

## Insect Biodiversity on Inorganic Cayenne Pepper Plants in Plosogeneng Village, Jombang Regency

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### **ABSTRACT**

*This research aims to determine the insect diversity index found on cayenne pepper plants in Plosogeneng Village, Jombang District and their dominance value. The method used in this research is a quantitative method, sampling was carried out by installing Yellow Trap insect traps which were placed at several points for 12 days. The results of this research are the insect diversity index found in this research, there are 5 families, a total of 28 individuals. Consists of Oxyopidae, Coccinellidae, Pentatomidae, Noctuidae and Coreidae. The diversity index (H') value for insects is -1.35. Meanwhile, the dominance index for cayenne pepper plantations in Plosogeneng Village, Jombang District in the Yellow Trap is 0.31.*

**Keywords:** *Insect Diversity, Dominance Index, Chili Plants*

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### **INTRODUCTION**

Indonesia is known as an agricultural country, many people are involved in agriculture and use plants for their daily needs. Vegetables are horticultural crops with high economic value because they contain vitamins and minerals. Many types of vegetables are available all year round, including tomatoes, kale, eggplant, spinach, lettuce, mustard greens and chilies. Chili is one of the important agricultural commodities in Indonesia. Its unique aroma, taste and color make it widely used as a spice and seasoning in cooking. As the population increases, demand for chilies also increases. Meeting these needs can be done by increasing chili production through the use of inorganic or chemical fertilizers. However, excessive use of chemical fertilizers can damage the ecosystem and environment and reduce the nutrient content of the soil. Insects have an influence on agricultural ecosystems. Their presence in plants can be categorized into herbivores, pollinators, predators, decomposers and parasitoids. Insects adapt to their environment based on available resources, such as plants, which determine insect diversity and abundance. NPK fertilizer is an inorganic fertilizer that is efficient in increasing the availability of macro nutrients. The advantages include single fertilizer replacement, simple use, and time and cost saving transportation and storage. Identification of insect types in an ecosystem through morphology and functional status is important for grouping species and creating a learning resource for farmers.

### **METHOD**

The materials and tools used are cayenne pepper, pest traps, Yellow Trap, books, pens, plastic and bamboo supports. The tool used to identify types of insects is a microscope. Sampling

is carried out by taking and collecting insects attached to each predetermined trap sample point. The insect samples taken were insects trapped and attached to Yellow Trap paper. These traps were placed in 5 different places every 3 days for 4 intervals for collecting insects in the experimental field by placing them in 4 corners of the field and 1 in the middle of the field. The insects that were trapped were then identified. Data collection was carried out in August 2023 4 times at 3 day intervals. Setting traps starts at 05.00 WIB and collecting traps at 17.00 WIB. Types of chili plant insects that stick to Yellow Trap traps. The collected insects will be identified according to the insect's body parts under the microscope, with comparisons using a minimum termination key to arrive at family level identification. Insect identification is carried out using a microscope and is seen based on herbivores, predators, parasitoids, detritivores and carnivores.

## RESULT AND DISCUSSION

### Result

The results of the identification of insect families found in the cayenne pepper plantations in Plosogeneng Village, Jombang District, Jombang Regency are as follows:

**Table 1** Data of insect families

Ordo	Famili	Jumlah	Peranan	Literatur
Araneae	Oxyopidae	1	Predator	Borrer, 1996
Coleoptera	Coccinellidae	13	Predator	Siwi, 1991
Hemiptera	Pentatomidae	5	Predator	Siwi, 1991
	Coreidae	3	Parasitoid	Siwi, 1991
Lepidoptera	Noctuidae	6	Herbovor	Borrer, 1996
<b>Total</b>		<b>28</b>		

According to Furlog and Zalucki (2010), the diversity of predatory insects in an ecosystem is very important to know, especially in suppressing pest insect populations through biological control. The greater diversity of predators in an ecosystem can reduce yield losses due to insect pests.

### Discussion

The diversity index is a mathematical depiction to make it easier to analyze information about family types and how many individual types there are in an area (Tambunan, 2013 in Purba, 2020). This is in accordance with the literature of Sanjaya and Dibiyantoro (2012) in Astari (2018) which states that by knowing the insect dominance index value in the vegetable crop environment, it is hoped that we can detect any disturbance to the environment or pollution, for example the side effects of using synthetic pesticides and chemical substances. others in the environment and non-target biota.

The results of observations and calculations according to the diversity index formula on cayenne pepper fields in Plosogeneng Village, Jombang District in the Yellow Trap, it is  $H' = 1.35$ . This shows that the diversity of insects in the land environment is in the medium category because  $1 < H' < 3$ . According to Krebs (1978) environmental conditions are moderate. These environmental conditions support the people in Plosogeneng Village to cultivate cayenne pepper plants due to the stable environmental conditions.

Based on the data that has been processed, the Dominance Index on cayenne pepper fields in Plosogeneng Village, Jombang District in the Yellow Trap is  $C = 0.31$ , indicating that the land has insect

families that are not diverse and the family that dominates is Coccinellidae. If the dominance index is  $>1$ , then the family is not diverse. This is in accordance with the literature of Sanjaya and Dibiyantoro (2012) in Astari (2018) which states that species dominance in the observed insect community is calculated based on the dominance index. If the dominance index value is  $< 1$  then the insect family is diverse, conversely if the dominance index value = 1, then the insect species are not diverse. If there is an insect species that dominates a place, it can be immediately addressed for a balanced insect diversity.

## CONCLUSIONS

Based on the result of the study, the insect diversity index found in this study contained 5 families, totaling 28 individuals. Consists of Oxyopidae, Coccinellidae, Pentatomidae, Noctuidae and Coreidae. The diversity index ( $H'$ ) value of insects is 1.35. This shows that the diversity of insects in the land environment is in the medium category because  $H' = 1 < H < 3$ . The dominance index on the land of cayenne pepper plants in Plosogeneng Village, Jombang District on the Yellow Trap is 0.31, indicating that the land has a variety of insect families and the dominant insect family is Coccinellidae. If the dominance index is  $> 1$ , then the family is not diverse.

## REFERENCES

- Dwi Zahara, A. T., Susantinah Wisnujati, N., Siswati, E., & Endang Siswati, dan. (2021). *Analisis Produksi dan Produktivitas Cabai Rawit (Capsicum frutescens L) di Indonesia* (Vol. 21, Issue 1).
- Panjang, K., Sinensis, V., Di Kabupaten, L. ), Ilir, O., Selatan, S., Yanti, P., Prasetyo, J. C., Zahra, M., Nurjannah, N., Apriani, R., Anggreni, U. A., Umayah, A., Gunawan, B., & Arsi, A. (2022). "Revitalisasi Sumber Pangan Nabati dan Hewani Pascapandemi dalam Mendukung Pertanian Lahan Suboptimal secara Berkelanjutan" *Ketertarikan Berbagai Spesies Serangga pada Pan Trap di Lahan The Preference of Various Insect Species in Pan Trap in Long Bean Field (Vigna sinensis L.) in Ogan Ilir Regency, South Sumatera*.
- Sari, P., Sjam, S., & Santosa, S. (2017). *ANALISIS KERAGAMAN JENIS SERANGGA HERBIVORA DI AREAL PERSAWAHAN KELURAHAN TAMALANREA KOTA MAKASSAR ANALYSIS OF BIODIVERSITY HERBIVORE INSECT IN PADDY FIELD AT TAMALANREA MAKASSAR CITY* (Vol. 2, Issue 1). <https://www.google.com/earth>,
- Sayuthi, M., Proteksi Tanaman, J., & Pertanian, F. (2022). The effect of trapcolor on coffee berry borer attraction. *Jurnal Ilmiah Mahasiswa Pertanian*, 7(4). [www.jim.unsyiah.ac.id/JFP](http://www.jim.unsyiah.ac.id/JFP)
- Selamat Duniaji, A., & Ketut Suter, dan I. (n.d.). *Pengujian Kandungan Residu Pestisida Pada Tanaman Sayuran Di Kabupaten Badung Dengan Kartu Pendeteksi Pestisida (Pesticide Detection Cards) Dan Gas Chromatography Mass Spectrophotometry*.
- Serangga Penyerbuk Pada Perkebunan Stroberi Di Desa Tongkoh Kecamatan Dolat Raya Kabupaten Karo Sumatera Utara Fanisah Labibah, K., Aisyah Hutasuhut, M., Idami, Z., Manik, F., Studi Biologi, P., Sains dan Teknologi, F., Islam Negeri Sumatera Utara, U., Penelitian dan Pengkajian Teknologi Pertanian, I., & Penelitian Tanaman Sayuran, B. (n.d.). *JB&P : Jurnal Biologi dan Pembelajarannya*. 10. <https://ojs.unpkediri.ac.id/index.php/biologi>
- Sholihah, S. M., Syahr Banu, L., Nuraini, A., & Amrih Piguno, P. (2020). Kajian Perbandingan Analisa Usaha Tani serta Produktivitas Tanaman Cabai Rawit di Dalam Polibag dan di Lahan Pekarangan. In *Jurnal Ilmiah Respati* (Vol. 11, Issue 1). <http://ejournal.urindo.ac.id/index.php/pertanian>
- Borror DJ, Triplehorn C.A & Johnson NF. 1996. *Pengenalan Pelajaran Serangga Edisi Enam*. UGM Press. Yogyakarta.
- Sayuran Lokal Indonesia: Provinsi Jawa Timur. (2019). (n.p.): Universitas Brawijaya Press.
- Sidabutar, V., & Lubis, L. (2017). Indeks Keanekaragaman Jenis Serangga pada Fase Vegetatif dan Generatif Tanaman Kedelai (Glycine maxMerill) di Lapangan: Diversity of insects on vegetative and generative phase of soybean (Glycine maxMerill) in the field. *JURNAL ONLINE AGROTEKNOLOGI*, 5(2), 474-483.
- Sipayung, S. M. (2018). *Keanekaragaman serangga pada pertanaman bawang merah (Allium ascalonicum L.) dengan spinkler dan tanpa sprinkler di desa paropo, kecamatan silahisabungan, kabupaten dairi*.