

Several local food plants with the potential as hosts for *Spodoptera frugiperda* (Lepidoptera: Noctuidae)

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Abstract. Nelly N, Hamid H, Lina EC, Yunisman, Hidrayani, Widyasari DM. 2022. Several local food plants with the potential as hosts for *Spodoptera frugiperda* (Lepidoptera: Noctuidae). *Biodiversitas* 23: 1693-1699. Fall armyworm (*Spodoptera frugiperda*) or abbreviated as FAW is a major invasive pest of corn crops in America, its native country. Therefore, this study aims to examine the effect of several plant types as hosts on *S. frugiperda* biology and reproduction. It was conducted at the Insect Bioecology Laboratory, Department of Plant Protection, Andalas University using a completely randomized design (CRD) with 3 treatments and 4 replications. The *S. frugiperda* larvae from the field were fed with different plant leaves, namely corn (*Zea mays*), rice (*Oryza sativa*), soybeans (*Glycine max*), and reared until the second generation. Meanwhile, the larvae in the second generation were used as test insects with different feed treatments. Observations were made on the morphology and life parameters of *S. frugiperda*, including the length of the stadia, egg, larvae, pupae, and adult, as well as the laying time and pattern, with the number of eggs produced. The results showed that there were no morphological differences in *S. frugiperda*, except for the size. Moreover, the body size of the adult-derived from larvae fed with soybean leaves, namely 25.95 mm, was the smallest compared to corn and rice, while the shortest time for larvae development from instar I to VI was obtained with corn leaf feed for 13.55 days. The life span of females derived from larvae fed on soybean leaves was shorter than the others. Larvae fed on soybeans, female life span was 26.00, rice was 34.00 and corn was 31.44 days. Adult females of larvae given soybean leaves produced the highest number of eggs (879.44 eggs) compared to rice (505.00 eggs) and maize (546.33 eggs). Local food crops other than corn, namely rice and soybeans, can be potential hosts for *S. frugiperda*.

Keywords: Fall armyworm, host, life parameters, local food, morphology

INTRODUCTION

Spodoptera frugiperda J.E Smith (Noctuidae: Lepidoptera), also called Fall armyworm (FAW) is a pest native to tropical and subtropical regions of the Americas. It is a major pest of corn in its native region and Brazil (Goergen et al. 2016) as well as has a high migratory nature with unique biological characteristics, therefore, this pest easily spreads throughout the world (Hardke et al. 2015; Nonci et al. 2019).

Spodoptera frugiperda has also spread to several countries in Africa, Asia, Australia, and its attacks were detected in Central and West Africa, including Sao Tome and Principe, Benin, Nigeria, and Togo in 2016. Furthermore, it was found throughout mainland South Africa except for Lesotho, Madagascar, and Seychelles in island nations. In Africa, this pest causes serious damage to corn crops (Goergen et al. 2016) and the climatic conditions of tropical South and Southeast Asia cause further migration to Australia, China, India, Indonesia, Malaysia, the Philippines, and Thailand (Early et al. 2018).

The Center for Forecasting Plant Destruction Organisms (Balai Besar Peramalan Organisme Pengganggu Tumbuhan, BBPOPT) in 2019 reported that *S. frugiperda* was found to have spread to Indonesia, particularly in the Sumatra regions such as Aceh, North Sumatra, West Sumatra, Jambi, South Sumatra, and Lampung. In March

2019, it was first discovered in West Sumatra, precisely in the West Pasaman District (Nelly et al. 2021a) also reported that *S. frugiperda* has spread to all corn plantations in West Sumatra. In this population, *S. frugiperda* is genetically divided into two large groups, which are depicted in the phylogeny tree.

This pest attacks and damages corn plants in various areas such as in West Sumatra, Indonesia. The attack rate ranges from 6.0-90% in the vegetative phase of corn plants, while the average number of larvae found in the field was 0.70 larvae/stem. Besides, several types of corn varieties are grown in West Sumatra, such as Bisi 18, Pertiwi, Pioneer, NK 2121, and NK 7328. The NK 212 variety is the most preferred species by *S. frugiperda*, with the percentage of damage reaching 90% (Nelly et al. 2021b). Corn is mostly grown in monoculture or polyculture on oil palm plantations. Almost all corn plants are attacked by pests (Nelly et al. 2022).

Early instar *S. frugiperda* larvae damage corn plants by eating the leaf epidermis layer (BBPOPT 2019). The larvae have a high feeding ability and attack the growing point of the plant, hence, it potentially causes a 5-20% reduction in yield. In each corn plant, more than 1 larvae of *S. frugiperda* are usually found (Nonci et al. 2019). On the African and European continents, the losses caused by this pest ranges from 8.3 to 20.6 million tons per year, with an economic loss of US\$ 2.5-6.2 billion per year (FAO 2019).

Spodoptera frugiperda is a polyphagous pest, which potentially causes heavy losses as it attacks more than 80 species in 23 plant families, including corn, sorghum, fodder grasses, rice, cotton, and peanuts (Hardke et al. 2015). Furthermore, Silva-Brandão et al. (2017) suggested that the pest prefers hosts belonging to grasses such as rice, corn, and wheat, as well as having a low potential to eat cotton and soybeans.

Several types of plants from the grass group are the main hosts of *S. frugiperda* in the various places of origin. Food crops other than corn, namely rice and soybeans, are the main food sources in Indonesia. Furthermore, it is suspected that these food plants can become hosts and affect the life of *S. frugiperda* as an invasive pest. It can be assumed that rice and soybeans can be suitable hosts. *S. frugiperda* is polyphagous, attacking many types of cultivated plants. Individuals of *S. frugiperda* have also been reported, divided into corn and rice strains (Prasifka et al. 2009). A high preference for this crop and many others are also preferred, such as soybeans and 50 or 60 crops. Local varieties of rice, corn, and soybeans are thought to affect the life of *S. frugiperda*. This has been observed in the life of *S. frugiperda* with larvae food. Therefore, this study aims to observe the life parameters of *S. frugiperda* due to different larvae feeding treatments to identify the potential of these food plants as hosts.

MATERIALS AND METHODS

Study site

Larvae *S. frugiperda* collected from corn plantation in Padang, West Sumatera, Indonesia. Observation and rearing were carried out in the Bioecology of Insect Laboratory, while the feed crops for the larvae were grown in warehouses at the Department of Plants Protection, Faculty of Agriculture, Andalas University. The study was conducted from July to November 2021.

Instruments and materials

The tools used include plastic insect rearing containers measuring diameter $\times$ height, (6 cm $\times$ 4 cm) and (9 cm $\times$ 11.5 cm), brush, scissors, binocular microscope, camera, stationery, and plastic tray (30 cm $\times$ 24 cm $\times$ 4 cm). Moreover, the materials used were *S. frugiperda* larvae, corn (*Zea mays*) with Paragon variety, rice (*Oryza sativa*) with Batang Piaman variety, soybean (*Glycine max*) Anjasromo variety, honey, soil, water, manure, cotton, tissue paper, label paper, polybag, and filter paper.

Procedures

The study was conducted using a completely randomized design with 3 treatments and 4 replications. The treatment includes different types of feed to *S. frugiperda* larvae, while the larvae's diet consists of plant leaf A. Corn, B. Rice, and C. Soybean.

Provision of feed for *Spodoptera frugiperda* larvae

The corn was planted in polybags with a volume of 3 kg and the soil was mixed with manure in a ratio of 1:1 up to

$\frac{3}{4}$ parts. Each polybag was planted with 3 corn seeds with a depth of 3 cm. Furthermore, planting was carried out in 10 polybags every 15 days during the study to maintain feed availability, then the young leaves were used to feed the larvae, is young leaf aged 3-4 weeks.

Rice was sown using trays measuring 30 cm $\times$ 24 cm $\times$ 4 cm, the seeds were soaked with water to cover the surface (± 2 mm high), while the seedlings were planted in pots with a water level of ± 2 cm. To maintain availability, rice plants were planted every 15 days during the study, and the young leaves aged 2-3 weeks were used as feed.

Soybeans were planted in 3 kg polybags with the soil mixed with manure in a ratio of 1:1 up to $\frac{3}{4}$ part. Each polybag was planted with 3 soybean seeds with a depth of 3 cm. The soybean plants were planted in 10 polybags every 15 days during the study to maintain feed availability and the young leaves aged 3-4 weeks were given as feed.

Rearing of *Spodoptera frugiperda*

The *S. frugiperda* larvae were taken directly by hand from farmers' corn plantations in the Padang area. Larvae are put into a plastic container 6 cm diameter and 4 cm height containing corn plant leaves as feed. In each plastic container, one larva of *S. frugiperda* was added and reared in the laboratory until they became adults. Furthermore, the female adult copulated with males and was fed with 10% honey, while the eggs produced by the female were harvested daily and were reared until they hatched into larvae, the first instar larvae were used as test insects.

Spodoptera frugiperda larvae with different feed

A total of 20 first instar larvae for each treatment with 4 replicates were reared in plastic containers with a diameter of 6 cm and a height of 4 cm. The larvae were reared 1 individual per container each and fed according to the treatment, namely corn, rice, and soybean leaves, then the feed was added or replaced every day to keep it fresh. Rearing with observations was carried out until pupae were formed as well as an adult. Moreover, the adult produced was fed with 10% honey. Adults fed in the form of honey dissolved in distilled water up to 10% (V: V), was given to all treated adults. Copulated to produce eggs in a plastic container measuring 9 cm in diameter $\times$ 11.5 cm in height. In the rearing container, the filter paper was used around where the eggs were laid. The eggs were maintained until they hatched into larvae, and then serve as test insects.

Life parameters of *Spodoptera frugiperda* from larvae fed different feed

Spodoptera frugiperda larvae were fed different feeds and observed for the morphology, namely the shape and structure of each developmental stage, including: (i) Body size, which is measured in length from the head to the tip of the abdomen; (ii) Egg stage length observed from the time the eggs are laid until they hatch; (iii) The length of the larvae stage counted from egg hatching to larvae until pupa is formed. The observations were made every day by examining the development of instar larvae I to VI; (iv) Percentage of larvae pupae (%). This parameter was observed to count the number of larvae that became pupae

using the following formula:

$$I = \frac{\text{total pupae formed}}{\text{total larvae given with treatment}} \times 100\%$$

(v) The length of the pupa stage; The pupa stage was counted from the pupa formed until the adult appeared. F) The percentage of adult that appears; The number of adults that managed to live from the total larvae treated. The percentage that becomes an adult is calculated by the following formula:

$$I = \frac{\text{Number of larvae that became adults}}{\text{Total larvae given treatment}} \times 100\%$$

Furthermore, the number of male and female adults from each treatment was also calculated. (vi) Life span of the adult; The adult stadia were calculated from the time it appears until death.

The parameters of life at the adult stage examined include: (i) Pre-oviposition time, which was calculated from the time the female adult emerged from the copulated and to lay the first egg; (ii) Oviposition time, counted from the first egg to the last egg laid; (iii) Post-oviposition time, calculated from the time the adult lays the last egg until death; (iv) The number of eggs laid (grain) observations were made every day, counting the total number of eggs laid by the first female adult until the last egg.

Data analysis

The data were analyzed for variance (ANOVA: Analysis of Variance) using the Statistix 8.0 program, while the standard deviation was calculated using the following formula:

$$s = \sqrt{\frac{n \sum_{i=1}^n x_i^2 - (\sum_{i=1}^n x_i)^2}{n(n-1)}}$$

Where, S: standard deviation; x_i : the value of the i-th x; $\bar{x}$: average; n: sample size

RESULTS AND DISCUSSION

Spodoptera frugiperda morphology

Spodoptera frugiperda larvae fed different larval feeds did not show any difference in shape from egg to adult. The difference can be seen in the length of the larval stadia or instars. Adult females will produce eggs after copulation occurs. The eggs laid by the female are in clusters as well as covered with fine and yellowish feathers as shown in Figure 1.

Recently laid eggs are yellowish with fine feathers, during development, the eggs change color from yellow to brown, then during hatching, the color becomes brownish, until the larvae are produced around the eggshell with a black-head, and larvae moved slowly. In early larvae, it is still around the leaf where the eggs are laid. When the larvae change to instars, it is marked by the presence of exudates around the larvae (Figure 2).

During development from the time the eggs hatch, the larvae are still small in size and continue to grow (Figure 2 a,b). Every time there is a change in the instar larvae, exudates are always found around the larvae (Figure 2c and e). Then there was a change in size from the 1st instar larvae to the 6th instar with slightly different shapes and colors (Figure 2 d, e, f, g, h, I, j k, and l). Meanwhile, instar VI larvae are not very active until they form pre-pupae and pupae (Figure 3).

Pre-pupae are yellowish-green and have started to settle down, when the pupae have formed, the skin is still soft with a light brown color, but after a few days, the cocoons of the pupae turn brown. The duration of the pupal stage is 8-10 days, and then the adult appears (Figure 4).

The morphology of male and female adults can be seen clearly and distinguished through the wings as the main distinguishing part between males and females, also, the size of the female body is larger than the male.

The length of larva, pupa, and adult was different at each stage, while the size of the larvae fed with corn, rice, and soybeans showed a significant difference. The results of the analysis of variance (ANOVA) and the LSD test at the 5% level, with P value $P < 0.001$ as shown in Table 1.

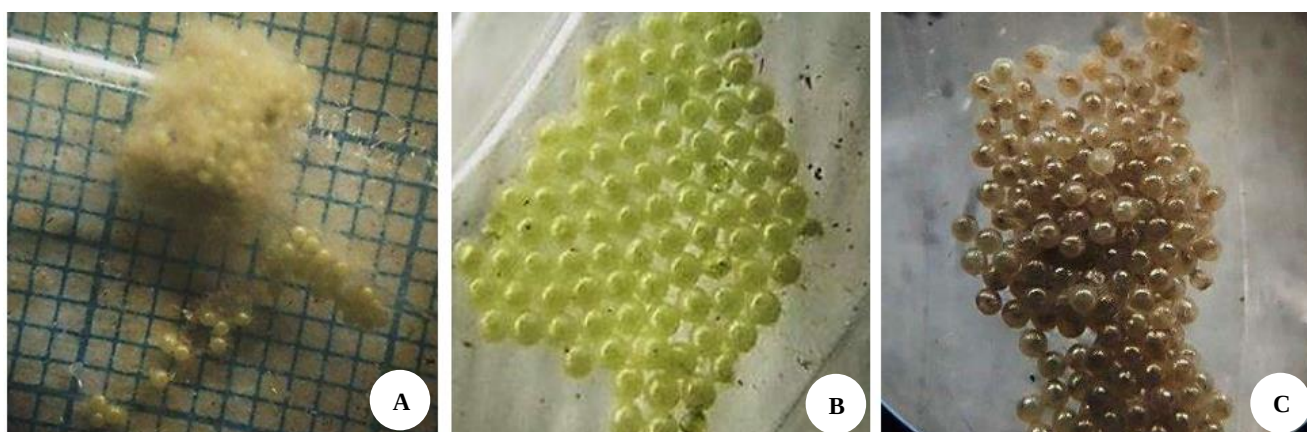


Figure 1. Egg stage of *Spodoptera frugiperda*. A. Group of eggs covered with fine hairs on the surface of the egg group day 1st; B. The color of the egg group becomes yellow days 2nd; C. The 3rd days eggs

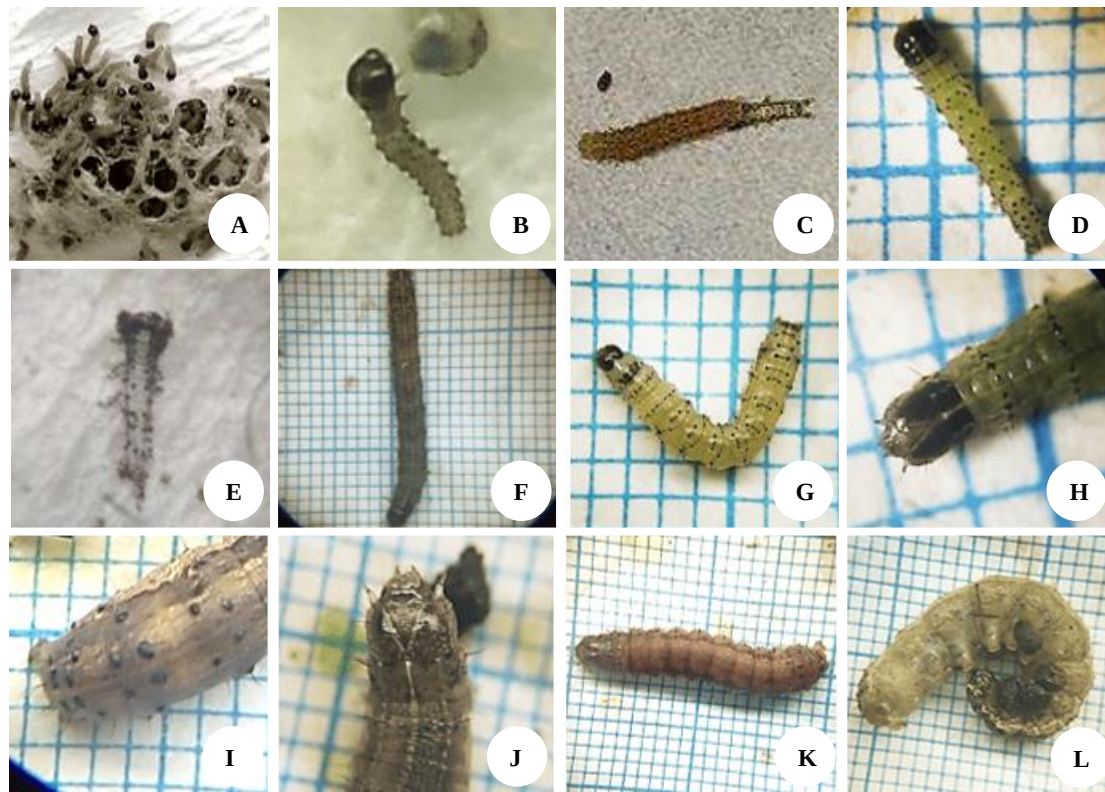


Figure 2. Development of the larvae stage of *Spodoptera frugiperda* from instar 1 to instar VI



Figure 3. Development of *Spodoptera frugiperda*. A. pre-pupae; B. pupae

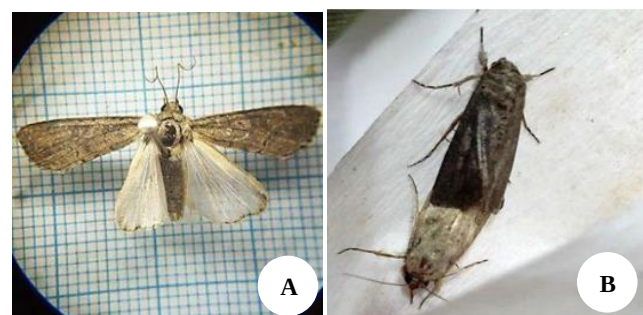


Figure 4. Stadia adult of *Spodoptera frugiperda*. A. Male adult; B. Female and male adult copulation

Table 1. Body size of *Spodoptera frugiperda* with different larvae feed treatment

Stadia	Body length ($\bar{x} \pm sd$) (mm)		
	Corn	Rice	Soybean
Larvae			
Instar larvae I	1.6 $\pm$ 0.13 a	1.52 $\pm$ 0.10 a	2.22 $\pm$ 0.29 b
Instar larvae II	4.34 $\pm$ 0.56 b	3.93 $\pm$ 0.38 c	6.28 $\pm$ 0.53 a
Instar larvae III	9.50 $\pm$ 0.79 b	7.97 $\pm$ 1.06 c	11.97 $\pm$ 0.76 a
Instar larvae IV	16.80 $\pm$ 1.79 b	15.26 $\pm$ 1.19 c	21.14 $\pm$ 2.06 a
Instar larvae V	25.78 $\pm$ 1.83 b	24.68 $\pm$ 1.67 b	28.9 $\pm$ 2.82 a
Instar larvae VI	28.31 $\pm$ 3.08 b	29.66 $\pm$ 2.37 b	33.42 $\pm$ 2.46 a
Prepupae	16.30 $\pm$ 0.65 b	20.30 $\pm$ 0.92 a	16.20 $\pm$ 1.01 b
Pupae	14.20 $\pm$ 0.69 b	16.55 $\pm$ 0.76 a	13.90 $\pm$ 0.96 b
Adult	30.90 $\pm$ 0.71 b	32.80 $\pm$ 1.47 a	25.95 $\pm$ 0.82 c
Male	30.45 $\pm$ 0.52 b	31.60 $\pm$ 0.84 a	25.90 $\pm$ 0.87 c
Female	31.44 $\pm$ 0.53 b	34.00 $\pm$ 0.81 a	26.00 $\pm$ 0.81 c

Note: numbers followed by the same lowercase letter on the same line are not significantly different based on the results of the LSD test at the 5% level

Table 2. Developmental time of *Spodoptera frugiperda* with different larvae feed treatments

Stadia	Development time ($\bar{x} \pm sd$) (day)		
	Corn	Rice	Soybean
Egg	2.36 $\pm$ 1.37 a	1.78 $\pm$ 1.24 a	2.60 $\pm$ 1.00 a
Larvae	13.55 $\pm$ 0.51 b	14.80 $\pm$ 1.39 a	15.05 $\pm$ 0.99 a
Instar larvae I	2.20 $\pm$ 0.41 b	2.20 $\pm$ 0.41 b	3.10 $\pm$ 0.30 a
Instar larvae II	1.95 $\pm$ 0.39 b	2.30 $\pm$ 0.44 b	2.90 $\pm$ 0.78 a
Instar larvae III	2.30 $\pm$ 0.47 b	2.25 $\pm$ 0.55 b	2.75 $\pm$ 0.55 a
Instar larvae IV	2.70 $\pm$ 0.47 ab	3.00 $\pm$ 0.79 a	2.45 $\pm$ 0.51 b
Instar larvae V	2.45 $\pm$ 0.51 a	2.80 $\pm$ 0.55 a	1.95 $\pm$ 0.68 b
Instar larvae VI	1.95 $\pm$ 0.51 b	2.60 $\pm$ 0.68 a	1.85 $\pm$ 0.67 b
Pre-pupae	2.15 $\pm$ 0.37 a	1.90 $\pm$ 0.45 a	2.00 $\pm$ 0.79 a
Pupae	10.15 $\pm$ 0.87 ab	9.65 $\pm$ 1.18 b	10.35 $\pm$ 1.08 a
Adult	11.05 $\pm$ 3.51 a	11.45 $\pm$ 2.01 a	9.05 $\pm$ 2.76 b
Male	10.00 $\pm$ 3.44 a	11.00 $\pm$ 2.78 a	10.10 $\pm$ 2.96 a
Female	12.33 $\pm$ 4.39 a	11.90 $\pm$ 1.64 a	8.00 $\pm$ 2.44 b

Note: numbers followed by the same lowercase letter on the same line are not significantly different based on the results of the LSD test at the 5% level

Table 3. Effect of larvae feed on the female adult reproduction time

Larvae feed	Period ($\bar{x} \pm sd$) (days)		
	Pre-oviposition	Oviposition	Post-oviposition
Corn	2.00 $\pm$ 1.00 a	6.33 $\pm$ 2.08 a	2.66 $\pm$ 2.51 a
Rice	3.67 $\pm$ 1.23 a	5.67 $\pm$ 1.64 a	1.33 $\pm$ 1.52 a
Soybean	2.33 $\pm$ 1.53 a	7.00 $\pm$ 1.90 a	1.62 $\pm$ 0.67 a

The size of the larvae in each instar showed differences, for example, the longest instar 1 was the larvae that fed on soybean leaves. The longest larvae in each instar (instars 1-6) were obtained with the soybean plants, while the longest pupae and adult sizes were found in larvae fed with rice, compared to corn and soybeans.

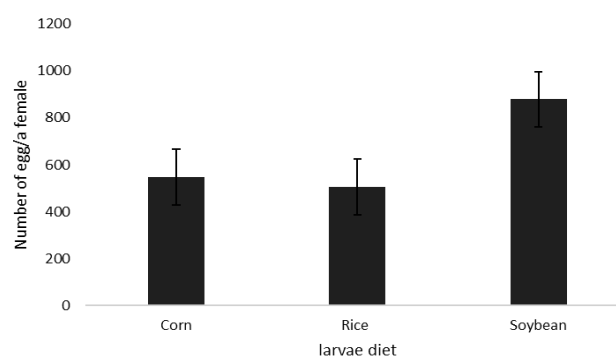
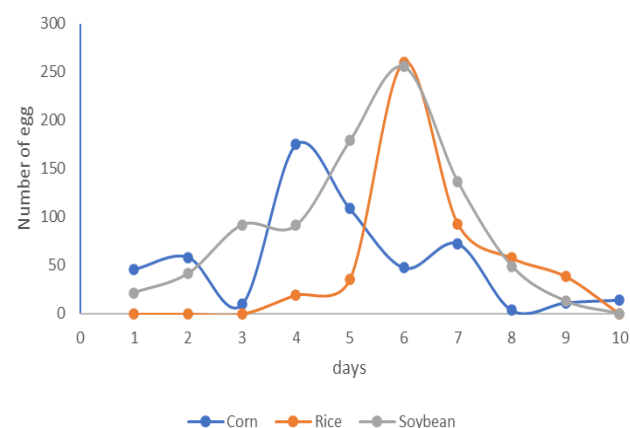
Spodoptera frugiperda of life parameters

Observations result on the length of *S. frugiperda* life given different feed treatments showed differences with P-value 0.003 as shown in Table 2.

Other life parameters, namely the period of pre-oviposition, oviposition, and post-oviposition of the female adult from larvae with different feeds, showed non-significant differences with a P-value of 0.3754 as displayed in Table 3.

The pre-oviposition period ranged from 2.00-3.67 days, the oviposition period was 5-7 days, and the post-oviposition ranged between 1.33-2.66 days. However, there was no significant difference in the period used to lay eggs by the females, but the number of eggs laid mostly came from larvae fed with soybeans (Figure 5).

The number of eggs laid by one female ranged from 500-900, with an average of 505.00 and 546.44 eggs per adult derived from larvae fed with rice and corn. The highest was found in female adults from larvae fed with soybeans, while the average time for laying eggs or oviposition was 10 days. The pattern of laying eggs by a female adult was fluctuating as shown in Figure 6.

**Figure 5.** Number of eggs laid by a female *Spodoptera frugiperda* from larvae with different feeds**Figure 6.** Laying pattern of a female *Spodoptera frugiperda* from larvae fed with different feeds

The number of eggs laid by a female *S. frugiperda* at the beginning was less than the following day. The larvae fed with corn produced the highest number of eggs on day 4, followed by rice and soybean. The pattern of laying eggs by an adult with different larvae feed showed fluctuations. At the beginning of oviposition, the number of eggs laid was still small but gradually increased with rising adult age. Most eggs were laid on day 6, by an adult from larvae fed with rice and soybeans, while larvae fed on corn laid the most eggs on day 4.

Discussion

The morphology of *S. frugiperda* fed with three types of plants show differences were observed in the development time, body size, and the number of eggs produced. The development of larvae fed with soybean leaves was longer, namely 15.05 days compared to rice 14.80 days, and corn 13.55 days as shown in Table 1. The larvae feed in the form of corn, rice, and soybean leaves also caused significantly different sizes. The size of the larvae fed with soybean leaves was larger compared to corn and rice. In general, the feed has a very significant effect on the life of Lepidoptera insects (He et al. 2021). Several studies also revealed that the type of feed for herbivorous Lepidoptera larvae greatly affects growth and development (Li et al. 2019), and (Negi et al. 2018). According to Li et al. (2013), different feeds for *Athetis lepigone* larvae affect growth and development. Furthermore, Saeed et al. (2010) stated that different host plants in *Plutella xylostella* also affect the development of the pest.

The growth of *S. frugiperda* larvae from instars 1 to 6 with soybean feed was greater than those fed with corn (Table 1), while at the pupae stage, the size was shorter than the 6 instar larvae. Pre-pupae were formed at the end of the larvae stage, where feeding activity was no longer observed. The pre-pupa process begins with the contraction and shortening of the 6th instar larvae, then it becomes pupae within 1-2 days as displayed in Table 2. The size of the pupae derived from larvae fed with soybeans was not significantly different from others fed with corn. Meanwhile, the adult fed with soybeans was smaller in size compared to the others fed with corn and rice. Lepidoptera insects carry out feeding activities at the larvae stage, therefore, the amount and nutritional content of the feed are very influential in its growth and development. The adult feed sources include nectar or glucose, while the optimum amount of feed consumed by larvae greatly determines the growth and development as well as fitness of Lepidoptera.

The lifespan of male adults did not differ between feed treatments, while the female form larvae fed on corn had a longer life than soybean feed but was not significantly different from rice. Moreover, several factors affect the length of life and reproduction of Lepidoptera adults, including feed content such as amino acid and fatty acid allocation (Levin et al. 2017).

The reproductive period of *S. frugiperda* derived from larvae with different feed treatments showed no significant difference. The pre-oviposition period ranged from 2-3 days, the reproductive period was between 5-7 days, and the oviposition period ranged from 1-2 days. Adult feed in

the form of 10% honey was given every day, therefore, the availability of the feed is always fulfilled. The amino acid content derived from the adult feed or at the larvae stage affects fecundity (Mevi-Schütz and Erhardt 2005).

The fecundity of *S. frugiperda*, based on the number of eggs laid by a female adult, showed a significant difference with $P < 0.001$. The highest was found in adults derived from larvae fed with soybeans, namely 879.44 grains compared to 546.33 grains for corn and 505.00 grains for rice. Montezano et al. (2018) stated that the host plant affects the pest biology, such as egg-laying behavior, the number of eggs produced, and the amount hatched. The *S. frugiperda* adult during its lifetime can lay up to 6-10 egg groups. One group of eggs might reach 100-200, while the total produced often reach 1500-2000 eggs per adult (Capinera 2017).

The pre-oviposition, oviposition, and post-oviposition length of female *S. frugiperda* adult from larvae treated with different feeds did not show any difference. In the female adult treated with soybean feed, for an average of 7 days, the number of eggs laid reached 879.44. Food crops, namely corn, rice, and soybeans, contain various nutrients for herbivorous insects, this tends to affect the number and pattern of spawning. The shortest pre-oviposition period ranged from 1-2 days, allowing the adult to produce numerous eggs. Meanwhile, the oviposition period was between 5-7 days and the highest number of eggs was produced on day 4 by an adult from larvae fed with corn, as well as on day 6 for rice and soybeans. Although *S. frugiperda* is polyphagous, the type of host plant also affects the egg-laying behavior. When oviposition and development of early instar larvae occur in non-main hosts, it is accompanied by migration. This insect in America is declared as strain C (Corn) and strain R (Rice) because it also attacks rice aside from corn. These two strains also attack other plants, namely *M. giganteus* and switchgrass. Strains C and R lay eggs as well as thrive in any host (Prasifka et al. 2009). In America, there are 2 strains of *S. frugiperda*, a strain that can attack corn, cotton, and sorghum, another strain that attacks grasses (Dumas et al. 2015). New and polyphagous invasive pests in Indonesia pose a great threat to food needs. Moreover, several main food crops in Indonesia, such as corn, rice, and soybeans are potential hosts of *S. frugiperda*.

Based on the results, it was concluded that the life and morphological parameters of *S. frugiperda* larvae fed with corn, rice, and soybean leaves, did not show significant differences except for size. The body size of the adult-derived larvae fed with soybean leaves was the smallest compared to corn and rice. Meanwhile, the shortest time for larvae development from instar I to VI was found with corn leaf feed for 13.55 days compared to others, while the shortest lifespan of the female adult was observed in the larvae fed with soybean, namely 8.00 days. Adult derived from larvae given soybean produced the highest number of eggs with 879.44 grains compared to rice 505.00 grains, and corn 546.33 grains. The conclusions of this study are; that local varieties of maize, rice, and soybean affect the life of *S. frugiperda*. All of these food crops can be potential hosts for *S. frugiperda*.

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