ECOLOGICAL FEATURES OF COCCINELLIDAES IN THE GANDZHA-KAZAKH ZONE OF AZERBAIJAN

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Abstract: - Ecological features of Coccinellidaes of Azerbaijan are studied. İt is established by method of atom-absorbing spectrometry that the maintenance of heavy metals in an organism of Coccinella septempunctata Linn., 1758; Adalia bipunctata (Linnaeus, 1758) kinds changes depending on degree of impurity of district of dwelling and corresponds: Fe (318.44 1034.37), Mn (30.08-42.64), Cu (53.86-30.69), Pb (23.11-28.03), Zn (106.60-123.52), Ni (9.43-18.88), Co (4.71-0.0) mg/kg. Influences of heavy metals are not only revealed on elementary structure of insects, but also on variability of their coloring and drawing are revealed.

Key-Words: ecology, heavy metals, atom-absorbing spectrometry, Adalia bipunctata, Coccinella septempunctata, influence, Coccinellidae

1 Introduction

Progressing environmental contamination by man-made emissions of the industrial enterprises: oil refining, oil-extracting, metallurgical, chemical, power branches of Azerbaijan conducts to gradual pauperization of fauna and flora of Azerbaijan.

Ladybirds (Coccinellidae) family of bugs – one of large families of group of Coleoptera, have more than 5000 kinds, from them 93 kinds live in Azerbaijan. Ladybirds are successfully applied in biological struggle, occupying the diversified biotopes.

However, the main reason of the diversity happening ecologically in their grouping and sperading is relevant to their specific nutritional

For comprehensive study of firstly ecology of entomofags which regulates the number of pests It is necessary firstly to study their phenology, food relations, the impact of a number of environmental factors (heavy metals).

Purposeful use of resources and ecologically clean resource is necessary for improvement the material welfare of the population, to meet maximum their growing demand .

Cultural and wild food plants is not only natural wealth of our country, but also valuable reserve source. Many of these plants have special importance in food of people from ancient times to nowadays. In other words, plants have leading role in the normal and healthy development of human body for food value, mineral substances,vitamins in the structure and the importance of treatment. However, plants are exposed to regular influence of pests, the mass are destroyed [1,2].

All methods applied to protection of plants in the ecological system of plant- fitofag-entomofags for managing the number of plant pests are included to strategy of integrated struggle [3].

Such fighting is not only to increase productivity, but also differs with taking into account the interests of the whole society in their utilization

It is important to know the main features of the agrosystems,biology and ecology of pests and entomofags,especially of Coccinelidaes for struggling against pests. Regulation of the The regulating number of population is one of the most important practice issues. Completely destroying of pests populations violates the existing balance in nature, so in the modern world the applying of the methods (the biological struggle against Coccinelidaes) which provides preservation at a low level of economic damage of pests.is considered more actual. [5, 6, 7].

In general, as a rule a stable environmental conditions are established in Gardens, Parks, etc., This environmental condition creates permanent structure of fauna of buğumayaqlı fitofags. The amount of these

species changes during the all year on seasons. This change connected with the adaptation of plants to nutrition with different organs mutually with their phenology [8, 9].

It should be noted that some researches on good-nature preys – Coccinelidaes and fitofag ticks (retina and the knob ticks) having the feature of sucking which spread in Azerbaijan have been carried out by some authors. Or The conducted researches have either cursory or the general character. There are alot of information about good –nature Coccinelidaes in the publications; [10, 11, 12, 13, 14, 15]. However, the fauna and ecological features of Ganja-Kazakh region (Coccinellidae) have been studied relatively weakly

The work purpose - studying of ecological features of Coccinellidaes , their economic value, on improvement of an ecosystem of the Gandzha-Kazakh zone of Azerbaijan with finding-out of fauna of harmful and useful arthropods and some wreckers living on fruit crops and in wood grounds, revealing of influence of pollutants (heavy metals and radiation) on a biodiversity of Coccinellidaes .

2 Material and research method

Definition of heavy metals in an organism of Coccinellidaes was spent by the method of atom-absorbing spectrometry on AAC-300, Perkin Elmer. Definition of heavy metals in samples of bugs was spent after a combustion at direct influence on ashes a solution of trichloroacetic acid. After sedimentation of proteins by trichloroacetic acid,definition of the maintenance of heavy metals in samples of bugs was spent.

The technique of definition of heavy metals by the method of atom-absorbing consists in the following. An exact hinge plate of ashes of bugs was placed in rotaryof a test tube, added 10 ml of solution HCl (1:1), further a solution was left in the thermostat at 400 With for an hour. After that 2 ml of 20 %-s' solutions CCl_3 COOH was added, with the subsequent keeping within 1st hour at room temperature and cebtrifugated within 10 minutes at 1500ob/minute Fe, Cr, Cu, Cd were defined in a filtrate

It is necessary to consider that fact that standard solutions should contain 5 % trichloroacetic acid. Thus, we pick up optimum conditions of definition Fe, Cr, Cu, Cd, Zn from trichloroacetic filtrate.

For quantitative definition of concentration of investigated metals in bioobjects we had constructed the graduated schedules of definition of standard metals in coordinates A-C. Under the graduated schedules in coordinates A-C we found concentration of a defined element.

For construction calibrating drawing, we entered serially into an air-acetylene flame of a torch working standard solutions, beginning from a solution with the minimum maintenance of a defined element not less than four concentration, including the concentration close, to that which is expected in an analyzed solution. Each measurement repeated twice (not less than 2 times), we took average value at schedule construction. Standard solutions of metals.

Iron. 0.1g iron wire were dissolved in 50 ml of the diluted nitric acid (1:1) HNO3 and lead up volume the distilled water to a label of 100 ml. 1.0 ml of the received solution contain 1 mg Fe.

Preparation of reference solutions for construction of calibrating drawing.

0, 0.1, 0.2, 0.4, 0.6, 0.8, 1.0 ml of a standard solution was placed in seven measured flasks in capacity of 100ml, diluted to a label with the distilled water and nuclear absorption of iron was measured. On the found sizes of optical density calibrating schedule (tab.) was built.

Cadmium. 0.1g metal cadmium in 15 ml to the diluted hydrochloric acid (1:1) HCl was dissolved. Further volume of an investigated solution the distilled water was lead up to 100 ml; 1 ml of the received solution contained 1.0 mg Cd.

Construction of reference solutions for construction of a calibrating drawing.

0.1, 0.2, 0.4, 0.6, 0.8, 1.0 ml standart solution of a cadmium was placed in a measured flask in capacity of 100ml placed, diluted with the distilled water to a label and nuclear absorption of Ca was measured at length of a wave 228, 8 nanometers in a flame acetylene-air.

Calcium. 0,25g CaCO3 was placed in a flask, further added 30 ml of the distilled water and the minimum volume of the concentrated nitric acid was entered on drops before full dissolution (10 ml). Further diluted with the distilled water to volume of 100.0 ml. 1 ml of the received solution contained 1.0 mg of Ca.

Preparation of reference solutions for construction of calibrating drawing.

In 5 measured flasks capacity of 100.0 ml 0.1, 0.2, 0.4, 0.6, 0.8 ml of a standard solution of Ca was placed and diluted with the distilled water to a label 100ml. In the subsequent nuclear absorption of Ca measured at length of a wave of 422.7 nanometers in a flame acetylene-air.

Manganese. 0.14g MnSO4 ·5H2 O was dissolved in 50.0 ml of the distilled water, flowed 2.0ml HNO3 and diluted with the distilled water to volume of 100 ml. 1.0 ml of the received solution contained 1.0 mg Mn.

Preparation of reference solutions for construction of calibrating drawing.

0.1, 0.2, 0.4, 0.8, 10.0 ml of a standard solution was placed in measured flasks in capacity of 100.0 ml and 3-4 ml of hydrochloric acid was flowed. The received solutions was diluted with the distilled water to a label 100ml and absorption of manganese was measured at length of a wave of 279.5 nm in a flame acetylene-air.

Chrome. For preparation of a standard solution of chrome 0.289г K2Cr2O7 was dissolved in 100.0 ml of the distilled water. In the subsequent 1.5 ml of the concentrated nitric acid was flowed. The volume of an investigated solution was lead up the distilled water to a label by of 100.0 ml. 1.0 ml of the received solution contained 1.0 mg Cr.

Preparation of reference solutions for construction of calibrating drawing Cr.

2.5, 5.0, 10.0, 20.0, 40.0 ml of a standard solution was placed in a measured flask capacity of 100.0 ml, was diluted with the distilled water to a label 100ml and absorption Cr was measured at length of a wave of 357,9 nanometers in a flame acetylene-air.

Zinc. For preparation of standard solution Zn, 0.1 g metal zinc was dissolved in 10.0 ml diluted (1:1) HCl and lead up volume the distilled water to a label of 100.0 ml. 1.0 ml of the received solution contained 1.0 mg of zinc. Preparation of a reference solution.

0.25, 0.5, 1.0, 2.0, 4.0, 8.0 and 10.0 ml of a standard solution was placed in measured flasks capacity of 100.0 ml placed, was diluted to a label with the distilled water and absorption Zn was measured at length of a wave of 213,7 nmin a flame acetylene air .

Definition of metals in investigated samples of bugs was spent by branch from a firm basis or by a wet or dry combustion, or a way of extraction of mineral acids.

At the analysis of traces of metals in samples of bugs a technique of a dry and wet combustion was used. At a combustion platinum pot was used, the preliminary carefully was washed out 3 % a solution of chloric acid.

At a dry combustion bugs were exposed to temperature processing at 5000 With within 24 hours, and then the dry rest dissolved in nitric acid and contents were lead up in a measured flask to volume by of 25 ml the deionized water.

Thus, the analyzed tests received have allowed to define maintenance of Mn, Zn, Cu, Fe, Cr in a range of maintenances from 1 to 100 mg/l, and Cd, Ni less than 0.1mg/l in an air-acetylene flame. Analysis operating conditions corresponded to technics of the analysis of the instrument description on the analyzer.

3 Results of researches

Coccinelidaes have rich flora and density of individuals in Azerbaijan. However, the ecological point of view the main reason for these differences in their specific groups and spreading is connected to their specific nutrition.

The evaluation of role of entomofags regulating the number of pests in acosystems is actual direction. Therefore, for the first comprehensive study of their ecology it is necessary to study firstly their phenology, food relations,the impact of some factors of environment.

We conducted successful research in fruit gardens, cultivated fields, fields, meadows and the garden of Ganja-Kazakh region. As a result, we have found effective akari and entomofags(ektomofag). We studied the behavioral characteristics of their nutrition, the winter shelters, the species composition, the spreading on biotops and influence of environmental factors(heavy metals). We have observed that the Coccinelidaes is developing mass in favorable conditions, regulate successfully the number of pests (fig.1, fig.2).

Fig. 1. Coccinella septempunctata

Fig.2. Adalia bipunctata

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We revealed that the maintenance of heavy metals in an organism of Coccinella septempunctata Linn., 1758; Adalia bipunctata (Linnaeus, 1758) kinds changes depending on degree of impurity of district of dwelling and corresponds: Fe (318.44 1034.37), Mn (30.08-42.64), Cu (53.86-30.69), Pb (23.11-28.03), Zn (106.60-123.52), Ni (9.43-18.88), Co (4.71-0.0) mg/kg.

It is established that depending on degree of impurity of investigated district coloring and drawing change is marked at bugs.

As a result of experimental researches we have revealed that degree of pollution of investigated habitats of Coccinellidaes influences not only elementary structure of insects, but also variability of their coloring and drawing.

4 Conclusions

Thus, in comparative aspect the influence of ecological factors on a biodiversity of bugs of the Gandzha-Kazakh zone of Azerbaijan is revealed.

1 family, 19 sorts and 35 kinds of bugs have been revealed. From them background 17 kinds of bugs. 19 kinds living only on fruit trees, other kinds live in kitchen gardens, on weed plants, trees and vegetables

Concentration of heavy metals in samples of the bugs collected in various biotopes of the Gandzha-Kazakh zone of Azerbaijan, and also in vegetative and soil tests have been defined.

On the basis of the received data it is possible to ascertain that depending on degree of impurity of district where gathering of samples of bugs has been spent, sampling of vegetation and soils in investigated samples the maintenance of heavy metals are revealed. Researches on revealing of influence of ecological factors on a biodiversity of bugs proceed. New structural elements of drawing of wing sheaths of polymorphic kinds of Coccineledaes are described that substantially will expand a range of their variability. The threshold nature of display of separate stains and drawing crosspieces have been revealed

As a result of researches, an object in view and problems open a new wide spectrum in revealing of fauna and features of ecology of Coccineledaes in the conditions of Azerbaijan, bringing the essential contribution to practical and theoretical biology.

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