



ЕНТОМОФАГИТЕ ОТ СЕМЕЙСТВО *SCELIONIDAE* (HYMENOPTERA),
БИОЛОГИЧНИЯ КОНТРОЛ И КАЧЕСТВОТО НА
СЕЛСКОСТОПАНСКАТА РАСТИТЕЛНА ПРОДУКЦИЯ

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THE ENTOMOPHAGES OF THE FAMILY *SCELIONIDAE* (HYMENOPTERA)
BIOLOGICAL PEST CONTROL AND QUALITY OF THE AGRICULTURAL
FOOD PRODUCTION

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Abstract. The issue of foods becomes more and more a live question for the entire mankind. Pesticides are a significant factor regarding food quality, as they are being used for the fight against pests and acari. The actual alternative is the efficient biological fight that may lead to improvement in the quantity and quality of the agricultural food products.

Introduction

Egg parasitoids of *microhymenoptera* are especially perspective in the biomethod, and the entomophages of the Family *Scelionidae* in particular. They have the important advantage over the other entomophages of destroying pests and acari at the very early egg stage before causing any damages to the plants.

The specified qualities of egg parasitoids determine their great economic significance and excellent perspectives for carrying out a biological fight.

In order to be possible for the species of the Family *Scelionidae* to be used for the purposes of biological control, it is necessary that first of all there is good knowledge of their species composition, their biology and ecology. There are certainly many more entomophages that are undescribed and unresearched, some of which may be effective regulators of pests and acari.

Characterizing of the problem.

Despite the fact that today pesticides are still the main and efficient way for protecting the yield against pests, they remain an important factor for the

environmental pollution due to their chemical nature. In recent years, this pollution has reached critical values.

The biomethod for fight against pests has some advantages over the use of fungus, bacterial and virus preparations that to some extent pollute the environment with its metabolites, which are often poisonous for warm-blooded organisms. Many of the agents causing diseases to pests do not have a direct influence on the human, but can infect neutral and even beneficial insects and thus disturb the balance of the ecosystems. Thus they impact human by decreasing the quantities and worsening the qualities of the plant production obtained.

The disadvantages mentioned above do not refer to the methods used for putting down the pests by their natural enemies – parasites and predatory animals.

The researches on the use of entomophages and acarophages are distinguished by 2 main fields that are also 2 successive stages of researches:

First – fundamental researches on the bio diversity, taxonomy and ecology of entomophages.

Second – scientific and applied developments directed towards the use of artificially bred predatory and parasitic arthropods in the fight against noxious species.

We should underline that all fields of the biomethod that are least developed are namely the fundamental sections, which refer to the issues on fauna, ecology and bio taxonomy on entomophages and acarophages. This impedes the realization of the practical developments of the biomethod, which have to be precise scientific ideas for the systematic status, the biocenotic connections and the morpho-physiological adaptations of parasites, predatory animals and their hosts.

There are many examples that prove that the level of knowledge about the phono groups of parasitic and predatory arthropods determine to a great extent the progress in the integrated managements of the number of pests.

The successful use of biological agents in limiting the number of noxious arthropods also depends on the possibilities and successful results from making a biological assessment of the complex of entomophages and acarophages.

It is important to note that if the number of the most important pests is few thousand species, the fauna of their natural enemies numbers few thousand species, among which many systematic groups remain poorly researched until now. As a result of the above the modern entomology finds it difficult to ground the integrated plant protection systems, for it does not have sufficient information on the species composition, ecology and biocenotic connections of the entomophages and acarophages, even for the main ecosystems.

As a whole the fauna of the beneficial insects from all regions around the world, including Bulgaria and the Balkans, is insufficiently researched at this point. This especially refers to the parasitic hymenoptera that are one of the leading groups of entomophages, both regarding the number species and their practical importance.

The fauna of the Palearctic ecozone includes about 20000 species of entomophages of Order *Hymenoptera* (Tobias, 1974). In Ukraine, a country close to

the latitudes of Bulgaria, the bioresources of insects-entomophages include over 9000 species, among which the predominant ones are the parasitic hymenoptera (Zerova, Tolkanits, 1987). In comparison, in Bulgaria and on the Balkans the known species number approximately 2000, i.e. about 22 % of the species of Ukraine and 10 % of the species of the Palearctic ecozone. There are scores of species of the Family *Scelionidae* known in Bulgaria – a very small number of their suggested species composition. In confirmation to this are also the results obtained during our researches in 2007 (financially supported by NATO Grant No. 982638/2006).

The great number of new species: 4 species new to the science; 5 species new to the fauna in Bulgaria; 22 species new to the fauna of the fruit plantation in Bulgaria, and 14 species new to the fauna of the apple plantations in the Plovdiv region. Future researches on the species composition of the parasitic *Hymenoptera* will surely increase many times the numerical indicators pointed out.

The researches regarding the issue on the taxonomy, the biocenotic connections and the regularities in the distribution of the main groups of entomophages are beyond the capacities of the scientists of just one country. It is necessary that there is international cooperation. The specialists under the separate groups of hymenoptera in Europe are few in number. It is impossible without their expert help to determine the exact species composition of a great part of the entomological material collected. The cooperation on the part of these specialists, together with the extensive research on the entomological collection in the European museums and institutes, as well as the carrying out of an additional collection in some unresearched Balkan regions of difficult access, are obligatory conditions for the precise assessment of the resources of the parasitic entomofauna in Bulgaria.

The Institute of Zoology at the National Academy of Science of Ukraine has a "Department of Entomophages Taxonomy and Ecological Basis of the Biomethod". Researches are carried out there on the biodiversity and ecology of parasitic and predatory arthropods, which are a component of the biomethod system. The purposeful researches on this branch have resulted in the establishment of a fundamental collection of parasitic and predatory species. There are over 800 species preserved here of holotypes of taxons of species rang of parasitic *Hymenoptera*, and over 7000 species of paratypes (personal communication of assistants in the Department, 2008). As a result of intensive researches, the range of hosts has been vastly expanded for many species and the specifics of the distribution have been specified, which in many cases is of important significance.

The efficiency of the entomophages also depends to a great extent on the environmental condition in the regions of introduction of intensive plant growing.

The seasonal cycles of development of all species of entomophages on the pests in the agrocenosis are connected with the contamination of a number of additional hosts growing in natural environment.

The direct dependency has been repeatedly pointed out between the plenty of entomophages in the agrocenosis and the forest biotopes that border on them.

The presence of a great number of noxious insects, which are common for the agrocenosis and the forests (leaf-rollers, etc.), predominates the considerable community of the entomophages in these two types of biotopes.

Conclusion.

After concluding the inventory of the species composition of the egg parasitoids of the Family *Scelionidae* (*Hymenoptera*) in Bulgaria, the next stage of work may be started, which /in its essence and independently/ is a separate field of the fundamental researches on parasitic and predatory insects. It is about the purposeful research on the ecological complexes of entomophages according to the most basic groups of pests on agricultural cultures and in forests. As a result questions arise over the population ecology and the throphic connections, as well as the vital cycles and the influence of the biotic and antibiotic factors.

From an economic point of view, the action of the parasitic hymenoptera is of significant importance in the agrobiocenosis: fruit and vine plantations, wheat and corn areas, fodder grasses and others, for it is connected with the direct influence on the yield obtained.

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