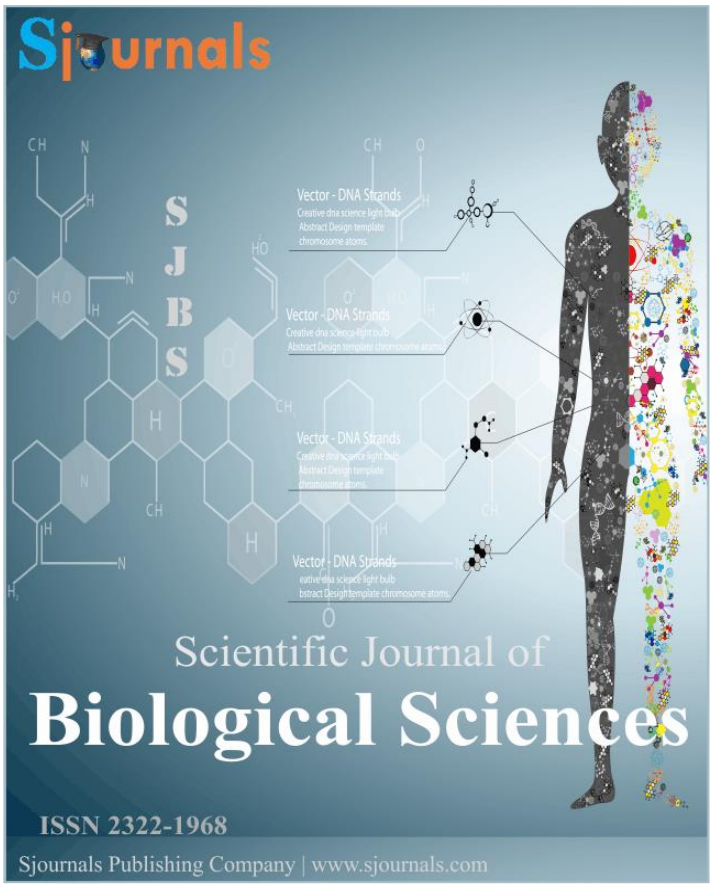

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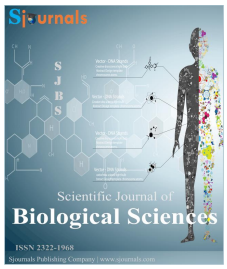

Original article

The apple orchard and some its parasites

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ABSTRACT

The following paper shows some of the specific damage to the apple orchard. These pests, very specific in terms of their morpho-anatomy, way of feeding, damage they cause and lifestyle, are representatives of the microscopic group of insects represented in the N / Order Coccoinea of the order Homoptera of this class (Insecta). The paper provides data collected on this group of insects and their importance in terms of the damage they cause to orchards, in this case to apples. The data were obtained by conducting a series of field expeditions in six main regions of Southern Albania (Vlora, Saranda, Delvina, Gjirokastra, Tepelena and Përmet). The expeditions have been carried out chronologically for over five years in a row and in every season of the year for every checkpoint. The material stored in liquid preservative (ethyl alcohol) was further processed, analyzed and interpreted in the laboratory. From this a number of important data have been obtained and it has been concluded in some important conclusions for the cultivation and breeding of this important orchard.

1. Introduction

Apple (*Malus domestica Borkh.*) Is one of the most important fruit trees of the food chain in the world. "An apple a day keeps the doctor away," says an ancient proverb. This is because apples have nutritional value and are a strong ally of health. It contains: water, protein, very little fat, sugar of some types such as fructose, glucose and

sucrose, fiber and mineral salts such as sodium, potassium, phosphorus, calcium, magnesium, iron, zinc and vitamins C, K, PP, E, B1, B2 and A. Its high appreciation comes for the fact that 7 miracles that this fruit have did related to human health, starting from the treatment of some pathologies up to cosmetic values. For this reason, the production of apples in our country as well as in the world has been increasing from year to year. Thus in our country this production reaches over 105 000 tons / year, in Europe over 18 000 000 tons / year and in the world over 90 000 000 tons / year. The parasites of this orchard, taken in our study, belong to the representatives of N / Order Coccoinea. This is a group of insects, to a considerable extent, powerful pests of citrus, fruit trees, ornamental plants, silviculture and greenhouse vegetation. Their massive multiplication, reaching four generations per year (depending on climate and region), speaks of a rapid and massive aggression and damage to the vegetation where they parasitize and to which they connect their livelihood. Since the parasites are equipped with a powerful drilling-suction oral apparate, they feed on plant lymph. Pests coexist with the plant even during the cold winter season by wintering in them as imago or larvae of the second stage, ready for reproduction with the arrival of spring. By parasitizing on leaves (mainly near their branches), they, as a result of lymph suction, cause the leaves of the plant to deform. As a result, their exposure to the sun changes, the yield of photosynthesis decreases and on these leaves it is already easier to find shelter for a series of other parasites and over the flowing liquid a series of fungal diseases begin to develop. In the stalk they are fixed mainly in the young twigs by deforming and drying them, which leads to deformation of the crown of the plant, up to the degradation of the trunk until its complete drying. Also when superimposed on fruits they cause a decrease in their quality and in general, together with the above consequences, they cause a decrease in the quality and quantity of production and vegetation degradation until its complete drying.

2. Material and methods

Material collected at checkpoints from various parts of the plant, such as stalks, leaves or even fruit, was preserved directly in test tubes with ethyl alcohol above 75 degrees. The material was further processed at the laboratory of the Department of Biology of the University "Eqrem Çabej" of Gjirokastra according to the methodologies given by (Arhangelskaja, 1974; Borol et De Long, 1950; Borhksenius, 1950; Kosta, 1981; Çeloaliaj, 1987). Here the material was processed by removing samples from their of wax coatings, smearing them in fuchsin solution and finalizing them in permanent zoological micropreparations which are stored in the scientific fund of the department in question. Familiarity and utilization of a rich literature identified the specifics of where our work should focus when determining these parasites by species. Further, by observing them in detail below the binocular, for a number of species we have also made sketches of their body parts with determinant values for the species (mainly for the external morphology and for the pigid). After that, working under binoculars and with the help of a series of defining keys, the specification and determination of the species given in this paper was done (Baçi, 1954; Borhksenius, 1949, 1957, 1966; Çeloaliaj, 1987; Minihsterstvo, 1948; Hasani, 1997).

3. Results and discussion

Fig. 1. Field checkpoints

The material obtained in the analysis was collected in the field in each season of the year at all checkpoints shown in Fig. 1. Of our 33 checkpoints (Fig. 1) in the apple orchard we have only contacted infected plants at 13 checkpoints (Fig. 2).

Meetings of contaminated plants:

- Mashkullorë GJ. - Sopik GJ.
- Krahas T. - Memaliaj T. - Tolar P.
-Ogren P.- Kosovë P.-Pandelejmon S. - Komat S. - "Asim Zenel" GJ.- Arrëz e Vogël T. - Frashër P. - Gostivisht P.

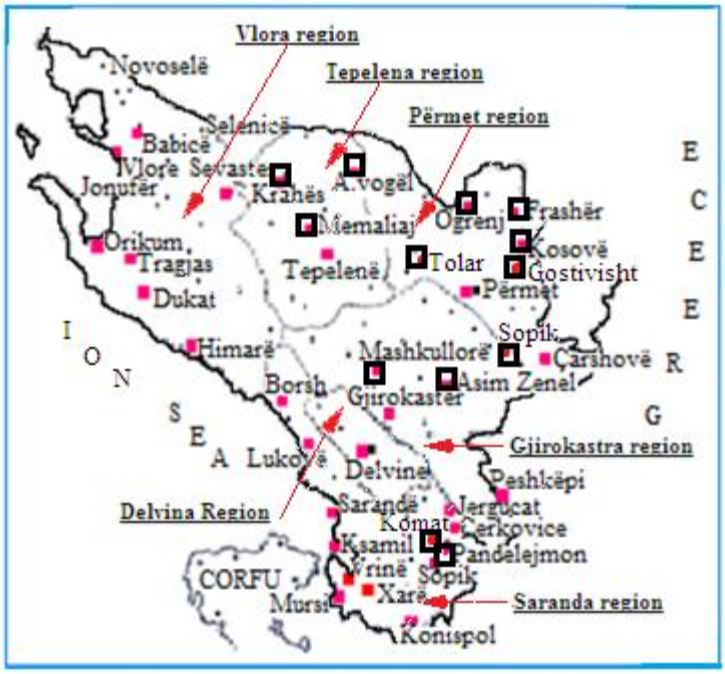

Fig. 2. Checkpoints where the met parasites

In all these points it turns out that the altitude above sea level of the spread of these contaminated plants varies from 120 m (in the region of Saranda) to 1020 meters above sea level (in the region of Përmet). This is related to the fact that this plant itself likes the continental mountain climate. The parasites met on the vegetation in January, February, March, April, May and December. As seen next to each of the identified parasites we have also presented the plant organ where he met. Specific in this case is the fact that we have encountered them mainly in plant shoots. The species quantity met and evidenced by us in the area under analysis, according to the literature (Borhksenius, 1950, 1949, 1966, 1964, 1949, 1937, 1973; Hasani, 1997; Anonymous, 1964; Anonymous, 1948), is presented as follows:

The pests encountered by us are:

1.*Pseudococcus maritimus Ehr.(k.)[m]
2.Coccus pseudomagnoliarum Kuw.(k.)[ms]
3.*Ceroplastes rusci L.(k.)[p]
4.*Parthenolecanium persicae F.(k.)[j,p]
5.*Parthenolecanium rufulum Ckll.(k.)[p]
6.Eulecanium mali Schr.(k.)[m,p]
7.*Eulecanium caraganae Borch.(k.)[p]
8.*Parlatoria cinerea Hadd.(k.)[j,dh]
9.*Epidiaspis leperii Sign.(k.)[m,sh,dh,ms,p]

VO: A – The plant organ where the harmer is found(x)

- (s.) = stem; - (l). = leaf; - (f.) = fruit

B – Explored regions

- V. = Vlorë ; - GJ. = Gjirokastër; - T. = Tepelenë;
- S. = Sarandë; - P. = Përmet; - D. = Delvinë

C – The months of the year [x]

- j, - sh, - ms, - p, - m, - q, - k, - g, - sht, - t, - n, - dh.

D – Damage

- (Name) = non-harming direct species
*- (*Name) = harming direct species*
*- (**Name) = strong, harming direct species*

The most affected plant organs, as well as the months of the year are given with abbreviations (in parentheses) next to the name of each parasite in their list of names above. There, for each parasite, the degree of their damaging power over this plant is given. This is presented by associating their scientific name with this symbolic (*). The number of different species met according to each of the months of the year is shown in Fig. 3. The number of different species met according to each plant organ is shown in Fig. 4. As seen in these graphs, contamination of this plant by a maximum number of species of these parasites we find in April. So the curve starts growing from the end of March, reaches its peak in April and starts falling there at the end of June (Fig. 3). From November begins another growth that continues and begins to fall there by the end of February. In terms of meeting according to the plant vegetative organ it turns out that parasites in the greatest variety are met mainly in the stalk, the other two organs obviously do not have the same preference (Fig. 4).

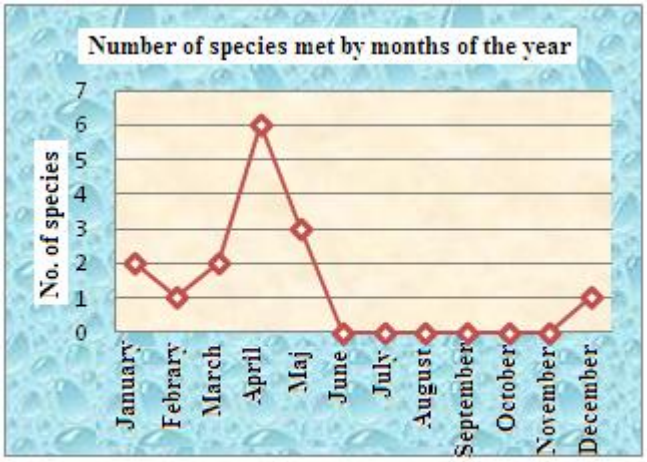

Fig. 3. Quantity of species met according to each month

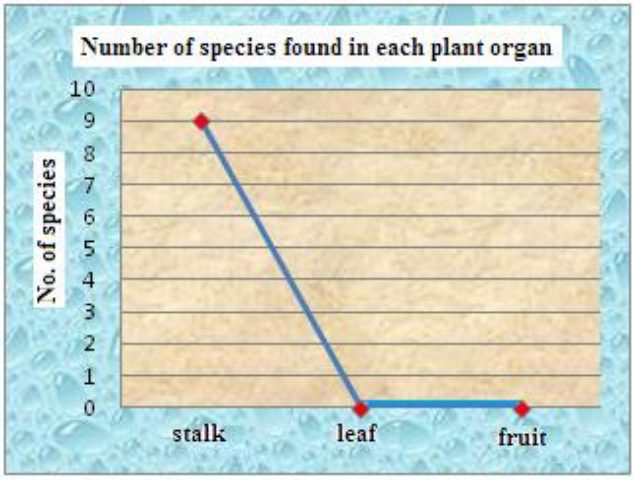

Fig. 4. Quantity of species found in each plant organ

For all types of pests encountered in the apple orchard we have sketched under a microscope also sketches of their general appearance or even specifically of the construction plan of the pigid itself as one of the body parts with significant deterministic characteristics (Fig. 5).

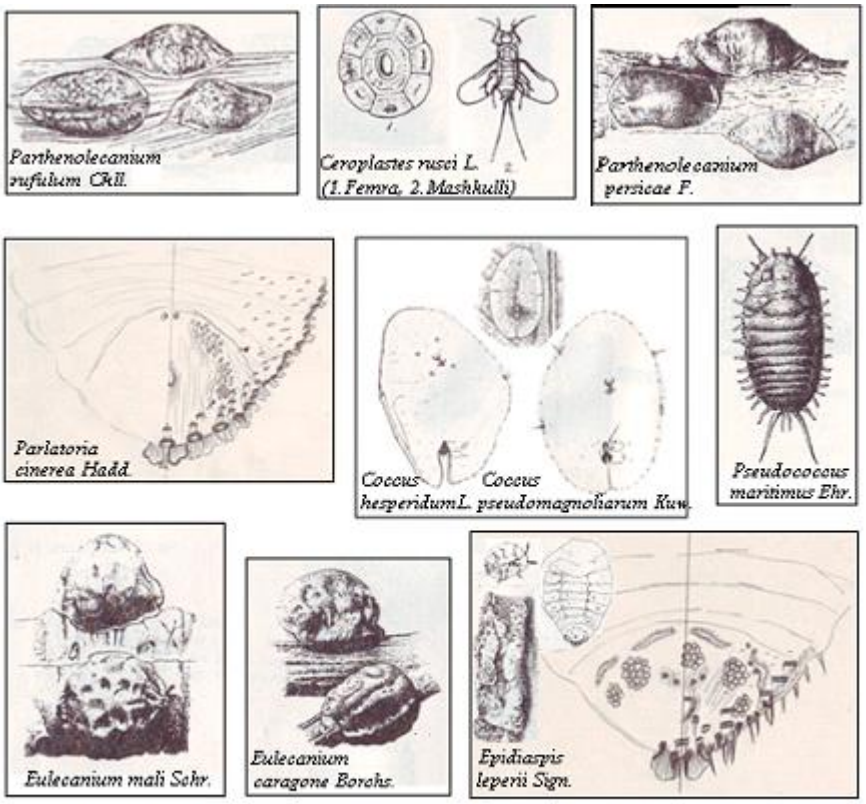

Fig. 5. The sketches made by us, mainly sub binocular, which represent the determining characteristics of the pigides of each species.

4. Conclusion

a. From the analyzed material, during our research, we have managed to identify a total of 9 species of parasites of the order Coccoinea of the order Homoptera, Kl. Insecta.

b. In this orchard the pests have been observed to parasitize only in the bounce and mainly in their young shoots. They appear to penetrate as food rather the plant lymph circulating in the plant shoots (Fig. 4).

c. Among these pests what is immediately noticeable is that, by and large, in terms of the degree of plant damage, they are dominated by direct powerful pests (7 out of 9 of them are exactly that), (* - in the list of above).

d. Parasites overwinter on the body of the plant so we have also observed two peaks of their development on the vegetation, one in winter and the other in spring (Fig. 3).

e. In many months of the year, starting from the end of June until November, we find that these parasites have not been met by us. This has nothing to do with the non-existence of these parasites in this plant but with the fact that in this period they are second mobile larvae and are not identified to be collected. This is the period of mass multiplication of their generations. We generally collected only fixed adults (Fig. 3).

f. Among the above species **Epidiaspis leperii Sign.* is the most met parasite throughout the year [ms, m, p, sh, dh, etc.]. It is most commonly found in the apple plant. This speaks to the fact that this is one of the most specific parasites of this plant. Even when there have been favors in the development of this group of insects, as a result of climatic conditions, we have seldom met it also in *Fig, Plum, Pear, Scorbus (Rowan berry)*, *Orange and Olive*.

g. It is noticed that in the region of Vlora and Delvina the parasites of this group have not met (Fig. 2). This fact is not a reality. This comes from that at our checkpoints they have not met and not that this plant in these

regions is not contaminated by these parasites. This comes from that apples as a plant, in the form of plantations, are cultivated mainly in areas with continental climate and in regions with altitudes above sea level.

Recommendations

a. Apple is one of the fruit trees that is massively contaminated by this group of parasites, so we must take into account the damage that these parasites cause to the plant itself as well as the quality and yield of its production.
b. The pruning method must be kept in consideration to control and fighting these pests. Exactly there it should be done, as far as possible, the selection of contaminated shoots and their elimination by burning.
c. To increase the effectiveness of chemical control over these pests should be taken into account that, in these regions, spraying should carried out in early spring when the first generation of larvae begins to come out. Here almost have to be two actions within a month. The next spraying should be done in June. From the end of autumn and during the winter chemical warfare has no effect. This is due to the fact that this season's imago parasites are fixed and protected by wax cover.

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