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SYRPHUS RIBESII (DIPTERA: SYRPHIDAE) FROM JAMMU REGION (J&K), INDIA

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## Research Article

### KARYOTYPIC AND MORPHOMETRIC ANALYSIS OF A PREDATORY HOVERFLY, *SYRPHUS RIBESII* (DIPTERA: SYRPHIDAE) FROM JAMMU REGION (J&K), INDIA

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#### ABSTRACT

During present investigation, the chromosomes of a predatory hoverfly, *Syrphus ribesii* of family Syrphidae were studied first time from the Jammu region (J&K). The larva of this hoverfly act as bio control agent for suppressing the populations of aphids. The observed diploid number of the species was  $2n=8$ . Observed meiotic stages included diplotene, diakinesis, pachytene and leptotene. The sex chromosomes include sub telocentric X and acrocentric Y chromosome. The present study regarding the chromosomes might help in the solution of taxonomic problems with in the family syrphidae.

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#### INTRODUCTION

In vegetable farming system, various predatory and parasitic insects play important roles in reducing aphids and other pests. Predatory dipterans of the Syrphidae family along with the Coccinellidae and chrysopidae are considered to be the most important group of aphidophagous insects which take part in a natural regulation of aphid populations. Along with the other predatory syrphids, *Syrphus ribesii* was found to be the common predator of woolly apple aphid *Eriosoma langigerum*. (Lessando M. Gontijol *et al.*, 2012).

Larvae of *Syrphus ribesii* are the predators of aphids in natural ecosystem. (Francis Gilbert, 2005). Chromosomal work on syrphid flies is scanty. Considering its economic importance as a biocontrol agent, chromosomal analysis was carried out to study its chromosomes, chromosome number and different stages of meiosis. The earliest karyotypic work regarding family Syrphidae of order diptera have been carried out by Boyes and Van Brink (1964, 1966, 1967, 1968, 1970, 1972). The present study includes the karyotypic analysis of *Syrphus ribesii* of tribe Syrphini of subfamily Syrphinae. The general karyotypic analysis of the genus *Syrphus* have been mentioned by Boyes (1964) in his report. Considering its economic importance as a biocontrol agent, chromosomal analysis was carried out to study its chromosomes, chromosome number and different stages of meiosis.

#### MATERIAL AND METHOD

Adult flies were collected from the gardens of Jammu university campus during April-May 2014. Adult male flies were selected for the karyotypic analysis. Males are easily identified by their holoptic eyes. After collection, anesthetized adult males were dissected to obtain their testis in distilled water. Testis is pair of minute brownish spherical bodies found in the last part of abdomen. Slides were prepared by squash method. Slides with testis were treated with 0.5%KCl for 40 minutes. Then the tissue was stained with 2% solution of lacto aceto-orcein. Stained slides were covered with cover slip and squashed. The resulting temporary mounts were sealed with either wax or colorless nail paint. Stained slides were scanned under Olympus camera aided microscope and results were photographed under CH20i BIMF microscope attached with Sony SSC-DC378P camera under 1000x magnification.

#### RESULTS

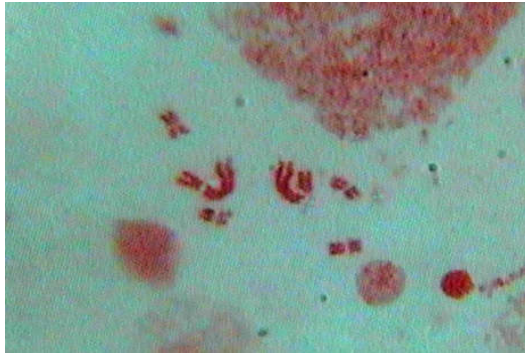
The Spermatogonial metaphase of *Syrphus ribesii* shows 8 chromosomes (fig.1) as diploid number i.e.  $2n=8$ . The karyotype revealed 4 metacentric, 2 sub meta, 1 sub telo and 1 acrocentric chromosome (fig.2). Sex chromosomes were found to be heteromorphic as sub telocentric X chromosome and telocentric Y chromosome. The haploid chromosome number is confirmed by diplotene stages (fig.3-C) in which 4 homologous pairs were seen.

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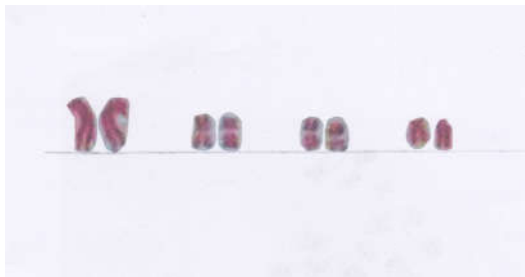
Department of Zoology, University of Jammu, Jammu and Kashmir-180006, India

**Table-1** Morphometric data of karyotype of male *Syrphus ribesii* showing  $2n=8$  ( $4m+2sm+1a+1t$ ).

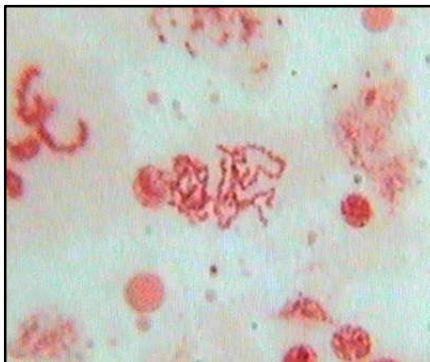
Chromosome pair number	Mean length of the short arm (p) in $\mu\text{m}$	Mean length of the long arm (q) in $\mu\text{m}$	Absolute length of the chromosome (p+q) in $\mu\text{m}$	Arm ratio (q/p)	Centromeric index	Nomenclature
1	0.5	1.1	1.6	2.2	31	Sub-metacentric
2	0.4	0.4	0.8	1	50	Metacentric
3	0.3	0.3	0.6	1	50	Metacentric
X	0.15	0.5	0.65	3.3	23	Sub-telocentric
Y	0.05	0.6	0.65	12	8	Telocentric



**Figure 1** *Syrphus ribesii*. Spermatogonial metaphase.



**Figure 2** Karyotype of *Syrphus ribesii*.



**A**



**B**

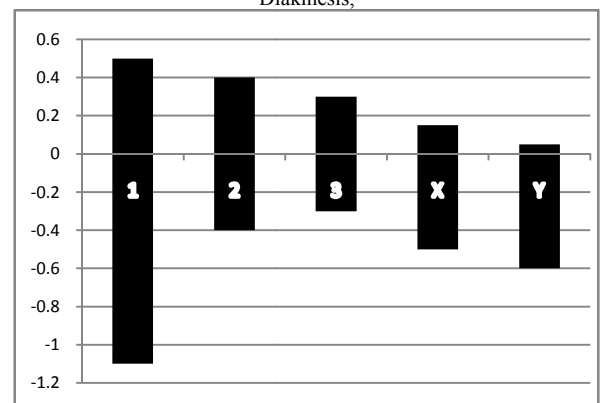


**c**



**D**

**Figure 3** *Syrphus ribesii*. A- Leptotene, B- Pachytene, C- Diplotene, D, - Diakinesis,



**Fig.4** Idiogram of *S. ribesii*.

## DISCUSSION

*Syrphus ribesii* showed a chromosome number of 8 for males i.e.  $2n=6+XY$ . The chromosomes were moderate in size. The first pair seemed to be sub metacentric, second and third appeared to be metacentric. The smallest pair of chromosomes is apparently the heteromorphic sex chromosomes with sub telocentric X chromosome and telocentric Y chromosome which is slightly shorter than the X chromosome. [J. W. Boyes](#)

and J. M. Van Brink,(1964) recorded the chromosome number of different species of tribe Syrphini of sub family Syrphinae. They recorded the haploid number of genus syrphus (tribe syrphini) to be n=8.

#### Acknowledgment

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