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ON THE LEGUMINOUS HOST PLANTS OF SEED PREDATOR WEEVILS (COLEOPTERA: APIONIDAE, CURCULIONIDAE) IN HUNGARY

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Fruit bearing shoots of 139 leguminous species (cca 86% of known species of Leguminosae in Hungary) were collected at 148 sites all over the country since 1978. Only 54 species (38.8%) were found to host altogether 43 weevil species. The rearing method largely reduced the probability of getting adult weevils that may have used a plant only as an adult food source or only as refuge. This strongly increased the reliability of the host plant data obtained. The host plant range showed great differences within and between weevil genera. From the 54 plant species found as hosts, 29 and 11 (altogether 74.1%) harboured only one and two weevil species, respectively. The resource exploitation rate turned out very low at the plant species level.

Key words: Apionini, Tychiini, Leguminosae, specialisation, resource use

INTRODUCTION

In the course of research programmes aiming to reveal the seed predator insects associated especially with wild leguminous species of the Hungarian flora, species of Apionidae and Curculionidae were reared from fruits collected all over the country. This enabled us to get reliable data on the host plant affiliations of weevils. As COLONNELLI and OSELLA (1998) pointed out, the literature contains data on genuine host species on which larval development takes place as well as data on refuge plants which are used only as food, as shelter, and for transport by the adults. Consequently, the reliability of earlier host plant data is often questionable. A further factor of uncertainty is the frequent change in the taxonomy of weevil species. Therefore, below we refer only to recent literature data that support our findings. We deliberately do not mention reports on host plants that differ from ours, because we do not want to repeat possibly dubious data already published.

In the following we discuss the main characteristics of the host plant ranges comparing the data within and between weevil genera taking into consideration also the higher taxa (tribes) of the family of Leguminosae.

METHOD

Short shoots bearing ripe or almost ripe pods or flower heads, in a few instances only pods, were collected throughout Hungary since 1978. Sampling was focused mostly on wild legume species of natural or semi-natural habitats. Cultivated legume species were sampled only occasionally. The samples were put separately in paper bags and were transferred in the laboratory into glass jars covered with linen. The repeated handling of the plant material before placing it into the jars largely reduced, though did not exclude totally, the possibility that adults using the plants only as food or refuge remained in the sample. Furthermore, this rearing method did not prevent us obtaining adults that developed as larvae in the short shoots of the samples. The larvae of most species pupated and developed to adults in the collected plant material. Those that emerged as fully grown larvae were put into separate glass jars with steamed soil for pupation. Unfortunately, the mortality of these larvae was high. All emerging adults were collected and preserved for identification. The jars were kept at room temperature until autumn, afterwards they were transferred to an open air insectary for overwintering. The jars were repeatedly checked for emerging insects for at least one year.

The taxonomy of the weevil species dealt with below is based primarily on the works of CALDARA (1990), DIECKMANN (1977, 1988), EHRET (1990), ENDRŐDI (1971), and GYÓRFFY (1956). We use the names of the plant tribes according to the publications of the Royal Botanical Gardens, Kew (POLHILL & RAVEN 1981), while the plant species names correspond to those in the work by TUTIN *et al.* (1978) with the exception of *Vicia angustifolia* that is regarded below as a separate species while according to TUTIN *et al.* it is only a subspecies of *Vicia sativa.*

RESULTS AND DISCUSSION

The biology of several weevil species, especially those developing in wild plants, is still very poorly known. Most literature sources are restricted to data on the collection of adults on certain plant species without rearing them from the plants, so the biology of the larvae remained unknown. As our rearing method did not exclude totally to get also adults that may have developed as larvae in the shoots or buds, in Table 1 we have marked with * those species for which seed predation can only be supposed by analogy of closely related species, though has not been proved yet.

The biology of the larvae of *Exapion corniculatum* was unknown earlier (DIECKMANN 1977). PODLUSSÁNY (1981) found, however, that the larva developed to adult within a single seed of *Lembotropis nigricans.* All *Tychius* spp. are most likely seed predators as, according to CALDARA (1990), no other types of larval feeding has been observed in this genus so far.

We collected samples at 148 sites (Table 2) from 139 species and subspecies of Leguminosae equalling roughly 86% of all known legume taxa of the Hungarian flora. Interestingly, only 54 species (38.8% of all sampled species) (Table 3) turned out to harbour weevils representing 43 species (Table 1). The host plant affiliation of weevil species found can be characterised as follows.

Table 1. Leguminous host plants of seed predator weevil species in Hungary

Weevil species[1]	Host plant species	Location codes[2] (No of samples)[3] References[4]
Cyanapion (Bothryorrhynchapion) platalea (GERMAR)	*Lathyrus tuberosus*	51, D, E
**Eutrichapion (Cnemapion) gribodoi* DESBROCHERS	*Galega officinalis*	92(2), D, E
Eutrichapion (Psilocalymma) punctigerum PAYKULL	*Vicia angustifolia*	19(3), 82, D, E
Exapion compactum (DESBROCHERS)	*Genista pilosa*	65, 142, D, E
Exapion corniculatum (GERMAR)	*Chamaecytisus austriacus*	102, 132
	Chamaecytisus supinus	46, 115, 138, D, E
	Genista tinctoria	42, 77(2), 81(2), 83, 105
	Lembotropis nigricans	82, 90(2), 139, D, E
Exapion difficile (HERBST)	*Genista tinctoria*	41, 42, 48, 51, 72, 77, 81(2), 115, D
Exapion elongatulum (DESBROCHERS)	*Chamaecytisus austriacus*	81(6)
	Chamaecytisus supinus	38, 46, 48, 64. 81(3), 115, 140, 141, D, E
	Genista tinctoria	106, D, E, G
Exapion formaneki (WAGNER)	*Chamaecytisus supinus*	47, D, E
	Genista tinctoria	47, 81, 115, D, E, G
Exapion fuscirostre (FABRICIUS)	*Cytisus scoparius*	33, 112(2), 114, 121, 138, 142, 147, D, E, G
Holotrichapion ononis (KIRBY)	*Ononis hircina*	1, E, G
	Ononis spinosa	9, 78, 96, 111, 112, 138, D, E, G
Ischnopterapion aeneomicans (WENCKER)	*Dorycnium pentaphyllum*	94, 90, D
Ischnopterapion loti (KIRBY)	*Dorycnium pentaphyllum*	54, D
	Lathyrus pratensis	72
	Lotus corniculatus	1, 10, 13, 16, 19(2), 20, 22, 23, 31, 36, 38, 40, 42, 49, 54, 64, 72(5), 74(2), 76(4), 77(2), 81, 82(10), 94(3), 97, 103, 110, 113(2), 118, 120, 124, 131, 136, 139, 141, 143, 145, D, E, J-B
	Lotus tenuis	119, D, E
	Medicago falcata	95
	Vicia tetrasperma	77, 83
Mesotrichapion punctirostre (GYLLENHAL)	*Astragalus asper*	67, D, E
	Astragalus onobrychis	16, D, E, G
Oxystoma cerdo (GERSTAECKER)	*Vicia angustifolia*	82
	Vicia cracca	22, 42, 76(2), 77, 110, D, E, G

Table 1 (continued)

Weevil species[1]	Host plant species	Location codes[2] (No of samples)[3] References[4]
Oxystoma cerdo (GERSTAECKER)	*Vicia tenuifolia*	19, 22, 26, 36, 41, 42, 44, 81(8), 90(2), 128, D, E
	Vicia villosa	35, D, E
Oxystoma craccae (LINNAEUS)	*Vicia hirsuta*	12(2), 13, 28, 83, 94, 116, D, E
**Oxystoma dimidiatum* (DESBROCHERS)	*Vicia villosa*	134
Oxystoma ochropus (GERMAR)	*Vicia grandiflora*	11, 13, 63, 117
	Vicia sepium	18, 83(2), 123, 148, D, E, G
	Vicia sparsiflora	87(2), 105, 106(2)
	Vicia tenuifolia	81(2)
Oxystoma pomonae (FABRICIUS)	*Vicia angustifolia*	12, 19(7), 24, 68(2), 82(8), 95 D, E
	Vicia sativa	19, D, E
Oxystoma subulatum (KIRBY)	*Astragalus glycyphyllos*	72
	Lathyrus pratensis	22, 30, 34, 42, 50, 64, 69, 70, 71, 72, 73(2), 74, 75, 76(3), 88, 93, 101, 104, 120, 123(2),136, D, E, G
	Lotus corniculatus	72, J-B, G
Protapion apricans (HERBST)	*Ononis spinosa*	66
	Trifolium pallidum	37
	Trifolium pratense	11, 19(3), 26, 53, 64, 82, 85, 86, 94, 107, D, E, J-B
	Trifolium rubens	11
	Vicia tetrasperma	107
Protapion assimile (KIRBY)	*Trifolium medium*	26, 31, D, E, J-B
	Trifolium pratense	80, 82, 86, D, E, J-B
Protapion fulvipes (FOURCROY)	*Trifolium angulatum*	24
	Trifolium aureum	64, 72, 76, E
	Trifolium hybridum	15, 53, 63
	Trifolium repens	19(2), 76, 82(2), 86, W
Protapion gracilipes (DIETRICH)	*Trifolium medium*	6, 27a, 37, 42, 52, 61, 72, 76, 107, 118, 146, D, E, G
Protapion nigritarse (KIRBY)	*Trifolium aureum*	67, 82, D, E
	Trifolium campestre	45, 94, 97, D, E
Protapion ononidis (GYLLENHAL)	*Ononis hircina*	1, 13, G
	Ononis spinosa	3, 5, 7, 25, 38, 59, 66, 96, 99, 108 118, 129, 138, D, E, G
Protapion ruficrus (GERMAR)	*Trifolium alpestre*	81, 84, D, E
**Protapion schoenherri* (BOHEMAN)	*Trifolium striatum*	89
Protapion trifolii (LINNAEUS)	*Trifolium alpestre*	84
	Trifolium fragiferum	13

Table 1 (continued)

Weevil species[1]	Host plant species	Location codes[2] (No of samples)[3] References[4]
Protapion trifolii (LINNAEUS)	*Trifolium medium*	13, 26, 42, 107, 134, D
	Trifolium ochroleucon	43, D
	Trifolium pannonicum	123
	Trifolium pratense	11, 19, 34, 53, 64, 107, 125(2), D, J-B
Protapion varipes (GERMAR)	*Trifolium pratense*	32, D, E, J-B
Pseudoprotapion astragali (PAYKULL)	*Astragalus glycyphyllos*	27a, 51, 135, D, E, G
Tychius breviusculus DESBROCHERS	*Melilotus officinalis*	98, C, D
**Tychius caldarai* DIECKMANN	*Lotus corniculatus*	113, D
**Tychius cuprifer* (PANZER)	*Trifolium repens*	82, D
Tychius flavus BECKER	*Dorycnium pentaphyllum*	132
	Lotus corniculatus	40, 94, 113
	Medicago falcata	128, C, D
Tychius junceus (REICH)	*Dorycnium pentaphyllum*	79, 132
	Medicago falcata	128
	Medicago prostrata	55
Tychius kulzeri PENECKE	*Dorycnium pentaphyllum*	25, 54, 132, C, D
	Lotus corniculatus	94
Tychius picirostris (FABRICIUS)	*Medicago falcata*	95
	Trifolium hybridum	63, 127, C, D
	Trifolium pratense	34, ES
	Trifolium repens	19, 82(2), C, D, W
Tychius quinquepunctatus (LINNAEUS)	*Genista tinctoria*	103
	Lathyrus latifolius	81(4), 128, C
	Lathyrus niger	43
	Lathyrus nissolia	61, 84
	Lathyrus pannonicus	81(2)
	Lathyrus pratensis	12, C, D
	Lathyrus sylvestris	74, C, D
	Lathyrus tuberosus	86, 90, J-B
	Pisum sativum	86, C, D, J-B
	Vicia angustifolia	12, 19(8), 24, 58, 60, 68(2), 82(11), 83, 86, 110, C, J-B
	Vicia cassubica	62
	Vicia cracca	14, 19(2), 27, 36, 136, 144, C, D
	Vicia grandiflora	11, 83(2), 107
	Vicia pannonica	94, 107, 113, 133
	Vicia sepium	83, C, D, J-B
	Vicia tenuifolia	90(2), 128, C, D
	Vicia tetrasperma	29

Table 1 (continued)

Weevil species[1]	Host plant species	Location codes[2] (No of samples)[3] References[4]
Tychius schneideri (HERBST)	*Anthyllis vulneraria* ssp. *polyphylla*	17, 21, 54, 56, 80, 132(3), 137, C, D, ES
Tychius squamulatus GYLLENHAL	*Lotus corniculatus*	1, 16, 19, 23, 40, 49, 54, 77, 83, 94(2), 113, C, D
**Tychius subsulcatus* TOURNIER	*Astragalus onobrychis*	16, C
**Tychius tibialis* BOHEMAN	*Trifolium striatum*	89, D
Tychius trivialis BOHEMAN	*Astragalus cicer*	98, C, D
	Astragalus exscapus	122
	Astragalus glycyphyllos	2, C, D

[1]Species marked with * are also most likely seed predators, although their biology is not exactly known [According to CALDARA (1990) all *Tychius* species are seed predators]

[2]See Table 2

[3]If more than one sample was taken at the given site from several plant stands or in different years

[4]Only publications containing data on host plant species are referred to. Publications mentioning plant genera only (e.g. "*Trifolium* spp.") have not been considered. C = CALDARA 1990; D = DIECKMANN 1977, 1988; E = EHRET 1990; ES = ENDRŐDI 1971; G = GYŐRFFY 1956; J-B = JERMY & BALÁZS 1990; W = WIECH & WUNK 1985

Table 2. Sites of collection of Leguminosae samples

Locality	Habitat[1]	Code
Acsalag (Földsziget)	hydric grassland	1
Aszód	roadside	2
Baja		3
Bakonybél	forest edge	4
Bakonybél	pasture	5
Bakonycsernye	oak-forest edge	6
Bakonyszűcs	pasture	7
Balatongyörök		9
Balatonszéplak	sandy edge of ditch	10
Barabás, Kaszonyi-hegy		11
Battonya, Tompapuszta	loess grassland	12
Bátorliget	hydric pasture	13
Bikács, Ökör-hegy	forest edge	14
Bogdása	forest understory	15
Budakeszi reptér	pasture and waste ground	16
Budaőrs, Út-hegy		17
Budapest, Feketefej	hornbeam-oak-forest understory	18
Budapest, Óbuda	abandoned orchard	19
Budapest, Pesthidegkút	grassland	20
Budapest, Sas-hegy	xeric grassland	21
Budapest, Sváb-hegy		22

Table 2 (continued)

Locality	Habitat[1]	Code
Bugac		23
Csanádpalota, Blaskovicspuszta	sodic grassland	24
Csákvár, Haraszt-hegy	xeric pasture	25
Csákvár, Vásár-hegy	forest edge	26
Csévharaszt	grassland	27
Csopak, Nosztori-völgy		27a
Csörötnek	brook bank	28
Csörötnek	grassy forest edge	29
Devecser	hydric grassland	30
Dömös, Vadálló-kövek		31
Drávaiványi	forest understory	32
Drávatamási	pine-forest edge	33
Egerbakta-Sirok	edge of xeric oak-forest	34
Farkasfa	pine-forest clearing	35
Felnémet	loess grassland	36
Felsőszölnök	grassland	37
Fenyőfő	pine-forest edge	38
Fót, Somlyó	xeric grassland	39
Füzérradvány	country house park	40
Galyatető	shrubby grassland	41
Galyatető	roadside	42
Gyöngyössolymos	shrubby clear-cut forest	43
Győrszentiván	grassland	44
Gyulafirátót	pasture road	45
Gyulafirátót	pasture	46
Hárskút	forest edge	47
Hárskút	pasture	48
Hortobágy	sodic grassland	49
Hortobágy, Nyírőlapos		50
Isztimér	oak-forest understory	51
Isztimér	roadside in a beech-forest	52
Jánd	mesic grassland	53
Kádárta	xeric grassland	54
Kádárta	black pine-forest edge	55
Kádárta		56
Kákics	grassland	57
Kápolna	old-field	58
Keszthely, Apró-hegyek		59
Kisgyőr		60
Komló, Zobák-bánya	pine-forest edge	61
Komló, Zobák-bánya	forest edge	62
Kömörő	forest understory	63

Table 2 (continued)

Locality	Habitat[1]	Code
Kőszegi-hegység	forest roadside	64
Kőszegi-hegység	chestnut-oak forest edge	65
Kunpeszér	hydric grassland	66
Kunszentmiklós, Apajpuszta	sodic grassland	67
Litér	pasture	68
Mátraháza, Tetves-rét	oak-forest clearing	69
Mátraszentimre	roadside	70
Mátraszentimre, Kút-hegy.	shrubby mesic grassland	71
Mátraszentimre, Bagolyirtás	shrubby mesic grassland	72
Mátraszentimre, Bőgős-rét	hydric forest clearing	73
Mátraszentimre, Darázs-hegy	beech-forest clearing	74
Mátraszentimre, Nárád-patak	beech-forest edge	75
Mátraszentistván	shrubby mesic grassland	76
Mátraszentlászló, Piszkés	mesic grassland	77
Meggyeskovácsi	pasture	78
Nagyharsány		79
Nagyharsány	mesic grassland	80
Nagykovácsi	xeric Turkey-oak-forest edge	81
Nagykovácsi	old-field	82
Nagykovácsi	shrubby mesic grassland	83
Nagykovácsi	Turkey-oak-forest edge	84
Nagykovácsi	Turkey-oak-forest understory	85
Nagykovácsi	cultivated field	86
Nagykovácsi, Remete-hegy	oak-forest understory	87
Nagytárkánypuszta, Csabrendek	hydric grassland	88
Nagyvázsony	xeric grassland	89
Noszvaj, Síkfőkút	oak-forest edge	90
Nyírád	brook bank	91
Nyírád	oak-forest edge	92
Nyírád	hydric grassland	93
Óbánya	old-field	94
Óbudavár	mesic grassland	95
Óbudavár	forest clearing	96
Ohati-erdő, Egyek	oak-forest clearing	97
Örkény	roadside	98
Öskü	pasture	99
Padragkút	oak-forest understory	100
Padragkút	hydric grassland	101
Pilisszántó	loess grassland	102
Pilisszenlélek		103
Pilisszentlászló	grassland	104
Pomáz, Csikóváralja		105
Pomáz, Csikóvár		106

Table 2 (continued)

Locality	Habitat[1]	Code
Pula	forest edge	107
Pula	grassland	108
Pusztaszer	pasture	109
Recsk	xeric pasture	110
Révfülöp	abandoned orchard, roadside	111
Rezi	pasture	112
Romhány	xeric shrubby grassland	113
Sümeg	pasture	114
Súr	pasture	115
Szalafő, Pityerszer	grassland adjacent cultivated fields	116
Szalafő, Pityerszer	grassland	117
Szalafő	grassland	118
Szentendrei sziget, Kisoroszi	hydric grassland	119
Szentpéterfölde		120
Szőce	pine-forest edge	121
Sződliget	railway bed	122
Tahi, Kalicsa-völgy	forest edge	123
Tápiószele	cultivated	124
Terecsenypuszta, Sas-rét	forest meadow	125
Tiszapüspöki	xeric grassland	126
Tokaj, Tisza-part	river bank	127
Tokaji-hegy	pine- and oak-forest understory	128
Ugod	pasture	129
Úrkút	oak-forest edge	130
Üllés	mesic grassland	131
Üröm	xeric limestone grassland	132
Üröm	edge of cultivated fields	133
Üröm, Nagykevély	xeric grassland	134
Vállus	xeric grassland	135
Várad, Sikota-puszta	forest edge	136
Várpalota	xeric dolomitic grassland	137
Várvölgy	pasture	138
Vászoly	xeric scrub vegetation	139
Vászoly	abandoned orchard	140
Velem	vineyard	141
Velem	roadside, oak and chestnut trees	142
Verpelét	mesic grassland	143
Vörs, Kis-Balaton	lake shore	144
Zalaszántó, Tátika		145
Zirc	pasture	146
Zirc		147
Zsófiapuszta, Úrkút	oak-forest edge	148

[1]At some localities the character of the habitat is lacking mostly because the samples were taken by other persons and the habitat could not been recalled exactly later

Table 3. Number of weevil species per plant species

Plant tribes and species	Weevil species	No. of infested samples	No. of samples collected
Tribe Galegeae			
Astragalus asper	*M. punctirostre*	1	3
A. cicer	*T. trivialis*	1	28
A. exscapus	*T. trivialis*	1	4
A. glycyphyllos	*O. subulatum*	1	66
	P. astragali	3	
	T. trivialis	1	
A. onobrychis	*M. punctirostre*	1	19
	T. subsulcatus	1	
Galega officinalis	*E. gribodoi*	2	7
Tribe Loteae			
Anthyllis vulneraria ssp. *polyphylla*	*T. schneideri*	9	26
Dorycnium pentaphyllum	*I. aeneomicans*	2	16
	I. loti	1	
	T. flavus	1	
	T. junceus	2	
	T. kulzeri	3	
Lotus corniculatus	*I. loti*	58	80
	O. subulatum	1	
	T. caldarai	1	
	T. flavus	3	
	T. kulzeri	1	
	T. squamulatus	12	
L. tenuis	*I. loti*	1	3
Tribe Vicieae			
Lathyrus latifolius	*T. 5-punctatus*	5	27
L. niger	*T. 5-punctatus*	1	26
L. nissolia	*T. 5-punctatus*	2	9
L. pannonicus	*T. 5-punctatus*	2	8
L. pratensis	*I. loti*	1	65
	O. subulatum	25	
	T. 5-punctatus	1	
L. sylvestris	*T. 5-punctatus*	1	33
L. tuberosus	*C. platalea*	1	55
	T. 5-punctatus	2	
Pisum sativum	*T. 5-punctatus*	1	12
Vicia angustifolia	*E. punctigerum*	4	116
	O. cerdo	1	
	O. pomonae	1	
	T. 5-punctatus	28	
V. cassubica	*T. 5-punctatus*	1	28

Table 3 (continued)

Plant tribes and species	Weevil species	No. of infested samples	No. of samples collected
Vicia cracca	*O. cerdo*	6	44
	T. 5-punctatus	7	
V. grandiflora	*O. ochropus*	4	25
	T. 5-punctatus	4	
V. hirsuta	*O. craccae*	7	22
V. pannonica ssp. *pannonica*	*T. 5-punctatus*	4	12
V. sativa ssp. *sativa*	*O. pomonae*	1	3
V. sepium	*O. ochropus*	5	35
	T. 5-punctatus	1	
V. sparsiflora	*O. ochropus*	5	8
V. tenuifolia	*O. cerdo*	18	78
	O. ochropus	2	
	T. 5-punctatus	3	
V. tetrasperma	*I. loti*	2	10
	P. apricans	1	
	T. 5-punctatus	1	
V. villosa	*O. cerdo*	1	24
	O. dimidiatum	1	
Tribe Trifolieae			
Medicago falcata	*I. loti*	1	14
	T. flavus	2	
	T. junceus	1	
	T. picirostris	1	
M. prostrata	*T. junceus*	1	2
Melilotus officinalis	*T. breviusculus*	1	6
Ononis hircina	*H. ononis*	1	3
	P. ononidis	1	
O. spinosa	*H. ononis*	6	26
	P. apricans	1	
	P. ononidis	13	
Trifolium alpestre	*P. ruficrus*	2	12
	P. trifolii	1	
T. angulatum	*P. fulvipes*	1	1
T. aureum	*P. fulvipes*	3	20
	P. nigritarse	2	
T. campestre	*P. nigritarse*	3	4
T. fragiferum	*P. trifolii*	1	3
T. hybridum	*P. fulvipes*	3	6
	T. picirostris	2	
T. medium	*P. assimile*	2	22
	P. gracilipes	11	
	P. trifolii	5	

Table 3 (continued)

Plant tribes and species	Weevil species	No. of infested samples	No. of samples collected
Trifolium ochroleucum	*P. trifolii*	1	4
T. pallidum	*P. apricans*	1	1
T. pannonicum	*P. trifolii*	1	1
T. pratense	*P. apricans*	12	13
	P. assimile	3	
	P. trifolii	8	
	P. varipes	1	
	T. picirostris	1	
T. repens	*P. fulvipes*	6	7
	T. cuprifer	1	
	T. picirostris	3	
T. rubens	*P. apricans*	1	18
T. striatum	*P. schoenherri*	1	5
	T. tibialis	1	
Tribe Genisteae			
Chamaecytisus austriacus	*E. corniculatum*	2	17
	E. elongatulum	6	
C. supinus	*E. corniculatum*	3	21
	E. elongatulum	10	
	E. formaneki	1	
Cytisus scoparius	*E. fuscirostre*	8	15
Genista pilosa	*E. compactum*	2	2
G. tinctoria	*E. corniculatum*	7	42
	E. difficile	9	
	E. elongatulum	1	
	E. formaneki	3	
	T. 5-punctatus	1	
Lembotropis nigricans	*E. corniculatum*	4	31

Monophagy or at least a very narrow specialisation has been found with the following species (considering only cases when at least 4 plant samples from at least 3 locations were collected): *Exapion difficile* on *Genista tinctoria* (9 samples from 8 locations), *E. fuscirostre* on *Cytisus scoparius* (8 samples from 7 locations), *Oxystoma craccae* on *Vicia hirsuta* (7 samples from 6 locations), *Tychius schneideri* on *Anthyllis vulneraria* ssp. *polyphylla* (9 samples from 7 locations), *T. squamulatus* on *Lotus corniculatus* (12 samples from 11 locations). According to DIECKMANN (1977) *Protapion gracilipes* is monophagous on *Trifolium medium.* This has been supported strongly by our data (11 samples from 11 locations).

It is important to note that all *Exapion* spp. were reared exclusively from genera belonging to one plant tribe: Genisteae (altogether 56 samples from 28 locations).

The species of *Protapion* are strongly specialised to *Trifolium* spp. Namely, 8 from the 10 species emerged exclusively from *Trifolium* spp. (56 samples from 34 locations). The exceptions are as follows: *P. ononidis* occurred on *Ononis* spp. (15 samples from 15 locations); *P. apricans* occurred, as well as on *Trifolium* spp. (14 samples from 12 locations), also on *Ononis spinosa* and *Vicia tetrasperma* (1 sample each). That means that *Protapion* spp. use mostly plant species of the tribe Trifolieae.

A less narrow specialisation prevails in the genus *Oxystoma,* though *Vicia* spp. occur most often among the host plants followed by *Lathyrus* spp. In detail, *O. cerdo, O. craccae* (not found in *Vicia cracca*!), *O. dimidiatum, O. ochropus,* and *O. pomonae* occurred only in *Vicia* spp. (71 samples from 23 locations). *O. subulatum* occurred, as well as on *Lathyrus pratensis* (25 samples from 21 locations), also on *Lotus corniculatus* and on *Astragalus glycyphyllos* (1 sample each). Thus, *Oxystoma* species were associated mostly with species of Vicieae, but sporadically also with species of Galegeae and Loteae.

A relatively broad host plant range (5 genera of 3 tribes) characterised *Ischnopterapion loti*, although it was mostly found in *Lotus* spp. (59 samples from 37 locations) while it was present in only one sample each of *Dorycnium pentaphyllum, Lathyrus pratensis, Medicago falcata* and in two samples of *V. tetrasperma.*

The species of *Tychius* showed a most variable host affiliation. Unfortunately, most species were found only in a few samples, therefore in most cases further investigation is necessary to get a better picture of host affiliation in this genus. Taking into consideration only species that were reared from at least 4 samples from at least 3 locations, there seems a decisive specialisation in *T. picirostris* to *Trifolium* spp. (6 samples from 5 locations) while *Medicago falcata* is represented only by one sample and, as mentioned before, in *T. schneideri* to *Anthyllis vulneraria* ssp. *polyphylla* (9 samples from 7 locations). On the other hand, several species use plant species of quite far related plant genera such as *T. flavus* (3 genera of 2 tribes) and *T. quinquepunctatus* (4 genera of 2 tribes).

In conclusion, the host plant specialisation of the seed predator weevil species shows a very variable picture from possible monophagy or at least ecological monophagy (FOX & MORROW 1981) to narrow oligophagy and to a broader host range such as in *Ischnopterapion loti*: species of 5 plant genera belonging to 3 tribes.

Besides the host plant species listed in Table 1 we have reared the following weevil species from plant species that seem "unusual" as they contradict both the

majority of our rearing data and the available literature data. They need further investigation the more so as we have reared only *one* adult of each species from these plants: *Oxystoma cerdo* from *Chamaecytisus supinus, Protapion ruficrus* from *Trifolium ochroleucon* and *Tychius quinquepunctatus* from *Astragalus glycyphyllos*.

As for the number of curculionid species per plant species (Table 3), it is remarkable that among the 54 plant species found as hosts, 29 and 11 species (i.e., 53.7 + 20.4 = 74.1%) were infested only by one and two weevil species, respectively, while the maximum of 6 species occurred only in *Lotus corniculatus*. Furthermore, in about two-third of the host plant species, weevils emerged from less than half of all samples collected. Considering also the fact that seed predator weevils occurred only in 38.8% of the sampled leguminous species, it can be concluded that the rate of resource exploitation by these insects is quite low at the plant species level.

*

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