

1 SUPPLEMENTARY MATERIAL

2 **Appendix S1.** Species list with total abundances of specialist and generalist leafhoppers. The
3 nomenclature follows Holzinger *et al.* (2003) and Biedermann & Niedringhaus (2004).

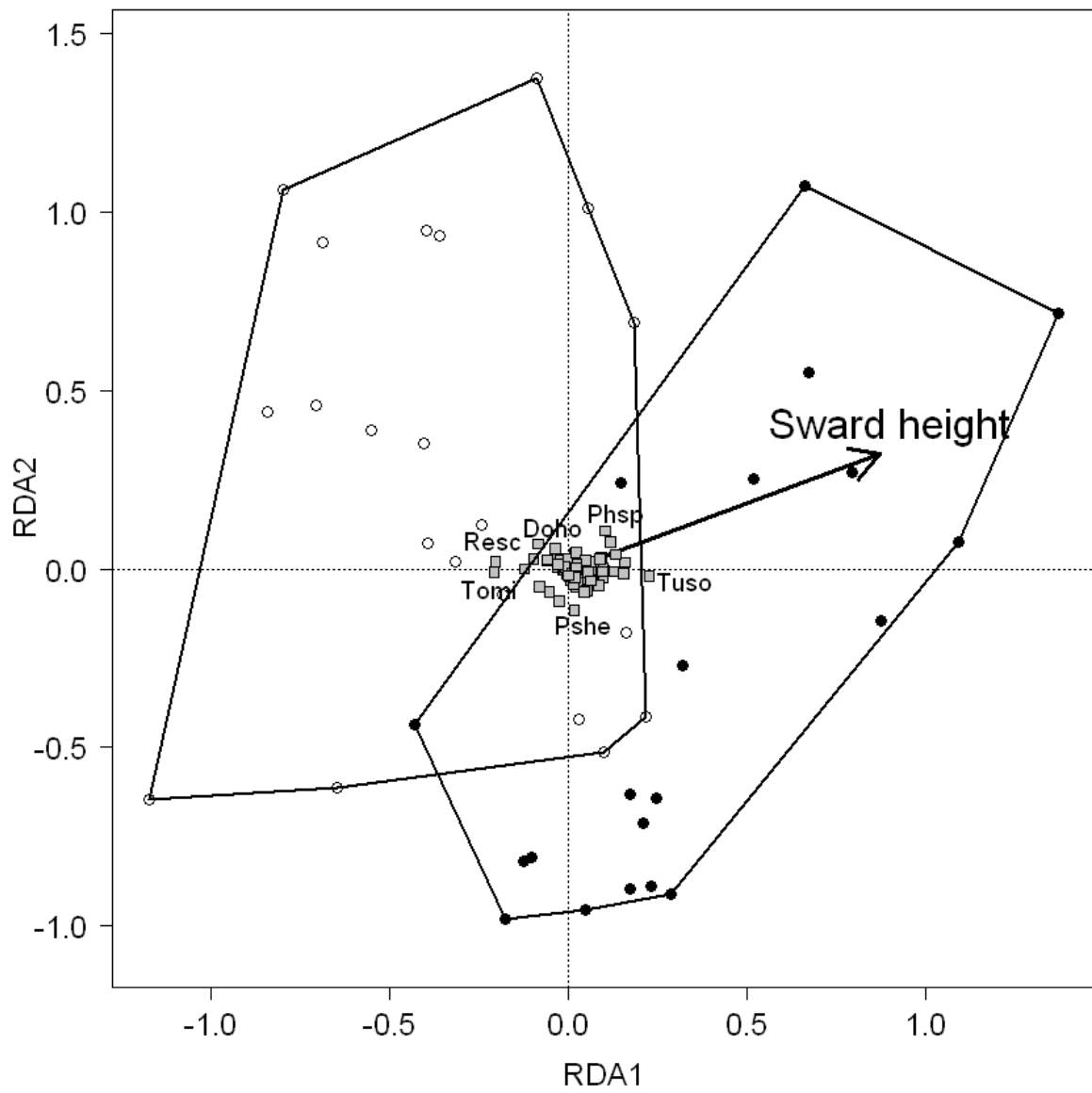
4

Species	Total abundance
Generalists	
<i>Aphrophora alni</i> (Fallén, 1805)	1
<i>Arthaldeus pascuellus</i> (Fallén, 1826)	4
<i>Cercopis sanguinolenta</i> (Scopoli, 1763)	13
<i>Deltocephalus pulicaris</i> (Fallén, 1806)	386
<i>Dicranotropis hamata</i> (Boheman, 1847)	1
<i>Dictyophara europaea</i> (Linnaeus, 1767)	1
<i>Diplocolenus abdominalis</i> (Fabricius, 1803)	29
<i>Errastunus ocellaris</i> (Fallén, 1806)	66
<i>Euscelis incisus</i> (Kirschbaum, 1858)	19
<i>Hyalesthes obsoletus</i> (Signoret, 1865)	2
<i>Kelisia pallidula</i> (Boheman, 1847)	63
<i>Laodelphax striatellus</i> (Fallén, 1826)	13
<i>Lepyronia coleoptrata</i> (Linnaeus, 1758)	131
<i>Macrosteles laevis</i> (Ribaut, 1927)	33
<i>Neoliturus haematoceps</i> (Mulsant et Rey, 1855)	4
<i>Paluda preyssleri</i> (Herrich-Schäffer, 1838)	2
<i>Philaenus spumarius</i> (Linnaeus, 1758)	314
<i>Platymetopius undatus</i> (de Geer, 1773)	2
<i>Psammotettix alienus</i> (Dahlbom, 1850)	864
<i>Psammotettix confinis</i> (Dahlbom, 1850)	1161
Specialists	
<i>Agallia laevis</i> (Ribaut, 1935)	85
<i>Agallia ribauti</i> (Ossianniilsson, 1938)	584
<i>Aphrodes bicinctus</i> (von Schrank, 1776)	150
<i>Aphrodes fuscofasciatus</i> (Goeze, 1778)	5
<i>Aphrodes trifasciatus</i> (Fourcroy, 1785)	50
<i>Aphrophora salicina</i> (Goeze, 1778)	1
<i>Arocephalus languidus</i> (Flor, 1861)	1609
<i>Arthaldeus striifrons</i> (Kirschbaum, 1868)	347
<i>Artianus interstitialis</i> (Germar, 1821)	927
<i>Athysanus argentarius</i> (Metcalf, 1955)	42
<i>Austroagallia sinuata</i> (Mulsant et Rey, 1855)	33
<i>Balclutha punctata</i> (Fabricius, 1775)	7
<i>Caliscelis wallengreni</i> (Stal, 1863)	1
<i>Chlorita paolii</i> (Ossianniilsson, 1939)	125
<i>Cicadella viridis</i> (Linnaeus, 1758)	194
<i>Cicadula placida</i> (Horváth, 1897)	6
<i>Cicadula quadrinotata</i> (Fabricius, 1794)	18
<i>Dictyophara pannonica</i> (Germar, 1830)	11
<i>Doratura exilis</i> (Horváth, 1903)	1214
<i>Doratura heterophyla</i> (Horváth, 1903)	97
<i>Doratura homophyla</i> (Flor, 1861)	6998

<i>Doratura impudica</i> (Horváth, 1897)	400
<i>Enantiocephalus cornutus</i> (Herrich-Schäffer, 1838)	7
<i>Euconomelus lepidus</i> (Boheman, 1847)	1
<i>Eupelix cuspidata</i> (Fabricius, 1775)	105
<i>Eupteryx vittata</i> (Linnaeus, 1758)	1
<i>Euscelis obsoletus</i> (Kirschbaum, 1868)	3
<i>Forcipata citrinella</i> (Zetterstedt, 1828)	1
<i>Graphocraerus ventralis</i> (Fallén, 1806)	250
<i>Hecalus glaucescens</i> (Fieber, 1866)	1
<i>Hephathus nanus</i> (Herrich-Schäffer, 1835)	75
<i>Jassargus obtusivalvis</i> (Kirschbaum, 1868)	22
<i>Jassargus sursumflexus</i> (Then, 1901)	1
<i>Kelisia guttula</i> (Germar, 1818)	69
<i>Laburrus handlirschi</i> (Matsumura, 1908)	39
<i>Limotettix striola</i> (Fallén, 1806)	44
<i>Megophthalmus scanicus</i> (Fallén, 1806)	19
<i>Mendrausus pauxillus</i> (Fieber, 1869)	1978
<i>Metalimnus formosus</i> (Boheman, 1845)	3
<i>Mocuellus collinus</i> (Boheman, 1850)	623
<i>Neoliturus fenestratus</i> (Herrich-Schäffer, 1834)	329
<i>Neophilaenus campestris</i> (Fallén, 1805)	47
<i>Neophilaenus lineatus</i> (Linnaeus, 1758)	36
<i>Ommatidiotus dissimilis</i> (Fallén, 1806)	49
<i>Ommatidiotus falleni</i> (Stal, 1863)	6
<i>Paluda vitripennis</i> (Flor, 1861)	215
<i>Paralimnus phragmitis</i> (Boheman, 1847)	8
<i>Pastiroma clypeata</i> (Horváth, 1897)	2
<i>Pentastiridius leporinus</i> (Linnaeus, 1761)	2
<i>Psammotettix asper</i> (Ribaut, 1925)	128
<i>Psammotettix helvolus</i> (Kirschbaum, 1868)	296
<i>Psammotettix kolosvarensis</i> (Matsumura, 1908)	2297
<i>Recilia schmidtgeni</i> (Wagner, 1939)	410
<i>Reptalus quinquecostatus</i> (Dufour, 1833)	159
<i>Rhoananus hypochlorus</i> (Fieber, 1869)	11
<i>Ribautodelphax imitans</i> (Ribaut, 1953)	9
<i>Setapius cuspidatus</i> (Fieber, 1876)	1
<i>Stictocoris picturatus</i> (Sahlberg, 1842)	106
<i>Tetartostylus pellucidus</i> (Wagner, 1951)	3
<i>Tettigometra obliqua</i> (Panzer, 1799)	5
<i>Toya minuscula</i> (Horváth, 1897)	2165
<i>Turrutus socialis</i> (Flor, 1861)	1526
<i>Ulopa trivialis</i> (Germar, 1821)	197
<i>Zyginidia pullula</i> (Boheman, 1845)	2

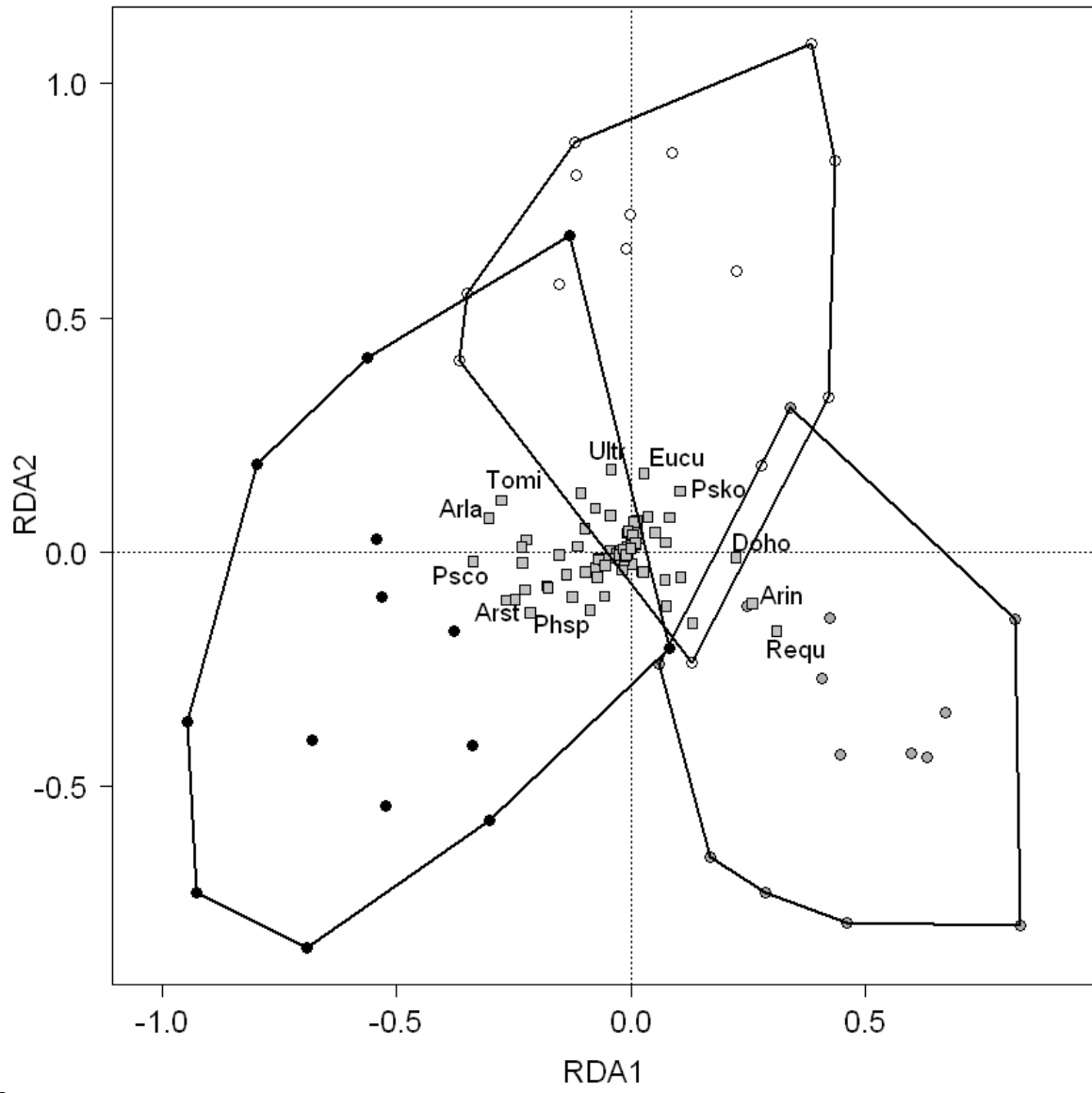
6Appendix S2. RDA plots for leafhoppers. Grey squares indicate species. Abbreviated names
7of the most separated species are presented. (Arin: *Artianus interstitialis*; Arla: *Arocephalus*
8*languidus*; Arst: *Arthaldeus striifrons*; Doho: *Doratura homophyla*; Eucu: *Eupelix cuspidata*;
9Phsp: *Philaenus spumarius*; Pscoc: *Psammotettix confinis*; Pshe: *Psammotettix helvolus*; Psko:
10*Psammotettix kolosvarensis*; Requ: *Reptalus quinquecostatus*; Resc: *Recilia schmidtgeni*;
11Tomi: *Toya minuscula*; Tuso: *Turrutus socialis*; Ultr: *Ulopa trivia*.) A: model type I, in which
12Region was the conditional variable. Open circles: intensively grazed pastures; solid circles:
13extensively grazed pastures. Minimum convex polygon of the two types of grazing intensity
14are shown. B: model type II, in which Region was the only constrained variable. Minimum
15convex polygons of the three regions are shown. Open circles: Region 1, grey circles: Region
162, solid circles: Region 3.

A



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B



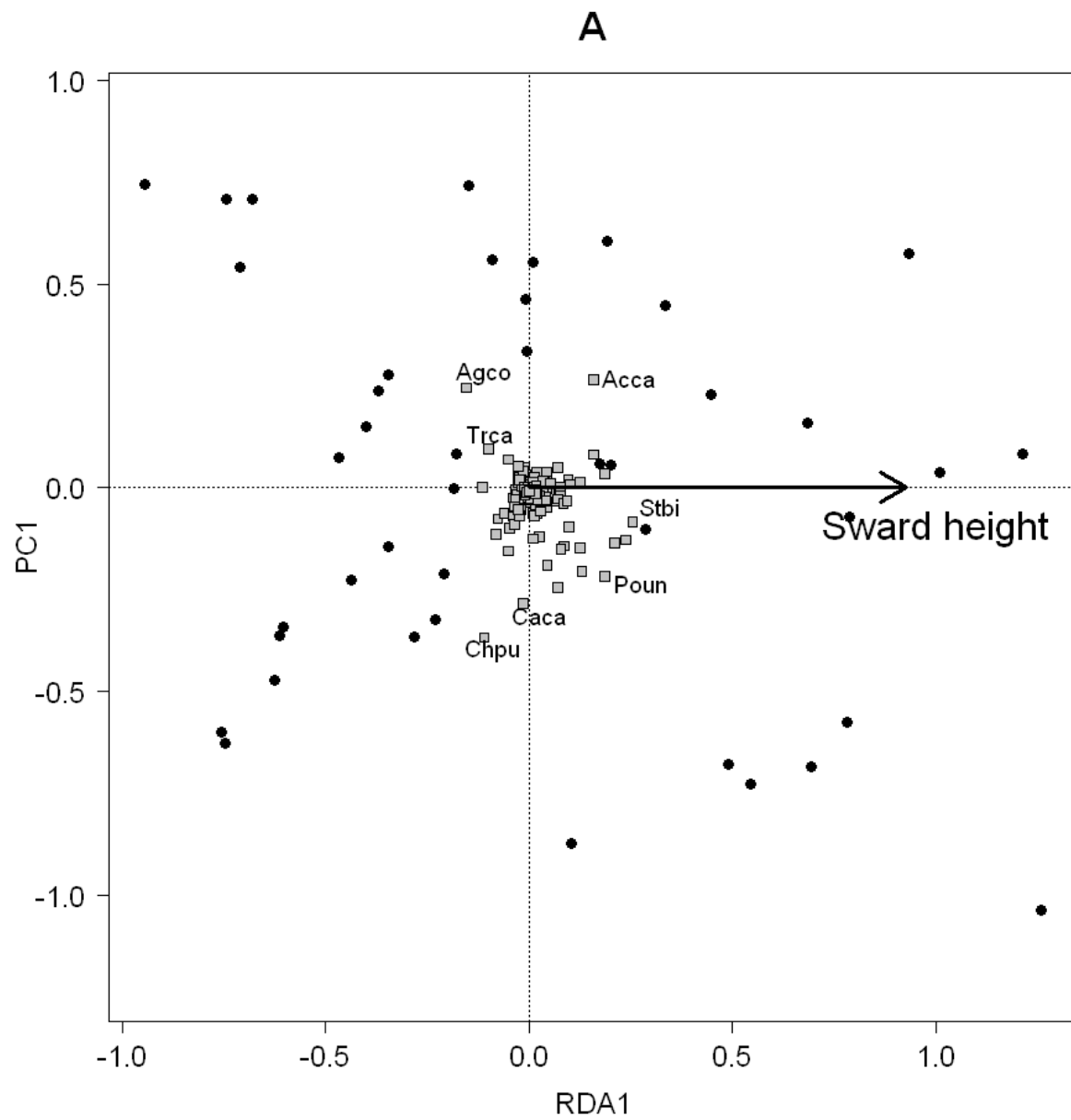
19**Appendix S3.** Categorized species list of true bugs with total abundances. The nomenclature follows the catalogue of Aukema & Rieger (1996, 1999, 2001, 2006).

Species	Phytophagous/ carnivorous	Plant/ground- dwelling	Hibernating (adult/immature)	Total abundance
<i>Acalypta gracilis</i> (Fieber, 1844)	phytophagous	ground	adult	2
<i>Acalypta marginata</i> (Wolff, 1804)	phytophagous	ground	adult	6
<i>Acetropis carinata</i> (Herrich-Schäffer, 1841)	phytophagous	plant	immature	682
<i>Acetropis longirostris</i> Puton, 1875	phytophagous	plant	immature	148
<i>Adelphocoris lineolatus</i> (Goeze, 1778)	phytophagous	plant	immature	137
<i>Adelphocoris seticornis</i> (Fabricius, 1775)	phytophagous	plant	immature	5
<i>Aelia acuminata</i> (Linnaeus, 1758)	phytophagous	plant	adult	85
<i>Aelia rostrata</i> Boheman, 1852	phytophagous	plant	adult	5
<i>Agramma confusum</i> (Puton, 1879)	phytophagous	plant	adult	88
<i>Alydus calcaratus</i> (Linnaeus, 1758)	phytophagous	plant	adult	8
<i>Anthemina lunulata</i> (Goeze, 1778)	phytophagous	plant	adult	21
<i>Atomoscelis onusta</i> (Fieber, 1861)	phytophagous	plant	immature	514
<i>Bathysolen nubilus</i> (Fallén, 1807)	phytophagous	ground	adult	12
<i>Beosus maritimus</i> (Scopoli, 1763)	phytophagous	ground	adult	1
<i>Beosus quadripunctatus</i> (Müller, 1766)	phytophagous	ground	adult	1
<i>Berytinus clavipes</i> (Fabricius, 1775)	phytophagous	ground	adult	3
<i>Berytinus minor minor</i> (Herrich-Schäffer, 1835)	phytophagous	ground	adult	1
<i>Berytinus montivagus</i> (Meyer-Dür, 1841)	phytophagous	ground	adult	2
<i>Brachycarenum tigrinus</i> (Schilling, 1817)	phytophagous	plant	adult	10
<i>Brachycoleus decolor</i> Reuter, 1887	phytophagous	plant	immature	2
<i>Camptopus lateralis</i> (Germar, 1817)	phytophagous	plant	adult	1
<i>Capsodes gothicus gothicus</i> (Linnaeus, 1758)	phytophagous	plant	immature	7
<i>Capsus ater</i> (Linnaeus, 1758)	phytophagous	plant	immature	9
<i>Carpocoris pudicus</i> (Poda, 1761)	phytophagous	plant	adult	1
<i>Carpocoris purpureipennis</i> (De Geer, 1773)	phytophagous	plant	adult	1
<i>Catoplatus carthusianus</i> (Goeze, 1778)	phytophagous	plant	adult	116
<i>Ceraleptus obtusus</i> (Brullé, 1839)	phytophagous	plant	adult	2
<i>Charagochilus gyllenhalii</i> (Fallén, 1807)	phytophagous	plant	immature	4
<i>Charagochilus weberi</i> Wagner, 1953	phytophagous	plant	immature	1
<i>Chlamydatus pulicarius</i> (Fallén, 1807)	phytophagous	plant	immature	1
<i>Chlamydatus pullus</i> (Reuter, 1870)	phytophagous	plant	immature	246
<i>Chlamydatus saltitans</i> (Fallén, 1807)	phytophagous	plant	immature	101
<i>Chorosoma schillingi</i> (Schummel, 1829)	phytophagous	plant	adult	80
<i>Closterotomus norwegicus</i> (Gmelin, 1790)	phytophagous	plant	immature	1
<i>Conostethus hungaricus</i> Wagner, 1941	phytophagous	plant	immature	51
<i>Coptosoma scutellatum</i> (Geoffroy, 1785)	phytophagous	plant	adult	4
<i>Coranus kerzhneri</i> P.V. Putshkov, 1982	carnivorous	ground	adult	1
<i>Coriomeris denticulatus</i> (Scopoli, 1763)	phytophagous	plant	adult	1
<i>Criocoris sulcicornis</i> (Kirschbaum, 1856)	phytophagous	plant	immature	71
<i>Crypsinus angustatus</i> (Bärensprung, 1859)	phytophagous	plant	adult	456
<i>Cydnus aterrimus</i> (Förster, 1771)	phytophagous	ground	adult	3
<i>Cymus aurescens</i> Distant, 1883	phytophagous	plant	adult	8
<i>Cymus glandicolor</i> Hahn, 1832	phytophagous	plant	adult	33
<i>Cymus melanocephalus</i> Fieber, 1861	phytophagous	plant	adult	1
<i>Deraeocoris ruber</i> (Linnaeus, 1758)	carnivorous	plant	immature	1
<i>Deraeocoris ventralis ventralis</i> Reuter, 1904	carnivorous	plant	immature	5
<i>Dicranocephalus agilis</i> (Scopoli, 1763)	phytophagous	plant	adult	1
<i>Dictyla echii</i> (Schrank, 1782)	phytophagous	plant	adult	1

<i>Dictyla platyoma</i> (Fieber, 1861)	phytophagous	plant	adult	22
<i>Dictyla rotundata</i> (Herrich-Schäffer, 1835)	phytophagous	plant	adult	5
<i>Dimorphopterus blissoides</i> (Bärensprung, 1859)	phytophagous	ground	adult	1
<i>Dimorphopterus doriae</i> (Ferrari, 1874)	phytophagous	ground	adult	2
<i>Dolycoris baccarum</i> (Linnaeus, 1758)	phytophagous	plant	adult	26
<i>Dyroderes umbraculatus</i> (Fabricius, 1775)	phytophagous	plant	adult	1
<i>Emblethis ciliatus</i> Horváth, 1875	phytophagous	ground	adult	1
<i>Emblethis griseus</i> (Wolff, 1802)	phytophagous	ground	adult	2
<i>Emblethis verbasci</i> (Fabricius, 1803)	phytophagous	ground	adult	6
<i>Eurydema oleraceum</i> (Linnaeus, 1758)	phytophagous	plant	adult	6
<i>Eurydema ornatum</i> (Linnaeus, 1758)	phytophagous	plant	adult	4
<i>Eurygaster maura</i> (Linnaeus, 1758)	phytophagous	plant	adult	21
<i>Eurygaster testudinaria</i> (Geoffroy, 1785)	phytophagous	plant	adult	124
<i>Euryopicoris nitidus</i> (Meyer-Dür, 1843)	phytophagous	plant	immature	2
<i>Eusarcoris aeneus</i> (Scopoli, 1763)	phytophagous	plant	adult	5
<i>Geocoris ater</i> (Fabricius, 1787)	carnivorous	ground	adult	4
<i>Geocoris grylloides</i> (Linnaeus, 1761)	carnivorous	ground	adult	36
<i>Graptopeltus lynceus</i> (Fabricius, 1775)	phytophagous	ground	adult	1
<i>Hallodapus montandoni</i> Reuter, 1895	phytophagous	ground	immature	3
<i>Halticus apterus apterus</i> (Linnaeus, 1758)	phytophagous	plant	immature	874
<i>Henestaris halophilus</i> (Burmeister, 1835)	phytophagous	ground	adult	13
<i>Heterocordylus genistae</i> (Scopoli, 1763)	phytophagous	plant	immature	6
<i>Holcostethus vernalis</i> (Wolff, 1804)	phytophagous	plant	adult	4
<i>Kalama tricornis</i> (Schrank, 1801)	phytophagous	plant	adult	8
<i>Lasiacantha capucina capucina</i> (Germar, 1837)	phytophagous	plant	adult	135
<i>Lasiacantha gracilis</i> (Herrich-Schäffer, 1830)	phytophagous	plant	adult	21
<i>Lasiacantha hermani</i> Vásárhelyi, 1977	phytophagous	plant	adult	4
<i>Leptopterna dolabrata</i> (Linnaeus, 1758)	phytophagous	plant	immature	28
<i>Liorhyssus hyalinus</i> (Fabricius, 1794)	phytophagous	plant	adult	2
<i>Lygaeosoma sardeum sardeum</i> Spinola, 1837	phytophagous	ground	adult	2
<i>Lygaeus simulans</i> Deckert, 1985	phytophagous	plant	adult	12
<i>Lygus gemellatus gemellatus</i> (Herrich-Schäffer, 1835)	phytophagous	plant	immature	1
<i>Lygus pratensis</i> (Linnaeus, 1758)	phytophagous	plant	immature	5
<i>Lygus rugulipennis</i> Poppius, 1911	phytophagous	plant	immature	16
<i>Megaloceroea recticornis</i> (Geoffroy, 1785)	phytophagous	plant	immature	36
<i>Megalonotus sabulicola</i> (Thomson, 1870)	phytophagous	ground	adult	2
<i>Menaccarus arenicola</i> (Scholtz, 1846)	phytophagous	ground	adult	1
<i>Metopoplax origani</i> (Kolenati, 1845)	phytophagous	plant	adult	115
<i>Myrmecoris gracilis</i> (R.F. Sahlberg, 1848)	carnivorous	plant	immature	5
<i>Myrmus miriformis</i> (Fallén, 1807)	phytophagous	plant	adult	224
<i>Nabis ferus</i> (Linnaeus, 1758)	carnivorous	plant	adult	5
<i>Nabis pseudoferus pseudoferus</i> Remane, 1949 + <i>Nabis punctatus punctatus</i> A. Costa, 1847	carnivorous	plant	adult	84
<i>Neides tipularius</i> (Linnaeus, 1758)	phytophagous	ground	adult	27
<i>Neottiglossa leporina</i> (Herrich-Schäffer, 1830)	phytophagous	plant	adult	3
<i>Notostira erratica</i> (Linnaeus, 1758)	phytophagous	plant	immature	34
<i>Nysius ericae ericae</i> (Schilling, 1829)	phytophagous	plant	adult	9
<i>Nysius senecionis senecionis</i> (Schilling, 1829)	phytophagous	plant	adult	15
<i>Omphalonotus quadriguttatus</i> (Kirschbaum, 1856)	phytophagous	plant	immature	3
<i>Oncochila scapularis</i> (Fieber, 1844)	phytophagous	plant	adult	17
<i>Orius niger</i> (Wolff, 1811)	carnivorous	plant	immature	15
<i>Orthocephalus saltator</i> (Hahn, 1835)	phytophagous	plant	immature	2
<i>Orthocephalus vittipennis</i> (Herrich-Schäffer, 1835)	phytophagous	plant	immature	11
<i>Ortholomus punctipennis</i> (Herrich-Schäffer, 1838)	phytophagous	plant	immature	120

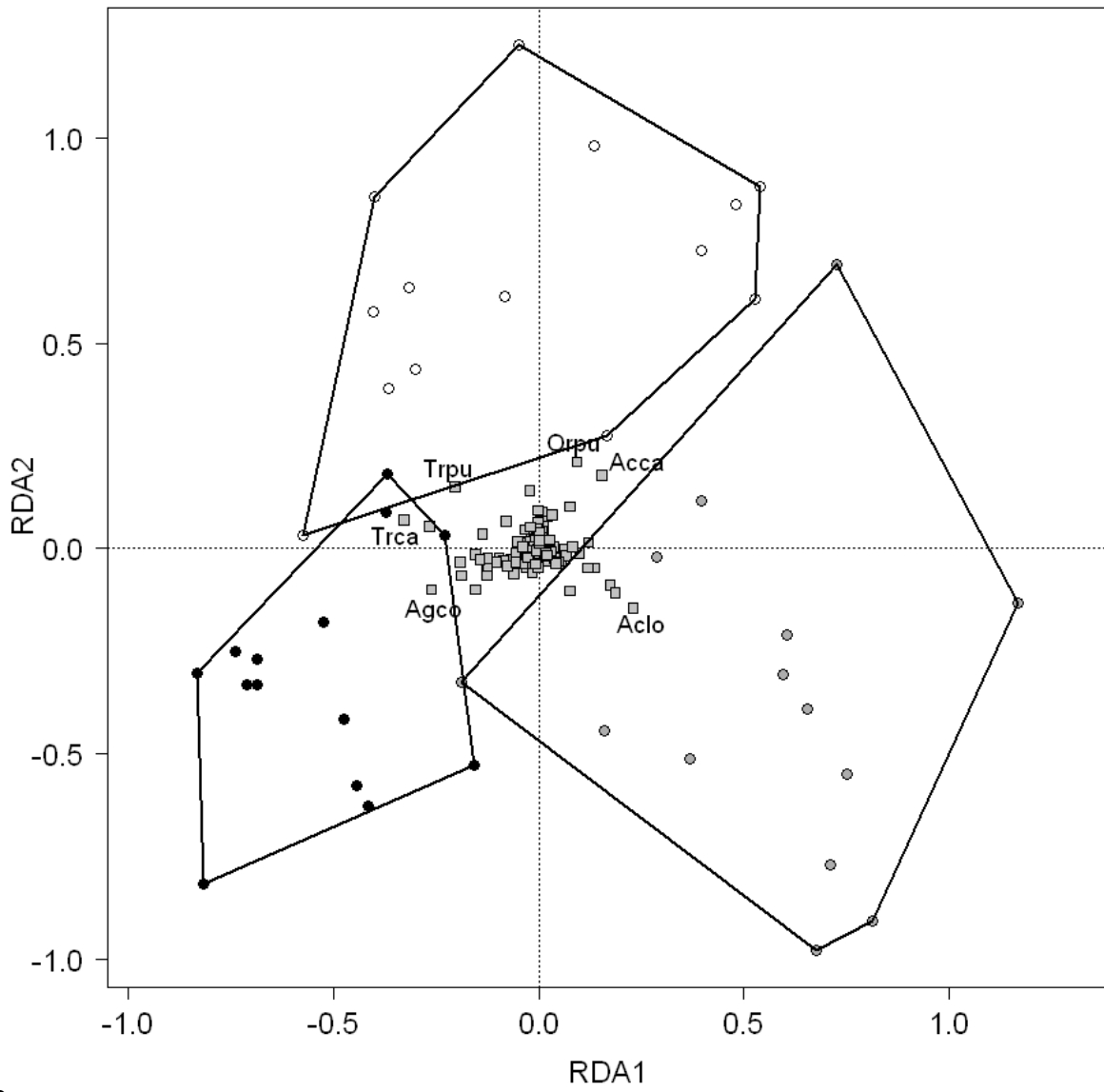
<i>Oxycarenus pallens</i> (Herrich-Schäffer, 1850)	phytophagous	plant	adult	2
<i>Phimodera amblygonia</i> (Fieber, 1863)	phytophagous	ground	adult	4
<i>Phimodera humeralis</i> (Dalman, 1823)	phytophagous	ground	adult	1
<i>Phytocoris insignis</i> Reuter, 1876	phytophagous	plant	immature	1
<i>Piesma maculatum</i> (Laporte, 1833)	phytophagous	plant	adult	6
<i>Pilophorus perplexus</i> Douglas & Scott, 1875	phytophagous	plant	immature	1
<i>Plagiognathus chrysanthemi</i> (Wolff, 1804)	phytophagous	plant	immature	2
<i>Polymerus unifasciatus</i> (Fabricius, 1794)	phytophagous	plant	immature	175
<i>Polymerus vulneratus</i> (Panzer, 1806)	phytophagous	plant	immature	6
<i>Pyrrhocoris apterus</i> (Linnaeus, 1758)	phytophagous	ground	adult	107
<i>Pyrrhocoris marginatus</i> (Kolenati, 1845)	phytophagous	ground	adult	1
<i>Rhopalus conspersus</i> (Fieber, 1837)	phytophagous	plant	adult	1
<i>Rhopalus distinctus</i> (Signoret, 1859)	phytophagous	plant	adult	3
<i>Rhopalus parumpunctatus</i> (Schilling, 1817)	phytophagous	plant	adult	124
<i>Rhyparochromus pini</i> (Linnaeus, 1758)	phytophagous	ground	adult	2
<i>Rhyparochromus vulgaris</i> (Schilling, 1829)	phytophagous	ground	adult	1
<i>Rubiconia intermedia</i> (Wolff, 1811)	phytophagous	plant	adult	15
<i>Sciocoris cursitans</i> (Fabricius, 1794)	phytophagous	ground	adult	24
<i>Sciocoris distinctus</i> Fieber, 1851	phytophagous	ground	adult	2
<i>Sciocoris microphthalmus</i> Flor, 1860	phytophagous	ground	adult	6
<i>Sciocoris sulcatus</i> Fieber, 1851	phytophagous	ground	adult	4
<i>Spathocera tuberculata</i> Horváth, 1882	phytophagous	ground	adult	3
<i>Stagonomus amoenus</i> (Brullé, 1832)	phytophagous	plant	adult	1
<i>Stagonomus pusillus</i> (Herrich-Schäffer, 1830)	phytophagous	plant	adult	4
<i>Stenodema calcarata</i> (Fallén, 1807)	phytophagous	plant	immature	297
<i>Stenotus binotatus</i> (Fabricius, 1794)	phytophagous	plant	immature	304
<i>Stictopleurus abutilon</i> (Rossi, 1790)	phytophagous	plant	adult	3
<i>Stictopleurus crassicornis</i> (Linnaeus, 1758)	phytophagous	plant	adult	8
<i>Stictopleurus punctatonervosus</i> (Goeze, 1778)	phytophagous	plant	adult	20
<i>Syromastes rhombeus</i> (Linnaeus, 1767)	phytophagous	plant	adult	5
<i>Systellonotus triguttatus</i> (Linnaeus, 1767)	phytophagous	plant	immature	79
<i>Tingis cardui</i> (Linnaeus, 1758)	phytophagous	plant	adult	2
<i>Trapezonotus arenarius arenarius</i> (Linnaeus, 1758)	phytophagous	ground	adult	1
<i>Trigonotylus caelestialium</i> (Kirkaldy, 1902)	phytophagous	plant	immature	109
<i>Trigonotylus pulchellus</i> (Hahn, 1834)	phytophagous	plant	immature	241
<i>Vilpianus galii</i> (Wolff, 1802)	phytophagous	plant	adult	6
<i>Xanthochilus quadratus</i> (Fabricius, 1798)	phytophagous	ground	adult	9
<i>Xylocoris galactinus</i> (Fieber, 1836)	carnivorous	plant	adult	1
<i>Zicrona caerulea</i> (Linnaeus, 1758)	carnivorous	plant	adult	3

22**Appendix S4.** RDA plots for true bugs. Grey squares indicate species. Abbreviated names of
23the most separated species are presented. (Acca: *Acetropis carinata*; Aclo: *Acetropis*
24*longirostris*; Agco: *Agramma confusum*; Caca: *Catoplatus carthusianus*; Chpu: *Chlamydatus*
25*pulicarius*; Orpu: *Ortholomus punctipennis*; Poun: *Polymerus unifasciatus*; Stbi: *Stenotus*
26*binotatus*; Trca: *Trigonotylus caelestialium*; Trpu: *Trigonotylus pulchellus*.) A: model type I,
27in which Region was the conditional variable. Solid circles indicate sampling sites. B: model
28type II, in which Region was the only constrained variable. Minimum convex polygon of the
29three regions are shown. Open circles: Region 1, grey circles: Region 2, solid circles: Region
303.



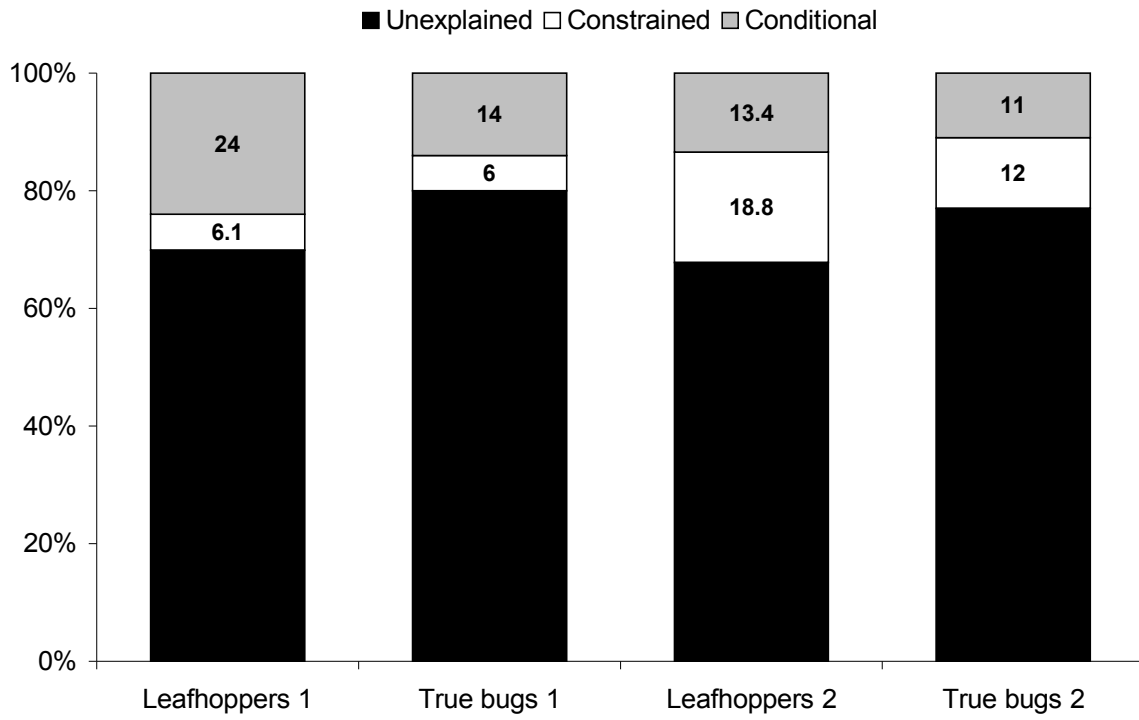
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B



32

33 **Appendix S5.** Variation partitioning in partial RDA models. In models '1', region was the
34 conditional term, in models '2' it was the only constrained term (see text for more details).



35

36References

- 37Aukema, B. & Rieger, C. (eds.) (1996) Catalogue of the Heteroptera of the Palaearctic
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