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Dragonflies Inventory (Odonata) in Kota Waringin Village, Puding Besar District – Bangka Island

Rahmat Pratama[1] and Rega Alfi Rosalini[2]
[1]Sriwijaya University
[2]Biology Department, State University of Jakarta

Abstract

Odonata is considered an environmental indicator group of freshwater habitats. Thus there is a need to have a good baseline data to use it for monitoring fluvial habitats. However, species composition of Odonata in Kota Waringin Village is poorly known.This study aims to determine the diversity of dragonfly species in the Kota Waringin Village, Puding Besar District – Bangka Island. Data were collected at Three different ecosystems in Kota Waringin Village area (River in Forest, River in oil palm plantations and yard). Location for data collection based on the availability of water resources using purposive sampling method. The species were identified using identification books (Dragonfly of Singapore and Australian Dragonfly). Based on research we revealed 13 species of dragonflies are exist in three sampling locations (*Agrionoptera insignis*, *Brachydiplax chalybea*, *Heliaeschna crassa*, *Ictinogomphus decoratus melaenops*, *Nannophya pygmaea*, *Neurothemis fluctuans*, *Neurothemis ramburii*, *Neurothemis terminata*, *Orthetrum chrysis*, *Orthetrum Sabina*, *Rhodothemis rufa*, *Zyxomma petiolatum* and *Rhyothemis phyllis*).

Keywords : Odonata, Dragonflies, Inventory, Conservation, Bangka Island

INTRODUCTION

Odonata is divided into two suborders: Zygoptera or damselflies and Anisoptera or true dragonflies (Kalkman et al, 2008).With 5,680 extant species, dragonflies are a relatively small order of insects. Their size and colour and their diurnal and often conspicuous behaviour make them a popular group for both professional and amateur entomologists. Dragonflies are among the most ancient of winged insects, dating back well into the Permian (Grimaldi & Engel, 2005). Some have changed very little between Mesozoic times and the present (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

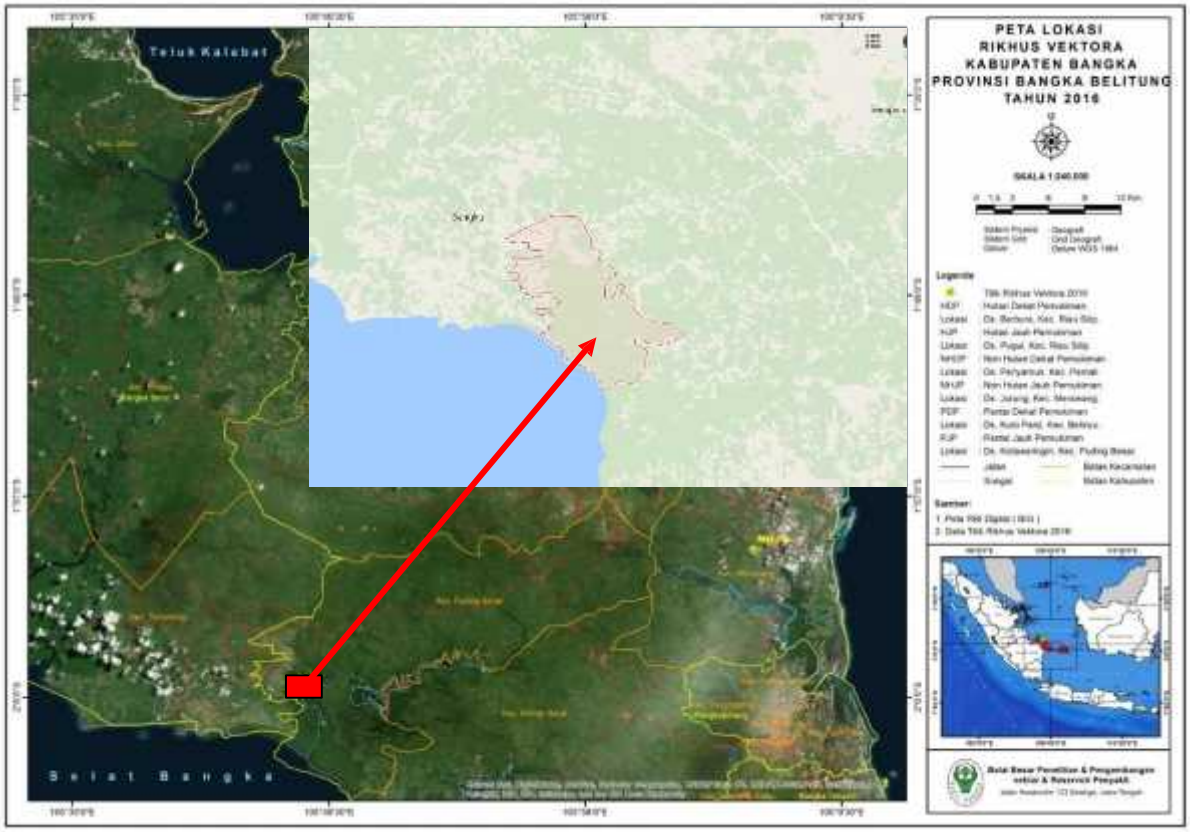
Dragonfly larvae live in freshwater environments and only a few species tolerate brackish conditions, two of which even live in salt marshes and mangroves. Both running and standing waters are used, while a few species are semi-terrestrial or inhabit water held in tree holes, leaf axils and other phytotelmata. Many species have small distributional ranges, and are habitat specialists, including inhabitants of alpine mountain bogs, seepage areas in tropical rain forests, and waterfalls (Kalkman *et al*, 2008).

A general outline of odonate diversity is given by Silsby (2001). A checklist of all dragonflies including synonyms and references is found on http://www.odonata.info (van Tol, 2005). species composition of Odonata in Kota Waringin Village is poorly known.This study aims to determine the diversity of dragonfly species in the Kota Waringin Village, Puding Besar District – Bangka Island. Dragonfly is one of the organisms that live in the river in Menoreh Karst. The life cycle of the dragonfly is depend on the availability and quality of Kota Waringin, some species of dragonfly are vulnerable to water pollution such as habitat change, pollution and disturbance from human activities.

RESEARCH METHOD

A. Observation

Determining the location for data collection started by observe of rivers in Kota Waringin with Three diffrent Ecosystems (River in Forest, River in oil palm plantations and yard).



Picture I: Data Collecting Location Of Dragonflies Inventory In Kota Waringin Village, Puding Besar District – Bangka Island

B.Data Collection

Data collection is using purposive sampling method. This method performed during the dragonfly active (08:00-15:00) West Indonesian Time. Data collection was repeated three times for each ecosystem. Other observations outside the sampling time is taken to strengthen data and also for documentation.

C.Recording Morphological Characteristic

Recording morphological characteristics performed on dragonfly that found. Dragonfly catched by insect net then record their morphological caharactersitic. Minimum recording is 3 individuals at least for each species. Recording morphological characteristics is used to check whether the species is recorded previously or not. Each species is documentated for easier identification (Rachman and Rohman, 2016).

RESULTS AND DISCUSSIONS

The results of research at three different ecosystems in Kota Waringin Village area (River in Forest, River in oil palm plantations and yard). found there are 13 species of dragonflies exist. Libellulidae family consists of 11 species, 1 Aeshnidae family and 1 Gomphidae family.

Tabel 1. Names of dragonflies in Kota Waringin Village area and it's Ecosystems (River in Forest, River in oil palm plantations and yard)

Family	Species	IUCN	Ecosytems		
			Forest	Oil palm plantations	Yard
Libellulidae	*Agrionoptera insignis*	LC	√	√	-
	Brachydiplax chalybea	LC	√	√	-
	Nannophya pygmaea	LC	√	√	-
	Neurothemis fluctuans	LC	√	√	√
	Neurothemis ramburii	LC	√	√	-
	Neurothemis terminata	LC	√	√	-
	Orthetrum chrysis	LC	√	√	-
	Orthetrum sabina	LC	√	√	√
	Rhodothemis rufa	LC	√	√	√
	Zyxomma petiolatum	LC	√	√	√
	Rhyothemis phyllis	LC	√	√	√
Aeshnidae	*Heliaeschna crassa*	LC	√	-	-
Gomphidae	*Ictinogomphus decoratus melaenops*	LC	√	√	√

Morphological Characteristic

Family : Libellulidae
Agrionoptera insignis (Rambur, 1842)
Habitat : Magrove, secondary mixed dipterocarp forest (Barta and Dolny, 2013)
Male : Hindwing 28-30 mm. Total body length 37-41 mm

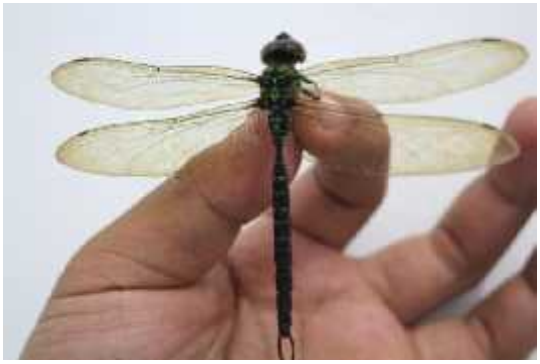
An uncommon species that inhabitat shady drains and luggish forested streams. The eyes are yellow (brown on top). The thorax has mottled yellow markings, irregular in outline, on dark metallic green beckground. As the dragonfly ages the yellow marks on the thorax darken and merge into the dark background. The abdomen is thin and largely red above, swollen slightly at its base. Last two segments of abdomen black. Abdomen of the femele similarly shaped but slightly thicker and duller in colour. This species is distinguished from the rather similar

Lathrecista asiatica by its smaller size, colour pattern of thorax and shape of the abdomen. The males are territorial (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

Family : Libellulidae
Brachydiplax chalybea (Brauer, 1868)
Blue Dasher
Habitat : Standing waters, marshes and weedy ponds (Barta and Dolny, 2013)
Male : Hindwing 24-27 mm. Total body length 33-35 mm

This species is common and widespread. Males are often seen in ponds, drains and disturbrd open habitats throughout Kota Waringin, including the reservoir. Females are rarely seen. The species is widespread in tropical Asia. The male has a powdery blue thorax and abdomen. The last three abdominal segments are dark. The side f thrax of the male is light brown. The base of the hindwing has a yellow tint, which separates it from the quite similar *Brachdiplax farinosa.* The female is brownish-yellow with dark markings along the dorsum of the abdomen. Its wings have a clear hindwing base (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

Family : Aeshnidae
Heliaeschna crassa Kruger, 1899
Nighthawker
Habitat : Swampy lowland forest and secondary mixed dipterocarp forest
(Barta and Dolny, 2013)
Male : Hindwing 49-52 mm. Total body length 72-77 mm



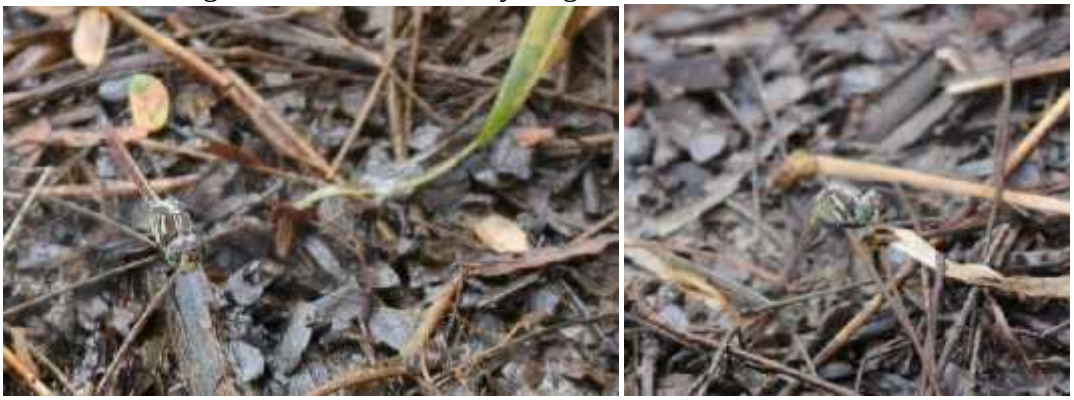
These two species are almost identical but *H. Idae* is n average slightly large than *H. Crassa.* The eyes and thorax of the male are bottle green. The top of the fronts is black, without a T-mark. The median space at the base of the wings has 4-5 crossveins, lacking in other aeshnid

genera markings on the base of the abdomen are green. Third segments of abdomen well constricted. Ground colour of abdomen dark reddish brown with green transverse flecks on segments 3-8. The female has a brown-coloured body and olive green to brownish eyes. It has smoky-brown wings. There is no constriction at the third segments. The hindwing base of the female is well rounded (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

Family : Gomphidae
Ictinogomphus decoratus melaenops (Selys, 1858)
Common Flangtail
Habitat : A wide variety of standing and flowing water habitats (Barta and Dolny, 2013)
Male : Hindwing 37-40 mm. Total body length 64-68 mm

This species is heavily built with strong greenish yellow bands and spots on its thorax and abdomen. The eyes are well-separated and greyish green in colour. Female is smilarly marked. It is often seen perching horizontally on the tips of twings by the edge of reservoirs or lakes. Sometimes, they are seen patroling along the shores of these water bodies. During the earlier part of morning, it often perches high in the trees, sunbathing in order to warm up. In the late morning, it comes down to the water. It does not enter forest and sometimes atays far from water. It often preys on other dragonflies (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

Family : Libellulidae
Nannophya pygmaea Rambur, 1842
Scarlet Pygmy
Habitat : A wide variety of standing water habitats (Barta and Dolny, 2013)
Male : Hindwing 12-13 mm. Total body length 16-17 mm.



The male has a red thorax and abdomen. Its eyes are red on top and dark brown below, with a sharp line of delineation. The wing base is tinted with amber. In the female the dorsumof the thorax is black. The abdomen has transverse bands of brown on top and olive green below. The immature male is yellowish brown in colour. This species is often seen in the obelisk posture at around noon. The obelisk posture is a handstand-like position that some dragonflies and damselflies assume to prevent overheating on sunny days. The abdomen is raised until its tip points toward the sun, minimising the surface area exposed to solar radiation (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

Family : Libellulidae
Neurothemis fluctuans (Fabricius, 1793)
Habitat : A wide range of standing water habitat (Barta and Dolny, 2013)
Male : Hindwing 22-25 mm. Total body length 30-34 mm

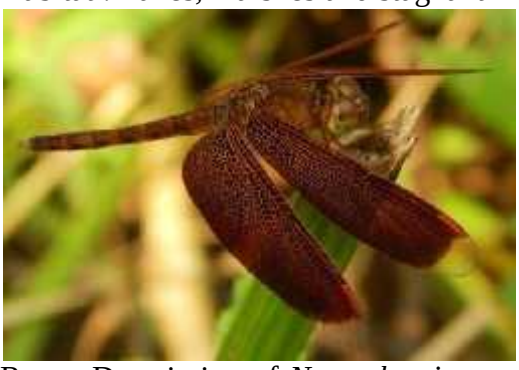
The male has a brownish-red thorax and abdomen. The wings are almost entirely brownish-red except for the tips and a thin tapering clear band around the hind margin from about its midpoint. The extent of the coloured part of the wings is somewhat variable. The female is light brown (grayish when old) with dark streaks along the abdomen and has clear wings. This dragonfly is not shy and can easily be approached as close as 30 cm without being startled. However, mating pairs are much more sensitive to disturbance. A slight movement by an observer 4 or 5 m away can cause the pair to fly away (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

Family : Libellulidae
Neurothemis ramburii (Brauer, 1866)
Habitat : Grassy borders of lakes, marshes, and other stagnant waters (Barta and Dolny, 2013)

Range descriptio of *Neurothemis ramburii* is distributed from Sundaland to New Guinea. There are records from Peninsular Malaysia, Taiwan, the Andaman Islands, Sumatra, Java,

Borneo (Sarawak, Sabah, Brunei and Kalimantan), the lesser Sunda islands, the Philippines, the Bismarck islands and New Guinea. This species is fairly common over much of its large range, but is less common in some areas (IUCN, 2016). The species haunts the grassy borders of lakes and marshes, from sea-level up to about 800 m and it is very local, but plentiful where found. (Lieftinck, 1954). Habitat loss is the only threat to this species, and not a serious one across much of its range at present, but it may become one with increased urbanization and industrial farming (Dow, R.A, 2009).

Family : Libellulidae
Neurothemis terminata (Rambur, 1842)
Habitat : Lakes, marshes and stagnant man-made water bodies (Barta and Dolny, 2013)

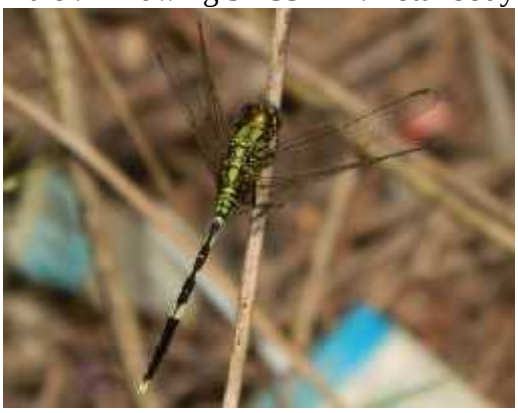


Range Description of *Neurothemis terminata* this is a widespread and often common species occurring from Peninsular Malaysia and Japan to the Lesser Sundas (Indonesia). (IUCN, 2016). *Neurothemis terminata* is often common when it is found in its preferred habitat. This species occurs on lakes, in marshes and in rice fields. It is mainly found in man-made habitats and is absent from well-developed forest. *Neurothemis terminata* is a widespread and often common species which can occur in man-made habitats. Assessed as Least Concern for these reasons (Kalkman, V, 2009).

Family : Libellulidae
Orthetrum chrysis (Selys, 1891)
Habitat : A wide Variety of standing and flowing water habitats (Barta and Dolny, 2013)
Male : Hindwing 31-34 mm. Total body length 41-48 mm

The male has a red face and dark grey eyes. The thorax is dark brown and the abdomen is red. The female is reddish brown. This species is easily confused with *Orthetrum testaceum* and can be differentiated by the colour of the thorax and eyes of the males and females as seen in the photos here. Other separating characters include the tuft of setae below the 2nd abdominal segment in *Orthetrum chrysis* male, lacking in *O. testaceum;* see drawings in Orr (2005).

Family : Libellulidae
Orthetrum sabina (Drury, 1773)
Habitat : A broad variety of standing and slow flowing water habitats (Barta and Dolny, 2013)
Male : Hindwing 32-35 mm. Total body length 47-52 mm

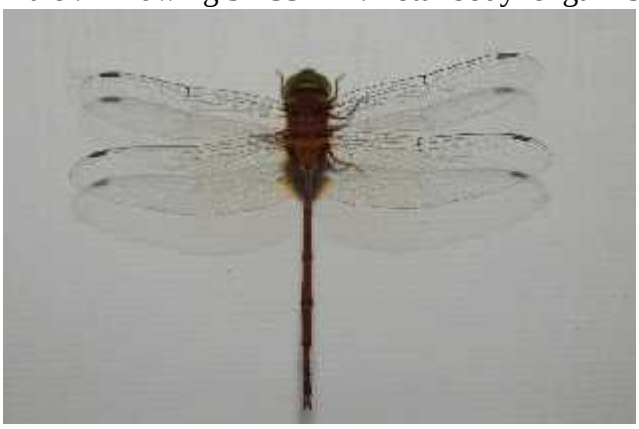


The eyes are pale green. The body is marked with a distinctive pattern of pale yellowish green. The base of the abdomen (segment 1-3) is swollen. The anal appendages are white. Males and females are similar. *Orthetrum Sabina* is a fast and strong flyer. It often preys on other dragonflies. The male remains close to the ovipositing female, guarding her against other males (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

Family : Libellulidae
Rhodothemis rufa (Rambur, 1842)
Habitat : A wide variety of standing water habitats; open ponds, marshes and lakes
(Barta and Dolny, 2013)
Male : Hindwing 33-35 mm. Total body length 41-44 mm

This is another of the medium sized species with red-bodied males. It is very easily confused with *Crocothemis servilia* and, similarly, the male also has red eyes, thorax and abdomen, with a thick pale band on the dorsum of the thorax. It is separated by features of the venation and the eyes, which just touch in *Rhodothemis rufa* (meeting more broadly in *Crocothemis servilia*). The female is brown with a bright yellow band along the dorsum of the thorax that extends to the third segment of the abdomen. Immature males are similar to the female. The pale band of the dorsum separates it from *Crocothemis servilia,* as well as the structural features nor for the male. Males tend to perch on the flat surfaces of leaves and lily pads, rather than on the tips of emergent plants (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

Family : Libellulidae
Zyxomma petiolatum (Rambur, 1842)
Habitat : A variety of standing water habitats and slow flowing rivers (Barta and Dolny, 2013)
Male : Hindwing 31-33 mm. Total body length 49-52 mm



The male has apple green eyes. The body is dark brown. The abdomen is very slender, but is swollen at the base (segment 1-3). The female has a brown body colour and slightly thicker abdomen. In older specimens of both sexes the wing tips are darkened. This species is active from late afternoon until after dusk. It flies rapidly along the sides of ponds and drains, hovering over water at times, and rarely perches. At night it often comes to light (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

Family : Libellulidae
Rhyothemis phyllis (Sulzer, 1776)
Yellow-Barred Flutterer
Habitat : A wide variety of standing and flowing water habitats (Barta and Dolny, 2013)
Male : Hindwing 33-3 mm. Total body length 39-41 mm

Males and females are very similar. The eyes are reddish brown on top and light brown below. The thorax and abdomen are dark, slightly metallic, almost black. The base of the hindwing has a distinctive barred pattern of yellow, dark brown and deep metallic blue. *Rhyothemmis phyllis* is a sun-loving species, perching on emergent sticks. It spends much of its day on the wing, flying with an easy fluttering glide. It often swarms when feeding, especially late in the afternoon, probably taking mosquitoes and midges. When in these swarms individuals tend to dart this way and that in a rather irregular fashion, perhaps reducing their chances of being taken by a predator, such as a bird, but more likely in

response to detecting prey items dispersed irregularly in the foraging area. Sometimes other species join these swarms, and *Rhyothemmis phyllis* can sometimes be found in swarms dominated by other species such as *Pantala flavescens* (Tang, H.B., L.K. Wang and M. Hamalainen, 2010).

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