insects usually seen only in very small numbers during the quadrat surveys were the stink bug (*Tetroda denticulifera* Berg.), until October 1974, and the black rice bug (*Scotinophara coarctata* (F.)), which is an important pest in both Vietnam (Hanson, 1963) and Thailand (Thailand, 1965, 1971). During overcast, humid conditions in August–September, 1974, *S. coarctata* completely destroyed the rice in fields scattered across the Vientiane plain.

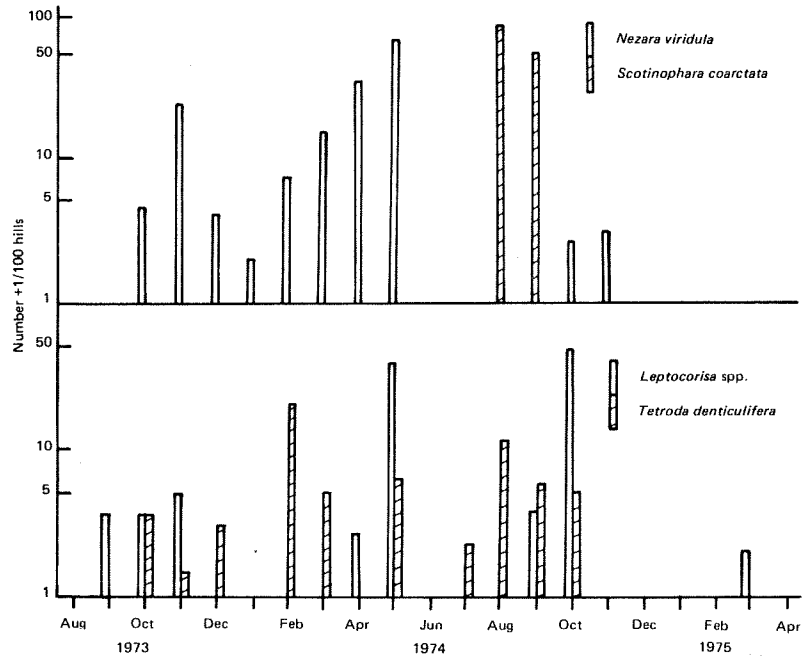

Fig. 5. Mean monthly abundance of *Leptocorisa* spp., *Nezara viridula, Scotinophara coarctata* and *Tetroda denticulifera* in quadrat surveys during 1973–75.

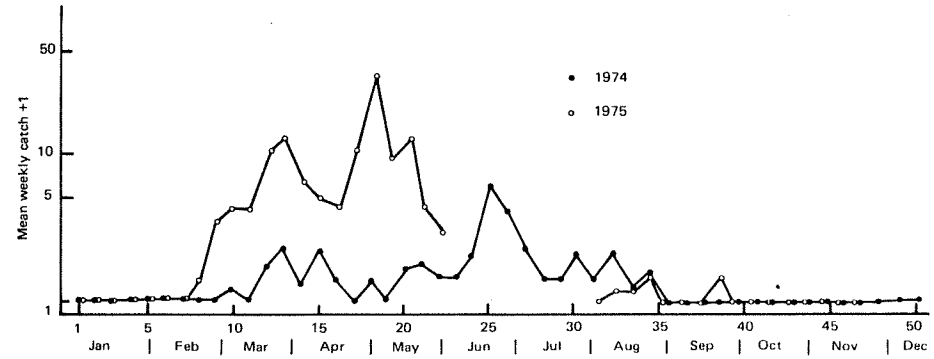

Fig. 6. Mean weekly numbers of *Leptocorisa* spp. caught in a Rothamsted light trap during 1974–75.

Leaf-eating insects

The most common leaf-eating insects were the Orthoptera, but except for small outbreaks of *Patanga succincta* in upland rice and *Hieroglyphus banian* (F.) in paddy rice growing near to bamboo thickets they probably caused relatively little crop loss during 1973–75. In the lowlands, the smaller grasshoppers (mainly *Oxya* and *Euscyrtus* spp.), which bred during January–February and again in July–August, were often very common in sweep net catches made from seedbeds (Dean, 1976), where they frayed most of the leaf tips, but dispersed over much larger areas of the paddy fields after transplanting.

Few leaf-eating caterpillars were found in the quadrats, but more were caught by sweep nets from the seedbeds than from the transplanted rice (Dean, 1976). The most common species were only minor pests; *Melanitis leda* L. which occasionally destroyed numbers of hills in some paddy fields, and two leaf rollers (*Brachmia arotraea* Meyr. and *Parnara naso* F.) in both upland and paddy rice. The *Nymphula, Mythimna* and *Spodoptera* spp. which are important pests in Vietnam (Hanson, 1963 a, b) and Thailand (1965, 1971) were rarely or never found.

Natural enemies

The potential insect predators were identified mainly from sweep net catches, the most common groups being Arinidae, Libellulidae, Coenagrionidae and Cocinellidae. Except for the Coccinellidae (Hanson, 1963 a, b), *Cyrtorhinus lividipennis* Reut., *Nabis* sp. and the spiders (Thailand, 1971) known to attack leaf- and planthoppers, the prey of the predators in Laos listed in Table 2 is uncertain.

The relative importance of the parasites (Table 3) reared from rice pests kept in the laboratory is also unknown for Laos, but they are reviewed by Grist and Lever (1969). According to Thailand, Ministry of Agriculture (1971), *Telenomus* and *Trichogramma* spp. were two of several species commonly attacking the eggs of stem borers and armyworms, and it was suggested that these pests occur only sporadically in Thailand because parasitism is highly effective in most years. Similarly, 33–93% of gallmidge larvae in Thailand were attacked by *Platygaster* sp. and other parasites which may explain why so few gallmidges were found in Laos.

TABLE 2. POTENTIAL INSECT PREDATORS OF PADDY RICE PESTS IN LAOS

Order	Family	Species	Order	Family	Species
ODONATA	Coenagrionidae	*Ceriagrion cerinorubellum* (Brauer)	HEMIPTERA	Miridae	*Cyrtorhinus lividipennis* Reut.
		5 other unidentified species		Nabidae	*Nabis capsiformis* (Germ.)
	Libellulidae	*Acisoma panorpoides* Ramb.			*Stenonabis* sp.
		Crocothemis servilla (Dru.)		Reduviidae	*Coranus* sp.
		Diplacodes trivialis (Ramb.)			*Coranus spiriscutus* Reut.
		Neurothemis sp. probably *tullia feralis* (Burm.)			*Polididus armatissimus* Stål
		Orthetrum sadina (Dru.)			*Rhinocoris fuscipes* (F.)
		Phyothemis sp. probably *variegata* (L.)			*Sycanus falleni* Stål
		Trithemis aurona Burm.	DIPTERA	Asilidae	*Philodicus* sp.
		4 other unidentified species	COLEOPTERA	Coccinellidae	*Brumoides suturalis* (F.)
					Coccinella axiridis Pall.
					Verania discolor (F.)
					Verania univittata (Hope)

TABLE 3. PARASITES OF EGGS OR LARVAE OF RICE PESTS COLLECTED BY REARING PARASITISED PESTS IN LAOS

Order	Family	Species	Host
DIPTERA	Tachinidae	*Halydaia luteicornis* Wlk.	Unknown
		Isomera sp.	Pupae of *Mythimna separata*
HYMENOPTERA	Braconidae	*Apanteles* sp. (*ultor* gp.)	Larvae of *Parnara naso*
		Xenosternum sp.	Larvae of *Mycalesis perseus?*
	Chalcididae	*Brachymeria* sp. probably *wittei* (Schmitz)	Pupae of *Charops bicolor*
	Eurytomidae	*Eurytoma* sp. nr. *nesiotes* Crwf.	Unknown
		Eurytoma sp.	Pupae of *Mythimna separata*
	Ichneumonidae	*Charops bicolor* (Szépl.)	Larvae of a stem borer
	Platygasteridae	*Platygaster* sp.	Pupae of *Pachydiplosis oryzae*
	Pteromalidae	*Eupteromalus* sp. nr. *parnarae* Gah.	Pupae of *Mythimna separata*
	Scelionidae	*Gryon* sp.	Eggs of *Nezara viridula*
		Telenomus sp.	Eggs of *Tryporyza incertulas*
	Tricho-grammatidae	*Trichogramma japonicum* Ashm.	Eggs of *Chilo suppressalis*

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APPENDIX 1. INSECTS FOUND ON PADDY RICE IN LAOS DURING 1973–75 (1) COMPARED WITH THOSE FOUND DURING AN EARLIER FAO SURVEY IN LAOS (2) (FAO, 1971) AND IN THAILAND (3) (THAILAND, 1965, 1971). AN ASTERISK INDICATES INSECTS OF POSSIBLE ECONOMIC IMPORTANCE

THYSANOPTERA	Thripidae	*Baliothrips biformis* (Bagn.) 3*
ORTHOPTERA	Acrididae	*Acrida* sp. 1, 3
		Aiolopus sp? *tamulus* (F.) 1, 3
		Aularches miliaris L. 1, 3
		Eyprepocnemis alacris (Serv.) 1, 3
		Ceracris hoffmanni Uv. 1, 3
		Ceracris sp. 1, 3
		Gastrimargus marmoratus (Thnb.) 1, 3
		Gastrimargus orientalis Sjöst. 1, 3
		Gesonula mundata laosana Rehn. 1, 3
		Hieroglyphus banian (F.) 1*, 3*
		Locusta migratoria (L.) 1, 3
		Oxya chinensis (Thnb.) 1, 3
		Oxya japonica japonica (Thnb.) 1
		Oxya hyla intricata (Stål) 1
		Patanga succincta (L.) 1, 3*
		Phlaeoba sp. 1, 3
		Quilta oryzae Uv. 1, 3
		Spathosternum prasiniferum Wlk. 1, 3
		Trilophidia annulata (Thnb.) 1, 3
	Pyrgomorphidae	*Atractomorpha crenulata crenulata* (F.) 1, 3
		Atractomorpha psittacina (De Hahn) 1, 3
		Atractomorpha? burri Bol. 1, 3
	Tettigoniidae	*Conocephalus* sp. nr. *maculatus* (Guill.) 1
		Ducetia curciata Brunn. 1
		Onomarchus uninotatus (Serv.) 1
		Euconocephalus nasutus Thnb. 1
		Xiphidion sp. 1
	Tetrigidae	*Criotettix cervina* (Wlk.) 1
	Tridactylidae	*Tridactylus variegatus* (Latr.) 1
	Gryllidae	*Euscyrtus* sp. 1
		Gryllus bimaculatus Deg. 1
	Gryllotalpidae	*Gryllotalpa africana* (P. de B.) 1
HEMIPTERA	Aphididae	*Hysteroneura setariae* (Thos.) 1
		Rhopalosiphum padi (L.) 1
		Rhopalosiphum rufiabdominalis (Sasaki) 1, 3
	Coreidae	*Clavigralla gibobosa* Spin. 1
		Leptocorisa oratoria (F.) 1, 3*
		Riptortus linearis (F.) 1
	Cixiidae	*Oliarus cocosivora* Muir 1
	Cicadellidae	*Balclutha* sp. 1, 3
		Batrachomorphus sp. 1
		Cicadella sp. 1
		Cicadella hopinensis (Dist.) 1
		Cicadella spectra (Dist.) 1, 3
		Cicadulina sp. 1, 3
		Doratulina sp.? *rotundus* (Pruthi) 1
		Empoascanara sp. 1
		Goniagnathus sp. 1
		Kolla sp. 1, 3
		Macrosteles sp. 1, 3
		Nephotettix nigropictus (Stål) 1*, 3
		Nephotettix virescens (Dist.) 1*, 3
		Nephotettix malayanus Ish. & Kawase 1, 3
		Nephotettix parvus Ish & Kawase 1, 3
		Parabolocratus concentralis Mats. 1, 3
		Parabolocratus porrestus (Wlk.) 3
		Petalocephala sp. 1, 3
		Recilia dorsalis (Motsch.) 1, 3
		Thaia oryzivora Ghauri 1
		Thaia sp. 1, 3
	Delphacidae	*Carbulo dodona* Fennah 1
		Cemus sp. 1
		Harmalia sp. 1
		Laodelphax striatella (Fall.) 1
		Nilaparvata bakeri (Muir) 1
		Nilaparvata lugens (Stål) 1*, 3*
		Poophilus costalis Wlk. 1
		Sardia rostrata Melich. 1, 3
		Sogatella furcifera (Horv.) 1, 3
		Sogatella pusana (Dist.) 1, 3
		Sogatella shirogata? 1
	Lygaeidae	*Blissus gibbus* F. 3*
		Pamera pallicornis Dall. 1
	Pentatomidae	*Andrallus spinidens* (F.) 1
		Medina formosa Westw. 1, 2
		Nezara viridula (L.) 1, 3
		Piezodorus hybneri (Gmel.) 1
		Scotinophara coarctata (F.) 1*, 3*
		Scotinophara ochracea Dist. 1
		Tetroda denticulifera Berg. 1
	Meenoplidae	*Nisia atrovenosa* Leth. 1, 3

APPENDIX 1—continued

LEPIDOPTERA	Noctuidae	*Mocis frugalis* (F.) 1
		Mythimna irregularis Wlk. 3
		Mythimna loreyi (Dup.) 3
		Mythimna separata (Wlk.) 2, 3*
		Mythimna venalba Moore 1
		Naranga diffusa Wlk. 1
		Sesamia inferens (Wlk.) 1*, 2, 3
		Spodoptera litura (F.) 1, 2
		Spodoptera mauritia (Boisd.) 1, 3*
	Pyralidae	*Ancylolomia chrysographella* Koll. & Redt 3
		Chilo polychrysus (Meyr.) 1*, 2, 3
		Chilo suppressalis Wlk. 1*, 2, 3
		Chilo auricilius Dudg. 3
		Cnaphalocrocis medinalis (Gn.) 1, 2, 3
		Nymphula depunctalis (Gn.) 1, 3*
		Tryporyza incertulas (Wlk.) 1, 2, 3
		Tryporyza innotata (Wlk.) 3
	Nymphalidae	*Melanitis leda* L. 1, 2, 3
		Mycalesis gotama fulginia Fruhst. 2
		Mycalesis perseus F. 1
		Orsotriaena medus medus F. 1
		Junonia almana (L.) 2
	Gelechiidae	*Sitotroga cerealella* Ol. 1*, 2, 3
		Brachmia arotraea Meyr. 1
	Hesperiidae	*Ampittia dioscorides* F. 1, 3
		Baoris pagara de Niceville 3
		Parnara guttata Bremer & Grey 2
		Parnara naso F. 1, 3
		Pelopidas mathias F. 3
		Pelopidas mathias oberthuri Ebans 3
	Lymantriidae	*Dasychira securis* Humb. 3
		Nygmia virgo Sm. 3
	Notodontidae	*Dinara combusta* Wlk. 3
	Scheonobiidae	*Scirpophaga chrysorrhoea* Zell. 3
		Scirphophaga intacta Sn. 3
		Scirphophaga sp. 3
COLEOPTERA	Bostrychidae	*Rhizopertha dominica* Steph. 1, 3
	Chrysomelidae	*Dicladispa armigera* (Ol.) 3*
		Dicladispa boutani Weise 2
		Dicladispa similis Weise 1
	Curculionidae	*Calandra oryzae* (L.) 1, 3
		Athesapeuta cyperi Motsch. 1
		Athesapeuta oryzae Motsch. 1
		Athesapeuta vinculata Fürst. 1
		Bagous sp. 1
		Cnaphoscapus decoratus Fürst. 1
		Manophyes nigritulus Boh. 1
		Nanophyes sp. 1
		Tanymecus sp. 1
	Tenebrionidae	*Tribolium* sp. (possibly *castaneum* Hbst.)) 1, 3
		Laemophloeus minutus (Schön.) 3
DIPTERA	Cecidomyiidae	*Pachydiplosis oryzae* (Wood-Mason) 1, 3*
	Ephydridae	*Hydrellia philippina* Ferino 1, 3
		Hydrellia sp. 3

APPENDIX 2. PESTS OF UPLAND RICE IN LAOS. AN ASTERISK INDICATES THOSE OF POSSIBLE ECONOMIC IMPORTANCE

ORTHOPTERA	Acrididae	*Chondracris rosea brunneri* Uv.
		Heteropternis respondens (Wlk.)
		Hieroglyphus banian (F.)
		Locusta migratoria (L.)
		Oxya spp.
		**Patanga succincta* (L.)
		Stenocatantops splenders (Thnb.)
		Xenocatantops humilis humilis Serv.
	Pyrgomorphidae	*Atractomopha burri* Bol.
		Gonista bicolor de Hahn
HEMIPTERA	Alydidae	**Leptocorisa acuta* (Thnb.)
		**Leptocorisa oratoria* (F.)
	Cercopidae	*Abidama producta* Wlk.
	Cicadellidae	*Nephotettix* spp.
	Coreidae	*Riptortus linearis* F.
	Delphacidae	*Nilaparvata lugens* (Stål)
	Pentatomidae	*Nezara viridula* (L.)
		Medina sp.
COLEOPTERA	Chrysomelidae	*Aulacophora* sp. nr. *similis* Ol.
		Monolepta cavipenne Baly
		Monolepta signata Ol.
LEPIDOPTERA	Noctuidae	**Sesamia inferens* (Wlk.)
	Gelechiidae	*Brachmia arotraea* Meyr.
	Hesperiidae	*Parnara naso* F.
DIPTERA	Cecidomyiidae	**Pachydiplosis oryzae* (Wood-Mason)