Sainmatika: Jurnal Ilmiah Matematika dan Ilmu Pengetahuan Alam
Volume 23 No. 1, June 2026 DOI 10.31851/sainmatika.v23i1.21399
https://jurnal.univpgri-palembang.ac.id/index.php/sainmatika

Incidence of Banana Leaf-Rollers Caterpillar *(Erionota thrax* L.*)* Attack on Banana Mas *(Musa acuminata),* South Sumatra

Arsi*, Suparman, Harman Hamidson, Titi Tricahyati, Muhammad Luthfi Kusuma
*****e-mail: arsi@fp.unsri.ac.id

Program Study of Plant Protection, Faculty of Agriculture, Sriwijaya University, Palembang, Indonesia

ABSTRACT

Banana plants are among the tropical fruit crops widely cultivated in Indonesia. Banana cultivation is not immune to pests that can reduce banana production. One pest that attacks banana plants is the banana skipper (*Erionota thrax* L.). This pest is characterized by its method of attacking plants: rolling up banana leaves. Indonesia is known as one of the world's banana producers. The purpose of this study was to determine the level of attack caused by leaf-rolling caterpillars on plantain trees in South Sumatra. This study used the Purposive Sampling method, while the data collection technique was carried out by taking samples from banana plants (*Musa acuminata*) affected in South Sumatra, consisting of 5 regencies/cities, namely Banyuasin Regency, Muara Enim Regency, Ogan Ilir Regency, East Ogan Komering Ulu Regency, and Lubuk Linggau City. Based on the research results, the highest percentage of affected banana clumps was in East OKU Regency at 29%, while the lowest was in Lubuk Linggau City at 13%. The highest number of affected banana stems was in Ogan Ilir Regency at 26%, and the lowest was in Banyuasin Regency at 11%. The highest percentage of attacks was in Lubuk Linggau City at 46.67%, and the lowest was in Banyuasin Regency at 34.78%. Lubuk Linggau is located in the lowlands and midlands, which provide *E. thrax* with suitable temperatures, resulting in healthier banana plants and better food for the larvae.

Keywords: Attack Intensity, Banana Mas, Erionota thrax

INTRODUCTION

Banana plants (*Musa* spp.) belong to the family Musaceae and are among the most important horticultural crops in tropical countries, including Indonesia. Bananas contain various nutrients that are beneficial to human health and are widely consumed by the Indonesian population (Hasanah and Daningsih, 2017; Nadeeshani et al., 2018). In Indonesia, bananas rank among the highest in national fruit consumption due to their availability, affordability, and adaptability to diverse environmental conditions (Fatin et al., 2020; Nola et al., 2022; Rumapea et al., 2022). Banana plants are commonly cultivated in home gardens, rice fields, and agricultural land because they are easy to grow and widely distributed in rural areas (Zunaidi et al., 2021; Sinta dan Hasibuan 2023). Indonesia is also recognized as one of the world's major banana-producing countries, with wide cultivated varieties showing considerable genetic diversity (Khaqqi et al., 2023). Among these, the Mas banana cultivar is considered superior because of its attractive appearance, sweet taste, and bright yellow fruit flesh (Laksamana et al., 2018)

Despite the high economic importance of banana plants, banana cultivation is still constrained by several

p-ISSN 1829 586X
e-ISSN 2581-0170

insect pests, one of the most important being the banana leaf roller, *E. thrax* L. This pest damages banana leaves by rolling and feeding on them, thereby reducing the photosynthetic area and potentially decreasing plant growth and yield. Previous studies have mainly focused on the biology, distribution, and general damage caused by *E. thrax*. In contrast, information regarding its infestation characteristics, damage intensity, or association with specific banana cultivars remains limited. In particular, studies evaluating the occurrence and damage caused by E. thrax on banana cultivars in Indonesia remain scarce. This lack of information limits the development of effective pest management strategies and cultivar-based control approaches. Therefore, this study was conducted to investigate the occurrence and damage caused by *E. thrax* on banana plants, to provide scientific information to support sustainable banana pest management programs.

One of the major pests attacking banana plants is the banana leaf roller, *E. thrax* L. (Luqmana et al., 2019; Mursyidin et al., 2025; Subari et al., 2022a). This pest damages banana plants by rolling the leaves, causing severe defoliation when infestations are left uncontrolled, leaving only the leaf veins visible (Tanzil et al., 2022). The larvae are green, approximately 7 cm long, and covered with a white powdery layer (Imanuel et al., 2021). Female butterflies lay yellow eggs on the underside edges of banana leaves. After hatching, the larvae cut and roll the leaves, feeding inside the rolled leaves and forming larger rolls as they grow (Cock et al., 2019; Wibowo et al., 2015). Adult butterflies are brown and mainly active during the late afternoon.

E. thrax has been widely distributed in several Southeast Asian countries, including Indonesia, and is recognized as one of the most destructive pests of banana plants (Subari et al., 2022). In South Sumatra, where banana plants are widely cultivated in home gardens and agricultural areas, infestations of *E. thrax* have become an important concern because severe attacks can substantially reduce leaf area and negatively affect banana production (Setiawan et al., 2019). The larval stage is the most damaging, as larvae cut and roll banana leaves into tube-like structures for feeding and shelter. Severe infestations may leave only the leaf veins visible, resulting in reduced photosynthetic capacity and decreased plant productivity (Rahmawati et al., 2018). Previous studies have generally reported the biology, distribution, and general symptoms of damage caused by E. thrax; however, information on the extent of damage this pest causes to Mas banana plants in South Sumatra remains limited. In addition, studies that specifically evaluate the intensity of E. thrax attacks under local cultivation conditions remain scarce. Therefore, this study was conducted to determine the level of damage caused by *E. thrax* on Mas banana plants in South Sumatra. The findings of this study are expected to provide baseline information for developing more effective pest management strategies for banana cultivation in the region.

MATERIAL AND METHOD

The research was conducted in banana plantations across 26 locations in South Sumatra, Indonesia, covering 5 regencies/cities: Banyuasin, Muara Enim, Ogan Ilir, Ogan Komering Ulu Timur, and Lubuk Linggau. These areas represent lowland banana-producing regions with diverse banana cultivars. The study used a survey method with purposive sampling. Sampling sites were selected based on the presence of banana plants infested with the leaf-rolling

p-ISSN 1829 586X
e-ISSN 2581-0170

caterpillar *Erionota thrax*. Infested banana plants were used as the central observation points. From each central point, an observation area was determined by drawing an imaginary circular plot with a radius of 50 m. Within each observation area, banana clumps were recorded and identified. Observations included counting the number of banana plants attacked by *E. thrax* and those that were healthy. Infested plants were identified based on typical symptoms, such as rolled leaves caused by young caterpillars cutting the leaf margins and forming tubular leaf structures. The incidence of pest was calculated using the formula proposed (Supriatna *et al.*, 2017):

$$P = \frac{A}{B} \times 100\%$$

Notes :
P = Incidence of pest or attacks (%)
A = Total number of infected or infested plants,
B = Total number of observed plants

Data Analysis

Presenting the data obtained based on the observed variables as images, is conducted using Microsoft Excel, with presentations in the form of tables, images, and diagrams.

RESULT AND DISCUSSION

The data collected on the number of banana 'Mas' clusters across several regencies in South Sumatra indicate the important role of this commodity in regional agriculture. The graph below shows the distribution of banana 'Mas' clusters in five regencies, namely Ogan Ilir, East Ogan Komering Ulu, Banyuasin, Lubuk Linggau, and Muara Enim. East Ogan Komering Ulu Regency recorded the highest percentage of banana 'Mas' clusters at 29%, followed by Ogan Ilir Regency (26%), Banyuasin Regency (17%), Muara Enim Regency (15%), and Lubuk Linggau City (13%). The high number of banana clusters in East Ogan Komering Ulu and Ogan Ilir is influenced by favorable abiotic factors, including suitable rainfall, optimal temperature, fertile soil, and adequate soil moisture, which support banana growth and fruit production. In addition, biotic factors also contribute to banana productivity, including the availability of healthy planting materials, cultivation practices, pollinator activity, and lower levels of pest and disease attacks. Differences in environmental conditions and pest pressure among regencies may influence the variation in banana cluster production observed in South Sumatra (Figure 1).

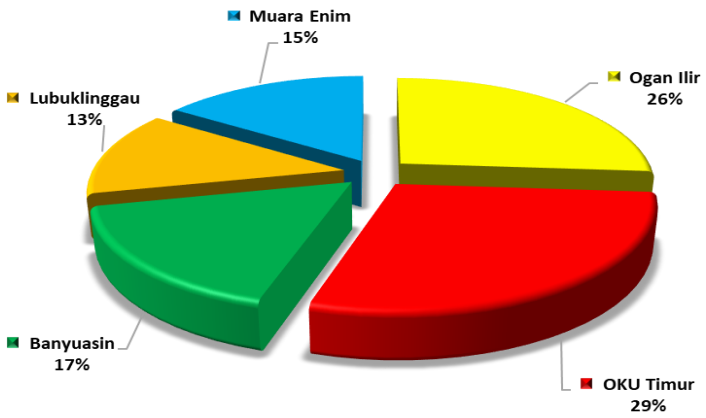

Figure 1. Incidence of Banana Mas Varieties in South Sumatra

p-ISSN 1829 586X
e-ISSN 2581-0170

The banana leaf roller (*Erionota thrax* L.) is an important pest of banana plants. *E. thrax* attacks the leaves of the plant by rolling them, and the larvae reside inside the rolled leaves. The morphology of *E. thrax* ranges in color from green to brownish, depending on the larval instar. During observations, several larvae were found on the same leaf, each rolling and binding its leaf close to the roll of another larva, then moving on to form rolls on other parts of the leaf (Lubis et al., 2022). The larvae feed on the inside of the leaf rolls, then move to other locations and form larger rolls as they progress through their instars. Young instar larvae have a relatively high mortality rate because their bodies are not yet covered with a wax layer and their leaf rolls remain open.

The highest number of clumps is in the South Indralaya District, with 22, while the lowest is in the Bunga Mayang District, with only 3. Various factors can affect the number of 'pisang mas' clumps based on the provided data, such as climatic conditions, since it is known that the climate in each regency can differ and influence the growth of 'pisang mas'. Soil quality, including factors like nutrient content and drainage, can vary from one area to another. Fertile soil that is suitable for the growth of 'pisang mas' will support a larger number of clumps (Table 1).

Table 1. Number of Banana Clumps Observed in the Study in South Sumatra

District/Regency	Sub-District	Coordinates		Altitude (mdpl)	Number of clumps
		Longitude (BTBB)	Latitude (LSLU)		
Ogan Ilir	Indralaya Selatan	3°315312"S	104°697171"E	16, 1	22
OKU Timur	Martapura	4°192717"S	104°19'46’97"E	102,0	21
	Bunga Mayang	4°204968"S	104°19'27’18"E	107,4	3
Banyuasin	Talang Kelapa	2° 53'50”S	104° 38' 19"E	16,9	14
Lubuklinggau	Lubuklinggau Utara 2	3°16096546"S	102°53'3510942”E	12,4	11
Muara Enim	Belimbing	3°12’40’578”S	104°39’5461”E	34,8	13

The number of stems found in the regencies/cities in South Sumatra includes: Ogan Ilir Regency, Ogan Komering Ulu Timur Regency, Banyuasin Regency, Lubuk Linggau City, and Muara Enim Regency. The number of banana stems growing on a single plant or stump can be influenced by several factors, including plant variety, age, soil conditions, climate, and weather, as well as diseases and pests that attack banana plants. The highest percentage of banana stems attacked by the pest *E. thrax* is in Ogan Ilir Regency at 26%, followed by Lubuk Linggau City at 23%, Ogan Komering Ulu Timur Regency at 21%, Ogan Ilir Regency at 20%, Muara Enim Regency at 19%, and the lowest percentage is in Banyuasin Regency at 17%. These percentages do not differ significantly between regencies/cities. These differences indicate that environmental conditions and cultivation practices strongly influence banana productivity in each region. Ecologically, regions with higher banana cluster percentages likely possess more favorable abiotic conditions, such as suitable rainfall, temperature, soil fertility, and water availability, which support better plant growth and fruit formation. In addition, lower pest and disease pressure may also contribute to higher productivity in these areas. (Figure 2)

p-ISSN 1829 586X
e-ISSN 2581-0170

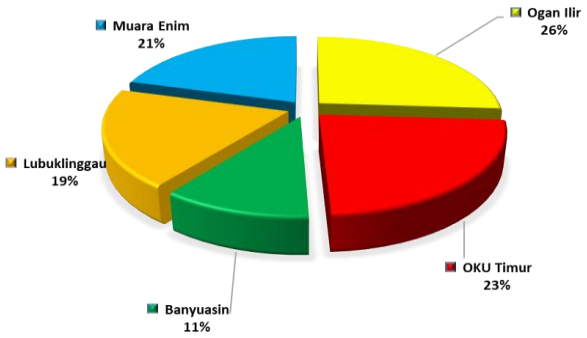

Figure 2. Incidence of Banana Plants Infected by *Erionota thrax* in South Sumatra

The attack level of *E. thrax* varies with its developmental stage. In the young instar, the leaves only curl slightly, and as the larvae grow, the attacked leaves can become bare, showing only the veins (Subari et al., 2022b). As soon as the larvae emerge from their eggs, they begin cutting the leaf lamina along the edges and rolling it up, eventually causing the leaves to dry out, tear, and potentially kill the plant if the damage continues. The total number of observed banana plants was 181, including 108 healthy and 73 infected. The highest number of infected plants was found in Talang Kelapa District, Banyuasin, and Lubuk Linggau Selatan 2, Lubuk Linggau, with 7 infected plants, followed by the highest number of healthy plants found in Talang Kelapa District, Banyuasin (Table 2).

Table 2. Incidence of Banana Plants Infected by *Erionota thrax* in South Sumatra

District/Regency	Sub-District	Coordinates		Altitude (MDPL)	Number of Stems	
		Longitude (BTBB)	Latitude (LSLU)		Healthy	Attacked
Ogan Ilir	Indralaya Selatan	3°315312” S	104°697171” E	16, 1	6	4
		3°312672”S	104°698526”E	9,5	3	3
		3°310210”S	104°699793”E	9,9	4	2
		3°310210”S	104°699793”E	9,9	2	1
		3°310210”S	104°699793”E	9,9	5	5
		3°310210”S	104°699793”E	9,9	8	4
OKU Timur	Martapura	4°192722"S	104°19'46.54"E	104,5	3	2
		4°192735"S	104°19'46.89"E	104,8	8	5
		4°192717"S	104°19'46.97"E	102,0	2	2
		4°192742"S	104°19'46.65"E	110,5	3	1
		4°192754"S	104°19'47.12"E	115,2	2	3
		4°192766"S	104°19'47.05"E	113,8	4	2
	Bunga Mayang	4°204968"S	104°19'27.18"E	107,4	2	0
		4°204973"S	104°19'26.86"E	107,3	0	2
Banyuasin	Talang Kelapa	2° 53' 50"S	104° 38' 19"E	16,9	4	1
		2° 53' 50"S	104° 38' 19"E	16,9	11	7
Lubuk Linggau	Lubuk Linggau Utara 2	3°16096546"S	102°53'3510942”E	12,4	2	3
		3°16096546"S	102°53'3510942”E	12,4	6	4
	Lubuk Linggau Selatan	3°16096546"S	102°53'3510942”E	12,4	8	7
Muara Enim	Belimbing	3°12’40’593”S	104°39’5’5218”E	28.4	2	2
		3°12’40’584”S	104°39’5’522”E	33,5	5	3
		3°12’40’578”S	104°39’5’461”E	34,8	6	2
		3°12’40’518”S	104°39’5’598”E	33,9	4	4
		3°12’40’585”S	104°39’5’437”E	34,4	8	4

E. thrax, also known as the "banana skipper" or "banana leaf roller," is an important pest of banana plants. The morphology of *E. thrax* larvae is light green to pale green. The larva's body is covered with fine hairs and a white powdery substance resulting from its metabolic residues. *E. thrax* has a dark brown to black head, with the larva measuring about 2 inches long. The symptoms of *E. thrax* infestation include leaf rolling. *E. thrax* cuts parts of the leaf from the edges at an angle, then rolls them to form a small tube. Severe infestations by these larvae can cause leaves to become bare, leaving only the midrib of the banana leaf. *E. thrax* cuts parts of the leaf from the edges at an angle, then rolls them to form a small tube. The caterpillars feed on the leaf from the interior and discard metabolic waste (Figure 3).

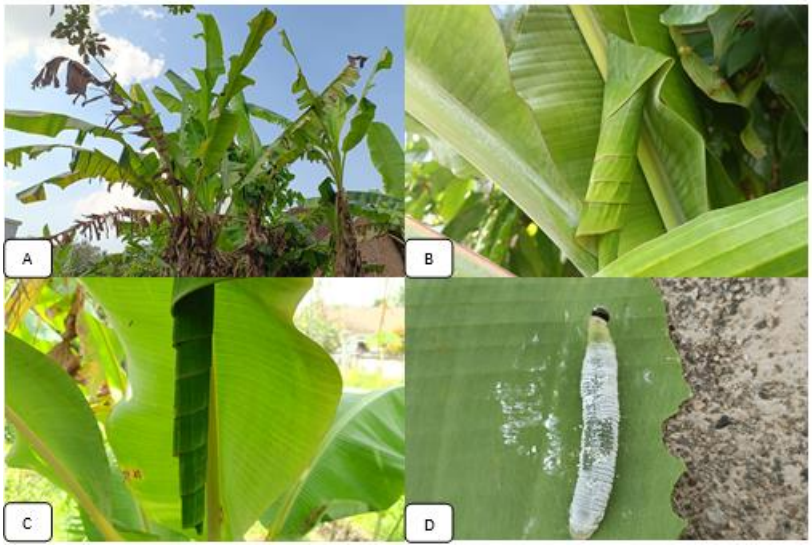

Figure 3. Mas Banana Plant Infected (A), Rolling Caused by *E. thrax* (B)(C), and larvae of *E. thrax* (D)

The percentage observed in this study was recorded in several districts/cities in South Sumatra. The percentage was calculated using a formula corresponding to the attack percentage formula. The highest attack percentage was found in Lubuk Linggau City, at 23%. Lubuk Linggau is located in a highland area, which provides optimal conditions for *E. thrax*, resulting in healthier banana plants and better food for the larvae. Lubuk Linggau regency is situated at an altitude of approximately 124.4 meters above sea level. The number of affected stems was 14, out of a total of 30 plants. *E. thrax* attacks cause serious problems for banana plants, which are an important crop in the agricultural industry in many countries. Based on the observations, *E. thrax* attacks all banana cultivars across the five locations. The lowest attack percentage was observed in Banyuasin, at 34.78%, with 8 plants affected. The highest percentage was in Lubuk Linggau Regency at 46.67%, with 14 plants affected. The growth of *E. thrax* depends on suitable temperatures and climate, as well as supportive environmental conditions; under these conditions, the larvae can reproduce rapidly and cause severe infestations in banana plantations (Table 3).

p-ISSN 1829 586X
e-ISSN 2581-0170

Table 3. Incidence of *Erionota thrax* attacks on Pisang Mas observed in a study in South Sumatra

District/Regency	Number of Stems	Number of Stems		Percentage of attacks (%)
		Attacked	Healthy	
Ogan Ilir	47	19	28	40,43
OKU Timur	41	17	24	41,46
Banyuasin	23	8	15	34,78
Lubuklinggau	30	14	16	46,67
Muara Enim	40	15	25	37,50

Environmental factors greatly influence the attack rate of *E. thrax*. In high-humidity weather, *E. thrax* finds plenty of food sources because banana plants have lush leaves, preventing the caterpillars from starving. Adequate food availability allows *E. thrax* to reproduce more effectively. Environmental factors, such as an imbalanced land ecosystem, can create a more vulnerable environment. Air temperature and humidity also significantly affect the development of *E. thrax*; warm temperatures and high humidity can accelerate their growth. *E. thrax* can be controlled in several ways, such as using natural enemies. The presence of natural enemies, such as parasitoids and predators that prey on *E. thrax*, can affect the population of these caterpillars. Agricultural practices also influence the development of *E. thrax*, including land management, the cutting of overly mature banana leaves, and the use of fertilizers. Control can also be carried out through regular monitoring of the plantation, with direct removal of larvae to reduce the population of *E. thrax*. Furthermore, land sanitation by cleaning the field and pruning affected leaves, as well as crop rotation, can also reduce the risk of repeated *E. thrax* attacks on banana plants.

CONCLUSION

Mas banana plants were attacked by *Erionota thrax*, causing leaf rolling damage. The highest infestation of banana clumps was found in East Ogan Komering Ulu, while the highest infestation of banana stems occurred in Ogan Ilir. The highest attack incidence was recorded in Lubuk Linggau City (46.67%), whereas the lowest was found in Banyuasin Regency (34.78%). These results indicate that *E. thrax* infestation levels vary among regions in South Sumatra.

Acknowledgments

Research Team and Lecturers Program Study Plant Protection, Faculty of Agriculture, Sriwijaya University.

REFERENCES

Cock, M. J. W., Buddie, A. G., & Cafa, G. (2019). Piloting the Use of DNA barcoding in support of natural enemy surveys : new parasitoid records for banana skippers (*Erionota* spp., Lepidoptera, Hesperiidae) in Malaysia. *Journal of Asia-Pacific Entomology*, *22*(1), 183–188. https://doi.org/10.1016/j.aspen.2018.12.019

Fatin, Z. N., Titik, E., & Mulyatno, S. B. (2020). The analysis of price and market integration of banana commodities. *RJOAS*, *3*(99), 61–68. https://doi.org/10.18551/rjoas.2020-03.07

Hafizah, D., Tanjung, F., Khairati, R., Hakimi, R., Akbar, I., & Zacky, F. Al. (2024). Evaluation of banana seed distribution in the " nagari

mandiri pangan " program in Padang Pariaman Regency, West Sumatra. *Journal of Integrated Agribusiness*, *6*(2), 252–260. https://doi.org/10.33019/jia.v6i2.5756

Imanuel, P., Suswati, & Indrawaty, A. (2021). Inventarisasi keanekaragaman musuh alami *Erionota thrax* L. pada beberapa jenis tanaman pisang bermikoriza di Desa Sampali. *Jurnal Ilmiah Pertanian (JIPERTA)*, *3*(1), 56–63.

Khaqqi, I., Prafiadi, S., Abidin, N., & Maturahmah, E. (2023). Filtrat daun mengkudu sebagai bioinsektisida ulat penggulung daun pada tanaman pisang. *Bincang Sains Dan Teknologi (BST)*, *2*(3), 90–97. https://doi.org/10.56741/bst.v2i03.357

Laksamana Suci, D., Sulhan, M., & Endy Budianto, A. (2018). Implementasi metode dempster shafer untuk diagnosa hama dan penyakit tanaman pisang mas berbasis Web. *Seminar Nasional FST*, *1*(1), 129–139.

Lestari, W., Meutia, R., & Saputra, M. (2022). Innovation of the utilization of sale banana (Pisang Sale) made from awak banana (*Musa paradisiaca* cv . Awak) and kepok banana (*Musa acuminata balbisiana* Colla) into skin moisturizer. *Buliten Pengabdian*, *2*(3), 70–74.

Lubis, M. H., Siregar, A. Z., & Pinem, M. I. (2022). Inventarisasi parasitoid larva hama penggulung daun pisang (*E. thrax* L.) di Desa Sampali Kecamatan Percut Sei Tuan Kabupaten Deli Serdang. *Jurnal Agrotek Indonesia*, *7*(2), 60–67. https://doi.org/10.4213/mzm13256

Luqmana, I., Putra, I., & Utami, L. B. (2019). The banana leaf roller *Erionota thrax* L. (Lepidoptera : Hesperiidae) and their parasitoid in germ plasm of Yogyakarta. *Gontor AGROTECH Science Journal*, *4*(2), 125–137.

Mursyidin, A. H., Jihadi, A., S, M. Q., Wahyu, L., & Pandya, A. (2025). Parasitoid larva yang berasosiasi dengan ulat penggulung daun pisang *Erionota thrax* Linnaeus (Lepidoptera : Hesperiidae) di Lombok Timur. *Jurnal Agrikultura*, *36*(3), 459–470.

Nadeeshani, H., Samarasinghe, G., Wimalasiri, S., Silva, R., & Madhujith, T. (2018). Evaluation of the nutritional value of selected banana varieties grown in Sri Lanka. *Proceedings of 2nd International Conference on Food Quality, Safety and Security*, *1*, 17–25.

Nashar, H. (2015). Proses Jenis tanaman pisang untuk dilakukan oleh kelompok usaha tani. *Jurnal Iqtishadia*, *2*(1), 92–116.

Nola, F., Priyanto, E., & Hidayat, S. I. (2022). Competitiveness analysis and factors affecting Indonesian banana exports in the destination country. *The International Journal of Business Management and Technology*, *6*(6), 18–25.

Rahmawati, Pasaru, F., & Yunus, M. (2018). Observasi jenis parasitoid *Erionata thrax* Linnaeus (Lepidoptera : Hesperidae) pada ketinggian tempat yang berbeda di Kabupaten Sigi. *Jurnal Agrotekbis*, *6*(2), 239–246.

Rumapea, E., Roessali, W., Prasetyo, E., & Sciences, A. (2022). Analysis of consumer attitudes and preferences to banana purchase decisions in the traditional market of Semarang city. *Jurnal Sosial Ekonomi Dan Kebijakan Pertanian*, *6*(May), 94–104.

Setiawan, S., Maimunah, M., & Suswati, S. (2019). Keragaman parasitoid *Erionota thrax* L. pada dua jenis tanaman pisang bermikoriza di Kabupaten Deli Serdang. *Jurnal*

Ilmiah Pertanian (JIPERTA), *1*(1), 37–44. https://doi.org/10.31289/jiperta.v1i1.95

Sinta, D., & Hasibuan, R. (2023). Analisis morfologi tanaman pisang kepok (*Musa paradisiaca* Var. *Balbisiana* colla) di Desa Tanjung Selamat Kabupaten Labuhanbatu Selatan. *Bioscientist : Jurnal Ilmiah Biologi*, *11*(1), 86–97.

Subari, W., Goo, N., & Siahaya, V. G. (2022a). Damage to banana plants by banana skipper (*Erionota thrax* L.) on Ambon Island. *Agrologia*, *11*(2), 107–114.

Subari, W., Goo, N., & Siahaya, V. G. (2022b). Kerusakan tanaman pisang oleh hama ulat penggulung daun (*Erionota thrax* L.) di Pulau Ambon. *Agrologia*, *11*(2), 107–114.

Supriatna, A. H., Haneda, N. F., & Wahyudi, I. (2017). Sebaran populasi, persentase serangan, dan tingkat kerusakan akibat hama boktor pada tanaman sengon: pengaruh umur, diameter, dan tinggi pohon. *Jurnal Silvikultur Tropika*, *8*(2), 79–87.

Suryani, R., & Owbel. (2019). Pentingnya eksplorasi dan karakterisasi tanaman pisang sehingga sumber daya genetik tetap terjaga. *Agriculture Journal*, *2*(2), 64–76.

Tanzil, A. I., Purnomo, H., Haryadi, N. T., & Muhlison, W. (2022). Implementation of banana plant and diseases management technology as an effort to improve banana producing center businesses in Lumajang District. *Jurnal Pengabdian Kepada Masyarakat*, *7*(1), 145–155. https://doi.org/10.32734/abdimastalenta.v7i1.7294

Wibowo, L., Indriyati, & Purnomo. (2015). Kemelimpahan dan keanekaragaman jenis parasitoid daun pisang *Erionata thrax* L. di Kabupaten Lampung Selatan. *Jurnal HPT Tropika*, *15*(1), 26–32.

Zeina, N., Sari, M., Kanya, N., & Kamil, I. (2024). Marketing promotion finance and accounting system in banana chip and peel community micro business Bandung. *Indonesian Journal of Community Research and Engagement*, *5*(2), 823–837. https://doi.org/10.37680/amalee.v5i2.5904

Zunaidi, M., Pane, U. F. S. S., & Nasyuha, A. H. (2021). Analisis teorema bayes dalam mendiagnosa penyakit tanaman pisang. *Jurnal Media Informatika Budidarma*, *5*(4), 1302–1308. https://doi.org/10.30865/mib.v5i4.3225

p-ISSN 1829 586X
e-ISSN 2581-0170