

A COLLECTION OF ODONATA FROM UMRER, NAGPUR DISTRICT, CENTRAL INDIA, WITH A NOTE ON THE BEHAVIOUR OF *PANTALA FLAVESCENS* (FABRICIUS) IN THE RAIN

R.J. ANDREW and S. CHANDRASEKHAR

Shri Shivaji ESA's Science College, Congress Nagar, Nagpur-440012, MS, India

Abstract – 48 spp. are recorded, 5 of these are new to the fauna of central India. The behaviour of *P. flavescens* during rainfall is discussed in terms of endothermic warming.

Introduction

LAIDLAW (1917, 1919) and FRASER (1933-1936) collectively recorded only 28 Odonata species from central India. Later, MITRA (1986), ANDREW (1995) and ANDREW & TEMBHARE (1997) added 11, 12 and 12 new taxa respectively, bringing the total to 63 species. Recently, SHARMA et al. (2000) collected 14 species at light from Tadoba-Tiger Reserve in Chandrapur district. The collections of ANDREW (1995) and ANDREW & TEMBHARE (1997) were made in the cities of Brahmapuri town and Nagpur, respectively. The distance between the two is about 120 km, and the town of Umrer lies between these two localities. The present report is based on collections made around natural and man-made water bodies of Umrer.

Location

The town of Umrer is situated 45 km E of Nagpur on the Nagpur-Gadchiroli Road, and 70 km W of Brahmapuri. Umrer Tehsil is part of Nagpur district (20°50'45"-20°52'50"N, 79°16'00"-79°18'30"E). It has a dense natural forest (southern dry tropical deciduous type) with a core protected area rich in wildlife. The area is mainly flat terrain, elevation ranging from 270-295 m above MSL. The Amb river is a tributary of the Wainganga, which passes Umrer and joins the Godavari river. The climate of this area is dry tropical, with summer from April to June, monsoon from July to August, post-monsoon from October to November and winter from December to January. The minimum temperature observed is 11.5°C and the maximum reaches up to 44°C.

Observations

The following species were collected during the monsoon and post-monsoon period of 1999-2000, from the Amb river, Makardhokra pond and Umrer

Talab (pond):

Coenagrionidae: *Agriocnemis lacteola* Sel.; *A. pygmaea* (Ramb.); *Coenagrion dyeri* (Fr.); *Ceragrion coromandelianum* (Fabr.); *Enallagma parvum* (Sel.); *Ischnura aurora* (Br.); *I. senegalensis* (Ramb.); *Mortonagrion varralli* Fraser; *Pseudagrion decorum* (Ramb.); *Rhodischnura nursei* (Morton); *P. r. rubriceps* Sel.; *P. hypermelas* Sel.

Platycnemididae: *Copera marginipes* (Ramb.).

Protoneuridae: *Disparoneura quadrimaculata* (Ramb.).

Lestidae: *Lestes elatus* (Hagen); *L. viridulus* Ramb.

Gomphidae: *Ictinogomphus rapax* (Ramb.); *Paragomphus lineatus* (Sel.).

Aeshnidae: *Anax guttatus* (Burm.); *A. immaculifrons* Ramb.; *Gynacantha millardi* Fraser; *Hemianax ephippiger* (Burm.).

Corduliidae: *Epophthalmia vittata* Burm.

Libellulidae: *Acisoma p. panorpoides* Ramb.; *Brachydiplax sobrina* (Ramb.); *Brachythemis contaminata* (Fabr.); *Bradinyopyga geminata* (Ramb.); *Crocothemis s. servilia* (Dru.); *Diplacodes trivialis* (Ramb.); *D. nebulosa* (Fabr.); *Neurothemis fulvia* (Dru.); *N. t. tullia* (Dru.); *Orthetrum chrysis* (Sel.); *O. glaucum* (Burm.); *O. luzonicum* (Br.); *O. pruinatum neglectum* (Ramb.); *O. s. sabina* (Dru.); *O. taeniolatum* (Schneider); *Pantala flavescens* (Fabr.); *Potamarcha congener* (Ramb.); *Tholymis tillarga* (Fabr.); *Tramea basilaris burmeisteri* Kirby; *T. virginia* Ramb.; *Tritthemis aurora* (Burm.); *T. festiva* (Ramb.); *T. pallidinervis* (Kirby); *Urothemis s. signata* (Ramb.); *Zyxomma petiolatum* Ramb.

Behaviour of *Pantala flavescens* in the rain

On 20-VIII-2000, the first author watched the behaviour of *P. flavescens* resting in the rain. At ca 2:30 pm it started raining and after about 3 min a *Pantala* came near a bush, and hung on a horizontal branch. It flew around the bush twice and resettled at the same spot, 5 ft above the ground, keeping its body almost perpendicular to the branch. The site did not completely protect the dragonfly from the rain; the insect shifted its body angle slightly and then settled down. Tiny water droplets accumulated on the thorax, mid legs and abdomen. At 40 s intervals the head was wiped clean of water droplets

by the forelegs and by head-cocking in all directions. The mid and hind legs gripped the branch and showed no movement.

Water from the upper part of the body accumulated as a large drop at the angle of the hind tibia and femur, and then because of wing flickering, dropped on the ground. The dragonfly was observed for more than 15 min; it did not change its position, posture or body angle. After picking it up gently, it did not respond initially, but after 30 s it commenced shivering and breathing heavily, suddenly it darted upwards and flew away.

On 27-VIII-2000, after three days of continuous rain, at 12:30 pm, the rain slowed down to a drizzle. A swarm of *P. flavescens* swooped on a group of flying termites by darting fast, turning and consuming as many termites as possible. As soon as it started raining heavily again, the dragonflies took shelter under a balcony, but the termites were now directionless and flew round and round. One *Pantala* still did not rest at a place, but kept darting in a slow forward and backward motion keeping the abdomen at 45°. Even after finding a dry spot, it did not stop but left it and again darted around the same site. When it stopped raining heavily, it flew out and off.

Discussion

PRASAD (1996) listed 83 species from the state of Maharashtra, while ANDREW & TEMBHARE (1997) reported 63 species from central India. The present collection adds 5 new species for central India, viz. *L. elatus*, *L. viridulus*, *N. fulvia*, *O. taeniolatum* and *U. signata*, bringing the total to 68. The number of species collected for Umrer (48) is higher than those collected from the surrounding areas, i.e. Nagpur city (43), Brahmपुरi town (29), Bhandara district (29) and Wardha district (9) (MITRA, 1986; ANDREW, 1995; ANDREW & TEMBHARE, 1997; PRASAD, 1996).

This species richness is probably due to the circumstance that a large area around Umrer represents the Government Forest Protection Core Area and except for the open caste government coal mines, the Western Coal Fields Limited (WCL), the area is untouched by other urban influence. The WCL has also undertaken a huge reforestation program and all the exhausted open caste mines and surrounding areas are being converted into dense forest. The high number of

species in this area is probably an indication of the success of the reforestation policies undertaken by the WCL.

LAHIRI (1975) reported that in rain, *Bayadera hyalina* hangs under the wire on which they regularly perch. Whereas MITRA (1999) watched a pair of *Neurothemis tullia* in rain during seven days, without changing position. In the Indian subcontinent, MITRA (1996) reported that with temperature falling the dragonfly reduces its activity, and finally stops at 23°C. At low temperature, wing shivering to produce endogenous heat before flight is confined to the most "primitive" species, such as aeshnids, and it is lacking in the Zygoptera and libellulids (MAY, 1976, 1991; HILFERT-RÜPPELL, 1998). But in the libellulid *P. flavescens*, during rainfall, when the temperature drops below the lower threshold, the primitive character of wing-shivering is utilised to increase body temperature. The regular cleaning of the head with the forelegs during rain, which is synchronised by head-cocking, may have thermo-regulatory importance since the head is the major centre of sensory input and high neural processing and it is suggested that in Odonata the thorax temperature is closely related to the temperature of the head during endothermic warming (MAY, 1986). Head cocking movements are made while on the lookout for prey or mates, in response to flying targets. Its frequency increases on warm days (MILLER,

1995). This is perhaps the first report on the head cocking movement which along with the forelegs help to wipe the face clear of water droplets.

Acknowledgements – We are thankful to Professor D.B. TEMBHARE and Dr M. PRASAD for constant encouragement. This work is part of the University Grant Commission (India), Minor Research Project No.23-382/99 (WRO).

References – ANDREW, R.J., 1995, *Notul. odonatol.* 4: 88-89; – ANDREW, R.J. & D.B. TEMBHARE, 1997, *Fraseria* (N.S.) 4: 1-4; – FRASER, F.C., 1933-1936, *Fauna of British India including Ceylon and Burma*, vols 1-3, Taylor & Francis, London; – LAIDLAW, F.F., 1917, *Rec. Indian Mus.* 13: 321-348; – 1919, *ibidem* 16: 169-195; – MAY, M.L., 1976, *Odonatologica* 5: 165-171; – 1986, *ibidem* 15: 119-128; – 1991, *Adv. Odonatol.* 5: 71-88; – HILFERT-RÜPPELL, D., 1998, *Odonatologica* 27: 45-59; – MILLER, P.L., 1995, *ibidem* 24: 301-310; – LAHIRI, T., 1975, *ibidem* 4: 255-257; – MITRA, T.R., 1999, *Rec. zool. Surv. India*, 97: 173-188; – MITRA, T.R., 1996, *Notul. odonatol.* 4: 133-138; – SHARMA, R.M., S.S. TALMALE & P.P. KULKARNI, 2000, *Bionotes* 2: 13.

Received February 5, 2001