



Heinrich Uzel, the father of Thysanoptera studies

PETER J. FEDOR^{1,4}, MARTINA DORIČOVÁ¹, PAVOL PROKOP² & LAURENCE A. MOUND³

¹Comenius University, Faculty of Natural Sciences, Department of Ecosozology (Conservation Biology), Mlynská dolina, 84215 Bratislava, Slovakia

²Institute of Zoology, Slovak Academy of Sciences, Bratislava, Slovakia

³CSIRO Ecosystem Sciences, Canberra, Australia

⁴Corresponding author. E-mail: fedor@fns.uniba.sk

Abstract

Jindřich (Heinrich) Uzel, a Czech phytopathologist and entomologist, published in 1895 a monograph on the Order Thysanoptera that provided the basis for almost all subsequent work on this group of insects. Here we review all the papers and books on thrips that were published by Uzel, including relevant phytosanitary reports. A list is provided of 91 species-group taxa described in the 1895 monograph, together with their current status.

Key words: Uzel, Thysanoptera, thrips

Introduction

The first known publication that recorded the existence of thrips appeared in the late 17th century. Filippo Bonanni, a Roman Catholic priest, published in 1691 sketches of an insect that was subsequently recognised by Uzel (1895) as a male of *Anthothrips staites*. However, Baron Carl De Geer (1744), of the 18th century Swedish royal court, is usually credited with the first record of insect species (*Physapus fuscus* and *P. ater*) that belong to the subsequently named Order Thysanoptera. Two years later Linnaeus (1746) used Thrips (in Greek θρίψ) as the group name for these insects, and he placed this genus at the end of the Hemiptera with three species numbered 726–728 (1746: 220–221). In addition to the two re-named species attributed to De Geer, he described a third species as *Thrips elytris albis nigrisque fasciis, corpore atro*, this being before the accepted date for the institution of binomial nomenclature in 1758. The Irish entomologist, Alexander Henry Haliday (1836) first proposed the ordinal name Thysanoptera in the first detailed publication about these insects. He included morphology and biology together with a survey of 41 known species in 11 genera. Following the summary published by Walker (1852), a series of smaller contributions on thrips anatomy, development and systematics were published by authors in several countries (e.g. Heeger 1852, Fitch 1855, Lindeman 1887).

Notwithstanding these smaller contributions, the first monograph dealing exclusively with this insect order was issued in 1895 by the Czech entomologist Jindřich (Heinrich) Uzel. This 500 page book not only summarized comprehensively almost all previously published information on Thysanoptera, but described 11 new genera, 63 species and 25 varieties, together with identification keys and illustrations. This remarkable, seminal, work provided the basis for a subsequent explosion in information about thrips in the early part of the 20th century. The volume by Uzel measured 34 x 27 x 4.5 cm, and weighed 3 kg. Despite these dimensions, the British thrips workers Richard Bagnall and Guy Morison used to carry this folio volume on their bicycles during thrips field studies in the early 1900's (teste Guy Morison to Laurence Mound in 1965). Not until Priesner (1926–1928) was any alternative text available for recognising Thysanoptera taxa.

In this paper we review all papers and books published by Uzel that include information on thrips, including many phytosanitary reports. Some of these are no longer available in their printed version, only as

his original manuscripts. In addition, we provide a list of the thrips taxa described by Uzel in his Monograph, primarily because of the potential confusion that arises through his repetitive use of some names.

Biographical notes

Jindřich Uzel is usually referred to by the German form of his name, Heinrich Uzel. He was a Czech naturalist, entomologist and phytopathologist, and is best known for providing the foundation for all modern research on Thysanoptera, the thrips. He developed a systematic basis for this group, together with a species level identification system, and moreover, he contributed broadly to phytosanitary matters. He was born on 10th of March, 1868, at Chomutov (Komotau) in the Czech Republic (formerly Austrian-Hungarian Empire) but spent his childhood in Hradec Králové (Königgrätz). Encouraged by his father, Vincenc Uzel, a high school professor, he developed a strong interest in nature, although this unfortunately led him to neglect his formal biological education at Charles University in Prague.

Initially interested in silverfish (Thysanura), Uzel became amazed by the world of tiny thrips. He studied these insects intensively for eight years and then in 1895, at the age of 27, he published his outstanding monograph that provided an overview of all that was known about Thysanoptera at that time. Curiously, he produced only one further publication on the taxonomy of this group, although as detailed below he published extensively on thrips as pests. Having laid the foundation for future studies on Thysanoptera, Uzel's interests changed direction and he then pursued higher education at Berlin, studying embryology and histology. After returning to Prague he successfully focused on the ontogeny of Apterygota, especially springtails (Collembola) and diplurans (Diplura). Thus in 1905 this young scientist was invited to become a special member of the Royal Czech Academy. Unfortunately there is no correspondence available between Uzel and other zoologists, that might explain in more detail his ideas and plans.



FIGURE 1. Heinrich Uzel.

Uzel (Figure 1) worked intensively in several biological and phytopathological stations, for instance as a vice-director of the State Botanical Garden in Peradenia, Ceylon (Sri Lanka). Later, as director of the sugar beet production research station in Prague he pursued a parallel career as professor of phytopathology and zoology (from 1920) at the Czech Technical College. He died in Prague in 1946 at the age of 78 (Koleška 1995).

According to our information, most of the thrips slides prepared by Uzel have been destroyed. More than 200 slides from the Ceylon collection have been deposited in the Natural History Museum in Vienna, Austria. Unfortunately there is no modern catalogue available, only an older list of collected slides. Most of them appear to be in a good condition, embedded in Canada balsam and moreover there is some material from Bohemia and Ceylon in alcohol, but with no catalogue available. Many slides were formerly deposited in Prague, the Czech Republic (Natural History Museum, Charles University, University of Agriculture), but most of them were destroyed during the World War II, when the University buildings were occupied by SS units (Koleška, 1975). A few slides of European species were obtained from Uzel by C.B. Williams, and these are now deposited in The Natural History Museum, London.

TABLE 1. New genera in the Monograph by Uzel (1895).

All of these genera remain valid and in current use.

Rhipidothrips
Prosopothrips
Dictyothrips
Rhaphidothrips
Dendrothrips
Stenothrips
Drepanothrips
Bolacothrips
Sminyothrips
Poecilothrips
Zygothrips

The Monograph

The Monograph on the order Thysanoptera (Uzel 1895) was published in both German and Czech. It was the first general, but also highly detailed, compendium on thrips published in the scientific world. Completed in May 1894, the book was given a special award by the Royal Czech Academy for its excellence. With its 481 pages, accompanied by 10 illustrated plates, the monograph was published at Hradec Králové (Königgrätz), a city that is today in the Czech Republic. In the systematic part, including the dichotomous identification key, Uzel presented 135 species of Thysanoptera, among these being 117 European, including 34 British and 28 Finnish. One hundred of these species were recorded from Bohemia, at that time a part of the Austrian Empire. Uzel included 11 new genera, 63 new species (34 known from both sexes), and 25 new varieties, and the names and current identity of each of these are indicated in Table 2. These new taxa were described from Bohemia, Helgoland, Budapest, Berlin, Rjeka and Lapland, and three families were recognised: Coleoptrata (Aeolothripidae), Stenoptera (Thripidae) and Phloeothripidae (Phlaeothripidae).

Extensive discussions followed the taxonomic section of the Monograph, and dealt with thrips palaeontology (phylogeny), morphology and anatomy, also development and ecology. In a relatively modern phytosanitary chapter the host plants, including glasshouse plants, are listed together with their Thysanoptera pests. A major contribution of the monograph is its historical presentation of information from many of the older papers and books dealing with thrips. The comprehensive, encyclopaedic nature of the Monograph is particularly remarkable considering that the author completed it between the ages of 19 and 27 years. The entire text of the book was printed in both Czech and German, almost on alternate pages, despite the traditional prejudice expressed by some subsequent authors.

TABLE 2. New species-group names in the Monograph by Uzel (1895).

Original name	Page	Original combination	Current identification
adusta	73	Aeolothrips fasciata adusta	<i>Aeolothrips intermedius</i>
adusta	81	Chirothrips manicata adusta	<i>Chirothrips manicatus</i>
adusta	96	Physopus vulgatissima adusta	<i>Frankliniella intonsa</i>
adusta	99	Physopus tenuicornis adusta	<i>Frankliniella tenuicornis</i>
adusta	120	Physopus primulae adusta	<i>Taeniothrips picipes</i>
adusta	110	Physopus pallipennis adusta	<i>Thrips vulgatissimus</i>
adusta	108	Physopus atrata adusta	<i>Thrips atratus</i>
adusta	180	Thrips major adusta	<i>Thrips major</i>
adusta	175	Thrips physopus adusta	<i>Thrips physapus</i>
adusta	185	Thrips adusta	<i>Thrips validus</i>
ajugae	136	Oxythrips ajugae	<i>Oxythrips ajugae</i>
albicornis	96	Physopus vulgatissima albicornis	<i>Frankliniella intonsa</i>
albopicta	264	Poecilothrips albopicta	<i>Poecilothrips albopictus</i>
albopilosa	190	Thrips albopilosa	<i>Thrips albopilosus</i>
alni	189	Thrips alni	<i>Thrips alni</i>
angusta	231	Cryptothrips angusta	<i>Cryptothrips angustus</i>
angusticeps	191	Thrips angusticeps	<i>Thrips angusticeps</i>
annulicornis	123	Physopus ulmifoliorum annulicornis	<i>Mycterothrips annulicornis</i>
annulicornis	177	Thrips communis annulicornis	<i>Thrips tabaci</i>
armata	145	Anaphothrips armata	<i>Anaphothrips euphorbiae</i>
betae	158	Dictyothrips betae	<i>Dictyothrips betae</i>
bicolor	136	Oxythrips ajugae bicolor	<i>Oxythrips ajugae</i>
bicolor	123	Physopus ulmifoliorum bicolor	<i>Mycterothrips salicis</i>
biuncata	208	Sminyothrips biuncata	<i>Sminyothrips biuncatus</i>
biuncinata	207	Sminyothrips biuncinata	<i>Sminyothrips biuncinatus</i>
Bonannii	227	Megalothrips Bonannii	<i>Megalothrips bonannii</i>
caespitis	248	Trichothrips caespitis	<i>Hoplothrips caespitis</i>
calcarata	195	Thrips calcarata	<i>Thrips calcaratus</i>
communis	176	Thrips communis	<i>Thrips tabaci</i>
concolor	172	Parthenothrips dracaenae concolor	<i>Parthenothrips dracaenae</i>
connaticornis	153	Aptinothrips rufa connaticornis	<i>Aptinothrips rufus</i>
copiosa	252	Trichothrips copiosa	<i>Hoplothrips corticis</i>
Degeeri	162	Dendrothrips Degeeri	<i>Dendrothrips degeeri</i>
dilatata	202	Thrips dilatata	<i>Thrips dilatatus</i>
distincta	121	Physopus distincta	<i>Ctenothrips distinctus</i>
distinguenda	239	Anthothrips distinguenda	<i>Haplothrips distinguendus</i>
Dudae	83	Chirothrips Dudae	<i>Chirothrips hamatus</i>
euphorbiae	146	Anaphothrips euphorbiae	<i>Anaphothrips euphorbiae</i>
ferruginea	143	Anaphothrips ferruginea	<i>Rubiothrips ferrugineus</i>
firma	138	Oxythrips firma	<i>Firmothrips firmus</i>
Friči	126	Physopus Friči	<i>Tenothrips friči</i>

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TABLE 2. (continued)

Original name	Page	Original combination	Current identification
frontalis	128	Physopus frontalis	<i>Pezothrips frontalis</i>
fulvicornis	96	Physopus vulgatissima fulvicornis	<i>Frankliniella intonsa</i>
gracilicornis	180	Thrips major gracilicornis	<i>Thrips major</i>
graminum	210	Stenothrips graminum	<i>Stenothrips graminum</i>
gratiosa	67	Rhipidothrips gratiosa	<i>Rhipidothrips gratiosus</i>
hastata	134	Oxythrips hastata	<i>Oxythrips bicolor</i>
hradecensis	262	Liothrips hradecensis	<i>Liothrips setinodis</i>
Icarus	232	Cryptothrips Icarus	<i>Bolothrips icarus</i>
inconsequens	117	Physopus inconsequens	<i>Taeniothrips inconsequens</i>
intermedia	114	Physopus intermedia	<i>Odontothrips intermedius</i>
Jordani	212	Bolacothrips Jordani	<i>Bolacothrips jordani</i>
Klapálecki	203	Thrips Klapálecki	<i>Thrips klapálecki</i>
laevior	199	Thrips nigropilosa laevior	<i>Thrips nigropilosus</i>
lata	230	Cryptothrips lata	<i>Cryptothrips nigripes</i>
linaria	192	Thrips linaria	<i>Thrips linarius</i>
longicollis	197	Thrips longicollis	<i>Thrips validus</i>
longistylusa	131	Rhaphidothrips longistylusa	<i>Rhaphidothrips longistylus</i>
major	179	Thrips major	<i>Thrips major</i>
minor	256	Phloeothrips minor	<i>Phlaeothrips minor</i>
minuta	243	Zygothrips minuta	<i>Haplothrips minutus</i>
nervosa	102	Physopus nervosa	<i>Frankliniella tenuicornis</i>
nigra	185	Thrips adusta nigra	<i>Thrips validus</i>
nigriventris	106	Physopus nigriventris	<i>Frankliniella nigriventris</i>
nigropilosa	198	Thrips nigropilosa	<i>Thrips nigropilosus</i>
nigropilosa	96	Physopus vulgatissima nigropilosa	<i>Frankliniella intonsa</i>
obscura	123	Physopus ulmifoliorum obscura	<i>Mycterothrips consociatus</i>
obsoleta	187	Thrips flava obsoleta	<i>Thrips tabaci</i>
pallida	101	Physopus pallida	<i>Frankliniella pallida</i>
pallipennis	110	Physopus pallipennis	<i>Thrips vulgatissimus</i>
pallipes	233	Cryptothrips Icarus pallipes	<i>Bolothrips icarus</i>
parva	257	Phloeothrips parva	<i>Hoplandrothrips parvus</i>
parviceps	139	Oxythrips parviceps	<i>Ceratothrips ericae</i>
pilosa	129	Physopus pilosa	<i>Theilopodothrips pilosus</i>
pini	125	Physopus pini	<i>Thrips pini</i>
pragensis	263	Liothrips setinodis pragensis	<i>Liothrips pragensis</i>
pulla	177	Thrips communis pulla	<i>Thrips tabaci</i>
Reuteri	213	Drepanothrips Reuteri	<i>Drepanothrips reuteri</i>
robusta	104	Physopus robusta	<i>Kakothrips pisivorus</i>
salicaria	182	Thrips salicaria	<i>Thrips viminalis</i>
saltatrix	164	Dendrothrips saltatrix	<i>Dendrothrips saltator</i>
semicaeca	249	Trichothrips semicaeca	<i>Hoplothrips semicaecus</i>

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TABLE 2. (continued)

Original name	Page	Original combination	Current identification
similis	145	Anaphothrips similis	<i>Anaphothrips euphorbiae</i>
sordida	150	Anaphothrips sordida	<i>Rubiothrips sordidus</i>
tenuicornis	99	Physopus tenuicornis	<i>Frankliniella tenuicornis</i>
tiliae	160	Dendrothrips tiliae	<i>Dendrothrips ornatus</i>
valida	183	Thrips valida	<i>Thrips validus</i>
Vejdowskýi	166	Prosopothrips Vejdowskýi	<i>Prosopothrips vejdowskýi</i>
versicolor	69	Aeolothrips versicolor	<i>Aeolothrips versicolor</i>
viminalis	196	Thrips viminalis	<i>Thrips viminalis</i>
virgo	148	Anaphothrips virgo	<i>Anaphothrips obscurus</i>

Papers and books by Uzel on Thysanoptera

(Original titles are accompanied by English translation)

1889

Puchýřnatky (Physopoda) (*Thrips*). Vesmír, (18), No. 21, p. 241–243, (in Czech).

Puchýřnatky (Physopoda) (*Thrips*). Vesmír, (18), No. 22, p. 258–259, (in Czech).

1895

Monografie řádu Thysanoptera (*Monograph on Thysanoptera*). Hradec Králové. Kwart, 500 pp (in Czech and German).

(URL: <http://ia301514.us.archive.org/1/items/monografieraduth00uzel/monografieraduth00uzel.pdf>)

1904

O třásněnkách (Thysanoptera), zvláště o druzích, jež byly v Čechách na cukrovce nalezeny (*On thrips, especially the species which were recorded in Bohemia on sugar beet*). Listy cukrovarnické, (22), No. 26, p. 429–433, (in Czech).

O třásněnkách (Thysanoptera), zvláště o druzích, jež byly v Čechách na cukrovce nalezeny (*On thrips, especially the species which were recorded in Bohemia on sugar beet*). Listy cukrovarnické, (22), No. 27, p. 449–451, (in Czech).

Ueber Thysanopteren (Blasenfüsse), insbesondere die Arten, welche in Böhmen auf der Zuckerrübe beobachtet worden sind (*On thrips, especially the species which were recorded in Bohemia on sugar beet*). Zeitschrift für Zuckerindustrie in Böhmen, 1, p. 89–102, (in German).

1905

Phloeothrips tepperi nov. sp., obyvatel nádorů na *Acacia aneura* v Australii, (*Phloeothrips tepperi* nov. sp., living in galls on *Acacia aneura* in Australia) Časopis české společnosti entomologické, (2), No. 4, p. 99–100, (in Czech).

Sbírání třásněnek a úprava jich pro studium (*Collecting and studying thrips*). In: DUDA, L., JOUKL, H. A., Klapálek, F., KUBES, P. A., LOKAY, E., ŠULC, K., UZEL, J., VÁVRA, V., VIMMER, A.: Entomologické příručky, I. Jak hledáme, usmrcujeme a pro sbírky upravujeme hmyz (*Entomological guides – How to find, kill and collect insects*), Česká společnost entomologická, Praha, p. 52–55, (in Czech).

1912

O třásněnkách čili puchýřnatkách (Thysanoptera), žijících na obilí v Čechách (*On thrips living on cereals in Bohemia*). Kodým, (8), p. 290–291, (in Czech).

Phytosanitary publications by Uzel with notes on Thysanoptera

(Original titles are accompanied by English translation)

1904

Zpráva výzkumné stanice fyziologické českého odboru zemědělské rady pro království České v Praze (C. Produkce rostlinná). Zpráva výzkumné stanice cukrovarnické v Praze za rok 1903 (*Annual report from the Sugar Beet Production Reserach Station for 1903, Prague*). Výroční zpráva českého odboru zemědělské rady za rok 1903, Prague, p. 4–7, (in Czech).

Bericht über Krankheiten und Parasiten der Kulturpflanzen, die im Jahre 1903 in der Abteilung für Pflanzenkrankheiten und Pflanzenschutz untersucht worden sind, erstattet von Dr. H. Uzel (A. Kulturpflanzen in Böhmen, B. Außerböhmische Kulturpflanzen) (*Report on diseases and parasites of cultural plants in 1903, Prague*). Bericht der physiologischen Versuchsstation der böhmischen Sektion des Landeskulturrates für das Königreich Böhmen in Prag, Zeitschrift für das landwirtschaftliche Versuchswesen in Oesterreich, p. 8–11, (in German).

Bemerkungen über die bedeutendsten im Frühjahr und im Sommer 1904 im Böhmen aufgetretenen Schädiger der Kulturpflanzen (*Notes on the most serious pests on cultural plants in Bohemia in spring and summer 1904*) Mitteilung aus der Physiologischen Versuchsstation des Landeskulturrates für das Königreich Böhmen an der k. k. böhm. Technischen Hochschule in Prag, Prague, p. 1–8, (in German).

Pflanzenschädlinge in Böhmen 1904 (*Pests in Bohemia, 1904*). Wiener landwirtschaftliche Zeitung, (54), No. 102, p. 917–918, (in German).

Zpráva oddělení pro choroby a ochranu rostlin kulturních Výzkumné stanice fyziologické rady zemědělské za rok 1904 - Přehled nejhlavnějších škůdců rostlin kulturních v Čechách r. 1904 pokud na stanici ohledání byli (*Report from the Department of diseases and plant protection - Survey of the most serious pests on cultural plants in Bohemia in 1904*). Třináctá zpráva o činnosti českého odboru rady zemědělské pro království České za rok 1904, Prague, p. 7–12, (in Czech).

1906

Zpráva oddělení fytopathologického - Přehled škůdců a chorob rostlin kulturních v Čechách r. 1905, pokud ma fytopathologickém oddělení přednostou ohledání byli (*Report from the Phytopathological Department – Survey of pests and diseases on cultural plants in Bohemia in 1905*). Zpráva o činnosti výzkumné stanice chemicko-fyziologické Českého odboru zemědělské rady pro království České při c. k. České vysoké škole technické v Praze za rok 1905, Prague, p. 26–35, (in Czech).

Mitteilung über Schädiger und Krankheiten der Kulturpflanzen in Böhmen im Jahre 1905 (*Report on pests and diseases on cultural plants in Bohemia in 1905*). Zeitschrift für Pflanzenkrankheiten, (17), No 2, p. 83–89, (in German).

1908

Zpráva oddělení fytopatologického - Přehled škůdců a chorob rostlin kulturních v Čechách r. 1907, pokud na fytopathologickém oddělení autorem ohledání neb jím v přírodě pozorování byli (*Report from the Phytopathological Department – Survey of pests and diseases on cultural plants in Bohemia in 1907*) Šestnáctá zpráva o činnosti českého odboru rady zemědělské pro království České za rok 1907, Prague, p. 36–45 (in Czech)

1908 – 1909

Škůdci a choroby rostlin s řepou cukrovou střídavě pěstovaných. Zpráva o škůdcích a chorobách řepy cukrové v Čechách r. 1907 a rostlin střídavě s ní pěstovaných (*Report on parasites and diseases of sugar beet and plants associated in 1907*). Listy cukrovarnické, (27), No. 21, p. 1–4, (in Czech).

1909

Krankheiten und Feinde der mit der Zuckerrübe abwechselnd kultivierten Pflanzen. Mitteilungen über Krankheiten und Feinde der Zuckerrübe in Böhmen im Jahre 1907 und der mit derselben abwechselnd kultivierten Pflanzen (*Report on parasites and diseases of sugar beet and plants associated in 1907*). Zeitschrift für Zuckerindustrie in Böhmen, (33), No. 6, p. 14–17, (in German).

1910

Zpráva o škůdcích a chorobách řepy cukrové a rostlin střídavě s ní pěstovaných v Čechách r. 1908 (Škůdci a choroby rostlin s řepou cukrovou střídavě pěstovaných). Zpráva z Výzkumné stanice cukrovarnické v Praze (*Report on parasites and diseases of sugar beet and plants associated in 1908 – Sugar Beet Production Research Station reports*). Listy cukrovarnické, (28), No. 21, p. 345–346, (in Czech).

Bericht über die Krankheiten und Feinde der Zuckerrübe in Böhmen und der mit derselben abwechselnd kultivierten Pflanzen im Jahre 1908 (Über Krankheiten und Feinde der Zuckerrübe) (*Report on parasites and diseases of sugar beet and plants associated in 1908 – Sugar Beet Production Research Station reports*). Zeitschrift für Zuckerindustrie in Böhmen, (34), No. 6, p. 36–44, (in German).

1911

O hmyzu navštěvujícím květy řepy cukrové i krmné (*On insects in beet flowers*). Listy cukrovarnické, (29), No. 29, p. 485–488, (in Czech).

O hmyzu navštěvujícím květy řepy cukrové i krmné (*On insects in beet flowers*). Listy cukrovarnické, (29), No. 30, p. 501–505, (in Czech).

Über die Insekten, welche die Blüten der Zucker- und Futterrübe besuchen, (*On insects in beet flowers*). Zeitschrift für Zuckerindustrie in Böhmen, (35), No. 11, p. 93–108, (in German).

1913/1914

Über Krankheiten und Feinde der mit der Zuckerrübe abwechselnd kultivierten Pflanzen. Bericht über Krankheiten und Feinde der Zuckerrübe in Böhmen und der mit derselben abwechselnd kultivierten Pflanzen im Jahre 1912 (*Report on parasites and diseases of sugar beet and plants associated in 1912*). Zeitschrift für die Zuckerindustrie in Böhmen, (1913/1914), p. 41–48.

1914

Zpráva o škůdcích a chorobách řepy cukrové a rostlin střídavě s ní pěstovaných v Čechách r. 1912 (Škůdci a choroby rostlin střídavě s cukrovkou pěstovaných). Zprávy Výzkumné stanice cukrovarnické v Praze (*Report on parasites and diseases of sugar beet and plants associated in 1912– Sugar Beet Production Research Station reports*). Listy cukrovarnické, (32), No. 35/36, p. 587–589, (in Czech).

1916

Zpráva o chorobách a škůdcích řepy cukrové a rostlin střídavě s ní pěstovaných v Čechách r. 1914 (Choroby a škůdci rostlin s řepou cukrovou střídavě pěstovaných). Zprávy z Výzkumné stanice cukrovarnické v Praze (*Report on parasites and diseases of sugar beet and plants associated in 1914 – Sugar Beet Production Research Station reports*). Listy cukrovarnické, (34), No. 28, p. 362–366, (in Czech).

Über Krankheiten und Feinde der Zuckerrübe. Bericht über Krankheiten und Feinde der Zuckerrübe in Böhmen und der mit derselben abwechselnd kultivierten Pflanzen im Jahre 1914 (*Report on parasites and diseases of sugar beet and plants associated in 1914*). Berichte der Versuchsstation für Zuckerindustrie in Prag, (40), p. 461–468.

1916/1917

Bericht über Krankheiten und Feinde der Zuckerrübe in Böhmen und der mit derselben abwechselnd kultivierten Pflanzen im Jahre 1916 (*Report on parasites and diseases of sugar beet and plants associated in 1916*). Zeitschrift für Zuckerindustrie in Böhmen, (1916/1917), p. 41–48.

1918

Zpráva o chorobách a škůdcích řepy cukrové a rostlin střídavě s ní pěstovaných v Čechách r. 1916 (*Report on parasites and diseases of sugar beet and plants associated in 1916 – Sugar Beet Production Research Station reports*). Listy cukrovarnické, (1917/18), p. 71–76, (in Czech).

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References

- Bonanni, Ph. (1691) *Observationes circa viventia, quae in rebus non viventibus reperiuntur*. Cum Micrographia Curiosa sive Rerum minutissimarum observatinibus, quae oope Microscopii recognitae ad vivum exprimuntur. His accesserunt aliquot Animalium Testaceorum Icones non antea in lucem editae. Omnia curiosorum Naturae Exploratorum Utilitati at Iucunditati expressa et oblata. Illustrissimo Domino D. LeoniStrozzae excellentissimi Ducis Strozzae filio. A Patrae Philippo Bonanni Societ. Jesu Sacerdote. Romae, Tapis Dominici Antonii Herculis MDCXCI.
- De Geer, C. (1744) Beskrifning på en Insekt af ett nytt Slägte (Genus), kallad Physapus. *Kongl. Sweneska Wettenskaps Akademiens Handlingar för monaderne januar, Februar ock Mart*, Vol. V, 1–9.
- Fitch, A. (1855) Report on the noxious, beneficial and other insects of the state New-York. *Transactions of the New York State Agricultural Society*, C. Van Benthuyesen, Albany, USA, 102–104.
- Haliday, A.A. (1836) An Epitome of the British Genera in the Order Thysanoptera, with Indications of a few of the Species. *The Entomological Magazine, London*, 3, 439–451.
- Heeger, E. (1852) Beiträge zur Naturgeschichte der Physopoden (Blasenfüsse). *Sitzungsberichte der math.-naturw. Classe der kais. Akademie der Wissenschaften. Wien*, VIII, Bd. Juni, 123–144.
- Kolečka, Z. (1995) Seznam biografí československých entomologů 15. *Klapalekiana, Supplement*, 31, 645–647.
- Kolečka, Z. (1975) Entomologie v historii Pražské vysoké školy zemědělské. Sborník Vysoké školy zemědělské v Praze – Fakulta agronomická. Řada A, 173–199.
- Lindeman, K. (1887) Die am Getreide lebenden Thrips-arten Mittelrusslands. *Bulletin de la Société Impériale des Naturalistes de Moscou*. Publié sous la Rédaction du Prof. Dr. Ch. Lindeman. Année 1886, No. 4, Moscow, 296–337.
- Linnaeus, C. (1746) *Fauna Svecica sistens Animalia Sveciae Regni: Qvadrupedia, Aves, Amphibia, Pisces, Insecta, Vermes, distributa per classes ordines, genera species*. Cum differentiis specierum, synonymis autorum nominibus incolarum, locis habitationum, descriptionibus insectorum. Stockholmiae, XXIV + 411 pp. + 2 pls.
- Priesner, H. (1926–28) *Die Thysanopteren Europas*. Abteilung I–II: 1–342 (1926); Abteilung III: 343–568 (1927); Abteilung IV, 569–755 (1928). F. Wagner verlag, Wien.
- Walker, F. (1852) List of the Specimens of Homopterous insects in the collection of the British Museum. Part IV, London, Order 3, Physapoda, published by British Museum, printed by Edward Newman, 1094–1118 (compiled from Haliday).