

Inventory of dragonflies in the Curug Panjang waterfall area, Muara Beliti District, Musi Rawas Regency

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Article information	ABSTRAK
Article history:	Fauna yang ada di Curug Panjang Muara Beliti, Kabupaten Musi Rawas
Received February 23, 2021	sangat banyak. Salah satu jenis fauna yang terdapat di kawasan ini
Revised April 16, 2021	adalah serangga, capung merupakan serangga yang habitatnya hidup di
Accepted April 24, 2021	air dan di udara. Penelitian ini memiliki tujuan untuk mendata jenis-jenis
Kata kunci:	capung dan faktor abiotik di kawasan Air Terjun Curug Panjang dengan
Inventarisasi	menggunakan metode <i>purposive sampling</i> . Teknik pengumpulan data
Capung	yaitu observasi, dokumentasi dan identifikasi. Pengambilan sampel
Curug Panjang	menggunakan alat jaring serangga. Hasil penelitian yang telah dilakukan
	diperoleh 2 sub ordo, 4 famili dan 12 spesies yang berbeda yaitu <i>Diplacodes trivialis</i> , <i>Orthetrum pruinosum</i> , <i>Orthetrum sabina</i> , <i>Orthetrum pruinosum</i> , <i>Crocothemis servillia</i> , <i>Neurothemis ramburii</i> , <i>Trithemis aurora</i> , <i>Pantala flavescens</i> , <i>Tholymis tillarga</i> , <i>Ictinogomphus decoratus</i> , <i>Agriocnemis femina</i> , <i>Agriocnemis pygmaea</i> , dan <i>Copera marginipes</i> . Hasil pengukuran faktor abiotik yaitu dengan rata-rata suhu udara 27,75°C, kelembapan udara 76% dan intensitas cahaya 396,5 lux.
	ABSTRACT
Keywords:	There are many kinds of fauna in the waterfall Curug Panjang Muara
Inventory	Beliti, Musi Rawas Regency. One of the types of fauna found in this area
Dragonflies	is insects. Dragonflies is insects whose habitats live in water and in the
Curug Panjang	air. This study aims to determine the types of dragonflies and abiotic
	factors carried out in the Curug Panjang waterfall area by using <i>purposive sampling</i> method. Data collection techniques are observation, documentation and identification. Sampling using insects net. The results of the study have been obtained by 2 sub-orders, 4 families and 12 different species namely <i>Diplacodes trivialis</i> , <i>Orthetrum pruinosum</i> , <i>Orthetrum sabina</i> , <i>Orthetrum pruinosum</i> , <i>Crocothemis servillia</i> , <i>Neurothemis ramburii</i> , <i>Trithemis aurora</i> , <i>Pantala flavescens</i> , <i>Tholymis tillarga</i> , <i>Orthetrum pruinosum</i> , <i>Crocothemis servillia</i> , <i>Neurothemis ramburii</i> , <i>Trithemis aurora</i> , <i>Pantala flavescens</i> , <i>Tholymis tillarga</i> , <i>Ictinogomphus decoratus</i> , <i>Agriocnemis pygmaea</i> , and <i>Copera marginipes</i> . Abiotic factor measurement results are with an average air temperature of 27,75°C, 76% air humidity and 396,5 lux light intensity.

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INTRODUCTION

Muara Beliti District is a sub-district in Musi Rawas Regency. geographically this area is a land area that has an altitude of <200 m above sea level. In Muara Beliti sub-district, precisely in Durian Remuk village, there is a waterfall that is shaped like a split river with a length of 40 meters and a height of 4 meters. This waterfall is often known as Curug Panjang Waterfall (BPS, 2018).

There are many kinds of fauna in the waterfall Curug Panjang Muara Beliti, Musi Rawas Regency. One of the types of fauna found in this area is insects, dragonflies. Dragonflies is insects whose habitats live in water and in the air. Dragonflies are one of the insects that live in tropical areas which have high biodiversity, which can be used as a parameter of water quality, because dragonflies are a component of the food chain process in aquatic habitats (Sumarni, 2018).

Pratama and Rosalini (2016: 94) suggest that dragonfly nymphs only live in freshwater environments and only a few species are resistant to brackish water conditions. According to Hanum & Salmah (2013: 71) dragonfly nymphs prey on small insects that live in water. Dragonfly nymphs can accommodate toxic pollutants from their prey. Dragonflies (Odonata) are predatory insects, because dragonflies eat smaller insects and even the same kind. The presence of dragonflies acts as a counterweight to other insect populations. Dragonflies also have benefits for the ecosystem. One kind of indicator of a good environmental and ecosystem condition is the presence of dragonflies (Odonata) in an area. The determining factors for the presence of dragonflies can be seen from the relationship between dragonflies and the abiotic and biotic factors that make up the ecosystem and the conditions that affect their life in nature (Muktitama, Prayogo, & Indrayani, 2018).



Picture 1. Research location

Based on the results of observations made on June 19, 2019 with one of the residents of Durian Remuk village in the Curug Panjang Waterfall area, Muara Beliti District, Musi Rawas Regency, it was known that, its natural conditions are far from urban and still natural, there has been no government intervention making the aquatic ecosystem still awake. Red dragonflies (*Neurothemis fluactuans*) and black green (*Orthetrum sabina*) were found, which often appear in the morning and evening on the banks of rivers and swamps. Until now there has been no data on the types of dragonflies in the Curug Panjang waterfall area, so based on this description it is necessary to conduct research on "Inventory of Dragonfly Types in Curug Panjang Waterfall, Muara Beliti District, Musi Rawas Regency".

METHODS

Research on dragonflies has been carried out in the area of Curug Panjang Waterfall, Muara Beliti District, Musi Rawas Regency. Data collection techniques are observation, documentation

and identification. Sampling using insects net. The tools and materials used in this research are insect nets, jars as sample storage, stationery, label paper, cell phone cameras, and dragonfly identification reference books.

Determination of the location for catching dragonflies is carried out in the area around the Curug Panjang Muara Beliti Waterfall. This study used a purposive sampling technique (technique of determining the sample by selecting samples from among the existing population in accordance with the objectives or problems in the study) line transect along the Curug Panjang waterfall area along 40 meters. This is in accordance with the results of observations which state that the length of the area of the long waterfall is 40 meters, the depth from the top to the level of the waterfall is 2 meters, and the width of the waterfall is 4-5 meters.

According to Suriana, Adi, & Hardiyanti (2014) measuring abiotic factors was carried out when the research was conducted, at 08.00-11.00 WITA (morning) and 14.00-17.00 WITA (afternoon). According to the active time of the dragonfly, the research was carried out for 3 days and repetition for 1 day (Herpina, Ade, & Acfnianti, 2014). Types and morphological characteristics are in accordance with the reference book for dragonfly identification, "Mengungkap Potensi Hulu Bengawan Solo" (2016) and the book "Naga Terbang Wendit"(2013).

RESULTS AND DISCUSSION

Based on the results of research conducted in the area of Curug Panjang Waterfall, there were 12 species of dragonflies consisting of 2 sub orders, namely Anisoptera and Zygoptera. Also obtained 4 different families, namely the Libellulidae, Gomphidae, Coenagrionidae, Platycnemididae families. Data on the types of dragonflies found in the Curug Panjang Waterfall area can be seen in Table 1.

Table 1. Types of Dragonflies in the Curug Panjang Waterfall Area

Sub-Order	Family	Genus	Species	Indonesian Name
Anisoptera	Libellulidae	Diplacodes	<i>Diplacodes trivialis</i>	Capung Tengger Biru, betina
		Orthetrum	<i>Orthetrum pruinosum</i>	Capung SambarMerah, betina dan jantan
			<i>Orthetrum Sabina</i>	Capung Sambar Hijau, jantan
		Crocothemis	<i>Crocothemis servillia</i>	Capung Sambar Garis Hitam, Jantan
		Neurothemis	<i>Neurothemis ramburii</i>	Capung Tengger Jala Tunggal, jantan
		Trithemis	<i>Trithemis aurora</i>	Capung Merah Jambu, jantan
		Pantala	<i>Pantala flavescens</i>	Capung Kembara, betina
		Tholymis	<i>Tholymis tillarga</i>	Capung Sambar Senja, betina
	Gomphidae	Ictinogomphus	<i>Ictinogomphus decorates</i>	Capung Tombak Loreng, betina
Zygoptera	Coenagrionidae	Agriocnemis	<i>Agriocnemis femina</i>	Capung Jarum Centil, jantan
		Agriocnemis	<i>Agriocnemis pygmaea</i>	Capung Jarum Kecil, betina
	Platycnemididae	Copera	<i>Copera marginipes</i>	Capung Hantu Kaki Kuning, jantan

This research was conducted in the dry season so that there were few dragonfly species. According to Hermawan & Fitriana (2015) research carried out in the dry season will obtain fewer dragonfly species, in the rainy season there will be found abundant density and diversity compared to the dry season.

According to Simbolon (2019), when dragonflies undergo metamorphosis, dragonflies do not lay their eggs in polluted waters. Dragonflies will look for clean waters. Dragonfly

metamorphosis ranging from eggs, nymphs, and imago. Dragonfly nymphs living in water will undergo changes to become imago (adult dragonflies). This dragonfly then lives in the air. If in an area there are no dragonflies, it indicates that the water in the area has been polluted.

The abiotic factors measured in the Curug Panjang Waterfall area were air temperature, humidity, and light intensity with measuring instruments used, namely a thermometer to measure air temperature, a hygrometer to measure air humidity, and a lux meter to measure light intensity. The results of the measurement of these three components also vary every day according to the environmental conditions around the Curug Panjang waterfall (Syarifah et al., 2018).

The most common dragonfly is the *Orthetrum sabina* species. This dragonfly is usually found perched on the grass at the edge of waterfalls and perched on rocks both in the morning and in the evening. This dragonfly species belongs to the Libellulidae family. High abundance indicates the dominance of this species at the research location. The Libellulidae family is a predator, this species is usually aggressive, eating all insects (Triyanti & Arisandy, 2020).

The elusive dragonfly is the species *Ictinogomphus decoratus* because it only occasionally perches on the tips of dry branches. In addition, this dragonfly that distinguishes it the most from other dragonflies is that it is characterized by a swollen lump on its stomach. According to Kamaludin et al, (2016: 44) this dragonfly is also known as the striped spear dragonfly because the tip of the abdomen resembles a pointed spear. The dominant body color is black with yellow stripes, compound eyes are green.

Based on the measurement of the abiotic factor, the measurement results of the air temperature around 27°C-29°C with an average air temperature of 27.75°C. According to Putri, Wimbaningrum, & Setiawan (2019), the effective temperature range when dragonflies are active is around 15-45 C, the air temperature is still classified as normal for all dragonflies to carry out activities. Measurements of air humidity that have been measured are around 70-92% with an average air humidity of 76%. According to Wulandari, Setyawati, & Kustiati (2019), the minimum humidity for dragonfly activity is 70%, while the optimal humidity that supports dragonfly life is between 85-90%. Air humidity that has been measured is still considered normal for dragonfly activity both for its life and when the dragonfly is populated.

Measurement of light intensity is around 335-490 lux with an average light intensity of 396.5 lux using a magnification of X 100. Dragonflies will actively search for prey and reproduce during the day when the sun is shining. Therefore, when the weather is clear, dragonflies are more active and difficult to approach. Dragonflies are easily approached at dusk and before sunrise (Putri et al., 2019). The large number of dragonflies found can be seen in Table 2.

Table 2. Amount of dragonflies in the Curug Panjang Waterfall area

Species	Indonesian Name, variety	Amount
<i>Diplacodes trivialis</i>	Capung Tengger Biru, betina	7
<i>Orthetrum pruinosum</i>	Capung Sambar Merah, betina dan jantan	12
<i>Orthetrum Sabina</i>	Capung Sambar Hijau, jantan	12
<i>Crocothemis servillia</i>	Capung Sambar Garis Hitam, Jantan	6
<i>Neurothemis ramburii</i>	Capung Tengger Jala Tunggal, jantan	8
<i>Trithemis aurora</i>	Capung Merah Jambu, jantan	9
<i>Pantala flavescens</i>	Capung Kembara, betina	5
<i>Tholymis tillarga</i>	Capung Sambar Senja, betina	4
<i>Ictinogomphus decorates</i>	Capung Tombak Loreng, betina	2
<i>Agriocnemis femina</i>	Capung Jarum Centil, jadan ntan	4
<i>Agriocnemis pygmaea</i>	Capung Jarum Kecil, betina	5
<i>Copera marginipes</i>	Capung Hantu Kaki Kuning, jantan	3

The sub-order Anisoptera is larger than the sub-order Zygoptera and has good flying abilities, the ability to fly up to 36 km / hour. When this dragonfly is resting, it will perch by spreading its right and left wings (Zaman, et al. 2017: 76). Dragonflies from the sub-order Zygoptera (needle dragonflies) are very often found and mostly live in streams and rivers, some are also found in swamps, perched in the grass around clean waterfall waters and flowing with moderate or high sunlight intensity, under the shade of trees and easy to catch because it has a narrow range (Pamungkas & Ridwan. 2015: 1297). The needle dragonfly, whose distribution is limited and with a low frequency, is very sensitive to changes in habitat, this type of dragonfly will not be found in areas that have experienced disturbance or function conversion (Wakhid, et al. 2014: 45).

Air temperature, humidity and light intensity are components of abiotic factors that greatly affect the life of dragonfly species from flying, foraging for prey, and copulation. The light intensity is sufficient to move or pump the thoracic muscles and dragonfly wings to carry out flying activities. The minimum temperature for dragonflies is ± 20 C, while the minimum humidity for dragonfly activity is $\pm 70\%$ (Julaika, et al. 2018: 41-42).

Temperature is an important environmental factor for living things and plays a direct role in regulating the activities of living things because temperature affects the rate of chemical reactions in the body and controls metabolic activities, namely animals to adapt to natural temperatures. Humidity is the amount of water in the air, death can occur if the humidity is too low or too high for insects. Light is a factor that can affect insect activity, some insects like high light and some insects like low light. Dragonflies are insects that have a positive response to light. The openness of the place is closely related to the intensity of light that enters and is needed by dragonflies for activities, thus making dragonflies only active during the day (Hartika, et al. 2017: 162).

CONCLUSION

Based on the results of the study, it can be concluded that 12 species of dragonflies were obtained, namely *Diplacodes trivialis*, *Orthetrum pruinosum*, *Orthetrum sabina*, *Crocothemis servillia*, *Neurothemis ramburii*, *Trithemis aurora*, *Pantala flavescens*, *Tholymis tillarga*, *Ictinogomphus decoratus*, *Agriocnemis femina*, *Agriocnemis pygmaea*, and *Copera marginipes*. Measurement of abiotic factors only includes air temperature with an average of 27.75 °C, air humidity with an average of 76%, and light intensity with an average of 396.5 lux.

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