

EXPLORATION OF PESTS ON PLANTS IN GERIH TOURISM PARK, SIBANG KAJA VILLAGE, ABIANSEMAL DISTRICT, BADUNG REGENCY, BALI

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ABSTRACT

*Pest exploration is an action to determine the presence of insect pests that damage plants or the results of their living activities can cause economic losses. The aim of this research is to find out the types of pests that attack plants in the Gerih Tourism Park and how to control them. This research was carried out at Gerih Tourism Park, Sibang Kaja Village, Abiansemal District, Badung Regency, Bali. From January to March 2024, it consists of determining the location, observing and collecting field data. The research location was chosen using purposive sampling. Data from observations in the field were then analyzed descriptively. The results of the research show that there are insect pests on plants in the Gerih tourist park. The results of identification in the field showed that there were *Paracoccus marginatus* pests on *Adenium* spp. The *Tetranychus urticae* pest was found on rose plants, then the *Planococcus citri* pest was found and attacked the croton plants. It is not necessary to control plant pests because the symptoms of pest attacks are in the moderate attack category. It is recommended, based on the results of observations of pest attacks, to monitor human activities that can cause new pests in the Gerih Tourism Park which can reduce the quality and growth of plants in the park.*

Keywords: exploration, pests, control methods and gerah tourist parks

1. INTRODUCTION

Bali Province has developed into a tourism city. The island of Bali or what is often called the Island of the Gods is one of the cities in Indonesia which is still known for its cleanliness and unique culture. The majority of the population in the province of Bali is Hindu, so it is not surprising that this city is often referred to as the city of a thousand temples. The island of Bali is a dense area. Apart from local residents, the city of Bali is also filled with residents who are not native Balinese, where they are just immigrants and guests who have certain goals, namely they are just self-employed, students or university students and so on. Some of the migrant population travels back and forth every day or remains as a non-permanent resident. Tourist visits, both domestic and foreign tourists, also increase the density of the city. Local residents, non-permanent residents and tourists are all observers (observation of the Bali city landscape in carrying out work or travel activities), these observers observe all existing elements (Aditya *et al.*, 2018)

These elements are objects that are observed both directly and indirectly forming the city. There are also agrotourism and recreation areas on the island of Bali, one of which is the Gerih Tourism Park which is located on the Gerih highway, Sibang Kaja Village, Abiansemal District, Badung Regency, Bali. One of the elements in plants is vegetation or trees which are adapted to the type, function and properties of absorbing pollutants, producing O₂, reducing noise (Triwibowo *et al.*, 2014). All plant vegetation has pests that damage the plant and can cause death to the plant itself. The importance of recognizing pests and plant diseases is as a basis for protecting plants caused by pathogens. Pathogens are both caused by biotic and

abiotic pathogens. Identifying pests and diseases caused by pathogens, both biotic and abiotic, is very necessary to know how to identify them and how to deal with them to improve plant quality (Triwibowo *et al.*, 2014).

Plant pests and diseases are not widely known or published in general. Therefore, it is necessary to carry out research on Pest Identification at Gerih Tourism Park, Sibang Kaja Village, Abiansemal District, Badung Regency, Bali

2. RESEARCH METHODOLOGY

2.1 Determination of Location

This research was conducted at Gerih Tourism Park, Sibang Kaja Village, Abiansemal Badung District, Bali. Gerih Tourism Park is located in the middle of a rice field area. The research location was chosen purposively by considering the following:

1. Gerih Tourism Park is a tourist destination that has a specific landscape based on the element of water.
2. Gerih Tourism Park has the potential for better development for local tourists.

The sample is part of the total number of individuals who are the object of research (Arukunto, 2006). Mardalis (2009) stated that sampling was carried out using an accidental sampling technique, namely the researcher determined the samples at the park location.

2.2 Types and Techniques of Data Collection

The data obtained from this research is primary data, namely data taken directly from the field. One of the data collection techniques taken is observation. Observation is a method used in research by making direct observations in the field. This method is used by researchers to make observations about pests in Tourism Parks. Apart from that, another method is Documentation. Documentation is a method used by researchers by taking data, images or photos directly to the research object.

2.3 Data Analysis

Data analysis is carried out after the research data is collected, then the data is processed and analyzed to produce correct conclusions so that they can answer the questions being researched and their truth can be confirmed (Sugiyono, 2011).

3. RELATED RESEARCH/LITERATURE REVIEW

3.1 Park

The general definition of a garden is an area that has space in various conditions. The conditions referred to include location, size or area, climate, and other special conditions such as the specific objectives and functions of park development (Sintia and Murhananto, 2004). According to Arifin (2006) a garden is a piece of open land with a certain area in which trees, shrubs, bushes and grass are planted which can be combined with creations from other materials. Generally used for sports, relaxing, playing, and so on.

3.2 Garden Elements

Landscape elements are everything in the form of objects, sounds, colors and atmosphere that form a landscape, both natural and man-made. Landscape elements in the form of objects consist of two elements, namely living objects and inanimate objects, whereas what is meant by living objects are plants, and what is meant by inanimate objects are soil, sand, rocks and other elements. Landscape elements consist of 3 types, namely hard elements, soft elements and supporting elements (Hakim *et al.*, 2003)

3.3 Pests on plants

Pests in a broad sense are all forms of disturbance to humans, livestock and plants. The definition of pests in a narrow sense related to plant cultivation activities are all animals that damage plants or their results, whose living activities can cause economic losses. The presence of an animal in a plant before it causes economic losses is not considered a pest in this sense. However, their potential as pests will need to be monitored in an activity called monitoring. In general, animals that can become pests can be insects, molluscs, mites, mice, birds or large mammals. (Wati *et al.*, 2021). Apart from being able to damage plants, pests can also act as disease vectors, such as some pests that can transmit dwarf virus disease (Nuryanto, 2018).

4. RESULTS AND DISCUSSION

4.1 General description of the research location

4.1.1 Geographical Location

Gerih Tourism Park is located in Sibang Kaja Village, Abiansema District, Badung Regency, Bali. If from Denpasar the distance is around 14 kilometers with a travel time of approximately 30 minutes. Gerih Tourism Park has a land area of 85 acres

4.1.2 General Conditions

Gerih Tourism Park is located in Sibang Kaja Village, Abiansema District, Badung Regency, Bali. This place is used by local tourists as a place to relax while enjoying the cool rural air, enjoying the elements in the park. This place is always visited by local tourists as a place for recreation and selfie sports and there is another thing that is the attraction of Gerih Tourism Park, namely there is a river for playing boats.

4.2 Pests in Gerih Tourism Park

Table 2. Pests on Plants in Gerih Tourism Park

No	Local Name	Latin Name	Family	Order	In Plants
1	Mealybugs	<i>Paracoccus marginatus</i>	Pseudococcidae	Hemiptera	<i>Adenium spp.</i>
2	Mite	<i>Tetranychus urticae</i>	Tetranychidae	Trombidiformes	Rose
3	Dompolan Flea	<i>Planococcus citri</i>	Lepidoptera	Iponomeutidae	Croton

4.3 *Paracoccus marginatus*

The White Flea *Paracoccus marginatus* is a type of flea whose entire body is covered with a layer of white wax. The body is oval-shaped with short, white hair-like appendages. This pest has several developmental phases, namely: egg, immature (nymph) and imago phases (Miller *et al.*, 2002). *P. marginatus* is a small insect that groups in large numbers. This soft-bodied insect is often found in large numbers and attacks plants by sucking fluids from plant twigs and leaves (Borror, *et al.*, 1996). Mealybugs are pests that attack various types of plants, one of which is *Adenium spp.*

Ways to control *P. marginatus* can use biological methods involving the use of natural enemies, such as parasitoids, which can help control mealybug populations. Even though there are many types of parasitoids that exist in nature, only a few of them can be found in Indonesia. This approach plays an important role in developing sustainable management strategies to overcome the challenges faced by farmers in controlling papaya mealybugs (Sumartayasa *et al.*, 2021)

4.4 *Tetranychus urticae*

Mites are a group of small, eight-limbed animals belonging to the suborder Acarina. Mites are a class of plant pest organisms (OPT) on plants (Indayani *et al.*, 2022). Mites are not fleas in the zoological sense even though they are both small (so some people consider them the same). While true lice are members of Insecta, mites are closer to spiders in terms of their relationship (Djaelani, 2016).

Mites are a group of segmented animals (Arthropods) belonging to the Acari subclass of the Arachnida class. Mites number more than 30,000 species and 1,700 genera. The body size of mites is very small, no more than 0.8 mm (Anastya, 2018). Mites are polyphagous, which means they have more than one host, not only found on rose plants, we can also find these mites on other plants (Kristaga *et al.*, 2020). Mites have a haushelata mouth type, namely a piercing and sucking mouth type so that the mites attack plants by piercing the surface of the leaves and sucking the fluid (Hasyim and Setiawati, 2017).

Control Method *T. urticae* can be done in a biological way using soursop plant extract (Indayani, 2022). Mite control can also be done with biology, namely using natural enemies, it can also be done with technical culture, namely planting resistant varieties, fertilizing and irrigation (Maryam *et al.*, 2012).

4.5 *Planococcus citri*

Planococcus citri bugs attack leaf stalks, shoots and bases of fruit, leaving yellow marks that then dry out so that many plant organs fall off. The affected area appears to be filled with white, cotton-like lice. The losses caused are stunted growth, decreased production due to leaf and shoot loss. Bioecology Adult fleas are oval, flat, brownish yellow, light yellow or dark yellow, 3-4 mm long, 1.5-2 mm wide. The body of soft insects is covered with a layer of wax. Along the edges of the flea's body there are 14-18 pairs of spines made of waxy material. A female is capable of laying 300 eggs, placed on plant parts and lasting between 2-17 days (Rosanti *et al.*, 2015)

The dompolan flea population increases in the dry season, especially when the relative humidity during the day is below 75%. The larvae from the eggs that hatch are pale yellow, green or dark red depending on the stage, move away from the mother and look for a place on another plant part. These fleas like places that are somewhat shady but not too humid, and are easily spread by wind and rain. The invading fleas secrete honeydew which produces sooty mold so that photosynthesis is hampered. Filled dompolan lice really like young citrus fruit and can also attack the shoots. The population will increase in the dry season and will decrease in the rainy season. Therefore, this period is a critical phase and monitoring needs to be carried out (Hartono, 2013)

How to control *P. citri* using technical culture methods, including methods that lead to the cultivation of healthy plants, namely: meeting growing requirements (temperature, rainfall, wind, altitude, soil), setting plant spacing, fertilizing and observing (Apriliyani, 2016). Mechanical and physical control is carried out by maintaining the cleanliness of the garden by sanitizing heavily infested weeds, branches and fruit and destroying them. Biological control, by utilizing natural enemies: Predators from the Coccinellidae family, *Scymnus apiciflavus*, *Brumus saturalis* F and *Coccinella repanda* (Hasibuan, 2005)

5. CONCLUSION

Three types of insect pests and three types of attacked plants were found in the Gerih Tourism Park, Sibang Kaja Village, Abiansemal District, Badung Regency, Bali, namely: pests *Paracoccus marginatus* attacks *Adenium spp* plants, *Tetranychus urticae* pest attacks rose plants and pests *Planococcus citria* tacks croton plants.

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