

## Short Communication

# Studies on the intraspecific variations in *Rhyothemis variegata variegata* (Linnaeus) (Odonata: Libellulidae)

Jagbir Singh Kirti, Simarjit Kaur\* and Archana Singh

Department of Zoology and Environmental Sciences, Punjabi University, Patiala- 147002, Punjab, India;  
prjagbir2005@gmail.com, simarjit485@gmail.com

## Abstract

Variations in the wing markings of male and female representatives of *Rhyothemis variegata variegata* (Linnaeus) collected from different parts of North-West India have been studied and illustrated in detail.

**Keywords:** Libellulidae, *Rhyothemis variegata variegata*, Variations, Wing Markings

## Introduction

Hagen (1867) erected genus *Rhyothemis* by giving a brief account of type species *Libellula phyllis* Sulzer. A total number of 4 species i.e., *obsolescens* Kirby, *plutonia* Selys, *triangularis* Kirby and *variegata variegata* (Linnaeus) are known from India under this genus. During different collection-cum-survey tours from various localities of North-West India, only two species *Rhyothemis triangularis* Kirby and *Rhyothemis variegata variegata* (Linnaeus) could be collected. The species of this genus are gregarious and occur in large colonies over marshy lands and are weak fliers.

Variations within the species of Odonata have been briefly studied and reported by Asahina (1952-53), Singh and Baijal (1954); Baijal and Agarwal (1955), Singh and Prasad (1976, 1977), Prasad (1976, 1976a, 1994), Prasad and Ghosh 1983, Prasad and Kumar (1981). The present research paper deals with the variations in the wing markings of male and female representatives of *Rhyothemis variegata variegata* also called as “Common Picture Wing”. The wing markings are distinctly different in both the sexes of this species (Figures 1 and 2). A total number of five variations in wings have been reported (three in male and two in female).

## Material and Methods

The adult dragonflies were collected with the help of insect collecting net from different localities of North-Western states of India i.e., Himachal Pradesh, Punjab, Haryana and Uttarakhand in different seasons from August 1997 to October 2000. The adult representatives of dragonflies were killed with ethyl acetate vapours in the killing bottle, and in case of teneral specimens or put alive into triangular paper packets and starved to death. The dead specimens were then bristled, pinned, stretched, dried and preserved. Fraser (1934, 1936) and Lahiri 1987 were followed for identification of the adult representatives.

## Results and Discussion

The present observations have been made on 50 specimens collected from various localities of North West India. *Rhyothemis variegata variegata* (Linnaeus) was found to be predominant in Kanjli and Harike wetland of Punjab, where it is usually seen in swarms. In this subspecies wing markings are distinctly different in both the sexes.

During the present course of study, three forms of wings have been observed in the male of *Rhyothemis variegata variegata* (Linnaeus) as follows:

\* Author for correspondence

1. Markings more extensive, forewing with nodal spot extending posteriorly up to median planate; well defined subapical spot present, apical spot extending inwards to as far as middle of pterostigma; spot at discoidal cell much larger; slight vestiges of marking in subcoastal space, hindwing with basal spot confluent with nodal spot and nodal spot joined by a narrow isthmus to spots in discoidal field. (Figure 3a).
2. Markings more or less restricted forewing with a very small spot at base of discoidal cell, hindwing with vestiges of subapical spot and spots present in discoidal field (Figure 3b).
3. Forewing with nodal spot extending posteriorly up to Riv+v, hindwing with nodal spot and those present in discoidal field well separated from one another (Figure 3c).

Variations in the wing markings of female:

1. Forewing with a distinct small spot at discoidal cell and a broad nodal spot extending proximally up to eighth antenodal nervure and posteriorly up to vein Cuii, hindwing with subapical broad fascia confined to posterior half of wing (Figure 4a).
2. Hindwing with subapical and basal markings well separated, not joined by an isthmus (Figure 4b).

The present observations have been made on specimens collected from various localities of North-West India and it was observed that even specimens from the same locality have different types of wing markings. Fraser (1936) while giving description of this species also mentioned

**Table 1.** Variations in wing markings of male and female of *Rhyothemis variegata variegata* (Linnaeus) and compared with published description of the species

Parameters	Male	Female	Published data
Length of Forewing	32-37 mm	30-36 mm	---
Length of Hindwing	30-34 mm	28-33 mm	33-36 mm (male) 28-37 mm (female)
Nodal Index	$\frac{10-9^{1/2}}{9-6/6} / \frac{10^{1/2}-10}{10}$		$\frac{11-11^{1/2}/9^{1/2}-11}{11-8/7-13}$
Pterostigma	2.40 mm	1.80 mm	Much smaller in female as compared to male

that wing markings are subject to considerable variation. Besides variations in wing markings, 2 males were having 2 cubitoanal nervures in forewing in place of one.

Coloration and variations in body length size play an important role in determining the age and sex of the species. Morphological variations are common in many genera like *Orthetrum* and have been reported by many workers like Samsudin, 2013. Identification of female dragonflies is much more difficult as compared to male dragonflies. They can be differentiated according to the color patterns of wings and abdomen. (Johnson and Triplehorn, 2005; Bedjanic *et al.*, 2007). However, the variability of color sometimes leads to the confusion to determine the species. Therefore, reports of these morphological variations would prove helpful in such cases.

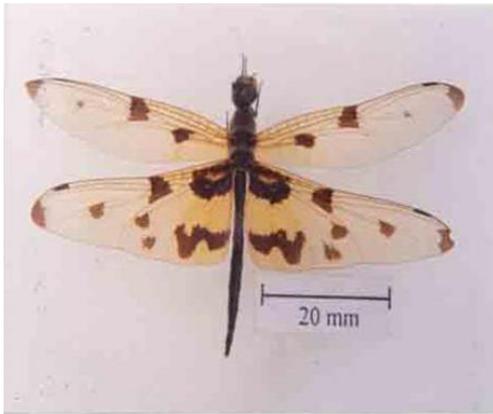
## Reference

- Asahina, S. 1952-53. Fauna and flora of Nepal Himalaya scientific results of the Japanese expeditions to Nepal Himalaya 1952-53, Edited by H. Kihara. Fauna and flora Res. Soc. Kyoto, 291-300.
- Baijal, H.N. and Agarwal, J.P. 1955. Pouscula Libellulologica. Agra Univ. J. Res. (Sci.), 4(2), 453-470.
- Bedjanic, M., Conniff, K. and Wijeyeratne, de Silva. 2007. A photographic guide to the dragonflies of Sri Lanka. Jetwing Eco Holidays, Colombo.
- Fraser, F.C. 1934. Fauna of British India including Ceylon and Burma. Odonata. London: Taylor and Francis Ltd.
- Fraser, F.C. 1936. Fauna of British India including Ceylon and Burma. Odonata. London: Taylor and Francis Ltd.
- Hagen, H.A. 1867. Notizen Studiem Von Brauer's Novara Neuroptera. *Verh. Zool. Bot. Ges. Wien.*, 17: 31-62.
- Lahiri, A.R. 1987. Studies on the Odonata fauna of Meghalaya. *Rec. Zool. Surv. India, Occ. Pap.*, 92: 1-402.
- Johnson, N.F. and Triplehorn, C.A. 2005. Borror and Delong's Introduction to the study of insects 7<sup>th</sup> Editions. 1-888.
- Prasad, M. 1976. On the occurrence of *Urothemis signata signata* (Rambur) (Odonata: Macrodiplactidae) from Eastern Uttar Pradesh, India. *Newsl. Zool. Surv. India*. 2(4): 142.
- Prasad, M. 1976a. Odonata of district Kangra (Himachal Pradesh). *Rec. zool. Surv. India*. 71(1-4): 195-219.
- Prasad, M. 1994. Variations in wing markings in the female of *Neurothemis fulvia* (Drury) collected from various regions of India. *Fraseria* (S.A.B.O.). 1(2): 5-7.

- Prasad, M. and Kumar, A. 1981. Studies on the intraspecific variations in *Trithemis festiva* (Rambur) (Odonata: Libellulidae). *J. Bombay Nat. Hist. Soc.* **77**: 238-246.
- Prasad, M. and Ghosh, S.K. 1983. Studies on the intraspecific variations in *Brachythemis contaminata* (fabricius) (Odonata: Libellulidae). *J. Bombay Nat. Hist. Soc.*, **80**(2): 341-348.
- Samsudin, N.B. 2013. Morphological variations of selected species in the genus *Orthetrum* (Odonata: Anisoptera) in Sarawak. Project, Universiti Malaysia Sarawak.
- Singh, A. and Prasad, M. 1976. Odonata of Doon Valley 1. Anisoptera. *Rec. Zool. Surv. India.* **70**(1-4): 21-38.
- Singh, A. and Prasad, M. 1977. Odonata (Insecta) of Corbett National Park (Uttar Pradesh, India). *J. Bombay Nat. Hist. Soc.* **73**(2): 419-421.
- Singh, S. and Baijal, H.N. 1954. Entomological Survey of the Himalaya II- on a collection of Odonata. *Agri. Univ. J. Res. (Sci.)*. **3**(2): 385-400.

### PLATE 1

*Rhyothemis variegata variegata* (Linnaeus)



**Figure 1.** Male



**Figure 2.** Female



**Figure 3.** Wing variations in male



**Figure 4.** Wing variations in female