



IDENTIFICATION OF INSECTS ON LONG BEA CLANTS (*Vigna unguiculata*) IN KOR HILL, MARANG, TERENGGANU

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Abstract

Long beans are a type of vegetable that is very popular among the people of Indonesia and the world. People around the world call it Yardlong Beans/Cow Peas. Pests are plant destroyers that can reduce the growth and production of cultivated plants, which can cause crop failure, thereby causing large losses for farmers. Pests that attack long bean plants are grasshoppers (*Oxya sp.* , Fam. Acrididae), green leafhoppers (*Empoasca spp.* , Fam. Cicadellidae), leaf caterpillars (Fam. Pyralidae), pod borers (Fam. Pyralidae), aphid lice (*Aphis craccivora* , Fam. Aphididae), green ladybugs (*Nezara viridula* , Fam. Pentatomidae), and whitefly (*Bemisia tabaci* , Fam. Hemiptera). The aim of this research was to determine the diversity of insects on long bean plants (*Vigna sinensis L.*) in Kor Hill, Marang, Terengganu. The research method was carried out using qualitative methods, this research collected insects on long bean cultivation plants. This research examines insect body parts, description and classification. The results of this research were fruit flies (*Bactrocera dorsalis*), green bottle flies (*Lucilia sericata*), red imported fire ants (*Solenopsis invicta*), koki beetles (*Epilachna admirabilis*), Sangit grasshoppers (*Leptocoris acuta*) and grasshoppers (*Valanga nigricornis*).

Keywords : Long Beans, Kor Hill, Insect Diversity, Insect Description.

Abstrak

Kacang panjang adalah salah satu jenis sayuran yang sudah sangat populer di kalangan masyarakat Indonesia maupun dunia. Masyarakat dunia menyebutnya dengan nama Yardlong Beans/Cow Peas. Hama adalah perusak tanaman yang dapat menurunkan pertumbuhan dan produksi dari tanaman yang dibudidayakan sehingga dapat menimbulkan gagal panen, sehingga menyebabkan kerugian yang besar bagi petani. Hama Kor Hill, yang menyerang tanaman kacang panjang yaitu belalang (*Oxya sp.* , Fam. Acrididae), wereng hijau (*Empoasca spp.* , Fam. Cicadellidae), ulat daun (Fam. Pyralidae), penggerek polong (Fam. Pyralidae), kutu aphid (*Aphis craccivora* , Fam. Aphididae), kepik hijau (*Nezara viridula* , Fam. Pentatomidae), dan kutu kebul (*Bemisia tabaci* , Fam. Hemiptera). Tujuan penelitian ini untuk mengetahui keanekaragaman serangga pada tanaman kacang panjang (*Vigna sinensis L.*) di bukit kor, marang, Terengganu. Metode penelitian di lakukan dengan cara metode kualitatif, penelitian ini mengumpulkan serangga pada tanaman budidaya kacang panjang. Penelitian ini mengamati bagian tubuh serangga, deskripsi dan klasifikasi. Hasil dari penelitian ini mendapatkan yaitu lalat buah (*Bactrocera dorsalis*), lalat botol hijau (*Lucilia sericata*), semut api impor merah (*Solenopsis invicta*), kumbang koki (*Epilachna admirabilis*), Walang Sangit (*Leptocoris acuta*) dan belalang (*Valanga nigricornis*).

Kata kunci : Kacang Panjang, Bukit Kor, Keanekaragaman Serangga, Deskripsi Serangga.

1. INTRODUCTION

Bukit Kor is an experimental area of the University of Malaysia Terengganu which has an area of 600 hectares. This land was a gift from the Terengganu kingdom to the University of Malaysia Terengganu. Kor hill land has a height of 32 meters above sea level and an average temperature of 26.7 °C and relative humidity of 77.7%. 250 hectares of Kor Hill land is still used for crop cultivation, one of which is winged bean plants planted on an area of 5000 m.

Long beans are a type of vegetable that is very popular among the people of Indonesia and the world. People around the world call it Yardlong Beans/Cow Peas. The germplasm of long bean plants comes from India and China. There are those who suspect it comes from the African region. The germplasm of the cowpea (*Vigna umbellata*) was found growing wild in the Indian Himalayas , while the germplasm of the cowpea (*Vigna unguiculata*) is

native to Africa. Therefore, the vine-type long bean plant originates from tropical regions and Africa, especially Abbisia and Ethiopia (Hidayat et al., 2022).

Long beans (*Vigna sinensis* L.) are legumes that can grow in the low and highlands. Long beans contain many nutrients, namely protein, vitamins, carbohydrates, vegetable fats and minerals. Long beans are one of the legume commodities that are in relatively high demand among the public, so market demand for long beans is considered quite high. Demand for long beans comes from various groups, starting from traditional markets, supermarkets and restaurants as a basic ingredient for cooking (Ilmam Hidayat & Guritno, 2023).

Cultivating long beans or other horticultural crops certainly has several factors that can reduce production yields, for example physiological disorders, environmental factors and others. However, until now the biggest influence on long bean production itself is pest and disease attacks, which can indirectly reduce long bean yields.

Pests are plant-disturbing organisms which are one of the factors causing damage to the growth of cultivated plants and can reduce production and can even cause crop failure, thus causing large losses for farmers. Important pests that attack long beans include red mites (*Tetranychus bimaculatus*), pod borers (*Maruca testulalis*), and aphids (*Aphis craccivora*).

Pests that attack long bean plants are grasshoppers (*Oxya sp.*, Fam. Acrididae), green leafhoppers (*Empoasca spp.*, Fam. Cicadellidae), leaf caterpillars (Fam. Pyralidae), pod borers (Fam. Pyralidae), aphid lice (*Aphis craccivora*, Fam. Aphididae), green ladybugs (*Nezara viridula*, Fam. Pentatomidae), and whiteflies (*Bemisia tabaci*, Fam. Hemiptera) (Arsi et al., 2020).

2. METHODS

The research was carried out in long bean fields in Kor Hill, Terengganu, from 13 to 16 September 2023. The materials used in this research were yellow envelopes, 6 species of insects, namely fruit flies, house flies, green planthoppers, ladybirds, kerengga, and grasshoppers. The tools used are a cellphone camera, petri dish, pen, book and measuring tape. Long bean fields have an average area of 1 hectare and have 10 plots with a plot length of 30.3 x 1.5 m and of the 10 plots only 3 plots were chosen randomly for insect observation. The method used in this research is a qualitative method and each plot is observed for the insects present, then pictures are taken and taken to the laboratory to be identified using an identification book (Borror and DeLong, 2005).

3. RESULTS AND DISCUSSION

The research results showed that there were several pests that attacked long beans, *Bactrocera dorsalis*, *Lucilia sericata*, *Solenopsis invicta*, *Epilachna admirabilis*, *Leptocorisa acuta*, *Valanga nigricornis*.

Table 1. Observations of insects on long bean plants on Khor Hill

Insecta	Replicate			Total	Average
	I	II	III		
<i>Bactrocera dorsalis</i>	2	1	2	5	1.67
<i>Lucilia sericata</i>	1	1	2	4	1.33
<i>Solenopsis invicta</i>	0	0	3	3	1.00
<i>Epilachna admirabilis</i>	1	1	0	2	0.67

Leptocorisa oratorius	0	0	1	1	0.33
Valanga nigricornis	0	0	1	1	0.33

It can be seen from table 1 that there are a lot of pests growing on the research land, this is because long bean plants are hosts for several pests which can cause the growth and production of long bean plants to not be optimal. More pests that attack bean plants cause the fruit of long beans to become damaged and rotten. Fruit flies are very dominant in attacking long bean fields, this is because fruit flies are pests that attack many fruits and vegetables such as mango, guava, star fruit, melon, jackfruit, water apple, tomatoes, red chilies and bitter melon. This pest is found throughout the Asia-Pacific region and is known to attack more than 26 types of fruit and vegetables. Losses due to fruit fly attacks are quite large, causing low production and quality of horticultural crops (DE Sari et al., 2020).

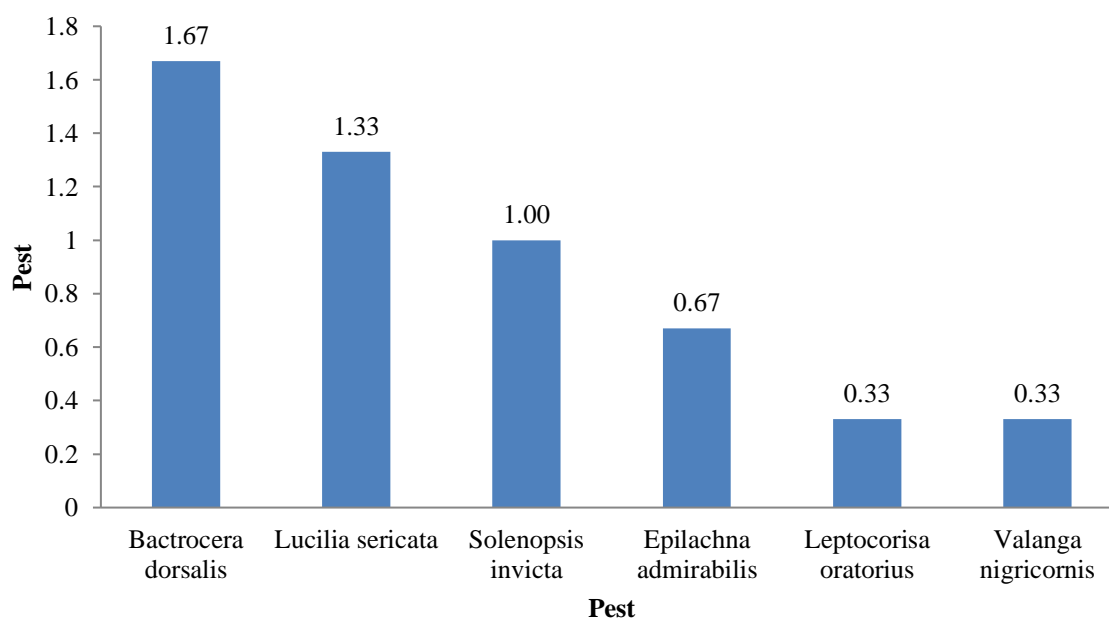


Figure 1. Population diagram of pests that attack long bean plantations

It can be seen from table 1, observing insects on long bean plants in Kor Hill that there are 6 species of insects in the long bean fields. There are also insects, namely Fruit Flies (*Bactrocera dorsalis*), House Flies (*Lucilia sericata*), Red Ants (*Solenopsis invicta*), Koksi Beetles (*Epilachna admirabilis*), Sangit Grasshoppers (*Leptocorisa oratorius*), and grasshoppers (*Valanga nigricornis*). The pest that most frequently attacks long bean fields is the Fruit Fly (*Bactrocera dorsalis*) with a total of 1.67 individuals and the lowest pest attack is *Leptocorisa oratorius* and *Valanga nigricornis* with a total of 0.33 individuals, this is because fruit flies attack the fruit by stabbing the ovipositor into the fruit that is already there. plants and leaves black marks and eggs. In accordance with the opinion of (Maesyaroh et al., 2020) it is stated that the attack stage begins with fruit flies laying their eggs under the skin of the fruit, then they hatch into larvae and then consume the flesh of the fruit. Fruit that is attacked by fruit flies will rot more quickly and fall from the tree prematurely.

Identification of pests that attack long bean fields in Khor Hill shows different attack symptoms and each pest has differences in the wings, thorax, abdomen. For more details, it can be explained as follows:

3.1 *Bactrocera dorsalis*

On the thorax, the scutum is reddish-brown black and has transverse bands on each side of the tip of the scutellum. A narrow costal band descends at the end of the R and the anal line is very narrow. The abdomen has a black line running across terga II, a black line running across terga III, a black line running along terga III to V to form the letter T.



Figure 2. *Bactrocera dorsalis* pest

The initial symptoms of *B. dorsalis* attacks are indicated by the presence of small black spots caused by ovipositor punctures. The newly hatched larvae immediately eat the flesh of the fruit, and cause the surrounding fruit to rot so that the fruit on the attacked plant rots and falls prematurely.

3.2 *Lucilia sericata*

Adult green bottle flies are 8 – 10 mm long. The color is metallic green or copper green. The back has feathers. The mouth is yellow and the eyes are red brown. Green bottle fly eggs are white or yellow, long and have one end pointed.

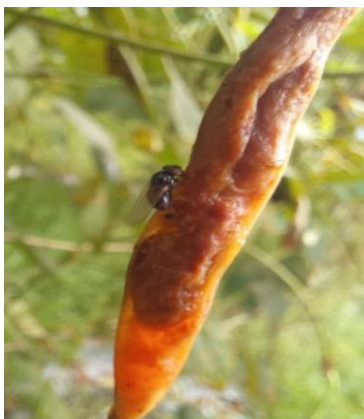


Figure 3. *Lucilia sericata* pest

Symptoms of attack caused by adult green bottle fly pests are by piercing the ovipositor into the fruit, then laying eggs into the fruit through the ovipositor and the eggs develop and the larvae eat the inside of the fruit, causing fruit rot. And the imago can cause plants to be attacked by diseases caused by bacteria found on the legs of green bottle flies (Pruna et al., 2019).

3.3 *Solenopsis invicta*

Fire ant's body has an exoskeleton or outer skeleton which provides protection and also

serves as a place for muscle attachment. Fire ants have compound eyes. The fire ant's chest has three pairs of legs and at the end of each leg there is a kind of small claw. Ants form a narrow waist. The fire ant's metasoma (stomach) contains many important internal organs, including reproductive organs.



Figure 4. *Selenopsis invicta* pest

The majority of attacks caused by fire ants (*S. invicta*) choose the stems of dragon fruit plants as part of the food they choose to consume. Fire ants are attracted to the nectar found in the flowers of dragon fruit plants (Rahman et al., 2022) .

3.4 *Epilachna admirabilis*

The hard wings on its back are colorful . The red elitera is coupled with a pattern such as varying black spots, the elitera of this species are relatively dull. The hind wings are transparent and are usually folded under the front wings when not in use. On its legs there are microscopic fine hairs.



Figure 5. *Epilachna admirabilis*

Predatory koxsi beetles can be used to control populations of aphids, mealybugs, mites and flour beetles. Chili plants that are still in the generative phase have leaves that are still soft, making it easier for aphids to pierce their stylets. So that it lures predatory koxsi beetles to land. Natural enemies can help humans in dealing with pests that cause economic losses. So that the environment does not experience pollution caused by excessive use of insecticides (Sutarma et al., 2023) .

3.5 *Leptocorisa acuta*

Blackish brown on the lateralventral side of the body. The body is robust (oval) with membraneous wings . Body color varies; green for nymphs, and brownish for imago. The male body size is larger than the female, the female body length is between 17.50–18.00 mm and the female body width is between 2.40–3.00 mm while the male body length is between 18.00–19.50 mm and the width is between 1.95–2.00 mm. The life span of the stink bug reaches 50 - 83 days.



Figure 6. *Leptocorisa acuta* pest

One type of important pest in rice plants is the sting grasshopper (*Leptocorisa spp* .) which attacks rice plants during the grain filling period, causing a decrease in grain quality. A pest attack on rice fruit can reduce production yields by 10-40%, while heavy attacks can reduce yields by up to 100% (Ramadhan et al., 2022) .

3.6 *Valanga nigricornis*

Own brownish green, there are spots on the back thighs. The rear calf bones are yellow and red. Two (pair) facet eyes. A pair of antennas. Three-segmented tarsi. The femur of the forelegs is enlarged, and the ovosity is short.

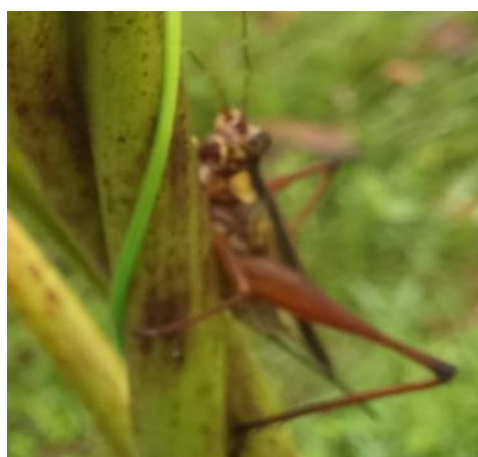


Figure 7. *Valanga nigricornis* pest

Wood grasshoppers cause leaves and shoots on plants to tear, holes and even cut leaf stalks. This is in line with (VI Sari et al., 2022) stating that grasshoppers are insects that are pests for agriculture. Young and adult grasshoppers are very greedy and generally attack plants from the Graminae family such as rice, corn and sugar cane, but also attack ornamental plants, fruit, vegetables and plantation crops. Plants attacked by this pest have symptoms of

tearing on the leaves, and in severe attacks almost the entire leaf is lost, including the leaf veins.

4. CONCLUSIONS

Identification of diversity in long beans succeeded in obtaining six insect species, namely fruit flies (*Bactrocera dorsalis*), green bottle flies (*Lucilia sericata*), red imported fire ants (*Solenopsis invicta*), koksii beetles (*Epilachna admirabilis*), Sangit grasshoppers (*Leptocorisa acuta*) and grasshoppers. (*Valanga nigricornis*). Insects that can be found on long bean cultivation plants have different attack symptoms and not all of them are destructive, some are also natural enemies (predators) for the plants.

It is best that this research is not only carried out on long bean fields, and is tried with the latest treatments so that it can produce maximum results. And carry out monitoring every day so that you can better monitor pests that attack plants.

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5. Reference

- Abidin, Z. (2021). Pengaruh Refugia Kacang Panjang (*Vigna unguiculata*) dan Bunga Telekan (*Tagetes erecta*) Terhadap Populasi Musuh Alami dan Hama pada Padi Organik. *G-Tech: Jurnal Teknologi Terapan*, 5(1), 395–401.
- Agustine, S. D., Aprilia, P., Cindi, A., & ... (2023). Inventarisasi Serangga Predator (Coleoptera) di Lahan Pare (*Momordica charantia*) dan Kacang Panjang (*Vigna sesquipedalis*) di Ogan Ilir, Sumatera Selatan. *Seminar Nasional ...*, 6051, 674–681.
- Arsi, A., Resita, R., SHK, S., Gunawan, B., Herlinda, S., Pujiastuti, Y., Suwandi, Irsan, C., Hamidson, H., Anwar, R., Efendi, & Budiarti, L. (2020). Pengaruh Kultur Teknis Terhadap Serangan Hama Dan Penyakit Pada Tanaman Kacang Panjang Di Kecamatan Lempuing Kabupaten Ogan Komering Ilir. *Sustainability (Switzerland)*, 14(2), 1–4.
- Fitri, M., Haris, R., & Indri, H. (2020). Biology of Stink Bug (*Nezara viridula* Linnaes, Hemiptera: Pentatomidae) with Long Beans as a Feed (*Vigna sinensis* L.) in Laboratory. *Agritrop : Jurnal Ilmu-Ilmu Pertanian (Journal of Agricultural Science)*, 18(1), 89–97.
- Hidayat, G. W., Romansah, E., Andriyani, L., Widya Kusuma, M., Luthfi Kusuma, M., Thosin, T., Umayah, A., Gunawan, B., & Arsi, A. (2022). “Revitalisasi Sumber Pangan Nabati dan Hewani Pascapandemi dalam Mendukung Pertanian Lahan Suboptimal secara Berkelanjutan” Inventarisasi Serangga Hama dan Predator pada Pertanaman Kacang Panjang (*Vigna sinensis* L.) di Kabupaten Ogan Ilir, Sumatera Selatan. *Universitas Sriwijaya (UNSRI)*, 6051, 414–422.
- Ilmam Hidayat, H. S., & Guritno, B. (2023). Pengaruh Pupuk Nitrogen dan Kalium terhadap Pertumbuhan dan Hasil Tanaman Kacang Panjang (*Vigna sinensis* L.). *Produksi Tanaman*, 011(04), 248–257.
- Maesyaroh, S. S., Mutakin, J., Sopandi, F. A., & Afifah, T. N. (2020). Pengaruh berbagai dosis atraktan terhadap efektivitas perangkap botol lalat buah pada tanaman jeruk (. *Prosiding Seminar Nasional Fakultas Pertanian UPN “Veteran” Yogyakarta 2020*, 133–139.
- Maimunah, S., Husni, H., & Sapdi, S. (2022). Keanekaragaman Serangga Herbivora pada Budidaya Tumpangsari Cabai, Bawang Daun, Kacang Panjang dan Monokultu. *Jurnal Ilmiah Mahasiswa Pertanian*, 7(2), 724–734.
- Murwani, A., Putrimulya, R. S. G., Nurbayti, H., A'yun, Q., & Hanik, N. R. (2022). Identification of Pests and

- Diseases in Long Bean Plants (*Vigna sinesis* L.) in Ploso Village, Jumapolo, Karanganyar. *Jurnal Biologi Tropis*, 22(2), 511–517.
- Pruna, W., Guarderas, P., Donoso, D. A., & Barragán, Á. (2019). Life cycle of *Lucilia sericata* (Meigen 1826) collected from Andean mountains. *Neotropical Biodiversity*, 5(1), 3–9.
- Rahman, A., Yuswana, A., Siti Anima Hisein, W., Pakki, T., Botek, M., Nur Isnaini Ulfa, dan, Proteksi Tanaman, J., Pertanian, F., Halu Oleo, U., & Korespondensi, P. (2022). PERILAKU SEMUT API (*Solenopsis invicta*) YANG BERASOSIASI DENGAN TANAMAN BUAH NAGA (*Hylocereus* sp.) The Behavior of Fire Ants (*Solenopsis invicta*) Associated with Dragon Fruit Plants (*Hylocereus* sp.). *Berkala Ilmu-Ilmu Pertanian-Journal of Agricultural Sciences*, 2022(02), 91–97.
- Ramadhan, A., Arista Bakti, K. K., Mayangsari, M. A., Qurrotaa'yunin, T. A., & Rahmawati, Y. F. (2022). IDENTIFIKASI PERILAKU WALANG SANGIT (*Leptocorisa oratorius*) DI KEBUN BIOLOGI FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM, UNIVERSITAS NEGERI YOGYAKARTA. *Kingdom (The Journal of Biological Studies)*, 8(1), 85–93.
- Sari, D. E., Mutmainna, I., Yustisia, D., Agroteknologi, P. S., Tinggi, S., Pertanian, I., & Sinjai, M. (2020). *Identifikasi Hama Lalat Buah (Diptera : Tephritidae pada Beberapa Tanaman Hortikultura*. 5(1), 1–9.
- Sari, V. I., Mudasir, & Sylvia Madusari. (2022). Pengendalian Hama Belalang (*Valanga nigricornis*) Dengan Bioinsektisida Batang Brotowali (*Tinospora crispa*). *Jurnal Pengelolaan Perkebunan (JPP)*, 3(2), 46–53.
- Sutarma, F. A., Rhomadon, A. G., Asrul, M. R., Fitriyani, D., Rahma, F. A., Anggraini, H. L., Umayah, A., Gunawan, B., & Arsi, A. (2023). Inventarisasi dan Identifikasi Kumbang Koksi (Coleoptera:Coccinellidae) pada Tanaman Solanaceae di Kabupaten Ogan Ilir, Sumatera Selatan. *Seminar Nasional Lahan Suboptimal*, 10(1), 450–457.