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FOOD SPECTRUM OF THE BEET ARMYWORM (*SPODOPTERA EXIGUA* (HÜBNER, 1808)) (LEPIDOPTERA, NOCTUIDAE) IN RAINFED AGRICULTURE OF THE FERGANA VALLEY

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Abstract:

In the territory of rainfed agriculture of the republic, 33 species of wild and weed plants have been identified, where egg-laying of the little ground moth was noted, for the first time a large number of plant species were noted as fodder plants of the pest. In the forecast of the development of the beet armyworm (Spodoptera exigua Hbn.), It is necessary to take into account not only the macroclimatic conditions of the year, but also the species composition of the forage plants.

Keywords: Beet armyworm, food spectrum, rainfed agriculture, Fergana Valley, Uzbekistan.

INTRODUCTION

Beet armyworm or small mottled willow moth (*Spodoptera exigua* (Hübner, 1808)) is known to be a polyphagous polyphagous, widespread species. Beet armyworm is widespread in the southern strip of the European part of Russia, the Urals, Southern Siberia, the Far East, the Baltic, Belarus, Ukraine, Moldova and Transcaucasia, Kazakhstan and Central Asia, Southern Europe, Africa, Asia, Australia, America [7].

It is the worst pest of cotton, sugar and table beets, alfalfa, chickpeas, peas, mung bean and other legumes, tomatoes, cabbage, onions; beet armyworm damages, sometimes very badly, corn, millet, potatoes, grapes and many other crops [13, 14, 15, 16]. In particular, food spectrum of species is expanding to the introduction or influx of harmful species into our country and the specialization of crops, which are now spreading around the world under the influence of natural and anthropogenic factors [8, 12, 13, 14, 16].

Weed plants are seasonal, which is the reason for the incomplete life cycle of insects on these plants. The use of plants by insects and the formation of a system of phytophage-host relations occurs because of a number of environmental factors [15, 16].

In addition to its great applied value, the beet armyworm is also of significant interest from a general biological point of view. It is one of the few insect species capable of sporadic mass reproduction. Its number in the year of depression is in a number of cases so insignificant that it gives rise to talk about the disappearance of the species from the fields, as well as the likelihood of its flight from the outside [10]. The nature of the suddenness that outbreaks often carry, the extremely fast breeding rates, and the difficulty of locating the wintering stock of the landworm may lead to the same conclusion. However, there is no reason to believe, as some authors believe [1], that, at least in the Central Asian republics, butterflies flying from somewhere far away cause them. Over the past 50 years, an outbreak of caradrina breeding was observed only in 1964 in many regions of Uzbekistan, incl. in the area of rainfed agriculture of the republic in 1969 and 1972. An increase in the number of the pest was observed in the Republic of Karakalpakstan, Khorezm, Kashkadarya and Bukhara regions, and in 1996, an outbreak of its reproduction was observed in many areas of the Fergana, Namangan and Andijan regions on an area of about 15 thousand hectares [6].

Although individual researchers [11] have established that the reasons for the mass reproduction of the little ground moth are its permanent foci in the territory of rainfed agriculture and the desert part of the republic, the fodder plants of the caradrina in these zones are far from being studied.

MATERIAL AND METHODS.

Research has been carried out since 2009 in a number of farms and pastures in the rain-fed territory of the Pap, Uychin, Chartak, Chust districts of the Fergana Valley.

A number of entomological methods were used in phenological and faunistic studies carried out in field and laboratory conditions [3, 4, 9, and 14].

Insect monitoring was carried out every 7-10 days at regular observation sites throughout the growing season and 2-3 times a month on the routes.

The frequency of occurrence of insects, quantitative density and dominance of populations were determined by the method of K.K. Fasulati [4].

The indices of the quantitative density of individuals were calculated using the following formula:

$$V = R/n$$

Here V – the quantitative population density;

R – the sum of the number of insects in all specimens belonging to the same species;

n – the number of typed copies.

The degree of occurrence of insects was determined by the following formula:

$$P = (n/N)\cdot 100$$

Here P – the frequency of occurrence of the insect;

n – the number of specimens in which the species was found;

N – the number of copies typed.

In the study of the ecology of insects, fundamental works were used - A.M. Gilyarov [5] and V.B. Chernyshev [2].

RESULTS AND DISCUSS.

For this purpose, for more than 20 years, we have studied the fodder plants of the pest in the territory of rainfed agriculture. Because of many years of research, beet armyworm was observed on the following plant species (table 1 & pic.1.):

Table 1

Host plants of the *Spodoptera exigua* (Hübner, 1808)

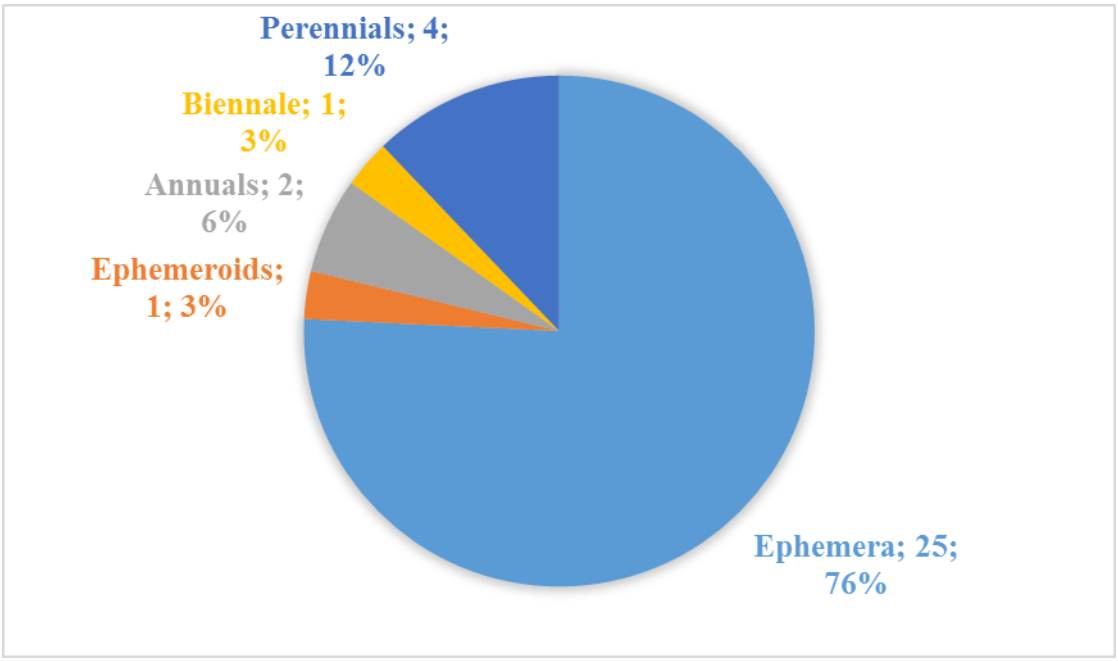
Host plant	Family	Occurrence	
		Characteristics	Density*
Ephemera			
Spinacia turkestanica Iljin	Chenopodiaceae Juss.	Common in the foothills, growing among crops as a weed;	Larvae
Trigonella grandiflora Bunge	Fabaceae Lindl.	An annual herbaceous wild plant growing in the mountains of Central Asia;	Larvae
Eremodaucus lehmannii Bunge	Apiaceae Lyndl.	An annual herb, widespread in the foothills, growing on hills, waste lands, numerous among rainfed crops;	Larvae ++
Hordeum spontaneum C. Koch	Poaceae Barn.	An annual herbaceous wild plant, common in the foothills;	Larvae ++
Carthamus oxyacantha M.B.	Acteraceae Dumort.	Annual grass, growing in foothills and oases;	Larvae +
Turgenia latifolia (L.) Hoffm.	Apiaceae Lyndl.	Annual weed. Widely distributed in the rainfed lands of Uzbekistan. Numerous in cereal crops rainfed;	Imago +
Bromus danthoniae Trin.	Poaceae Barn.	An annual plant. Distributed in steppes, adyry and on river banks;	Larvae +
Galium tricorne Stokes	Rubiaceae Juss.	An annual herb that grows like a weed among many crops.	Imago ++
Hypecoum parviflorum Ket. K.	Papaveraceae Juss.	Grows in steppes, adyrs, sometimes among crops;	Eggs, larvae ++
Neslia apiculata Fisch., C.A.Mey. & Avé-Lall.	Cruciferae L.	An annual herb, distributed in the plains near the mountains, irrigated lands as a weed, often found on alfalfa, cereals, grape and garden plantations;	Larvae +
Anagallis coerulea Schreb.	Primulaceae L.	Annual grass, growing in foothills and tugai;	Larvae +
Vicia hyrcanica Fisch.	Fabaceae Lindl.	Annual grass. Grows on empty lands and	Larvae

et Meg.		among crops;	++
Aegilops crassa Boiss.	Poaceae Barn.	Annual grass grows in deserts, adirs and foothills among crops and waste lands;	Imago +
Phleum paniculatum Huds.	Poaceae Barn.	Annual grass, grows on adirs and mountains, waste lands;	Larvae ++
Sinapis arvensis L.	*Brassicaceae* Burnet	Annual weed. Grows among different crops, along roads, etc .;	Larvae, imago ++
Bromus oxyodon Schrenk	Poaceae Barn.	Annual grass. Grows in steppes, adirs, in mountainous areas and oases; in the rich among the crops like a weed;	Eggs, larvae ++
Adonis parviflora Fisch.	Ranunculaceae Juss.	Annual plant. Grows in foothills, plains among crops and waste lands;	Larvae +
Phalaris minor Retz.	Poaceae Barn.	Annual weed. It grows mainly among cereals in the irrigated zone, sometimes among alfalfa. In addition, it grows on the banks of ditches, etc.;	Larvae +
Scandix pecten-veneris L.	Apiaceae Lyndl.	An annual plant. It grows among alfalfa, irrigated cereals, as well as in gardens and vineyards, in addition, on the banks of irrigation ditches in the foothills;	Larvae, imago +
Geterocaryum oligacanthum (Boiss) Bornm	Boraginaceae Juss.	Annual grass. Grows in stony and sandy adirs.	Larvae, imago ++
Koelpinia linearis Pall.	Acteraceae Dumort.	An annual ephemeral plant. It mainly grows among the cereal crops of rainfed.	Larvae ++
Lolium temulentum L.	Poaceae Barn.	Annual weed. Grows among crops of wheat and barley;	Larvae +
Medicago denticulata Willd.	Fabaceae Lindl.	Grows in the foothills, on the banks of ditches, sais and rivers;	Larvae +
Silene conoides L.	Caryophyllaceae Juss	An annual herb that grows in waste lands, in oases and foothills;	Larvae ++
Torilis leptophylla (L.) Rchb.	Apiaceae Lyndl.	Annual grass grows in irrigated gardens and crops, on the banks of ditches and canals.	Eggs, Larvae +
Ephemeroids			
Poa bulbosa L.	Phocaea Barn.	Perennial herb. Widespread in semi-desert and desert areas.	Larvae +
Annuals			
Diarthron vesiculosum (F. et M.) CAM	Thymeliaceae Juss.	An annual herb. Often grows among spring crops;	Eggs, larvae, imago ++
Chenopodium album L.	Chenopodiaceae Juss.	An annual herb. It grows everywhere in the republic.	Eggs, larvae, imago ++
Biennale			
Cousinia mucrocarpa Boiss.	Acteraceae Dumort.	Biennial herb. A lot grows on the bogar among the ears.	Eggs, larvae, imago +++
Perennials			
Convolvulus arvensis L.	*Convolvulaceae* Juss.	Perennial weed plant. Grows among all crops;	Eggs, larvae, imago +++
Psoralea drupacea Bge.	Fabaceae Lindl.	A perennial herb that grows among the grain crops of rainfed;	Eggs, larvae, imago

Alhagi pseudalhagi Desf.	Fabaceae Lindl.	Perennial herb, widespread in the steppes, adyrs and in the mountainous zone;	+ Eggs, Larvae, Imago
Hoplohyllum perforatum (MB) K. et K	*Rutaceae* Juss.	Perennial	++ Eggs, larvae, imago +++

*** density:** + - few; ++ - middle; +++ - high.

Thus, in the rainfed territory of the republic, on 33 species of weeds and wild plants, we noted ovipositions and caterpillars of the little ground moth. For the first time, an exceptionally large number of plant species (with the exception of *Medicago denticulata, Alhagi pseudalhagi, Chenopodium album,* and *Convolvulus arvensis*) were observed as fodder plants of the pest. Especially in the years of outbreaks of mass reproduction (1964, 1969, 1972, 1996), the density of caterpillars per 100 plants of bindweed and swans reached 975 and 1767 specimens, and in some ordinary years, 89 and 93 specimens, respectively [6, 11].



Picture 1. Food spectrum of *Spodoptera exigua* (Hübner, 1808).

Especially strong caterpillars injured the leaves and cavities of the quinoa stems. Among the wild ones, the field bindweed and the camel's thorn were severely damaged, too. In the camel thorn, not only the leaves and stems were being eaten, but also the thorns. First, the apical, dried part of the thorn is gnawed, which falls off, and the remaining juicy part is eaten to the base.

CONCLUSION

In the territory of rainfed agriculture of the republic, 33 species of wild and weed plants have been identified, where egg-laying of the small landworm was noted, for the first time a large number of plant species were noted as fodder plants of the pest. In the forecast of the development of the beet armyworm (*Spodoptera exigua* Hbn.), It is necessary to take into account not only the macroclimatic conditions of the year, but also the species composition of the forage plants.

Thus, it can be supposed that the reason for the mass reproduction of the little ground moth or beet armyworm is its permanent foci in the territory of rainfed agriculture and the desert part of the republic. Therefore, it is extremely important to organize deep research in the breeding centers of the pest for the development of long-term forecasts of its reproduction.

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