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RESEARCH ARTICLE

FAUNA OF APHIDS (HOMOPTERA, APHIDINEA) OF ACCLIMATIZED TREES AND SHRUBS IN TASHKENT

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Abstract

This work contains the comparative analysis of the long-term research of the aphids (Homoptera, Aphidinea) fauna of trees and shrubs acclimatized in Tashkent against the scientific research held by the regional and global lead aphidologists. According to the results, the aphidsof acclimatized trees and shrubs inTashkent consists of 6 families, 113 species of 50 genera and 1 subspecies. In addition, 1 genius and 1 species were first recorded in Uzbekistan with 1 species in the fauna of Central Asia, and 44 species in Tashkent, in particular. The dendrophages lives on 179 species of trees and shrubs. Population density of 57 species of aphids are massive (high), 40 species – medium and 16 species – few. tem for natural insemination cattle have been introduced.

Introduction:-

Being the metropolitan city of Uzbekistan, Tashkent is the major place for the array of ornamental and fruit plants grown in parks, alleys, around the city highways imported from different countries. In the recent couple of years, the diversity of accent plants throughout cities and residential areas is enriched with imported trees and shrubs when focused on landscaping,

The plant acclimatization improves the regional flora and biodiversity and, furthermore, it alters the fauna of insects, including aphids, when the unique aphidofauna is formed [1, 6, 15, 18]. Observed were the emergence of species not specific for the regional fauna, including acclimatized plants, and their transformation to hazardous pests, or adapting some native species of aphids to the newly introduced plants [19, 29, 32]. These insects with complicated life cycle and constant reproduction cause the serious damage to ornamental and fruit trees and shrubs throughout

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the season [31]. To avoid this, the effective and science-based measures are required held in a timely manner. This, in turn, requires the exhaustive study of the species composition, level of damage, biological and ecological properties of the same insects [5, 19, 29].

To note, the tree and shrub aphids acclimatized for long years within the national borders were expansively studied, including the Almaty region of Kazakhstan [13, 23] and in Issyk-Kul of Kyrgyzstan [8].

Initially, we studied the aphids of trees and shrubs acclimatized to Tashkent, Uzbekistan, during 1998-2019; thus, we obtained the detailed information on the fauna, and biology and ecology of these insects [18, 19, 30]. In particular, the dendrophilous aphidofauna of Tashkent was studied in detail with the nutrient spectrum of the aphids widely evaluated. The Eulachnus genus was first revealed in the fauna of Uzbekistan. E. Tauricus was first reported in Asia, where as E.alticola - in the fauna of Uzbekistan; 44 species of aphids were first reported in the aphidofauna of Tashkent. We obtained the new findings on the spread of dendrophilic aphids, and the features of fauna creation in this region were described [1, 2, 15, 16]. The peculiar properties of ecological concentration of aphids on trees and shrubs, and the main trends in evolution of these insects depending on climatic conditions of Tashkent were studied [2, 17]. The acquired information served as the ground to elaborate the identifier of acclimatized tree and shrub aphids [1]. The aphidologists have never studied the sap of trees and shrubs conditioned in Uzbekistan, especially in Tashkent.

Thereby, these finding expand, to the certain extent, the scope of knowledge on the formation of dendrophilic fauna of aphids in Uzbekistan.

Materials and Method:-

The findings, as well as the results of research and observations, held in Tashkent and adjacent areas in 1998-2019, served as the basis for the scientific data used in this paper. The most part of materials was collected in March to late November, where the other part was obtained during winter months.

Through the researches, the ornamental and fruit trees and shrubs were under the observation which grow throughout the alleys, parks, resorts and highways in Tashkent. In addition, we took the aphid samples.

All aphid species were identified as directed by M.Kh. Akhmedov; the plants were identification based on certain identification indexes as assisted by the personnel of the Laboratory of Plant Introduction and Climate Change of the Botanical Garden of the Academy of Sciences of the Republic of Uzbekistan. We use main aphidological classifications during reserchers [1, 3, 8, 9, 10, 12, 14, 25].

Aphid samples were compared against those kept at the Aphidological Laboratory of Fergana State University. The authenticity of plant classification was verified by comparing with herbarium samples of the Botanical Garden of the Academy of Sciences of the Republic of Uzbekistan.

Result and Discussion:-

All biomaterials collected were clarified by species with their taxonomic status duly defined. Also, the list of aphids found on trees and shrubs acclimatized to and around Tashkent was classified. Furthermore, in the course of comparative analysis of the scientific findings by aphidologists who held scientific researches in the Central Asian region, the following scientific findings are brought for you consideration as follow (Table 1):

Table I:- List of aphids found on trees and shrubs acclimatized in Tashkent.

Name of spesies	Host plant	Population density*	First reported species*
PEMPHIGIDAE			
Pemphiginae			
Thecabiusaffinis (Kaltenbach, 1843)	Populus pyramidalis, P.nigra	■	+++
Pemphigus bursarius (Linnaeus, 1758)	Populus pyramidalis, P.nigra	■■	
Pemphigus immunis Buckton, 1896	Populus pyramidalis	■■■	

Pemphigus napaeus (Buckton, 1896)	Populus densa	■	+++
Pemphigus populi Courchet, 1879	Populus pyramidalis, P.nigra	■	+++
Pemphigus populinigrae (Schrank, 1801)	Populus pyramidalis, P.nigra	■■	+++
Pemphigus protospirae Lichstenstein, 1885	Populus pyramidalis, P.nigra, P.densa,	■■■	+++
Pemphigus vesicarius Passerini, 1862	Populuspyramidalis, P.nigra, P.densa	■■■	
Prociphilus umarovi Narzikulov, 1964	Lonicera tatarica	■■	+++
Prociphilus (Aphis) xylostei De Geer, 1773	Lonicera tatarica	■	
Eriosomatinae			
Eriosoma lanigerum (Hausmann, 1802)	Malus domestica	■■■	
Eriosoma lanuginosum (Hartig, 1839)	Ulmus densa	■■■	
Eriosoma phaenax Mordvilko, 1923	Ulmus densa	■■	
Eriosoma ulmi (Linnaeus, 1758)	Ulmus densa	■	
Kaltenbachiella pallida (Haliday, 1838)	Ulmus densa	■■	
Tetraneura caerulescens (Passerini, 1856)	Ulmus densa	■■■	
Tetraneura ulmi (Linnaeus, 1758)	Ulmus densa	■	
Forda hirsuta Mordvilko, 1928	Pistácia véra	■	
Slavum lentiscoides Mordvilko, 1927	Ulmus densa	■■	
LACHNIDAE **Cinarinae**			
Cinara piceae (Panzer, 1801)	Picea koraiensis, P.schrenkiana	■	+++
Cinara tujafilina (del Guercio, 1909)	Biota orientalis, Juniperus seravshanica, J.turkestanica, J.communis, Thuja occidentalis	■■■	
Eulachnus alticola (Börner, 1940)	Pinus pallasiana	■■■	++
Eulachnus tauricusBozhko,1961	Pinus pallasiana	■■	+
Tuberolachnus salignus (Gmelin, 1790)	Salix alba,S.adenophylla, S.purpurae,S.cinerea	■■■	
Pterochloroides persicae (Cholodkovsky, 1899)	Amygdalus spinosissima, Prunus domestica, Armeniaca vulgaris, Persica vulgaris	■■■	
Maculolachnus submacula (Walker, 1848)	Rosa beggeriana, R.fedtschenkoana	■	+++
ANOECIIDAE			
Anoecia corni (Fabricius, 1775)	Poaceae	■■■	
DREPANOSIPHIDAE			
Tinocallis saltans (Nevsky, 1929)	Ulmus densa	■■■	
Tuberculatus annulatus (Hartig, 1841)	Quercus alba	■■	
Shivaphis celticola (Nevsky, 1929)		■	+++
Panaphis juglandis(Goeze, 1778)	Juglans regia	■■■	
Chromaphis juglandicola (Kaltenbach, 1843)	Juglans regia, J.nigra	■■■	
CHAITOPHORIDAE **Chaitophorinae**			
Chaitophorus capreae (Mosley,1841)	Salix alba,S.purpurae, S.cinerea	■■■	
Chaitophorus leucomelas (Koch, 1854)	Populus pyramidalis, P.nigra	■■■	+++

Chaitophorus populeti (Panzer, 1801)	Populus alba	■■■	
Chaitophorus populialbae (Boyer de Fonscolombe, 1841)	Populus nigra, P.alba	■■■	+++
Chaitophorus pruinosae (Narzikulov, 1954)	Salix alba	■■	+++
Chaitophorus salicti (Schrank, 1801)	Salix alba	■■■	
Periphyllus mamontovae (Narzikulov, 1957)	Acer regelii	■■■	+++
Periphyllus nevskyii (Mamontova, 1955)	Acer regelii	■■	
APHIDIDAE **Pterocommatinae**			
Pterocomma pilosum (Buckton, 1879)	Salix alba, S.purpurae	■■■	+++
Pterocomma populea (Kaltenbach, 1843)	Populus nigra, P.densa, Salix alba	■■■	
Aphidinae			
Rhopalosiphum insertum (Walker, 1849)	Crataegus altaica	■■■	+++
Rhopalosiphum nymphaceae (Linnaeus, 1761)	Prunus sogdiana, P.domestica,Armeniaca vulgaris	■■■	
Rhopalosiphum padi (Linnaeus, 1758)	Padus mahleb	■■■	+++
Schizaphis pyri (Shaposhnikov, 1952)	Prunus sogdiana, Pyrus communis	■■	+++
Hyalopterus pruni (Geoffroy, 1762)	Prunus domestica, Armeniaca vulgaris, Persica vulgaris	■■■	
Aphidina			
Aphis catalpae (Mamontova, 1953)	Catalpa	■■■	
Aphischilopsidi (Davletshina)	Chilópsis	■	++
Aphis craccivora (Koch, 1854)	Robinia pseudacacia, Albizzia julibrissin, Amorpha canescens, Caragana acanthophylla	■■■	
Aphis cytisorum (Hartig, 1841)	Fabaceae	■■	
Aphis evonymi (Fabricius, 1775)	Evonymus Americana	■■■	
Aphis fabae (Scopoli, 1763)	Viburnum acerifolium	■■■	
Aphis farinosa (J.F. Gmelin, 1790)	Salix alba, S.purpurae	■■	
Aphis frangulae (Kaltenbach, 1845)	Rhamnus cathartica	■■	
Aphis grossulariae (Kaltenbach, 1843)	Ribes hispidulum	■■	
Aphis idaei (Van der Goot, 1912)	Rubus spp.	■■■	
Aphis nasturtii (Kaltenbach, 1843)	Rhamnus cathartica	■■	
Aphis nerii (Boyer de Fonscolombe, 1841)	Nerium oleander	■	
Aphis pomi (De Geer, 1773)	Spiraea hypericifolia, Pyrus communis, Malus domestica, Sorbus persica, Crataegus hissarica, C.songorica, Cydonia vulgaris, C.oblonga	■■■	
Aphis punicae (Passerini, 1863)	Punica granatum	■■■	
Aphis ruborum (Börner, 1932)	Rubus occidentalis	■■■	
Aphis sambuci (Linnaeus, 1758)	Sumbacus canadensis	■■	
Aphis spiraephaga (Muller, 1961)	Spiraea hypericifolia	■■■	+++
Aphis spiraephila (Patch, 1914)	S.hypericifolia	■■■	

Aphistecomae (Davletshina)	Campsis radicans	■■	
Aphisvitalbae (Ferrari, 1872)	Clematis spp.	■	
Ephedraphis ephedrae (Nevsky, 1929)	Ephedra spp.	■■■	
Brachyunguis tamaricis (Lichtenstein, 1885)	Tamarix ramosissima	■■	
Brachyunguis tamaricophilus (Nevsky, 1928)	Tamarix ramosissima	■■	+++
Anuraphis subterranea (Walker, 1852)	Pyrus communis	■■	
Dysaphis affinis (Mordvilko, 1928)	Malus domestica	■■■	+++
Dysaphis crataegi (Kaltenbach, 1843)	Crataegus hissarica	■■■	+++
Dysaphis microsiphon (Nevsky, 1929)	Cotoniaster hissarica	■■	
Dysaphis plantaginea (Passerini, 1860)	Malus domestica	■■■	
Dysaphis pyri (Boyer de Fonscolombe, 1841)	Pyrus communis	■■■	
Dysaphis reamuri (Mordvilko, 1928)	Pyrus communis	■■■	
Brachycaudus helichrysi (Kaltenbach, 1843)	Amygdalus spinosissima, Persica vulgaris,	■■■	
Brachycaudus spiraeae (Börner, 1932)	Spiraea hypericifolia	■■■	+++
Brachycaudus cardui (Linnaeus, 1758)	Prunus Sogdiana	■■■	
Brachycaudus prunicola (Kaltenbach, 1843)	Prunus Sogdiana, Persica vulgaris	■■■	+++
Brachycaudus (Mordvilkomemor) pilosus (Mordv. ex Nevs.)	Armeniaca	■■	+++
Brachycaudus amygdalinus (Schouteden, 1905)	Amygdalus spinosissima	■■	
Myzaphis rosarum (Kaltenbach, 1843)	Rosa beggeriana,	■■	
Liosomaphis turanica (Narzikulov, 1960)	Berberis nummularia	■■	+++
Cavariella aegopodii (Scopoli, 1763)	Salix alba	■■	
Cavariella archangelicae (Scopoli, 1763)	Salix alba,S.purpurae, S.cinerea	■■	+++
Cavariella pastinacae (Linnaeus, 1758)	Salix alba,S.purpurae, S.cinerea	■■	+++
Cavariella theobaldi (Gillette & Bragg, 1918)	Salix alba,S.purpurae, S.cinerea	■■	+++
Hyadaphis passerinii (Del Guercio, 1911)	Lonicera simulatrix	■■■	
Hyadaphis tataricae (Aizenberg, 1935)	Lonicera tatarica	■■■	+++
Semiaphis lonicerina (Shaposhnikov,1952)	Lonicera tatarica, L.simulatrix	■■■	+++
Macchiatiella rhamni tarani (Nevsky, 1928)	Rhamnus cathartica	■■	+++
Ovatus insitus (Walker, 1849)	Cydonia oblonga	■■	+++
Phorodon humuli (Schrank, 1801)	Prunus domestica	■■	+++
Myzus amygdalinus (Nevsky, 1928)	Amygdalus spinosissima	■■	++
Myzus persicae (Sulzer, 1776)	Persica vulgaris, Citrullus limonum	■■■	
Rhopalomyzus hissarica (Narzikulov, 1965)	Cotoniaster hissarica	■	
Rhopalomyzus lonicerae (Siebold, 1839)	Lonicera simulatrix	■	+++
Chaetosiphon chaetosiphon (Nevsky, 1928)	Rosa fedtschenkoana	■■	+++
Cryptomyzus asiatica (Narzikulov, 1969)	Ribes hispidulum	■■	+++
Capitophorus archangelskii (Nevsky, 1928)	Eleagnus angistifolia	■■	
Capitophorus elaeagni (Del Guercio, 1894)	Eleagnus angistifolia	■■	
Capitophorus hippophaes (Walker,1852)	Hyppophae rhamonides, Eleagnus angistifolia	■■	
Capitophorus pakansus (Hottes & Frison, 1918)	Eleagnus angistifolia	■	+++
Berberidaphis lydiae (Narzikulov, 1957)	Berberis nummularia	■■	+++
Acyrthosiphon caraganae (Cholodkovsky, 1908)	Caragana arborescens	■■■	+++
Acyrthosiphon rubi (Narzikulov, 1957)	Rubus occidentalis	■■■	+++
Metopolophium dirhodum (Walker, 1849)	Rosa beggeriana	■■■	+++

Hyperomyzus lactucae (Linnaeus, 1758)	Ribes hispidulum	■■■	+++
Amphorophora catharinae (Nevsky, 1928)	Rosa beggeriana	■■■	+++
Amphorophora rubi (Kaltenbach, 1843)	Rubus occidentalis	■■■	
Macrosiphum rosae (Linnaeus, 1758)	Rosa beggeriana, R.fedtschenkoana	■■■	

Note: first reported species: + in Central Asia; ++ in Uzbekistan; +++ in Tashkent. The name of the new genes in the fauna of Uzbekistan is separated by line; ■■■massive (high); ■■medium; ■few.

It is evident from the findings that the Anoeciidae and Drepanosiphidae families are remarkable for their least number of species in this fauna. These families form 12% of the generic diversity in the fauna and 5.31% of the species. The Anoeciidae family consists of 1 species of the Anocia genus, and Drepanosiphidae consist of 5 species of the Tinocallis, Tuberculatus, Shivaphis, Callaphis, and Chromaphis genus.

Lachnidae representatives include 7 species (6.20 %) of the Cinara, Eulachnus, Tuberolachnus, Pterochloroides, Maculolachnus genus, and Chaitophoridae includes 8 species (7.08%) of the Chaitophorus and Periphyllus genus [30]. The Pemphigidae family ranks second to the Aphididae family in terms of the number of generations and species. This aphid family consists of 8 generations (16%) and 19 species (16.81%).The region is rich in species of aphids of the Aphididae family which are abundunt. The proportion of this family in the aphidofauna is 64.60% by species and 58% by genus diversity (Table 2).

Table II:- Spread of aphids found on trees and shrubs acclimatized to Tashkent by families.

No.	Name of families	Number of families, % ratio	Number of species, % ratio
1	Anoeciidae	1 (2.00 %)	1 (0.88 %)
2	Chaitophoridae	2 (4.00 %)	8 (7.08 %)
3	Drepanosiphidae	5 (10.00 %)	5 (4.43 %)
4	Lachnidae	5 (10.00 %)	7 (6.19 %)
5	Pemphigidae	8 (16.00 %)	19 (16.81 %)
6	Aphididae	29 (58.00 %)	73 (64.60 %)

Though the members of the Phylloxeridae, Mindaridae, Thelaxidae, Phloemyzida Hormaphididae families prevail in the Central Asian regions bordering with Uzbekistan [10, 11] they do not inhabit the trees and shrubs acclimatized to Tashkent.

According to the quantitative ratio analysis of aphids found on acclimatized trees and shrubs, there is one highly polymorphic generation totaling over 20 species.

The Aphis genus, which refers to this group, includes 21 species (18.58%). In addition, this aphidofauna is unique to have 7 to 12 species of the single polymorphic genus, the Pemphigus, with the number of species to be 7 (6.19%). The average generation is mainly represented by 5 to 6 species. The proportion of species of such genera (Dysaphis, Brachycaudus, Chaitophorus) in the fauna is 15.93% (18 species). In the target aphidofauna, weak species with a few species (2 to 4) as well as monotypic genera with the only specie rank high. If the number of generations in the first group is 15 (30%), it is 60% (30 generations) in the second group which includes 67 species. In total, there are 9 genera in the regional aphidofauna with a high diversity of species, which make 53.98% of the species in fauna (61 species). Of the remaining generations, 11 have 2 species (22 species, 19.47%) and 30 have one species.

The comparative analysis of the aphidofauna of Tashkent against the fauna of Issyk-Kul and Almaty regions, which border with Uzbekistan, reveals the noteworthy variances in species composition and diversity. In particular, the number of Pemphigidae species in the Tashkent aphidofauna is 2 to 2.5 times higher than in the compared regions, while it is 2 to 4 times lower than in the same regions for the Drepanosiphidae and Lachnidae families. The proportion of the Aphididae family in the aphidofauna of Almaty is 57.04%, in Issyk-Kul -55.56% and in Tashkent - 64.60%.

The absence of species of the Phylloxeridae, Thelaxidae and Hormaphididae families in the target aphidofauna, as well as the scarcity of species in the Lachnidae and Drepanosiphidae families are evidently specified by the dramatically changing arid climatic conditions in the region. During the study, the new data on the prevalence of

dendrophilic aphids were acquired, and one generation and one species of these insects were first reported in Uzbekistan, one species in the Central Asian aphidofauna, and 44 species - in Tashkent. For example, neither of the 4 species of the Eulachnus genus (E. tamaricis, E. alticola, E. agilis, E. rileyi), known in the southern Kazakhstan and Issyk-Kul, have been reported in Uzbekistan. Following the researches, E. tauricus and E. alticola genus species were first found in Tashkent. E. tauricus was first recorded in Central Asia [15], [16], [17]. It should be noted that D. Hille Ris Lambers recognized this species as a subspecies of E. riley aphids. According to V.A. Mamontova [14], this includes the independent species. In our opinion, the specific characteristics of E. tauricus aphids within the species do not require additional proof. The discovery of this species in Tashkent confirms the validity of the opinion by M.P. Bozhko [7] that it quickly spreads with the edible plant, namely, the Crimean pine.

Most authors proved that the Thecabius affinis aphid, first found in the Tashkent Botanical Garden, quite widely spread in various parts of Central Asia [1, 2, 12]. Tashkent is rich in poplar aphids. Pemphigus napaeus, P. populi, P. populinigrae, P. protospirae, P. vesicarius were first reported in this region.

Prociphilus umarovi was found in the Southern Kazakhstan, Alay and Chatkal Ridges, Kyrgyz Alatoo, spreading to the foothills and lowlands of the Fergana Valley [3, 21], and now it is known to be revealed in Tashkent. Until now, the Macchiatiella ramni subsp. tarani aphid is found only in the middle mountain region at the altitude of 3000 m above sea level (Akhmedov and Mansurkhojaeva, 1998). The bare fact that this aphid is found in the Botanical Garden proves the possibilities of environmental adaptation wider therein. Like this aphids, Amphorophora catharinare has also been discovered to be mountainous and that it does not form large colonies living in mountainous areas. This species has also been reported to appear in Pakistan at 1700-2800 m above the sea level. In Beijing and Tashkent, it is abundant on wild and cultivated roses to evidence on the aphid capacity to live comfortably even under lowland conditions.

The boundary of the Cinara grossa, which prevail within the European continent, was known to cross the Chatkal Ridges in Central Asia[20]. The bare fact that this aphid currently populated Tashkent proves that its realm in Central Asia is wider.

Maculolachnus submacula is abundant throughout the Palearctic [26]. In Uzbekistan, it was known only in the Fergana Valley. Now it is expected in Tashkent. Like this species, Shivaphis celticola was first recorded in the Chilustun Mountains (Alay Range) of the Fergana Valley. Before that, it was known in Tajikistan and Chimgan, and now it has been found in Pakistan (Nevsky, 1925). According to these authors, Sh. chelti, which is close to Pakistan, also lives in the tarragon. But in Tashkent, as in the whole of Central Asia, there is a single Sh. celticola aphid.

Chaitophorus aphids, especially Ch.leucomelas, Ch.populialbae are distinguished by their prevalence throughout all regions [24]. However, the same species were first found in the fauna of Tashkent. Another species of this genus, Ch.pruinosae, is a species native to tugai and desert regions, but has been found to be abundant in acclimatized desert poplars in the Botanical Garden.

Palearctic species - Pterocomma pilosum and P. populeum - are common for Tashkent. Periphyllus mamontovae aphid, first found in the Botanical Garden, was also found in the Dushanbe Botanical Garden [22].

Three species of Ropalosiphum (Rh.insertum, Rh.numphaceae, Rh.padi) are specific to the fauna of Tashkent, of which Rh.numphaceae was previously known in the region. But the remaining 2 species of this generation were found for the first time, on the major forage plants.

The Urals and Western Siberia, the Fergana Valley [1, 4], bordered the areal of Shizaphis pyre. Now it has also been found in the Botanical Garden, where it lives on wild pear leaves.

Although Aphis spiraephila and Brachycaudus spiraea were first recorded in Tobulgi, they were known earlier than in other regions of Uzbekistan [1].

The species B.tamaricis and B.tamaricophilus, close to the aphid of the Brachyunguis genus in morphology, live on the sagebrush plant. The latter has never been seen in Tashkent.

The discovery of Dysaphis affinis, D.microsiphon, D.pyri, Brachycaudus prunkola, B.pilosum aphids in the fauna of the target area will definitely serve to clarify and expand the evidence on the spread and ecology of these species.

Berberidaphis lydiae and Liosomaphis turanicus aphids live on barberries and cause damage to it. It was first noted that these species prevailing in mountainous areas [1]were also distributed within the oasis.

Prior to our research, only one species of the Cavariella (C.aegopodii) genus was known to appear in Tashkent, and now 3 more species (C.archangelicae, C.pastinacae, C.theobaldi) have been revealed in there.

Hyadaphis tataricae, Semiaphis lonicerina, Rhopalomyzus lonicerae are the most common for Tashkent. Of particular importance is the fact that the aphid of Rh.lonicerae was found in Tashkent, because until recently, the southernmost points of its geographical distribution were bordered by South Kazakhstan [10, 11]. It is now known that its area includes Tashkent.

Phorodon humuli was found only in the post-Central Asian years. According to our information, Tashkent is the third largest species of this species in Central Asia. In contrast, Ovatus insitus as a cosmopolitan species is widespread in all regions [22]. Therefore, it is natural to be revealed in Tashkent.

Chaetosiphon chaetosiphon, Metopolophium dirhodum aphids of roses are abundant in Central Asia, as well as in Pakistan and adjacent areas at 1900-2500 m above the sea level [7, 24], as well as a variety of cultured roses being the integral part of the terrain. In particular, these aphids are accustomed to the streets of Tashkent, and, like other aphids, the cause significant damage to roses.

Cryptomyzus asiatica, Capitophorus pakansus, Acyrthosiphon caraganae, A.rubi, Hyperomyzus lactucae aphids, were first reported in Tashkent, being of wide ecological valence and spread over the entire regions of Central Asia.
The distribution of aphids of acclimatized trees and shrubs in the terrain of Tashkent and their quantitative prevalence in groups, the frequency of contact were evaluated. The aphids were grouped in 3 and studied:
1. Massive species. This group of 57 aphids accounts for more than half of the total fauna (50.4%). Although they are common in various biogeocenoses, they are typical for the constantly high quantitative density in trees and shrubs. This group of aphids feeds on plants in spring and early summer (e.g., Pemphigus immunis, P.protospirae, P.vesicarius, Tetraneura coerulescens, Rhopalosiphum numphaceae, Hyalopterus pruni, Dysaphis affinis, D.crataegi, Hyadaphis passerinii, Myzus persicae and others). During the season (Cinara tujafilina, Tuberolachnus salignus, Pterochloroides persicae, Callaphis juglandis, Aphis catalpae, A.farinosa, Hyadaphis tataricae, Semiaphis lonicerina, Amphorophora catharinae, Macrosiphum rosae and a number of other species) can cause serious damage. Many aphids of this group can be revealed on fruit orchards, either, which can drastically reduce the yields. These include Aphis pomi, A.punicae, Dysaphis affinis, D.pyri, D.reamuri, Brachycaudus helichrysi, B.cardui and other species.
2. The share of species with moderate distribution in the fauna is 35.4% (39 species and 1 subspecies). As per observations the rate of occurrence of those from this group in different entomocenoses is not high, however, their quantitative density is also easily distinguished by their moderate pattern. This group includes Pemphigus bursarius, Prociphilus umarovi, Slavum lentiscoides, Eulachnus tauricus, E.alticola, Periphillus nevskii, Dysaphis microsiphon, Phorodon humuli, Berberidaphis lydiae, Cavariella genus and others. Although these aphids are relatively rare, they can largely affiliate providing the climatic conditions are adequate, and cause the material damage to forage plants. This condition is more common in the aphids of Eulachnus tauricus, Phorodon humuli, Berberidaphis lydiae, Ovatus insitus.
3. The rate of occurrence of rare species is low and has been found in only 1-2 places during the years of research. These include Thecabius affinis, Pemphigus napaeus, P.populi, Prociphilus xylostei, Cinara grossa, Shivaphis celticola, Aphis vitalbae, Rhopalomyzus hissarica, Rh.lonicerae and others. Aphis chilopsid, that is referred to this group, was only once found in the Botanical Garden by the author [13].

The rate of spread of rare species is unequal to their quantitative density and they be sometimes found on forage plants in abundancy. In total, the number of species of this group of aphids in the fauna is 16, which is 14.2%.

The study of the quantitative ratios of aphids of acclimatized tree and shrubs in the family reveals that the majority of the representatives of the families Anoeciidae, Drepanosiphidae, Chaitophoridae and Aphididae are endangered species. Out of them, this figure is 53-100%. The share of the most common species of Pemphigidae in the mass is 26.32%, while in the Lachnidae family it is slightly higher - 42.86%. The Aphididae (38.36%) and Pemphigidae

(36.84%) families are in the first place in terms of the number of species with average distribution. For other families, the figure is less than 30%. The lowest frequency of encounters was recorded in the Pemphigidae family. There are 7 such phids in this family, or 36.84% of the species diversity. In contrast, the proportion of rare species in the Aphididae family relative to all families in the fauna is the lowest, at 8.22% (Table 3).

Table III:- Quantitative spread of aphids on trees and shrubs acclimatized to Tashkent.

Names of families	Number of species	Quantitative prevalence of species as per the prevalence indexes (% in ration)		
		High prevalence	Moderate prevalence	Low prevalence
Pemphigidae	19	5(26.32%)	7(36,84%)	7(36,84%)
Lachnidae	7	3(42.86%)	2(28,57%)	2(28,57%)
Anoeciidae	1	1(100%)	-	-
Drepanosiphidae	5	3(60%)	1(20%)	1(20%)
Chaitophoridae	8	6(75%)	2(25%)	-
Aphididae	73	39(53.42%)	28(38,36%)	6(8,22%)

Conclusion:-

Thus, by the finals of our research ad based on the materials above, the aphids on trees and shrubs acclimatized to Tashkent were defined to consist of 6 families, 113 species belonging to 50 genus and 1 subspecies. They are classified for families as follows: Pemphigidae - 19 (8 genus), Lachnidae - 7 (5), Anoeciidae - 1 (1), Drepanosiphidae - 5 (5), Chaitophoridae - 8 (2), Aphididae - 73 (29); out of them, 1 generation and 1 species were first reported in Uzbekistan with 1 species in the fauna of Central Asia, and 44 species - in Tashkent. Based on the data above, the "indicator of aphids on acclimatized trees and shrubs" was elaborated. The dendrophages lives on 179 species of trees and shrubs in Tashkent. Population density of 57 species of aphids (50.4%) of acclimatized trees and shrubs are high, 40 species (35.4%) – medium and 16 species 14.2% – few.

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