ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 06,2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

BIOECOLOGICAL PROPERTIES OF BENEFICIAL INSECTS (Goldeneye , Bracon , Trichogramma)

Yusupov Ibrahim Mirsaydalievich
Kokand state university ,
Chemistry technology and natural sciences faculty ,
Biology department associate professor ,
Village farm sciences according to philosophy Doctor of Philosophy (Ph.D.)
Phone : (998)-99-904-64-97, E-mail: ibrohimjony999@gmail.com

Abstract : This in the article useful insects biological and ecological characteristics , their village on the farm importance , living environment and natural to enemies against natural under control role lit. Basically pollinators (e.g. bees) , biopesticides against natural enemies (parasites) and predators) and nutritional on the chain place about scientific information analysis Also , their population protection to do and multiplication measures , human activity under the influence to the surface coming also see the dangers released .

Support phrases . Useful Insects , Bioecological Features , Pollinator insects , Entomophagous (predatory) and parasite insects), in the ecosystem Role , Biological balance , Village farm benefits , natural control factors , Anthropogenic impact , Biological struggle tool .

Beneficial insects are insects that reduce the number of plant pests and also provide direct or indirect benefits to humans. Beneficial insects

1. a pollinator of plant flowers,
2. a supplier of raw materials for food products and industry,
3. natural predators of crop pests and other harmful animals and weeds,

into groups such as those involved in natural processes. Insects , especially bees and of bees plant flowers pollination importance long ago known .

Food products and technique materials giver Useful to insects bees (honey) and wax), mulberry silk caterpillar (cocoon), some chervets (lock) working (releases) and other enters .

Pest insects my friend or in them parasitism doer many useful insects known . For example , goldfinches , syrphids , and ladybirds beetles , mealybugs , thrips , predators kandala - orius , aphids and others . Plants protection to do biological in the way parasite from entomophages Trichogramma , from Gabrabracon (tunnels) egg and to the worm against) is used . To Shumgiya against local herbivore — phytomycete fly successful used [2].

Insects soil appearance also participate in the (for example , primary wingless from insects legged). Many insects soil layer organic substances with enriches (in the soil) resident ants , termites , worms and some beetles).

1. Type – Goldeneye – (Chrysoperla carnea.) (Family – Chrysopidae. Order – Lepidoptera – Neuroptera.)

Insects belonging to this family are widespread in Europe, Asia, Africa, and America. Currently, 24 species have been identified in Central Asia, 33 in Azerbaijan, and 15 in Kazakhstan. In Uzbekistan Chrysoperla carnea , Chrysoperla septempanum cfata W., Chrysoperla albolineata L. and Chrysoperla vittata W. many occurs in Uzbekistan under the

ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23

American Academic publishers, volume 05, issue 06,2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

circumstances Species composition of goldfish the most many widespread and promising types some bioecological features AKMansurov , FMuspensky , O.Sh. Yuzbashyan and others They studied . golden-eyed about 11 species These are the gold - eyed natural only in biocenoses not , maybe every kind in crops and also found in trees .

Goldeneyes golden hungry green colorful very thin insects is considered . Their much The broad, pearly or iridescent wings reach a spread of 19 to 55 mm. The whiskers are feathery, and the forehead is flat. It flies well towards the light. The newly laid eggs are light green, then gradually darken (Figure 1) . The female lays her eggs singly or in clusters on the branches, leaves, or nodes of the cotton plant, on a thin silky base.

Figure 1. The newly laid eggs are light green, then gradually darken.

The body of the goldfish is compact from the front and back, and its legs are well-developed for fast running . The color is from light green to light yellow. There are empodia between the claws on the paws. On the chest and abdomen, there are pairs of ridges covered with large hairs with hooked tips on the sides of the body. The long, sickle-shaped curved upper jaws on the large flat head of the larva are adapted for capturing prey. The lower jaws are compressed at the top, forming a closed tube.

The internal organs and tissues of the prey, previously dissolved by means of a special digestive juice sent through this tube, are sucked through this tube. The larva's oral cavity is covered with a membrane. The third-instar worm, having fed, spins a round white cocoon from silky threads produced by the Malpighian tubes.

After a few days, the worm sheds its last shell and turns into a pupa. The open-type pupa is green in color. At the end of development, it becomes mobile, gnawing at the top of the cocoon, which opens like a lid.

The fungus emerges from **the resulting hole and, choosing a suitable place, firmly attaches itself to the substrate and pupates, eventually emerging as an adult. Only the larvae of the golden eye** lead a predatory life, they are extremely agile, have the ability to move quickly from place to place and are excellent foragers. Being very omnivorous, they are It feeds on more than 70 species of arthropods, including 11 species of mites.

The life cycle of a goldeneye is as follows (Figure 2) .

ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 06,2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

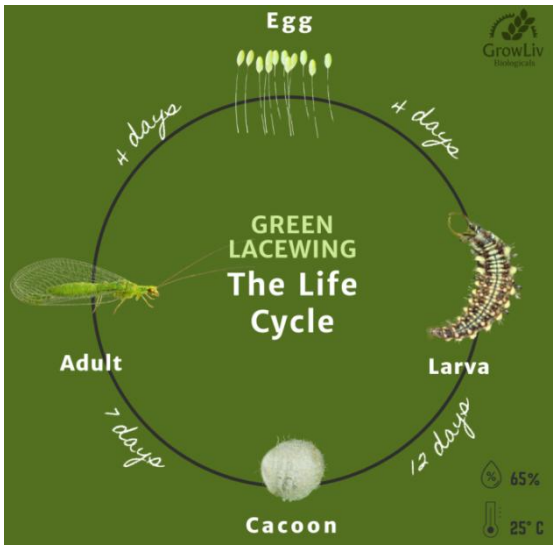

Figure 2. Goldeneye life cycle .[3]

It overwinters as an adult and partially as a cocoon in soil clods, under plant debris, in crevices of trees and buildings. According to O.Yu. Yuzbashyan, it overwinters only as an adult in other buildings. Under natural conditions, hibernating goldfinches become active in early spring, in late March - early April, when the average day-night temperature reaches 10-11 ^{o}C.

Insects emerging from hibernation at this time feed on pollen from flowering plants , mate, and then begin laying eggs (Figure 3).


Figure 3. Goldeneye from winter after leaving after flower dust with they feed .

Eggs plant of leaves surface and under to the sides and other to places one by one or one how many ball-ball as puts , they thin stem in case to the substrate (Figure 4).

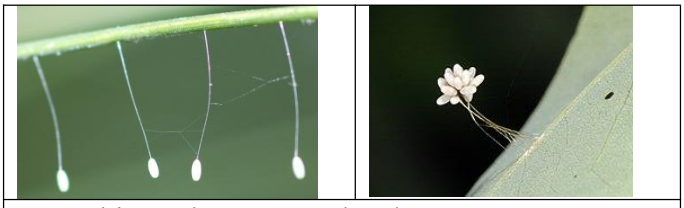
Eggs thin to the stem settles down .

Figure 4. Gold mine eggs .

Often golden eye eggs juice very increased in places , larvae for feed easy to be found to the places laid an egg to put flat It's going to happen . One accent day up to 65 throughout , all life during and up to 500-750 egg sheep takes .

ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 06,2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

First-instar larvae feed mainly on insect eggs, aphids, and mites .

The second and third instars are less active and prefer larger prey. During the development period, the larva eats up to 300 aphids, spider mites, and harmful weevil eggs (Figure 5).

Figure 5. Age 1 larvae feeds on insect eggs, aphids and mites, 2 and 3 their age The larva eats up to 300 eggs of aphids, spider mites, and harmful mites, and cannibalism is also observed among them.

Adult larvae feed on the plant, spin a cocoon, and pupate directly on the plant, in its various sheltered places (Figure 6).

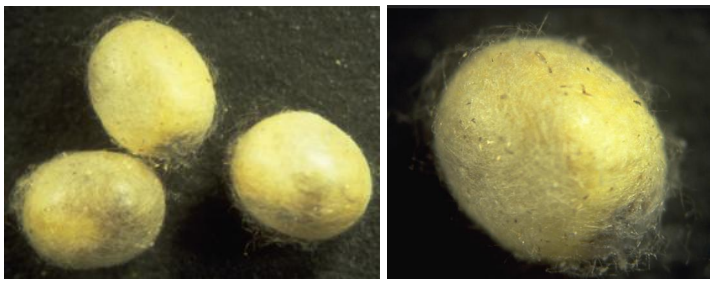

Figure 6. Goldfinch (Chrysoperla carnea) the dome .[4]

In Uzbekistan, the main species of goldfish **reproduce by laying 4-5 joints.** In nature, the number of joints a goldfish lays depends on climatic conditions and the density of arthropods in the surrounding vegetation.

2. Type – Bracon – (Habrobracon hebetor Say.) (Family – Braconids – Braconidae . Order – Hymenoptera – Hymenoptera.)

Brakon entomophagous is mainly recommended for biological control of the bollworm. This **ectoparasite** infects the larvae of many other butterflies, in addition to the bollworm. Brakon is an external parasite that paralyzes the larvae of the bollworm, and then lays 4-5 to 16 eggs on them. If there is a lot of prey, it does not lay eggs on all the paralyzed larvae. The eggs can be located singly or in groups. Each female can lay up to 400 or more eggs (Figure 7) .

ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23
American Academic publishers, volume 05, issue 06,2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

		
Poaching body structure .	Poaching is flying .	Poaching to a large wax moth egg is putting .

Figure 7. Bracon – (Habrobracon) hebetor Say.)

Life rotation . Bee at 30°C life rotation elementary from parasitism starting adults appearance until it is approximately 10-13 days continue will reach . Adult reached female about 23 days lives , this time inside it is 100 close egg working 1 - 8 egg alone , paralyzed , evening in periods moth in the larvae is collected (Figure 8).

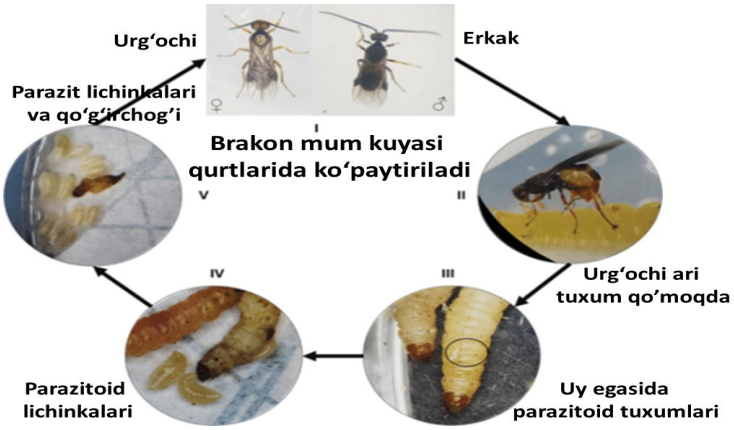

Figure 8. Life cycle of Bracon brevicornis and Bracon hebetor [5] .

Biological under control use . These bees fast they feed , that's why for intestine enzymes moth in the larvae blood proteins fast my heart This is effective . biocontrol agent value of the type as increases .[6]

The adult moth overwinters under tree bark, plant debris, and stumps. In addition to its natural occurrence, this entomophage is also propagated in laboratory conditions in wax moth larvae. Methods for the propagation of this entomophage in laboratory conditions in special mechanized devices have been developed. When cotton bollworms appear on plants, biological control programs distribute from 500 to 2000 of them per hectare, depending on the number of pests (in a ratio of 10-14 / 1).

3. Type – Trichogramma – (Trichogramma chilonis) (Family – Trichogrammatidae . Order – Hymenoptera .)

Trichogramma is an insect belonging to the order Hymenoptera, the family Chalsidoidae , and the family Trichgrammatidae. About 140 species of Trichogramma have been identified in nature around the world . In the conditions of Uzbekistan 12 species have

ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23

American Academic publishers, volume 05, issue 06,2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

been identified. Trichogramma lives by laying its eggs in the eggs of insects belonging to various families.

Three species of Trichogramma are cultivated in Uzbekistan , namely (1) Trichogramma evanescens, (2) Trichogramma pintoi and (3) Trichogramma chilonis. Trichogramma species are mainly used against the eggs of the borer. Cultivation of Trichogramma (Trichogramma chilonis) in biolaboratories is carried out in several stages. This process includes (1) cultivation of the laboratory host for Trichogramma, the grain moth (sitatroga), and (2) cultivation of Trichogramma on the eggs of the grain moth (Figure 9).

Trichogramma mature of the breed size 0.5 mm.

The female parasitoid Trichogramma lays eggs inside the eggs of the pest .

Figure 9. Trichogramma - (Trichogramma chilonis)

The size of the adult Trichogramma is 0.5 mm. The female is larger than the male. It takes an average of 10-15 days for the parasite to develop from an egg into an adult. Therefore, before the pest insect produces one larva, the Trichogramma can produce 2-3 larvae. Trichogramma is mainly propagated in the eggs of the grain moth, since this pest reproduces very quickly (it produces 14-15 larvae per year) and is convenient for use in continuous (flow) systems of biofactories.

The Trichogramma moth can lay one to several eggs in a single egg. The entire development of the parasite takes place in the egg of the prey until the winged insect emerges [7] (Figure 10).

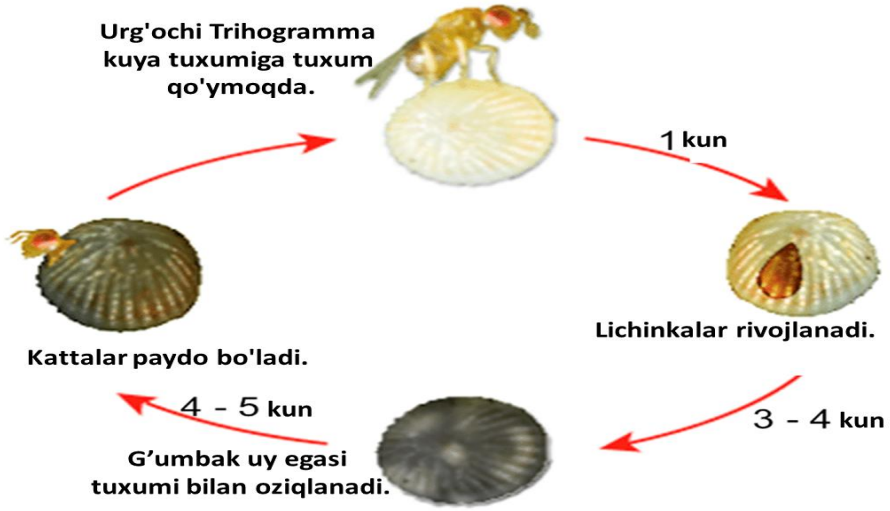

Figure 10. Trichogramma all development period .

ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-5206, Impact Factor: 12,23

American Academic publishers, volume 05, issue 06,2025

Journal: https://www.academicpublishers.org/journals/index.php/ijai

The parasite is spread in the form of infected eggs or adults by workers manually spreading them into the field. In the future, this process may be carried out using special equipment - tractors or hang gliders. Research in this area is ongoing.

Due to its high reproductive rate, good adaptation to environmental conditions, and the many effective results obtained from it, attempts were made to artificially propagate this parasite as early as the 1930s. After the 1970s, with the establishment of biolaboratories and biofactories, it became possible to use this method against borers on cotton and other crops. Currently, Trichogramma is successfully used in biological control programs to combat the eggs of various borers. For this purpose, species of Trichogramma suitable for the extreme climatic conditions of Uzbekistan (1) Trichogramma evanescens , (2) Trichogramma pinto and (3) Trichogramma chilonis) is being propagated by cuttings.

in Uzbekistan , and currently there are more than 700 biolaboratories and biofactories in the regions of the republic. The product developed in them is enough to process the entire protected crop area 6-7 times in one season.

Conclusion

Useful insects not only in nature biological balance in storage , maybe village farm of crops pollination and to pests against natural in the fight important role plays . Their bioecological features deep to learn , to live conditions into account take protection to do , in agroecosystems their activity support necessary . In the article analysis As it is said , man activities , especially pesticides wrong application this useful organisms number to decrease take is coming . Therefore , it is useful insects protection to do and from them biological in the fight use according to stable strategies working exit is a pressing issue .

References:

1. Yusupov I.M. Entomologiya fanidan amaliy mashg'ulotlari. O'zbekiston respublikasi oliy ta'lim, fan va innovatsiyalar vazirligi. Qo'qon davlat unversiteti. 60510100 – Biologiya. O'quv qo'llanma. Toshkent-2025. 63-74 betlar.
2. https://uz.wikipedia.org/wiki/Foydali_hasharotlar
3. https://en.wikipedia.org/wiki/Chrysopidae
4. https://www.flickr.com/photos/koppert/2773697115/in/photostream/ 5. https://www.researchgate.net/figure/Life-cycle-of-Bracon-brevicornis-and-B-hebetor-Life-cycle-of-Bracon-brevicornis-and-B_fig1_351916259
5. https://en.wikipedia.org/wiki/Habrobracon_hebetor
6. https://www.researchgate.net/figure/Life-cycle-of-Trichogramma-spps_fig15_335978434