

# Revision of charipine aphid hyperparasitoids (Hymenoptera: Cynipoidea: Figitidae) from central Europe

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The Charipinae species of Central Europe are reviewed. Based on 1,439 specimens, 36 species were identified. A diagnosis for each species is provided and the diagnostic features illustrated. *Alloxysta hendrickxi* (Benoit, 1956) and *Alloxysta pilosa* Ferrer-Suay & Pujade-Villar, 2013, are recorded from Europe for the first time. All the other species identified are recorded for the first time from central Europe, mostly from the Czech and Slovak Republics but also from Slovenia and Poland. New trophic relationships are described for some species, which considerably improves the knowledge of Charipinae hosts. In total 389 new trophic relations were established.

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## 1. Introduction

Charipinae is a subfamily composed of very small wasps (0.8–2.0 mm), with smooth and shiny bodies. This subfamily is economically very important because the species act as secondary parasitoids of aphids via Aphidiinae (Hymenoptera: Braconidae) and Aphelininae (Hymenoptera: Aphelinidae) and secondary parasitoids of psyllids via Encyrtidae (Hymenoptera: Chalcidoidea) (Menke & Evenhuis 1991). Due to few morphological features, the taxonomy of Charipinae has been very complicated. However, re-

cently all the described species have been revised (Ferrer-Suay *et al.* 2012b, c, 2013a, b, c, d), making species identification possible.

The basis of the present work is numerous samples collected all over the world, as a part of studies on Aphidiinae. However, the material was mainly collected in the Czech and Slovak Republics (former Czechoslovakia), reflecting the early phases of research undertaken by P. Starý. His approach was based on sampling and rearing tritrophic associations (plant–aphid–parasitoids–hyperparasitoids), taken throughout these countries in different habitats and years. A number of

other countries were also occasionally sampled. Previously, only one study has been published on the Charipinae present in Europe (Balkan Peninsula), describing two new species and establishing many new records (Ferrer-Suay *et al.* 2013f). The only species previously cited from the Czech Republic is *Alloxysta postica* (Hartig, 1841) by Dalla Torre & Kieffer (1910: 257).

In this study, 36 species have been identified, based on a total 1,439 specimens. For each of the species recognized, a diagnosis, list of material studied, host and distribution are provided. Most of the species here identified are recorded for the first time from central Europe (the Czech Republic, the Slovak Republic and some from Slovenia and Poland). Additionally, new trophic relationships are documented for the first time for some species, which considerably improves knowledge of Charipinae hosts. This information is very useful for the analysis of host specialization in this subfamily to augment the most recent publication (Ferrer-Suay *et al.* 2014).

The goal of this work is to improve the knowledge of Charipinae hosts. This paper presents important information on the natural history of some Charipinae species and is based on a relatively large dataset of reared parasitoids. These types of studies are the base of the ecological knowledge of the subfamily Charipinae, which will be very useful in the future for the biological control programs.

## 2. Materials and methods

The approach of the fieldwork was to determine tritrophic associations (plant–aphid–parasitoid) in different habitats. A piece of aphid-infested plant was gently cut with scissors and transferred into a plastic jar (250–500 cm) covered by nylon mesh. The plant was either identified in situ or taken as a herbarium sample. Also, part of the aphids, and even attending ants, was preserved in 70% ethanol for later identification. The jars were then transferred to the laboratory where they were kept at room temperature or in a temperature controlled room under +18–24 °C and generally visited daily to sample emerging parasitoids. However, the samples were maintained for about two next weeks, when the whole sample was re-

visited to collect the other (hyper) parasitoids and, eventually, other natural enemies from the litter on the bottom. Each sample was numbered.

The specimens were studied using a stereo microscope (NIKON SMZ-1) and environmental scanning electron microscope (FEI Quanta 200 ESEM) belonging to “Serveis Científicotècnics de la Universitat de Barcelona”. The field-emission gun environmental scanning electron microscope was used for high-resolution imaging without gold-coating of the specimens.

The morphological terms used are taken from Paretas-Martínez *et al.* (2007). The measurements and abbreviations include F1–F12 for the first and subsequent flagellomeres. The width of the forewing radial cell is measured from the margin of the wing to the beginning Rs vein. The transfacial line is measured as the distance between the inner margins of the compound eyes, measured across the face through the antennal sockets divided by the height of the eye. The malar space is measured by the distance from the lower part of the gena from the mouthparts to the ventral margin of the compound eye, divided by the height of the eye. In the descriptions, females and males of each species have the same characters except where indicated.

The new host’s records have an asterisk before the name in the Material studied section for each species and also in Table 1. Abbreviations used in the locality data (the Czech Republic and the Slovak Republic) in the Material studied sections are:

Boh, B. – Bohemia

Mor, M. – Moravia (parts of the Czech Republic)

Slov, S. – the Slovak Republic

bor. – borealis

c. – centralis

m. – meridionalis

occ. – occidentalis

or. – orientalis

XX/YY – sample numbers (YY) in the individual years (XX). e.g. 58 = 1958, 66 = 1966

BZKU – Botanická zahrada KU, Praha 2 = Botanical garden of the Charles University

For better comparison, the figures of the antennae of *Alloxysta* species are grouped in Fig. 1 and those of *Phaenoglyphis* species in Fig. 2, the ra-

Table 1. List of aphid–parasitoid host records for the Charipinae species identified from the Stary collection. The new host records have an asterisk before the name of each species. The specific relationships between aphids and primary parasitoids are presented in the material studied section of each species.

Charipinae species	Aphid	Primary parasitoid	
<i>Alloxysta arcuata</i>	<i>Aphis</i> sp.	* <i>Aphidius microlophii</i>	
	<i>Aphis brohmeri</i>	* <i>Binodoxys acalephae</i>	
	* <i>Aphis cichorii</i>	* <i>Binodoxys angelicae</i>	
	* <i>Aphis cognatella</i>	* <i>Binodoxys brevicornis</i>	
	* <i>Aphis craccae</i>	<i>Diaeretiella rapae</i>	
	* <i>Aphis craccivora</i>	* <i>Ephedrus cerasicola</i>	
	<i>Aphis fabae</i>	* <i>Ephedrus dysaphidis</i>	
	* <i>Aphis farinosa</i>	* <i>Ephedrus nacheri</i>	
	<i>Aphis idaei</i>	<i>Ephedrus persicae</i>	
	* <i>Aphis intybi</i>	* <i>Ephedrus plagiator</i>	
	<i>Aphis nasturtii</i>	* <i>Lipolexis gracilis</i>	
	* <i>Aphis pomi</i>	* <i>Lysiphlebus cardui</i>	
	* <i>Aphis salviae</i>	* <i>Lysiphlebus fabarum</i>	
	<i>Aphis urticata</i>	* <i>Lysiphlebu gr. fabarum</i>	
	* <i>Aphis viburni</i>	* <i>Monoctonus ligustri</i>	
	<i>Brachycaudus</i> sp.	* <i>Monoctonus mali</i>	
	* <i>Brachycaudus cardui</i>	* <i>Praon abjectum</i>	
	<i>Dysaphis plantaginea</i>	* <i>Praon necans</i>	
	<i>Eucallipterus tiliae</i>	* <i>Praon volucre</i>	
	<i>Euceraphis punctipennis</i>	* <i>Trioxys curvicaudus</i>	
	* <i>Hyadaphis foeniculi</i>	* <i>Trioxys pallidus</i>	
	<i>Impatientinum balsamines</i>	* <i>Trioxys tenuicaudus</i>	
	* <i>Lipaphis erysimi</i>		
	<i>Macrosiphum rosae</i>		
	* <i>Microlophium carnosum</i>		
	<i>Myzaphis rosarum</i>		
	<i>Myzus cerasi</i>		
	<i>Myzus ligustri</i>		
	* <i>Rhopalosiphum insertum</i>		
	* <i>Rhopalosiphum nymphaeae</i>		
	<i>Schizaphistylphaeae</i>		
	* <i>Kallistaphis flava</i>		
	<i>Alloxysta basimacula</i>		
	<i>Alloxysta brachyptera</i>	* <i>Hayhurstia atriplicis</i>	* <i>Diaeretiella rapae</i>
		<i>Hydaphias</i> sp.	
<i>Alloxysta brevis</i>	<i>Aphis</i> sp.	* <i>Aphidius absinthii</i>	
	* <i>Aphis brohmeri</i>	* <i>Aphidius arvensis</i>	
	* <i>Aphis cichorii</i>	* <i>Aphidius colemani</i>	
	* <i>Aphis craccae</i>	* <i>Aphidius matricariae</i>	
	<i>Aphis fabae</i>	<i>Aphidius galiobii</i>	
	* <i>Aphis farinosa</i>	* <i>Binodoxys acalephae</i>	
	* <i>Aphis idaei</i>	* <i>Binodoxys angelicae</i>	
	* <i>Aphis intybi</i>	* <i>Binodoxys brevicornis</i>	
	* <i>Aphis jacobaeae</i>	<i>Diaeretiella rapae</i>	
	* <i>Aphis nasturtii</i>	* <i>Ephedrus nacheri</i>	
	* <i>Aphis pomi</i>	<i>Ephedrus persicae</i>	
	<i>Aphis rumicis</i>	* <i>Ephedrus plagiator</i>	
	* <i>Aphis sambuci</i>	* <i>Lipolexis gracilis</i>	
	* <i>Aphis spiraephaga</i>	* <i>Lysiphlebus cardui</i>	
	* <i>Aphis urticata</i>	* <i>Lysiphlebus fabarum</i>	
	* <i>Aphis viburni</i>	* <i>Praon abjectum</i>	
	<i>Brachycaudus</i> sp.	* <i>Praon necans</i>	
	<i>Cinara</i> sp.	<i>Praon volucre</i>	
	<i>Cryptosiphum artemisiae</i>		

Table 1, continued

	<i>Galiobium</i>	
	* <i>Hayhurstia atriplicis</i>	
	* <i>Hyadaphis foeniculi</i>	
	* <i>Macrosiphum rosae</i>	
	* <i>Myzus ligustri</i>	
	* <i>Rhopalosiphum nymphaeae</i>	
<i>Alloxysta castanea</i>	<i>Aphis</i> sp.	* <i>Aphidius aquilus</i>
	* <i>Aphis fabae</i>	<i>Aphidius rosae</i>
	<i>Aulacorthum</i> sp.	* <i>Aphidius salicis</i>
	<i>Betulaphis</i> sp.	* <i>Aphidius transcaspicus</i>
	<i>Cavariella</i> sp.	* <i>Aphidius urticae</i>
	* <i>Ceruraphis eriophori</i>	* <i>Aphidius uzbekistanicus</i>
	<i>Cryptomyzus</i> sp.	<i>Binodoxys angelicae</i>
	<i>Euceraphis</i> sp.	* <i>Ephedrus lacertosus</i>
	<i>Hyalopterus pruni</i>	* <i>Ephedrus laevis</i>
	<i>Hyperomyzus</i> sp.	* <i>Ephedrus plagiator</i>
	* <i>Liosomaphis berberidis</i>	* <i>Lysiphlebus cardui</i>
	* <i>Macrosiphum euphorbiellus</i>	<i>Praon volucre</i>
	<i>Macrosiphum prenanthidis</i>	
	* <i>Macrosiphum rosae</i>	
	<i>Myzaphis rosarum</i>	
	<i>Ovatus</i> sp.	
	* <i>Phorodon humili</i>	
	* <i>Rhopalosiphoninus</i> sp.	
	* <i>Rhopalosiphum padi</i>	
	<i>Sitobion</i> sp.	
<i>Alloxysta circumscripta</i>	* <i>Aphis fabae</i>	* <i>Binodoxys angelicae</i>
		* <i>Praon abjectum</i>
<i>Alloxysta citripes</i>	* <i>Aphis cognatella</i>	* <i>Binodoxys angelicae</i>
	* <i>Brachycaudus cardui</i>	<i>Falciconus pseudoplatani</i>
	<i>Chromaphis juglandicola</i>	* <i>Lysiphlebus gr. fabarum</i>
	* <i>Drepanosiphum platanoides</i>	* <i>Praon flavinode</i>
	<i>Eucallipterus tiliae</i>	* <i>Trioxyx cirsii</i>
	<i>Hoplocallis rupertii</i>	* <i>Trioxyx curvicaudus</i>
	* <i>Myzocallis carpini</i>	<i>Trioxyx pallidus</i>
	<i>Myzocallis coryli</i>	* <i>Trioxyx tenuicaudus</i>
	<i>Periphyllus</i> sp.	
	<i>Thelaxes</i> sp.	
	<i>Tinocallis</i> sp.	
	<i>Tuberculatus annulatus</i>	
<i>Alloxysta consobrina</i>	* <i>Acyrtosiphon pisum</i>	<i>Aphidius</i> sp.
	<i>Aphis fabae</i>	* <i>Aphidius arvensis</i>
	* <i>Aphis urticae</i>	* <i>Aphidius ervi</i>
	<i>Brevicoryne brassicae</i>	* <i>Aphidius hieraciorum</i>
	<i>Cavariella</i> sp.	* <i>Aphidius hortensis</i>
	* <i>Coloradoa achilleae</i>	* <i>Aphidius ribis</i>
	<i>Cryptomyzus ribis</i>	<i>Aphidius salicis</i>
	<i>Hyadaphis</i> sp.	* <i>Binodoxys angelicae</i>
	* <i>Liosomaphis berberidis</i>	* <i>Binodoxys brevicornis</i>
	<i>Nasonovia</i> sp.	<i>Diaretiella rapae</i>
	* <i>Therioaphis trifolii</i>	* <i>Lysiphlebus fabarum</i>
		* <i>Lysiphlebus gr. fabarum</i>
		* <i>Praon exsoletum</i>
<i>Alloxysta fracticornis</i>	* <i>Acyrtosiphon</i> sp.	* <i>Aphidius urticae</i>
<i>Alloxysta halterata</i>	* <i>Aulacorthum langei</i>	
<i>Alloxysta hendrikxi</i>	* <i>Aphis fabae</i>	
	<i>Aphis poterii</i>	

Table 1, continued

<i>Alloxysta kovilovika</i>	<i>*Brachycaudus helichrysi</i>	<i>*Diaretiella rapae</i>
<i>Alloxysta leunisii</i>	<i>*Brevicoryne brassicae</i>	<i>Aphidius ervi</i>
<i>Alloxysta macrophadna</i>	<i>Acyrtosiphon pisum</i>	<i>*Aphidius rosae</i>
	<i>Amphorophora ampullata</i>	<i>*Aphidius urticae</i>
	<i>Dysaphis</i> sp.	<i>*Ephedrus persicae</i>
	<i>Euceraphis</i> sp.	<i>*Ephedrus plagiator</i>
	<i>Judenkoa</i> sp.	<i>*Praon volucre</i>
	<i>*Macrosiphum daphnidis</i>	
	<i>*Macrosiphum funestum</i>	
	<i>*Macrosiphum gei</i>	
	<i>*Macrosiphum rosae</i>	
	<i>Rhopalomyzus</i> sp.	
	<i>*Uroleucon aeneus</i>	
<i>Alloxysta melanogaster</i>	<i>*Amphorophora</i> sp.	<i>*Ephedrus cerasicola</i>
	<i>*Myzus cerasi</i>	<i>*Ephedrus lacertosus</i>
	<i>Rhopalosiphoninus</i> sp.	<i>Ephedrus persicae</i>
		<i>*Ephedrus plagiator</i>
<i>Alloxysta mullensis</i>	<i>Aphis</i> sp.	<i>*Adialytus ambiguus</i>
	<i>*Aphis craccivora</i>	<i>*Binodoxys angelicae</i>
	<i>Aphis fabae</i>	<i>*Ephedrus plagiator</i>
	<i>*Aphis farinosa</i>	<i>*Lipolexis gracilis</i>
	<i>*Aphis frangulae</i>	<i>*Lysiphlebus cardui</i>
	<i>Aphis jacobaeae</i>	<i>Lysiphlebus fabarum</i>
	<i>*Aphis pomi</i>	<i>Praon abjectum</i>
	<i>*Aphis sambuci</i>	
	<i>*Aphis viburni</i>	
	<i>Sipha</i> sp.	
<i>Alloxysta nigricans</i>	<i>Periphyllus</i> sp.	<i>*Euaphidius setiger</i>
<i>Alloxysta obscurata</i>	<i>Aulacorthum</i> sp.	<i>*Aphidius urticae</i>
	<i>Linosiphon</i> sp.	<i>*Aphidius ribis</i>
	<i>*Myzus galeopsidis</i>	
<i>Alloxysta pallidicornis</i>	<i>Cinara</i> sp.	<i>*Pauesia laricis</i>
		<i>*Pauesia pini</i>
<i>Alloxysta pilipennis</i>	<i>Acyrtosiphon caraganae</i>	<i>*Aphidius phalangomyzi</i>
	<i>Aphis fabae</i>	<i>*Areopraon silvestre</i>
	<i>*Aphis pomi</i>	<i>Binodoxys angelicae</i>
	<i>*Cryptomyzus ribis</i>	<i>*Dyscritulus planiceps</i>
	<i>*Drepanosiphum platanoides</i>	<i>*Ephedrus cerasicola</i>
	<i>Dysaphis</i> sp.	<i>*Ephedrus dysaphidis</i>
	<i>Dysaphis plantaginea</i>	<i>*Ephedrus persicae</i>
	<i>Eucallipterus</i> sp.	<i>*Ephedrus plagiator</i>
	<i>*Macrosiphum rosae</i>	<i>*Euaphidius setiger</i>
	<i>Macrosiphoniella oblonga</i>	<i>*Falciconus pseudoplatani</i>
	<i>Myzus cerasi</i>	<i>*Lysiphlebus fabarum</i>
	<i>Myzus varians</i>	<i>*Praon volucre</i>
	<i>Periphyllus</i> sp.	<i>*Trioxys cirsii</i>
	<i>Periphyllus aceris</i>	<i>*Trioxys curvicaudus</i>
	<i>Periphyllus hirticonis</i>	<i>Trioxys falcatus</i>
	<i>*Peryphyllus lyropictus</i>	
	<i>Peryphyllus rthenanus</i>	
	<i>*Peryphyllus testudinaceus</i>	
	<i>*Phorodon humili</i>	
	<i>Rhopalomyzus</i> sp.	
<i>Alloxysta pilosa</i>	<i>*Impatiensinum balsamines</i>	<i>*Monoctonus nervosus</i>
<i>Alloxysta pleuralis</i>	<i>Aphis</i> sp.	<i>*Aphidius salicis</i>
	<i>*Aphis cognatella</i>	<i>*Binodoxys acalephae</i>
	<i>Aphis craccae</i>	<i>*Binodoxys angelicae</i>

Table 1, continued

	<i>Aphis craccivora</i>	* <i>Ephedrus cerasicola</i>
	<i>Aphis fabae</i>	* <i>Ephedrus heleni</i>
	* <i>Aphis farinosa</i>	* <i>Ephedrus nacheri</i>
	* <i>Aphis intybi</i>	* <i>Ephedrus persicae</i>
	* <i>Aphis mordwiliana</i>	* <i>Lipolexis gracilis</i>
	* <i>Apis nasturtii</i>	* <i>Lysiphlebus cardui</i>
	<i>Aphis pomi</i>	<i>Lysiphlebus fabarum</i>
	* <i>Aphis salviae</i>	* <i>Lysiphlebus fritzmulleri</i>
	* <i>Aphis spiraephaga</i>	* <i>Praon abjectum</i>
	* <i>Aphis urticae</i>	
	* <i>Aphis viburni</i>	
	* <i>Cavariella</i> sp.	
	* <i>Myzus cerasi</i>	
<i>Alloxysta postica</i>	<i>Brachycaudus</i>	* <i>Aphidius salicis</i>
	<i>Cavariella</i> sp.	<i>Binodoxys angelicae</i>
		* <i>Ephedrus persicae</i>
<i>Alloxysta pusilla</i>	<i>Aphis</i> sp.	* <i>Aphidius matricariae</i>
	* <i>Aphis euphorbiae</i>	* <i>Binodoxys acalephae</i>
	<i>Aphis fabae</i>	* <i>Binodoxys angelicae</i>
	* <i>Aphis farinosa</i>	* <i>Diaeretiella rapae</i>
	* <i>Aphis intybi</i>	* <i>Ephedrus plagiator</i>
	* <i>Aphis polygonata</i>	* <i>Lipolexis gracilis</i>
	* <i>Aphis salviae</i>	* <i>Lysiphlebus fabarum</i>
	* <i>Aphis urticae</i>	* <i>Monoctonus ligustri</i>
	<i>Capitophorus</i>	* <i>Praon abjectum</i>
	<i>Cavariella</i> sp.	* <i>Praon volucre</i>
	<i>Hyalopterus pruni</i>	
	* <i>Myzus ligustri</i>	
	* <i>Phorodon humuli</i>	
	* <i>Rhopalomyzus alpigenae</i>	
	<i>Schizaphistypheae</i>	
<i>Alloxysta ramulifera</i>	<i>Aphis</i> sp.	* <i>Binodoxys angelicae</i>
	* <i>Aphis fabae</i>	* <i>Ephedrus nacheri</i>
	<i>Aphis rumicis</i>	* <i>Lysiphlebus fabarum</i>
	* <i>Aphis spiraephaga</i>	* <i>Lysiphlebus confusus</i>
	* <i>Aphis urticae</i>	* <i>Praon volucre</i>
<i>Alloxysta sawoniewiczzi</i>	* <i>Lipaphis erysimi</i>	
	* <i>Aphis farinosa</i>	* <i>Binodoxys angelicae</i>
	<i>Hyadaphis foeniculi</i>	
<i>Alloxysta semiaperta</i>	<i>Hyperomyzus</i> sp.	* <i>Aphidius rosae</i>
	* <i>Impatiensiphum asiaticum</i>	* <i>Aphidius urticae</i>
	* <i>Impatiensiphum balsamines</i>	* <i>Ephedrus plagiator</i>
	<i>Linosiphon</i> sp.	* <i>Praon longicorne</i>
	* <i>Macrosiphum gei</i>	* <i>Praon volucre</i>
	* <i>Macrosiphum rosae</i>	
	<i>Myzocallis</i> sp.	
<i>Alloxysta victrix</i>	<i>Acyrtosiphon</i> sp.	* <i>Aphidius aquilus</i>
	* <i>Acyrtosiphon caraganae</i>	* <i>Aphidius arvensis</i>
	* <i>Amphorophora ampullata</i>	<i>Aphidius ervi</i>
	* <i>Aphis cognatella</i>	* <i>Aphidius hieraciorum</i>
	<i>Aulacorthum</i> sp.	* <i>Aphidius linosiphonis</i>
	<i>Betulaphis</i> sp.	<i>Aphidius matricariae</i>
	<i>Brachycaudus</i> sp.	* <i>Aphidius microlophii</i>
	* <i>Brachycaudus klugkisti</i>	* <i>Aphidius ribis</i>
	<i>Brevicoryne brassicae</i>	<i>Aphidius rosae</i>
	<i>Capitophorus</i> sp.	<i>Aphidius salicis</i>

Table 1, continued

	<i>Cavariella</i> sp.	* <i>Aphidius urticae</i>
	<i>Coloradoa artemisiae</i>	<i>Aphidius uzbekistanicus</i>
	* <i>Cryptomyzus ribis</i>	* <i>Areopraon silvestris</i>
	<i>Macrosiphum</i> sp.	* <i>Betuloxys compressicornis</i>
	* <i>Macrosiphum euphorbiae</i>	* <i>Binodoxys angelicae</i>
	* <i>Macrosiphum funestum</i>	* <i>Diaretiella rapae</i>
	* <i>Macrosiphum gei</i>	* <i>Ephedrus lacertosus</i>
	* <i>Macrosiphum melampyri</i>	* <i>Ephedrus plagiator</i>
	* <i>Macrosiphum oredonensis</i>	* <i>Euaphidius setiger</i>
	* <i>Macrosiphum prenathidis</i>	<i>Lysiphlebus fabarum</i>
	<i>Macrosiphum rosae</i>	* <i>Praon pubescens</i>
	<i>Microlophium carnosum</i>	* <i>Praon necans</i>
	* <i>Myzus ajugae</i>	<i>Praon volucre</i>
	<i>Myzus galeopsidis</i>	* <i>Praon yomenae</i>
	<i>Myzus persicae</i>	* <i>Toxares deltiger</i>
	<i>Nasonovia</i> sp.	
	<i>Peryphyllus</i> sp.	
	* <i>Periphyllus lyropictus</i>	
	<i>Rhopalosiphum nymphaeae</i>	
	* <i>Rhopalosiphum padi</i>	
	<i>Sitobion avenae</i>	
<i>Phaenoglyphis evenhuisi</i>	<i>Brachycaudus lychnidis</i>	* <i>Diaretiella rapae</i>
<i>Phaenoglyphis heterocera</i>	<i>Aphis fabae</i>	* <i>Praon volucre</i>
	* <i>Aphis sambuci</i>	* <i>Binodoxys angelicae</i>
	<i>Brachycaudus</i> sp.	* <i>Lipolexis gracilis</i>
	* <i>Uroleucon cichorii</i>	* <i>Lysiphlebus fabarum</i>
<i>Phaenoglyphis longicornis</i>	<i>Uroleucon</i> sp.	* <i>Lysiphlebus gr. fabarum</i>
<i>Phaenoglyphis ruficornis</i>	<i>Cinara juniperi</i>	* <i>Praon abjectum</i>
<i>Phaenoglyphis salicis</i>	* <i>Aphis fabae</i>	* <i>Aphidius funebris</i>
	<i>Cavariella</i> sp.	* <i>Pauesia juniperorum</i>
<i>Phaenoglyphis stricta</i>	* <i>Aphis urticata</i>	* <i>Lysiphlebus fabarum</i>
<i>Phaenoglyphis villosa</i>	* <i>Aphis craccae</i>	* <i>Aphidius salicis</i>
	<i>Aphis fabae</i>	* <i>Binodoxys brevicornis</i>
	<i>Aphis farinosa</i>	* <i>Binodoxys acalephae</i>
	<i>Aphis spiraephaga</i>	<i>Aphidius hortensis</i>
	* <i>Aphis urticata</i>	* <i>Aphidius matricariae</i>
	<i>Brevicoryne brassicae</i>	* <i>Aphidius transcaspicus</i>
	<i>Hyadaphis</i> sp.	* <i>Aphidius urticae</i>
	<i>Hyalopterus pruni</i>	* <i>Binodoxys angelicae</i>
	<i>Hyperomyzus</i> sp.	* <i>Binodoxys acalephae</i>
	<i>Liosomaphis berberidis</i>	<i>Diaretiella rapae</i>
	<i>Myzus cerasi</i>	<i>Ephedrus persicae</i>
	<i>Myzus ligustri</i>	<i>Ephedrus plagiator</i>
<i>Myzus persicae</i>	* <i>Monoctonus ligustri</i>	* <i>Lysiphlebus cardui</i>
	* <i>Rhopalosiphum nymphaeae</i>	<i>Lysiphlebus fabarum</i>
	<i>Schizaphis</i> sp.	* <i>Lysiphlebus fritzmuelleri</i>
	<i>Praon volucre</i>	
<i>Phaenoglyphis xanthochroa</i>	* <i>Impatiatinum balsamines</i>	* <i>Praon abjectum</i>
		* <i>Praon necans</i>
		* <i>Monoctonus nervosus</i>

dial cells of *Alloxysta* species in Figs 3 and 4, different types of pronotum in Fig. 5 and different types of propodeum in Fig. 6.

The material is deposited in P. Starý's personal collection (when not indicated) or in the University of Barcelona (UB) (indicated).

### 3. Annotated list of Charipinae aphid hyperparasitoids from the Czech and Slovak Republics

#### 3.1. *Alloxysta arcuata* (Kieffer, 1902)

*Diagnosis.* *Alloxysta arcuata* is mainly characterized having a small closed radial cell 2.3 times as long as wide (Fig. 3a), pronotal carinae present (Fig. 5a), propodeal carinae forming a plate (Fig. 6a), female antennae with beginning of rhinaria in F3; F1 subequal to pedicel and longer to F2, F2 subequal to F3 (Fig. 1a), male antennae with beginning of rhinaria in F2, F2 slightly curved, F1 longer than pedicel, F1 subequal to F2, F2 shorter than F3. It is similar to *Alloxysta ramulifera* (Thomson, 1862) but can be differentiated by the beginning of rhinaria: in F3 in *A. arcuata* (Fig. 1a) while in F4 in *A. ramulifera* (Fig. 1y); shape of pronotal carinae: well defined and visible in *A. arcuata* but small and sometimes difficult to see under the pubescence in *A. ramulifera*; size of radial cell: 2.3 times as long as wide in *A. arcuata* (Fig. 3a) but 2.0 in *A. ramulifera* (Fig. 4i) and shape of propodeal carinae: with curved sides in *A. arcuata* and with straight sides in *A. ramulifera*.

*Material studied.* 62♂ & 90♀. "57/96, Praha, BZKU, B. c., 3.VI.1957, *Aphis fabae*, *Euonymus europaeus*": 2♀; "58/120, Praha, Seminářská zahrada, B. c., 8.VI.1958, *Aphis fabae*, *Philadelphus*": 1♂; "58/228, Komárov, B. or. 23.VII.1958, *Aphis cognatella*, *Euonymus europaeus*, *Binodoxys angelicae*": 1♀; "58/229, Praha, BZKU, B. c., 28.VI.1958, *Aphis fabae*, *Chenopodium album*, *Lysiphlebus fabarum*": 1♂ & 2♀; "58/231, Praha, BZKU, B. c., 28.VII.1958, *Aphis craccivora*, *Robinia pseudoacacia*, *Ephedrus plagiator*": 1♂; "58/29, Šíd, Fil'ákovo, Slov. m., 22.V.1958, *Aphis fabae*, *Euonymus europaeus*": 1♀; "58/61, Pusté Čemerné, nr. Michalovice, Slov. or.,

26.V.1958, *Aphis fabae*, *Euonymus europaeus*": 2♂ & 1♀; "58/84, Chochoľná, Trenčín, Slov. occ., 29.V.1958, *Myzus ligustri*, *Ligustrum*, *Ephedrus cerasicola*": 1♂; "59/111, Praha, BZKU, B. c., 9.VI.1959, *Aphis viburni*, *Viburnum opulus*, *Binodoxys angelicae*": 1♂ & 3♀; "59/20, Kysak, Slov. or., 23.V.1959, *Aphis fabae*, *Euonymus europaeus*, *Ephedrus plagiator*": 1♂; "59/217, Zátaví, B. m., 26.VI.1959, *Myzaphis, Rosa*": 3♀; "59/232, Orlik, B. m., 26.VI.1959, *Aphis, Cirsium*, *Binodoxys angelicae*": 1♀; "59/79, Praha, Seminářská zahrada, B. c., 24.V.1959, *Aphis fabae*, *Euonymus europaeus*, *Binodoxys angelicae*": 1♀; "60/116, Čelákovice B. c., 26.V.1960, *Dysaphis, Crataegus*": 1♀; "60/141, Král.Chlmec, Slov. or., 1.VI.1960, *Aphis urticata*, *Urtica dioica*, *Binodoxys aculephae*": 1♂ & 1♀; "60/164, Král.Chlmec, Slov. or., 1.VI.1960, *Aphis, Onobrychis sativa*, *Binodoxys aculephae*": 1♀; "60/2, Malá Jiz. Louka, Jizerské hory, B. bor., 19.V.1960, *Cinara* sp., *Pinus uncinata*": 6♂ & 3♀; "60/212, Uherčice, M. m., 4.VI.1960, *Aphis salviae*, *Salvia nemorosa*, *Binodoxys aculephae*, *Lipolexis gracilis*": 1♀; "60/320, Praha, Seminářská zahrada, B. c., 12.VI.1960, *Aphis urticata*, *Urtica dioica*, *Binodoxys aculephae*": 1♂; "60/337, Praha, BZKU, B. c., 15.VI.1960, *Myzus cerasi*, *Prunus cerasus*, *Ephedrus persicae*": 2♀; "60/380, Dobříš, B. c., 23.VI.1960, M. only, *Quercus*": 2♀; "60/388, Praha, BZKU, B. c., 24.VI.1960, *Dysaphis, Pyrus communis*": 1♂; "60/411, Praha, Vojanovy sady, B. c., 26.VI.1960, *Eucallipterus tiliae*, *Tilia*, *Trioxyys pallidus*, *Trioxyys curvicaudus*": 1♀; "60/417, Praha, Chotkovy sady, B. c., 27.VI.1960, *Eucallipterus, Tilia*, *Trioxyys tenuicaudus*": 1♀; "60/42, Pouzdřany, M. m., 19.V.1960, *Myzus cerasi*, *Prunus avium*, *Lipolexis gracilis*": 1♀; "60/424, Praha, BZKU, B. c., 28.VI.1960, *Aphis fabae*, *Rumex*, *Binodoxys angelicae*, *Lipolexis gracilis*, *Lysiphlebus fabarum*": 2♂ & 1♀; "60/440, Mnich. Hradiště, B. c., 1.VII.1960, *Aphis fabae*, *Beta vulgaris*": 1♀; "60/442, Praha, BZKU, B. c., 6.VII.1960, *Aphis farinosa*, *Salix*, *Binodoxys angelicae*": 2♀; "60/443, Praha, BZKU, B. c., 7.VII.1960, *Brachycaudus*, *Prunus persica*, *Binodoxys angelicae*, *Lysiphlebus gr. fabarum*": 1♂; "60/443, Praha, BZKU, B. c.,



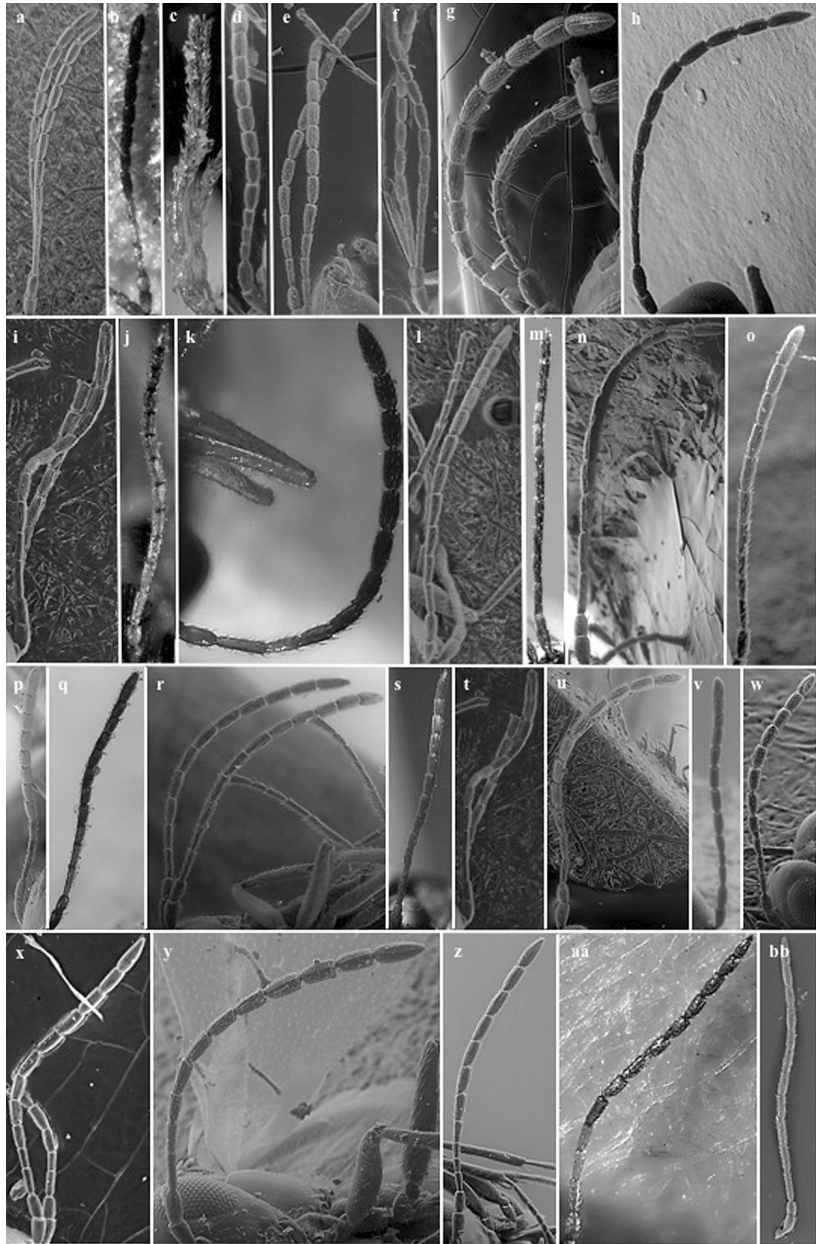


Fig. 1. Types of *Alloxysta* antennae. – a. *Alloxysta arcuata*. – b. *A. basimacula*. – c. *A. brachyptera*. – d. *A. brevis*. – e. *A. castanea*. – f. *A. circumscripta*. – g. *A. citripes*. – h. *A. consobrina*. – i. *A. fracticornis*. – j. *A. halterata*. – k. *A. hendrickxi*. – l. *A. kovilovicus*. – m. *A. leunisii*. – n. *A. macrophadna*. – o. *A. melanogaster*. – p. *A. mullensis*. – q. *A. nigricans*. – r. *A. obscurata*. – s. *A. pallidicornis*. – t. *A. pilipennis*. – u. *A. pilosa*. – v. *A. pleuralis*. – w. *A. postica*. – x. *A. pusilla*. – y. *A. ramulifera*. – z. *A. sawoniewiczii*. – aa. *A. semiaperta*. – bb. *A. victrix*.

7.VII.1960, *Brachycaudus*, *Prunus persica*, *Binodoxys angelicae*, *Ephedrus persicae*: 1♂; “60/447, Praha, Seminářská zahrada, B. c., 8.VII.1960, *Aphis*, *Laburnum vulgare*: 1♂ & 2♀; “60/458, Mažice, B. m., 12.VII.1960, *Aphis idaei*, *Rubus idaeus*: 1♂; “60/487, Praha, BZKU, B. c., 16.VII.1960, *Anthemis sancti-johannis*: 1♂; “60/503, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Rumex conglomeratus*, *Binodoxys acalephae*: 8♂ & 2♀; “60/504,

Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Rumex flexuosus*: 1♂; “60/523, Dobřichovice, B. c., 26.VII.1960, *Aphis*, *Rumex*, *Lysiphlebus fabarum*: 1♀; “60/531, Dobřichovice, B. c., 26.VII.1960, *Compositae*: 1♂; “60/543, Trněný Újezd, B. c., 26.VII.1960, *Aphis fabae*, *Beta vulgaris*, *Lysiphlebus fabarum*: 2♀; “60/583, Č. Brod, B. c. 28.VII.1960, \**Brachycaudus cardui*, *Arctium lappa*: 3♀; “60/585, Č. Brod, B. c., 28.VII.1960, *Aphis*, *Robinia pseudoacacia*: 4♂;

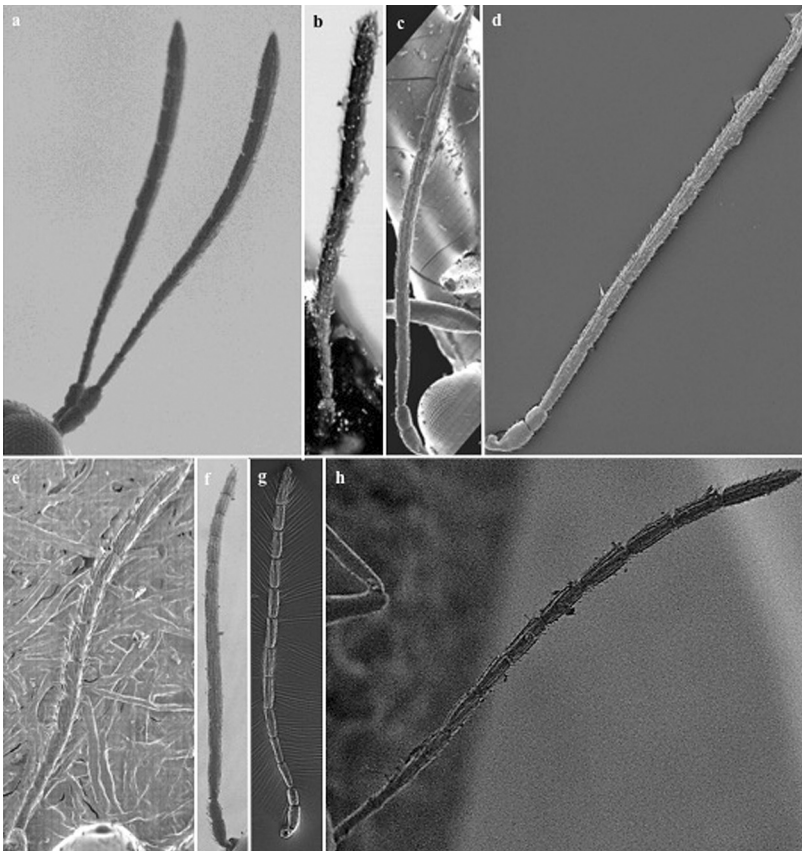


Fig. 2. Types of *Phaenoglyphis* antennae. – a. *Phaenoglyphis evenhuisi*. – b. *P. heterocea*. – c. *P. longicornis*. – d. *P. ruficornis*. – e. *P. salicis*. – f. *P. stricta*. – g. *P. villosa*. – h. *P. xanthochroa*.

“61/132 Praha, BZKU, B. c., 1.VI.1961, *Aphis, Rhamus cathartica*”: 1♀; “61/233, Královský Chlmec, Slov. or., 6.VI.1961, *Myzus ligustri, Ligustrum, \*Ephedrus cerasicola, \*Monoctonus ligustri*”: 1♀; “61/245, Somotor, Slov. m., 7.VI.1961, *Aphis fabae, Silene alba, Lysiphlebus fabarum*”: 3♀; “61/283, Svătoša, Slov. or., 8.VI.1961, *Myzus cerasi, Prunus avium, Ephedrus persicae*”: 1♀; “61/314, Piliš, Slov. N. Město, Slov. or., 9.VI.1961, *\*Aphis cichorii, Cichorium intybus, Lipolexis gracilis*”: 3♀; “61/349, Plešivec, Slov. or., 10.VI.1961, *Aphis fabae, Papaver*”: 1♂; “61/506, Štúrovo, Slov. m., 27.VI.1961, *Hyadaphis, Conium maculatum, \*Binodoxys brevicornis*”: 1♂; “61/642, Pavlovské kopce, M. m., 3.VII.1961, *Aphis fabae, Arctium*”: 1♀; “62/375, Žirovnice, B. m., VIII.1962, *Aphis fabae, Cirsium*”: 1♂ & 1♀; “62/528, Smilovy hory, B. m., VIII.1962, *Aphis fabae, Cirsium, Lysiphlebus fabarum*”: 1♀; “64/150, Praha, B. c., 22.VI.1964, *Aphis nasturtii, Nasturtium, Binodoxys acalephae*”: 1♂ & 1♀;

“64/50, Bánovce, Slov.m., 30.V.1964, *Aphis salviae, Salvia, Lipolexis gracilis*”: 1♀; “64/79, Luka p. Medníkem, B. c., VI.1964, *Aphis brohmeri, Anthriscus silvestris, Lysiphlebus fabarum*”: 2♂ & 5♀; “66/100, Lednice, M. m., 24.V.1966, *Aphis urticata, Urtica dioica, Lysiphlebus fabarum*”: 3♀; “66/127, Praha, Strahovská zahrada, B. c., 25.VI.1966, *Euceraphis, Betula verrucosa*”: 3♀; “67/26, Český Krumlov, B. m., 8.VII.1967, *\*Microlophium carnosum, Urtica dioica, \*Aphidius microlophii*”: 1♀; “70/116, Valtice, M. m., 19.VI.1970, *Aphis urticata, Urtica dioica, Lysiphlebus fabarum*”: 2♂ & 2♀; “70/98, Těchobuz, nr. Pacov, B. m., 15.VI.1970, *\*Lipaphis erysimi, Thlaspi arvense, \*Ephedrus nacheri, \*Praon volucre*”: 1♀; “71/11, Valtice M. m., 11.V.1971, *\*Rhopalosiphum insertum, Dysaphis plantaginea, Malus communis, \*Ephedrus dysaphidis, \*Monoctonus mali*”: 2♀; “71/137, Praha, Karlovo náměstí, B. c., 13.VII.1971, *\*Hyadaphis foeniculi, Lonicera*

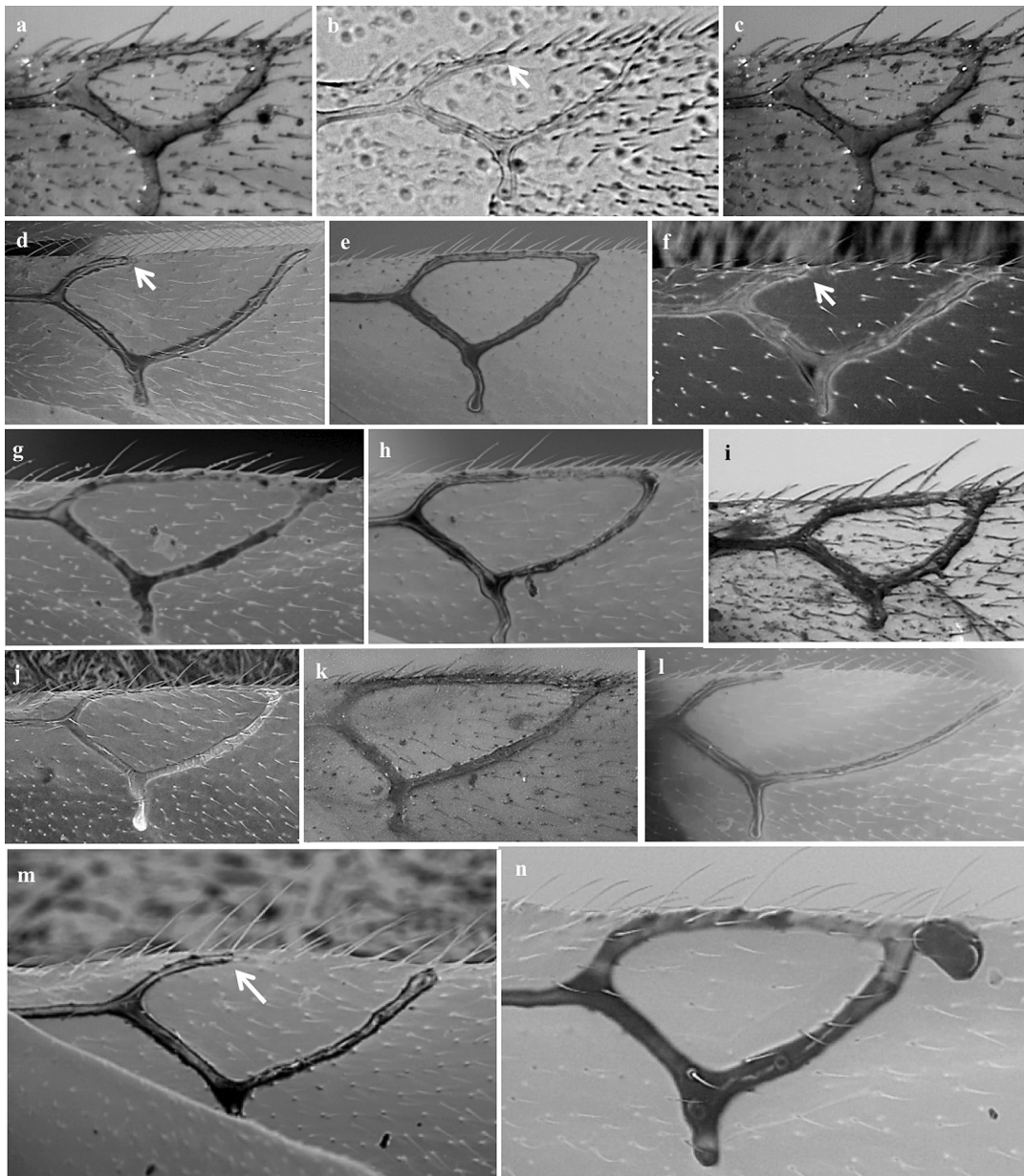


Fig. 3. Types of *Alloxysta* radial cell. – a. *Alloxysta arcuata*. – b. *A. basimacula*. – c. *A. brevis*. – d. *A. castanea*. – e. *A. circumscripta*. – f. *A. citripes*. – g. *A. consobrina*. – h. *A. fracticornis*. – i. *A. hendrickxi*. – j. *A. kovilovicus*. – k. *A. leunisii*. – l. *A. macrophadna*. – m. *A. melanogaster*. – n. *A. mullensis*.

*xylosteum*": 4♂ & 2♀; "73/360, Těchobuz, B. m., 2.IX.1973, *Impatientinum balsamines*, *Impatiens nollitangere*": 1♂; "74/273, Praha, BZKU, B.c., 1.VII.1974, *Myzus ligustri*, *Ligustrum*, *Ephedrus plagiator*": 1♀; "74/321, Průhonice, B.c., 13.VII.1974, \**Aphis pomi*, *Cotoneaster horizontalis*, *Binodoxys Angelicae*": 1♂;

"74/349, Praha, BZKU, B.c., 9.VIII.1974, \**Rhopalosiphum nymphaeae*, *Sagittaria*, \**Praon necans*": 1♂; "84/141, Jetřichovec, B.m., 6.VIII.1984, *Aphis fabae*, *Cirsium arvense*, \**Lysiphlebus cardui*": 1♂; "85/24, Lednice, M. m., 3.VII.1985, \**Aphis intybi*, *Cichorium intybus*, *Lipolexis gracilis*": 2♂ & 1♀; "85/25,

Lednice, M.m., 3.VII.1985, *Aphis fabae*, *Chenopodium*, *Binodoxys angelicae*, *Ephedrus nacheri*, *Ephedrus plagiator*": 1♂; "85/3, České Budějovice, B.m., 17.VI.1985, \**Aphis craccae*, *Vicia cracca*, *Binodoxys acalephae*, \**Praon abjectum*": 1♂; "85/46, Kojetín, M.c., 4.VII.1985, *Aphis fabae*, *Arctium*, *Binodoxys acalephae*": 1♂; "87/123, Hlavošovice – Záboreň, B.m., 19.VII.1987, *Schizaphis typhaeae*, *Typha*, *Diaeretiella rapae*, *Ephedrus plagiator*": 1♀; "58/231b, Praha, BZKU, B.c., 25.VII.1958, *Aphis craccivora*, *Robinia pseudoacacia*": 1♀; "60/360, Praha, Seminářská zahrada, B.c., 21.VI.1960, *Aphis fabae*, *Philadelphus coronarius*": 1♀; "60/422, Praha, BZKU, B.c., 28.VI.1960, *Aphis urticata*, *Urtica urens*": 1♂ & 1♀; "61/63, Praha, Seminářská zahrada, B.c., 13.V.1961, *Macrosiphum rosae*, *Rosa*": 1♂ & 2♀; "62/32, Praha, Chuchle, B.c., 3.VI.1962, *Myzus cerasi*, *Prunus avium*, *Ephedrus persicae*": 1♀; "71/29A, Karlštejn, B.c., 25.V.1971, *Dysaphis* sp., *Rhop.insertum*, *Malus communis*,": 1♂ & 5♀. 5♂ & 5♀ in UB.

*Distribution.* Holarctic, Neotropical and Oriental Regions (Ferrer-Suay et al. 2012a). New records for the Czech and Slovak Republics.

### 3.2. *Alloxysta basimacula* (Cameron, 1886)

*Diagnosis.* *Alloxysta basimacula* is mainly characterized having a completely open radial cell 3.0 times as long as wide (Fig. 3b), pronotal carinae present, propodeal carinae absent, beginning of rhinaria in F4, F1 longer than pedicel and subequal to F2, F2 longer than F3 and F3 shorter than F4 (Fig. 1b). It is similar to *Alloxysta brachycera* Hellén, 1963 but they can be differentiated by the relation between F1/F2: F1 subequal to F2 in *A. basimacula* (Fig. 1b) while F1 longer than F2 in *A. brachycera*; size of radial cell: 3.0 times as long as wide in *A. basimacula* (Fig. 3b) but 2.7 times as long as wide in *A. brachycera*.

*Material studied.* 1♀. "74/292, Praha, Seminářská zahrada, B.c., 10.VII.1974, \**Kallistaphis flava*, *Betula*": 1♀ in UB.

*Distribution.* Palaearctic (Ferrer-Suay et al. 2012a). New record for the Czech Republic.

### 3.3. *Alloxysta brachyptera* (Hartig, 1840)

*Diagnosis.* *Alloxysta brachyptera* is mainly characterized being a brachypterous species, with pronotal carinae absent, propodeal carinae present and F1 shorter than pedicel (Fig. 1c). It is similar to *Alloxysta pedestris* (Curtis, 1838) but can be easily differentiated by the presence of propodeal carinae: present in *A. brachyptera* while absent in *A. pedestris*.

*Material studied.* 3♂. "61/197, Královský Chlumec, Slov. or, 5.VI.1961, *Hydaphias*, *Galium verum*": 1♂; "83/48, Praha, Hanspaulka, B.c., 6.VII.1983, \**Hayhurstia atriplicis*, *Chenopodium*, \**Diaeretiella rapae*": 1♂; "84/149, Pelhřimov, B.m., 8.VIII.1984, Undet. (green aphids), *Polygonum*": 1♂. 1♂ in UB.

*Distribution.* Palaearctic (Ferrer-Suay et al. 2012a). New record for the Czech Republic.

### 3.4. *Alloxysta brevis* (Thomson, 1862)

*Diagnosis.* *Alloxysta brevis* is mainly characterized having a small closed radial cell 2.1 times as long as wide (Fig. 3c), pronotal carina absent (Fig. 5b), propodeal carinae present forming a plate, female and male antennae with the beginning of rhinaria in F4, F1 shorter than pedicel and F1–F3 subequal in length (Fig. 1c). It is similar to *Alloxysta darci* (Girault, 1933), can be differentiated by length of antennae: shorter than body in *A. brevis* while longer in *A. darci*; forewing with marginal setae shorter in *A. brevis* than in *A. darci*.

*Material studied.* 54♂ & 130♀. "57/107, Lnáňe, B.m., 5.VI.1957, \**Aphis farinosa*, *Salix*, \**Binodoxys angelicae*": 1♂ & 1♀; "57/204, Praha, Kinského sady, B.c., 16.VI.1957, *Aphis fabae*, *Philadelphus*": 2♀; "57/96, Praha, BZKU, B.c., 3.VI.1957, *Aphis fabae*, *Euonymus europaeus*": 1♂; "58/116, Praha, Seminářská zahrada, B.c., 8.VI.1958, \**Aphis, Spirea*": 1♀; "58/181, Opatov, nr. Svitavy, B. or. 8.VII.1958, *Aphis fabae*, *Beta vulgaris*, \**Binodoxys acalephae*": 3♀; "58/21, Filákovo, Slov.m. 22.V.1958, \**Aphis sambuci*, *Sambucus nigra*": 1♂ & 1♀; "58/241, Karlštejn, B.c. 2.VIII.1958, *Aphis fabae*, *Lappa major*, \**Lysiphlebus fabarum*": 2♀; "58/29, Šíd, Filákovo, Slov.m., 22.V.1958, *Aphis fabae*, *Euonymus europaeus*":

- 1♂ & 1♀; “58/334, Turňa a. B., Slov.m., 15.X.1958, *Aphis fabae*, *Evonymus europaeus*, *Binodoxys angelicae*”: 2♀; “58/35, Šíd, Fil’ákovno, Slov.m., 22.V.1958, *Aphis fabae*, *Euonymus europaeus*”: 1♂ & 1♀; “58/47, Humenné, Jasenský Hrad, Slov. or., 25.V.1958, *Aphis fabae*, *Euonymus europaeus*”: 1♂ & 2♀; “58/59, Kamienka, nr. Humenné, Slov.or., 25.V.1958, *Viburnum*”: 1♂ & 1♀; “58/61, Pusté Čemerné, nr. Michalovice, Slov. or., 26.V.1958, *Aphis fabae*, *Euonymus europaeus*”: 3♀; “58/79, Trenčín, Slov.occ., 29.V.1958, *Aphis*, *Spirea*, *Binodoxys angelicae*”: 1♀; “59/112, Praha, BZKU, B.c., 9.VI.1959, \**Aphis viburni*, *Viburnum opulus*, *Binodoxys angelicae*”: 1♂ & 3♀; “59/116, Praha, BZKU, B.c., 9.VI.1959, \**Aphis pomi*, *Malus communis*, *Binodoxys angelicae*”: 1♂ & 1♀; “59/250, Praha, BZKU, B.c., 1.VII.1959, *Aphis fabae*, *Campanula rapunculoides*, *Lysiphlebus fabarum* “: 1♀; “59/49, Martin, Slov.c., 18.V.1959, *Aphis fabae*, *Euonymus europaeus*, *Binodoxys angelicae*”: 1♂; “60/115, Čelákovice B.c., 26.V.1960, *Hydaphias*, *Galium mollugo*, \**Aphidius matricariae*”: 1♂ & 1♀; “60/164, Král.Chlmec, Slov. or., 1.VI.1960, *Aphis*, *Onobrychis sativa*, *Binodoxys aculephae*”: 1♀; “60/2, Malá Jiz. Louka, Jizerské hory, B.bor., 19.V.1960, *Cinara* sp., *Pinus uncinnata*”: 2♀; “60/320, Praha, Seminářská zahrada, B.c., 12.VI.1960, *Aphis urticata*, *Urtica dioica*, *Binodoxys aculephae*”: 1♀; “60/338, Praha, BZKU, 15.VI.1960, *Aphis fabae*, *Arctium*, *Binodoxys angelicae*, *Lysiphlebus fabarum*”: 1♀; “60/401, Praha, BZKU, B. c., 25.VI.1960, *Polygonum amphibicum*”: 1♂; “60/404, Praha, BZKU, B. c., 25.VI.1960, *Trifolium fragiferum*”: 1♀; “60/405, Praha, BZKU, B.c., 25.VI.1960, *Aphis farinosa*, *Salix repens rosmarinifolia*, *Binodoxys angelicae*, \**Lysiphlebus cardui*”: 2♂ & 1♀; “60/420, Praha, BZKU, B. c., 29.VI.1960, *Aphis fabae*, *Beta vulgaris*, *Lysiphlebus fabarum*”: 1♂ & 4♀; “60/424, Praha, BZKU, B. c., 28.VI.1960, *Aphis fabae*, *Rumex*, *Binodoxys angelicae*, *Lipolexis gracilis*, *Lysiphlebus fabarum*”: 3♂ & 3♀; “60/440, Mnich. Hradiště, B.bor., 1.VII.1960, *Aphis fabae*, *Beta vulgaris*”: 1♀; “60/442, Praha, BZKU, B. c., 6.VII.1960, *Aphis farinosa*, *Salix*, *Lysiphlebus cardui*”: 1♂ & 1♀; “60/443, Praha, BZKU, B. c., 7.VII.1960, *Brachycaudus*, *Prunus persica*, *Binodoxys angelicae*, *Ephedrus persicae*”: 1♂; “60/458, Mažice, B. m., 12.VII.1960, \**Aphis idaei*, *Rubus idaeus*”: 1♀; “60/485, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Laburnum anagyroides*, *Binodoxys angelicae*”: 5♂ & 2♀; “60/49, Srbsko, B. c., 25.III.1960, *Aphis*, *Therioaphis*, *Medicago sativa*, *Lipolexis gracilis*”: 1♂ & 4♀; “60/494, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Arnica sacchaliensis*”: 1♂ & 1♀; “60/502, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Tropaeolum majus*, *Binodoxys angelicae*”: 2♂ & 1♀; “60/503, Praha, BZKU, B.c., 16.VII.1960, *Aphis*, *Rumex conglomeratus*, *Binodoxys aculephae*”: 2♀; “60/504, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Rumex flexuosus*”: 2♀; “60/505, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Rumex balcanicus*, \**Praon abjectum*”: 1♂ & 2♀; “60/506, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Rumex nepalensis*”: 1♂; “60/507, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Rumex salicifolius*”: 2♀; “60/509, Praha, BZKU, B.c., 16.VII.1960, *Rheum compactum*”: 1♀; “60/514, Praha, BZKU, B. c., 20.VII.1960, *Aphis fabae*, *Beta vulgaris*”: 1♂; “60/519, Dobřichovice, B. c., 26.VII.1960, *Cryptosiphum*, *Artemisia vulgaris*, \**Ephedrus nacheri*”: 2♀; “60/523, Dobřichovice, B c, 26.VII.1960, *Aphis*, *Rumex*, *Lysiphlebus fabarum*”: 2♂ & 3♀; “60/531, Dobřichovice, B. c., 26.VII.1960, *Compositae*”: 1♀; “60/581, Č. Brod, B. c., 28.VII.1960, *Hyadaphis*, *Conium maculatum*, \**Ephedrus plagiator*, \**Binodoxys brevicornis*, *Praon volucre*”: 1♀; “60/586, Praha, BZKU, B. c., 30.VII.1960, *Aphis*, *Robinia pseudoacacia*, *Binodoxys angelicae*, *Lysiphlebus cardui*”: 1♂ & 1♀; “60/587, Praha, BZKU, B. c., 30.VII.1960, *Aphis farinosa*, *Salix*, *Lysiphlebus cardui*”: 1♂ & 1♀; “61/132, Praha, BZKU, B. c., 1.VI.1961, *Aphis*, *Rhamus cathartica*”: 1♀; “61/231, Královský Chlmec, Slov. or, 6.VI.1961, *Brachycaudus*, *Achillea millefolium*, \**Aphidius absinthii*”: 2♂; “61/314, Piliš, Slov. N. Město, Slov. or., 9.VI.1961, \**Aphis cichorii*, *Cichorium intybus*, \**Lipolexis gracilis*”: 2♀; “61/416, Praha, Seminářská zahrada, B. c., 20.VI.1961, *Aphis*, *Spirea*”: 1♀; “61/428, Praha, BZKU, B. c., 21.VI.1961, \**Aphis pomi*, *Crataegus monogyna*, *Ephedrus plagiator*”: 1♂ & 1♀; “61/506, Štúrovo, Slov m, 27.VI.1961, *Hyadaphis*, *Conium maculatum*, *Binodoxys brevicornis*”: 1♀

1♀; “61/56, Praha, Seminářská zahrada, B. c., 13.V.1961, *Aphis fabae*, *Philadelphus coronarius*, *Binodoxys angelicae*”: 1♀; “61/66, Praha, BZKU, B. c., 15.V.1961, *Aphis*, *Viburnum opulus*, *Binodoxys angelicae*, *\*Praon abjectum*”: 1♂; “61/664, Mikulov, M. m., 4.VII.1961, *Hyadaphis passerinii*, *Lonicera caprifolium*”: 1♂ & 1♀; “62/528, Smilovy hory, B. m., VIII.1962, *Aphis fabae*, *Cirsium*, *Lysiphlebus fabarum*”: 4♀; “63/780, Belanské Tatry, Slov.bor., 6.VIII.1963, *\*Macrosiphum rosae*, *Aphis fabae*, *Valeriana officinalis*, *\*Ephedrus plagiator*”: 2♀; “64/150, Praha, B. c., 22.VI.1964, *\*Aphis nasturtii*, *Nasturtium*, *Binodoxys aculephae*”: 2♂ & 2♀; “64/79, Luka p. Medníkem, B. c., VI.1964, *\*Aphis brohmeri*, *Anthriscus silvestris*, *Lysiphlebus cardui* 2♀; “66/100, Lednice, M. m., 24.V.1966, *\*Aphis urticata*, *Urtica dioica*, *Lysiphlebus fabarum*”: 2♀; “70/209, Jičín, B. or., 20.VIII.1970, *Aphis fabae*, *Yucca*, *Lysiphlebus fabarum*”: 5♀; “71/137, Praha, Karlovo náměstí, B. c., 13.VII.1971, *\*Hyadaphis foeniculi*, *Lonicera xylosteum*”: 1♀; “71/164, Karlštejn, B. c., 21.VII.1971, *\*Aphis intybi*, *Cichorium intybus*, *Lysiphlebus fabarum*”: 1♀; “71/67, Kroměříž, M. or., 7.VI.1971, *Aphis urticata*, *Urtica dioica*, *Binodoxys aculephae*”: 1♀; “72/142, Hustopeče, M. m., 7.VI.1972, *Galiobium*, *Galium*”: 1♂; “74/116, Praha, Seminářská zahrada, B.c., 7.VI.1974, *\*Aphis spiraephaga*, *Spirea*, *Binodoxys angelicae*”: 1♂ & 1♀; “74/242, Lipt. Ján, Slov.bor., 25.VI.1974, *Cryptosiphum*, *Artemisia vulgaris*, *Lipolexis gracilis*”: 5♀; “74/273, Praha, BZKU, B.c., 1.VII.1974, *\*Myzus ligustri*, *Ligustrum*, *Ephedrus plagiator*”: 1♀; “74/332, Praha, BZKU, B.c., 24.VII.1974, *\*Rhopalosiphum nymphaeae*, *Caltha palustris* and other aquatic plants, *\*Praon necans*”: 1♂; “74/343, Praha, BZKU, B.c., 28.VII.1974, *Rhopalosiphum nymphaeae*, *Sagittaria*, *\*Aphidius colemani*, *Praon necans*”: 1♂ & 1♀; “74/348, Praha, BZKU, B.c., 9.VIII.1974, *\*Rhopalosiphum nymphaeae*, *Sagittaria*, *Praon necans*”: 1♀; “80/14, Příbram, B.c., 2.VII.1980, *Aphis urticata*, *Urtica dioica*, *Binodoxys aculephae*”: 2♂ & 5♀; “83/48, Praha, Hanspaulka, B.c., 6.VII.1983, *\*Hayhurstia atriplicis*, *Chenopodium*, *Diaeretiella rapae*”: 1♀; “83/50, České Budějovice, B.m., 13.VIII.1983, *Aphis*

*fabae*, *Cirsium arvense*”: 1♂ & 1♀; “83/55, Brloh, Blanský les, B.m., 14.VII.1983, *\*Aphis jacobaeae*, *Senecio*, *\*Lipolexis gracilis*”: 1♂ & 2♀; “85/3, České Budějovice, B.m., 17.VI.1985, *\*Aphis craccae*, *Vicia cracca*, *Binodoxys aculephae*, *\*Praon abjectum*”: 5♂ & 2♀; “89/160, Prachatice, B.m., 22.VI.1989, *Cryptosiphum*, *Coloradoa*, *Artemisia vulgaris*, *\*Aphidius arvensis*, *\*Ephedrus nacheri*”: 8♀; “89/172, České Budějovice, B.m., 28.VI.1989, *Aphis fabae*, *Cirsium arvense*, *Binodoxys angelicae*, *Lysiphlebus cardui*”: 2♀; “60/399, Praha, BZKU, B.c., 24.06.1960, *Aphis*, *Arnica montana*”: 2♀; “60/422, Praha, BZKU, B.c., 28.VI.1960, *Aphis urticata*, *Urtica urens*”: 1♂ & 5♀; “61/287, Svatoša, S.or., 8.VI.1961, *Aphis fabae*, *Chenopodium*”: 1♀, 5♂ & 5♀ in UB.

*Distribution.* Holarctic, Neotropical and Oriental Regions (Ferrer-Suay et al. 2012a). New records for the Czech and Slovak Republics.

### 3.5. *Alloxysta castanea* (Hartig, 1841)

*Diagnosis.* *Alloxysta castanea* is mainly characterized by having a partially open radial cell 2.4 times as long as wide (Fig. 3d), pronotal and propodeal carinae present, male and female with the beginning of rhinaria in F3, F2–F4 subequal in length (Fig. 1e), F1 and F2 slightly curved in male. It is similar to *Alloxysta aurata* Belizin, 1968 but can be differentiated by the relation between F2 and F3: F2 subequal to F3 in *A. castanea* (Fig. 1e) but F2 shorter than F3 in *A. aurata*; and size of the radial cell: 2.4 times as long as wide in *A. castanea* (Fig. 3d) while 3.0 times in *A. aurata*.

*Material studied.* 16♂ & 29♀. “58/116, Praha, Seminářská zahrada, B.c., 8.VI.1958, *\*Aphis*, *Spirea*”: 1♂; “58/125, Čejkova pila, Šumava, B. occ, 3.V.1958, *\*Rhopalosiphum padi*, *Prunus padus*, *\*Ephedrus plagiator*”: 2♀; “58/38, Šíd, Fil’ákovo, Slov.m., 22.V.1958, *Myzaphis rosarum*, *Macrosiphum rosae*, *Rosa*, *\*Ephedrus laevicollis*, *Ephedrus plagiator*, *Praon volucre*”: 2♀; “59/113, Praha, BZKU, B.c., 9.VI.1959, *\*Liosomaphis berberidis*, *Berberidis vulgaris*”: 1♂; “59/201, Katovice, B. occ., 25.VI.1959, *\*Macrosiphum rosae*, *Rosa* sp., *Praon volucre*”: 1♀; “59/226, Mirotice, B.m., 26.VI.1959, *Cryptomyzus*, *Ribes rubrum*”:

3♀; “59/291, Mnichová, Orl.hory, B. or., 8.VII.1959, *Cavariella* sp., *Salix*, 1♀; “59/42, Martin, Slov.c., 18.V.1959, *Rhopalosiphum padi*, *Prunus padus*, *Ephedrus plagiator*”: 1♂; “59/80, Praha, Seminářská zahrada, B.c., 24.V.1959, *Hyperomyzus*, *Grossularia*, *Ephedrus plagiator*, *Praon volucre*”: 1♀; “60/111, Čelákovice B.c., 26.V.1960, *Aulacorthum*, *Potentilla argentea*, \**Aphidius urticae*, *Ephedrus plagiator*”: 2♀; “60/264, Javorník, M. or., 7.VI.1960, \**Macrosiphum euphorbiellum*, *Euphorbia amygdaloides*”: 1♂; “60/575, Č. Brod, B. c., 28.VII.1960, *Hyalopterus pruni*, *Phragmites communis*, *Praon volucre*”: 1♂; “60/616, Prachov, B. bor., 2.VIII.1960, \**Rhopalosiphoninus*, *Oxalis acetosella*”: 1♂; “60/620, Prachov, B.bor. 2.VIII.1960, *Rhopalosiphoninus*, *Oxalis acetosella*, \**Ephedrus lacertosus*”: 1♂ & 1♀; “61/10, Praha, BZKU, B. c., 2.V.1961, \**Ceruraphis eriophori*, *Viburnum lantana*, *Binodoxys angelicae*”: 1♂; “61/164, Královský Chlmec, Slov. or, 5.VI.1961, \**Phorodon humuli*, *Humulus lupulus*, \**Lysiphlebus cardui*”: 1♀; “61/204, Královský Chlmec, Slov. or, 6.VI.1961, *Hyalopterus pruni*, *Prunus domestica*, *Praon volucre*”: 1♂; “61/224, Královský Chlmec, Slov. or, 6.VI.1961, *Macrosiphum rosae*, *Rosa*, *Aphidius rosae*”: 1♂; “61/35, Český Krumlov, B. m., 10.V.1961, \**Aphis fabae*, *Euonymus europaeus*, *Ephedrus plagiator*”: 1♂; “62/24, Lovoš, Č. Středohoří, B. bor., 31.V.1962, *Ceruraphis eriophori*, *Viburnum opulus*, *Ephedrus plagiator*”: 1♂; “62/469, Putimov, nr. Pelhřimov, VIII.1962, *Sitobion avenae*, *Avena sativa*, \**Aphidius uzbekistanicus*, *Ephedrus plagiator*”: 1♀; “63/664, Hostýn, Hostýnské vrchy, M.or., 15.VII.1963, *Macrosiphum*, *Prenanthes purpurea*, *Aphidius urticae*, *Ephedrus plagiator*”: 1♀; “66/197, Lednice, M. m., 14.VII.1966, *Hyalopterus*, *Phragmites communis*, \**Aphidius transcasicus*”: 1♀; “67/39, Mladá Vožice, Šelmbek, B. m., 27.VIII.1967, *Euphorbia*, *Praon volucre*”: 1♀; “71/34, Praha, BZKU, B. c., 24.V.1971, *Ovatus*, *Crataegus monogyna*, *Ephedrus plagiator*”: 1♂ & 7♀; “74/156, Dolina 7-prameňov, Bel. Tatry, Slov.bor., 20.VI.1974, *Betulaphis*, *Betula*, \**Aphidius aquilus*”: 1♀; “74/249, Lipt.Ján, Slov.bor., 25.VI.1974, *Cavariella*, *Salix*, \**Aphidius salicis*”: 2♂;

“70/110, Rusava, Hostýnské vrchy, M.or., 17.06.1970, *Cavariella*, *Salix*”: 1♂ & 3♀. 3♂ & 5♀ in UB.

*Distribution.* Holarctic, Neotropical and Oriental Regions (Ferrer-Suay *et al.* 2012a). New records for the Czech and Slovak Republics.

### 3.6. *Alloxysta circumscripta* (Hartig, 1841)

*Diagnosis.* *Alloxysta circumscripta* is mainly characterized by having a closed radial cell 2.3 times as long as wide (Fig. 3e), pronotal carinae present, propodeal carinae absent, female antennae with the beginning of rhinaria in F5, F2 shorter than F3, F3 shorter than F4 (Fig. 1f), male antennae with the beginning of rhinaria in F4, F2 longer than F3, F3 shorter than F4. It is similar to *Alloxysta consobrina* (Zetterstedt, 1838) but can be differentiated by the proportions among flagellomeres: F1 subequal to F2, F2 shorter or subequal to F3 in *A. circumscripta* (Fig. 1f) while F1 longer than F2, F2 subequal to F3 in *A. consobrina* (Fig. 1h); size of radial cell: 2.5 times as long as wide in *A. circumscripta* (Fig. 3e) but 2.7 in *A. consobrina* (Fig. 3g).

*Material studied.* 2♂ & 5♀. “57/96, Praha, BZKU, B.c., 3.VI.1957, \**Aphis fabae*, *Euonymus europaeus*”: 2♂; “60/20, BZKU, B.c., 17.V.1960, *Aphis fabae*, *Euonymus europaeus*, \**Binodoxys angelicae*, \**Praon abjectum*”: 5♀. 1♂ & 3♀ in UB.

*Distribution.* Palearctic (Ferrer-Suay *et al.* 2012a). New record for the Czech Republic.

### 3.7. *Alloxysta citripes* (Thomson, 1862)

*Diagnosis.* *Alloxysta citripes* is mainly characterized by having a partially open small radial cell 2.1 times as long as wide (Fig. 3f), pronotal carinae present, propodeal carinae present forming a plate but not protruding, female antennae with the beginning of rhinaria in F4, F1 subequal to pedicel and longer than F2, F2–F4 subequal in length (Fig. 1g), male antennae with the beginning of rhinaria in F1, pedicel–F3 subequal, F3 slightly shorter than F4. It is similar to *Alloxysta postica* (Hartig, 1841) but can be differentiated by the shape of the propodeal carinae: they are not protruding in *A. citripes* while they are clearly visible and forming a protruding plate in *A.*

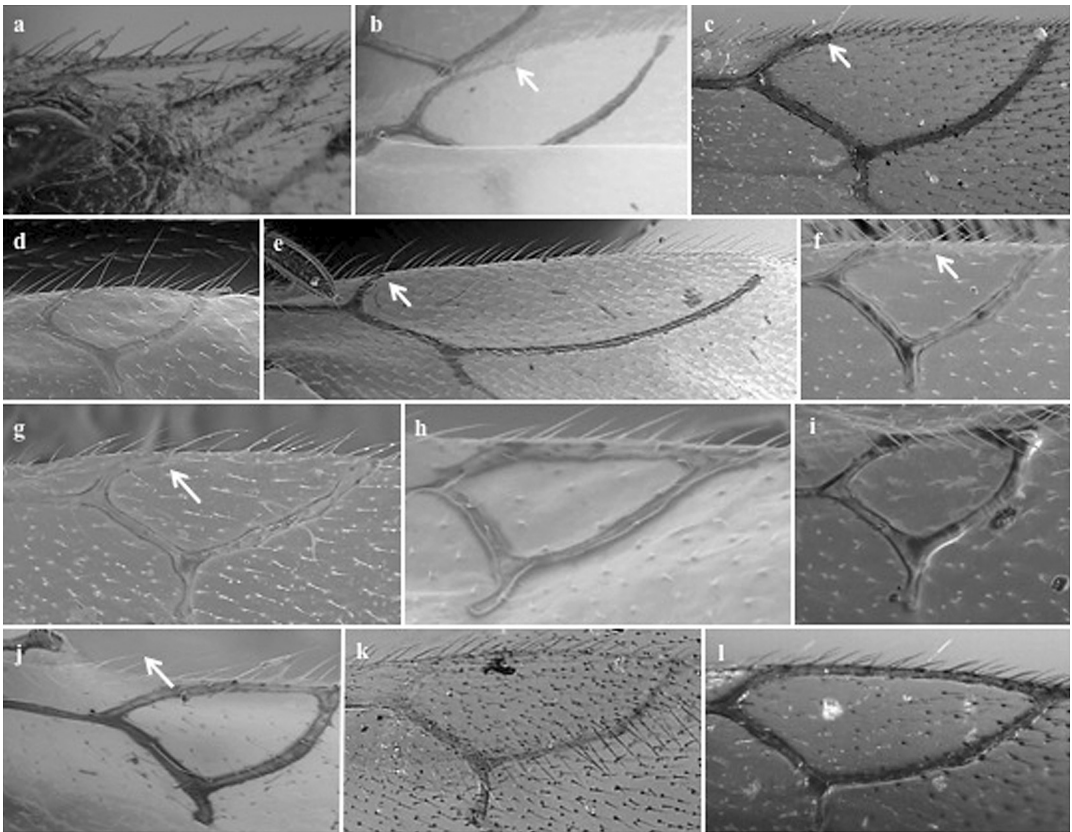


Fig. 4. Types of *Alloxysta* radial cell. – a. *A. nigricans*. – b. *A. obscurata*. – c. *A. pallidiconis*. – d. *A. pilipennis*. – e. *A. pilosa*. – f. *A. pleuralis*. – g. *A. postica*. – h. *A. pusilla*. – i. *A. ramulifera*. – j. *A. sawoniewiczzi*. – k. *A. semiapertura*. – l. *A. victrix*.

*postica*; size of radial cell: 2.1 times as long as wide in *A. citripes* (Fig. 3f) but 2.5 times as long as wide in *A. postica* (Fig. 4g).

**Material studied.** 20♂ & 54♀. “58/111, Praha, BZKU, B. c., 30.V.1958, *Eucallipterus tiliae*, *Tilia tomentosa*, \**Praon flavinode*, \**Trioxys curvicaudus*”: 1♀; “58/228, Komárov, B. or., 23.VII.1958, \**Aphis cognatella*, *Euonymus europaeus*, \**Binodoxys angelicae*”: 1♂; “58/269, Sušice, B.m., 12.VIII.1958, \**Brachycaudus cardui*, *Carduus nutans*, \**Lysiphlebus gr. fabarum*”: 1♂; “60/362, Praha, Kinského sady, B. c., 21.VI.1960, *Myzocallis, CarPinus*”: 1♀; “60/411, Praha, Vojanovy sady, B.c., 26.VI.1960, *Eucallipterus tiliae*, *Tilia, Trioxys pallidus, Trioxys curvicaudus*”: 2♂ & 1♀; “60/418, Praha Strahovská zahrada, B. c., 27.VI.1960, M. only, *Quercus, Trioxys curvicaudus*”: 1♀; “60/546, Trněný Újezd, B. c., 26.VII.1960, *Thelaxes, Quercus*”: 1♀; “60/595,

V. Ježov, B. m., *Drepanosiphum, Acer pseudoplatanus, \*Trioxys cirsi*”: 1♀; “60/668, Praha, Nábřeží Legií, B. c., 25.VIII.1960, *Periphyllus, Drepanosiphum, Acer pseudoplatanus*”: 6♀; “60/673, Těchobuz, nr.Pacov, B. m., 30.VIII.1960, *Periphyllus, Drepanosiphum, Acer pseudoplatanus*”: 1♀; “60/681, Kováčov, Slov. m., 31.VIII.1960, *Hoplocallis rupertii, Quercus ilex*”: 1♀; “61/220, Královský Chlmec, Slov. or, 6.VI.1961, M. only, *Quercus, Trioxys pallidus*”: 1♀; “61/406, Praha, Seminářská zahrada, B. c., 20.VI.1961, *Tuberculatus annulatus, Quercus, Trioxys pallidus*”: 1♀; “61/420, Praha, BZKU, B. c., 21.VI.1961, *Quercus, Trioxys pallidus*”: 2♂; “61/421, *Carpinus betulus*, Praha, BZKU, B. c., 21.VI.1961, \**Myzocallis carpini, Trioxys pallidus*”: 1♀; “61/473, Praha, Kinského sady, B. c., 25.VI.1961, *Eucallipterus tiliae, Tilia, Trioxys curvicaudus*”: 1♀; “68/368, Praha, Seminářská zahrada, B. c., 12.VIII.1968, \**Drepanosiphum*



*platanoides*, *Acer pseudoplatanus*": 1♀; "69/107, Praha, Kinského sady, B. c., 17.VI.1969, *Tuberculatus*, *Quercus*, *Praon flavinode*": 2♀; "69/199, Těchobuz, nr. Pacov, B. m., 8.VII.1969, *Drepanosiphum*, *Acer pseudoplatanus*": 1♀; "69/30, Praha, Seminářská zahrada, B. c., 23.V.1969, *Drepanosiphum*, *Acer pseudoplatanus*": 1♀; "69/89, Těchobuz nr. Pacov, B. m., 8.VI.1969, *Drepanosiphum*, *Acer pseudoplatanus*, *Falciconus pseudoplatani*, *Trioxys cirsi*": 1♀; "74/119, Praha, Seminářská zahrada, B. c., 7.VI.1974, *Myzocallis carpini*, *Carpinus*, *Trioxys pallidus*": 2♀; "74/133, Praha, BZKU, B. c., 12.VI.1974, *Myzocallis carpini*, *Carpinus betulus*, *Trioxys pallidus*": 1♂ & 1♀; "74/200, Stankovany, Choč.pohorie, Slov.bor., 24.VI.1974, *Eucallipterus tiliae*, *Tilia*": 1♂; "82/12, Pacov, B. m., 22.VI.1982, *Myzocallis coryli*, *Corylus*, *Trioxys tenuicaudus*": 2♂ & 1♀; "83/15, České Budějovice, B. m., 8.VI.1983, *Tuberculatus*, *Quercus*, *Trioxys pallidus*": 3♂ & 6♀; "83/29, České Budějovice, B. m., 24.VI.1983, *Eucallipterus tiliae*, *Tilia*": 2♂ & 2♀; "84/16, České Budějovice, B. m., 16.VI.1984, *Tuberculatus*, *Quercus*, *Trioxys pallidus*, *\*Trioxys tenuicaudus*": 2♀; "84/4, Znojmo, M. m., 5.VI.1984, *Chromaphis juglandicola*, *Juglans regia*, *Trioxys pallidus*": 1♂ & 2♀; "84/44, Hluboká nad Vltavou, B. m., 21.VI.1984, *Myzocallis*, *Carpinus*, *Trioxys pallidus*, *Trioxys tenuicaudus*": 5♀; "84/44, Hluboká nad Vltavou, B. m., 21.VI.1984, *Myzocallis*, *Carpinus*, *Trioxys tenuicaudus*": 1♂ & 2♀; "84/61, Čimelice, B. c., 28.VI.1984, *Tuberculatus*, *Quercus*, *Trioxys tenuicaudus*": 1♂ & 3♀; "84/78, České Budějovice, B. m., 3.VII.1984, *Tuberculatus*, *Quercus*, *Praon flavinode*, *Trioxys pallidus*": 1♀; "84/79, České Budějovice, B. m., 3.VII.1984, *Tinocallis*, *Ulmus*, *Trioxys tenuicaudus*": 1♂; "84/80, České Budějovice, B. m., 5.VII.1984, *Eucallipterus tiliae*, *Tilia*, *Trioxys tenuicaudus*": 1♂ & 1♀; "84/89, Pacov, B. m., 10.VII.1984, *Myzocallis*, *Corylus*": 1♀; "85/27, Lednice, M. m., 3.VII.1985, *Aphis fabae*, *Cirsium arvense*": 1♀. 5♂ & 5♀ in UB.

*Distribution.* Palaearctic (Ferrer-Suay et al. 2012a). New records for the Czech and Slovak Republics.

### 3.8. *Alloxysta consobrina* (Zetterstedt, 1838)

*Diagnosis.* *Alloxysta consobrina* is mainly characterized by having a closed radial cell 2.7 times as long as wide (Fig. 3g), pronotal carinae present, propodeal carinae absent, male and female antennae with the beginning of rhinaria in F4, F2 longer than F3, F3 shorter than F4 (Fig. 1h), F1–F3 bowed in male. It is similar to *A. circumscripta* but can be differentiated by the proportions among flagellomeres: F1 longer than F2, F2 subequal to F3 in *A. consobrina* (Fig. 1h) while F1 subequal to F2, F2 shorter or subequal to F3 in *A. circumscripta* (Fig. 1f); size of radial cell: 2.7 times as long as wide in *A. consobrina* (Fig. 3g) but 2.5 in *A. circumscripta* (Fig. 3e).

*Material studied.* 43♂ & 88♀. "57/156, Karlštejn, B. c., 12.VI.1957, *Aphis fabae*, *Chenopodium bonus-henricus*, *\*Lysiphlebus fabarum*": 1♂ & 1♀; "57/96, Praha, BZKU, B. c., 3.VI.1957, *Aphis fabae*, *Euonymus europaeus*": 1♀; "59/226, Mirovice, B. m., 26.VI.1959, *Cryptomyzus*, *Ribes rubrum*": 3♂ & 3♀; "59/358, Krč, B. m., 24.VII.1959, *\*Acyrtosiphon pisum*, *Trifolium pratense*, *\*Aphidius ervi*": 2♂; "60/251, Strážnice, M m, 6.VI.1960, *\*Aphis urticata*, *Urtica dioica*": 2♂ & 7♀; "60/341, Raná, Luony, B. c., 17.VI.1960, *Brevicoryne brassicae*, *Sinapis arvensis*, *Diaeretiella rapae*": 1♂ & 8♀; "60/36, Rajhrad, M. m., 19.V.1960, *Brevicoryne brassicae*, *Brassica napus*, *Diaeretiella rapae*": 1♂ & 6♀; "60/36, Rajhrad, M. m., 19.V.1960, *Brevicoryne brassicae*, *Brassica napus*, *Diaeretiella rapae*": 2♂ & 3♀; "60/389, Praha. BZKU, B c, 24.VI.1960, *Cavariella*, *Daucus carota*, *Aphidius salicis*, *\*Binodoxys brevicornis*": 1♀; "60/477, Praha, Strahovská zahrada, B. c., 10.VII.1960, *Brevicoryne brassicae*, *Brassica oleracea capitata*, *Diaeretiella rapae*": 2♂ & 2♀; "60/547, Trněný Újezd, B. c., 26.VII.1960, *Brevicoryne brassicae*, *Brassica oleracea*": 2♂ & 5♀; "60/549, Trněný Újezd, B. c., 26.VII.1960, *Brevicoryne brassicae*, *Brassica oleracea* var., *Diaeretiella rapae*": 2♂ & 2♀; "60/60, Korno, B. c., 23.V.1960, *\*Coloradoa achilleae*, *Achillea millefolium*, *\*Aphidius arvensis*: 1♂ & 1♀; "61/215, Královský Chlumec, Slov. or, 6.VI.1961, *\*Liosomaphis berberidis*, *Berberis vulgaris*, *\*Aphidius*

*hortensis*": 2♀; "61/246, Somotor, Slov. m., 7.VI.1961, *Brevicoryne brassicae*, *Brassica napus*, *Diaeretiella rapae*": 2♂ & 3♀; "61/327, Piliš, Slov. N. Město, Slov. or., 9.VI.1961, *Hyadaphis*, *Conium maculatum*": 1♀; "61/535, Štúrovo, Slov. m., 29.VI.1961, *Brevicoryne brassicae*, *Raphanus raphanistrum*, *Diaeretiella rapae*": 2♂ & 3♀; "61/568, Šahy, Slov. m., 30.VI.1961, *Cryptomyzus ribis*, *Ribes rubrum*": 1♀; "62/298, Praha, Seminářská zahrada, B. c., VII.1962, *Liosomaphis berberidis*, *Berberis vulgaris*": 1♀; "66/251, Benešov, nr. Semily, B. bor., VI.1966, *Nasonovia*, *Saxifraga caespitosa decipiens*, *Aphidius hieraciorum*": 1♀; "67/9, Lednice, M.m., 5.VI.1967, *Aphis fabae*, *Chenopodium*, *Binodoxys angelicae*": 1♀; "69/71, Šamorín, Slov.m., 4.VI.1969, *Brevicoryne brassicae*, *Brassica napus*, *Diaeretiella rapae*": 4♂ & 5♀; "74/340, Obrátice, B.m., 28.VII.1974, *Brevicoryne brassicae*, *Sinapis arvensis*, *Diaeretiella rapae*": 4♂ & 1♀; "76/199, Průhonice, B.c., 12.VII.1976, *Therioaphis trifolii*, *Medicago*, *Praon exsoletum*": 3♀; "83/10, České Budějovice, B.m., 7.VI.1983, *Liosomaphis berberidis*, *Berberis*, *Aphidius hortensis*": 2♀; "83/30, České Budějovice, B.m., 24.VI.1983, *Cryptomyzus*, *Ribes rubrum*, *Aphidius ribis*": 4♂ & 4♀; "83/39, Holašovice, B.m., 4.VII.1983, *Brevicoryne brassicae*, *Brassica napus*, *Diaeretiella rapae*": 1♂ & 9♀; "89/22, České Budějovice, B.m., 26.V.1989, *Aphis fabae*, *Philadelphus coronarius*, *Aphidius* sp.": 1♀; "60/70, Srbsko, B.c., 23.V.1960, *Cryptomyzus ribis*, *Ribes rubrum*, *Aphidius ribis*": 6♂ & 3♀; "61/9, Karlštejn, B.c., 30.IV.1961, *Aphis fabae*, *Euonymus europaeus*": 1♀; "89/71, Veselí n.L., B.m., 10.VI.1989, *Brevicoryne brassicae*, *Brassica napus*": 1♂ & 5♀. 5♂ & 5♀ in UB.

*Distribution.* Cosmopolitan (Ferrer-Suay et al. 2012a). New records for the Czech and Slovak Republics.

### 3.9. *Alloxysta fracticornis* (Thomson, 1862)

*Diagnosis.* *Alloxysta fracticornis* is mainly characterized by having a closed radial cell 2.2 times as long as wide (Fig. 3h), pronotal carinae absent, propodeal carinae present, male and female with the beginning of rhinaria in F3, F1–F3 subequal

in length (Fig. 1i), F3 curved in male. It is similar to *Alloxysta mullensis* (Cameron, 1883) but can be differentiated by the relation between F1 and the pedicel: F1 longer than pedicel in *A. fracticornis* (Fig. 1i) while F1 subequal to pedicel in *A. mullensis* (Fig. 1t); F1–F3 subequal in length in *A. fracticornis* (Fig. 1i) but F1 longer than F2 and F2 subequal to F3 in *A. mullensis* (Fig. 1t); F3 curved in *A. fracticornis* male but without any flagellomere curved in *A. mullensis* male.

*Material studied.* 2♂. "61/398, Plešivec, Slov. m., 13.VI.1961, *Acyrtosiphon*, *Euphorbia cyparissias*, *Aphidius urticae*": 2♂. 1♂ in UB.

*Distribution.* Palaearctic (Ferrer-Suay et al. 2012a). New record for the Slovak Republic.

### 3.10. *Alloxysta halterata* (Thomson, 1862)

*Diagnosis.* *Alloxysta halterata* is easily differentiated from the other brachypterous *Alloxysta* species (*A. brachyptera*, *A. pedestris* (Curtis, 1838) and *A. apteroidea* Hellén, 1963) by having pronotal carinae while the others do not. Females with normal sized wings are similar to *A. victrix* in that both species have a closed radial cell and propodeal carinae absent, but they can be differentiated by the size of radial cell: 2.4 times as long as wide in some *A. halterata* female but 3.0 times in *Alloxysta victrix* (Westwood, 1833) (Fig. 4m); and relation between F1 and F2 in females: F1 subequal to F2 in *A. halterata* while F1 longer than F2 in *A. victrix* (Fig. 1.bb).

*Material studied.* 1♂. "69/168, Jerichov, nr. Bánovce n.B., Slovenia occ., 28.VI.1969, *Aulacorthum langei*, *Pulmonaria officinalis*": 1♂.

*Distribution.* Palaearctic (Ferrer-Suay et al. 2012a). New record for Slovenia.

### 3.11. *Alloxysta hendrikxi* (Benoit, 1956)

*Diagnosis.* *Alloxysta hendrikxi* is mainly characterized having a closed radial cell 2.2 times as long as wide (Fig. 3i), pronotal carinae absent, propodeal carinae present being thin and straight on top, forming a plate on bottom with sides angled, rhinaria and antennal club beginning in F3, F1 longer than pedicel and F2, F2 subequal to F3

and F3 shorter than F4 (Fig. 1k). It is similar to *Alloxysta mullensis* but can be differentiated by the relation between F1 and the pedicel: F1 longer than pedicel in *A. hendrikxi* (Fig. 1k) but subequal in *A. mullensis* (Fig. 1t); shape of propodeal carinae: being thin and straight on top, forming a plate on bottom with sides angled in *A. hendrikxi* while forming a complete plate with curved sides in *A. mullensis*.

*Material studied.* 2♀. “89/39, C. Budejovice, B.m., 1.VI.1989, \**Aphis fabae*, *Philadelphus coronarius*”: 1♀; “89/45, Nove Hradky, B.m., 5.VI.1989, *Aphis fabae*, *A. poterii*, *Umbelliferae*”: 1♀. 1♀ in UB.

*Distribution.* Africa (Ferrer-Suay *et al.* 2012a). New record for the European continent.

### 3.12. *Alloxysta kovilovica* Ferrer-Suay & Pujade-Villar, 2013

*Diagnosis.* *Alloxysta kovilovica* is mainly characterized by having a closed radial cell 2.5 times as long as wide (Fig. 3j), beginning of antennal club and rhinaria in F3, F1 longer than pedicel and F2, F2 equal to F3 and F3 slightly shorter than F4 (Fig. 3j), pronotal and propodeal carinae are absent. It is similar to *Alloxysta aperta* (Hartig, 1841) but can be differentiated by the relation between F1–F3: not subequal in *A. kovilovica* while they are subequal in *A. aperta*.

*Material studied.* 1♀. “61/617, Dolní Věstonice, M. m., 3.VII.1961, \**Brachycaudus helichrysi*, *Matricaria inodora*”: 1♀.

*Distribution.* Serbia (Ferrer-Suay *et al.* 2013e: 256). New record for the Czech Republic.

### 3.13. *Alloxysta leunisia* (Hartig, 1841)

*Diagnosis.* *Alloxysta leunisia* is mainly characterized by having a closed radial cell, 2.0 times as long as wide (Fig. 3k), pronotal carinae present, propodeal carinae absent, rhinaria and antennal club beginning in F2, F1 longer than pedicel and subequal to F2 and F3 in female (Fig. 1m), male with the same proportions except F3 longer than F2. It is similar to *A. consobrina* but can be differentiated by the beginning of rhinaria in female: F2 in *A. leunisia* (Fig. 1m) and F3/F4 in *A. consobrina* (Fig. 1h); shape of flagellomeres in male: F1 slightly curved in *A. leunisia* while F1–

F3 strongly curved in *A. consobrina*; size of radial cell: 2.0 times as long as wide in *A. leunisia* (Fig. 3k) but 2.7 times as long as wide in *A. consobrina* (Fig. 3g).

*Material studied.* 3♀. “60/357, Stěhelčevce B. c., 17.VI.1960, \**Brevicoryne brassicae*, *Brassica napus*”: 2♀; “60/36, Rajhrad, M. m., 19.V.1960, *Brevicoryne brassicae*, *Brassica napus*, \**Diaeretiella rapae*”: 1♀. 1♀ in UB.

*Distribution.* Palaearctic (Ferrer-Suay *et al.* 2012a). New record for the Czech Republic.

### 3.14. *Alloxysta macrophadna* (Hartig, 1841)

*Diagnosis.* *Alloxysta macrophadna* is mainly characterized by having a big, partially open radial cell (Fig. 3l), pronotal carinae present, propodeal carinae absent, rhinaria and antennal club beginning in F4 in females and F3 in males. It is similar to *Alloxysta obscurata* (Hartig, 1840) but can be differentiated by the shape and proportion between flagellomeres: F1 subequal to F2, F2 longer than F3 and F3 subequal to F4 in *A. macrophadna* (Fig. 1n) while F1 longer than F2, F2 shorter than F3 and F3 shorter than F4 in *A. obscurata* (Fig. 1v); F2 and F3 strongly curved in *A. macrophadna* male but without any flagellomere curved in *A. obscurata* male; size of radial cell: 3.0 times as long as wide in *A. macrophadna* (Fig. 3l) but 2.7 times as long as wide in *A. obscurata* (Fig. 4b).

*Material studied.* 9♂ & 12♀. “59/201, Katovice, B. occ., 25.VI.1959, \**Macrosiphum rosae*, *Rosa*, \**Praon volucre*”: 3♀; “59/204, Rojice, B.m., 25.VI.1959, *Macrosiphum rosae*, *Rosa*, \**Aphidius rosae*”: 1♂; “59/362, Bechyně, B.m., 24.VII.1959, *Acyrtosiphum pisum*, *Trifolium*, *Aphidius ervi*”: 1♂; “60/306, Rusava, M. or., 11.VI.1960, \**Macrosiphum funestum*, *Rubus*, \**Aphidius urticae*”: 4♀; “61/387, Domica, Slov. m., 12.VI.1961, *Dysaphis*, *Pyrus communis*, \**Ephedrus persicae*”: 2♂; “61/410, Praha, Seminářská zahrada, B. c., 20.VI.1961, \**Macrosiphum gei*, *Geum*”: \**Macrosiphum daphnidis*, *Daphne mezereum*”: 2♀; “64/16, Slapy, B. c., 24.V.1964, *Euceraphis*, *Betula pendula*”: 2♂; “64/27, Pavlovské kopce, M. m., 27.V.1964, *Judenkoa*, *Lonicera*, \**Ephedrus plagiator*”: 1♂; “64/81, Prachov, B. or., VI.1964, *Amphorophora ampullata*, *Aulacorthum*

*dryopteridis*, *Athyrium filis-mas*, *Aphidius urticae*": 1♀; "70/185, V.Tatry, Tomanova dolina, Slov.bor., 25.VII.1970, *Macrosiphum, Rosa alpina*": 1♂ & 1♀; "61/180, Královský Chlmec, S.or., 5.VI.1961, \**Uroleucon aeneus*, *Carduus nutans*": 1♂. 1♂ & 3♀ in UB.

*Distribution.* Holarctic (Ferrer-Suay et al. 2012a). New records for the Czech Republic, Poland and the Slovak Republic.

### 3.15. *Alloxysta melanogaster* (Hartig, 1840)

*Diagnosis.* *Alloxysta melanogaster* is mainly characterized by having a partially open radial cell 2.3 times as long as wide (Fig. 3m), pronotal and propodeal carinae present, female antennae with the beginning of rhinaria in F3, F1 subequal to pedicel, F1 longer than F2, F2 subequal to F3, F4 longer than F3 (Fig. 1o), male antennae with the beginning of rhinaria in F2, F1 longer than pedicel and F2, F2–F4 subequal in length. It is similar to *A. longipennis* but can be differentiated by the proportions among flagellomeres in female: pedicel-F3 in *A. melanogaster* while F1 longer than pedicel and F2, F2 subequal to F3 in *A. longipennis*; size of radial cell 2.3 times as long as wide in *A. melanogaster* but 2.6 times as long as wide in *A. longipennis*.

*Material studied.* 3♂ & 6♀. "59/110, Praha, BZKU, B.c., 9.VI.1959, \**Myzus cerasi*, *Prunus avium*, \**Ephedrus cerasicola*, \**Ephedrus persicae*, \**Ephedrus plagiator*": 3♀; "60/313, Hostýn, Hostýnske hory, Mor. or., 11.VI.1960, *Rhopalosiphoninus*, *Oxalis*, \**Ephedrus laceratosus*": 3♂ & 2♀; "66/249, Kozly, Louny, B. c., 19.VIII.1966, \**Amphorophora*, *Pulmonaria officinalis*": 1♀. 1♂ & 1♀ in UB.

*Distribution.* Palaearctic and Oriental Regions (Ferrer-Suay et al. 2012a). New record for the Czech Republic.

### 3.16. *Alloxysta mullensis* (Cameron, 1883)

*Diagnosis.* *Alloxysta mullensis* is mainly characterized by having a closed radial cell 2.2 times as long as wide (Fig. 3n), pronotal carinae absent, propodeal carinae present forming a plate, beginning of rhinaria in F4, F1 longer than F2, F2 subequal to F3, F3 shorter than F4 (Fig. 1p). It is similar to *A. fracticornis* but can be differentiated

by the relation between F1 and pedicel: F1 subequal to pedicel in *A. mullensis* (Fig. 1p) while F1 longer than pedicel in *A. fracticornis* (Fig. 1i); proportion between flagellomeres: F1 longer than F2 and F2 subequal to F3 in *A. mullensis* female (Fig. 1p) but F1–F3 subequal in length in *A. fracticornis* female (Fig. 1i); without any flagellomere curved in *A. mullensis* male but F3 curved in *A. fracticornis* male.

*Material studied.* 23♂ & 75♀. "57/204, Praha, Kinského sady, B.c., 16.VI.1957, *Aphis fabae*, *Philadelphus*": 2♀; "57/96, Praha, BZKU, B.c., 3.VI.1957, *Aphis fabae*, *Euonymus europaeus*": 1♂ & 2♀; "58/154, Praha, Kinského sady, B.c., 2.VII.1958, \**Aphis*, *Spirea*, \**Binodoxys angelicae*, \**Ephedrus plagiator*": 1♀; "58/21, Filákovo, Slov.m. 22.V.1958, \**Aphis sambuci*, *Sambucus nigra*": 1♀; "58/231, Praha, BZKU, B.c., 28.VII.1958, \**Aphis craccivora*, *Robinia pseudoacacia*, \**Ephedrus plagiator*": 1♀; "59/112, Praha, BZKU, B.c., 9.VI.1959, \**Aphis viburni*, *Viburnum opulus*, *Binodoxys angelicae*": 1♀; "59/249, Praha, BZKU, B.c., 1.VII.1959, \**Aphis farinosa*, *Salix*, \**Lysiphlebus cardui*": 3♂ & 6♀; "59/250, Praha, BZKU, B.c., 1.7.1959, *Aphis fabae*, *Campanula rapunculoides*, \**Lysiphlebus cardui*": 1♂ & 2♀; "60/171, Adamov, Mor. m., 3.VI.1960, *Aphis fabae*, *Rumex*, *Lysiphlebus fabarum*": 1♀; 4♂ & 4♀; "60/336, Bot. Praha, BZKU, 15.VI.1960, *Aphis farinosa*, *Salix*, *Binodoxys angelicae*, *Lysiphlebus cardui*": 1♂; "60/338, Praha, BZKU, 15.VI.1960, *Aphis fabae*, *Arctium*, *Binodoxys angelicae*, *Lysiphlebus fabarum*": 3♀; "60/420, Praha, BZKU, B. c., 29.VI.1960, *Aphis fabae*, *Beta vulgaris*, *Lysiphlebus fabarum*": 3♀; "60/442, Praha, BZKU, B. c., 6.VII.1960, *Aphis farinosa*, *Salix*, *Lysiphlebus cardui*": 3♀; "60/494, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Arnica sacchaliensis*": 1♀; "60/502, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Tropaeolum majus*, *Binodoxys angelicae*": 2♀; "60/505, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Rumex balcanicus*, *Praon abjectum*": 1♀; "60/507, Praha, BZKU, B.c. 16.VII.1960, *Aphis*, *Rumex salicifolius*": 1♂ & 1♀; "60/514, Praha, BZKU, B. c., 20.VII.1960, *Aphis fabae*, *Beta vulgaris*": 1♀; "60/543, Trněný Újezd, B. c., 26.VII.1960, *Aphis fabae*, *Beta vulgaris*, *Lysiphlebus gr.fabarum*": 1♀; "60/546, Trněný Újezd, B. c.,

26.VII. 1960, *Thelaxes, Quercus*": 2♂ & 3♀; "60/587, Praha, BZKU, B. c., 30.VII.1960, *Aphis farinosa, Salix, Lysiphlebus cardui*": 3♀; "60/84, Karlštejn, B. c., 23.V.1960, *Sipha, Agropyrum*": 4♀; "61/416, Praha, Seminářská zahrada, B. c., 20.VI.1961, *Aphis, Spirea*": 2♀; "61/428, Praha, BZKU, B. c., 21.VI.1961, *Aphis pomi, Crataegus monogyna, Ephedrus plagiator*": 3♂ & 6♀; "61/501, Štúrovo, Slov. m., 27.VI.1961, *Sipha, Agropyrum repens, \*Adialytus*": 1♀; "70/209, Jičín, B. or., 20.VIII.1970, *Aphis fabae, Yucca, Lysiphlebus fabarum*": 1♀; "70/71, Praha, BZKU, B. c., 4.VI.1970, *\*Aphis frangulae, Frangula alnus, Binodoxys angelicae*": 2♀; "71/139, Praha, BZKU B. c., 16.VII.1971, *\*Aphis pomi, Malus*": 2♂ & 2♀; "74/108, Praha, BZKU, B.c., 4.VI.1974, *Aphis fabae, Evonymus europaeus, Praon abjectum*": 1♂; "74/118, Praha, Seminářská zahrada, B.c., 7.VI.1974, *Aphis, Laburnum anagyroides, Binodoxys angelicae*": 2♂ & 12♀; "83/55, Brloh, Blanský les, B.m., 14.VII.1983, *Aphis jacobaeae, Senecio, \*Lipolexis gracilis*": 2♀; "60/422, Praha, BZKU, B.c., 28.VI.1960, *Aphis urticata, Urtica urens*": 2♂. 5♂ & 5♀ in UB.

*Distribution.* Palaearctic, Neotropical and Africa Regions (Ferrer-Suay *et al.* 2012a). New record for the Czech and Slovak Republics.

### 3.17. *Alloxysta nigricans* Hellén, 1963

*Diagnosis.* *Alloxysta nigricans* is mainly characterized by having a closed radial cell 2.7 times as long as wide (Fig. 4a), pronotal carinae present, propodeal plate present, rhinaria and club shaped begin in F4 in both male and female and F1 longer than pedicel (Fig. 1q). *Alloxysta nigricans* is similar to *A. antananarivoi* Ferrer-Suay & Pujade-Villar, 2012, but they can be distinguished by the size of radial cell: 2.7 times as long as wide in *A. nigricans* but 2.4 times as long as wide in *A. antananarivoi*; shape of propodeal carinae: propodeal carinae forming a complete plate with few setae on top and with divergent peaks in the base in *A. nigricans* while propodeal carinae well defined, separated by setae in the first half and forming a plate in the last half, straight sides in *A. antananarivoi*.

*Material studied.* 2♀. "69/220, Praha, Strahovská zahrada, B. c., 20.VII.1969, *Peri-*

*phyllus, Acer platanoides, \*Euaphidius setiger*": 2♀. 1♀ in UB.

*Distribution.* Finland (Hellén 1963: 16). New record for the Czech Republic.

### 3.18. *Alloxysta obscurata* (Hartig, 1840)

*Diagnosis.* *Alloxysta obscurata* is mainly characterized by having a partially open radial cell 2.7 times as long as wide (Fig. 4b), pronotal carinae present, propodeal carinae absent, female antennae with the beginning of rhinaria in F3, F1 longer than pedicel and F2, F2 subequal to F3, F3 shorter than F4 (Fig. 1r), male antennae with the beginning of rhinaria in F4, F2 slightly curved, F1 longer than pedicel and F2, F2 longer than F3 and F3 longer than F4. It is similar to *A. macrophadna* but can be differentiated by the shape and proportions among flagellomeres: F1 longer than F2, F2 shorter than F3 and F3 shorter than F4 in *A. obscurata* (Fig. 1r) while F1 subequal to F2, F2 longer than F3 and F3 subequal to F4 in *A. macrophadna* (Fig. 1n); without any flagellomere curved in *A. obscurata* male but F2 and F3 strongly curved in *A. macrophadna* male; size of radial cell: 2.7 times as long as wide in *A. obscurata* (Fig. 4b) but 3.0 times as long as wide in *A. macrophadna* (Fig. 3o).

*Material studied.* 3♂ & 1♀. "58/255, Karlštejn, B.c., 2.VIII.1958, *Aulacorthum sp., Geranium robertianum*": 1♂; "58/315, Malacký-okolí, Slov. occ., 10.IX.1958, *\*Myzus galeopsidis, Galeopsis speciosa, \*Aphidius ribis*": 1♀; "58/322, Hrádek, Orl. Hory, B.or., 9.X.1958, *Aulacorthum, Athyrium filis-mas, \*Aphidius urticae*": 1♂; "60/107, Karlštejn, B.c., 27.V.1960, *Liniosiphon, Galium silvaticum*": 1♂. 1♂ in UB.

*Distribution.* Holarctic and Neotropical (Ferrer-Suay *et al.* 2012a). New records for the Czech and Slovak Republics.

### 3.19. *Alloxysta pallidicornis* (Curtis, 1838)

*Diagnosis.* *Alloxysta pallidicornis* is easily differentiated from the other *Alloxysta* species by its combination of features: radial cell completely open (Fig. 4c), pronotal carinae present, propodeal carinae present, well defined and separated by setae in the first half and forming a plate in the last half, beginning of rhinaria in F2 and F1

with very large length/width relation (Fig. 1s). It is similar to *Alloxysta abdera* Fergusson, 1986, but can be differentiated by the relation between F2–F4: F2–F4 subequal in length in *A. pallidicornis* but F2 longer than F3 and F3 longer than F4 in *A. abdera*; shape of propodeal carinae: propodeum with two carinae well defined and separated in the first half with setae present in *A. pallidicornis* while propodeum has two carinae joining forming a thick plate, with setae on top and curved sides in *A. abdera*, and they also differ in the size of radial cell: 2.6 times as long as wide in *A. pallidicornis* but 2.2 times as long as wide in *A. abdera*.

*Material studied.* 5♀. “59/202, Katovice, B. occ., 25.VI.1959, *Cinara, Pinus, \*Pauesia laricis, \*Pauesia pini*”: 1♀; “59/329, Pěkná, Šumava, B.m., 22.VII.1959, *Cinara, Pinus*”: 1♀; “59/335, Blažejovice, Šumava, B.m., 22.VII.1959, *Cinara, Pinus, Pauesia pini*”: 1♀; “60/220, Mohelno M. m., 5.VI.1960, *Cinara, Pinus sylvestris, Pauesia pini*”: 1♀; “60/453, Vel. Tisý, B. m., 11.VII.1960, *Cinara, Schizolachnus, Pinus sylvestris*”: 1♀. 1♀ in UB.

*Distribution.* Holarctic (Ferrer-Suay et al. 2012a). New records for Poland and the Czech Republic.

### 3.20. *Alloxysta pilipennis* (Hartig, 1840)

*Diagnosis.* *Alloxysta pilipennis* is mainly characterized by having a closed radial cell 2.5 times as long as wide (Fig. 4d), pronotal and propodeal carinae present, female antennae with the beginning of rhinaria in F3, F1 longer than pedicel and F2, F2–F4 subequal in length (Fig. 1t). It is similar to *Alloxysta pusilla* (Kieffer, 1902) but can be differentiated by the proportions among flagellomeres: F2 subequal to F3 in *A. pilipennis* female (Fig. 1t) but F2 shorter than F3 in *A. pusilla* female (Fig. 1μ.); F1–F3 not subequal and without any flagellomere curved in *A. pilipennis* male but F1–F3 subequal in length and slightly curved in *A. pusilla* male; size of radial cell: 2.4 times as long as wide in *A. pilipennis* female (Fig. 4d) but 2.7 times as long as wide in *A. pusilla* female (Fig. 4h).

*Material studied.* 21♂ & 50♀. “58/238, Karlštejn, B.c. 2.VIII.1958, *\*Macrosiphum rosae, Rosa*”: 1♀; “59/243, Praha, Strahovská

zahrada, B.c., 28.VI.1959, M. only, *Acer platanoides*”: 2♀; “59/95, Zadní Třebaň, B.c., 29.V.1959, *Eucallipterus, Tilia, \*Trioxys curvicaudus*”: 2♀; “60/333, Praha, Strahovská zahrada, B.c., 12.VI.1960, *Dysaphis, Malus communis*”: 1♀; “60/343, Raná, Louny, B. c., 17.VI.1960, *Sappaphis ?, Pyrus communis, \*Ephedrus persicae*”: 2♀; “60/346, Raná, Louny, B. c., 17.VI.1960, *Dysaphis, Malus communis, Ephedrus persicae*”: 1♀; “60/365, Praha, Kinského sady, B. c., 21.VI.1960, *Drepanosiphum, Acer pseudoplatanus, \*Dyscritulus planiceps*”: 1♀; “61/161, Královský Chlmec, Slov. or, 5.VI.1961, *Myzus cerasi, Prunus avium, \*Ephedrus cerasicola, Ephedrus persicae*”: 2♂; “61/35, Český Krumlov, B. m., 10.V.1961, *Aphis fabae, Euonymus europaeus, \*Ephedrus plagiator*”: 1♀; “61/454, Karlštejn, B. c., 23.VI.1961, *Macrosiphoniella oblonga, Artemisia vulgaris, \*Aphidius phalangomyzi*”: 1♀; “62/339, Praha, M. Strana, B. c., VII.1962, *\*Aphis pomi, Ovatus, Crataegus, Binodoxys angelicae*”: 1♀; “62/36, Lovoš, Č. Středohoří, B. bor., 31.V.1962, *Myzus cerasi, Prunus avium, Ephedrus persicae*”: 2♂ & 1♀; “64/27, Pavlovské kopce, M. m., 27.V.1964, *Judenkoa, Lonicera, Ephedrus plagiator*”: 1♀; “64/65, Praha, Kinského sady, B.c., 8.VI.1964, *Periphyllus, Acer platanoides*”: 1♀; “66/71, Lednice, M. m., 11.V.1966, *\*Phorodon humuli, Prunus domestica, Ephedrus persicae, Ephedrus plagiator, \*Praon volucre*”: 2♂; “66/94, Lednice, M. m., 24.V.1966, *Phorodon humuli*, over all outbreak, *Prunus domestica, Ephedrus plagiator, Praon volucre*”: 1♂; “68/342, Těchobuz, B. m., 25.VII.1968, *\*Aphis fabae, Cirsium arvense, \*Lysiphlebus fabarum*”: 1♀; “68/369, Praha, Seminářská zahrada, B. c., 12.VIII.1968, *\*Drepanosiphum platanoides, Acer pseudoplatanus*”: 2♀; “69/105, Praha, Kinského sady, B. c., 17.VI.1969, *Periphyllus, Acer platanoides, \*Euaphidius setiger, Trioxys falcatus*”: 1♀; “69/14, Praha, Seminářská zahrada, B. c., 16.V.1969, *\*Periphyllus testudinaceus, Acer pseudoplatanus*”: 1♂ & 3♀; “69/17, Praha, Seminářská zahrada, B. c., 16.V.1969, *Periphyllus testudinaceus, Acer campestre*”: 1♀; “69/170, Praha, Nábřeží Legii, B.c., 22.VI.1969, *Periphyllus, Acer platanoides, \*Falciconus pseudoplatani*”: 1♀; “69/180,

Červený Kláštor, Pierniny, Slov.bor., 1.VII.1969, *Periphyllus* sp., *Periphyllus lyropictus*, *Acer platanoides*, *Euaphidius setiger*": 1♀; "69/181, Praha, Seminářská zahrada, B.c., 1.VII.1969, \**Periphyllus lyropictus*, *Acer platanoides*, *Euaphidius setiger*": 1♀; "69/183, Praha, Seminářská zahrada, B.c., 1.VII.1969, *Periphyllus*, *Acer platanoides*": 1♀; "69/216, Praha, Seminářská zahrada, B. c., 20.VII.1969, *Periphyllus*, *Acer platanoides*, *Euaphidius setiger*": 1♂; "69/220, Praha, Strahovská zahrada, B. c., 20.VII.1969, *Periphyllus*, *Acer platanoides*, *Euaphidius setiger*": 2♀; "69/246, Praha, B. c., 23.X.1969, *Myzus varians*, *Clematis alba*, *Ephedrus plagiator*": 1♀; "69/26, Praha, Seminářská zahrada B. c., 23.V.1969, *Drepanosiphum*, *Acer pseudoplatanus*": 4♀; "69/30, Praha, Seminářská zahrada, B. c., 23.V.1969, *Drepanosiphum*, *Acer pseudoplatanus*": 2♂ & 1♀; "69/39, Praha, Seminářská zahrada, B. c., 23.V.1969, *Periphyllus*, *Acer campestre*, \**Areopraon silvestre*": 2♂; "70/130, Lednice, M. m., 19.VI.1970, *Periphyllus rhenanus*, *Acer platanoides*": 1♀; "70/14, Valtice, M. m., 7.V.1970, *Periphyllus* sp., *Periphyllus hirticornis*, *Acer campestre*": 1♂ & 1♀; "70/22, Valtice, M. m., 27.V.1970, *Drepanosiphum*, *Acer pseudoplatanus*, *Falciconus pseudoplatani*, \**Trioxys cirsii*": 1♂ & 1♀; "70/32, Valtice, M. m., 27.V.1970, *Periphyllus lyropictus*, *Acer platanoides*, *Areopraon silvestre*, *Trioxys falcatus*": 1♀; "70/64, Bystřice p.Host., M. or., 29.V.1970, *Periphyllus aceris*, *Acer platanoides*, *Areopraon silvestre*": 1♂ & 2♀; "70/84, Praha, BZKU, B. c., 4.VI.1970, *Periphyllus testudinaceus*, *Acer platanoides*, *Areopraon silvestre*": 1♂ & 1♀; "70/88, Praha, BZKU, B. c., 4.VI.1970, *Periphyllus*, *Acer pseudoplatanus*, *Trioxys falcatus*": 1♂ & 2♀; "71/102, Praha, Strahov, B.c., 20.VI.1971, *Dysaphis plantaginea*, *Malus*, *Ephedrus persicae*": 1♀; "71/38, Praha, Kinského sady, B. c., 27.V.1971, *Dysaphis*, *Malus communis*, *Ephedrus persicae*": 1♀; "71/43, Praha, Šárka, B c, 30.V.1971, *Dysaphis*, *Malus communis*, \**Ephedrus dysaphidis*": 1♂; "74/295, Praha, Seminářská zahrada, B.c., 10.VII.1974, *Drepanosiphum*, *Acer pseudoplatanus*, *Dyscritulus planiceps*, \**Falciconus pseudoplatani*":

1♀; "89/117, České Budějovice, B.m, 15.VI.1989, \**Cryptomyzus ribis*, *Ribes rubrum*": 1♀; "61/680, Praha, Kinského sady, B.c., 10.VII.1961, *Acyrtosiphon caraganae*, *Caragana arborescens*": 1♀; "70/64a, Bystřice p.Host., M.or., 29.V.1970, *Periphyllus aceris* et spp., *Acer platanoides*": 2♂. 5♂ & 5♀ in UB.

*Distribution.* Palaearctic and Neotropical (Ferrer-Suay *et al.* 2012a). New records for the Czech and Slovak Republics.

### 3.21. *Alloxysta pilosa*

Ferrer-Suay & Pujade-Villar, 2013

*Diagnosis.* *Alloxysta pilosa* is mainly characterized having an open radial cell, 4.9 times as long as wide (Fig. 4e), female antennae with the beginning of rhinaria in F4 in female and F3 in male, F1 subequal to pedicel and slightly shorter than F2, F2 subequal to F3 in female (Fig. 1u), F1 longer than pedicel and subequal to F2, F2 shorter than F3 in male, pronotal carinae present and propodeal carinae absent. It is similar to *Alloxysta brachycera* Hellén, 1963, but can be differentiated by pilosity of body: body covered by abundant pubescence in *A. pilosa* but only by scattered setae in *A. brachycera*; size of radial cell: 4.9 times as long as wide in *A. pilosa*, 2.7 times as long as wide in *A. brachycera*.

*Material studied.* 1♀. "69/172, Těchobuz, nr. Pacov, B.m., 21.VI.1969, \**Impatiens balsamines*, *Impatiens noli tangere*, \**Monoctonus nervosus*": 1♀ in UB.

*Distribution.* Eastern Palaearctic: Japan. Oriental Region: Nepal, Thailand and Taiwan (Ferrer-Suay *et al.* 2013e). New record for central Europe.

### 3.22. *Alloxysta pleuralis* (Cameron, 1879)

*Diagnosis.* This species is easily differentiated from other *Alloxysta* species by the following combination of features: partially open radial cell (Fig. 4f); pronotal carinae present; two well defined propodeal carinae reaching the base independently; female antennae: F1 longer than F2, F2 shorter than F3 and F3 shorter than F4 (Fig. 1v); male antennae: F1–F3 subequal in length and slightly curved. It is similar to *Alloxysta citripes* (Thomson, 1862) but can be

easily differentiated by the shape of propodeal carinae: propodeum with two carinae well defined, reaching the base independently, thick and with the sides curved in *A. pleuralis* while in *A. citripes* propodeal carinae are not protruding.

*Material studied.* 17♂ & 123♀. “57/204, Praha, Kinského sady, B.c., 16.VI.1957, *Aphis fabae*, *Philadelphus*”: 1♀; “58/116, Praha, Seminářská zahrada, B.c., 8.VI.1958, \**Aphis*, *Spirea*”: 1♀; “58/174, Synkov, B. or. 7.VII.1958, \**Cavariella*, \**Heracleum*, \**Ephedrus helleni*”: 3♀; “58/228, Komárov, B. or., 23.VII.1958, \**Aphis cognatella*, *Euonymus europaeus*, \**Binodoxys angelicae*”: 1♀; “58/282, Těchobuz, nr. Pacov, B.m. 20.VIII.1958, *Aphis*, *Vicia*, \**Binodoxys acalephae*”: 3♀; “59/112, Praha, BZKU, B.c., 9.VI.1959, \**Aphis viburni*, *Viburnum opulus*, *Binodoxys angelicae*”: 1♀; “59/116, Praha, BZKU, B.c., 9.VI.1959, *Aphis pomi*, *Malus communis*, *Binodoxys angelicae*”: 1♀; “59/116, Praha, BZKU, B.c., 9.VI.1959, *Aphis pomi*, *Malus communis*, *Binodoxys angelicae*”: 3♀; “59/291, Mnichová, Orl.hory, B. or., 8.VII.1959, *Cavariella* sp., *Salix*, \**Aphidius salicis*”: 1♀; “59/368, Praha, Seminářská zahrada, B. c., 18.VII.1959, *Aphis*, *Robinia*, \**Praon abjectum*”: 1♀; “60/141, Král.Chlmec, Slov. or., 1.VI.1960, *Aphis urticata*, *Urtica dioica*, *Binodoxys acalephae*”: 2♀; “60/212, Uherčice, M.m., 4.VI.1960, \**Aphis salviae*, *Salvia nemorosa*, *Binodoxys acalephae*, \**Lipolexis gracilis*”: 5♀; “60/320, Praha, Seminářská zahrada, B.c., 12.VI.1960, \**Aphis urticata*, *Urtica dioica*, *Binodoxys acalephae*”: 1♂ & 1♀; “60/338, Praha, BZKU, 15.VI.1960, *Aphis fabae*, *Arctium*, *Binodoxys angelicae*, *Lysiphlebus fabarum*”: 1♂ & 5♀; “60/400, Praha, BZKU, B. c., 25.VI.1960, *Aphis fabae*, *Cirsium*, *Carduus rigens*, *Praon abjectum*”: 1♀; “60/405, Praha, BZKU, B. c., 25.VI.1960, *Aphis farinosa*, *Salix repens rosmarinifolia*, *Binodoxys angelicae*, \**Lysiphlebus cardui*”: 2♀; “60/440, Mnich. Hradiště, B.sept., 1.VII.1960, *Aphis fabae*, *Beta vulgaris*”: 5♀; “60/442, Praha, BZKU, B. c., 6.VII.1960, \**Aphis farinosa*, *Salix*, *Binodoxys angelicae*”: 1♂ & 5♀; “60/444, Praha, BZKU, B. c., 7.VII.1960, *Aphis pomi*, *Malus sylvestris*, *Binodoxys angelicae*”: 11♀; “60/507, Praha, BZKU, B. c., 16.VII.1960, *Aphis*, *Rumex salicifolius*”: 1♀; “60/540, Karlík, B. c.,

26.VII.1960, *Angelica*”: 1♀; “60/545, Trněný Újezd, B. c., 26.VII.1960, *Aphis pomi*, *Malus sylvestris*, *Binodoxys angelicae*”: 7♀; “60/586, Praha, BZKU, B. c., 30.VII.1960, *Aphis*, *Robinia pseudoacacia*, *Binodoxys angelicae*, *Lysiphlebus cardui*”: 6♀; “60/607, Těchobuz, nr.Pacov, B. m., *Aphis craccae*, *Vicia cracca*, \**Lysiphlebus fritzmulleri*”: 3♀; “61/161, Královský Chlmec, Slov. or, 5.VI.1961, \**Myzus cerasi*, *Prunus avium*, \**Ephedrus cerasicola*, \**Ephedrus persicae*”: 1♀; “61/346, Piliš, Slov. N. Město, Slov. or., 9.VI.1961, \**Aphis mordwiliana*, *Rubus*”: 1♀; “61/416, Praha, Seminářská zahrada, B. c., 20.VI.1961, *Aphis*, *Spirea*”: 1♀; “61/522, Štúrovo, Slov. m., 28.VI.1961, *Aphis*, *Caragana arborescens*, *Binodoxys acalephae*”: 1♀; “62/339, Praha, M. Strana, B. c., VII.1962, *Aphis pomi*, *Ovatus*, *Crataegus*, *Binodoxys angelicae*”: 3♀; “62/367, Stranná, B. m., VII.1962, *Aphis fabae*, *Cirsium*, *Lysiphlebus fabarum* “: 1♀; “62/375, Žirovnice, B. m., VIII.1962, *Aphis fabae*, *Cirsium*”: 1♀; “70/163, Praha, Seminářská zahrada, B. c., 16.VII.1970, *Aphis pomi*, *Malus communis*, *Binodoxys angelicae*”: 5♀; “71/101, Praha, Strahov, B.c. 20.VI.1971, *Aphis pomi*, *Malus*, *Binodoxys angelicae*”: 2♀; “71/122, Praha, BZKU, B. c., 8.VII.1971, *Dysaphis*, *Pyrus communis*, *Binodoxys angelicae*, *Ephedrus persicae*”: 3♂ & 1♀; “71/139, Praha, BZKU, B. c., 16.VII.1971, *Aphis pomi*, *Malus*”: 4♀; “71/67, Kroměříž M. or., 7.VI.1971, *Aphis urticata*, *Urtica dioica*, *Binodoxys acalephae*”: 3♀; “72/155, Karlštejn, B. c., 7.VII.1972, *Aphis pomi*, *Malus*, *Binodoxys angelicae*”: 3♀; “74/108, Praha, BZKU, B.c., 4.VI.1974, *Aphis fabae*, *Evonymus europaeus*, *Praon abjectum*”: 1♀; “74/321, Průhonice, B.c., 13.VII.1974, *Aphis pomi*, *Cotoneaster horizontalis*, *Binodoxys angelicae*”: 2♂ & 1♀; “74/333, Praha, BZKU, B.c., 24.VII.1974, \**Aphis nasturtii*, *Caltha palustris*, *Binodoxys acalephae*, *Praon abjectum*”: 3♀; “78/208, Vítonice, nr. Kroměříž, M. or., 14.VII.1978, *Aphis urticata*, *Urtica dioica*, *Binodoxys acalephae*”: 2♀; “80/14, Příbram, B.c., 2.VII.1980, *Aphis urticata*, *Urtica dioica*, *Binodoxys acalephae*”: 1♀; “81/35, Obrátice, B.m., 18.IX.1981, *Aphis fabae*, *Cirsium arvense*, *Lysiphlebus cardui*”: 7♀; “83/42, Česká Budějovice, B.m., 4.VII.1983, *Aphis fabae*,



*Cirsium arvense*, *Lysiphlebus cardui*": 7♀; "83/50, České Budějovice, B.m., 13.VIII.1983, *Aphis fabae*, *Cirsium arvense*": 2♀; "84/141, Jetřichovec, B.m., 6.VIII.1984, *Aphis fabae*, *Cirsium arvense*, *Lysiphlebus cardui*": 1♀; "84/145, Pacov, B.m., 8.VIII.1984, *Aphis fabae*, *Cirsium arvense*": 5♀; "85/22, Lednice, M.m., 3.VII.1985, *Aphis urticata*, *Urtica dioica*, *Binodoxys acalephae*": 6♀; "85/24, Lednice, M.m., 3.VII.1985, \**Aphis intybi*, *Cichorium intybus*, \**Lipolexis gracilis*": 6♀; "85/25, Lednice, M.m., 3.VII.1985, *Aphis fabae*, *Chenopodium*, *Binodoxys angelicae*, \**Ephedrus nacheri*, *Ephedrus plagiator*": 1♀; "85/3, České Budějovice, B.m., 17.VI.1985, *Aphis craccae*, *Vicia cracca*, *Binodoxys acalephae*, *Praon abjectum*": 1♀; "85/33, Holešov, M.or., 3.VII.1985, *Aphis fabae*, *Cirsium arvense*, *Binodoxys acalephae*, *Lysiphlebus cardui*": 1♂ & 8♀; "85/36, Bilavsko, M.or., 4.VII.1985, *Aphis fabae*, *Cirsium arvense*": 4♀; "85/46, Kojetín, M.c., 4.VII.1985, *Aphis fabae*, *Artium*, *Binodoxys acalephae*": 4♂ & 8♀; "85/54, Pištín, B.m., 10.VII.1985, *Aphis fabae*, *Faba vulgaris*, *Binodoxys angelicae*, *Lysiphlebus fabarum*": 10♀; "85/69, Jetřichovec, B.m., 26.VII.1985, *Aphis fabae*, *Chenopodium*, *Ephedrus plagiator*": 5♀; "85/72, Jetřichovec, B.m., 18.VIII.1985, *Aphis fabae*, *Chenopodium*, *Lysiphlebus fabarum*": 2♂ & 13♀; "87/79, Holašovice, Zábouř, B.m., 15.VII.1987, *Aphis fabae cirsiacanthidis*, *Cirsium arvense*": 7♀; "89/134, České Budějovice, B.m., 19.VI.1989, Mummies only, *Malus*, *Binodoxys angelicae*": 4♀; "89/155, České Budějovice, B.m., 21.VI.1989, *Aphis fabae*, *Philadelphus*, *Binodoxys angelicae*": 9♀; "89/186, České Budějovice, B.m., 2.VII.1989, *Aphis fabae*, *Philadelphus*": 1♀; "58/231b, Praha, BZKU, B.c., 25.VII.1958, *Aphis craccivora*, *Robinia pseudoacacia*": 2♀; "60/360, Praha, Seminářská zahrada, B.c., 21.VI.1960, *Aphis fabae*, *Philadelphus coronarius*": 1♀; "60/446, Praha, Seminářská zahrada, B.c., 8.VII.1960, \**Aphis spiraephaga*, *Spirea vanhouttei*": 1♀; "85/27, Lednice, M.m., 3.VII.1985, *Aphis fabae*, *Cirsium arvense*": 2♂ & 8♀. 3♂ & 5♀ in UB.

*Distribution.* Palaearctic and Oriental Regions (Ferrer-Suay *et al.* 2012a). New records for the Czech and Slovak Republics.

### 3.23. *Alloxysta postica* (Hartig, 1841)

*Diagnosis.* Male unknown. *Alloxysta postica* is mainly characterized by having a partially open radial cell 2.5 times as long as wide (Fig. 4g), pronotal carinae and propodeal carinae present, female antennae with the beginning of rhinaria in F4, pedicel-F4 subequal in length (Fig. 1w). It is similar to *A. citripes* but can be differentiated by the shape of the propodeal carinae: clearly visible and forming a protruding plate in *A. postica* while the carinae are not protruding in *A. citripes*; size of radial cell: 2.5 times as long as wide in *A. postica* (Fig. 4g) but 2.1 times as long as wide in *A. citripes* (Fig. 3f).

*Material studied.* 4♀. "58/222, Žiželice, nr. Chlumec, B. or., 25.VII.1958, *Cavariella* sp., *Angelica sylvestris*, \**Aphidius salicis*": 3♀; "60/443, Praha, BZKU, B. c., 7.VII.1960, *Brachycaudus*, *Prunus persica*, *Binodoxys angelicae*, \**Ephedrus persicae*": 1♀. 1♀ in UB.

*Distribution.* Palaearctic (Ferrer-Suay *et al.* 2012a). New record for the Czech Republic.

### 3.24. *Alloxysta pusilla* (Kieffer, 1902)

*Diagnosis.* *Alloxysta pusilla* is mainly characterized having a closed radial cell 2.7 times as long as wide in female (Fig. 4h) and 2.4 times as long as wide in male, pronotal and propodeal carinae present forming a plate, female antennae with the beginning of rhinaria in F3, F1 longer than pedicel and F2, F2 shorter than F3 and F3 shorter than F4 (Fig. 1x), male antennae with the beginning of rhinaria in F1, pedicel-F3 subequal in length, F4 longer than F3, F1–F3 slightly curved. It is similar to *A. pilipennis* but can be differentiated by the proportions between flagellomeres in both male and female: F2 shorter than F3 in *A. pusilla* female (Fig. 1x) but F2 subequal to F3 in *A. pilipennis* female (Fig. 1x); F1–F3 subequal in length and slightly curved in *A. pusilla* male but F1–F3 not subequal and without any flagellomere curved in *A. pilipennis* male; size of the radial cell: 2.7 times as long as wide in *A. pusilla* female (Fig. 4h) but 2.4 times as long as wide in *A. pilipennis* female (Fig. 4d).

*Material studied.* 53♂ & 41♀. "58/106, Praha, Seminářská zahrada, B.c., 1.VI.1958, Par., *Rosa*": 1♂; "58/110, \**Rhopalomyzus alpigenae*, *Lonicera tatarica*, Praha, BZKU, B.c.,

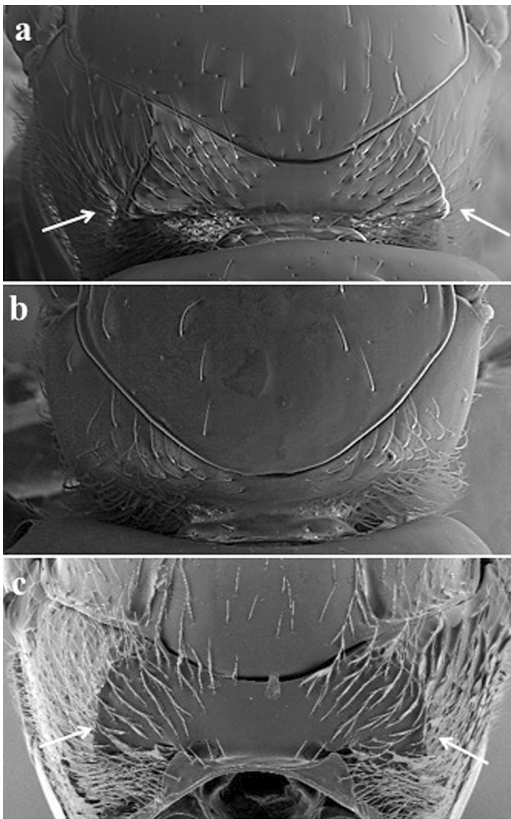


Fig. 5. Types of pronotum. – a. *Alloxysta arcuata*. – b. *A. brevis*. – c. *Phaenoglyphis americana*.

30.V.1958”: 1♂ & 1♀; “58/234, Praha, BZKU, B. c., 31.VII.1958, *Aphis fabae*, *Cirsium*, \**Lysiphlebus fabarum*”: 1♂ & 4♀; “58/241, Karlštejn, B.c. 2.VIII.1958, *Aphis fabae*, *Lappa major*, *Lysiphlebus fabarum*”: 1♀; “58/282, Těchobuz, nr. Pacov, B.m. 20.VIII.1958, *Aphis*, *Vicia*, \**Lysiphlebus fabarum*”: 1♂; “59/20, Kysak, Slov. or., 23.V.1959, *Aphis fabae*, *Euonymus europaeus*, \**Ephedrus plagiator*”: 1♀; “60/156, Král.Chlmec, Slov. or., 1.VI.1960, \**Aphis urticata*, *Urtica dioica*, \**Binodoxys acalephae*, *Lysiphlebus fabarum*”: 2♂; “60/164, Král.Chlmec, Slov. or., 1.VI.1960, \**Aphis*, *Onobrychis sativa*, *Binodoxys acalephae*”: 4♂ & 6♀; “60/212, Uherčice, M.m., 4.VI.1960, \**Aphis salviae*, *Salvia nemorosa*, *Binodoxys acalephae*, \**Lipolexis gracilis*”: 5♂; “60/336, Praha, BZKU, B.c., 15.VI.1960, \**Aphis farinosa*, *Salix*, \**Binodoxys angelicae*, \**Praon abjectum*”: 1♂; “60/440, Mnich. Hradiště, B. bor., 1.VII.1960, *Aphis fabae*, *Beta vulgaris*”: 2♂; “60/517, Praha,

BZKU, B. c., 20.VII.1960, *Aphis urticata*, *Urtica urens*, \**Diaeretiella rapae*”: 2♂; “60/543, Trněný Újezd, B. c., 26.VII.1960, *Aphis fabae*, *Beta vulgaris*, *Lysiphlebus fabarum*”: 3♂ & 4♀; “60/543, Trněný Újezd, B. c., 26.VII.1960, *Aphis fabae*, *Beta vulgaris*, *Lysiphlebus fabarum*”: 3♂ & 3♀; “61/183, Královský Chlumec, Slov. or., 5.VI.1961, \**Aphis polygonata*, *Polygonum aviculare*, \**Lipolexis gracilis*”: 1♂; “61/218, Královský Chlumec, Slov. or., 6.VI.1961, \**Myzus ligustri*, *Ligustrum*, \**Monoctonus ligustri*, \**Praon volucre*”: 1♀; “61/329, Piliš, Slov. N. Město, Slov. or., 9.VI.1961, *Capitophorus*, *Carduus nutans*, \**Aphidius matricariae*”: 1♂; “61/335, Piliš, Slov. N. Město, Slov. or., 9.VI.1961, \**Aphis euphorbiae*, *Euphorbia cyparissias*, *Binodoxys acalephae*”: 4♂ & 4♀; “61/606, Mikulov, Mor. m., 2.VII.1961, *Aphis fabae*, *Beta vulgaris*”: 1♂; “61/95, Karlštejn, B. c., 19.V.1961, \**Phorodon humuli*, *Prunus domestica*”: 1♂; “62/365, Žirovnice, B. m., 12.VIII.1962, *Cavariella*, *Salix*”: 1♂; “62/484, Těchobuz, B. m., VIII.1962, *Aphis fabae*, *Cirsium*, *Lysiphlebus fabarum*”: 1♂; “62/528, Smilovy hory, B. m., VIII.1962, *Aphis fabae*, *Cirsium*, *Lysiphlebus fabarum*”: 1♀; “64/63, Praha, Botanická zahrada, B.c., 6.VI.1964, *Hyalopterus pruni*, *Prunus domestica*, *Ephedrus plagiator*”: 1♀; “66/100, Lednice, M. m., 24.V.1966, *Aphis urticata*, *Urtica dioica*, *Lysiphlebus fabarum*”: 2♂ & 5♀; “83/40, České Budějovice, B.m., 4.VII.1983, *Aphis fabae*, *Cirsium*, *Binodoxys acalephae*, *Lysiphlebus fabarum*”: 3♂ & 3♀; “85/22, Lednice, M.m., 3.VII.1985, *Aphis urticata*, *Urtica dioica*, *Binodoxys acalephae*”: 2♂ & 1♀; “85/24, Lednice, M.m., 3.VII.1985, \**Aphis intybi*, *Cichorium intybus*, *Lipolexis gracilis*”: 2♂; “85/54, Pištín, B.m., 10.VII.1985, *Aphis fabae*, *Faba vulgaris*, *Binodoxys angelicae*, *Lysiphlebus fabarum*”: 1♂; “87/123, Holašovice – Záboří, B.m., 19.VII.1987, *Schizaphis typhaeae*, *Typha*, *Diaeretiella rapae*, *Ephedrus plagiator*”: 3♂; “61/287, Svātuša, S.or., 8.VI.1961, *Aphis fabae*, *Chenopodium*”: 1♂; “85/27, Lednice, M.m., 3.VII.1985, *Aphis fabae*, *Cirsium arvense*”: 2♀. 5♂ & 5♀ in UB.

*Distribution.* Palearctic and Oriental Regions (Ferrer-Suay et al. 2012a). New records for the Czech and Slovak Republics.

3.25. *Alloxysta ramulifera* (Thomson, 1862)

*Diagnosis.* *Alloxysta ramulifera* is mainly characterized by having a small closed radial cell, 2.0 times as long as wide (Fig. 4i), pronotal carinae present but very small and sometimes difficult to see under the pubescence, propodeal carinae forming a plate, rhinaria and antennal club begin in F4, F1 subequal to pedicel, F1 longer than F2, F2 subequal to F3, F3 shorter than F4 (Fig. 1y). *Alloxysta ramulifera* is very similar to *A. arcuata* in that both species have pronotal carinae, a propodeal plate, and radial cell small and closed. They can be distinguished by: shape of pronotal carinae, small and sometimes very difficult to see under the pubescence in *A. ramulifera* (thick and clearly visible in *A. arcuata*); shape of propodeal plate, in *A. ramulifera* carinae are straight and separated by setae in the first 1/3 and forming a plate in the last 2/3 (forming a complete plate in *A. arcuata*); and in size of radial cell: 2.0 times as long as wide in *A. ramulifera* (Fig. 4i) (2.3 times as long as wide in *A. arcuata* Fig. 3a).

*Material studied.* 1♂ & 9♀. “60/507, Praha, BZKU, B. c., 16.VII.1960, *Aphis, Rumex salicifolius*”: 1♀; “60/523, Dobřichovice, B. c., 26.VII.1960, *Aphis, Rumex, \*Lysiphlebus confusus*”: 3♀; “60/543, Trněný Újezd, B. c., 26.VII.1960, *\*Aphis fabae, Beta vulgaris, Lysiphlebus confusus*”: 1♂ & 3♀; “66/100, Lednice, M. m., 24.V.1966, *\*Aphis urticata, Urtica dioica, Lysiphlebus confusus*”: 1♀; “66/93, Lednice, M. m., 24.V.1966, *\*Aphis spiraephaga, Spirea, \*Binodoxys angelicae*”: 1♀; “70/98, Těchobuz, nr. Pacov, B. m., 15.VI.1970, *\*Lipaphis erysimi, Thlaspi arvense, \*Ephedrus nacheri, \*Praon volucre*”: 1♂. 3♀ in UB.

*Distribution.* Palaearctic (Ferrer-Suay et al. 2012a). New record for the Czech Republic.

3.26. *Alloxysta sawoniewiczzi* (Kierych, 1988)

*Diagnosis.* *Alloxysta sawoniewiczzi* is similar to *A. arcuata* in having closed radial cell, pronotal and propodeal carinae, and F1 subequal to pedicel. They can be distinguished by: *A. sawoniewiczzi* has antennae shorter than body length, while *A. arcuata* has them longer; in *A. sawoniewiczzi* rhinaria begin in F5 in female (Fig. 1z) and F4 in

male, in *A. arcuata* rhinaria begin in F3 in female (Fig. 1a) and F2 in male; *A. sawoniewiczzi* has propodeal carinae narrow and well defined in upper half, wide and forming a plate in lower half with sharp margins, while *A. arcuata* has propodeal carinae forming a complete plate with few setae on top and margins slightly curved.

*Material studied.* 1♂ & 2♀. “57/107, Lnáře, B. m., 5.VI.1957, *\*Aphis farinosa, Salix, \*Binodoxys angelicae*”: 1♀; “71/137, Praha, Karlovo náměstí, B. c., 13.VII.1971, *Hyadaphis foeniculi, Lonicera xylosteum*”: 1♂ & 1♀. 1♀ in UB.

*Distribution.* Palaearctic (Ferrer-Suay et al. 2012a). New record for the Czech Republic.

3.27. *Alloxysta semiaperta* Fergusson, 1986

*Diagnosis.* *Alloxysta semiaperta* is mainly characterized by having a partially open radial cell, 2.7 times as long as wide (Fig. 4k), pronotal carinae present, propodeal carinae absent, rhinaria and antennal club begin in F3 in female and F4 in male; F1 longer than pedicel and F2, F2 shorter than F3 in female and subequal in male, F3 shorter than F4 (Fig. 1aa). It is similar to *Alloxysta salicicola* Belizin, 1973, but they can be differentiated by the length of the flagellomeres, being the relation between length and width longer in *A. salicicola*.

*Material studied.* 5♂ & 8♀. “59/77, Praha, Seminářská zahrada, B. c., 24.V.1959, *\*Macrosiphum gei, Geum, \*Aphidius urticae*”: 1♂; “59/80, Praha, Seminářská zahrada, B. c., 24.V.1959, *Hyperomyzus, Grossularia, \*Ephedrus plagiator, \*Praon volucre*”: 1♀; “60/96, Karlštejn, B. c., 23.V.1960, *\*Macrosiphum rosae, Rosa, \*Aphidius rosae*”: 1♂; “62/15, Lovoš, Č. Středohoří, B. bor., 31.V.1962, *Aphidius rosae, Macrosiphum rosae, Rosa*”: 1♀; “67/36, Těchobuz, nr. Pacov, B. m., 7.VI.1967, *\*Impatiens balsamines, Impatiens noli tangere, \*Praon longicorne*”: 1♂ & 1♀; “69/54, Karlštejn, B. c., 28.V.1969, *Linosiphon, Galium silvaticum*”: 1♀; “70/174, Karlštejn, B. c., 22.VII.1970, *\*Impatiens asiaticum, Impatiens parviflora*”: 2♂; “70/196, Konopiště, B. c., 2.IX.1970, *Impatiens balsamines, Impatiens parviflora, Praon volucre*”: 1♀; “74/288, Praha, Kinského sady, B. c., 10.VII.1974, *Myzocallis, Corylobium, Corylus*”:

1♀; “92/78, Chvalčov, nr. Bystřice pod Hostýnem, M.or., 25.VIII.1992, *Impatientinum asiaticum*, *Impatiens parviflora*”: 2♀, 1♀ in UB.

*Distribution.* Palaearctic (Ferrer-Suay et al. 2012a). New record for the Czech Republic.

### 3.28. *Alloxysta victrix* (Westwood, 1833)

*Diagnosis.* *Alloxysta victrix* is mainly characterized by having a large, closed radial cell 3.0 times as long as wide (Fig. 4l), pronotal carinae present, propodeal carinae absent lacking setae on longitudinal areas where carinae are present in other Charipinae species (Fig. 6b), beginning of rhinaria in F3, F1 longer than pedicel and F2, F2–F4 subequal (Fig. 1bb), F1–F3 curved in male. It is similar to *A. consobrina* but can be differentiated by the proportion between flagellomeres: F2–F4 subequal in length in *A. victrix* (Fig. 1bb) while F2 subequal to F3 and F3 shorter than F4 in *A. consobrina* (Fig. 1h); size of radial cell: 3.0 times as long as wide in *A. victrix* (Fig. 4l) but 2.7 times as long as wide in *A. consobrina* (Fig. 3g), and type of propodeal pubescence: in *A. victrix* propodeum lacks setae at the longitudinal area where carinae are present in Charipinae while *A. consobrina* has propodeum completely covered with dense setae.

*Material studied.* 81♂ & 148♀. “58/132, Praha, Ruzyně, B.c. 13.VI.1958, \**Cryptomyzus ribis*, *Ribes rubrum*, \**Aphidius ribis*”: 8♀ & 2♂; “58/228, Komárov, B. or., 23.VII.1958, \**Aphis cognatella*, *Euonymus europaeus*, \**Binodoxys angelicae*”: 1♀; “58/238, Karlštejn, B.c. 2.VIII.1958, *Macrosiphum rosae*, *Rosa*”: 1♂; “58/321, Bělá p.B., N. Paka, B.c., 5.X.1958, \**Amphorophora ampullata*, *Dryopteris austriaca*”: 1♂; “58/95, Pov. Inovec, Slov.occ., 30.V.1958”: 1♂; “58/98, Pov. Inovec, Slov. occ., 30.V.1958 *Nasonovia*, *Silene*, \**Aphidius hieraciorum*, \**Praon pubescens*”: 1♂; “59/172, Studnice, B.m., 22.VI.1959, *Cavariella* sp., *Heracleum sphondylium*”: 1♂; “59/204, Rojice, B.m., 25.VI.1959, *Macrosiphum rosae*, *Rosa*, *Aphidius rosae*”: 2♂ & 3♀; “59/209, Dubí h., Strakonice, B. occ., 25.VI.1959, *Macrosiphum rosae*, *Rosa*”: 1♀; “59/282, Říčky, Orl.hory, B. or., 7.I.1959, \**Macrosiphum prenathidis*, *Prenanthes purpurea*, *Praon volucre*”: 1♀; “59/282, Říčky, Orl.hory, B. or., 7.VII.1959, Macro-

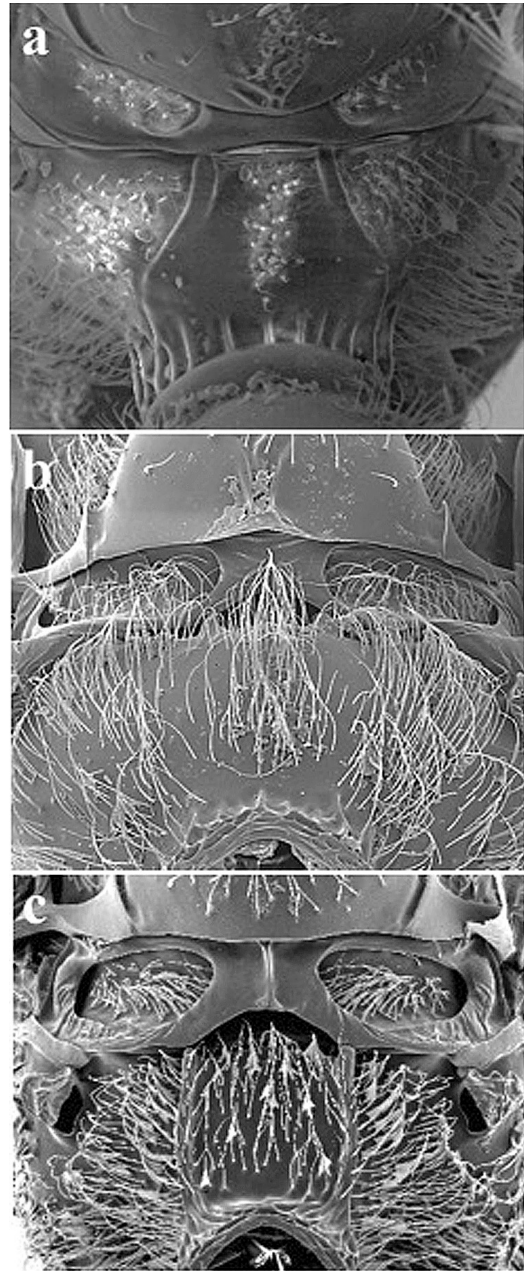


Fig. 6. Types of propodeum. – a. *Alloxysta arcuata*. – b. *A. victrix*. – c. *Phaenoglyphis americana*.

*siphum prenathidis*, *Prenanthes purpurea*, \**Aphidius urticae*, \**Ephedrus plagiator*”: 1♀; “59/286, Anenská Hut, Orl. Hory, B.or., 8.VII.1959, *Rhopalosiphoninus*, *Oxalis*, \**Ephedrus lacertosus*, *Praon volucre*”: 1♀; “60/106, Karlštejn, B.c, 23.V.1960, *Macrosiphum rosae*, *Rosa*, *Aphidius rosae*, *Praon*

- volucre*": 2♂ & 1♀; "60/107, Karlštejn, B.c., 23.V.1960, *Liniosiphon*, *Galium silvaticum*, \**Aphidius liniosiphonis*, *Praon volucre*": 1♀; "60/109, Karlštejn, B.c., 23.V.1960, *Macrosiphum rosae*, *Rosa*, *Aphidius rosae*": 2♀; "60/111, Čelákovice, B.c., 26.V.1960, *Aulacorthum*, *Potentilla argentea*, *Aphidius urticae*, *Ephedrus plagiator*": 3♀; "60/284, Hostýn, Hostýnské hory, M. or., 9.VI.1960, \**Macrosiphum funestum*, *Rubus*": 1♀; "60/302, Praha, BZKU, B.c., 8.VI.1960, \**Myzus ajugae*, *Ajuga reptans*, *Aphidius matricariae*": 1♂; "60/357, Stěhelčevy B. c., 17.VI.1960, *Brevicoryne brassicae*, *Brassica napus*": 31♂ & 64♀; "60/357, Stěhelčevy B. c., 17.VI.1960, *Brevicoryne brassicae*, *Brassica napus*": 2♀; "60/36, Rajhrad, M. m., 19.V.1960, *Brevicoryne brassicae*, *Brassica napus*, \**Diaeretiella rapae*": 1♂ & 3♀; "60/381, Dobříš, B. c., 23.VI.1960, *Macrosiphum rosae*, *Rosa*, *Aphidius rosae*": 1♂ & 2♀; "60/396, Praha, BZKU, B. c., 24.VI.1960, \**Acyrtosiphon caraganae*, *Caragana arborescens*, *Aphidius ervi*, \**Ephedrus plagiator*": 3♂; "60/419, Praha, BZKU, B. c., 28.VI.1960, *Myzus persicae*, *Urtica urens*, *Diaeretiella rapae*": 4♂ & 2♀; "60/473, Blatná-ensv., B. m. 13.VII.1960, *Brachycaudus*, *Senecio*, *Aphidius ervi*": 1♂; "60/516, Praha, BZKU, B. c., 20.VII.1960, *Hyperomyzus*, *Sonchus oleraceus*, *Praon volucre*": 1♂ & 1♀; "60/611, Bílý Kostel, B. bor., 9.VIII.1960, *Sitobion avenae*, *Festuca nemoralis*, *Lysiphlebus confusus*": 1♂; "60/684, Sušice, B. m., 4.IX.1960, *Myzus galeopsidis*, *Galeopsis ladanum*": 1♀; "60/82, Karlštejn, B. c., 23.V.1960, *Acyrtosiphon*, *Euphorbia cyparissias*, *Aphidius ervi*": 2♀; "60/86, Karlštejn, B. c., 23.V.1960, *Aulacorthum*, *Sanguisorba minor*, *Aphidius urticae*": 2♂ & 2♀; "60/96, Karlštejn, B. c., 23.V.1960, *Macrosiphum rosae*, *Rosa*, *Aphidius rosae*": 2♀; "61/149, Praha, Seminářská zahrada, B. c., 4.VI.1961, \**Macrosiphum gei*, *Geum*, *Aphidius urticae*": 1♀; "61/155, Královský Chlmec, Slov. or., 5.VI.1961, *Cryptomyzus*, *Ribes rubrum*, *Aphidius ribis*": 3♂ & 3♀; "61/199, Královský Chlmec, Slov. or., 5.VI.1961, *Macrosiphum rosae*, *Rosa*, *Aphidius rosae*": 1♀; "61/284, Svātuša, Slov. or., 8.VI.1961, *Macrosiphum rosae*, *Rosa*, *Aphidius rosae*": 6♀; "61/327, Piliš, Slov. N. Město, Slov. or., 9.VI.1961, *Hyadaphis*, *Conium maculatum*": 3♀; "61/605, Mikulov, Mor. m., 2.VII.1961, *Macrosiphum rosae*, *Rosa*, *Praon volucre*": 1♀; "61/64, Praha, Seminářská zahrada, B. c., 13.V.1961, \**Rhopalosiphum padi*, *Prunus padus*, *Ephedrus plagiator*": 1♂ & 2♀; "62/315, Štúrovo, Slov. m., 6.VI.1962, \**Macrosiphum euphorbiae*, *Euphorbia palustris*": 1♀; "62/469, Putimov, nr. Pelhřimov, B. m., VIII.1962, *Sitobion avenae*, *Avena sativa*, *Aphidius uzbekistanicus*, *Ephedrus plagiator*": 1♀; "64/21, Karlštejn, B. c., 25.V.1964, \**Aphidius liniosiphonis*, *Liniosiphon*, *Galium silvaticum*": 1♂; "65/1148, Těchobuz, nr. Pacov, B.m., 25.IX.1965, *Aphis fabae*, *Cavariella*, *Compositae*": 1♂1♀; "66/9, Kroměříž, M.c., 19.IV.1966, *Myzus persicae*, *Asparagus sprengeri*, *Aphidius matricariae*": 1♀; "67/14, Kláštorisko, Slov. Ráj, Slov.bor., 27.V.1967, \**Macrosiphum oredonensis*, *Lonicera nigra*": 1♀; "67/17, Mnichov, B. occ., 14.VI.1967, \**Macrosiphum melampyri*, *Melampyrum pratense*": 1♂ & 1♀; "69/216, Praha, Seminářská zahrada, B.c., 20.VII.1969, *Periphyllus*, *Acer platanoides*, \**Euaphidius setiger*": 2♂; "69/220, Praha, Strahovská zahrada, B. c., 20.VII.1969, *Periphyllus*, *Acer platanoides*, *Euaphidius setiger*": 1♂; "70/110, Rusava, Hostýnské vrchy, M. or., 17.VI.1970, *Cavariella*, *Salix*": 1♂; "70/188, V. Tatry, Tomanova dolina, Slov.bor., 23.VII.1970, \**Brachycaudus klugkisti*, *Silene rubra*": 1♀; "70/32, Valtice, M. m., 27.V.1970, \**Periphyllus lyropictus*, *Acer platanoides*, *Euaphidius setiger*, \**Areopraon silvestre*": 1♂; "71/158, Praha, Podolí, B. c., 18.VII.1971, *Macrosiphoniella*, *Achillea millefolium*": 1♀; "71/35, Praha, Kinského sady, B. c., 27.V.1971, *Cryptomyzus*, *Ribes*, *Aphidius ribis*, \**Toxares deltiger*": 1♀; "72/151, Blatnice, nr. Mladá Vožice B m, 2.VII.1972, *Sitobion*, *Secale arvense*, *Aphidius uzbekistanicus*": 2♂; "74/107, Praha, BZKU, B., c., 4.VI.1974, *Capitophorus*, *Elaeagnus angustifolia*, *Aphidius matricariae*": 1♂; "74/110, Praha, Kinského sady, B.c., 6.VI.1974, *Euceraphis punctipennis*, *Betula*, \**Betuloxys compressicornis*": 1♂; "74/122, Praha, Seminářská zahrada, B.c., 7.VI.1974, *Betulaphis*, *Betula*, \**Aphidius aquilus*": 3♂ & 2♀; "78/174, Praha, Seminářská zahrada, B.c., 20.VI.1978, *Cavariella*, *Umbelliferae*, *Aphidius*

*salicis*”: 2♂ & 2♀; “78/180, Praha, Dejvice, Šárka, B.c., 27.VI.1978, *Macrosiphum*, *Rubus*, *Aphidius urticae*”: 1♂; “81/29, Praha-Motol, B.c., 13.VII.1981, *Macrosiphum rosae*, *Rosa*, *Aphidius rosae*”: 4♀; “87/112, Holašovice, B.m., 23.VII.1987, *Rhopalosiphum nymphaeae*, *Schizaphis*, *Typha angustifolia*, \**Praon necans*”: 1♀; “89/160, Prachatic, B.m., 22.VI.1989, *Cryptosiphum*, *Artemisia vulgaris*, \**Aphidius arvensis*, *Ephedrus nacheri*”: 1♀; “89/165, Nové Hrad, B.m., 23.VI.1989, *Brevicoryne brassicae*, *Brassica napus*, *Diaeretiella rapae*”: 2♂ & 3♀; “89/176, České Budějovice, B.m., 28.VI.1989, *Microlophium carnosum*, *Urtica dioica*, \**Aphidius microlophii*, *Aphidius urticae*, \**Praon yomenae*”: 1♀; “60/107, Karštejn, B.c., 27.V.1960, *Linosiphon*, *Galium silvaticum*”: 1♀; “60/431, Žel.Brod, Jizerské hory, B.bor., 1.VII.1960, *Nasonovia*, *Uroleucon*, *Hieracium*”: 1♀; “60/70, Srbsko, B.c., 23.V.1960, *Cryptomyzus ribis*, *Ribes rubrum*, *Aphidius ribis*”: 1♀.

*Distribution*. Cosmopolitan (Ferrer-Suay et al. 2012a). New records for the Czech and Slovak Republics.

### 3.29. *Phaenoglyphis evenhuisi*

Pujade-Villar & Paretas-Martínez, 2006

*Diagnosis*. *Phaenoglyphis evenhuisi* is mainly characterized by having radial cell closed and 3.0 times as long as wide, notauli evanescent, scutellar foveae present with a complete transverse, inner, posterior carina defined and separated by a carina, female antennae with rhinaria and antennal club beginning in F4, F1 longer than pedicel and F2, F2 subequal to F3 and F3 shorter than F4 (Fig. 2a). It is similar to *Phaenoglyphis pubicollis* (Thomson, 1877) but can be differentiated by the beginning of rhinaria: F4 in *P. evenhuisi* (Fig. 2a) but F1 in *P. pubicollis*; shape of notauli: only evanescent in *P. evenhuisi* while only evanescent in front and well-marked in back in *P. pubicollis*.

*Material studied*. 2♀. “60/537, Karlík, B. c., 26.VII.1960, *Brachycaudus? lychnidis*, *Silene alba*, \**Diaeretiella rapae*, \**Praon volucre*”: 1♀; “60/539, Karlík, B. c., 26.VII.1960, *Brachycaudus*, *Arctium lappa*”: 1♀. 1♀ in UB.

*Distribution*. Palaearctic (Ferrer-Suay et al. 2012a). New record for the Czech Republic.

### 3.30. *Phaenoglyphis heterocera* (Hartig, 1841)

*Diagnosis*. *Phaenoglyphis heterocera* is mainly characterized by having F1 shorter than pedicel in female (Fig. 2b) but longer in male, rhinaria and antennal club begin in F3, rounded scutellar foveae not delimited on top and bottom. It is similar to *Phaenoglyphis stenosis* Andrews, 1978, but can be differentiated by the beginning of rhinaria: in F3 in *P. heterocera* but F2 in *P. stenosis*; F1 shorter than pedicel in *P. heterocera* female (Fig. 2b) but F1 longer than pedicel in *P. stenosis* female; F1–F3 subequal in length in *P. heterocera* female while F1–F3 not subequal in *P. stenosis* female being F1 longer than F2 and F2 subequal to F3; scutellar fovea separated by a carina in *P. heterocera* but scutellar foveae partly fused in *P. stenosis*.

*Material studied*. 2♂ & 4♀. “58/188, Čáslavokolí, B. or., 9.VII.1958, \**Uroleucon cichorii*, *Crepis biennis*, \**Lipolexis gracilis*”: 1♂; “60/573, Č. Brod, B. c., 28.VII.1960, *Brachycaudus*, *Arctium lappa*, \**Lysiphlebus gr. fabarum*”: 1♂; “81/35, Obrátice, B.m., 18.IX.1981, *Aphis fabae*, *Cirsium arvense*, \**Lysiphlebus fabarum*”: 3♀; “84/33, České Budějovice, B.m., 20.VI.1984, \**Aphis sambuci*, *Sambucus nigra*, \**Binodoxys angelicae*, \**Praon abjectum*”: 1♀. 1♂ & 1♀ in UB.

*Distribution*. Palaearctic (Ferrer-Suay et al. 2012a). New record for the Czech Republic.

### 3.31. *Phaenoglyphis longicornis* (Hartig, 1840)

*Diagnosis*. *Phaenoglyphis longicornis* is mainly characterized by having a closed radial cell 2.7 times as long as wide, pronotal and propodeal carinae, notauli present, oval scutellar foveae with straight margins, separated by a carina and not delimited at the bottom, female antennae with the beginning of rhinaria in F1, F1 longer than pedicel and F2, F2 subequal to F3 and F3 shorter than F4 (Fig. 2c). It is similar to *Phaenoglyphis stricta* (Thomson, 1877) but can be differentiated by the beginning of rhinaria: they are in the entire surface of F1 in *P. longicornis* (Fig. 2c) while they begin in the last three quarters of F1 in *P. stricta* (Fig. 2f); shape of scutellar foveae: not delimited on the bottom in *P. longicornis* while they are not delimited on the top and on the bottom in

*P. stricta*; size of radial cell: 2.7 times as long as wide in *P. longicornis* but 2.4 times as long as wide in *P. stricta*.

*Material studied.* 1♀. “72/153, Praha, Suchdol, B. c., 7.VII.1972, *Uroleucon*, *Cirsium arvense*, \**Aphidius funebris*”: 1♀.

*Distribution.* Palaearctic (Ferrer-Suay *et al.* 2012a). New record for the Czech Republic.

### 3.32. *Phaenoglyphis ruficornis* (Förster, 1869)

*Diagnosis.* *Phaenoglyphis ruficornis* is mainly characterized by having notauli present, with a few wrinkles on the distal side of the notauli, scutellar foveae present and horizontally elongated, separated by a carina and completely open at the bottom, rhinaria and antennal club begin in F1, F1 longer than pedicel and F2, F2–F4 subequal in length (Fig. 2d). It is similar to *P. pubicollis* and *P. evenhuisi* in sculpturing. However, they can be differentiated by *P. ruficornis* having the mesoscutum mostly smooth, with a few wrinkles on the distal side of the notauli, while *P. pubicollis* and *P. evenhuisi* have distinctive imbricate sculpturing on all surfaces.

*Material studied.* 1♀. “74/214, Stankovany, Choč.pohorie, Slov.bor., 24.VI.1974, *Cinara juniperi*, *Juniperus*, \**Pauesia juniperorum*”: 1♀.

*Distribution.* Holarctic (Ferrer-Suay *et al.* 2012a). New record for the Slovak Republic.

### 3.33. *Phaenoglyphis salicis* (Cameron, 1883)

*Diagnosis.* *Phaenoglyphis salicis* is mainly characterized by having a closed radial cell 2.5 times as long as wide, pronotal and propodeal carinae present, notauli weakly present, oval scutellar foveae present, completely defined and with two lines on top, female antennae with the beginning of rhinaria in F3, F1 longer than pedicel and F2, F2 shorter than F3, F3 subequal to F4 (Fig. 2e). It is similar to *Phaenoglyphis gutierrezii* Andrews, 1978, but can be differentiated by the relations among flagellomeres: F2 shorter than F3, F3–F4 subequal in length in *P. salicis* (Fig. 2e) while F2–F4 subequal in length in *P. gutierrezii*; shape of scutellar foveae: scutellar foveae completely defined and with two lines at the top in *P. salicis* but scutellar foveae slightly open at the bottom in *P. gutierrezii*.

*Material studied.* 12♀. “60/389, Praha, BZKU, B. c., 24.VI.1960, *Cavariella*, *Daucus carota*, \**Aphidius salicis*, \**Binodoxys brevicornis*”: 5♀; “68/342, Těchobuz, B. m., 25.VII.1968, \**Aphis fabae*, *Cirsium arvense*, \**Lysiphlebus fabarum*”: 7♀. 3♀ in UB.

*Distribution.* Palaearctic (Ferrer-Suay *et al.* 2012a). New record for the Czech Republic.

### 3.34. *Phaenoglyphis stricta* (Thomson, 1877)

*Diagnosis.* *Phaenoglyphis stricta* is mainly characterized by having notauli, scutellar fovea with straight sides and open on the top and on the bottom; female antennae with rhinaria and antennal club beginning in the last two thirds of F1, F1 longer than pedicel and F2, F2–F4 subequal in length (Fig. 2f). It is similar to *Phaenoglyphis insperatus* Belizin, 1973, but can be differentiated by the shape of scutellar foveae: they are with straight sides and open both on the top and on the bottom in *P. stricta* while rounded and slightly open at the bottom in *P. insperatus*; size of radial cell: 2.4 times as long as wide in *P. stricta* but in *P. insperatus* 2.9 times as long as wide.

*Material studied.* 4♀. “60/342, Raná, Louny, B.c., 17.VI.1960, \**Aphis urticata*, *Urtica dioica*, \**Binodoxys acalephae*”: 4♀. 1♀ in UB.

*Distribution.* Palaearctic and Neotropical Regions (Ferrer-Suay *et al.* 2012a). New record for the Czech Republic.

### 3.35. *Phaenoglyphis villosa* (Hartig, 1841)

*Diagnosis.* *Phaenoglyphis villosa* is characterized by having a partially open radial cell 2.1–2.7 times as long as wide, pronotal and propodeal carinae present, notauli absent, scutellum with two deep oval foveae more or less separated by a carina or completely fused, female antennae with the beginning of rhinaria in F3, F1 as long as pedicel or slightly longer, F1 subequal to F2, F2 shorter than F3, F3 shorter than F4, male antennae with the beginning of rhinaria in F3, F1 subequal to F2, F2 shorter than F3. At the moment *P. villosa* is easily differentiated from the other *Phaenoglyphis* species because it is the only one with a partially open radial cell.

*Material studied.* 43♂ & 54♀. “58/154, Praha, Kinského sady, B.c., 2.VII.1958, *Aphis*

- Spirea*, \**Binodoxys angelicae*, *Ephedrus plagiator*": 1♂; "58/181, Opatov, nr. Svitavy, B. or. 8.VII.1958, *Aphis fabae*, *Beta vulgaris*, \**Binodoxys acalephae*": 1♂ & 1♀; "59/20, Kysak, Slov. or., 23.V.1959, *Aphis fabae*, *Euonymus europaeus*, *Ephedrus plagiator*": 4♀; "59/20, Kysak, Slov. or., 23.V.1959, *Aphis fabae*, *Euonymus europaeus*, *Ephedrus plagiator*": 1♂; "59/26, Praha, BZKU, B.c., 14.V.1959, *Aphis fabae*, *Euonymus europaeus*, *Ephedrus plagiator*, \**Praon abjectum*": 1♀; "59/26, Kapušany, S. or., 14.V.1959, *Aphis fabae*, *Euonymus europaeus*, *Binodoxys angelicae*, *Praon abjectum*": 1♂; "59/29, Kapušany, S. or., 14.V.1959, *Aphis fabae*, *Euonymus europaeus*, *Praon abjectum*": 3♀; "60/337, Praha, BZKU, 15.VI.1960, *Myzus cerasi*, *Prunus cerasus*, *Ephedrus persicae*": 1♀; "60/341, Raná, Louny, B.c., 17.VI.1960, *Brevicoryne brassicae*, *Sinapis arvenses*, *Diaeretiella rapae*": 1♂; "60/357, Stěhelčevy B. c., 17.VI.1960, *Brevicoryne brassicae*, *Brassica napus*": 1♂ & 1♀; "60/364, Praha, Seminářská zahrada, B. c., 21.VI.1960, *Liosomaphis berberidis*, *Berberidis vulgaris*": 1♀; "60/404, Praha, BZKU, B. c., 25.VI.1960, *Trifolium fragiferum*": 1♀; "60/405, Praha, BZKU, B. c., 25.VI.1960, *Aphis farinosa*, *Salix repens rosmarinifolia*, *Binodoxys angelicae*, \**Lysiphlebus cardui*": 3♂ & 4♀; "60/419, Praha, BZKU, B. c., 28.VI.1960, *Myzus persicae*, *Urtica urens*, *Diaeretiella rapae*": 2♂ & 2♀; "60/423, Praha, BZKU, B. c., 28.VI.1960, *Aphis fabae*, *Cirsium*, *Lysiphlebus fabarum*": 1♂; "60/460, Mažice, B. m., 12.VII.1960, \**Aphis craccae*, *Vicia cracca*, \**Lysiphlebus fritzmulleri*": 1♂ & 6♀; "60/463, Mažice, B. m., 12.VII.1960, *Schizaphis*, *Typha angustifolia*, *Diaeretiella rapae*, \**Aphidius urticae*": 8♀ & 2♂; "60/515, Praha, BZKU, B. c., 20.VII.1960, *Myzus persicae*, *Beta vulgaris*": 2♂; "60/516, Praha, BZKU, B. c., 20.VII.1960, *Hyperomyzus*, *Sonchus oleraceus*, *Praon volucre*": 1♂; "60/517, Praha, BZKU, B. c., 20.VII.1960, *Aphis urticae*, *Urtica urens*, *Diaeretiella rapae*": 2♀; "60/543, Trněný Újezd, B. c., 26.VII.1960, *Aphis fabae*, *Beta vulgaris*, *Lysiphlebus fabarum* 1♂; "60/543, Trněný Újezd, B. c., 26.VII.1960, *Aphis fabae*, *Beta vulgaris*, *Lysiphlebus fabarum*": 1♀; "60/59, Korno, B. c., 23.V.1960, *Hydaphis*, *Galium mollugo*, \**Aphidius matricariae*": 1♂; "60/607, Těchobuz, nr. Pacov, B. m., *Aphis craccae*, *Vicia cracca*, *Lysiphlebus fritzmulleri*": 2♂; "60/667, Praha-Košíře, B.c., 24.VIII.1960, *Aphis fabae*, *Beta vulgaris*": 1♂; "61/218, Královský Chlumec, Slov. or, 6.VI.1961, *Myzus ligustri*, *Ligustrum*, \**Monoctonus ligustri*, *Praon volucre*": 1♀; "61/245, Somotor, Slov.m., 7.VI.1961, *Aphis fabae*, *Silene alba*, *Lysiphlebus fabarum*": 2♂ & 2♀; "62/396, Františkov, nr. M. Vožice, B. m., VIII.1962, *Solanum*": 1♂; "62/528, Smilovy hory, B. m., VIII.1962, *Aphis fabae*, *Cirsium*, *Lysiphlebus fabarum*": 1♂ & 2♀; "66/197, Lednice, M. m., 14.VII.1966, *Hyalopterus*, *Phragmites communis*, \**Aphidius transcaspicus*": 1♂; "70/116, Valtice, M. m., 19.VI.1970, \**Aphis urticae*, *Urtica dioica*, *Lysiphlebus fabarum*": 1♀; "70/209, Jičín, B. bor., 20.VIII.1970, *Aphis fabae*, *Yucca*, *Lysiphlebus fabarum*": 1♀; "73/360, Těchobuz, B. m., 2.IX.1973, *Impatiens balsamines*, *Impatiens nollitangere*": 2♂ & 2♀; "74/108, Praha, BZKU, B.c., 4.VI.1974, *Aphis fabae*, *Euonymus europaeus*, *Praon abjectum*": 1♂ & 2♀; "74/331, Praha, BZKU, B.c., 24.VII.1974, \**Rhopalosiphum nymphaeae*, *Sagittaria*": 1♂; "74/349, Praha, BZKU, B.c., 9.VIII.1974, *Rhopalosiphum nymphaeae*, *Sagittaria*, \**Praon necans*": 1♂; "81/35, Obrátice, B.m., 18.IX.1981, *Uroleucon*, *Aphis fabae*, *Cirsium arvense*, *Lysiphlebus fabarum*": 1♀; "83/10, České Budějovice, B.m., 7.VI.1983, *Liosomaphis berberidis*, *Berberis*, *Aphidius hortensis*": 2♂ & 1♀; "84/134, Pacov, B.m., 4.VIII.1984, *Aphis fabae*, *Cirsium arvense*, *Binodoxys acalephae*": 1♀; "84/141, Jetřichovec, B.m., 6.VIII.1984, *Aphis fabae*, *Cirsium arvense*, *Lysiphlebus cardui*": 4♂ & 2♀; "84/145, Pacov, B.m., 8.VIII.1984, *Aphis fabae*, *Cirsium arvense*": 2♂; "84/149, Pelhřimov, B.m., 8.VIII.1984, Undet. (green aphids), *Polygonum*": 1♀; "85/3, České Budějovice, B.m., 17.VI.1985, *Aphis craccae*, *Vicia cracca*, *Binodoxys acalephae*, *Praon abjectum*": 1♀; "87/112, Holašovice, B.m., 23.VII.1987, *Rhopalosiphum nymphaeae*, *Schizaphis*, *Typha angustifolia*, *Praon necans*": 1♂; "61/287, Svătoša, S.or., 8.VI.1961, *Aphis fabae*, *Chenopodium*": 1♂. 5♂ & 5♀ in UB.



Table 2. List of the new records per country of each Charipinae species identified in this work.

The Check and Slovak Republics	The Check Republic	The Slovak Republic
<i>Alloxysta arcuata</i>	<i>Alloxysta basimacula</i>	<i>Alloxysta fracticornis</i>
<i>Alloxysta brevis</i>	<i>Alloxysta brachyptera</i>	<i>Phaenoglyphis ruficornis</i>
<i>Alloxysta castanea</i>	<i>Alloxysta circumscripta</i>	
<i>Alloxysta citripes</i>	<i>Alloxysta hendrickxi</i>	<b>Slovenia</b>
<i>Alloxysta consobrina</i>	<i>Alloxysta kovilovica</i>	<i>Alloxysta halterata</i>
<i>Alloxysta macrophadna</i>	<i>Alloxysta leunisia</i>	
<i>Alloxysta mullensis</i>	<i>Alloxysta melanogaster</i>	<b>Poland</b>
<i>Alloxysta obscurata</i>	<i>Alloxysta nigricans</i>	<i>Alloxysta macrophadna</i>
<i>Alloxysta pilipennis</i>	<i>Alloxysta pallidicornis</i>	<i>Alloxysta pallidicornis</i>
<i>Alloxysta pleuralis</i>	<i>Alloxysta pilosa</i>	
<i>Alloxysta pusilla</i>	<i>Alloxysta postica</i>	
<i>Alloxysta victrix</i>	<i>Alloxysta ramulifera</i>	
<i>Phaenoglyphis villosa</i>	<i>Alloxysta sawoniewiczzi</i>	
	<i>Alloxysta semiaperta</i>	
	<i>Phaenoglyphis evenhuisi</i>	
	<i>Phaenoglyphis heterocera</i>	
	<i>Phaenoglyphis longicornis</i>	
	<i>Phaenoglyphis salicis</i>	
	<i>Phaenoglyphis stricta</i>	
	<i>Phaenoglyphis xanthochroa</i>	

*Distribution.* Cosmopolitan (Ferrer-Suay *et al.* 2012a). New records for the Czech and Slovak Republics.

### 3.36. *Phaenoglyphis xanthochroa* Förster, 1869

*Diagnosis.* *Phaenoglyphis xanthochroa* is easily differentiated from the other *Phaenoglyphis* species because of its dark yellow body and its deeply excavated notauli. It is similar to *Phaenoglyphis pilosus* Andrews, 1978, but they can be differentiated by the relations among F2–F10: F2 shorter than F3, F3–F10 subequal in length and width in *P. xanthochroa* but F2–F10 subequal in length and width in *P. pilosus*; mesoscutum and scutellum with few scattered setae in *P. xanthochroa* while mesoscutum and scutellum completely covered by long setae in *P. pilosus*.

*Material studied.* 6♂. “78/214, Chvalčov, M. or., 14.VII.1978, \**Impatiens balsamines*, \**Impatiens nolitangere*, \**Monoctonus nervosus*”: 6♂. 1♂ in UB.

*Distribution.* Palaearctic (Ferrer-Suay *et al.* 2012a). New record for the Czech Republic.

## 4. Discussion

Numerous host relations have been established here (Table 1). In total 389 new trophic relations are documented in this work. The number in parentheses after each species is the number of new host records for that species: *Alloxysta arcuata* (51), *A. basimacula* (1), *A. brachyptera* (2), *A. brevis* (44), *A. castanea* (28), *A. citripes* (2), *A. circumscripta* (19), *A. consobrina* (14), *A. fracticornis* (1), *A. halterata* (1), *A. hendrickxi* (2), *A. kovilovica* (1), *A. leunisia* (1), *A. macrophadna* (12), *A. melanogaster* (5), *A. mullensis* (14), *A. nigricans* (1), *A. obscurata* (3), *A. pallidicornis* (3), *A. pilipennis* (32), *A. pilosa* (1), *A. pleuralis* (27), *A. postica* (3), *A. pusilla* (22), *A. ramulifera* (7), *A. sawoniewiczzi* (2), *A. semiaperta* (8), *A. victrix* (45), *Phaenoglyphis evenhuisi* (2), *P. heterocera* (5), *P. longicornis* (1), *P. ruficornis* (1), *P. salicis* (3), *P. stricta* (1), *P. villosa* (23) and *P. xanthochroa* (1).

The material studied was collected mainly in former Czechoslovakia. Nearly all the species listed and localities are new for the Czech and Slovak Republics. Table 2 shows the species cited for the first time in each of the countries studied in this work. All the Charipinae species here identi-

fied, except *A. postica*, are recorded for the first time in this area. Up to now, only one recent study has focused on the Charipinae species present in Europe, from the Balkan Peninsula (Ferrer-Suay et al. 2013f). In that study, nine species were recorded for the first time from that region: *Alloxysta arcuata*, *A. brevis*, *A. castanea*, *A. fracticornis*, *A. fuscicornis* (Hartig, 1841), *A. macrophadna*, *A. mullensis*, *A. pleuralis*, and *A. salicicola*; and two new species were described: *Alloxysta kovilovica* Ferrer-Suay & Pujade-Villar, 2013 and *A. slovenica* Ferrer-Suay & Pujade-Villar, 2013. Vasileva-Sumnalieva (1976) already recorded five Charipinae species from the Balkan Peninsula (*Alloxysta macrophadna*, *A. nigrita* (Thomson, 1862), *A. postica*, *Apocharips trapezoidea* (Hartig, 1841) and *Phaenoglyphis villosa*). However, these records must be confirmed taking into account the taxonomic chaos within this subfamily before our revisions. Additionally, with the same considerations, *A. postica* was cited from the Czech Republic by Dalla-Torre & Kieffer (1910).

The need to continue the sampling and studies of the Charipinae fauna all around the world must be emphasized, as it is important to collect more material to know the real distribution patterns of the Charipinae species, which are nowadays mostly just spots on the globe.

The information provided in this study is very valuable for the study of host specialization and preferences of Charipinae. The information related to the Charipinae hosts is still very sparse and the study of old collections with a complete register of their hosts is one of the bases of this knowledge. Reviews of the aphidiine parasitoids and their aphid-plant associations are presented in Starý (2006) and Starý and Lukáš (2009).

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