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SCIENTIFIC BASES OF STUDYING HARMFUL BUGS OF THE MEDICINAL PLANT PRICKLY CAPER (CAPPARIS SPINOSA L.)

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Abstract: Identification of the species composition of pests occurring on the prickly caper (*Capparis spinosa* L) plant grown in Uzbekistan and reduction of their damage through the development of necessary control measures and norms are relevant not only in the agricultural sphere, but also in pharmaceuticals and forestry. Based on observations made by our scientific research, in April and May 2023, several species of bed bugs from the genus of hemiptera were found in the mother nursery at Babur forest plot belonging to Andijan State Forestry - these are field bugs (*Lygus protensis* L.), cruciferous bugs (*eurydema Ornate* L.) Cabbage bug (*eurydema ventralis* col.), fruit shield (*dolycoris baccarum*), Bagrađa bug (*bagrađa hilaris*), The Garden Bug (*eurydema dominulus*), Kozachok or red bug (*pyrrhocoris apterus*). This article presents information on species composition, biology and damage of bed bugs occurring on medicinal plant prickly caper *Capparis spinosa* L in conditions of Andijan region.

Keywords: Andijan region, prickly caper (*Capparis spinosa* L), forest fund, pests, identification, harm reduction.

Special attention is paid to improving the ecological condition of the lands of the forest fund of the Andijan region, their restoration, effective use of foothill and hilly lands, including the cultivation of pistachio seedlings, almonds and medicinal plants.

At present, flower buds of caper (*Capparis spinosa L.*) collected by the population are purchased at the price of 9000 soums per 1 kg. The Turkish state buys pickled products of *Capparis spinosa L.*, grown in Uzbekistan, for 2 US dollars per kilogram. The Turkish state exports *Capparis spinosa L.* products from Uzbekistan at a price of 8 euros per kilogram to European countries such as Spain, Italy, France, and Germany. From this it can be seen that the demand for the products of *Capparis spinosa L.* is very high [12,14].

The forest Fund of the Andijan region pays special attention to improving the ecological condition of the lands, their restoration, effective use of foothill and hilly lands, including the cultivation of pistachio seedlings, almonds and medicinal plants. There are opportunities on the lands of the forest fund to achieve economic benefits by creating plantations of medicinal plants, effectively using unused steppe hilly and foothill territories. The leaves, fruits and vascular membrane of *Capparis spinosa L.* are used in medicine. It is used to treat various edema, shortness of breath, hardening of the spleen, expulsion of worms, polyarthritis, goiter. This inexpensive and time-consuming plant can be harvested four times a year. This plant, also known as *Capparis spinosa L.*, is a plant with healing properties [7].

No scientific research has been conducted in our republic to study the species composition of pests found in the plant *Capparis spinosa L.* grown in Uzbekistan. Therefore, determining the species composition of pests found on a given plant and reducing their harm by developing the necessary control measures and norms are relevant not only in the agricultural sector, but also in pharmaceuticals and forestry [3,13].

The decree of the Cabinet of Ministers of the Republic of Uzbekistan dated September 3, 2017 No. 991-F raised the issue of the organization of plantations of the medicinal plant *Capparis spinosa L.* and their cultivation and processing for export. Based on the tasks set out in Resolution No. PQ-4670 of April 10, 2020 On Measures for the protection, Cultivation, Processing and Rational Use of Available Resources of Wild Medicinal Plants, as well as in the implementation of tasks provided for by regulatory legal acts related to this activity, the results of these scientific studies will serve to a certain extent [12].

Large-scale studies of medicinal and nutritional properties, growth and study of species and varieties of the *Capparis spinosa L.* plant have been carried out in Spain, Iran, Saudi Arabia, Cyprus, China, India, Morocco, Uzbekistan, Turkey and other countries. It was conducted by such scientists as Tlili N., Elfalleh W., Saadaoui E., Aghil N., Rashidi I., Mombeini A., Chedraoui S., Alain Abi-Rizk, Beyrouthy M., H.Y.Jiang, X.Li, D.K.Ferguson, Y.F.Wang, Rivera D., Inocencio C., Obon C., Rai S., Sher H. Merganov A., Abdullaev Z.I., Abdullaeva X.Z., Bo'stonov Z.T., Xomidov J.J., Eshonqulova N.T.

The above-mentioned scientists carried out research work on the study of cultivated and wild

species of the *Capparis spinosa* L plant, which is characterized by the presence of rutin, quartzine, sugars, thiaglycosides, glucosides, and iodine substances in the fruits. Due to this chemical property, it has been used in Traditional medicine to treat asthma, gastrointestinal tract, hepatitis, tuberculosis, cholera, vomiting, goiter, scabies and white spots on the body [4,7].

Currently, scientific research is underway in the republic on the organization of the plantation of the prickly *Capparis spinosa* L, as well as on the processing and packaging of newly created flowers and fruits of (Uzbekistan 20 variety). In this regard, according to scientific research, the determination of the species composition of harmful organisms found on existing plantations of the *Capparis spinosa* L plant, the study of the degree of their damage, as well as the development of necessary methods and criteria for combating them remain an urgent task for the cultivation of high-quality products. The solution of these issues is aimed at solving a number of problematic issues that allow expanding, obtaining a high-quality harvest and increasing the yield of *Capparis spinosa* L plantations, which are being built throughout the republic today.

Creating a strategy for protecting plants from pests, diseases and weeds in modern farming conditions is an important factor in growing agricultural products [6].

The initial stage of agroclimatic research into the dynamics of pest populations is to create a descriptive logical model of the process depending on the state of the environment, the development characteristics of forage plants, the presence and activity of beneficial species, and a set of agrotechnical and chemical measures [16]. The plant protection complex inherently refers to agricultural practices [11].

From the above, (*Capparis spinosa* L.) in its medicinal plant, it was aimed at determining the species composition of insects, studying the degree of harmfulness, as well as scientific research on the development and implementation of a harmonized system of struggle.

To achieve this goal:

determination of the places of natural growth of a medicinal plant (*Capparis Spinosa* L.) and the study of the terms of its vegetation;

determination of the species composition of insect pests affected during the growing season, identification of dominant pest species;

testing of microbiological preparations against identified pests, the use of entomophages against identified pests in various norms,

development of comprehensive measures to combat identified insect pests.

Currently, on the existing plantation in the Haqiqat array of the Andijan district of the Andijan region grows (*Capparis Spinosa* L.), the areas of growth of the medicinal plant in its natural and cultivated form (Uzbekistan 20 variety) are being monitored, as well as the Cole plant growing in the maternal nursery in the Babur forest area under the Andijan State Forestry. The development of measures to identify the species composition of pests that cause harm in the fields where the *Capparis*

Spinosa L is grown and harmoniously combat them is the main task of our scientific research work.

This research work is relevant in connection with the development and widespread implementation of an optimal control system that ensures the production of high-quality products for farms growing Capparis Spinosa L, using integrated protection methods, with the determination of the species composition of insect pests on the Capparis Spinosa L plant.

Based on observations made during our scientific research, in April and May 2023, several species of bedbugs belonging to the genus *Hemiptera* (*Hemiptera*) were discovered in the maternal nursery in the Babur forest area belonging to the Andijan State Forestry, and their species composition was determined.

They are– Field bug (*Lygus pratensis* L.), Cruciferous bug (*Eurydema Ornate* L.) and cabbage bug (*Eurydema ventralis* Kol.), field shield bug (*Dolycoris Baccarum*), *Bagrada* bug (*Bagrada hilaris*), the garden bug (*Eurydema dominulus*), kozachok or red bug qizil (*Pyrrhocoris apterus*).

There are 650 species (170 genera) of blind bugs in the CIS (*Hemiptera* - genus *Hemiptera*, *miridae* – family *miridae*), of which only 1% harms cultivated plants. In various ecological conditions of Uzbekistan, they surpass other systematic groups in terms of the number of genera and species, and the level of occurrence. Only in the agrobiocenosis of cotton alfalfa itself, 12 species of horseflies have been noted, most of which affect the vegetative and generative organs of the plant. But the species composition of the family has not been studied enough, as well as the fauna of pests.

Field bug (*Lygus pratensis* L.). Broadly defined (*Lygus pratensis* L.), Which damages various cultural plants in the CIS and Western European countries.

The body size of an adult bedbug is slightly larger-5.8-7.3 mm. The body color ranges from yellowish-green to dark brown. There are 4 dark spots parallel to each other on the front of the shoulder (Fig.-1.).

Lygus pratensis L during the adult insect winters under herbaceous plants, crumbling puddles. Bedbugs begin to fly in search of food when the air temperature reaches 120C, and individual broods rise to 160C. But the bedbugs wintering under a thick mattress come out only when the temperature reaches 22-250C, that is, their mass exit from wintering lasts from the second half of March to the end of the first decade of April. The broods of bedbugs that have emerged from winter quarters are initially harvested for the winter wheat harvest. After 9-12 days, the females, whose eggs mature, first leave the fields of winter crops and gather in massive flowering whole plants, such as Shepherd's purse, surepka, sorrel and others. Male bedbugs, on the other hand, leave autumn crops a week after the departure of the females.



Figure-1. Field bug (*Lygus protensis L.*) larva

In condition of Uzbekistan there are the following types of the garden bugs; Cabbage bug (*Eurydema ventralis Kol.*), Cruciferous bugs (*Eurydema Ornate L.*), red bug (*Pyrrhocoris apterus*) belonging to the family of (*Hemiptera*), shield bugs (*Pentatomidae*). The most common of these is Cabbage bug (*Eurydema ventralis Kol.*) They are all found in whole crops, especially cabbage. They feed by sucking the sap from the leaves of plants. The plant completely dies when the bugs multiply The top of the cabbage bug (*Eurydema ventralis Kol.*), is black and blue with a white-red tint.

Most of the wing is whitish in color with two rows of black spots on the belly. Cabbage bug eggs are 0.6-1 mm in size. It can be light green or light gray in color. Cruciferous bugs (*Eurydema Ornate L.*), differ from others in that the upper part of the egg is covered with a black spot or black dots in the center. The cruciferous egg of bedbugs (*Eurydema Ornate L.*), is 1 mm in size, green in color, with a dark flange at the base and apex; there is a dark ring in the center of the upper part, and a round spot next to the egg.a blind spot. Small leaf-shaped flanged teeth are located along the upper edge, and the eggshell is dissected into small hexagonal lobes.

Young larvae are rounded, with a more convex apex, as they develop they shed their bark and become similar to adult shackles.

Cabbage bugs (*Eurydema ventralis Kol.*), overwinter in their mature phase under insects in gardens and cultivated areas. In one night, when the daily temperature rises above an average of 12-130C, the bugs begin to hatch from wintering. This condition often falls on March. Cabbage wings are initially fed by sucking on juices from foreign bushy plants. With the appearance of cabbage and other cultural bushy plants in the field, they migrate to them. They are on average 10-15 days of additional feeding and mating.The fattened female bugs lays the eggs on the top of the Leaf. The number of eggs in each laid ball is stacked in two rows of 6 pieces (12 pieces each). Depending on the natural conditions, within 6-15 days from the eggs, the larvae begin to hatch. The larvae stay around the eggshells overnight and spread around to feed. Larvae develop for 25-30 days. In the spring season, it develops into a mature bug in 40-50 days. They give different generations in different regions. For example, in Western Pomir, it gives two generations per season, and in Uzbek conditions-three.



Figure-2. Cabbage bug (*Eurydema ventralis* Kol.)

Cruciferous bugs (*E. ornata*) Is an agricultural pest. Distributed in the steppe and forest-steppe zone. Brassicaceae family. Adult insects overwinter under various plant debris, most often under the leaves and stems of woody plants. In the spring, after a period of intensive feeding, insects mate and females begin to lay eggs. Postembryonal development is 25-30 (in the south) up to 50-60 (in the north) days; therefore, in the southern regions it can give two or even three generations. Larvae and adult insects suck cell juice from plants. Colorless white spots appear on the leaves and stems in places where the skin of the plant is punctured by the nose.



Figure-3. Cruciferous bug (*Eurydema Ornate* L.)

Kozachok, soldier bug, wingless red bug, or red bug (*Pyrrhocoris apterus*) – It belongs to the family of red bugs (*Pyrrhocoris apterus*), a species of common ground bugs measuring 9-11 mm. They are found in grass, shrubs and tree trunks from March to October.

The color is black with a red pattern on the front shoulders and upper part of the wings. The eyes are dark red. The hindwings are usually absent, but there are exceptions. The long nose helps the insect to sting plants and other insects.

Soldier bugs eat pollen, fruits, juice and seeds of plants growing nearby. In addition, their diet includes arthropods, as well as other invertebrates such as worms and slugs. Sometimes they live and hunt in the bark of trees. Soldier bugs often attack their relatives.

It is distributed throughout the Palearctic from the Atlantic coast of Europe and North Africa to

Northwestern China. Also in the USA, Central America and India [10].



Figure-4. Red bug (*Pyrrhocoris apterus*)

The garden bug (*Eurydema dominulus*) or North bug (*Eurydema dominulus*) are insects of the family — shield bugs (*Pentatomidae*).

The body length of an adult is from 5.5 to 8 millimeters. The head of the bug is slightly curved, tapering in front, trapezoidal in shape. The body is close to oval in shape. The pattern on the body is mottled, consists of dark and light spots. Dark spots of black, bluish-black or greenish-black color with a metallic sheen. Light spots close to yellow, red or white. The pictures are changing. The antennae of the bug are covered with short hairs. The color of the antennae is dark.



Figure-5. The garden bug (*Eurydema dominulus*)

Fruit shield (*Dolycoris baccarum*) – a species of insect from the family of real shield beetles (*Pentatomidae*).

The length of the bug is 10-12 mm. The body is flat. The coloration of adults is gray, yellowish or reddish-brown, the upper part of the shield and the lower part of the body are white. The body is long-pubescent, with black stripes on the upper part. The moustache is long and articulated, consisting of black and yellow rings. The abdomen is black with yellowish transverse stripes. The larvae are covered with thick light hairs. The head and chest of the first 2 stages of the larvae are black, from the 3rd year they are yellowish with brown spots. The abdomen is yellowish, with reddish stripes on the seams.



Figure-6. Fruit shield (*Dolycoris baccarum*)

Polyphages feed on various plants: berries, fruits, garden crops, cereals, oilseeds, technical and ornamental plants, etc. bedbugs pierce soft leaves, stems, fruits, often cause drying and falling of flowers and fruits, their color changes, and then the appearance of yellow-brown spots on leaves and stems. Imagos overwinter under the soil. It is found in meadows and forests, on perennial grasses, shrubs, sometimes trees, as well as in fields covered with weeds. It occurs from April to October [15].

***Bagrada hilaris* - Bagrada hilaris or (painted bug)** is a species of thyroid bugs known by common names. It is often confused with the Harlequin bug. His homeland is Southeast Africa. It is known as an introduced species in other places, including the states of California and Arizona, which were first reported in 2008[8]. Cabbage plants are the main insect pests of *Brassica oleracea* crops (including cabbage, cauliflower, Brussels sprouts and broccoli). The imago and larva of this species suck the juice from the leaves of plants such as turnips, rapeseed and mustard belonging to dark-colored plants, as a result of which they wither and turn yellow, which leads to a slowdown in growth [1]. In addition to the Cruciferous family, insects are known to occur on papaya, oats, corn, potatoes, cotton, hemp, pearl millet and some legumes. [8] A large number of insects accumulate on plants, which cause great harm.

The adult insect is 5 to 7 millimeters long, thyroid-shaped, black in color with white and orange markings. The female, which is larger than the male, lays up to 100 oval or barrel-shaped eggs on leaves or in the soil under plants. The eggs are white when they are just laid, and turn orange over time. After 8 days, the first nymph appears. It has a bright orange-red color, becoming darker as it grows and turning black in the final stage [1].



Figure-7. *Bagrada bug*(*Bagrada hilaris*)

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