G.J.L.S.B.R.,Vol.2(3):4-6 (July-September, 2016) ISSN: 2456-3102

GLOBAL JOURNAL OF LIFE SCIENCES AND BIOLOGICAL RESEARCH
(Published By: Global Institute for Research & Education)

www.gifre.org

Seasonal Variation in the Population of Rice Grasshopper, *Oxya japonica* (Orthoptera: Acrididae) in the Agricultural Zones of Kashmir Valley

Mir Tajamul[1], S. Tariq Ahmad[1], Irfan-ur-Rauf Tak[2] & Jehangir Shafi[2]

[1]Entomology Research Division, Department of Zoology, University of Kashmir.
[2]Centre of Research for Development, University of Kashmir.

Abstract

The present research work was carried out during 2015, to study seasonal variation in the population of *Oxya japonica* in agricultural fields of Kashmir. It was observed that the hopper and adults were abundantly found during summer and autumn months. Various instar stages were found in abundance during midsummer while as the adult insects were abundantly found during late summer and early autumn. In winter months the population of hoppers and adult stages was found to be zero.

Keywords: *Oxya japonica*, Seasonal variation, net sweep.

Introduction

The state of Jammu and Kashmir occupies a unique geo-political position in the Indian sub-continent. Consisting of three divisions- Jammu, the valley of Kashmir and Ladakh, it constitutes the northernmost extremity of India. The thickly forested Himalayan foot hills and the Pir Panjal range of lesser Himalayas separate the relatively low-lying Jammu plains from the larger, more fertile and heavily populated valley of Kashmir to the north. Kashmir Valley is situated at an elevation of about 1829 meters from the sea level.

The grasshopper genus *Oxya* was established by Serville (1831) and revised by other authors for several times (Hollis, 1971, 1975; Uvarov, 1931; Willemese, 1925). In particular, Hollis published his revisions of *Oxya* in 1971 and 1975. The grasshoppers of the genus *Oxya* (Orthoptera: Acrididea) are distributed across Indian subcontinent, China, southeastern Russia, and Australia. Some species were also reported in Hawaii during the 19th century (Hollis, 1971). The populations of grasshopper species are subjected to great variations. *Oxya japonica* is a polyphagous pest feeding on a variety of food crops, grasses, herbs and shrubs. Adults and nymphs are occasionally gregarious and congregate in masses on thick grasses and bushes and are photosensitive in nature. It has been reported that infestation of 2-4 adults per square meter can reduce output by 1.7-6.8%. The presect research work is a prelimnary work to study the seasonal variation in the population of *Oxya japonica.*

Material and Methods

The adult grasshoppers and various nymphal stages of *O. japonica* were mostly collected from the cultivated rice fields and other surrounding vegetation of grasses from different regions of Kashmir division during months of May-September in the year 2015. The net used to collect the insects was made of white muslin cloth with a long handle. Sweeping net being more durable is recommended for such work. As the grasshoppers show saltatory type of locomotion, net sweeping method proved to be extremely useful.

The collections were made from 10:00 am to 3:00 pm from specific sites in the districts of Ananthnag, Shopian, Pulwama, Srinagar, Budgam, Ganderbal, Bandipore and Baramulla. In each trial 50 sweeps were made and and the number of individuals collected from each site were recorded (Azim & Reshi, 2010).

Statistical Analysis

Data obtained from experimental groups was evalvated using MS Exel 2007 and PRIMER software.

Results and Discussion

The collection of insects was made fortnightly throughout the year, 2015 from January to December. Table I depicts the seasonal variation of *O. japonica.*

Table I: Population count of *O. japonica.*

Year	Temperature (°C)			Collected Fortnightly			
	Max.	Min.	Mean	Hoppers	Total	Adults	Total
January	8.5	-3.7	2.4	-	-	-	-
	10.1	-4.2	2.95	-	-	-	-
February	11.3	-2.5	4.4	-	-	-	-
	9.3	-1.8	3.75	-	-	-	-
March	18.4	1.3	9.85	-	-	-	-
	16.6	3.4	10	-	-	-	-
April	22.2	4.6	13.4	-	-	-	-
	24.1	5.2	14.65	-	-	-	-
May	25.6	7.9	16.75	18	-	-	-
	26.1	8.2	17.15	24	42	-	-
June	31.1	12.3	21.7	27	-	-	-
	32.5	13.6	23.05	34	69	8	8
July	33.6	14.3	23.95	52	-	22	-
	34.5	15.8	25.15	61	113	28	50
August	31.2	10.1	20.65	38	-	42	-
	34.1	13.2	23.65	23	61	48	90
September	32.6	12.4	22.5	9	-	48	-
	29.4	10.9	20.15	4	13	45	93
October	27.3	11.7	19.5	-	-	35	-
	23.7	4.2	13.95	-	-	18	53
November	18.4	10.3	14.35	-	-	-	-
	14.6	9.8	12.2	-	-	8	8
December	10.4	1.2	5.8	-	-	-	-
	8.9	-0.8	4.05	-	-	-	-

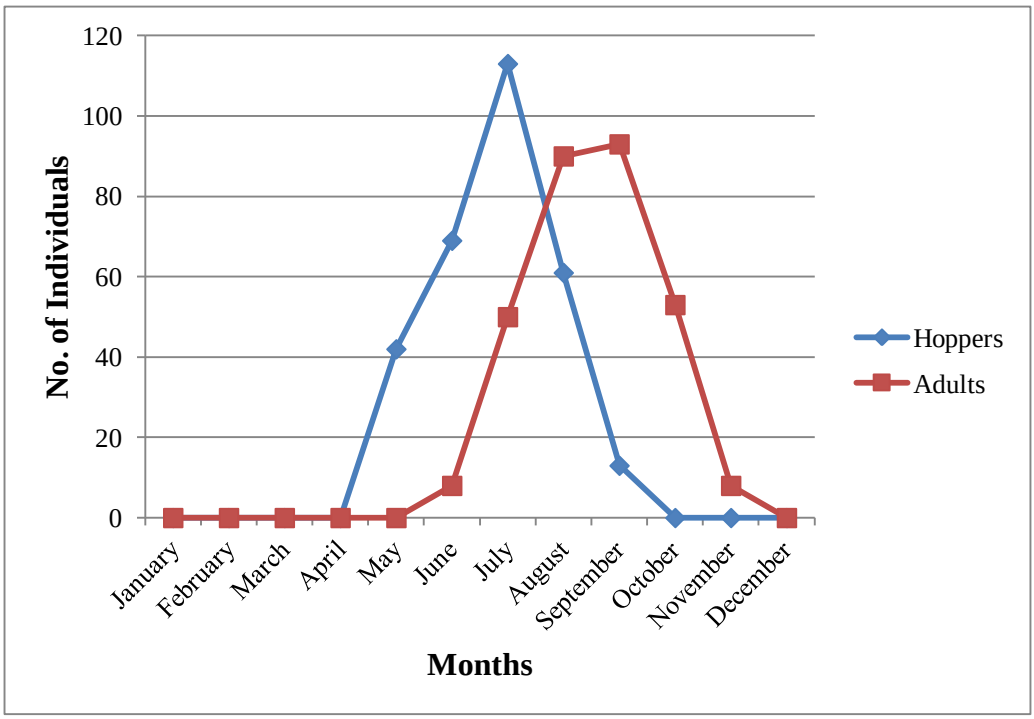

Fig.1. Seasonal variations in the population of *Oxya japonica.*

It was found that that the hopper and adults were abundantly found during summer and autumn months. Various instar stages were found in abundance during midsummer while as the adult insects were abundantly found during late summer and early autumn. Table I reveals that the population of *O. japonica* was recorded almost zero during the months of January, February, March and April. This was due to the presence of unfavorable conditions of food, temperature and moisture. The first instar hopper of *O. japonica* was collected during first fortnight of May and the hoppers reached to their highest population in the month of July. The population of *O. japonica* adults reached to a peak of maximum abundance during the months of August & September during which 90 and 93 individuals were collected, respectively. The abundance of grasshoppers during these months was due to availability of optimum ecological conditions particularly temperature, humidity and food. Mating was observed during the months of August to September. Eggs were laid soon after mating and due to unfavorable conditions eggs underwent diapauses and no movement of grasshoppers was observed during winter months. With the increase in temperature and presence of optimum moisture, eggs hatched during spring months. The study provide an insight on the life cycle of Oxya japonica.

References

Hollis, D. (1971). A preliminary revision of the genus *Oxya* Audinet–Serville (Orthoptera: Acridoidea). *Bull. Br. Mus. Nat. Hist. Entomol*., 269–344.

Hollis, D. (1975). A review of the subfamily Oxyinae (Orthoptera: Acridoidea). *Bull. Br. Mus. Nat. Hist. Entomol*., **31**:189–234.

Nayyar. M. & Reshi. SA. (2010). Taxonomic notes on the tribe Acridini latreille (Acridinae: Acrididae: Orthoptera) of Kashmir, India. Acta Zoológica Mexicana. 26(1): 219-222 (2010).

Uvarov, B.P. (1924). A revision of the old world Cyrtacanthacrini. *Annual Magazine of Natural History*, **13**(9):1–19.

Uvarov, B.P. (1927). Distributional records of Indian Acrididae. *Records of Indian Museum*, **29**: 233–239.

Uvarov, B.P. (1931). Notes on the Genus *Oxya* Serv. (Orthoptera: Acrididae). *Bull. Ent. Res*., **17**: 45–48.

Willemese, C. (1925). Revision der Gattung *Oxya* (Serville) (Orhoptera, Subfam. Acridoidea, trib.Cyrtacanthacrinae). *Tidjschr. Ent.*, **68**: 1–70.