



Kontyû, Tokyo, 52 (4): 482-486. December 25, 1984

Notes on the Thrips (Thysanoptera) Occurring on the Soybean in Java

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Abstract Eight species of thrips are listed as inhabitants of the soybean plant in Java. Dominant species were *Scirtothrips dorsalis* HOOD, *Ayyaria chaetophora* KARNY and *Megalurothrips usitatus* (BAGNALL). *A. chaetophora*, *Bathrips melanicornis* (SHUMSHER SINGH) and *Frankliniella schultzei* (TRYBOM) are recorded from Java for the first time.

Little attention has usually been paid to thrips occurring on the soybean plant (*Glycine max*). This is mainly because they are usually of minor importance as pests in soybean cultivation. It is known, however, that thrips may constitute a substantial part of insect fauna associated with soybean fields (BLICKENSTAFF *et al.*, 1962; OKU *et al.*, 1970; PACEO, 1976; TAHARA *et al.*, 1951). According to BLICKENSTAFF *et al.* (1962), for instance, the soybean thrips, *Sericothrips variabilis*, was the most numerous among the insects found in soybean fields in Missouri, and of 10 most abundant species 3 belonged to Thysanoptera. As clearly pointed out by IRWIN *et al.* (1980), it is desirable to incorporate information on thrips in the soybean pest management programme, since they may act as pests under certain circumstances (WEDBERG *et al.*, 1976), as vectors of virus diseases to a limited degree (BERGESON *et al.*, 1964; MESSIEHA, 1969), as predators against other organisms (LINCOLN *et al.*, 1953), and as reservoir of other predators such as anthocorids (IRWIN *et al.*, 1979).

During March to May, 1982, we had an opportunity to collect soybean thrips in Java. In the following lines will be given a list of thrips species which are considered to feed on soybean plants. Several other species which are represented in the present collection by only a few individuals are excluded from the list. Information on their relative abundance in the soybean fields will also be given.

List of Species Collected

During the present survey, the following 5 species have been collected from soybean plants. The dates of collecting are given in Table 1.

1. *Scirtothrips dorsalis* HOOD

Localities of collection. Central Java: Wonosari. East Java: Ponorogo,

Jombang, Nganjuk, Madiun and Gresik.

Host association. Polyphagous, known as a pest of various cultivated plants such as tea (*Thea* spp.), citrus (*Citrus* spp.), strawberries (*Fragaria ananassa*), red and sweet peppers (*Capsicum annuum*), etc. During the present survey, the thrips was seen commonly on soybean, and to a lesser degree on other leguminous crops such as groundnut (*Atrachya hypogaea*), mungbean (*Phaseolus radiatus*) and kidney bean (*Phaseolus vulgaris*).

Geographical distribution. This species has hitherto been recorded from Sumatra, Java, New Guinea, Solomon Isl., Queensland, Malaysia, Thailand, Pakistan, India, Sri Lanka, Sulawesi, Taiwan, and Japan.

2. *Ayyaria chaetophora* KARNY

Localities of collection. Central Java: Wonosari and Purworejo. East Java: Ponorogo, Peterongan, Jombang, Nganjuk and Madiun.

Host association. This species is common on soybean, and has been seen on groundnut as well. In the literature the species is recorded from Euphorbiaceae (*Acalypha*, *Croton* and *Ricinus*) and Malvaceae (*Gossypium*), in addition to Leguminosae.

Geographical distribution. This species has hitherto been known from India, the Philippines, Taiwan, Japan and Tahiti. This is the first record of the species from Java.

3. *Bathrips melanicornis* (SHUMSHER SINGH)

Localities of collection. East Java: Jombang.

Host association. In the literature this species is recorded from *Morus*, *Jasminum*, *Ipomoea* and *Phaseolus*. The present specimens were collected from soybean (in Jombang) and groundnut (in Bogor).

Geographical distribution. This is the first record of the species from Java. The species is also distributed in Burma, India and Taiwan.

4. *Frankliniella schultzei* (TRYBOM)

Localities of collection. Central Java: Purworejo. East Java: Ponorogo and Kediri.

Host association. Polyphagous. On soybean only a small number of individuals were seen during the present survey.

Geographical distribution. Widely distributed throughout the tropical and subtropical areas. So far as the authors are aware, however, this is the first definite record of the species from Java.

5. *Megathrips usitatus* (BAGNALL)

Localities of collection. Central Java: Wonosari and Purworejo. East Java: Bojonegoro, Ponorogo, Mojokerto, Peterongan, Jombang, Nganjuk, Madiun, and Gresik.

Host association. Polyphagous, but feeds preferably on leguminous plants. This is one of the thrips species which were most commonly found on soybean, and it was also collected from mungbean and groundnut.

Geographical distribution. Widely distributed from Japan (Ryukyus) through Southeast Asia to Australia.

6. *Thrips orientalis* (BAGNALL)

Localities of collection. West Java: Bogor, and Pacet near Puncak. East Java: Mojokerto.

Host association. Some specimens were collected from soybean, and also from mungbean, kidney bean and groundnut. Damages caused on red pepper by this species, coupled with *Scirrotlirips dorsalis*, were often observed in Central and East Java. In the literature *Oleacea* and *Jasminum* of Oleaceae and *Morinda* and *Gardenia* of Rubiaceae are also recorded as hosts.

Geographical distribution. Java, Malaysia, Thailand, India, China, Hawaii, Lesser Antilles, and Tanzania.

7. *Thrips palmi* KARNY

Localities of collection. West Java: Pacet. East Java: Bojonegoro and Ponorogo.

Host association. Polyphagous. Recently in Japan, this species has attained to an important pest status on such vegetables and fruits as eggplants (*Solanum melongena*), sweet peppers, cucumber (*Cucumis sativus*), melon (*Cucumis melo*), etc. They may also spoil the marketability of some ornamental plants. In Java no such heavy damages were observed during the period of the survey, excepting an instance in Pacet (W. Java), where farmers had experienced rather heavy damages on eggplants. On soybean the thrips was found in some localities, but in small numbers in most cases.

Geographical distribution. This species has been recorded from Java, Sumatra, Malaysia, Thailand, Bangladesh, India, Pakistan, the Philippines, Taiwan, China (Hongkong), and Sudan. It was established in Japan in 1978, and is now spreading in the southern parts of the country. It was also recorded from the Canary Islands in 1981.

8. *Haplothrips guwdeyi* (FRANKLIN)

Localities of collection. Central Java: Purworejo.

Host association. Polyphagous. During the present survey this species was collected from soybean, and also from groundnut and kidney bean.

Geographical distribution. This species is widely distributed throughout the tropical regions.

Relative Abundance of the Species

We were able to identify at least 8 phytophagous thrips species from soybean plants in Java as listed above. They are shown in Table 1 with information of their relative abundance in each sampling site. Sampling in each site was made by beating 10 batches of soybean plants (a batch consists of several individual plants of soybean) with a net of white cloth of 35×35 cm under the plants. Abundance of each thrips species was classified arbitrarily into 3 categories, *i.e.* 'many' where 100 or more individuals were observed, 'few' where 20 or less individuals were observed, and 'moderate' where the number is intermediate between the other 2 categories.

Thrips were found in all the fields surveyed, although their occurrence was not impressive in some of the fields (*e.g.*, in Pacet, Ponorogo B, Kediri, and Peterongan). About 50 per cent of the surveyed fields were estimated to harbour considerable amount of thrips (*e.g.*, Ponorogo A and C, and Nganjuk B). The predominating species were *S. dorsalis*, *A. chaetophora* and *M. usitatus*. These 3 species have been encountered in many (about 60 per cent or more) of the surveyed fields, and often in large quantities. The other species were encountered much less frequently and in small numbers in most cases.

IRWIN *et al.* (1979) who made surveys on thrips in soybean fields in Illinois gave 10 thrips species, of which 2 or 3 (*Sericothrips variabilis*, *Frankliniella tritici* and/or *F. fusca*) were very abundant. Just like the result given by them, the present survey

Table 1. Thysanopteran species found on soybean plants in Java and their relative abundance.

Thrips species	W. Java		C. Java		E. Java												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Thripidae																	
<i>Sciriorhrips dorsalis</i>	●		○				△	●			△	△	●	○	●	△	
<i>Ayyaria chaetophora</i>			△	○		●	●			△	●	○	○	○	○		
<i>Bathrips melanicornis</i>												—					
<i>Frankliniella schultzei</i>				△		△			△								
<i>Megalurothrips usitatus</i>			△	●	○	●		○		○	△	○	●	●	●	○	○
<i>Thrips orientalis</i>	△	△		△						△							
<i>Thrips palmi</i>		△			○		△	△									
Phlaeothripidae																	
<i>Haplothrips gowdevi</i>				△													

Localities. WEST JAVA: 1, Bogor; 2, Pacet. CENTRAL JAVA: 3, Wonosari; 4, Purworejo. EAST JAVA: 5, Bojonegoro; 6, Ponorogo A; 7, Ponorogo B; 8, Ponorogo C; 9, Kediri; 10, Mojokerto; 11, Peterongan; 12, Jombang; 13, Nganjuk A; 14, Nganjuk B; 15, Madiun A; 16, Madiun B; 17, Gresik.

Date of collection (in 1982). 1: 25-iii. 2: 24-iii. 3: 17-v. 4: 23-v. 5: 20-v. 6-9: 21-v. 10-16: 22-v. 17: 26-V.

Evaluation of relative abundance of thrips species. By beating 10 batches of soybean plants, there have been observed 100 or more (●), 20-100 (○), or 20 or less (△) individuals.

in Java also indicates that thrips are often abundant in soybean fields and that the essential part of the thysanopteran complex belongs to a limited number of species, although the species composition may be diverse.

Acknowledgements The senior author would like to express his cordial thanks to Dr. D. M. TAKTERA of the Bogor Research Institute for Food Crops, Bogor, for laboratory facilities at BORIF, and to Dr. A. NAITO of the Agricultural Research Center, Yatabe, for his kind help in various ways in promoting the present survey.

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