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*AUCHENORRHYNCHA (HOMOPTERA) OF WARSAW AND MAZOVIA*

ABSTRACT

There were 270 *Auchenorrhyncha* species recorded from Mazovia and Warsaw and 171 species recorded from Warsaw, including 125 species in the suburbs, 97 in parks, 60 in green areas of housing estates, and 43 species in green of the centre of the town. In the town there was an increase in the proportion of the species with wide ranges, particularly Holarctic species.

An analysis of the species composition of *Auchenorrhyncha* occurring in Warsaw and Mazovia shows that the proportion of ubiquitous species and those associated with meadows and pastures increased with growing urban pressure. The species living in tree crowns can find suitable conditions in the town.

INTRODUCTION

So far 488 *Auchenorrhyncha* species have been recorded from Poland, that is, more than 30% of the species known from Europe. The *Auchenorrhyncha* different regions of Poland were unevenly studied. There are seven regions relatively well known: the Baltic coast, Pomeranian Lakeland, Kujavian-Great Poland Lowland, Sandomierz Lowland, Kraków-Wieluń Upland, West Beskids, and Pieniny Mountains. The other regions are poorly known or not studied at all [19].

No comprehensive work on *Auchenorrhyncha* of Mazovia has been published. The first information on this group was provided by Waga (26), who in the middle of the 19th century recorded two species from this region: *Tettigometra virescens* and *Eupelix cuspidata*. Since then to the 1930s no larger publication appeared and only some information on the pests of cultivated plants is available. At that time the only species recorded from Mazovia were *Edwardsiana rosae*, a rose pest [25], and *Allygidus atomarius* [21]. In 1936—1938. Nast published several papers in which he listed 18 species occurring in Mazovia [12—15]. The first broader work on *Auchenorrhyncha* living in Poland was prepared by Smreczyński and issued in 1954. He recorded 85 species from Mazovia [23]. Since that time more than ten papers have appeared in which information on other species occurring in Mazovia,



including Warsaw, can be found [1—3, 5—10, 17, 22]. The most recent comprehensive contribution to the *Auchenorrhyncha* of Poland is *The Catalogue of the Fauna of Poland* prepared by Nast [18] and issued in 1976. The catalogue contains the literature data largely supplemented by author's own materials. In this work there is information on 488 species recorded from Poland, including 218 from Mazovia and 51 from Warsaw.

The present paper is a part of the extensive contribution to the fauna of Warsaw [24]. It is based on the material collected in Warsaw in 1974—1976. The *Auchenorrhyncha* were caught from May to October each year by means of the entomological sweep net, Moericke's traps suspended in tree crowns, and a light trap [4]. To compare the *Auchenorrhyncha* occurring in the town with those living in ecosystems subject to lower human pressure, the comparative material was collected from homologous natural habitats [11].

In Mazovia the study was carried out in mixed coniferous forests and moist coniferous forests (the Kampinos forest), and also in oak-hornbeam forests and alder-ash carrs (the Jaktorów forest). Moreover, such areas were under study as a rural park on the site of an oak-hornbeam forest (Młochów) and meadows on the site of an oak-hornbeam forest at Mroków and Świdry Wielkie near Otwock. In Warsaw, suburban and urban areas were distinguished. The suburbs are largely covered with vegetation. Various types of suburban habitats were under study, such as a mixed coniferous forest, a moist coniferous forest, oak-hornbeam forest, and alder-ash carr (Białoleka Dworska), an oak-hornbeam forest (Bielany) and a park on the site of an oak-hornbeam forest (Ursynów). Three types of urban green areas have been distinguished, differing in the degree of anthropogenic pressure. These were urban parks (Łazienki, Praski, the park surrounding the Cemetery of Soviet Soldiers, Saxon Garden), green areas of housing estates loosely built (Wierzbno, Stawki), and green of the centre of the town, which is subject to the heaviest urban pressure and includes lawns and trees growing in small courtyards surrounded with buildings (at Wilcza, Hoża and Piękna streets), as well as green along roads with much traffic (at streets Grójecka, Al. Niepodległości, Marchlewskiego, Al. Ujazdowskie, and at the Konstytucji Square) [20].

The study of the *Auchenorrhyncha* was restricted to the sites most characteristic of urban green areas, thus the material collected does not represent all the habitat types occurring in Warsaw and Mazovia.

In all the study plots, the material was collected from two vegetation layers such as herbaceous plants and tree crowns. The *Auchenorrhyncha* associated with the herb layer were collected in meadows and lawns on the sites of oak-hornbeam forests, and arranged along an increasing gradient of urban pressure. As a result, it was possible to follow changes in the species composition from the species living in oak-hornbeam forests, through those associated with meadows on the sites of oak-hornbeam forests, to those living in urban lawns in the centre of the town. The species composition



of *Auchenorrhyncha* associated with carrs is poorly known and requires further studies.

The *Auchenorrhyncha* associated with tree crowns were caught on such trees as the lime (*Tilia* sp.), oak (*Quercus robur* L.), alder (*Alnus glutinosa* L.), hornbeam (*Carpinus betulus* L.), Scots pine (*Pinus silvestris* L.), horse-chestnut (*Aesculus hippocastanum* L.), birch (*Betula* sp.), and sycamore (*Acer pseudoplatanus* L.). The *Auchenorrhyncha* associated with tree crowns of limes were most accurately studied. Since Moericke's traps were placed in all the study plots, a picture of changes occurring in the species composition cause by urban pressure was obtained. Such an analysis was not possible for *Auchenorrhyncha* is associated with other tree species because the material has not been complete.

The data on the species composition of *Auchenorrhyncha* of Warsaw and Mazovia are shown in Table 3, in the taxonomic order based on the list of Palaearctic *Auchenorrhyncha* prepared by Nast [16].

#### SPECIES COMPOSITION

There are 271 species recorded from Mazovia (the literature data and author's materials). They include 32 species caught only in Warsaw and not in the surroundings. A total of 52 species are new to Mazovia and two of them, *Ribautiana scalaris* Rib. and *Anoplotettix horvathi* Metc., are new to Poland.

In Warsaw, 171 species were recorded, or 63% of the species known from Mazovia so far. They were distributed over various types of urban green areas as follows: in parks 97 species (57% of the species occurring in the town), in green areas of housing estates 60 species (35% of the species living in Warsaw), and in the centre of the town, where urban pressure is high, 43 species (25% of the species recorded in the town).

In the town there are various types of green, differing in the species composition of plant cover, size of the area occupied, and the degree of air and vegetation pollution. In this relation there are differences in the species composition and abundance of *Auchenorrhyncha* among them.

The richest species composition associated with the herb layer was observed in the parks with large green areas and diversified plant cover. There are 55 species recorded there, the most common being *Deltocephalus pulicaris*, *Javesella pellucida* and *Psammotettix confinis*. In more humid areas also *Ributodelphax albostriatus* and *Acantodelphax spinosus* can often be met. In parks there are many species not occurring in other types of urban green areas. This is due to greater number of herbaceous plants, higher humidity, and rich shrub layer. Such species as *Gargara genistae*, *Megophtalmus scanicus*, *Eupteryx stachydearum*, *Macrosteles viridigriseus*, or *Arocephalus languidus* can find suitable conditions in parks.



In the herb layer of green areas of housing estates, 38 species have been recorded. Like in parks, the most common are *Deltocephalus pulicaris* and *Javesella pellucida*. The abundance of *Psammotettix confinis* and *Macrosteles laevis*, however, increased. A more simplified plant cover and overdrying of the area accounted for an impoverishment of the species composition, as compared with parks. In green areas of housing estates there are no many species with higher moisture requirements, or they are scarce. Also the lack of many herbaceous plants limits the occurrence of many species.

In the areas subject to the heaviest human pressure (small courtyards in the centre of the town trampled areas in housing estates, and streetside green), the number of species is relatively small, a dozen or so, but only a few reach high abundance. In lawns of the centre of the town, the most frequent species are *Macrosteles laevis* and *Psammotettix confinis*, also *Arthaldeus pascuellus* and *Paluda vitripennis*. Other species are caught very rarely and in small numbers (one or a few specimens over the season).

Also the number of *Auchenorrhyncha* species associated with trees dropped with increasing urban pressure in Warsaw. This tendency can be best characterized for species occurring on limes (*Tilia* sp.), one of the most common tree in the town. The number of species caught on limes growing in an oak-hornbeam forest in Mazovia (Jaktorów forest) was 30, in Białoleka Dworska (a suburb) 21 species were recorded, in large urban parks 19 species, on limes in housing estates 14 species, and on limes growing in the centre of the town on squares covered with concrete 9 species occurred. The most common species is *Alebra wahlbergi*. Its abundance increased with growing urban pressure so that it largely predominates the community of *Auchenorrhyncha* on limes in the centre of the town.

In parks the most common species are *Typhlocyba bifasciata*, *T. fraterculus* and *Fagocyba cruenta* on the hornbeam, *Alebra albostriella*, *Lamprotettix nitidulus* and *Jassus lanio* on oaks, and *Lamprotettix nitidulus* and *Alebra albostriella* on the alder.

#### ZOOGEOGRAPHICAL ANALYSIS

The *Auchenorrhyncha* occurring in Mazovia and Warsaw can be classified into five zoogeographical elements. The proportions of particular elements vary with increasing urban pressure (Tab. 1). Mazovia is dominated by Palaearctic species (33,2%), then there are Euro-Siberian species (28,8%) and Holarctic species (18,8%). In sum the proportion of the species with large ranges (Holarctic and Palaearctic) is 52% in Mazovia. Moreover, 25 European and 7 submediterranean species were recorded in Mazovia, e.g. *Dictyophara europea* or *Myndus musivus*.



Table 1. Proportions of zoogeographical elements in *Auchenorrhyncha* of Warsaw and non-urban habitats of Mazovia (N—number of species)

Zoogeographical element	Mazovia		Warsaw									
			Suburbs		Urban green areas							
					Total		Parks		Housing estates		Town centre	
	N	%	N	%	N	%	N	%	N	%	N	%
Holarctic	51	18.80	26	20.80	38	22.20	26	26.80	16	26.70	16	37.20
Palaeartic	90	33.20	52	41.60	58	33.90	31	32.00	21	35.00	17	39.50
Euro-Siberian	78	28.80	22	17.60	44	25.70	16	16.50	10	16.60	8	18.60
Submediterranean	7	2.60	3	2.40	3	1.80	1	1.00	—	—	—	—
European	25	9.20	15	12.00	23	13.50	12	12.30	2	3.30	2	4.60
Unknown	20	7.40	7	5.60	5	2.90	11	11.50	18.30	18.30	—	—



In Warsaw, the proportion of particular zoogeographical elements is relatively little changed as compared with Mazovia. The proportion of the species with large ranges increased by 3%, this being due to an increase in the proportion of Holarctic species from 18.8% in Mazovia to 22.2% in Warsaw. Also the proportion of European species increased, while the proportion of Euro-Siberian and submediterranean species decreased.

A comparison of proportions of particular zoogeographical elements in Mazovia and in typical urban areas (parks, green areas of housing estates, green in the centre of the town) shows that the proportion of the species with large ranges, mostly Holarctic, increases with growing urban pressure. The joint proportion of Holarctic and Palaearctic species increased from 52% in Mazovia to 58.8% in urban parks, and 61.7% in housing estates, while the number of Euro-Siberian species dropped from 28.8% in Mazovia to 16.5%. In green of the centre of the town, Holarctic and Palaearctic species accounted for 76.7% of all species, while the number of Euro-Siberian species dropped from 28.8% in Mazovia to 18.6%. Also the proportion of European species is reduced and submediterranean species disappeared.

#### ECOLOGICAL ANALYSIS

In Poland 488 species have been recorded so far but their real number can exceed 500. The biology and ecology of these insects are poorly known. The literature data on their host plants are not always precise, a plant on which a specimen was caught being considered frequently its host plant. Besides, the *Auchenorrhyncha* can occur on various plants under different geographical and ecological conditions [18].

When an ecological classification of species occurring in Warsaw and Mazovia was prepared, it was difficult to identify typical habitats of many species. Sometimes it was impossible. Also mosaic occurrence accounted for difficulty in the classification of some species.

When the possibilities of life of *Auchenorrhyncha* under urban conditions were analysed, their abundance and dominance structure were not considered (this was not the aim of the work), and the fact that equal importance was given to abundant and sporadic species darkens the picture of changes in urban fauna as compared with that in natural habitats. For this reason the data shown in Table 2 are a rough approximation. They can be used as preliminary data for further, more detailed analysis of changes in the species composition subject to anthropogenic pressure.

The analysis of changes in the species composition of *Auchenorrhyncha* subject to increasing urban pressure is based on the proportions of xerophilous, mesophilous, and hygrophilous species. Such a classification into three ecological groups has been proposed by Schiemenz [27]. The group of xerophilous species (denoted by X) occupies plant communities



of the classes *Sedo-Sclaranthetea* and *Festuco-Brometea* (rare in Mazovia). Mesophilous species (M) inhabit communities of moits meadows of the order *Arrhenatheretalia* and the vegetation of the class *Nardo-Callunetea*. Hygrophilous species (H) occur on moors of the class *Oxycocco-Shagnetea* and meadows of the order *Molinietales*. The species occurring in both dry and wet habitats are classified into all the three groups (XMH), their habitat preferences, e.g. for moisture conditions, being indicated by a bar above respective symbols. In this way more than 40 species occurring in Mazovia and Warsaw have been analysed.

The *Auchenorrhyncha* of Mazovia are represented by a large number of xerophilous species, or by the species showing preferences for xerothermal grasslands of various types developed on sands (Tab. 2). Some xerophilous species such as *Hardya tenuis*, *Tettigometra atra*, or *Psammotettix albo-marginatus* have not been recorded in Warsaw. Other species, like *Dictyophara europea*, *Pinumius aeratus*, or *Eupelix cuspidata*, were sporadically met there. Although the number of xerophilous species drops with increasing urban pressure, their proportion increased from 48.2% in Mazovia to 54.3% in Warsaw.

The most common xerophilous species (X, XM and  $\bar{X}MH$ ) were *Paluda vitripennis*, *Doratura homophyla*, *Anaceragallia ribauti*, *Delthocephalus pulicaris*, and *Turrutus socialis*.

The number of mesophilous species (XMH,  $\bar{X}MH$ ) occurring in Warsaw was similar to that in Mazovia, being 18 and 20, respectively. It decreased with increasing urban pressure from 17 mesophilous species in the suburbs to 13 in parks and green areas of housing estates, and 10 in streetside and courtyard green. A similar tendency was observed for the group of  $\bar{X}MH$  species. There were ten species of this group in Mazovia, and eight in Warsaw, including six in urban parks, also six in green areas of housing estates, and five species in streetside green. Instead, the proportion of the species with high moisture tolerance increased with growing urban pressure (Tab. 2), from 27.2% in Mazovia to 40.4% in the suburbs of Warsaw. In parks it was 42%, in green areas of housing estates 53%, and in the green subject to the heaviest urban pressure 58%. In this group there are dominants of urban green areas, such as *Psammotettix confinis*, *Macrosteles laevis*, or *Javesella pellucida*. In cultivated green areas of Warsaw also such species are frequent as *Aphrodes bicinctus*, *Acanthodelphax spinosus* (in parks), *Balclutha punctata*, and *Arthaldeus pascuellus* (particularly abundant in green of courtyards in the centre of the town). Such species as *Dicraneura variata*, *Hyledelphax elegantulus*, *Jassargus flori*, or *Ulopa reticulata* were caught only in the suburbs. Also *Speudotettix subfuscus* or *Elymana sulphurella*, abundantly caught in Mazovia and in the suburbs, were very scarce in cultivated urban green.

In Warsaw both the number of hygrophilous species and their proportions are very low (Tab. 2). Of 27 species recorded from Mazovia, their number



Table 2. Proportions of the species with differing moisture requirements in the *Auchenor rhyncha* of urban and non-urban habitats  
(N—number of species)

X—xerophilous species, M—mesophilous species, H—hygrophilous species

Ecological groups	Mazovia		Warsaw									
			Suburbs		Urban green areas							
	N	%			N	%	Total		Parks		Housing estates	
			N	%			N	%	N	%	N	%
X	23	20.9	11	19.3	15	22.0	6	13.3	5	13.9	2	7.7
X̄M	12	10.9	7	12.3	10	14.7	7	15.6	4	11.1	3	11.5
X̄MH	7	6.4	5	8.8	6	8.8	5	11.1	2	5.6	3	11.5
X̄M	11	10.0	6	10.5	6	8.8	4	8.9	4	11.1	2	7.7
XM̄H	14	12.7	12	21.1	13	19.1	10	22.2	10	27.8	8	30.8
X̄M̄H	6	5.4	5	8.8	5	7.4	3	6.6	3	8.3	2	7.7
X̄M̄H̄	10	9.1	6	10.5	8	11.7	6	13.3	6	16.7	5	19.2
XM̄H̄	13	11.8	3	5.2	3	5.7	3	6.6	1	2.8	1	3.8
H̄M	9	8.2	1	1.7	1	1.4	—	—	—	—	—	—
H	5	4.6	1	1.7	1	1.4	1	2.2	1	2.8	—	—



dropped to five in Warsaw, and their proportion from 25% in Mazovia to 8%. Also the abundance of hygrophilous species was small in Warsaw, except for the suburbs. For instance, *Macrosteles sexnotatus* or *Agallia brachyptera*, both rather abundant in the suburbs, sporadically occurred in cultivated urban green. Similarly *Cicadella viridis* and *Aphrodes flavostriatus* occurred in small numbers in urban green areas.

In Warsaw the species composition of *Auchenorrhyncha* is changed because urban green areas are overdried, the herb layer is impoverished, grasses being reduced to few species and the proportion of dicotyledonous plants being lowered. As compared with open areas of Mazovia, in the town the proportion of species inhabiting meadows and pastures is higher, while the proportion of species with higher moisture requirements drops. The proportion of meadow- and pasture-dwelling of *Auchenorrhyncha* increased with growing urban pressure from 26.6% in Mazovia to 34.4% in the suburbs and 36.1 in urban parks. In urban green areas located in the centre of the town, 17 species of herbivorous *Auchenorrhyncha* were recorded, which accounts for 39.5% of the number of *Auchenorrhyncha* caught there. This exceptionally high proportion of the species associated with meadows and pastures is related to the floral composition of urban green, particularly in housing estates and in the centre of the town. Most frequently it is an impoverished form of moist pastures (alliance *Cynosurion*) or even it approximates xerothermal grasslands (Wysocki personal communication). Hence pasture-dwelling species can find suitable conditions in Warsaw. There are no in Warsaw, however, many species associated with the herb layer of oak-hornbeam forests and carrs. For example, *Hyledelphax elegantulus* or *Dikraneura variata* occur only in the suburbs and not in urban parks or housing estates. A similar situation is observed in the case of the species associated with meadows of high humidity. Their number drops from 30 in Mazovia to a few in Warsaw (7 in the suburbs, 3 in housing estates and in the centre of the town). It seems, however, that such species as *Streptanus sordidus* or *Aphrodes serratulae*, which in non-urban areas inhabit wet meadows and in Warsaw are frequently caught in all the study plots, have higher habitat amplitude than it was suggested so far. Other species typical of carrs and wet meadows are rarely met in Warsaw, only single specimens being caught in the suburbs or urban parks. To this group such species belong as *Cicadella viridis* and *Cicadula quadrinotata*, sporadically caught in Łazienki park. Some species, e.g. *Eupteryx calcarata*, occurring on nettles, was caught both in parks and in housing estates.

Forest-dwelling species of Mazovia occur on various trees, shrubs and also in the herb layer. In Mazovia 90 species associated with forest habitats have been recorded. In Warsaw their numbers is reduced to 67. The proportion of forest-dwelling species increases with urban pressure. This is firstly the case of the species associated with moist forests. Their proportion increased from 14.8% in Mazovia to 24% in urban parks and



25.6% in the centre of the town. However, this result can be burden with a large error since the species composition of forest *Auchenorrhyncha* living in natural habitats of both Mazovia and Warsaw is poorly known. The analysis of the species composition of Warsaw and Mazovia only shows that the species living in tree crowns can find suitable conditions in the town (in parks). A similar number of species occurred on the study trees in their natural habitats and in the town. For example, 18 species were caught on lime growing in the Łazienki park and 21 species on a lime growing in the Jaktorów forest in the same season; 18 species were caught on a hornbeam growing in Mazovia and 15 in the park; 21 species on an alder in the Jaktorów forest and 18 in the park. The species composition and the number of species occurring in crowns of these trees do not essentially differ from those in natural habitats. On limes in the park there occur 85.7% of the species living in natural habitats, on hornbeams 83.3% and on alders 85.7%. But no species occurring in the herb layer of various types of forests were recorded in urban green. For example, *Stiroma bicarinata*, *Unakanodes excisa*, or *Neophilaenus exclamationis* do not occur in Warsaw. Some species, e.g. *Eurysa linneata* were caught only in the suburbs.

The studies on the species composition of *Auchenorrhyncha* living in natural habitats of Mazovia and in some habitat types in Warsaw (carrs, alder swamps, or coniferous woods) should be continued, it may be expected, however, that the general pattern of changes occurring in the species composition of *Auchenorrhyncha* in response to urban pressure will be confirmed.

#### CONCLUSIONS

1. In Warsaw, 171 *Auchenorrhyncha* species have been recorded, which accounts for 63% of the species recorded from Mazovia.
2. The number of species decreased with growing urban pressure.
3. The proportion of the species with wide ranges, mostly Holarctic, increases with urban pressure, while the proportion of Euro-Siberian, European, and submediterranean species decreases.
4. The proportion of xerophilous and mesophilous species increases with growing urban pressure.
5. The species composition of *Auchenorrhyncha* living in Warsaw and Mazovia shows that the species associated with tree crowns can find suitable conditions in the town, particularly in the suburbs and large parks.



## SPECIES NEW TO MAZOVIA AND WARSAW

*Cixiidae**Cixius cunicularius* L.

Jaktorów forest, Kampinos forest, Warsaw (parks). On birches, limes and alders. From late June to late August.

*Cixius simplex* H.-S.

Warsaw—two specimens caught by Moericke's traps on a lime in the Ursynów park, in October.

*Delphacidae**Stiroma bicarinata* H.—S.

Jaktorów forest — three males caught in forest cutting. Młochów: one male in a meadow of a rural park. In June.

*Muellerianella brevipennis* Boh.

Młochów—29 specimens in a meadow of a rural park. In October.

*Javesella pellucida* F.

One of the most abundant species in meadows and pastures. Caught on all the plots in Warsaw and Mazovia. Less abundant in carrs, moits coniferous forests and mixed coniferous forests. From June to September.

*Javesella dubia* Kbm.

Młochów — numerous in a meadow of a rural park in July. Warsaw (parks) — single specimens from July to September.

*Javesella salina* Hpt.

Warsaw (park)—one male in a lawn, in July.

*Cercopidae**Neophilaenus exclamationis* Thnb.

Kampinos forest—four specimens in a moits coniferous forest, in July. Warsaw (Białoleka Dworska)—one male in July.

*Aphrophora alni* Fall.

Common species, living in all habitats and layers. Jaktorów forest, Młochów. In Warsaw caught in all the plots. From mid-June to October.

*Philaenus spumarius* L.

Very common in all habitats and vegetation. Kampinos forest, Jaktorów forest, Młochów. In Warsaw in all the study plots. From July to October.

*Cicadellidae**Megophthalmus scanicus* Fall.

Relatively frequently caught in insolated habitats. Jaktorów forest, Młochów. In Warsaw (parks) numerous on open lawns. Caught also on limes and hornbeams. From July to the end of August.

*Oncopsis alni* Schrk.

Jaktorów forest, Warsaw (Białoleka Dworska, parks). On alders abundant from June to August.



*Oncopsis flavicollis* L.

Kampinos forest, Warsaw (parks, Białoleka Dworska). On birches. From June to the end of July.

*Hephathus nanus* H.-S.

Młochów—one male caught by Moericke's traps, Warsaw (park)—one male caught in a lawn in July.

*Agallia consobrina* Curt.

Młochów—one male in a meadow of an urban park in July.

*Idiocerus fulgidus* F.

Jaktorów forest—single individuals caught by Moericke's traps. In Warsaw caught by a light trap. From July to October.

*Idiocerus populi* L.

Warsaw—single individuals caught by a light trap. From June to August.

*Aphrodes bifasciatus* L.

Jaktorów forest—two specimens caught in forest cutting. Warsaw (park)—two specimens in a lawn in August.

*Aphrodes flavostriatus* Don.

Jaktorów forest, Radziejowice—numerous in meadows, Warsaw (parks, housing estates, Białoleka Dworska). From August to September.

*Dikraneura variata* Hardy

Radziejowice—a meadow on the site of an oak-hornbeam forest. From July to September. Białoleka Dworska—numerous in a meadow on the site of an oak-hornbeam forest in August.

*Empoasca solani* Curt.

Common on various herbaceous plants, in meadows, lawns, and on trees. In all the study plots of Mazovia and Warsaw. From the end of July to October.

*Edwardsiana ampliata* Wagn.

Jaktorów forest, Radziejowice, Warsaw (parks, housing estates, centre of the town), Białoleka Dworska. Numerous on limes. Caught in low numbers by Moericke's traps on hornbeams, alders and oaks. From June to October.

*Edwardsiana avellanae* Edw.

Warsaw (parks, housing estates, centre), Białoleka Dworska. Single individuals in crowns of hornbeams and limes. From July to October.

*Edwardsiana crataegi* Dgl.

Warsaw (allotments)—single individuals on apple-trees.

*Edwardsiana flavescens* F.

Jaktorów forest—numerous in an oak-hornbeam forest, a forest cutting, in October, Warsaw (park), Białoleka Dworska—single individuals caught by Moericke's traps in October.

*Edwardsiana frustrator* Edw.

Warsaw (housing estates)—one male caught by Moericke's trap on a lime in October.

*Edwardsiana geometrica* Schrk.

Warsaw, Białoleka Dworska—one male on an alder in July.



*Edwardsiana gratiosa* Boh.

Jaktorów forest—9 specimens caught on an alder in July. Warsaw, Białoleka Dworska—7 specimens caught on an alder in July.

*Edwardsiana hippocastani* Edw.

Common on various deciduous trees. In Mazovia and Warsaw caught on all the study plots on limes, alders, and hornbeams. From June to October.

*Edwardsiana lethierryi* Edw.

Warsaw, Białoleka Dworska—4 specimens on an oak in July.

*Edwardsiana salicicola* Edw.

Warsaw (park)—2 specimens caught by Moericke's traps on a lime in October.

*Edwardsiana smreczynskii* Dwor.

Warsaw (park)—6 specimens on a lime in September.

*Edwardsiana tersa* Edw.

Jaktorów forest—single individuals on alders in August. Warsaw (parks). Białoleka Dworska on alders, also numerous in limes in parks. From July to the end of September.

*Ribautiana scalaris* Rib.

A species new to Poland. Warsaw—one male caught by Moericke's trap on a lime in October.

*Eurhadina loewii* Then

Warsaw (park)—a few specimens on a maple.

*Eurhadina untica* Dlb.

Warsaw (housing estates)—5 specimens caught by Moericke's traps on a lime in August.

*Eupteryx aurata* L.

Jaktorów forest, Warsaw, in all the plots. Occurs on nettles. From June to September.

*Eupteryx collina* Flor.

Młochów. Warsaw (housing estates). Single specimens caught on a meadow in a rural park and in lawns in July and August.

*Eupteryx curtisii* Flor.

Jaktorów forest—3 specimens caught by a sweep net in a carr, Radziejowice—one specimen in a meadow in a park in June.

*Eupteryx notata* Curt.

Very abundant in dry, insolated habitats. Caught in a meadow in the park at Radziejowice, and in park lawns of Warsaw. From June to October.

*Eupteryx tenella* Fall.

Radziejowice—single specimens caught in a meadow on the of an oak-hornbeam forest. Warsaw (parks), Białoleka Dworska—single specimens caught in a meadow on the site of an oak-hornbeam forest. From June to September.

*Eupteryx urticae* F.

Jaktorów forest. Warsaw, Białoleka Dworska—caught in a carr from June to September.

*Macrosteles laevis* Rib.

Very common over Poland. Very numerous in meadows and lawns from June to September. Caught in all the study plots of Mazovia and Warsaw.



*Anoplotettix horvathi* Metc.

The species new to Poland. Młochów—4 specimens caught by Moerick's traps on a lime in a rural park in August and September.

*Allygus mixtus* F.

Jaktorów forest. Warsaw (parks), Białoleka Dworska. Common on deciduous trees such as the hornbeam, oak, lime, alder, birch. Caught by Moericke's traps also on a pine. From July to October.

*Paluda preysleri* H.-S.

Jaktorów forest. Warsaw—Białoleka Dworska. One males caught in each of the carrs in July, by a sweep net.

*Cicadula quadrinotata* F.

Jaktorów forest, Młochów, Mroków, Warsaw—Białoleka Dworska. Single individuals caught in meadows and carrs from June to September.

*Mocydiopsis attenuata* Germ.

Warsaw, Białoleka Dworska—one male caught by a sweep net in a mixed coniferous forest in June.

*Euscelis incisus* Kbm.

Świdry Wielkie—5 specimens caught in a meadow, Warsaw, Białoleka Dworska—3 specimens caught in by Moericke's traps in a mixed coniferous forest. In June and July.

*Acrocephalus languidus* Fl.

Warsaw (park)—several specimens caught on a lawn in June and September.

*Arocephalus punctum* Fl.

Jaktorów forest—one male caught in an oak-hornbeam forest, a forest cutting, in August.

*Psammotettix confinis* Dhlb.

Radziejowice, Młochów, Mroków, Warsaw. Numerous on meadows, one of the most common species in all the study plots in Warsaw. From June to October.

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Table 3. Check-list of *Auchenorrhyncha* (*Homoptera*) species occurring in Warsaw and Mazovia

No.	○ — literature data ● — proved literature data + — unpublished data  Species	Mazovia	Warsaw				
			Suburban areas	Parks	Green areas in housing estates	Town centre	Other sampling areas
1	2	3	4	5	6	7	8
1	<i>Cixius eunicularius</i> (L.)	+	+	+	—	—	—
2	<i>Cixius nervosus</i> (L.)	●	+	—	—	—	—
3	<i>Cixius similis</i> Kbm.	●	—	—	—	—	—
4	<i>Cixius simplex</i> (H.-S.)	+	+	—	—	—	—
5	<i>Tachycixius pilosus</i> (Ol.)	○	—	—	—	—	—
6	<i>Myndus musivus</i> (Germ.)	○	—	—	—	—	—
7	<i>Pentastiridus leporinus</i> (L.)	○	○	—	—	—	—
8	<i>Kelisia guttula</i> (Germ.)	○	—	—	—	—	—
9	<i>Kelisia monoceros</i> Rib.	○	—	—	—	—	—
10	<i>Anakelisia perspicillata</i> (Boh.)	○	—	—	—	—	—
11	<i>Stenocranus major</i> (Kbm.)	○	—	—	—	—	—
12	<i>Jassidaeus lugubris</i> (Sign.)	—	—	—	—	—	○
13	<i>Delphacinus mesomelas</i> (Boh.)	○	+	+	—	—	—
14	<i>Ditropis pteridis</i> (Spin.)	○	—	—	—	—	—
15	<i>Eurysa lineata</i> (Perr.)	○	●	—	—	—	—
16	<i>Eurysula lurida</i> (Fieb.)	○	—	—	—	—	○
17	<i>Stiroma affinis</i> Fieb.	●	+	—	—	—	—
18	<i>Stiroma bicarinata</i> (H.-S.)	+	—	—	—	—	—
19	<i>Euconomelus lepidus</i> (Boh.)	○	—	—	—	—	—
20	<i>Conomelus anceps</i> (Germ.)	○	—	—	—	—	—
21	<i>Conomelus dehnelti</i> Nast	○	—	—	—	—	—
22	<i>Chloriona dorsata</i> Edw.	○	—	—	—	—	—
23	<i>Chloriona glaucescens</i> Fieb.	○	—	—	—	—	—
24	<i>Megamelus notula</i> (Germ.)	○	—	—	+	—	—
25	<i>Unkanodes excisa</i> (Mel.)	○	—	—	—	—	—
26	<i>Laodelphax striatellus</i> (Fall.)	●	+	+	+	+	—
27	<i>Paraliburnia adela</i> (Fl.)	○	—	—	—	—	—
28	<i>Hyledelphax elegantulus</i> (Boh.)	●	+	—	—	—	—
29	<i>Delphacodes capnodes</i> (Scott)	○	—	—	—	—	—
30	<i>Muellerianella brevipennis</i> (Boh.)	+	—	—	—	—	—
31	<i>Muellerianella fairmairei</i> (Perr.)	○	—	—	—	—	—
32	<i>Muirodelphax aubei</i> (Perr.)	○	—	—	—	—	○
33	<i>Acanthodelphax denticauda</i> (Boh.)	○	—	—	—	—	—
34	<i>Acanthodelphax spinosus</i> (Fieb.)	●	+	+	—	—	—
35	<i>Tyrphodelphax distinctus</i> (Fl.)	○	—	—	—	—	—
36	<i>Dicranotropis hamata</i> (Boh.)	○	+	+	+	+	—
37	<i>Kosswigianella exigua</i> (Boh.)	○	—	+	+	—	—
38	<i>Struebingianella lugubrina</i> (Boh.)	○	—	—	—	—	—
39	<i>Xanthodelphax flaveolus</i> (Fl.)	○	—	—	—	—	—
40	<i>Xanthodelphax stramineus</i> (Stål)	○	—	—	—	—	—
41	<i>Oncodelphax pullulus</i> (Boh.)	○	—	—	—	—	—



1	2	3	4	5	6	7	8
42	<i>Criomorphus albomarginatus</i> Curt.	●	+	+	—	—	—
43	<i>Javesella dubia</i> (Kbm.)	+	+	+	+	—	—
44	<i>Javesella obscurella</i> (Boh.)	○	—	+	—	—	—
45	<i>Javesella pellucida</i> (F.)	+	+	+	+	+	—
46	<i>Javesella salina</i> (Hpt.)	—	—	+	—	—	—
47	<i>Javesella stali</i> (Metc.)	—	○	—	—	—	—
48	<i>Ribautodelphax albostrigatus</i> (Fieb.)	●	+	+	+	—	—
49	<i>Dictyophara europaea</i> (L.)	○	○	+	—	—	—
50	<i>Tettigometra astra</i> f. <i>laetifica</i> Metc.	—	○	—	—	—	—
51	<i>Tettigometra atrata</i> Fieb.	○	—	—	—	—	—
52	<i>Tettigometra obliqua</i> (Panz.)	○	—	—	—	—	—
53	<i>Tettigometra virescens</i> (Panz.)	○	—	—	—	—	—
54	<i>Ommatidiotus dissimilis</i> (Fall.)	○	—	—	—	—	—
55	<i>Cicadetta montana</i> (Scop.)	○	—	—	—	—	—
56	<i>Lepyronia coleoptrata</i> (L.)	○	—	—	—	—	—
57	<i>Neophilaenus campestris</i> (Fall.)	○	—	—	—	—	—
58	<i>Neophilaenus exclamationis</i> (Thunb.)	+	—	—	—	—	—
59	<i>Neophilaenus lineatus</i> (L.)	●	—	—	—	—	—
60	<i>Neophilaenus minor</i> (Kbm.)	○	—	—	+	—	○
61	<i>Aphrophora alni</i> (Fall.)	+	+	+	+	—	—
62	<i>Aphrophora corticea</i> Germ.	●	—	+	—	—	—
63	<i>Aphrophora costalis</i> Mats.	○	—	—	—	—	—
64	<i>Aphrophora salicina</i> (Goeze)	○	—	—	—	—	—
65	<i>Philaenus spumarius</i> (L.)	+	+	+	+	+	—
66	<i>Gargara genistae</i> (F.)	●	+	+	—	—	—
67	<i>Centrotus cornutus</i> (L.)	○	—	—	—	—	—
68	<i>Ulopa reticulata</i> (F.)	○	+	—	—	—	—
69	<i>Ulopa trivialis</i> Germ.	○	○	—	—	—	—
70	<i>Megophthalmus scanicus</i> (Fall.)	+	+	+	—	—	—
71	<i>Ledra aurita</i> (L.)	○	—	—	—	—	—
72	<i>Oncopsis alni</i> (Schrk.)	+	+	+	—	—	—
73	<i>Oncopsis carpini</i> (J. Shlb.)	●	+	+	—	—	—
74	<i>Oncopsis flavicollis</i> (L.)	+	+	+	—	—	—
75	<i>Oncopsis subangulata</i> (J. Shlb.)	○	+	—	—	—	—
76	<i>Oncopsis tristis</i> (Zett.)	●	+	—	—	—	—
77	<i>Pediopsis tiliae</i> (Germ.)	●	+	+	+	+	—
78	<i>Macropsis fuscineris</i> (Boh.)	○	—	—	—	—	—
79	<i>Macropsis fuscula</i> (Zett.)	○	—	—	—	—	—
80	<i>Macropsis glandacea</i> Fieb.	○	—	—	—	—	—
81	<i>Macropsis graminea</i> (F.)	○	—	—	—	—	—
82	<i>Macropsis infuscata</i> (J. Shlb.)	○	—	—	—	—	—
83	<i>Macropsis mendax</i> (Fieb.)	○	—	—	—	—	—
84	<i>Macropsis vicina</i> (Horv.)	○	—	—	—	—	—
85	<i>Hephathus manus</i> (H.-S.)	+	—	+	—	—	—
86	<i>Agallia brachyptera</i> (Boh.)	●	+	—	—	—	—
87	<i>Agallia consobrina</i> Curt.	+	—	—	—	—	—
88	<i>Anaceratagallia ribauti</i> (Oss.)	●	+	+	—	+	—
89	<i>Rhytidodus decimusquartus</i> (Schrk.)	○	—	—	—	—	—
90	<i>Idiocerus albicans</i> Kbm.	○	—	—	—	+	—
91	<i>Idiocerus confusus</i> Fl.	●	—	—	—	—	○
92	<i>Idiocerus distinguendus</i> Kbm.	○	+	+	+	—	—



1	2	3	4	5	6	7	8
93	<i>Idiocerus fulgidus</i> (F.)	—	+	+	—	+	—
94	<i>Idiocerus herrichi</i> Kbm.	○	—	—	—	—	—
95	<i>Idiocerus lituratus</i> (Fall.)	○	—	—	—	—	—
96	<i>Idioceratus nitidissimus</i> (H.-S.)	○	—	—	—	—	—
97	<i>Idiocerus poecilus</i> (H.-S.)	○	—	—	—	—	—
98	<i>Idiocerus similis</i> Kbm.	○	—	—	—	—	—
99	<i>Idiocerus populi</i> (L.)	+	—	—	—	—	—
100	<i>Idiocerus stigmatalis</i> Lew.	○	—	—	—	—	—
101	<i>Batracomorphus allioni</i> (Turt.)	○	—	—	—	—	—
102	<i>Idiocerus ustulatus</i> (M.-R.)	○	—	—	—	—	—
103	<i>Jassus lanio</i> (L.)	●	+	+	—	—	—
104	<i>Jassus scutellaris</i> (Fieb.)	○	+	—	—	—	—
105	<i>Penthimia nigra</i> (Goeze)	—	—	—	—	—	○
106	<i>Eupelix cuspidata</i> (F.)	○	+	—	—	+	—
107	<i>Aphrodes albiger</i> (Germ.)	○	—	—	—	—	—
108	<i>Aphrodes bicinctus</i> (Schrk.)	●	+	+	+	+	—
109	<i>Aphrodes bifasciatus</i> (L.)	+	+	—	—	—	—
110	<i>Aphrodes flavoatriatus</i> (Don.)	+	+	+	+	—	—
111	<i>Aphrodes histrionicus</i> (F.)	●	+	—	—	—	—
112	<i>Aphrodes serratulae</i> (F.)	●	+	+	—	+	—
113	<i>Stroggylocephalus agrestis</i> (Fall.)	○	—	—	—	—	—
114	<i>Stroggylocephalus livens</i> (Zett.)	○	—	—	—	—	—
115	<i>Evacanthus acuminatus</i> (F.)	●	—	—	—	—	—
116	<i>Evacanthus interruptus</i> (L.)	●	—	—	—	—	—
117	<i>Cicadella viridis</i> (L.)	●	+	+	—	—	—
118	<i>Alebra albostriella</i> (Fall.)	●	+	+	—	—	—
119	<i>Alebra neglecta</i> Wagn.	—	—	—	—	—	○
120	<i>Alebra wahlbergi</i> (Boh.)	●	+	+	+	+	○
121	<i>Erythria aureola</i> (Fall.)	○	—	—	—	—	○
122	<i>Dikraneura variata</i> Hardy	+	+	—	—	—	—
123	<i>Forcipata citrinella</i> (Zett.)	●	+	—	+	—	—
124	<i>Notus flavipennis</i> (Zett.)	○	—	—	—	—	—
125	<i>Kybos abstrusus</i> (Lnv.)	—	○	—	—	—	—
126	<i>Kybos butleri</i> (Edw.)	—	—	—	—	—	○
127	<i>Kybos limpidus</i> (Wagn.)	—	○	—	—	—	○
128	<i>Kybos lindbergi</i> (Lnv.)	●	●	+	—	—	—
129	<i>Kybos populi</i> (Edw.)	+	+	+	+	+	○
130	<i>Kybos rufescens</i> Mel.	○	○	—	—	—	—
131	<i>Kybos smaragdulus</i> (Fall.)	+	+	+	—	—	○
132	<i>Kybos verbae</i> Zachv.	○	○	—	—	—	—
133	<i>Kybos virgator</i> (Rib.)	○	○	+	×	—	○
134	<i>Empoasca affinis</i> Nast	○	○	—	—	—	—
135	<i>Empoasca decipiens</i> Paoli	○	—	—	—	—	—
136	<i>Empoasca solani</i> (Curt.)	+	+	+	+	+	—
137	<i>Austroasca vittata</i> (Leth.)	○	—	—	—	—	—
138	<i>Empoasca vitis</i> (Göthe)	●	+	+	+	+	○
139	<i>Chlorita dumosa</i> (Rib.)	○	—	—	—	—	—
140	<i>Chlorita paoli</i> (Oss.)	+	+	+	+	+	○
141	<i>Fagocyba cruenta</i> (H.-S.)	●	+	+	+	+	—
142	<i>Edwardsiana ampliata</i> (Wagn.)	+	+	+	+	+	—
143	<i>Edwardsiana avellanae</i> (Edw.)	—	+	+	+	+	—



1	2	3	4	5	6	7	8
144	<i>Edwardsiana candidula</i> (Kbm.)	○	—	—	—	—	—
145	<i>Edwardsiana crataegi</i> (Dgl.)	—	—	—	—	—	+
146	<i>Edwardsiana flavescens</i> (F.)	+	+	+	—	—	—
147	<i>Edwardsiana frustrator</i> (Edw.)	—	—	+	—	—	—
148	<i>Edwardsiana gratiosa</i> (Boh.)	+	—	+	—	—	—
149	<i>Edwardsiana geometrica</i> (Schrk.)	—	+	—	—	—	—
150	<i>Edwardsiana hippocastani</i> (Edw.)	+	+	+	+	+	—
151	<i>Edwardsiana lethierryi</i> (Edw.)	—	+	—	—	—	—
152	<i>Edwardsiana plebeja</i> (Edw.)	○	—	+	+	+	—
153	<i>Edwardsiana prunicola</i> (Edw.)	○	—	—	—	—	—
154	<i>Edwardsiana rosae</i> (L.)	○	—	+	+	+	+
155	<i>Edwardsiana salicicola</i> (Edw.)	—	—	+	—	—	—
156	<i>Edwardsiana smreczynskii</i> Dwor.	—	—	+	—	—	—
157	<i>Edwardsiana sociabilis</i> (Oss.)	○	—	—	—	—	—
158	<i>Edwardsiana tersa</i> (Edw.)	—	+	+	—	—	—
159	<i>Eupterycyba jucunda</i> H.-S.	○	+	—	—	—	—
160	<i>Linnavuoriana decempunctata</i> (Fall.)	○	—	—	—	—	—
161	<i>Linnavuoriana sexmaculata</i> (Hardy)	○	—	—	—	—	—
162	<i>Ribautiana ognevi</i> (Zachv.)	○	—	—	—	—	—
163	<i>Ribautiana tenerrima</i> (H.-S.)	○	—	—	—	—	—
164	<i>Ribautiana ulmi</i> (L.)	●	—	+	+	+	—
165	<i>Ribautiana scalaris</i> Rib.	—	—	+	—	—	—
166	<i>Typhlocyba bifasciata</i> Boh.	●	+	+	—	+	—
167	<i>Typhlocyba quercus</i> (F.)	●	+	+	—	+	—
168	<i>Eurhadina concinna</i> (Germ.)	●	+	+	—	—	—
169	<i>Eurhadina kirschbaumi</i> Wagn.	○	—	—	—	—	—
170	<i>Eurhadina loewii</i> (Then)	—	—	+	—	—	—
171	<i>Eurhadina pulchella</i> (Fall.)	●	+	+	—	—	—
172	<i>Eurhadina saageri</i> Wagn.	○	○	—	—	—	○
173	<i>Eurhadina untica</i> Dlab.	—	—	—	+	+	—
174	<i>Eupteryx aurata</i> (L.)	+	+	+	+	+	—
175	<i>Eupteryx calcarata</i> Oss.	●	+	+	—	—	—
176	<i>Eupteryx collina</i> (Fl.)	+	—	—	+	—	—
177	<i>Eupteryx curtisii</i> (Fl.)	+	—	—	+	—	—
178	<i>Eupteryx cyclops</i> Metc.	●	●	—	—	—	—
179	<i>Eupteryx florida</i> Rib.	○	—	—	—	—	—
180	<i>Eupteryx notata</i> Curt.	+	+	+	—	—	—
181	<i>Eupteryx stachydearum</i> (Hardy)	+	●	+	—	—	—
182	<i>Eupteryx tenella</i> (Fall.)	+	+	+	—	—	—
183	<i>Eupteryx tenella</i> (Fall.)	+	+	+	—	—	—
184	<i>Eupteryx urticae</i> (F.)	+	+	—	—	—	—
185	<i>Eupteryx vittata</i> (L.)	●	+	+	+	+	—
186	<i>Aguriahana gemari</i> (Zett.)	●	+	—	—	—	—
187	<i>Aguriahana stellulata</i> (Burm.)	●	+	+	—	+	—
188	<i>Zyginidia viadensis</i> (Wagn.)	○	○	—	—	—	—
189	<i>Alnetoidia alneti</i> (Dhlab.)	●	+	+	+	+	—
190	<i>Zygina flammigera</i> (Fourcr.)	+	+	+	+	+	—
191	<i>Zygina tithidae</i> Ferr.	—	○	—	—	—	—
192	<i>Arboridia parvula</i> (Boh.)	●	+	—	—	—	—
193	<i>Arboridia velata</i> (Rib.)	○	—	—	—	—	—
194	<i>Grypotes puncticollis</i> (H.-S.)	●	●	—	—	—	—



1	22	3	4	5	6	7	8
195	<i>Neoliturus fenestratus</i> (H.-S.)	○	—	—	—	—	—
196	<i>Nealiturus haematoceps</i> (M.-R.)	—	○	—	—	—	—
197	<i>Balclutha punctata</i> (F.)	●	+	+	+	—	—
198	<i>Macrosteles cristatus</i> (Rib.)	○	—	—	—	—	—
199	<i>Macrosteles frontalis</i> (Scott)	—	—	—	—	—	○
200	<i>Macrosteles laevis</i> (Rib.)	+	+	+	+	+	—
201	<i>Macrosteles maculosus</i> (Then)	—	+	—	—	—	○
202	<i>Macrosteles ossianilssoni</i> Ldb.	○	—	—	—	—	—
203	<i>Macrosteles quadripunctulatus</i> (Kbm.)	○	+	+	—	—	○
204	<i>Macrosteles sexnotatus</i> (Fall.)	○	+	+	+	+	—
205	<i>Macrosteles variatus</i> (Fall.)	○	+	—	—	—	—
206	<i>Macrosteles viridigriseus</i> (Edw.)	●	—	+	—	—	—
207	<i>Sonronius dahlbomi</i> (Zett.)	—	—	—	—	—	○
208	<i>Sagatus punctifrons</i> (Fall.)	○	—	—	—	—	—
209	<i>Deltocephalus pulicaris</i> (Fall.)	●	+	+	+	+	—
210	<i>Doratura exilis</i> Horv.	●	+	—	—	—	—
211	<i>Doratura homophyla</i> (Fl.)	●	+	+	+	+	—
212	<i>Doratura impudica</i> Horv.	●	+	+	—	—	—
213	<i>Doratura stylata</i> (Boh.)	○	—	+	—	—	—
214	<i>Fieberiella septentrionalis</i> Wagn.	●	+	+	+	—	—
215	<i>Platymetopius guttatus</i> Fieb.	○	—	—	—	—	—
216	<i>Platymetopis major</i> (Kbm.)	○	+	—	—	—	○
217	<i>Anoplotettix horvathi</i> Metc.	+	—	—	—	—	—
218	<i>Colladonus torneellus</i> (Zett.)	+	●	—	—	—	—
219	<i>Lamprotettix nitidulus</i> (F.)	●	+	+	—	+	—
220	<i>Allygus maculatus</i> Rib.	—	●	—	—	—	—
221	<i>Allygus mixtus</i> (F.)	+	+	+	—	—	—
222	<i>Allygidus atomarius</i> (F.)	●	—	—	+	—	—
223	<i>Allygidus commutatus</i> (Fieb.)	○	—	—	—	—	—
224	<i>Graphocraerus ventralis</i> (Fall.)	●	—	—	—	—	○
225	<i>Rhytistylus proceps</i> (Kbm.)	○	—	—	—	—	○
226	<i>Hardya signifera</i> (Then)	—	○	—	—	—	—
227	<i>Hardya tenuis</i> (Germ.)	●	—	—	—	—	—
228	<i>Paluda adumbrata</i> (C. Shlb.)	—	○	—	—	—	—
229	<i>Paluda preysleri</i> (H.-S.)	+	+	—	—	—	—
230	<i>Paluda vitripennis</i> (Fl.)	●	+	+	+	+	—
231	<i>Elymana sulphurella</i> (Zett.)	●	+	+	+	—	—
232	<i>Cicadula persimilis</i> (Edw.)	●	+	—	—	—	—
233	<i>Cicadula quadrinotata</i> F.	+	+	+	—	—	—
234	<i>Mocydiopsis attenuata</i> (Germ.)	+	—	—	—	—	—
235	<i>Speudotettix subfuscus</i> (Fall.)	●	+	—	+	—	—
236	<i>Hesium domino</i> (Reut.)	●	—	—	—	—	—
237	<i>Thamnotettix confinis</i> Zett.	—	—	—	—	—	○
238	<i>Macustus grisescens</i> (Zett.)	○	—	—	—	—	○
239	<i>Athysanus argentarius</i> Metc.	○	—	—	—	—	○
240	<i>Athysanus quadrum</i> Boh.	○	—	—	—	—	○
241	<i>Stictocoris picturatus</i> (C. Shlb.)	●	—	—	—	—	—
242	<i>Scleroracus documanus</i> (Kontk.)	○	—	—	—	—	—
243	<i>Scleroracus transversus</i> (Fall.)	○	—	—	—	—	○
244	<i>Limotettix striola</i> (Fall.)	○	—	—	—	—	—
245	<i>Laburrus impictifrons</i> (Boh.)	○	+	—	—	—	—

1	2	3	4	5	6	7	8
246	<i>Euscelidius schenckii</i> (Kbm.)	●	—	+	—	—	—
247	<i>Conosanus obsoletus</i> (Kbm.)	○	—	—	—	—	—
248	<i>Streptanus aemulans</i> (bm.)	●	+	+	+	+	—
249	<i>Streptanus marginatus</i> (Kbm.)	○	—	—	—	—	—
250	<i>Streptanus sordidus</i> (Zett.)	●	+	+	+	+	—
251	<i>Euscelis incisus</i> (Kbm.)	+	+	—	—	—	—
252	<i>Artianus interstitialis</i> (Germ.)	○	+	+	+	—	○
253	<i>Metalimnius formosus</i> (Boh.)	○	—	—	—	—	—
254	<i>Arocephalus languidus</i> (Fl.)	—	—	+	—	—	—
255	<i>Arocephalus punctum</i> (Fl.)	+	—	—	—	—	—
256	<i>Psammotettix albomarginatus</i> Wagn.	○	—	—	—	—	—
257	<i>Psammotettix alienus</i> (Dhlb.)	●	+	+	+	+	—
258	<i>Psammotettix angulatus</i> (Then)	○	—	—	—	—	—
259	<i>Psammotettix confinis</i> (Dhlb.)	+	+	+	+	+	—
260	<i>Psammotettix poecilus</i> (Fl.)	—	—	—	—	—	○
261	<i>Addarus multinotatus</i> (Boh.)	○	—	—	—	—	—
262	<i>Addarus ocellaris</i> (Fall.)	●	+	+	+	+	—
263	<i>Turrutus socialis</i> (Fl.)	●	+	+	+	—	—
264	<i>Jassargus flori</i> (Fieb.)	●	+	—	—	—	—
265	<i>Pinumius areatus</i> (Stål)	●	●	—	—	—	—
267	<i>Diplocolenus abdominalis</i> (F.)	○	—	—	—	—	—
268	<i>Arthaldeus pascuellus</i> (Fall.)	●	+	+	+	+	—
269	<i>Arthaldeus strifrons</i> (Kbm.)	●	+	+	+	+	—
270	<i>Mocuellus collinus</i> (Boh.)	○	+	+	—	+	○
271	<i>Mocuellus metrius</i> (Fl.)	○	—	—	—	—	—



PIEWIKI (*HOMOPTERA*, *AUCHENORRHYNCHA*) WARSZAWY I MAZOWSZA

## STRESZCZENIE

Na terenie Niziny Mazowieckiej stwierdzono występowanie 270 gatunków piewików (dane literaturowe oraz własne materiały). Wśród nich 32 gatunki odłowione tylko w obrębie aglomeracji warszawskiej, a nie wykazano ich z terenów otaczających, natomiast 52 gatunki wykazano jako nowe dla Mazowsza i w tym dwa — *Ribautiana scalaris* Rib. oraz *Anoplotettix horvathi* Metc. — nowe dla Polski. W Warszawie stwierdzono występowanie 171 gatunków piewików, co stanowi 63% gatunków wykazanych z Mazowsza. W miarę wzrostu presji urbanizacyjnej liczba gatunków piewików maleje. W Warszawie, w różnych typach zieleni miejskiej, stwierdzono kolejno występowanie: w parkach — 97, w zieleni osiedlowej — 60, a na zieleńcach usytuowanych w centrum miasta — 43 gatunki piewików.

Piewiki występujące na obszarze Mazowsza i Warszawy należą do pięciu elementów zoogeograficznych. Udział poszczególnych elementów zmienia się w miarę wzrostu stopnia zurbanizowania terenu. Z porównania udziałów procentowych elementów zoogeograficznych na Mazowszu i na terenach typowo miejskich (parki, zielenie osiedli, zieleńce w centrum) wynika, że w mieście wzrasta udział gatunków o szerokim zasięgu występowania, przede wszystkim gatunków holaraktycznych. Łączny udział gatunków holaraktycznych i palearktycznych z 52% na Mazowszu wzrasta w parkach do 58,8%, w osiedlach do 61,7%, a na zieleńcach usytuowanych w centrum miasta gatunki holaraktyczne i palearktyczne stanowią 76,7% całej fauny piewików.

Podjętą próbę oceny ekologicznej fauny piewików Mazowsza i Warszawy określono przynależność poszczególnych gatunków do ich środowisk naturalnych. Z analizy składu gatunkowego piewików Warszawy i Mazowsza wynika, że w mieście w miarę wzrostu presji urbanizacyjnej zwiększa się udział procentowy gatunków ubikwistycznych oraz gatunków żyjących na łąkach i pastwiskach. Maleje natomiast udział gatunków o większych wymaganiach wilgotnościowych. Wyjątkowo duży udział gatunków łąkowych i pastwiskowych w faunie aglomeracji warszawskiej jest spowodowany przede wszystkim składem florystycznym zieleni miejskiej oraz przesuszeniem terenów zielonych miasta. Stąd gatunki żyjące poza miastem na łąkach i pastwiskach znajdują w mieście dogodne warunki życia. Natomiast piewicy na badanych drzewach środowisk naturalnych i w mieście (w parkach) wykazują podobieństwo składu i liczby gatunków. W parkach występuje na lipie 85,7%, na grabie 83,3%, a na osłsy czarnej 85,7% gatunków żyjących na tych drzewach w środowiskach naturalnych.

*AUCHENORRHYNCHA* (*HOMOPTERA*) ВАРШАВЫ И МАЗОВИИ

## РÉЗЮМЕ

На территории Варшавы и Мазовии констатировано 270 вид *Auchenorrhyncha*. В Варшаве констатировано 171 вид, в субурбиях — 125, в парках — 97, в зелени жилых микрорайонов — 60, в центре города 43 вида. На территории города возрастает количество видов, характеризующихся широким географическим ареалом, прежде всего гомарктических. Как следует из анализа видового состава *Auchenorrhyncha* Варшавы и Мазовии, в городе по мере роста урбанизационного пресса увеличивается процентное содержание убиквистов, а также луговых и пастбищных видов. Благоприятные условия развития в городе находят виды, живущие в кронах деревьев.