

HARMFUL ENTOMOACARICOMPLEX OF INDUSTRIAL PLANTINGS OF APPLE TREES IN FOREST-STEPPE OF UKRAINE

I.S. KRAVETS, D.M. ADAMENKO, Candidates of Agricultural Sciences
Uman National University of Horticulture

Research materials of composition of harmful entomoacaricomplex of industrial plantings of apple trees in Forest-Steppe of Ukraine are presented.

Keywords: *entomoacaricomplex, industrial plantings of apple trees, varieties and types of pests.*

In Ukraine gardening has long been a traditional branch of agriculture. During 1991-2007 the area of fruit and berry plantings declined by 73.3%, although at present there has been a tendency to increase. Therefore, the revival of industrial gardening of Ukraine is one of the important tasks of agriculture. Decreasing production of fruit and berry products is not only because of reduction in the area of fruit-bearing plantings but also reducing their productivity. The main objectives of government programs of horticultural industry development are: stabilization and subsequent increase in the production of fruits and berries; saturation of domestic food market with competitive products and expanding their exports; increased production of environmentally friendly products; introduction of innovative technologies and organization of production [1, 2].

In fruit and berry agrocenoses there are favorable conditions for the continuous reproduction and storage of pests, which is one of the factors of reducing yields. In the absence or delay of protection the yield reduces by 30-50%. For effectiveness of protective measures it is important to know the species composition of pests, which needs to be clarified due to changing weather conditions.

In Ukrainian gardens it is registered about 400 species of pests, of which over 160 cause significant damage. Structure of harmful entomofauna depends on the age, physical condition of fruit trees and fruit area [3, 4].

Research methods. Studies on the species composition of apple pests were carried out by generally accepted methods [5, 6] during 2011-2013 in industrial plantings of farms of Cherkasy (Uman NUH) and Vinnitsa (LLC "Agrodar Group") regions. Varieties are Jonagold, Idared and Reinette Semerenko. Density of planting is 2 x 5 m and 2 x 4 m; shape of the crown is rounded. Number of repetitions is 4, one tree in each account. Variants are random located.

Determination of pest species composition was carried out using professional literature and atlases [7, 8].

Research results. As a result of studies it was found that in industrial plantings of apple trees phytophages is a class of Arachnids (7.8%) and Insects (92.2%).

In industrial apple plantings of Forest Steppe of Ukraine harmful entomoacaricomplex is presented by different varieties (Fig.). The largest share

belongs to Lepidopterans (36.2%) and Homopterans (34.0%), the lowest to Hymenopterans (2.1%) and Dipterans (4.2%). Also in the process of research pests like Acarians and Coleopterans were found.

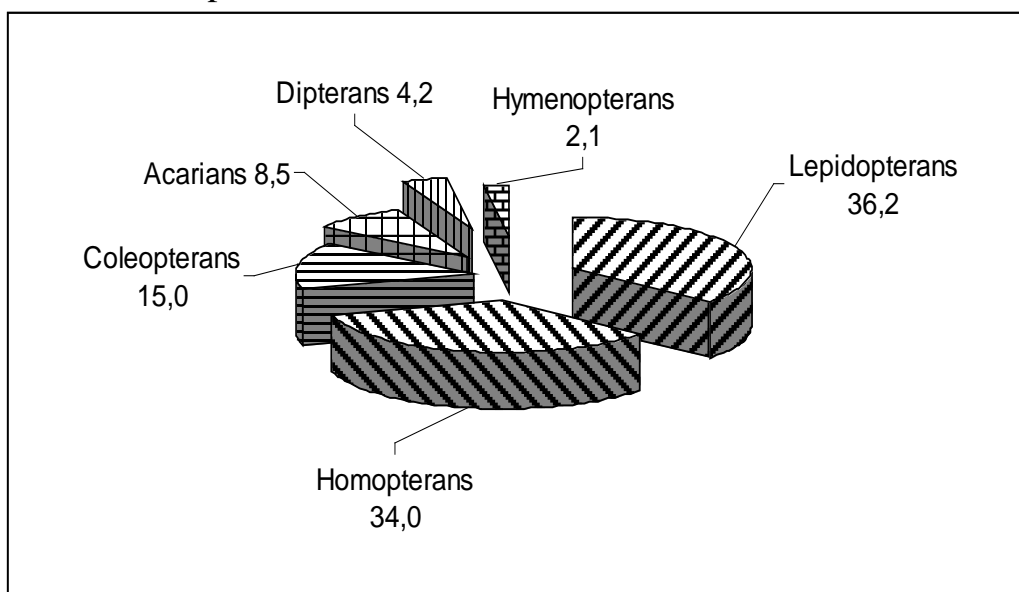


Fig. Structure of harmful entomoacaric complex of industrial plantings of apple trees in Forest-Steppe of Ukraine

Species composition of harmful entomoacaric complex of industrial plantings of apple trees is various (Table). As a result of research we found 51 species of harmful arthropods, which according to a systematic division were distributed as follows:

- Acarians: Spider mites (red fruit mite, hawthorn mite, ordinary spider mite), Brown mites (brown fruit mite);

- Insects: Treehoppers (buffalo treehopper), Leafhoppers (green leafhopper, Rozanov leafhopper), Rust flies (small apple psylla, apple psylla, hawthorn psylla), Aphids (green apple aphid, apple aphid, red blister or grey aphid, woolly apple aphid), Armoured scales (black pine-leaf scale, mussel scale, pear oyster scale), False armoured scales (European fruit scale, hawthorn scale, circular apple scale), Dung beetles (lagriid beetle, European cockchafer), Leaf-rolling weevils (*Coenorrhinus pauxillus*, *Rhynchites bacchus*), Weevils (nephritic grey weevil, apple blossom weevil, grey beet weevil), Tiger moths (fall webworm), Leaf-roller moths (cream-cloak apple shoot leaf roller, Rozanov leaf-roller moth, summer fruit tortricid, phalonid moth, apple fir seed moth), Geometrid moths (small winter moth, great winter moth, belted brindled beauty), Leaf blotch miners (apple-leaf blister moth, gold-brindled purple moth), Cosmets (mountain ash bentwing, grey apple pigmy), Casebearers (common hawthorn moth), Carpenter moths (shot-hole borer), Tussock moth (*Orgyia antiqua* L.), Clearwing moths (apple clearwing), Gall gnats (apple leaf-curling midge, pear leaf-curling midge), Sawflies (apple sawfly).

Conclusions. Industrial plantings of apple trees in Forest-Steppe of Ukraine are inhabited by a large number of pests, including 20 families of insects and 2 families of mites, therefore to create an environmentally safe and cost-effective system to protect industrial apple plantings we should specify their composition and biological characteristics of development, especially of major pests.

Table. Species composition of harmful entomoacaricomplex of industrial plantings of apple trees in Forest Steppe of Ukraine

Type	Superclasses	Class	Underclasses	Variety	Under variety	Family	Species
Arthropods – Arthropoda		Arachnids – Arachnida		Acarians – Acarina	Acariforms – Acariformes	Spider mites – Tetranychidae	1. Red fruit mite – PanonychusulmiKoch. 2. Hawthorn mite – Tetranychusviennensis Zacher 3. Ordinary spider mite – TetranychusurticaeKoch.
						Brown mites – Broidiidae	1. Brown fruit mite – BryobiaradikorseviRech.
Arthropods – Arthropoda	Hexapedal – Hexapoda	Insects – Insecta	Pterygots – Pterygota	Homoptera – Homoptera	Cycads – Auchenorrhyncha or Cicadinea	Treehoppers – Membracidae	1. Buffalo treehopper – Stictocephalabubalus F.
						Leafhoppers – Cicadellidae	1. Green leafhopper – Cicadellaviridis L. 2. Rozanov leafhopper – Edwardsianarosae L.
						Rust flies – Psyllidae	1. Small apple psylla – PsyllacostalisFlor. 2. Apple psylla – PsyllamaliSchmdbg. 3. Hawthorn psylla – PsyllapyriL.
						Aphids – Aphidinea	1. Green apple aphid – Aphis pomi Deg. 2. Apple aphid – Dysaphismali-Ferr. plantagineaPass. 3. Red blister or grey aphid – Dysaphisdevecta Walk. 4. Woolly apple aphid – Eriosomalenigerum

					Armoured scales – Coceoidae	Armoured scales – Diaspididae	1. Black pine-leaf scale – <i>Quadraspidotus perniciosus</i> Comst. 2. Mussel scale – <i>Lepidosaphesulmi</i> L. 3. Pear oyster scale – <i>Diaspidiotus ostreaformis</i> Curt.
						False armoured scales – Coccidae	1. European fruit scale – <i>Parthenolecanium corni</i> Bouche 2. Hawthorn scale – <i>Palaeolecanium bitubercularum</i> Targ. 3. Circular apple scale – <i>Eulecanium mali</i> Schr.
				Coleopterans – Coleoptera		Dung beetles – Scarabaeidae	1. European cockchafer – <i>Melolontha melolontha</i> L. 2. Lagriid beetle – <i>Tropinotus hirticornis</i> Poda
						Leaf-rolling weevils – Attelabidae	1. <i>Coenorrhinus pauxillus</i> Germ. 2. <i>Rhynchites bacchus</i> L.
						Weevils – Curculionidae	1. Nephritic grey weevil – <i>Sciaphobus gualidus</i> Gyll. 2. Apple blossom weevil – <i>Anthonomus pomorum</i> L. 3. Grey beet weevil – <i>Tanymecus palliatus</i> F.
				Lepidoptera – Lepidoptera		Leaf-roller moths – Tortricidae	1. Cream-cloak apple shoot leaf roller – <i>Spilonota ocellana</i> F. 2. Rozanov leaf-roller moth – <i>Archips rosana</i> L.

				tera			3. Summer fruit tortricid – Adoxophyesorana F.R. 4. Phalonid moth – Archipsxylosteanal. 5. Apple fir seed moth – Carpocapsa (Laspeyresia) pomonella
						Tiger moths – Arctiidae	1. Fall webworm – HyphantriacuneaDrury
						Geometrid moths – Geometridae	1. Small winter moth – Operophterabrumatal. 2. Great winter moth – ErannisdefoliariaCl. 3. Belted brindled beauty – BistonhirtariaIchiff.
						Leaf blotch miners – Lithocolletidae	1. Apple-leaf blister moth – LithocolletispyrifoliellaGrsm. 2. Gold-brindled purple moth – LithocolletiscjrylifoliellaHw.
						Cosmets – Gemios-tomidae	1. Mountain ash bentwing – Gemios-tomascitella Z. 2. Grey apple pigmy – Lyonetiacerckella L.
						Casebearers – Coleophoridae	1. Common hawthorn moth – ColeophorahemerobiellaScop.
						Carpenter moths – Cossidae	1. Shot-hole borer – Zeuzerapyrina L.
						Tussock moth – Lymantriidae	1. Orgyaantigua L.
						Clearwing moths – Aege-	1. Apple clearwing – SynanthedonmyopaeformisBkh.

						riidae	
				Dipterans – Diptera		Gall gnats – Cecidomyiidae	1. Apple leaf-curling midge – Dasyneuramali Kieffer. 2. Pear leaf-curling midge – Dasyneurapuri Bouche.
				Hymenoptera – Hymenoptera			1. Apple sawfly – Hoplocampatestudinea Klug.

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