Unambiguous Structure Of Cicadas Of Rainfed Alfalfa In Uzbekistan And Biology Of Some Species

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Abstract: The article presents the materials for determining cicada species composition of rainfed alfalfa of Uzbekistan, their nutritional relationships, morphological and biological features. Studies have shown that in the rainfed crops of alfalfa fields in Uzbekistan, 28 species of cicadas were identified, including 22 species in the plain-hilly zone, 18 species in the foothill zone and 6 species in the mountain zone. From the families Arphrophoridae, Cicadellidae, Delphacidae, Dicryorharidae, Cixiidaae, Tettigometridae and Issidae.

Index Terms: species composition, alfalfa, pests, cicadas, damage, abundance, agricultural plants, species of cicadas, genital apparatus, polyphages, oligophages.

1. INTRODUCTION

A lfalfa is damaged by various pests. Mostly by insects. The species composition of insects of alfalfa fields is rich and diverse, therefore, the study of alfalfa fields fauna is important from a general biocenotic point of view. In addition, alfalfa fields create optimal conditions for wintering, development and reproduction of many insects [1]. Cicadas are widely represented in various conditions. They are especially numerous in grassy communities. In the conditions of artificial irrigation, favorable conditions are created not only for plants, but also for pests that damage this crop. The physical - geographic and soil-climatic conditions of the research areas allow to run intensive agricultural production throughout Uzbekistan, from plains to highland meadows. However, the climate of Uzbekistan differs markedly in certain naturally historical zones within the country. Therefore, our studies were carried out in various soil and climatic zones of Uzbekistan [2].

2 METHODS OF RESEARCH

The material for this work was 10 years of research conducted in various soil and climatic zones of Uzbekistan. Special and generally accepted methods in entomology were used in research works. Alfalfa is damaged by various pests, mainly by insects, including cicadas. Cicadas are insects with stitching-sucking mouth apparatus. In addition to short 3- segmented antennae with end setae and 3-segmented little paws, they are also distinguished by jumping hind legs and wings structure; they have not only longitudinal, but also transverse veins, and the front pair is often thicker than hind ones [3]. The definition of cicadas is rather complicated, because many species and genus differ mainly in the structure of the male genital apparatus. Live and eat cicadas on the underside of leaves. When larvae and Imagoes of cicadas feeding on the leaves of alfalfa and other plants, pale, irregular spots are formed. The assimilation surface of the leaves is greatly reduced in severe damage [4]. The species composition of cicadas collected on rainfed alfalfa and their distribution on landscape zones are given in the table.

***Table 1**. Species composition of cicadas on rainfed alfalfa (2008-2018)*

Families	Species	Landscape zones of Uzbekistan		
		Flat-hilly zone	Foot hills zone	Moumtan zone
Aphrophoridae	Lepyronia coleoptrata L.		+	+
	Philaenus spumarius L.		+	
Cicadellidae	Anaceratagallia aciculata Horv.	+		
	A. laevis Rib.	+		
	A. acuteangulata Zachv.	+	+	
	Batracomorphus irroratus Lew.	+	+	
	Aphrodes ferganensis Dub.		+	+
	Cicadella viridis L.	+		
	Empoasca meridiana Zachv.	+		
	Kyboasca bipunctata Osh.	+	+	+
	Pseudophiepsius dinotatus Sign.	+		
	Circulifer opacipennis Leth.	+	+	
	Macrosteles laevis Rib.	+	+	
	M. quadripunctulatus Kbm.	+		
	Phlepsus intricatus H.-S.	+		
	Psammotettix striatus L.	+	+	
	P. dubovskyi Vilb.		+	+
Delphacidae	Asiraca clavicornis F.	+	+	
	Laodelphax striatellus Fall.	+	+	
	Ribautodelphax zeravshanicus Dub.	+	+	
Dictyopharidae	Dictyophara europaea L.	+		
Cixiidae	Pentastiridius leporinus L.		+	+
	P. pallens Germ.	+	+	
	Reptalus rufocarinatus	+	+	+

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	Kusn.			
	Hyalesthes obsoletus Sign.	+		
Tettigometridae	Tettigometra varia Fieb.	+		
	T. vittelina Fieb.		+	
Issidae	Scorlupaster asiaticus Leth.	+	+	

The most numerous species on rainfed alfalfa in the flat-hilly zone: Anaceratagallia aciculata Horv., Batracomorphus irroratus Lew., Cicadella viridis L., Empoasca meridiana Zachv., Kyboatash bipatha Circulifer orasinnis Leth., M. quadripunctulatus Kbm., Phlepsus intricatus H.-S., Psammotettix striatus L. .., Asiras clavicornis F., Pentastiridius pallens Germ. Hyalesthes obsoletus Sign. In the foothills there are numerous species: Anaceratagallia acuteangulata Zachv., Circulifer opacipennis Leth., Psammotettis striatus L., Ribautodelphax zeravshanicus Dub., Reptalus rufocarinatus Kusn .. Tettigometra vittelina Fieb. Numerous species in the mountains: Lepyronia coleoptrata L., Philaenus spumarius L., Aphrodes ferganensis Dub., Psammotettix dubovskyi Vilb., Pentastiridius leporinus L. Studies have shown that 28 species of cicadas were found on rainfed crops of alfalfa in Uzbekistan, including on plain- hilly zone 22 species, in the foothills zone 18 species and in the mountain zone 6 species. From the families of Aphrophoridae, Cicadellidae, 18 species and in the zone of Delphacidae, Dictyopharidae, Cixiidae, Tettigometridae and Issidae. It was established that the species composition of cicadas in the rainfed alfalfa is poorer and their number is much lower than in the alfalfa of irrigated lands. The number of cicadas in alfalfa fields varies during one season and during different years, but annually, as a rule, an increase in their number in alfalfa in early spring and, especially, in autumn is observed. In addition, the number of cicadas in the alfalfa field is gradually increasing and reaches a maximum in late summer and autumn. Cicadas registered on alfalfa fields, as shown by studies, were mainly polyphages or oligophages and their feeding connected with various agricultural and weed plants. We have studied the biology of some types of pests: Cicadella viridis L. in the conditions of Uzbekistan feeds on alfalfa, mung bean, beans and other legumes. It is abundant on weeds. C. viridis in the conditions of Uzbekistan gives 2-3 generations. Wintering C. viridis in the egg phase. Larvae of the first generation appear in April from overwintered eggs. Depending on the growing zone of rainfed alfalfa and the meteorological conditions of spring, they appear in the second or the third decade. The development of one generation spends approximately 44-50 days. The next egg laying occurs in the second or third decade of June. Larvae of the second generation appear in late June or early August and usually finish their development in the second decade of August, using 35-40 days for their development. Then again, egg laying occurs and in late August larvae of the third generation begin to appear. Their development lasts until the third decade of October. In October or early November, females lay wintering eggs. Empoasca meridiana Zachv. is a mass species, polyphage, damages alfalfa, cotton, corn, beets, carrots, bell peppers, eggplant, watermelons, melons, tomatoes, beans, peas, mung bean, chickpeas, potatoes, and other plants. Observations of the development dynamics of this cicada showed that it develops in 4-5 generations per year. Adult cicadas overwinter. Overwintered imagoes appear in late February and early March. The entire development cycle of E. meridiana takes place on alfalfa, but feeding depends on the state of feed plant and its population by others pests. E. meridiana reaches its highest abundance in alfalfa fields in September and October. In November, adults (imagoes) go to winter. The duration of one generation lasts from 26 to 49 days. Kyboasca bipunctata Osh. is a widespread species. K. bipunctata is a polyphage, causes harms to alfalfa, cotton, corn, sorghum, carrots, beans, peas, mung bean, potatoes and other plants. If alfalfa leaves are damaged by this polyphage, characteristic spotting in the form of irregular points appear on them. The larvae and adults of K. bipunctata live on the underside of leaves and suck out plant juices from them. The leaf acquires a marble look in severe damage. Eggs of K. bipunctata are wintered. At the beginning of their development, cicadas emerge from eggs and feed on licorice. The first generation of the pest takes place on licorice. Sometimes in early spring, K. bipunctata develops on alfalfa and other legumes. K. bipunctata from licorice migrates to alfalfa and other crops and damages them. In autumn, cicadas concentrate on alfalfa and other vegetative plants. In a year it develops in 4-5 generations. Aphrodes ferganensis Dub. Is a mass species. Eggs spend the winter. Cicada larvae appear at the end of April or at the beginning of May. They mainly live on alfalfa and other legumes. Larvae development lasts till the end of July, but the main mass of them turn into adults (imagoes) phase in the middle of July. Adults (imagoes) as their larvae feed on by legumes. In August they lay eggs, which stay for the winter. Develops A.ferganensis in one generation per year. Asiraca clavicornis F. damages on alfalfa. Localize at the point of growth. Except legumes, they can damage other crops. Cicada in the phase of adult (imago) gets out of the winter at the beginning or in the middle of March and right away move to alfalfa. The development cycle of A.clavicornis passes during 60-65 days. Two generations are developed per year. Larvae develops for 44-55 days. In October, finishing feeding adults (imagoes), go for wintering.

3 CONCLUSION

Our studies have shown that in the rainfed crops of alfalfa fields in Uzbekistan, 28 species of cicadas were identified, including 22 species in the plain-hilly zone, in the foothill zone 18 species and in the mountain zone 6 species. From the families Aphrophoridae, Cicadellidae, Delphacidae, Dietyopharidae, Cixiidae, Tettigometridae and Issidae. The cicadas registered in alfalfa fields are mostly polyphages and oligophages; they are connected with various agricultural and weed plants by their diet. These circumstances make it necessary to comprehensively study the cicadas of alfalfa fields.

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