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# Odonate Diversity at Wena Dam of Nagpur District (Ms), India

Zoology

**KEYWORDS :** Odonata, dragonfly, damselfly, Nagpur, Wena dam

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## ABSTRACT

*A survey was undertaken at the Wena Dam of Nagpur district during the post monsoon period of 2012 to record the Odonata fauna of this reservoir. A total of 52 odonates, 34 belonging to Anisoptera and 18 to Zygoptera sub- group were recorded during this survey. The anisopterans predominantly belonged to the family Libellulidae (27), Followed by Aeshnidae (4), Gomphidae (2) and Macromiidae (1). The zygopterans belonged to the family Coenagrionidae (14), Lestidae and Platycenemididae (2 each). The most abundant and commonly found odonate species of this reservoir are- Anax guttatus, Ictinogomphus rapax, Brachydiplax sobrina, Brachythemis contaminata, Bradinopyga geminata, Crocothemis servilia, Diplacodes trivialis, Neurothemis tullia, Orthetrum sabina sabina, Pantala flavescens, Potamarcha congener, Rhyothemis variegata, Tramea basilaris burmeisteri, Tramea limbata, Trithemis aurora, Trithemis pallidinervis, Ceriagrion coromandelianum, Ischnura aurora, Pseudagrion decorum and Rhodischnura nursei.*

## Introduction

Although much attention in conservation biology is directed towards large scale coastal and inland ecosystem, the smaller ecosystems have contributed disproportionately to regional diversity, largely because of their high *beta* diversity (compositional dissimilarity among sites). They not only offer a powerful potential for studies in ecology, evolutionary- and conservation biology, but also are good model systems for large scale surveys (Meester *et al.,* 2005). In addition they provide migration corridors and stepping stones for biota (Mitchels & Merriam, 1991). Ponds and lakes are vital for providing new opportunities for irrigation farming, fisheries development, transport and recreation. Many lakes and reservoir have been impounded in India to provide a continuous water supply and provide an opportunity to investigate the seasonal variation in physiochemical and biological factors. The use of invertebrates to determine the level of diversity of indicator groups of an ecosystem and for prediction for the presence of other taxa is now being well recognized (Olive & Baettie, 1993; Das *et al.,* 2012). Odonates being voracious predators both as larva and adult play a significant role in a wetland ecosystem. They feed on various vectors of medical and veterinary importance and also help in control of agricultural pest. Their value as indicators of quality of the biotope is now being increasingly recognized. The region lying at the centre of India is dotted with small and large water bodies containing a rich odonate fauna (Fraser, 1933-36; Mitra, 1988; Andrew, 1995, Andrew & Chandrasekhar, 2001;, Andrew & Tembhare, 1997; Andrew *et al.,* 2008,10,11,12 Tiple *et al.,* 2008) .The present work was undertaken to study the odonate biodiversity of a large commercially important reservoir, Vena dam, located at the outskirt of Nagpur city.

## Material and Methods

**Site**- Wena (Vena/ Wana) dam is a mid- size reservoir built on Wena river and is situated on National Highway No. 6 between the city of Nagpur and Amravati in the state of Maharashtra (Central India). It is located at 21°9'6"N 78°52'0"E near Wadgaon Village in Umred Taluka of Nagpur District. The height of the dam is 53.3 feet while length is 8,245 feet with 12 gates. The storage capacity is 14,918 cubic meters. It lies 18 km west of Nagpur city and provides water to Ordnance factory and Kalmeshwar MIDC Area. The area lies at the southern fringe of Satpuda mountain range (21o 10'N $79^0$ 12' E) and is an undulating plateau with altitude ranging between 274 to 305 m above mean sea level. The diurnal temperature varies from$10^0$ C in Dec-Jan (winter) to a maximum of $46^0$ C in May June (summer). The normal rainfall varies from 100-200 cm which precipitates mostly during monsoon from June to September.

The Physico-chemical properties of the water of Wena dam is given below (Antulay, 2004). In order to study the Odonata fauna, specimens were collected, photographed and were identified using standard manuals (Fraser 1933-36; Subramanian 2005; Andrew *et al.,* 2008) to confirm their identity.

**Table 1. The Physico-chemical properties of the water of Wena dam (Antulay, 2004).**

| pH | | | BOD | COD | DO | | |
|---|---|---|---|---|---|---|---|
| Max. | Min. | Ave. | | | Max. | Min. | Ave. |
| 8.09 | 8.7 | 8.41 | 3.08 | 16 | 5.95 | 6.22 | 6.08 |

## Results and Discussion

The Odonate biodiversity is well represented at Wena reservoir with 52 species belonging to the sub group Anisoptera (34) and Zygoptera (18). The anisopterans are represented by four families- Libellulidae (27), Aeshnidae (4), Gomphidae (2) and Corduliidae (1). The zygopterans are represented by the families- Coenagrionidae (14), Lestidae (2) and Platycenemididae (2) (Table 2). Among Aeshnidae the most regular species is *Anax guttatus* which is regularly found patrolling along the water edge. *Ictinogomphus rapax*, belonging to family Gomphidae is commonly observed perched on emerging vegetation. The common dragonflies of Wena belonging to family Libellulidae are- *Brachydiplax sobrina, Brachythemis contaminata, Bradinopyga geminata, Crocothemis servilia, Diplacodes trivialis, Neurothemis tullia, Orthetrum sabina sabina, Pantala flavescens, Potamarcha congener, Rhyothemis variegata, Tramea basilaris burmeisteri, Tramea limbata, Trithemis aurora* and *Trithemis pallidinervis.*

Among Zygoptera, the most abundant and commonly found damselflies belong to the family Coenagrionidae (*Ceriagrion coromandelianum, Ischnura aurora, Pseudagrion decorum* and *Rhodischnura nursei).* A comparative account on the richness of Odonata fauna of Wena reservoir with that of the peninsular India is presented in Table 3.

The odonates belonging to the family Libellulidae and Coenagrionidae dominate and are well represented at Wena reservoir. The 27 species belonging to the family Libellulidae represent 54% of species reported from peninsular India where as 14 species of Coenagrionidae represent 56% of peninsular India. Although eight species of Lestidae are recorded from peninsular India, we could record only two species but both the representatives of Platycenemidide of peninsular India (*Copera marginipes* and *C. vittata*) are also found in this reservoir. Odonates belonging to the families Corgulegasteridae and Cordulidae of Anisoptera and Protoneuridae, Calopterygida Chloroyphidae, Euphaeidae and Platystictidae of Zygoptera are not found in Wena dam probably because most of the species of these families are restricted to high altitude and/or breed in running water streams

in forest landscape (Subramanian. 2005).

**Table 2. The list of Odonata found breeding in and around Wena dam.**

| S. No | Species | Population |
|---|---|---|
| **Sub Order- ANISOPTERA** | | |
| **Family: Aeshnidae** | | |
| **1** | Anax guttatus (Burmeister, 1839) | *** |
| **2** | Anax immaculifrons (Rambur, 1842) | * |
| **3** | Gynacantha bayadera Selys, 1891 | * |
| **4** | Hemianax ephippiger (Burmeister, 1839) | ** |
| **Family: Gomphidae** | | |
| **5** | Ictinogomphus rapax (Rambur, 1842) | **** |
| **6** | Paragomphus lineatus (Selys,1850) | ** |
| **Family: Libellulidae** | | |
| **7** | Acisoma panorpoides Rambur, 1842 | ** |
| **8** | Brachydiplax sobrina (Rambur, 1842) | *** |
| **9** | Brachythemis contaminata (Fabricius,1793) | ***** |
| **10** | Bradinopyga geminata (Rambur, 1842) | *** |
| **11** | Crocothemis servilia (Drury, 1770) | ***** |
| **12** | Diplacodes trivialis (Rambur,1842) | *** |
| **13** | Diplacodes nebulosa (Fabricius, 1793) | * |
| **14** | Lathrecista asiatica (Fabricius, 1798) | * |
| **15** | Neurothemis fulvia (Drury, 1773) | * |
| **16** | Neurothemis intermedia (Rambur, 1842) | * |
| **17** | Neurothemis tullia (Drury, 1773) | *** |
| **18** | Orthetrum chrysis (Selys, 1891) | * |
| **19** | Orthetrum glaucum (Brauer, 1865) | ** |
| **20** | Orthetrum luzonicum (Brauer, 1868) | * |
| **21** | Orthetrum pruinosum neglectum (Rambur, 1842) | * |
| **22** | Orthetrum sabina sabina (Drury, 1770) | ***** |
| **23** | Pantala flavescens (Fabricius, 1798) | ***** |
| **24** | Potamarcha congener (Rambur, 1842) | *** |
| **25** | Rhodothemis rufa (Rambur, 1842) | ** |
| **26** | Rhyothemis variegata (Linnaeus, 1763) | *** |
| **27** | Tholymis tillarga (Fabricius, 1798) | ** |
| **28** | Tramea basilaris burmeisteri (Kirby,1889) | *** |
| **29** | Tramea limbata (Rambur,1842) | *** |
| **30** | Trithemis aurora (Burmeister, 1839) | *** |
| **31** | Trithemis festiva (Rambur, 1842) | ** |
| **32** | Trithemis pallidinervis (Kirby, 1889) | ***** |
| **33** | Zyxomma petiolatum (Rambur, 1842) | ** |
| **Family:Cordulidae** | | |
| **34** | Epophthalmia vittata (Burmeister,1839) | * |
| **Sub Order- ZYGOPTERA** | | |
| **Family: Coenagrionidae** | | |
| **35** | Aciagrion pallidum (Selys,1891) | * |
| **36** | Agriocnemis lacteola (Selys,1877) | ** |
| **37** | Agriocnemis femina (Brauer, 1868) | ** |
| **38** | Agriocnemis pygmaea (Rambur, 1842) | * |
| **39** | Ceriagrion cerinorubellum (Brauer, 1865) | ** |
| **40** | Ceriagrion coromandelianum (Fabricius, 1798) | ***** |
| **41** | Enallagma parvum (Selys,1876) | ** |
| **42** | Ischnura aurora (Brauer, 1865) | ***** |
| **43** | Ischnura senegalensis (Rambur, 1842) | ** |
| **44** | Mortonagrion varralli (Fraser, 1920) | * |
| **45** | Pseudagrion spencei Fraser, 1922 | * |
| **46** | Pseudagrion decorum (Rambur, 1842) | **** |
| **47** | Pseudagrion rubriceps (Selys, 1876b) | ** |
| **48** | Rhodischnura nursei (Morton,1907) | **** |
| **Family: Lestidae** | | |
| **49** | Lestes umbrinus Selys,1891 | * |
| **50** | Lestes viridulus Rambur, 1842 | * |
| **Family: Platycenemididae** | | |
| **51** | Copera marginipes (Rambur, 1842) | ** |
| **52** | Copera vittata Laidlaw, 1917 | * |

(***** Very high, **** high, *** moderate, ** low, * rare)

**Table. 3. Comparative account of the number of species of Odonata* found at Wena dam**

| Family | Number of Species | | | |
|---|---|---|---|---|
| | World | India | Peninsular India | Wena dam |
| Aeshnidae | 412 | 42 | 08 | 04 |
| Gomphidae | 919 | 90 | 27 | 02 |
| Libellulidae | 1139 | 95 | 50 | 27 |
| Corduliidae** | 403 | 32 | 21 | 1 |
| Coenagrionidae | 1147 | 65 | 25 | 14 |
| Lestidae | 157 | 25 | 08 | 2 |
| Platycenemididae | 197 | 30 | 2 | 2 |

( *Subramanian, 2005; **Davies & Tobin, 1985)


**Figs. 1-6 Odonates of Wena dam [Fig.1-** *Orthetrum pruinosum neglectum;* **Fig.2-** *Orthetrum glaucum;* **Fig.3-** *Neurothemis tullia;* **Fig.4-** *Rhyothemis variegata* **(female); Fig.5-** *Crocothemis servilia;* **Fig.6-** *Rhyothemis variegata* **(male)].**

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**Figs. 7-12 Odonates of Wena dam [Fig.7-** *Ceriagrion coromandelianum;* **Fig.8-** *Epophthalmia vittata;* **Fig.9-** *Orthetrum luzonicum;* **Fig.10-** *Ictinogomphus rapax;* **Fig.11-** *Orthetrum sabina sabina;* **Fig.12-** *Trithemis aurora***].**

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