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## **Bamboo Shoot Fruit Flies (*Gastrozona fasciventris* and *G.soror*) (Diptera:Tephritidae:Dacinae) in Thailand**

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Two species Bamboo-shoot fruit flies (*Gastrozona fasciventris* and *G. soror*), have been reared from the shoots of the Siamese bamboo, *Thyrsostachys siamensis* Gamble (Poaceae). Morphological studies showed that *G.fasciventris* (Macquart) was similar to *G. soror* in possessing a plumose arista on the 3<sup>rd</sup> segment of antenna, with 3 pairs of inferior and 2 pairs of superior fronto-orbital bristle recognized on the frons. A pair of dorsocentral setae presented in line with the anterior supra-alars on mesonotum . An apical spur of middle tibia was strong and stout. The basal segment (oviscape) of ovipositor is black. Apex of the piercer (aculeus) had 2 pairs of subapical keels and 2 large and 2 small pairs of subapical setae. *G. fasciventris* differs from *G. soror* by lacking the subbasal crossband and V band on the wing, having a small hyaline spot at the apex of vein R2+3, leg with black markings on the apices of middle and hind femora.

**Keywords:** bamboo-shoot fruit flies, *Gastrozona fasciventris*, *G. soror*, Tephritidae

### **Introduction**

*Gastrozona fasciventris* and *G. soror* are in the order of Diptera, family Tephritidae and subfamily Dacinae. They are important pest of bamboo belonged to family Bambusaceae. Many bamboo varieties both wild and domesticated types are grown commercially in Thailand. They are found fruit fly larvae eat and live inside bamboo shoots. When it became fully grown, larvae will pupate in the soil. After pupation period, it will turn into an adult. Adults were attract to the smell of bamboo shoots. They like the smell of bamboo shoots. The population of the fly will be a large number of bamboo shoots in the rainy season coinciding with the timing of bamboo shoot blooming.

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Surakrai found that there were 7 species of bamboo-shoot fruit flies from the southern part of Thailand in 1995 and later he reported 9 species more on: *Acanthonevra vaga* , *Acroceratitis plumose* , *Acrotaeniostola quinaria*, *Enicoptera gigantea* , *Euphranta striatella* , *Felderimyia fuscipennis* , *Gastrozona fasciventris* , *Ptilona confinis* and *Taeniostola vittigera*. *G. fasciventris* is widely distributed in China, India , Laos, Taiwan, Bangladesh, Burma, Vietnam, Malaysia and Indonesia and in several parts of Thailand at Saraburi (Phu khae), Chaingmai(Chaingdow, Doi Suthep, Doi Pui Phang), Nan, Nakhonsrithammarat, Ratchburi and Kanjanaburi Province, Pathalong(Nawong) and Yala(Thantai)(Hardy,1973; Surakrai, 2005) Host plants of *G. fasciventris* are *Bambusa vulgaris*, *Dendrocalamus asper*, *D. giganteus*, *Bambusa vulgaris*, *Dendrocalamus asper*, *D. giganteus*, *D. latiflorus* , *Gigantochloa auriculata* and *Thyrostachys siamensis* (Surakrai, 2005)

Current studies showed that there is not much information on bamboo-shoot fruit flies especially the aspects of external morphology and biology. The bamboo shoot fruit flies would be one of an important factor that effect the bamboo shoot production in the future. The knowledge gained from this work would basic information that can be utilized in fruit fly control.

Objectives: comparision morphological characteristics between *Gastrozona facsciventris* and *G. soror*

## **Materials and methods**

Bamboo shoots infested with fruit flies were collected from Pakkhaosan Sub-district, Muang District of Saraburi Province. Bamboo shoots were cut into small pieces and then put in clear plastic boxes. Sampling of bamboo shoots from the district of Saraburi. Saraburi Province. For example, bamboo shoots are cut into pieces and put in a clear plastic box. Coconut coir fiber was placed at the bottom of plastic box about 1 inch high for the fly larvae to pupate. Collection date was recorded. Bring the samples back to the laboratory and observe the developmental stage and external morphology of *G. fasciventris*. After adult emergence, they were individually separated and placed each into a plastic box sized 7×9×4.5 cm and fed with 3% of sugar solution. The adult was reared in the insect rearing room till aged 14 days or more, then it was investigated under the streomicroscope for fron hair, marked on face and arista on antennae. On thorax, hair and color mark was investigated as well as wing marking and spine on leg appendage. Marking on the dorsal part of abdomen, sterna of both sexes and ovipositer character of the last segment was measured and recorded.

Measurement of body length, wing span, ovipositor length including aedeagus length were performed by using digital micrometer. The technical term and keys for the research was based on Economic fruit flies of the south Pacific region (Drew, 1982), Fruit flies of economic significance : Their identification and bionomics (White and Elson-Harris , 1992) and The fruit flies (Tephritidae-Diptera) of Thailand and bordering countries (Hardy,1973).

## **Results**

### ***Life history of G. fascivantris***

Sizes of different developmental stage including measurement of male and female (Table 1-2 and Fig. 1). The body length including ovipositor is averaged  $6.16 \pm 0.47$  mm, wing length and width averaged  $5.19 \pm 0.42$  and  $2.52 \pm 0.26$  mm, respectively.

### ***External morphology of G. fascivantris***

#### **Description of Female**

It has reddish brown eyes, and yellow frons(Figure 2 ) with 3 pairs of inferior fronto-orbital setae, 1 pair of ocellar setae (Figure 3 ), 2 pairs of orbital setae and 1 pair of dark inner vertical setae. It has 3 segmented antenna with short on the first and second antenna and longest on the third segment which has plumose arista type(Figure4).Three pairs of legs were faded brown and yellow. Femur of hind legs near the end had a dark brown band(Figure5). Tibia of middle leg had an apical black spurs. Tibia of hind legs had a spine. Reproductive organs have three segments with the first segment is black(Figure6). The final segment (aculeusb) close to the end of his second pair on each side of two similar to the aculeusb of *G. fascivantris*

#### **Description of Male**

General characteristics of adult males are resemble females. The differences are as follows: the dorsal side of abdomen is covered with large number of the brown and yellow hair except for the latter part of the third segment with transverse black stripes extend to the edge. The color of scutellum and the abdomen is difference from the female.

### ***External morphology of G. soror***

#### **Description of Female**

It has a pair of big red brown eyes, yellow frons and 3 segmented antenna. The longest one is the third segment and has brown color. One plumose arista

(Figure 7), red brown compound eyes and one pair of ocellar setae are on front with yellow face(Figure 8). Three black vittae were located on the dorsal part of thorax. Its body was 5.53-6.97 mm long. Wing width was 2.15-3.15 mm

### Description of Male

Appearance character of the male is generally similar to the female, however, they do have sexual dimorphism. The color at thorax and abdomen is different such as yellow mesonotum of males or brown spots on the yellow background of scutellum.

**Table 1.** The measurement in mm of developmental stages

value	egg length	the 3 <sup>rd</sup> instar		pupa	
		body length	body width	length	width
mean±S.D.	0.56±0.03	6.87±1.34	1.12±0.08	4.16±0.23	2.07±0.03
range	8.08-7.62	0.96-1.25	4.29-4.98	1.01-2.02	0.53-0.61

**Table 2** The measurement in mm of insect body parts

Insect body parts	female	male
body length	6.16±0.49	6.38±0.57
wing length	5.19±0.43	4.87±0.42
wing width	2.52±0.26	2.58±0.18
ovipositor length	5.88±0.41	
oviscape	1.49±0.17	
aculeus	1.93±0.16	
aedeagal length		10.03±0.50



**Figure 1** Males and females of *G. fasciventris*



**Figure 2** Red brown eyes and the frontal parts of *G. fasciventris*



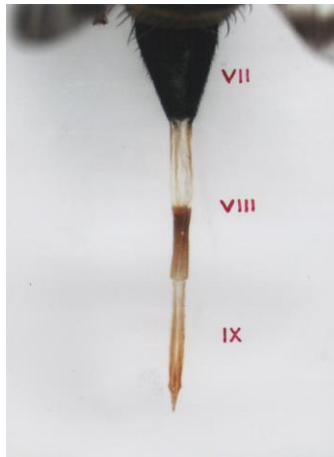
**Figure3** Ocellar setae (arrow point)



**Figure 4** arista on the third segment of antenna



**Figure 5** leg appendage of *G. fasciventris*



**Figure 6** The substitutorial ovipositor of *G. fasciventris* female



**Figure 7** Setae on frons of *G. soror*



**Figure 8** Leg appendage of *G. soror*

## Discussions

*G. fasciventris* is very similar to *G. soror* and they are found in the infested hosts at the same time. The adult of the two species can be differentiated from each other by wing marking which has both S and V bands. They were found at Nakhonsawan, Singburi, Nakhonayok, Prachuabkilikun and Kampanghet (Hardy, 1973)

They are likely to be classified as a species complex. *Gastrozona* is different from *Bactrocera* and *Dacus* at the plumose arista, ocellar setae. The dorsocentral seta was found near a single eye and ocellar setae and dorsocentral setae are on thorax.

## Conclusions

Both *Gastrozona fasciventris* and *G. soror* belong to family Tephritidae, subfamily Dacirae, tribe Ceratitini and subtribe *Gastrozona*. The insect in this subtribe will have plumose arista, therefore, both of *G. fasciventris* and *G. soror* have plumose arista and found destroyed *Thrsostachys siamensis* Gamble, wild bamboos. Larvae, pupa and adult are very much alike and very difficult to separate them from each other.

*G. fasciventris*'s wing has no subbasal crossband at the wing basal. No V band was found at the end of preapical crossband comes into contact with the



tip of the posterior apical crossband. The end of the femur of middle and hind legs are dark brown to black.

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