

ICHNEUMON FLIES (HYMENOPTERA, ICHNEUMONIDAE) FROM INVASIVE PLANT AREAS IN THE DANUBE DELTA BIOSPHERE RESERVE, ROMANIA

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The paper presents 10 species of ichneumon wasps, one of them being reported for the first time in the Danube Delta Biosphere Reserve, Romania. Research has been carried out in some invasive plants areas of the Danube Delta Biosphere Reserve. There are being reported representatives of arthropod fauna (Insecta and Araneida) from four stations containing invasive plants: Pătlăgeanca, Beștepe, Plauru and Sabangia. One particular interest was the identification of the ichneumon wasps species in these areas.

Keywords: Arthropods, Ichneumon flies, invasive plants, Danube Delta Biosphere Reserve, Romania.

INTRODUCTION

The Danube Delta Biosphere Reserve is located in the historical province of Dobrogea, South-Eastern Romania. This paper is part of a larger study, which will ultimately lead to the exact establishment of the number and a checklist of Ichneumonidae species in the Danube Delta. However, from the ichneumonological fauna of Dobrogea, approximately 650 species have been reported so far, published in over 50 scientific papers, including the species reported by us for the first time in Danube Delta Biosphere Reserve, in previous stages of this study (Lungu-Constantineanu, 2018, 2020) or other studies (Constantineanu I. & Constantineanu R., 2001).

MATERIAL AND METHODS

We conducted qualitative and quantitative analysis of the arthropod fauna and the diversity study of the ichneumon wasps fauna (Hymenoptera, Ichneumonidae) in four areas with invasive plants:

1. **Pătlăgeanca**, meadow with *Elaeagnus angustifolia*;
2. **Beștepe**, vine with *Ailanthus altissima*;
3. **Plauru**, *Populus alba* young and old plantation with *Amorpha fruticosa*;

4. Sabangia, meadow with *Cannabis ruderalis*.

The insect collecting was made on 6th June 2019 (Pătlăgeanca and Plauru), 7th June 2019 (Beștepe) and 8th June 2019 (Sabangia). So far, Ichneumonidae species have been reported from Beștepe and Plauru stations in previous studies, while Pătlăgeanca and Sabangia have been studied first time ever. To capture the insects we used the entomological net. The mowing method (x100) was used in the surveyed areas. The captured insects were moved into special zipper bags containing 2–3 ml of alcohol, to neutralize them. In each zipper bag we introduced a note with the day, place and type of vegetation from where the collection was made. Each zipper bag has constituted a sample. Thus, for studying the arthropod fauna in the surveyed stations, four samples were obtained, which were studied later in the laboratory. Each sample was cleared of vegetal remains, then the arthropods, particularly insects, were separated by scientific order. The insects were identified using the Olympus binocular magnifier, determination keys and comparison method. The fauna material obtained was subjected to the microscopic study and was classified by systematic groups, the most important being analyzed up to families. For each station studied, was recorded sample by sample, drawing inventory sheets and calculating the relative abundance of the arthropod systematic groups.

The entomofauna research of the Danube Delta has been and continues to be a very difficult problem due to the severe conditions of field trips. Field research staff must confront the aggressiveness of various types of insects, such as tabanids, whose stings can seriously affect health, or mosquitoes, staphylinids, small hymenoptera or beetles that can sting or eliminate stinging liquids. Also, traveling many kilometers on sandy, muddy, dusty ground, or moving the research equipment from one place to another, as well as stationing the research team in canicular places, can even affect the researchers body integrity. Therefore, Danube Delta, with its many forest strips and dunes, will continue to be a difficult territory to try for a long time, which will reveal its faunal secrets only gradually and only through sacrifices, perseverance and passion (Popescu-Gorj, 1985).

To verify the nomenclature of the identified Ichneumonidae species, as well as to avoid possible synonyms, we consulted the catalog of Yu & Horstmann (1997).

RESULTS

It were collected 194 specimens of arthropods (Araneidae and Insecta), belonging to the following orders: *Aranea* (Arachnida), *Collembola*, *Orthoptera*, *Thysanoptera*, *Heteroptera*, *Homoptera*, *Coleoptera*, *Lepidoptera*, *Diptera* and *Hymenoptera* (Insecta), entomofauna representing 88,15% of systematic groups, the rest of 11,85% being araneids.

The Tables 1–4 presents the relative abundance of arthropod fauna from the four areas with invasive vegetation.

Table 1

Arthropod fauna in Pătlăgeanca station, Tulcea county, 6.06.2019

Systematic category		Number of individuals	Abundance (%)	
Order	Inferior systematic category		A	B
Aranea		5	100,0	9,43
Collembola		-	-	-
Orthoptera		3	100,0	5,66
Thysanoptera		1	100,0	1,88
Heteroptera		3	100,0	5,66
Homoptera		1		1,88
	Cicadidae	1	100,0	1,88
	Aleyrodidae	-	-	-
	Aphididae	-	-	-
Coleoptera		10		18,86
	Coccinellidae	6	60,0	11,32
	Other coleopterans	4	40,0	7,54
Lepidoptera		11	-	-
Diptera		9		16,98
	Brachycera	2	22,22	3,77
	Nematocera	7	77,73	13,20
Hymenoptera		10		18,86
	Aculeata	7	77,77	13,20
	Apidae	-	-	-
	Vespidae	-	-	-
	Formicidae	7	100,0	13,20
	Parasitica	3	22,23	5,66
	Braconidae	-	-	-
	Ichneumonidae	3	100,0	5,66
Chalcidoidea	-	-	-	
TOTAL		53		

Abbreviations:

A = relative abundance reported to the systematic category;

B = relative abundance reported to the total number of individuals.

Table 2

Arthropod fauna in Beștepe station, Tulcea county, 6.06.2019

Systematic category		Number of individuals	Abundance %	
Order	Inferior systematic category		A	B
Aranea		11		17,46
Collembola		-		-
Orthoptera		3		4,76
Thysanoptera		1		1,58
Heteroptera		4		6,35
Homoptera		-		-
	Cicadidae	-		-
	Aleyrodidae	-		-
	Aphididae	-		-
Coleoptera		16		25,40
	Coccinellidae	4	25,0	6,35
	Other coleopterans	12	75,0	19,04
Lepidoptera		5		7,93
Diptera		11		15,87
	Brachycera	4	36,36	6,35
	Nematocera	7	63,64	11,11
Hymenoptera		12		19,04
	Aculeata	9	75,00	14,28
	Apidae	1	11,11	1,58
	Vespidae	1	11,11	1,58
	Formicidae	7	77,78	11,11
	Parasitica	3	25,0	4,76
	Braconidae	-	-	-
	Ichneumonidae	3	100,0	4,76
	Chalcidoidea	-	-	-
TOTAL		63		

Abbreviations:

A = relative abundance reported to the systematic category;

B = relative abundance reported to the total number of individuals.

Table 3

Arthropod fauna in Plauru station, Tulcea county, 7.06.2019

Systematic category		Number of individuals	Abundance %	
Order	Inferior systematic category		A	B
Aranea		6		13,04
Collembola		1		2,17
Orthoptera		4		8,69
Thysanoptera		1		2,17
Heteroptera		2		4,34
Homoptera		-		-
	Cicadidae	-	-	-
	Aleyrodidae	-	-	-
	Aphididae	-	-	-
Coleoptera		11		23,91
	Coccinellidae	6	54,54	13,04
	Other coleopterans	5	45,46	10,87
Lepidoptera		5		10,07
Diptera		9		19,56
	Brachycera	1	11,11	2,17
	Nematocera	8	88,89	17,39
Hymenoptera		7		15,21
	Aculeata	4	57,14	8,69
	Vespidae	1	25,0	2,17
	Formicidae	3	75,0	6,52
	Parasitica	3	42,86	6,52
	Braconidae	1	33,33	2,17
	Aphidiidae	-	-	-
	Ichneumonidae	2	66,67	4,34
	Chalcidoidea	-	-	-
TOTAL		46		

Abbreviations:

A = relative abundance reported to the systematic category;

B = relative abundance reported to the total number of individuals.

In Plauru station we report the presence of two host-parasitoid relations. Thus, the presence of the pest *Chrysomela populi* L. (Coleoptera, Chrysomelidae), known as poplar defoliator, is related to the presence of the parasitoid *Virgichneumon monostagon* Grav. (Hymenoptera, Ichneumonidae). We also report the presence of the pest *Celypha rivulana* Scop. (Lepidoptera, Tortricidae), related to the presence of the parasitoid *Barichneumon albicaudatus* Fons. (Hymenoptera, Ichneumonidae).

Table 4

Arthropod fauna in Sabangia station, Tulcea county, 8.06.2019

Systematic category		Number of individuals	Abundance %	
Order	Inferior systematic category		A	B
Aranea		1		3,12
Collembola		-		-
Orthoptera		1		3,12
Thysanoptera		-		-
Heteroptera		3		9,37
Homoptera		1		3,12
	Cicadidae	1	100,0	3,12
	Aleyrodidae	-	-	-
	Aphididae	-	-	-
Coleoptera		9		28,12
	Coccinelidae	7	77,77	21,87
	Other coleopterans	2	22,23	6,25
Lepidoptera		3		9,37
Diptera		8		25,0
	Brachycera	3	37,50	9,37
	Nematocera	5	62,50	15,62
Hymenoptera		6		18,75
	Aculeata	2	33,33	6,25
	Vespidae	-	-	-
	Formicidae	2	100,0	6,25
	Parasitica	4	66,67	12,50
	Braconidae	-	-	-
	Ichneumonidae	4	100,0	12,50
Chalcidoidea	-	-	-	
TOTAL		32		

Abbreviations:

A = relative abundance reported to the systematic category;

B = relative abundance reported to the total number of individuals.

In all four stations, we notice the presence of 27 individuals of *Culex pipiens* (Diptera, Nematocera), due to the fact that the stations are located in wetlands or near wetlands, on the bank of a canal or nearby. It were collected 12 specimens of ichneumon wasps (6,18% of the total arthropods collected), from 10 genera, belonging to six subfamilies: Anomaloninae, Diplazontinae, Ichneumoninae, Pimplinae, Campopleginae and Cremastinae.

It is observed that the ichneumonological fauna is relatively weak, as there is no direct link between the ichneumon wasps collected and the pests (hosts) or plants. The exception is Plauru station, where are reported two pest species in the poplar plantations, which are closely related to two parasitoid ichneumon wasps. We interpret that most of the species of ichneumon flies were in passage, not finding hosts there to parasitize or plants to provide them with the pollen or nectar needed for feeding.

We present the synopsis of the ichneumon wasps collected from the four stations.

Order HYMENOPTERA Linnaeus, 1758

Suborder Apocrita Gerstaecker, 1758

Superfamily Ichneumonoidea Viereck, 1916

Family Ichneumonidae Latreille, 1802

Subfamily ANOMALONINAE Viereck, 1918

I. Genus *ANOMALON* Panzer, 1804

1. *Anomalon cruentatum* Geoffroy, 1785, ♀♂

Synonyms: *Ophion foliator* Fabricius, 1798

Material: 1 ♀ 6. VI. 2019, Pătlăgeanca, Tulcea County, in meadow zone.

Body length: 10–14 mm.

Hosts: *Opatrum sabulosum* L. (Col., Tenebrionidae); *Hymenorus doubleri* Muls. (Col., Alleculidae) [M. Constantineanu *et al.*, 1975] (Pisică, 2001).

Geographical distribution: Central and Southern Europe, Ukraine, Russia (European and Siberian parts), Kazakhstan, Turkestan. In Romania is a common species, being previously reported from Harghita, Mehedinți, Satu Mare, Arad, Sibiu, Iași, Mureș, Bihor, Botoșani, Galați, Hunedoara, Brăila, Constanța, Tulcea, Gorj, Suceava, Neamț counties (Pisică, 2001).

II. Genus *BARYLYPA* Förster, 1869

2. *Barylypa pallida* Gravenhorst, 1829, ♂

Synonyms: 1829 *Anomalon pallidum* Gravenhorst, Ichn. Eur., **3**: 1 – 1097; 1895

Anomalon humeralis Brauns, Termész. Füzet., **18**: 42 – 49.

Material: 1 ♂, 6.VI.2019, Beștepe, Tulcea County, in vine zone.

Body length: 14–18 mm.

Hosts: *Malacosoma neustria* L. (Lep., Lasiocampidae), *Helicoverpa armigera* Hb., *Spodoptera exigua* Hb. (Lep., Noctuidae) (Pisică, 2001).

Geographical distribution: Egypt, Western Europe, Russia (European and Siberian parts), Kazakhstan. In Romania is a rare species, being previously reported from Mehadia (Mocsáry, 1918), Strâmbu-Brăila, Brăila County, Valu lui Traian, Constanța County (M. Constantineanu, 1967), Bârlad, Zorleni, Vaslui County (Petcu, 1984; Pisică, 2001). **New species in the Danube Delta Biosphere Reserve.**

Subfamily **DIPLAZONTINAE** Hopper, 1959III. Genus **DIPLAZON** Nees, 18183. **Diplazon laetatorius** (Fabricius) 1781, ♀

Synonyms: 1781 *Ichneumon laetatorius* Fabricius, Sp. Ins., 1: 1-552; 1781 *Ichneumon dichrous* Schrank, Enum. Ins. Austr. Indig., Augustae vindelicorum, 548 pp.; 1835 *Anomalon attractus* Say, Boston Journ. Nat. Hist., 1: 210-305; 1858 *Bassus albovarius* Say, Ann. Mag. Nat. Hist., 3 (1): 18-28; 1868 *Bassus cincipes* Holmgren, Kongl. Svensk. Freg. Eug. Resa omkr. Jord. Zool., 6:391-442; 1868 *Bassus sycophynta* Cresson, Trans. Amer. Soc., 2: 89-114; 1873 *Bassus tripicticus* Walsh, Trans. Acad. Sci. St. Louis, 3: 65-166; 1878 *Scolobates varipes* Smith, Trans. Ent. Soc. London: 1-7; 1892 *Bassus venustus* Saussure, Hymenopteres, in: Grandidier A.: Hist. Phys. Nat. Polit. Madagascar, 20: 1-590; 1894 *Bassus balearicus* Kriechbaumer, An. Hist. Nat. Soc. España., 23: 239-253; 1895 *Bassus laetatorius* var. *terminalis* Davis, Trans. Amer. Ent. Soc., 22: 17-30; 1898 *Bassus generosus* Cameron, Mem. Proc. Manchester Liter. Philos. Soc., 42 (1): 1-53; 1936 *Bassus laetatorius* var. *ikiti* Cheesman, Trans. Roy. Soc. London, 85 (7): 169-195.

Material: 1 ♀, 6. VI. 2019, Beștepe, Tulcea county, vine zone; 2 ♀♀, 8. VI. 2019, Sabangia, Tulcea County, in meadow.

Body length = 5 mm.

Hosts: *Allograpta fracta* O. S., *Allograpta obliqua* Say, *Allograpta exotica* Wied., *Baccha clavata* Walk., *Baccha lemur*, *Baccha lugens* Lw., *Eupeodes volucris* O. S., *Ischiodon scutellaris* F., *Lasiophthicus topiarius* Mg., *Melanostoma mellinum* L., *Mesogramma* sp., *Mesograpta polita*, *Metasyrphus luniger* Meig., *Metasyrphus frequens* Mats., *Metasyrphus corollae* F., *Metasyrphus nitens* Zett., *Metasyrphus americanus* Wied., *Metasyrphus annulipes* Zett., *Episyrphus balteatus* DeG., *Paragus bicolor* F., *Paragus tibialis* Fall., *Paragus quadrifasciatus* Mg., *Sphaerophoris cylindrica* Say, *Sphaerophoris scripta* L., *Sphaerophoris rüPELLI* Wd., *Sphaerophoris robusta* Curr., *Pipiza noctiluca*, *Meliscaeva auricollis* Meig., *Meliscaeva cinctella* Zett., *Orphnabaccha erratica* Wied., *Melangyna novaezelandiae* Macq., *Scaeva pyrastris* L., *Syrphus ribesii* L., *Syrphus serarius* Wied., *Syrphus torvus* O. S., *Syrphus viridiceps* Macq., *Syrphus vitripennis* Mg., *Syrphus wiedmanni* Johns., *Syrphus ortas*, *Syrphus rectus* O. S., *Syrphus vittafrons* Shann. *Syrphus braueri* Egger (Dipt., Syrphidae), *Laspeyresia pomonella* L., *Zeiraphera griseana* Hb., *Zeiraphera diniana* Güen., *Paralobesia viteana*, *Ancylis comptana* (Froel) (Lep., Tortricidae), *Lymantria dispar* L., (Lep., Lymantriidae), *Plutella maculipennis* Curt. (Lep., Plutellidae), *Depressaria heracliana* L. (Lep., Oecophoridae), *Ostrinia nubilalis* Hb. (Lep., Pyraustidae), *Gilpinia polytoma* Htg., *Ardis bipunctata* (Kl.) (Hym., Tenthredinidae), *Galeruca pomonae* Scop., *Galeruca interrupta* (Col., Chrysomelidae), *Hyalopterus arundinis* F. and *Aphis jacobaeae* (Hom., Aphidae) (Pisică, 2001).

Geographical distribution: It is a ubiquitous species, which is found in almost all zoogeographic regions of the globe (Indo-Australian, Ethiopian, Holarctic,

Neotropical). In Romania is a common species, being previously reported by Mocsáry (1918) and Kiss (1922–1924, 1925–1926, 1929–1930, 1931–1932) from 13 localities in Transilvania. R. Constantineanu (1972) reported this species from 33 localities in 12 counties from Moldova, Muntenia, Dobrogea, Oltenia, Transilvania and Banat (Pisică, 2001).

IV. Genus *PROMETHES* Förster, 1869

4. *Promethes sulcator* (Gravenhorst, 1829), ♀♂

Synonyms: 1829 *Bassus sulcator* Gravenhorst, Ichn. Eur., **3**: 1-1097; 1856 *Bassus areolatus* Holmgren, Svensk. Vet. -Akad. Handl., **75**: 1-104; 1865 *Orthopelma anomalus* Taschenberg, Zeit. Ges. Naturwiss., **25** (1-2): 1-142; 1883 *Bassus longicornis* Provancher, Faun. Canad. Hym., Nat. Canad., **14**: 3-20; 1906 *Promethus dodsi* Morley, Trans. Roy. Ent. Soc. London, **4**: 419-438; 1964 *Promethes splendidus* ssp. *sulcator* Dasch, Mem. Amer. Ent. Inst., **3**: 1-304.

Material: 1 ♂, 6.VI. 2019, Pătlăgeanca, Tulcea county, in meadow zone, probably searching for food, especially pollen.

Body length = 5–6 mm.

Hosts: *Cnephasia longana*, *Sphaerophoria robusta* Curran, *Melanostoma mellinum* L., *Syrphus* sp. (Dipt., Syrphidae), *Delia brassicae* Bouché (Dipt., Anthomyiidae), *Pieris brassicae* L. (Lep., Pieridae) and *Plutella maculipennis* Curt. (Lep., Plutellidae) (Pisică, 2001).

Geographical distribution: It is the most frequent species of the genus *Promethes* and one of the most common species of ichneumon wasps, being reported in the Holarctic and Indo-Australian regions. In Romania is a common species, being previously reported from Arad, Cluj, Caraș-Severin, Mehedinți, Vaslui, Suceava, Botoșani, Tulcea, Neamț, Hunedoara (Pisică, 2001).

Subfamily ICHNEUMONINAE Latreille, 1802

V. Genus *BARICHNEUMON* Thomson, 1893

5. *Barichneumon albicaudatus* Fonscolombe 1847, ♀♂

Synonyms: 1847 *Ichneumon albicaudatus* Fonscolombe, Ann. Soc. Ent. France, **2** (5): 51-70; 1848 *Ichneumon angustatus* Wesmael, Bull. Acad. Sc. Belg., **15**: 338, ♂;

1903 *Barichneumon angustatus* Morley, Ichn. Brit., **1**: 102, ♂; 1925 *Pterocormus angustatus* G. Ceballos, Him. Esp. Mem. Acad. Cienc. Madrid, **31**: 69; 1981 *Barichneumon albicaudatus* Kasparyan, Opr. Nasek. Evr. Ciasti SSSR, **3** (Hym.) (3): 584.

Material: 1 ♀ 7. VI. 2019, Plauru, Tulcea County, in young poplar plantation.

Body length: 7–11 mm.

Hosts: *Celypha rivulana* Scop. (Lep., Tortricidae) (Pisică, 2001).

Geographical distribution: England, Spain, Germany, France, Hungary, Russia (European and Siberian parts), Kazakhstan. In Romania is a common species, being previously reported from Hunedoara, Sibiu, Mureș, Suceava, Botoșani, Iași, Bacău, Vaslui, Galați and Tulcea counties (Pisică, 2001).

VI. Genus *VIRGICHNEUMON* Heinrich, 1967

6. *Virgichneumon monostagon* (Gravenhorst 1820), ♀♂

Synonyms: 1820 *Ichneumon monostagon* Gravenhorst, Mem. Acad. Sc. Torino, **24**: 287, ♂; 1893 *Melanichneumon monostagon* Thomson, Opusc. Ent., **18**: 1956; 1925 *Pterocormus monostagon* G. Ceballos, Him. Esp. Mem. Acad. Cienc. Madrid, **31**: 70; 1820 *Virgichneumon monostagon* Gravenhorst, Mem. Reale Acad. Sci. Torino, **24**: 275-388.

Material: 1 ♀ 6. VI. 2019, Plauru, Tulcea County, in old poplar plantation.

Body length: 7–12 mm.

Hosts: *Archanara geminipuncta* (Haw.), *Archanara sparganii* Esp. (Lep., Noctuidae), *Spilosoma lubricipeda* Esp. (Lep., Arctiidae) and *Euproctis chrysorrhoea* L. (Lep., Lymantriidae) (Pisică, 2001).

Geographical distribution: Western Europe, Hungary, Russia (Iaroslav, Nijnegorod, Tambov, Ijevsk, Caucaz). In Romania is a common species, being previously reported from Arad, Bihor, Satu Mare, Maramureș, Mehedinți, Caraș-Severin, Hunedoara, Gorj, Suceava, Botoșani, Iași, Neamț, Bacău, Vaslui, Galați, Tulcea and Constanța counties (Pisică, 2001).

VII. Genus *VULGICHNEUMON* Heinrich, 1961

7. *Vulgichneumon saturatorius* (Linnaeus 1758), ♂

Synonyms: 1758 *Ichneumon saturatorius* Linnaeus, Syst. Nat., ed. 10, **1**: 561; 1763 *Ichneumon nigratorius* Pontoppidan, Danske Atlas Könige –Riget Dannemark, **1**: 692-693; 1776 *Ichneumon clavatorius* Müller, Zool. Dan. Prodr.: 152, 153; 1829 *Ichneumon fuscocastaneus* Gravenhorst, Ichn. Eur, **1**: 1-827; 1838 *Ichneumon saturator* Zetterstedt, Ins. Lapp., **2**: 317-476; 1893 *Melanichneumon saturatorius* Thomson, Opusc. Ent., **18**: 1957, ♀♂; 1925 *Pterocormus saturatorius* G. Ceballos, Him. Esp. Mem. Acad. Cienc. Madrid, **31**: 71.

Material: 1 ♀, 6. VI. 2019, Beștepe, Tulcea County, in zone with herbaceous vegetation, close to vine.

Body length: 10–12 mm.

Hosts: *Cerura vinula* L. (Lep., Notodontidae), *Senta flammea* Curt., *Autographa gamma* (L.), *Arenostola phragmitidis* Hb. (Lep., Noctuidae) (Pisică, 2001).

Geographical distribution: Western Europe, Russia (European and Siberian parts), Kazakhstan, Iran. In Romania is a common species, being previously reported from Arad, Satu Mare, Alba, Mureș, Mehedinți, Bistrița-Năsăud, Caraș-Severin, Hunedoara, Cluj, Prahova, Suceava, Botoșani, Neamț, Iași, Vaslui and Tulcea counties (Pisică, 2001).

Subfamily **PIMPLINAE** Cresson, 1887VIII. Genus **EXERISTES** Förster 18698. *Exeristes roborator* (Fabricius, 1793), ♀

Material: 1 ♀, 8. VI. 2019, Sabangia, Tulcea County, meadow zone.

Body length: 7 mm.

Hosts: It is a polyphagous species, the larvae developing in Lepidoptera, Coleoptera and Hymenoptera.

Geographical distribution: Europe, Northern Africa, Asia. In Romania is a common species, being previously reported from: Alba, Arad, Maramureş, Satu Mare, Hunedoara, Sibiu, Cluj, Mureş, Covasna, Harghita, Caraş-Severin, Suceava, Botoşani, Bacău, Iaşi, Vrancea, Ilfov, Buzău, Ialomiţa, Tulcea and Constanţa counties (Pisică, 2001).

IX. Genus **SINOPHORUS** Förster 18699. *Sinophorus turionum* (Ratzeburg 1844), ♀♂

Synonyms: 1844 *Campoplex turionum* Ratzeburg, Ichneum. Forstins. Ent., Berlin: 1-234; 1883 *Limneria spectabilis* Rudow, Ent. Nachr., **9** (5): 57-75, ♂; 1887 *Limneria planiscapus* Thomson, Opusc. Ent., **11**: 1043-1182; 1887 *Limneria ruffemur* (Thomson, 1887), Opusc. Ent., **11**: 1043-1182; 1928 *Limnerium alcae* Ellinger & Sachtleben, Internat. Corn Borer Invest. Sc. Rep.: 109:134.

Material: 1 ♂, 6. VI. 2019, Pătlăgeanca, Tulcea County, meadow zone.

Body length: 5–6 mm.

Hosts: *Pyrausta sticticalis* L., *Ostrinia nubilalis* Hb., *Titanio phrygialis* Hb., *Mesographa forticalis* L. (Lep., Pyraustidae), *Heliothis peltigera* Schiff., *H. dipsacea* L. (Lep., Noctuidae), *Zeiraphera diniana* Guen., *Rhyacionia buoliana* Schiff. (Lep., Tortricidae) (Pisică, 2001).

Geographical distribution: Central and Northern Europe, Ukraine, Russia (European and Siberian parts). In Romania is a common species, being previously reported from Arad, Satu Mare, Sălaj, Hunedoara, Sibiu, Cluj, Mureş, Bistriţa-Năsăud, Mehedinţi, Vâlcea, Buzău, Constanţa, Tulcea, Suceava, Botoşani and Iaşi counties (Pisică, 2001).

Subfamily **CREMASTINAE** Förster, 1869X. Genus **CREMASTUS** Gravenhorst 182910. *Cremastus bellicosus* Gravenhorst 1829, ♀

Synonyms: 1829 *Cremastus bellicosus* Gravenhorst, Ichn. Eur., **3**: 1-1097; 1899 *Cremastus partitus* Szépligeti, Beitr. z. Kenntnis ung. Ichn., **2** (23): 1-38; 1960 *Cremastus meridionator* Aub., Bul. Soc. Ent. France, **65**: 228-241.

Material: 1 ♀, 8. VI. 2019, Sabangia, Tulcea County, ruderal zone.

Body length: 3–4 mm.

Hosts: unknown.

Geographical distribution: Central Europe, Republic of Moldova. In Romania is a common species, being previously reported from Maramureș (Mocsáry, 1918), Aiud, Alba County, Rus, Sălaj County (Kiss, 1922–1924, 1925–1926), Caraorman forest, Periprava (M. Constantineanu, 1973; Petcu, 1990), Tulcea County (Pisică, 2001).

We notice that from the four stations, we collected a relatively small number, approximately equal, of ichneumon wasps: three at Pătlăgeanca and Beștepe, two at Plauru, respectively four at Sabangia.

Comparing the present study with earlier studies in Danube Delta, it is noted that the arthropod fauna (Araneida and Insecta) in areas with invasive plants, is richer than in salty areas (85 specimens), similar to meadows and plantations but much lower than in agricultural crops or plantations. However, it is significantly lower than the arthropod fauna of agricultural crops (398 specimens), due to the type of stationary, abundant vegetation, which provides a favorable environment for the development of parasitoid hymenoptera and their hosts. The salty and sandy meadows with low vegetation areas, do not provide the right environment for the development of arthropods (Lungu-Constantineanu, 2018).

CONCLUSIONS

The diversity of arthropod fauna in areas with invasive vegetation in the Danube Delta is richer compared to that in salty areas, but less rich than in crops and plantations.

It were collected 194 arthropod specimens (Araneida and Insecta), belonging to the following orders: Aranea (Arachnida), Collembola, Orthoptera, Thysanoptera, Heteroptera, Homoptera, Coleoptera, Lepidoptera, Diptera and Hymenoptera (Insecta), entomofauna representing 88,15% of these systematic groups, the rest of 11,85% being araneids.

The ichneumonological fauna is represented by 12 specimens (6,18% of the total arthropods) from 10 genera, belonging to six subfamilies: Anomaloninae, Diplazontinae, Ichneumoninae, Pimplinae, Campopleginae and Cremastinae.

The species *Barylypa pallida* (Grav.) is reported for the first time from Danube Delta Biosphere Reserve.

We report two host – parasitoid relationship at Plauru area:

1. the presence of the pest *Chrysomela populi* L., known a poplar defoliator, linked to the presence of the parasitoid *Virgichneumon monostagon* Grav.;

2. the presence of the pest *Celypha rivulana* Scop., linked to the presence of the parasitoid *Barichneumon albicaudatus* Fons.

The ichneumon wasps identified in the areas with invasive vegetation were mostly in transit from neighboring ecosystems.

Acknowledgements. This work was supported by the Romanian Ministry of Education and Research through the NUCLEU program (Contract no. 25N/2019/Project code 19-270301).

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Received July 16, 2021

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