

Insect Diversity In Taman Jangkar Surabaya

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ABSTRACT

Insects are animals with jointed legs that are often found in many places with various types. This is because insects have a very high level of adaptation, for example those found in the Taman Jangkar in Surabaya. The purpose of this study was to describe the diversity of insects in the Taman Jangkar area and to compare the number of members of each insect order in the Taman Jangkar area. The method used in this research task is observation, which is to go directly to the field to capture insects around Taman Jangkar Surabaya with 4 repetitions in each plot, then collect data for identification. Based on the results of observations, collection, and identification, it can be obtained that there are various insects in the area. This is evidenced by the discovery of various orders of insecta, including: order Lepidoptera, order Odonata, order Hymenoptera, order Diptera, and order Orthoptera. Comparison of the number of species from each order is different. The most dominant number of species is in the order Lepidoptera which is then followed by the order Hymenoptera

Keywords: *insect, diversity, Taman Jangkar*

INTRODUCTION

Insects are a type of animal that does not have a backbone, the number and types are very large. Insects are animals with jointed legs that are often found in many places with various types. This is because the insects class has a very high adaptation rate. Insects are relatively small in size and were the first to successfully colonize the earth because of their high adaptability to their habitat (Fakhrah, 2016). There are two roles of insects in everyday life, namely harmful and beneficial. One of the beneficial roles of insects for humans and plants is as pollinating animals that naturally help the survival of growing plants (Herlinda, *et al.*, 2021). A substantial role of insects is needed in areas with a large number of urban parks, such as the city of Surabaya.

Taman Jangkar is one of the many parks spread across the city of Surabaya which is empowered by the City Government. It is called the Taman Jangkar because it corresponds to the location in the Karah Village, Jambangan District, Surabaya. This park is crowded with residents, especially during holidays, Saturdays or Sundays. Every day the park, which is located in the middle of the settlement, is indeed interesting to visit because it provides many entertainment and sports facilities (Susanti, 2022). City parks are a form of social and environmental responsibility that function as agents of absorbing pollution and to beautify the structure of the city. Behind the function of the Taman Jangkar as mentioned above, without realizing it, it turns out that the Taman Jangkar itself stores many animals that biologically help the survival of the various kinds of plants that grow in it. The purpose of this study was to describe the diversity of insects in the Taman Jangkar area and to find out the comparison of the number of members of each order in the Taman Jangkar area.

METHOD

The type of research on insect diversity in the Taman Jangkar area is observation. The research site for insect diversity was carried out in the Taman Jangkar Surabaya area, which is located in the Environmental Tourism Village, Jalan Jambangan RW V, Jambangan Village, Jambangan District,

Surabaya. The study was conducted for 3 weeks in the first week to the third week of February 2022. Research and data collection were carried out in the morning and evening.

The equipment needed for research and data collection of insects in the Taman Jangkar area is a net to catch insects, an insectarium box made of cardboard, 2 plastic jars to anesthetize insects, a 1 ml syringe for injecting formalin solution into the insect's body and the camera used to document insects. While the materials needed are styrofoam to fix the catch of insects, chloroform solution, 4% formalin solution for the preservation process, cotton, pins, and camphor for preservation. The expected target in this research is the insectarium as an indicator of insect diversity in the Taman Jangkar area of Surabaya. The research was carried out by taking documentation from insects that had been found, capturing and taking objects in the form of various types of insects in the Taman Jangkar area of Surabaya and then preserving them.

This research was conducted by first preparing the tools and materials to be used. Before the insects are caught using nets, first the pictures of the insects are taken to be documented. After taking pictures, the insects were caught carefully so that no part of the insects was damaged during the capture procession. Then the insects were put into plastic jars that had previously been filled with cotton that had been moistened with chloroform to anesthetize the captured insects to death. Insects that have died are then carefully transferred onto styrofoam for fixation (Wahyudi et al, 2021). This fixation is done using a pin. The pins are mounted at an acute angle to the insect's body (not pierced), so as to minimize damage to the insect's body parts to be preserved. Insects are positioned in such a way that all parts of the insect's body are visible. Both insect wings are spread out and one type of insect should be fixed in different positions, so that the dorsal and ventral positions will be seen. This is intended to make insects easier to observe and identify. Insects that have been fixed, then smeared with 4% formalin using a brush for preservation. For insects with a large enough size, formalin injection should be carried out using a syringe so that the inside of the insect does not rot. After that, insect identification was carried out using the book *Serangga Taman Gunung Halimun Jawa Bagian Barat* (Kahono, 2010) dan *Kunci Determinasi Serangga* (Subyanto,1991).

RESULT AND DISCUSSION

Result

Table 1. Kind of butterfly in Taman Jangkar Surabaya

Ordo	Family	Genus	Species	Amount
Lepidoptera	Hesperideae	<i>Calforis</i>	<i>Calforis bromus</i>	3
	Pieridae	<i>Delias</i>	<i>Delias periboea</i>	7
		<i>Leptosia</i>	<i>Leptosia nina</i>	7
		<i>Eurema</i>	<i>Eurema hecabe merguiana</i>	9
			<i>Eurema alitha</i>	7
	Nymphalidae	<i>Appias</i>	<i>Appias libythea olferna</i>	6
		<i>Elymnia</i>	<i>Elymnia hypermnesta</i>	7
		<i>Junonia</i>	<i>Junonia atlites</i>	6
		<i>Euploea</i>	<i>Euploea gamelia</i>	6

Table 2. Kind of dragonfly in Taman Jangkar Surabaya

Ordo	Family	Genus	Species	Amount
Odonata	Libellulidae	<i>Orthetrum</i>	<i>Orthetrum sabina</i>	2
		<i>Brachythemis</i>	<i>Brachythemis contaminate</i>	7

Table 3. Kind of bee in Taman Jangkar Surabaya

Ordo	Family	Genus	Species	Amount
Hymenoptera	Vespidae	<i>Rhyncium</i>	<i>Rhyncium haemorrhaidale</i>	7
		<i>Ropalidia</i>	<i>Ropalidia fasciata</i>	6
	Apidae	<i>Apis</i>	<i>Apis cerana</i>	5
		<i>Xylocopa</i>	<i>Xylocopa confuse</i>	4

Table 4. Kind of fly in Taman Jangkar Surabaya

Ordo	Family	Genus	Species	Amount
Diptera	Muscidae	<i>Musca</i>	<i>Musca domestica</i>	1
	Stratiomyidae	<i>Hermetia</i>	<i>Hermetia illucens</i>	1

Table 5. Kind of grasshopper in Taman Jangkar Surabaya

Ordo	Family	Genus	Species	Amount
Orthoptera	Acrididae	<i>Phlaeoba</i>	<i>Phlaeoba fomusa</i>	4

Discussion

Based on the results of the research that has been done, it can be seen that all the species collected are kingdom Animalia, phylum Arthropoda, and class Insecta. From the observations, the species obtained can be grouped based on orders which are divided into 5 orders, namely the order Lepidoptera, order Odonata, order Hymenoptera, order Diptera, and order Orthoptera. Each order has its own characteristics that can distinguish it from the others so that it can be used for identification keys.

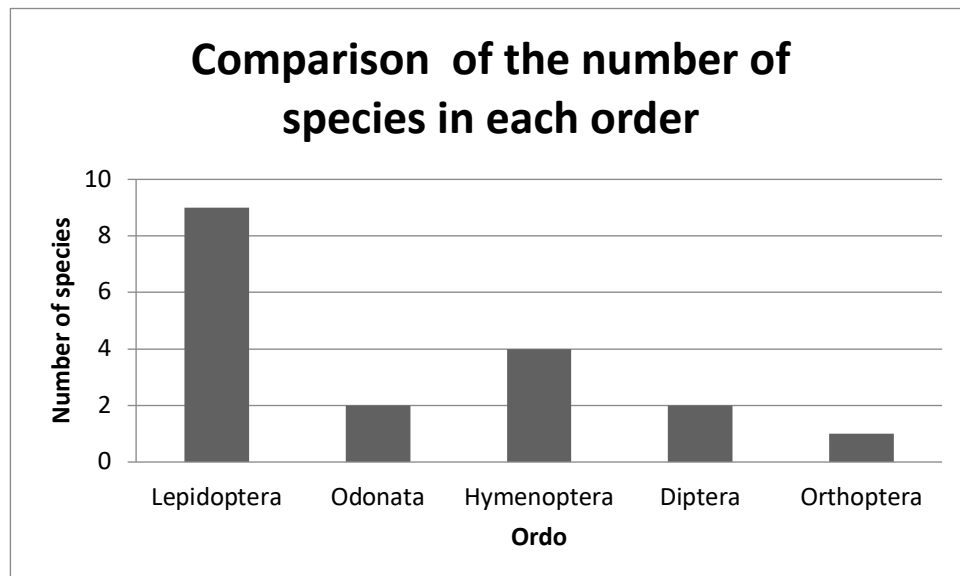


Figure 1. Comparison of the number of members of each order in the insect class around the Taman Jangkar area

The order Lepidoptera has the characteristics of having 2 pairs of wings covered with feathers and scales, has a rather long antenna, attractive wing color, the larval phase is usually a caterpillar, and has a small or large size. The number of the order Lepidoptera obtained was 8 species, namely *Calforis bromus* as many as 3 individuals with the characteristics of having wings that are less attractive when compared to butterflies in general, which are brown with white and yellow spots, and relatively short wing sizes. *Delias periboea* as many as 7 individuals, with special characteristics such as batik wing pattern which is a combination of black and yellow. *Leptosia nina* as many as 7 individuals, the special characteristic is the dominant white wing color with black spots or dots on both anterior wings. *Eurema hecabe merguiana* as many as 9 individuals, has a characteristic that is yellow wing color with black wing edges. *Eurema alitha* as many as 7 individuals, has characteristics that are almost similar to *Eurema hecabe merguiana*,

but the color of the wings is slightly faded yellow. This butterfly has been successfully captured, but due to poor care, this butterfly is finally damaged. *Appias libythea olferna* as many as 6 individuals, with the characteristics of a wing pattern like batik, with a white base color and black pattern. *Elymnias hypermnesta* as many as 7 individuals, have special characteristics in the form of jagged wing edges and a combination of colors on the wings (dark brown, a little black and white). *Junonia athletes* as many as 6 individuals, have special characteristics, namely patterns such as brown batik with a combination of white and dark brown. This butterfly has been successfully caught but was damaged due to the wrong fixation, so that its wings were torn. *Euploea gamelia* as many as 6 individuals, has a special characteristic, namely wavy wing edges with black wings and there are regular white circles.



Figure 2. *Brachythemis contaminata*



Figure 3. *Xylocopa confuse*

The order Odonata has characteristics such as medium to large body size, short and stiff antennae, long and slender abdomen. Biting and chewing mouthparts. Wings are like membranes and veins. The order Odonata mostly lives in aquatic habitats at the time of nymph and is found on land or in free air as adults. The number of order Odonata obtained as many as 2 species, namely *Orthetrum sabina* as many as 2 individuals who have special characteristics, namely having 2 pairs of black wings, green body with alternating segments between green and black. *Brachythemis contaminata* (Figure 2) as many as 7 individuals who have characteristics of medium size. Orange in color from the body to the wings. Segmented tail.

The order Hymenoptera has characteristics, including very small to large body sizes. The order Hymenoptera has 2 pairs of wings with membrane-like characteristics, few veins, for small ones they have almost no veins, the front wings are larger than the hind wings. There are antennae with a total of 10 segments or more, the type of sucking-biting mouth mat. Female species generally have ovipositors that breed, some types of ovipositors are modified into stinging mats to defend themselves. Habitat adult species are found in various habitats, most are found in flowers or plants, some live on the ground or in ruins. Larvae of the order Hymenoptera exist on plants or in the bodies of other insects. The number of orders Hymenoptera obtained as many as 3 species, namely *Rhyncium haemorrhoidale* as many as 7 individuals, has a characteristic that is a combination of body color between black and brown. *Ropalidia fasciata* as many as 6 individuals, with special characteristics, namely the body is dark brown with one yellow stripe on the abdomen. This bee has been caught before, but due to improper fixation, its body was broken. *Apis cerana* as many as 5 individuals, has a characteristic that is a black bulging tail with a circular yellow line. The transparent wings are black on the outline and have a cobweb-like pattern. *Xylocopa confuse* (Figure 3) as many as 4 individuals, with special characteristics that are golden yellow and have evenly distributed fur to the feet.

The order Diptera has characteristics such as very small to medium sized bodies. The order Diptera has 2 wings (1 pair) which are the front wings, the hind wings reduce to dumbbells which function as a balance tool. Type of mouth tool jiiiit and sucker pencucuk. The larvae are called magot, set or short, without legs, small head, smooth body, thin. The habitat of the order Diptera is in various habitats, magot likes moist places, in plant tissues or in the bodies of other insects. Adult species are free-livin. The number of the order Diptera obtained was as many as 1 species, namely *Musca domestica*, with a special characteristic, namely a black head and brown belly, but this fly was not caught, so there are only photos. *Hermetia illucens* (Figure 4) as many as 1 individual, has a special characteristic, namely the body is greenish with black horizontal lines and black stripes on the abdomen.



Figure 4. *Hermetia illucens*



Figure 5. : *Phlaeoba fomusa*

The Orthoptera order has characteristics, including medium to large body size, members of the Orthoptera order some have wings and some do not. The winged species have two pairs of wings with long narrow wings, many veins, thickened like parchment paper. The hind wings are membranous, wide and have many veins. Chewing biting mouthparts. Female species generally have an ovipositor that breeds, the male has a sound-producing apparatus, located on the tibia or abdomen. The habitat of the order Orthoptera is in the area of cultivated plants, there is also a home or residential environment. The number of orders Orthoptera obtained was only 1 individual, namely *Phlaeoba fomusa* (Figure 5) which has a special characteristic, namely its tapered head.

The diversity of insects around the Taman Anchor Surabaya area is dominated by the order Leidoptera with 9 species. This is because the vegetation and habitat around the park are more supportive of the survival of the Leidoptera order, namely the large number of shrubs and flowering plants that are used for protection and food for the Leidoptera order.

CONCLUSION

Based on the results of observations, collection, and identification of the diversity of insects around Taman Anchors Surabaya, it can be concluded that the diversity of insects in the area is quite diverse with the discovery of various insects from various orders, including: order Lepidoptera, order Odonata, order Hymenoptera, order Diptera, and order Orthoptera. The ratio of the number of species in each order is different. The most dominant number of species is in the order Hymenoptera and the order Lepidoptera when compared to the number of species in other orders.

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