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– ECOLOGICAL ANALYSIS OF THE DISTRIBUTION OF DOMINANT AND INVASIVE SPECIES IN THE JUJUBE AGROCENOSIS.

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Annotatsiya. *Ushbu maqolada unabi o'simligi agrotsenozida uchrovchi dominant va invaziv turlar tarqalishining ekologik tahlili keltirilgan. Unda unabi agrotsenozida uchrovchi dominant va invaziv turlar kirib kelishi va moslashish xususiyatlariga ko'ra uchta ekologik guruhga ajratilgan hamda tahlil etilgan.*

Abstract: This article provides an ecological analysis of the distribution of dominant and invasive species in the agrocenosis of the jujube (ziziphus jujuba). The dominant and invasive species found in the jujube (ziziphus jujuba) agrocenosis were classified into three ecological groups based on their introduction and adaptation characteristics, and they were analyzed.

Key words: *ziziphus jujuba, insect, pest, ecology, group, Carpomyia vesuviana.*

Introduction. Studying the patterns of insect invasion and adaptation in orchards and other agrocenoses established by humans serves as a basis for preventing a range of problems in fruit and vegetable cultivation. The primary basis for the ecological adaptation and survival of insects found in the jujube agrocenosis is related to the specific internal and external characteristics of these species. Including, the feeding habits of each species in the climate conditions of the biocenosis that they inhabit, their use of plants as shelter and food, and the use of soil by certain insect species at specific stages of their development are of significant importance. Premised on ecological principles, the introduction and adaptation of a new insect species, not previously encountered in the jujube agrocenosis, due to certain external factors, leads to the migration of populations of other organisms associated with this insect in the food chain, including microorganisms (pathogens), mites, and other insects. In our observations, the acclimatization of the jujube plant has led to the migration and adaptation of many local phytophagous insects from other agrocenoses to this plant.

For example, the gradual introduction of polyphagous and monophagous insects from the jujube agrocenosis, which was planted by importing from China, includes scale insects, leaf rodents, jujube fruit flies, and other phytophagous insects. This, in turn, leads to the formation of populations of their predators, such as lacewings (*Chrysopidae*), hoverflies (*Syrphidae*), ladybird beetles (*Coccinella septempunctata*), mites (*Phytoseiulus persimilis*, *Amblyseius swirkii*, *Amblyseius ackenziei*, *Neoseiulus californicus*), and the southern warehouse moth (*Plodia interpunctella*), which occurs during the storage period of jujube fruit, as well as parasitoids from the Braconidae family (Bracon hebetor Say, Bracon yuglandis Ashm). [1; 132-b.] From this perspective, the introduction and adaptation characteristics of dominant and invasive species found in the jujube agrocenosis can be conditionally classified into the following ecological groups.

The first ecological group - consists of monophagous insects that feed exclusively on the jujube plant, specifically the jujube fruit fly and the jujube incomplete fruit fly, which form highly stable populations in the jujube agrocenosis. Because these species feed only on jujube fruit, they rapidly invade new jujube agrocenoses in the areas where they are distributed and adapt, demonstrating their phytophagous characteristics. The first of these insects is the jujube fruit fly (Carpomyia vesuviana A Costa), which is distributed in Uzbekistan, Tajikistan, Turkmenistan, the Caucasus, Italy, Yugoslavia, Turkey, Afghanistan, Pakistan, India, China, and Thailand. One jujube fruit can host the development of 2, 3, or more larvae of the pest, while the second species, Carpomyia incomplete, is distributed in Italy, Spain, Egypt, Sudan, and Ethiopia, but it is not found in the jujube agrocenosis in Uzbekistan [2; 37-b., 3; 312-b.].

Both species of insects belong to the order Diptera and feed exclusively on jujube fruit during their larval development stage.Therefore, these species invade the jujube agrocenosis in the areas where they are distributed after the plants begin to flower and bear fruit, establishing strong populations and causing significant damage to fertility. Therefore, these species are considered dominant species. They expand their range

through natural means and spread via rooted jujube seedlings and damaged fruits.

The second ecological group - consists of polyphagous insects that feed on jujube and several other plant species, which also form stable populations. Among these are the scale insects of the order Hemiptera found in the jujube agrocenoses of Uzbekistan, including the California red scale (Diaspidiotus perniciosus), the purple scale (Parlatoria oleae Colvee), the Turon scale (Diaspidiotus prunorum), the apple oyster scale (Lepidosaphes ulmi Lin.), and the oleaster oyster scale (Lepidosaphes turanica Arch.). These species establish more stable populations compared to other scale insects.

These scale insects damage the stems, branches, fruits, and leaves of numerous plant families, in addition to jujube. They cause harm to apple, date, walnut, olive, pomegranate, rose, jujube, apricot, cherry, peach, and many other plants. Predatory ladybugs and lacewings have been observed feeding on the larvae of scale insects in nature.

Numerous pest species from the family Tephritidae cause significant damage to naturally and culturally growing jujube forests worldwide. In the jujube agrocenosis globally, six species of phytophagous pest insects belonging to the order Diptera have been identified. Among these, two monophagous species were mentioned above. The remaining four species are polyphagous and have not been identified in Uzbekistan, meaning they are not present, but there is a risk of their introduction. The most widely distributed polyphagous species among the dipterans is the Mediterranean fruit fly (Segatatis saritata Wiedemann), which originates from the southern regions of Morocco. Currently, this fly is widespread in Yugoslavia, Greece, Austria, Australia, Switzerland, Italy, Portugal, France, Czechoslovakia, Germany, Africa, Australia, South America, and Oceania [4; 251-285, 5; 231-252].

These six insect species belong to the family fruit flies *Tephritidae* within the order Diptera and only begin to invade and spread in the jujube agrocenosis after the jujube

plants bloom and produce fruit. Five of these species—guava fruit fly (Bactrocera correcta), oriental fruit fly (Bactrocera dorsalis), Mediterranean fruit fly (Ceratitis capitata), Natal fruit fly (Ceratitis rosa), and incomplete jujube fruit fly (Carpomya incompleta)—are not found in Uzbekistan, but they pose a risk of invasion and can form large and stable populations of polyphagous species in various agrocenoses. This situation is particularly dangerous for the stable establishment of agricultural crop agrocenoses, as these species are considered invasive within plant quarantine.

This second ecological group includes insects from the plant quarantine that are not found in Uzbekistan. These insects belong to the order Hemiptera, family Diaspididae, and include two species: the red pomelo scale (Aonidiella orientalis) and the mulberry scale (Pseudaulacaspis pentagona). Additionally, three species from the family Coccidae include the Japanese wax scale (Ceroplastes japonicus), Indian wax scale (Ceroplastes ceriferus), and giant eulecanium wax scale (Eulecanium gigantea). The brown marmorated stink bug (Halyomorpha halys Stal) belongs to the family Miridae within the order Hemiptera, while the Japanese beetle (Popillia japonica) is from the family Scarabaeidae within the order Coleoptera. Furthermore, the apple fruit borer (Thaumatotibia leucotreta) from the family Gelechiidae and the fall webworm (Hyphantria cunea Drury) from the family Arctiidae within the order Lepidoptera can also be included.

The third ecological group - consists of polyphagous insects that utilize jujube and several other plant species as food and habitat. These insects form unstable populations and do not cause harm to the formation of agrocenoses. This group includes certain mealybugs found in the jujube agrocenoses of Uzbekistan, the white rose beetle (Oxythyrea funesta), bees, squash bees, ants, root feeders, and leaf-eaters.

Conclusion. Therefore, the introduction and adaptation characteristics of dominant and invasive species found in the jujube agrocenosis can be classified into three ecological groups.

The first group consists of monophagous insects that feed exclusively on jujube. The first of these pests is the jujube fruit fly (Carpomyia vesuviana A Costa), which is found in Uzbekistan and other countries where jujube grows. One jujube fruit can host 2,

3, or more larvae of this pest. The second species is Carpomyia incompleta, which has not spread in Uzbekistan, thus preventing its introduction is necessary.

The second ecological group includes polyphagous insects that feed on jujube and many other plant species. Many species within this second ecological group that do not exist in Uzbekistan belong to plant quarantine and their introduction and spread is extremely dangerous for agrocenosis. Species belonging to this group also expand their range naturally and can spread through imported and exported products via root jujube seedlings and damaged fruits. Therefore, it is necessary to adhere to the requirements of plant quarantine to prevent their introduction and spread.

In contrast, insects belonging to the third ecological group do not cause harm to the formation of jujube and other plant agrocenoses.

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