IDENTIFICATION OF GARDEN ELEMENTS AND PESTS IN THE IDA DEWA JAMBE MONUMENT PARK IN KLUNGKUNG DISTRICT, KLUNGKUNG REGENCY

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ABSTRACT

Ida Dewa Jambe Monument Park is one of the historical monument parks of Puputan Klungkung. The Puputan Klungkung Monument is a city park equipped with a monument of inscriptions and is located in the heart of Semarapura City, Klungkung Regency. The building towering 28 meters from the base/base is in the form of Lingga-Yoni which is built on an area of 123 square meters. This monument has landscape elements found in the monument park. This study aims to determine what elements of the park and pests are in the Ida Dewa Jambe Monument Park. The method used in this study is a direct survey to the field to find primary data and secondary data. Primary data in the form of data obtained from direct observation at the research location and secondary data in the form of data obtained from library sources to support the research results. From this study, it was found that the elements found in the Ida Dewa Jambe Monument Park are soft elements and hard elements. Soft elements are elements that form the park such as trees, shrubs, and ground cover plants while those included in the hard elements are information boards, footpaths, park lights, park chairs, park washbasins, and bengong halls. Pest insects found in the Ida Dewa Jambe Monument Park are white lice (Pseudococcus sp), leafhoppers (Planococcus citri), leafhoppers (Psyllidae), and grasshoppers (Caelifera).

Keywords: *identification, soft elements, hard elements, plant pests*

1. INTRODUCTION

Landscape is a natural landscape with certain characteristics, which can be enjoyed by all human senses (Simonds, 2006). The components in a park are hard elements (*hardscape*) and soft elements (*softscape*). The combination of these two elements produces a balance in the arrangement of elements in a park. Ida Dewa Jambe Monument Park Klungkung is a city park equipped with a monument of inscriptions and is located in the heart of Klungkung city. In this park there are many plants that decorate the park area. Plants are one of the living things that have many benefits for the surrounding environment. Various benefits can be obtained from a plant, namely as herbal medicine, food ingredients, and most importantly, plants can produce oxygen which is useful for human survival. There are many types of plants, from their various physical forms, to their different benefits. Of the many plants, plants are divided into several groups. One of them is the ornamental plant group. Ornamental plants are defined as all plants that have ornamental value from the flower, root, leaf, aroma and stem parts themselves, and these plants have aesthetic and artistic value (Santoso, 2010). So it can be said that all plants that have a function as beauty can be classified into ornamental plant groups. Ornamental plants can function as stabilizers and environmental maintenance, education, health maintenance, as well as economic and social (Rukmana, 2012). Many problems occur in maintaining the beauty of ornamental plants, one of which is the presence of insects that have their respective functions and roles in plants.

Insects are animals that play an important role in an ecosystem. According to Astuti *et al*., (2019) the main roles of insects in the ecosystem include as pollinators, decomposers, predators and parasitoids. The presence of insects in a place can be an indicator of biodiversity, ecosystem health and landscape degradation. Insects are animals that have a wide habitat distribution. Insects can be found in various habitats ranging from mountains, forests, fields, agriculture, residential areas to urban areas (Dewi *et al*., 2016). According to Tustiyani *et al*., (2020) insects that can harm plant life are called pests. Insects are said to be pests because they attack and damage plants or vegetation, have an impact on the basic health of plants and their productivity, damage plants by cutting their roots, stems and leaves. So far, no one has reported the types of plants and types of pests in the Ida Dewa Jambe Monument Park, Klungkung District, Klungkung Regency. Therefore, research was conducted on the identification of garden elements and pests in the Ida Dewa Jambe Monument Park.

2. RESEARCH METODOLOGY

This research was conducted at the Ida Dewa Jambe Monument Park, Klungkung District, Klungkung Regency, Bali Province. All plant and pest populations in the research location were used as data sources and identified. The data used in this study were primary data and secondary data. Primary data were data obtained from direct observation at the research location and secondary data were data obtained from library sources to support the research results. The data analysis method used was descriptive analysis. Descriptive analysis is a method that describes all specific phenomena related to this research and at the same time provides interpretation of the data collected.

3. LITERATUR REVIEW

3.1 Identification of Garden Elements

Vegetation includes identifying the types of plants in the park, such as ornamental plants, shade trees, and ground cover plants. The selection of plants that are appropriate to Bali's climate and soil conditions, as well as how these plants play a role in the aesthetics and ecological function of the park, will be the main focus. Identifying park facilities such as park elements such as park benches, pedestrian paths, lighting, fountains, and monuments. These elements support visitor comfort as well as the aesthetics of the park. Landscape design elements are designed to create a balance between visual, functional, and ecological aspects.

3.2 Pest Identification

Pests found in the park, both those that attack plants and those that disturb the comfort of visitors, such as insects, rats, or other plant pests. The impact of pests on plants includes the negative impacts that pests may cause on plant growth and health, as well as control methods that are in accordance with environmentally friendly principles. The way to overcome the negative impacts of pest attacks is to carry out integrated pest control or other techniques that do not damage the park ecosystem and have minimal impact on the environment.

4. RESULTS AND DISCUSSION

According to Handayani (2009), the supporting elements of a garden can be divided into two types, namely soft elements (*softscape*) and hard elements (*hardscape*). Soft elements are supporting elements that are usually vegetation, such as trees, shrubs and grass. The use of a garden plays a very important role in the results of arranging a garden. Garden elements have several unique characteristics that distinguish them from several other elements. The most important and prominent characteristic is that plants are living and growing elements. With such unique characteristics, there are several things that must be considered. First, plants are dynamic elements, changing at all times, be it size, texture, leaf density or overall

character according to their growth characteristics. Second, the dynamic quality has implications for the use of plants in garden arrangement. Plant characteristics display the characteristics and forms of plants consisting of: size, shape, color and texture of plants. Meanwhile, hard elements (*hardscape*) are elements that are not alive in the landscape and function as supporting elements to improve the quality of the landscape. Hard elements include information boards, photo spots, park names, fences, water reservoirs.

4.1 Soft Elements

Soft elements are supporting elements that are usually found in a park in the form of vegetation, such as types of trees, shrubs and ground cover plants. The following are soft elements in the Ida Dewa Jambe Monument Park which can be seen in table 1.

Table 1. Soft Elements in the Ida Dewa Jambe Monument Park

Types of Plants	Vegetation	Latin Name
Trees	Frangipani Tree	*Plumeria sp*
Trees	Glodok Tree	*Polyalthia longifolia*
Trees	Cempaka Tree	*Magnolia champaca*
shrub	Paper Flower	*Bougainvillea*
shrub	Purple Kencana Flower	*Ruellia simplex*
shrub	Puring	*Codiaeum variegatus*
shrub	Roses	*Rosa multiflora L.*
shrub	Soka Flower	*The saffron of the asoca*
shrub	Yellow Cut Flowers	*Duranta erecta L*
shrub	Yellow Japanese Jasmine Flower	*Pseuderanthemum reticulatum*
Ground Cover Plants	Pearl Grass	*Hedyotis corymbosa L*

4.1.1 Trees

Ida Dewa Jambe Monument Park is a city park equipped with a monument inscription located in Samarapura city, Klungkung Regency, a towering building about 28 meters from the base in the form of Lingga-Yoni built on an area of 123 square meters, and filled with various tree gardens. Like the frangipani/jepun tree which is useful as a shade plant besides absorbing toxins (pollutants) and CO2 in the air and producing oxygen so that the air is fresher (Arsona and Arwan, 2017). Glodok trees are generally always present in every park and let them grow or are maintained because generally this tree grows easily in hot areas and is resistant to wind so it is suitable for use as a shade plant on the road that can absorb pollution elements from motor vehicle exhaust fumes. While the cempaka plant (Michelia alba) is a tree that has a height that can reach 30 meters and has a woody trunk. On the branches of the cempaka tree are usually covered with fine grayish hairs. The single kantil (white cempaka) leaf is oval in shape and green in color.

4.1.2 Shrubs

Shrubs are a type of woody plant that has many branches and is not included in the annual plant with a height of shrubs only reaching less than 5 meters and most have many branches near the main stem. Ida Dewa Jambe Monument Park has several shrubs including:

a. Paper Flower

The bougainvillea flowers in the Ida Dewa Jambe Monument park have the main purpose as ornamental plants to make the atmosphere more artistic and attractive. However, these plants can also be used as water and soil retaining plants or as ground cover.

b. Soka Flower

The soka plant is one of the plants in the Ida Dewa Jambe Monument park. This shrubby plant, which is often grown as an ornamental plant, grows to around 5 meters with dark green, leathery and shiny leaves.

c. Croton flower

Croton flower (*Codiaeum variegatum*) is a popular ornamental plant in the form of a shrub with very varied leaf shapes and colors. Various cultivars have been developed with color variations from green, yellow, orange, red, purple, and a mixture of these.

d. Purple Kencana Flower

The purple kencana flower is a wild plant that grows in unkempt land, but the one in the Ida Dewa Jambe Monument Park is used as an ornamental plant, a plant that has a single flower and resembles a troppet, with green stems and leaves.

e. Yellow Cut Flowers

Yellow prune plant is one of the ornamental shrubs that people usually plant as a hedge or garden component. Yellow prune plant is also an ornamental plant that has a combination of yellow and green leaves with a small size of approximately 2-3 cm. The edges of the leaves are serrated, purple flowers grow in clusters. Yellow fruits are arranged in a row in a hanging bunch. The height of this plant reaches 3 meters, with a crown width reaching 3 meters Jurnal Brata Wiadnyana.

f. Yellow Japanese Jasmine Flower

Yellow Japanese Jasmine is a jasmine flower that grows a lot in Japan, and has different physical characteristics from other jasmine. Japanese jasmine looks more elegant and is usually used as an ornamental plant that is generally often planted in public parks.

4.1.3 Hard Elements

Hard elements are non-living elements in the landscape and function as supporting elements to improve the quality of the landscape. Hard elements in the Ida Dewa Jambe monument park are as follows:

a. Information boards

The information board is one of the hard elements in the Ida Dewa Jambe Monument Park which aims to inform visitors to the Ida Dewa Jambe Monument Park. The information board is located in front of the park entrance which explains the History of Klungkung.

b. Bengong Hall and Garden Chairs

The bengong hall and garden chairs are one of the hard elements in the Ida Dewa Jambe Monument park. Which aims to be a place to rest/relax for visitors and local residents who carry out activities at the Ida Dewa Jambe Monument park. In the Ida Dewa Jambe Monument park, there are four bale bengong in each corner of the park and five park chairs.

c. Garden Sink and Garden Light

Garden sinks and garden lights are one of the hard elements in the Ida Dewa Jambe Monument park. The sink in the Ida Dewa Jambe Monument park is used for washing hands for park visitors and park officers and even for the surrounding environment in the park. While garden lights are used for lighting and not only as lighting but also as garden decoration and decoration for the beauty of the park.

d. Footpath

Paths generally function to keep plants, especially grass, from being easily damaged by feet crossing the garden and play a role in beautifying the garden atmosphere. Paths also serve as a base or footrest while watering beautiful flowers in the garden. This can also be used to add to the aesthetics of the garden.

4.2 Types of Pests at the Ida Dewa Jambe Monument Park

Pests are organisms that can really disrupt plant growth, so that plants cannot grow and develop properly because of insects/animals whose activities cause damage to plants.

a. Whitefly Pests on Croton Plants

Mealybugs (*Pseudococcus sp.*) are round, greenish pests whose bodies are covered in a whitish wax layer. Mealybugs attack plants by sucking leaf fluids. This pest also carries sooty mold disease. As a result of this whitefly attack, the leaves become curly and the flowers or fruits fall off. This study aims to determine the effectiveness of sweet orange peel solution as a natural pesticide to control whitefly pests (*Pseudococcus sp.*) (Suleman, 2021)

b. Pests of Fleas on Plumeria Plants

The lice pest (*Planococcus citri*) is a pest in the form of *Pseudococcus lice*. Adults are oval in shape, measuring 3 mm, yellow to yellowish brown, covered in white flour, have protrusions on the edge of the body with a number of 14-18 pairs. Long protrusions on the back of the body of P. citri (Kalshoven, LGE 1981).

c. Flea Pests on Cempaka Plants

The leafhopper pest is one of the pests that attacks cempaka plants. This insect lives by eating plant fluids, shoots and young leaves so that some types are known as dangerous pests of Psyllidae (Endarto, 2014).

d. Grasshopper Pests on Soka Flower Plants

Grasshopper pests are insects that are pests for agriculture. Young and adult grasshoppers are very greedy and generally attack plants from the Graminae family such as food crops and also attack ornamental plants, fruits, vegetables, and caelifera plantation crops. Grasshopper pests were found on soka flowers at the Ida Dewa Jambe Monument. The results of the study are in accordance with Adnan's statement (2009) that grasshopper pests were found attacking the leaves of soka flower plants.

5. CONCLUSION

1. Hard elements in the Ida Dewa Jembe Monument Park are information boards, bale bengong, park chairs, park lights and wash basins. Soft elements in the Ida Dewa Jembe Monument Park are supporting plants in the Ida Dewa Jambe Monument Park consisting of Frangipani Trees, Glodok Trees, Cempaka Trees, Soka Flowers, Purple Kencana Flowers, Yellow Pruning Flowers, Yellow Japanese Jasmine Flowers, Paper Flowers, Purih Flowers, Puring, Grass and Fountains in the Ida Dewa Jambe Monument Park.
2. Plant pests found in the Ida Dewa Jambe Monument Park are White Lice (*Pseudococcus sp*), Leaf Lice (*Planococcus citri*), Leafhoppers (*Psyllidae*) and Grasshoppers (*Caelifera*).

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