

# Assessment of Odonata and Lepidoptera Fauna of the University of Mindanao Matina, Davao City, Philippines

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## ABSTRACT

Under the umbrella of the “Biodiversity assessment of the University of Mindanao (UM), Matina Campus” a rapid assessment of Odonata and Lepidoptera fauna was conducted between October 2016 and November, 2017. Opportunistic sampling and photo-documentation was conducted in three sampling areas: grassland, mini forest, and open landscapes near the college buildings. Nine species of Odonata were documented where the mini-forest has the highest species richness and open landscapes near the buildings have the poorest. One Philippine endemic Odonata species *Coeriagrion lieftincki* was found inhabiting the fluvial systems near the grassland. At present, this endemic species is considered least concern with stable population in the wild. Fifteen species of Lepidopterans were documented where the highest species richness was observed near the professional school. Majority are oriental species with one Philippine endemic *Hypolimnas bolina philippensis*. The minimal number of Odonata and Lepidoptera within the campus can be attributed to its severely disturbed fluvial systems limiting the survival of endemic species paving the way to more tolerant oriental species. The low species richness of Lepidoptera can be attributed to the low diversity of angiosperms in the campus serving as their host and food plants. The present microhabitat within UM Matina campus is not suitable haven for endemics.

**Keywords:** Survey, Dragonfly, Damselfly, Butterfly, UM, Davao, Philippines.

## INTRODUCTION

Insects in the Philippines comprised roughly about 22,000 species with new species are described almost every year in the last decade. Two of the most studied insect groups in the Philippines are Odonata (dragonfly & damselfly) and Lepidoptera (butterfly & moth). Odonata and Lepidoptera are among the most conspicuous and colorful insect groups inhabiting the forests, agro ecosystems, and green spaces in urban ecosystems (Dennis et al. 2017). Aside from their being charismatic, both groups play pivotal roles in maintaining ecosystem's balance. Odonatans control pests while Lepidopterans served as primary pollinators to diverse groups of angiosperms. Both taxa are good bio indicators of ecosystems' overall health.

There are more than 300+ Odonata species in the Philippines where 90% of Zygopterans are endemic and 40% for Anisoptera (Hamalainen, 2004). For Lepidoptera, there are more than a thousand species found in the country with relatively high level of endemism and diversity (Treadaway, 1995). Majority of the studies conducted on these taxa are taxonomic and faunistic in nature. Most faunistic studies have been conducted in forested ecosystems. No studies have been conducted within the available green spaces in the urban areas like Davao City. These data are important in assessing the remaining species of these taxa that is thriving in urban ecosystems which is useful in promoting urban conservation strategies. Moreover, Lepidopteran species responds sensitively to rapid

urbanization (Lee et al., 2012) and greatly affected by vegetation changes since this species have a strong association with their host and food plants. The type of plants present in the campus would also determine the kind of butterfly species.

Scientists believed that urban green spaces serve as a haven for many groups of organisms that have been displaced by industrialization (Lee et al., 2015). Hence, this paper aims to document the Odonata and Lepidoptera fauna of the University of Mindanao, Matina campus. This is beneficial in establishing the database for urban biodiversity in Davao City and further conservation initiatives.

## MATERIALS AND METHODS

Purposive sampling and photo documentation were employed in the three vegetation types of the University of Mindanao, Matina campus from October to November, 2016. Odonata species were collected by handpicking and hand netting for elusive species. Vouchers were soaked for 24 hours in acetone, air dried, and placed in individual paper triangles. Lepidoptera were photo documented using Nikon D5300 from 9:00 am to 3:00 pm. No collection of Lepidoptera species was conducted.

Odonatans were identified using published works and photo guide by Villanueva (2009, 2011), and Medina et al. (2016). Lepidoptera was identified using published journals and photographs of identified specimens and a checklist of Treadaway (1995). Confirmation of species was done by Dr. Alma B. Mohagan. Endemicity and conservation status were obtained using the International Union for Conservation of Nature (IUCN) Red List of Threatened Species.

## RESULTS AND DISCUSSION

A total of 9 species of Odonata from 8 genera and 3 families were recorded from University of Mindanao, Matina campus. Of the 9 species, 6 are Anisoptera while 3 are Zygoptera. Five species were under the family Libellulidae while 3 species are from the family Coenagrionidae. One species recorded was for Aeshnidae. For Lepidoptera, 8 species under 7 genera and 4 families were recorded.

**Table 1.** Odonatan species in the University of Mindanao, Matina Campus

No.	Scientific name	Family	HUM	IUCN Status	GD
1	<i>Diplacodes trivialis</i>	Libellulidae	G	LC	O
2	<i>Gynacantha subinterrupta</i>	Aeshnidae	B	LC	O
3	<i>Neurothemis ramburii</i>	Libellulidae	B, MF	LC	O
4	<i>Orthetrum sp.</i>	Libellulidae	G	LC	O
5	<i>Orthetrum sabina sabina</i>	Libellulidae	G	LC	O
6	<i>Pantala flavescens</i>	Libellulidae	G	LC	O
7	<i>Agriocnemis femina femina</i>	Coenagrionidae	G, B	LC	O
8	<i>Coeriagrion lieftincki</i>	Coenagrionidae	MF	LC	PE
9	<i>Ishnura senegalensis</i>	Coenagrionidae	G	LC	O

**Legend:** HUM – Habitat type in UM; GD – Geographic Distribution;  
LC – Least Concern; O – Oriental; PE – Philippine Endemic;  
B- Buildings, G- Grassland, MF- Mini forest.

The Odonata fauna of the University of Mindanao, Matina campus is dominated by the family Libellulidae and Coenagrionidae which are species highly tolerant to anthropogenic disturbances and have less preference for water quality (Medina et al., 2012; Medina et al., 2015a). Species from these two families are the most dominant odonates worldwide that inhabits open areas with less vegetation and standing waters (Keize & Kalkman, 2009).

The kind of species found in the campus indicates that the remaining fluvial system in the campus is heavily polluted with little possibility of harboring quality or endemic species. Endemic and rare species of Odonata are associated with forested habitats and pristine fluvial systems (Villanueva, 2011). Hence, ecological restoration activities would be made to the creeks inside UM Campus with regular clean-up drive and tree planting activities might permit the re-occurrence of more endemic species.



**Fig. 1** A. *Diplacodes trivialis*, B. *Gynacantha subinterrupta*, C. *Neurothemis ramburii*, D. *Orthetrum* sp., E. *Orthetrum sabina sabina*, F. *Pantala flavescens*, G. *Agriocnemis femina femina*, H. *Coeriagrion lieftincki*, I. *Ishnura senegalensis*.

Majority of the species found in the university are Oriental and Least Concerned based on the International Union of Conservation of Nature 2017-2 version which indicates that the fluvial habitats are no longer pristine to hoard endemic species. Only one species *Coeriagrion lieftincki* is Philippine endemic however this species of zygoptera is also found in disturbed habitats such as pond margins or marches (Medina et al., 2015b).

**Table 2.** Lepidopterans of the University of Mindanao, Matina Campus

No.	Species	Family	HUM	IUCN Status	GD
1	<i>Pothantus mingo mingo</i>	Hesperiidae	G	Rare	O
2	<i>Zizina otis oriens</i>	Lycaenidae	G	LC	O
3	<i>Melanitis leda leda</i>	Nymphalidae	MF	LC	W
4	<i>Hypolimnas bolina philippensis</i>	Nymphalidae	MF	LC	PE
5	<i>Hypolimnas missipus</i>	Nymphalidae	MF	LC	O
6	<i>Mycalesis felderi</i>	Nymphalidae	MF	LC	O
7	<i>Eurema sp.</i>	Pieridae	B	LC	O
8	<i>Appias olferna</i>	Pieridae	G	LC	O

**Legend:** B- Buildings, G- Grassland, MF- Mini forest.

Lepidoptera fauna of the University of Mindanao, Matina campus exhibited poor species richness which can be attributed to low diversity of angiosperm species found in the campus. Majority of butterflies found in UM Matina campus are Oriental species and are Least Concerned except for *H. bolina philippensis* and *P. mingo mingo*. *H. bolina philippensis* is a Philippine endemic species while *P. mingo mingo* is a rare species. The low species richness indicates that the butterfly species inside UM campus has been adversely affected by urbanization.

The greater number of non-native species was observed which are more tolerant compared to the endemics. Moreover, the unavailability of host plants also limits the survival of endemic species within UM Matina campus.



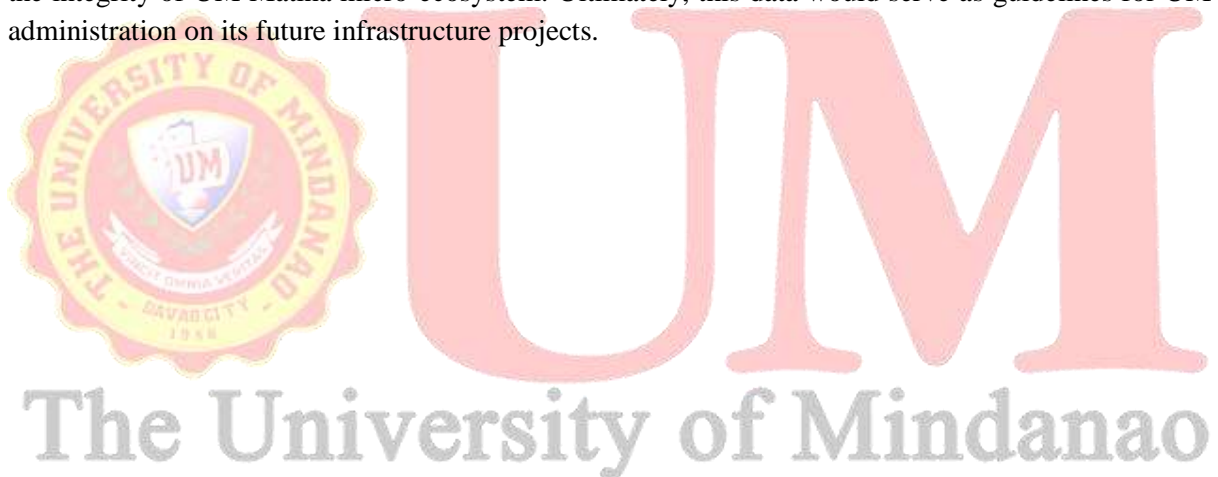
**Fig. 2** J. *Pothantus mingo mingo*, K. *Zizina otis oriens*,  
 L. *Melanitis leda leda*, M. *Hypolimnas bolina philippensis*,  
 N. *Mycalesis felderi*, O. *Appias olferna*

Butterfly communities respond sensitively to rapid urbanization (Lee et al., 2012) and are greatly affected by vegetation changes since this species have a strong association with their host and food

plants. The type of plants present in the campus would also determine the kind of butterfly species. In United Kingdom, there is a rapid decline of butterflies in urban areas by as much as 69% as compared to the rural areas with only 45% for the past 20 years (Dennis et al., 2017). Considering the important role of butterflies played in pollination, the low number of species in rural areas such as UM Matina campus must be taken into consideration in drafting policies to increase butterfly diversity in urban green spaces.

### CONCLUSION AND RECOMMENDATION

The low species richness of Odonata and Lepdoptera found in the University of Mindanao, Matina Campus can be attributed to its severely disturbed fluvial systems which limits the survival of endemic species paving the way to more tolerant Oriental species. The present microhabitat within UM Matina campus is not suitable for the survival of endemic species. To possibly increase the number of Lepidopteran and Odonatan endemic species inside UM Matina campus, clean-up drive, tree planting along the creeks, planting of Lepidopteran host plants could be done. In addition, an administrative policy on protecting the existing tree species inside the campus would help maintain the integrity of UM Matina micro-ecosystem. Ultimately, this data would serve as guidelines for UM administration on its future infrastructure projects.



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