

Distribution Characteristics of Pyralid Moths (Lepidoptera: Pyralidae, Crambidae) in the Agroecosystems of the Fergana Valley

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Annotation: The article presents a characteristic of the distribution of moth butterflies (Pyralidae, Crambidae) in agroecosystems of the Fergana Valley by plant families and life forms. 22 species of butterflies have a trophic relationship with 30 species of cultivated plants belonging to 10 families. There are 18 species in cultivated herbaceous plants, 3 species in trees, and 1 species in shrubs.

Key words: Pyraloidea, Pyralidae, Crambidae, butterfly, larva, fodder plants, agroecosystem

Enter. The large family of moths (Pyraloidea) unites the family Crambidae and the family of moths (Pyralidae). The family Crambidae is species-rich, with more than 11,500 species belonging to 17 subfamilies [15]. The Pyralidae family includes about 5000 species [14]. These include unique specialized groups that prefer natural landscapes and agroecosystems, as well as highly plastic eurybionts and broad polyphages, including serious pests of agricultural crops. Based on this, a comprehensive study of the fauna and ecology of the agro-ecosystems of the Fergana Valley is of urgent scientific and practical importance.

Literature analysis. In Uzbekistan, species of Crambidae family such as *Glyphodes pyloalis*, *Loxostege sticticalis*, *Achyra (Loxostege) nudalis*, *Ostrinia nubilalis*, *Ostrinia kasmirica*, *Ostrinia narynensis*, *Udea prunalis* are recorded as pests of cultivated crops [10; 1; 3; 11; 9; 12]. *Glyphodes pyloalis*, *Ostrinia nubilalis*, *Achyra (Loxostege) nudalis* have been studied in the Fergana Valley until now [10; 11; 3]. In the scientific sources on the entomofauna of the territory of Uzbekistan, there is information about the species of the moth-winged insects of the Pyralidae family with high economic damage - the Makhsar butterfly (*Myelois cinctipalpella*), the sunflower moth (*Homoeosoma nebulella*), and the pomegranate worm (*Euzophera punicaella* = *bigella*). In the conditions of the Fergana Valley, the pomegranate fruit-eater and the sunflower moth are recorded as common pest species belonging to this family [9; 13]. In the Fergana Valley, studies aimed at studying different types of winged insects were limited to studies of the unique silkworm (1972), the mulberry moth (1985), the mulberry moth (2010), the pomegranate worm and the fig moth (2010) [8; 7; 10; 4].

Research object and methods. M. Shermatov (2022) identified and described 22 species of the large family of butterflies (Pyraloidea) with trophic relationship with cultivated plants in the Fergana Valley [16]. The distribution of butterflies in agroecosystems by plant species, families and life forms was carried out based on the analysis of these materials. If necessary, the distribution and feeding characteristics of butterfly caterpillars were observed in agroecosystems, and additional information was collected about the food spectrum of some species. Entomological identifiers and electronic catalogs, as well as the works of scientists who conducted research in this direction were used for data analysis and identification of collected samples [6; 2; 5; 17; 18]

Analyzes and results.

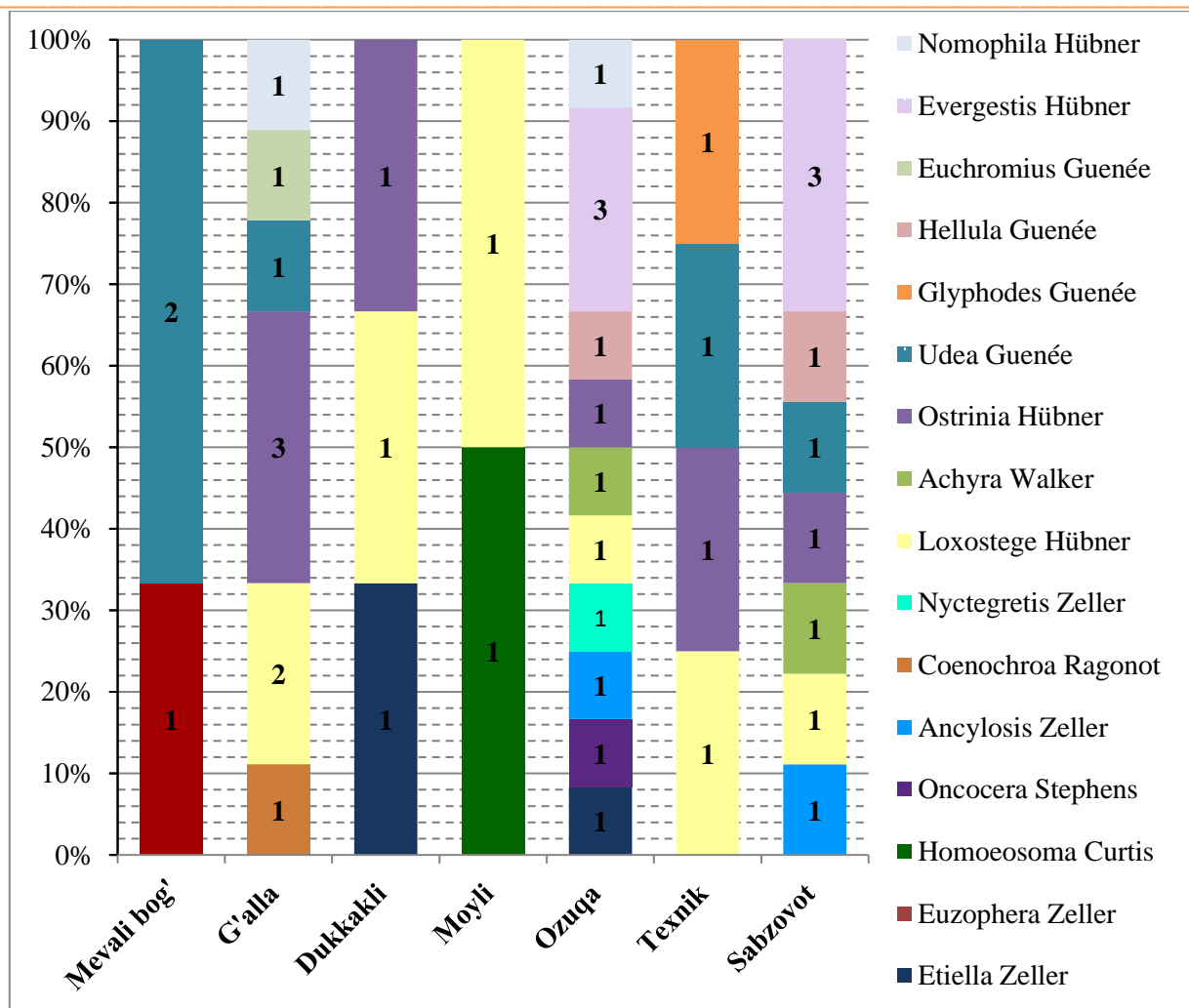
Based on the analysis of the fauna of butterflies (Pyraloidea) in the section of agrocenoses, it will be possible to explain the formation of isolated entomocenoses and their role and importance in the entomofauna of the region. According to the results, in the agro-ecosystems of the Fergana Valley, butterflies are ecologically connected with 30 species of cultivated plants belonging to 10 families included in the list of main agricultural crops.

According to the analysis, the most species of butterflies are distributed in agrocenoses of food crops, 10 (*Etiella* Zeller, 1839; *Oncocera* Stephens, 1829; *Ancylois* Zeller, 1839; *Nyctegretis* Zeller, 1848; *Loxostege* Hübner, 1825; *Achyra* Walker, 1849; *Ostrinia* Hübner, 1825; *Hellula* Guenée, 1854; *Evergestis* Hübner, 1825; *Nomophila* Hübner, 1825) there are 12 species of the genus. In particular, 5 species are distributed in beets and 4 species in rapeseed and alfalfa (Fig. 1).

9 species belonging to 6 genera of butterflies (*Coenochroa* Ragonot, 1887; *Loxostege* Hübner, 1825; *Ostrinia* Hübner, 1825; *Udea* Guenée, 1845; *Euchromius* Guenée, 1845; *Nomophila* Hübner, 1825) were found in the agrocenoses of grain crops of the Fergana Valley. In the conditions of the valley, on the farmsteads of the population, the common maize is mainly grown. Also, in the following years, the cultivation of corn as a second crop on the fields of farms freed from wheat increased sharply. This creates conditions for the development of moth caterpillars, which are connected to the corn plant through a food chain, throughout the season. In particular, the number of species of butterflies specialized trophically on the corn plant is 8. In the traditional agriculture of the valley, special attention is paid to the cultivation of johori. 3 types of moths were recorded in Johori entomocomplex. The number of species is 3 in wheat and 1 in rice.

9 species of butterflies belonging to 7 genera have biocenotic relationship with vegetable crops. The largest number of species (6) are trophically associated with beetroot. The distribution of species for other vegetable crops is 5 in cabbage, 3 in radish, 1 in potato, turnip, and radish.

1 species of 4 genera (*Loxostege* Hübner, 1825; *Ostrinia* Hübner, 1825; *Udea* Guenée, 1845; *Glyphodes* Guenée, 1854) are found in technical crops. Sentence



Picture 1. Distribution spectrum of butterflies in agroecosystems

Izox: The range of colors defines the share (%) of the generation in the agroecosystem; the number of species is given in numbers.

3 species belonging to 2 genera of butterflies (Eusophera Zeller, 1867; Udea Guenée, 1845) can be found in orchard agroecosystems. In particular, 2 types of butterflies have a trophic connection with apple and plum, and 1 type with pomegranate bush, apricot, cherry, pear, quince trees and strawberry from berry-bearing plants. Beans, beans, peanuts, soybeans and chickpeas are grown in the Fergana Valley. In the following years, the cultivation of mash as a second crop on the land freed from wheat is increasing. During the research, it was observed that leguminous crops attract 3 species of butterfly belonging to 3 genera (Etiella Zeller, 1839; Loxostege Hübner, 1825; Ostrinia Hübner, 1825). In the section of leguminous plants, this indicator corresponds to 3 types in soybeans, 2 in peas, and 1 in mash and beans.

Among the secondary crops, special attention is paid to the cultivation of sunflower from oil crops. There are 2 species of butterflies belonging to 2 genera (Homoeosoma Curtis, 1833; Loxostege Hübner, 1825) that are trophically specialized on the sunflower plant (Fig. 1).

Based on the analysis of distribution characteristics of butterflies in plant families and different life forms, it will be possible to reveal the role and importance of structural changes occurring in agroecosystems in the formation of entomofauna.

According to the analysis, in the agro-ecosystems of the Fergana Valley, butterflies have a trophic relationship with cultivated plants belonging to 10 families (Fig. 2).

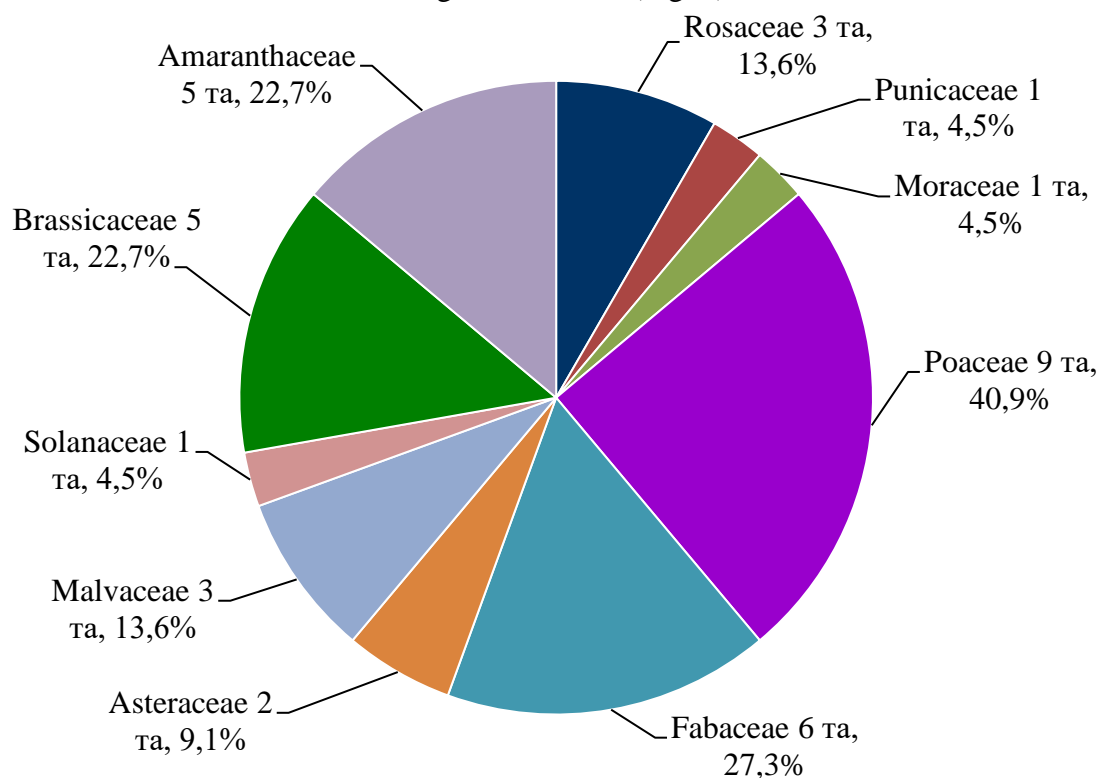
Representatives of the Poaceae or Gramineae family of plants have the highest diversity of butterflies. In particular, 9 species belonging to 6 genera of butterflies were recorded in cultivated plants of this family. Their share is 20% by genera and 25% by species in relation to the total butterfly fauna.

In this regard, the next level is occupied by cultivated plants belonging to the family of legumes (Fabaceae). As a result of faunistic studies, 6 (16.7%) species of butterflies belonging to 6 (20%) genera of leguminous butterflies were identified.

In agroecosystems, the number of species of butterflies found in various varieties of families such as Brassicaceae and Amaranthaceae is relatively high (13.9%), 5 of them are found.

Cultivated plants belonging to the Rosaceae, Malvaceae and Asteraceae families occupy the middle rank in terms of the diversity of butterflies. In particular, 2 genera and 3 species of cultivated plants belonging to the Rosaceae family, 3 species of 3 genera and 3 species of cultivated plants of the Malvaceae family, and 2 genera and 2 species of cultivated plants of the Asteraceae family have a trophic relationship.

Butterflies are the rarest plants belonging to Moraceae, Punicaceae, Solanaceae families, in which 1 species of 1 genus is found (Fig. 2).



Picture 2. Distribution of butterflies by plant families

Agricultural plants grown in agro-ecosystems of the Fergana Valley consist of trees, shrubs, shrubs, annual, biennial and perennial grasses according to their life forms [Pratov, Jumaev, 2003]. According to the life form, most of the trees belong to orchards, only one mulberry tree is described as a technical crop. In agroecosystems, the number of tree plants in which caterpillars of butterflies were recorded is 7, which is 21% of the total number of plant species (30). 3 (13.6%) species of butterflies are connected with trees grown in agroecosystems through the food chain.

It was found that only 1 (4.5%) species of butterflies feed on pomegranate from shrubs.

The main types of agricultural crops (22 species, 73.3%) in which butterfly butterflies were recorded are herbaceous plants according to their life form. 18 species or 81.8% of the total Pyraloidea fauna are found in these plants. Among them, there are 13 cultivated crops belonging to annual herbaceous plants, and the number of butterfly species with which they have a biocenotic relationship is 15 (68.2%). There are 6 types of two-year cultivated plants, and 8 (36.4%) species of butterflies are distributed in them. Although the number of cultivated crops belonging to perennial herbaceous plants according to their life form is small (3), the number of species in trophic relationship with them is relatively high - 6, and their share in the fauna is 27.3%.

In general, the number of butterfly species in agroecosystems is the highest in herbaceous plants (18) and this indicator is relatively low in trees (3) and shrubs (1) compared to the diversity of cultivated crops (Fig. 3).

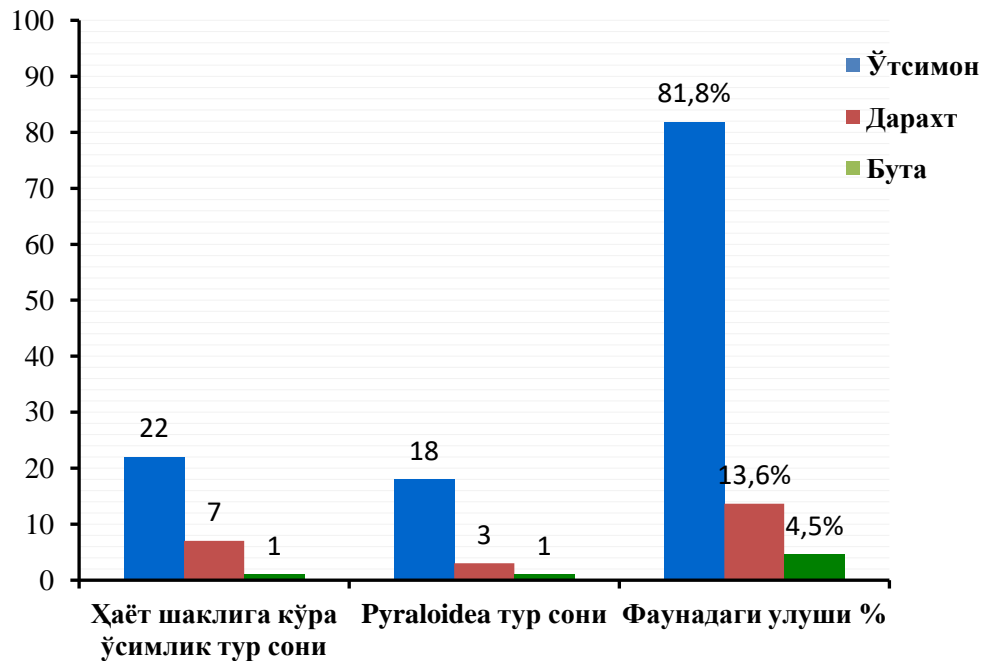


Figure 3. Distribution of butterflies by plant life forms

Conclusions. In the agroecosystems of the Fergana Valley, butterflies have a trophic relationship with 30 species of cultivated plants belonging to 10 families included in the list of main agricultural crops. The most species of butterflies are distributed in agroecosystems of food crops, 12 species of 10 genera are found. 6 species were recorded in agroecosystems of grain crops, 9 species in vegetable crops, 4 species in technical crops, 3 species in orchard agroecosystems, 3 species in leguminous crops, and 2 species in oil crops. Representatives of the Poaceae or Gramineae family of plants have the highest diversity of butterflies. 9 species belonging to 6 genera of butterflies can be found in cultivated plants of this family. These indicators decrease in the sequence of Fabaceae (6), Brassicaceae, Amaranthaceae (5), Rosaceae, Malvaceae (3), Asteraceae (2), Moraceae, Punicaceae, Solanaceae (1) families. The number of species of butterflies in agroecosystems is the highest in herbaceous plants (18), compared to the diversity of cultivated crops, and this indicator is distinguished by its relatively low number in trees (3) and shrubby plants (1).

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