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A review of spiders on tree trunks in Europe (Araneae)

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Abstract: The present paper provides an overview of the European publications concerning bark-dwelling spiders. A total of 29 works have been investigated during the work: articles, M.Sc. theses and books. Collections on which the publications were based upon, demonstrated the presence of a total of 298 spiders on the bark of different tree species. This high species number can be attributed mostly to the species occurring randomly on the tree bark; however, it can unanimously be stated that there are facultative and exclusive bark-dwelling spider species as well**.** Among the species occurring randomly, a high proportion is constituted by the ground-dwelling linyphiid spiders of small body, which make up a large proportion in the species number, however, their abundance is low. Different authors used different sampling methods and efforts. In spite of this, several conclusions could be drawn concerning the bark-dwelling spider assemblages: i) within the total population in tree bark, the widespread bark-dwelling species were dominant, regardless of tree species and location; ii) in the case of a single tree species, significant differences may be present within a smaller region – even within a town – in the species composition of spider assemblages; iii) the altitude plays an important role in the formation of the bark-dwelling spider assemblages within a given area; iv) the occurrence frequency is characteristically changing with the geographical latitude; v) the composition of the bark-dwelling spider assemblages is seasonally changing even within a single tree species. A significant difference is shown between the summer and winter assemblages.

Key words: bark-dwelling spiders, coniferous trees, deciduous trees, urban habitats, seasonality

Introduction

Trees represent well-defined and unique habitats for animals. On the one hand, trees are structurally complex and include several microhabitats (foliage, branch, trunks). Thus, they provide ample opportunity for niche-segregation (Lawton 1978). On the other hand, trees provide a stable food source for animals dwelling on them (Southwood 1978). These characters are coupled with a large geographical range in most tree species (Strong 1979). All these factors result in a high species richness and diversity of tree-living animal communities. Tree trunks, as a distinctive microhabitat of the tree, are characterised by numerous unique biotic and abiotic environmental factors, which explains why we can also discern a separate, so-called bark-dwelling arthropod assemblage. Spiders represent a dominant taxon of bark-dwelling predatory arthropods. Well-recognisable adaptation phenomena, which can be observed in bark-dwelling spiders, provide evidence for the evolution of species living on or under tree bark. Adaptations of bark-dwelling spiders can be seen in morphology, phenology, and physiology. Relatively few studies have been published on bark-dwelling-spiders to date, and most of them are of a rather faunistical nature (Koslinska 1967, Albert 1976, Wunderlich 1982, Nicolai 1986, Hansen 1992, Malten 1994). Systematic surveys on bark-dwelling spiders were carried out in Hungary by the mid-nineties (Sebestyén 1996, Horváth, Szinetár 1998, 2002, Bogya *et al*. 1995, Horváth *et al*. 2001, 2004, 2005, Szinetár *et al*. 2002). Up to this date, primarily the black pine (*Pinus nigra*), Norway spruce (*Picea abies*), Scots pine (*Pinus sylvestris*), European beech (*Fagus sylvatica*), English

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oak (*Quercus robur*), London planetree (*Platanus hybrida*) and Apple tree (*Pyrus malus*) have been investigated for bark-dwelling spider species. In case of the Norway spruce, planetree and apple surveys were carried out in several Hungarian land regions while in the case of the other species, the surveys were carried out in Western Transdanubia only. Simultaneously with the Hungarian surveys, other countries in Europe also conducted similar studies recently (Simon 1995, Weiss 1995, Koponen 1996, 2004, Koponen *et al*. 1997, Rinne *et al*. 1998, Pekár 1999, Kubcová, Schlaghamerský 2002).

Our overview on European bark-dwelling spider fauna is based on the results of nearly fourteen years of our investigations and foreign literature data.

Overview and evaluation on the survey methods

The different authors employ various methods to collect spiders dwelling on the trunk and branches of the trees (parts covered by bark). Beyond the fact that all methods endeavour to capture the species dwelling on bark as efficiently as possible and provide the most comprehensive picture on the assemblages dwelling on bark, these methods resulted in very different samples that can be compared to each other in a very limited manner. The tree eclectors (various stammeclectors, modified pitfall trap, branch traps) of continuous operation, with killing liquid, and mounted on the trunk and the branches are in several aspects similar to the Barber pitfall trap. The animals get into the trap owing to their active movements. A number of similar, automated traps were employed by the authors (Nicolai 1986, Simon 1995, Weiss 1995, Koponen 1996, 2004, Koponen *et al.* 1997, Rinne *et al.* 1998, Kubcová, Schlaghamerský 2002). Different preservation liquids were used for the collecting containers e.g. NaCl solution, 4% formaldehyde, ethylene glycol. In this aspect too, the traps are similar to the Barber traps. The other widespread method of trapping from the bark is the trap band, differing significantly from the traps mentioned above. In Hungary and other countries too, one of the often-employed methods is the corrugated cardboard trap band (Bogya *et al.* 1995, Sebestyén 1996, Horváth, Szinetár 1998, 2002, Pekár 1999, Horváth *et al.* 2001, 2004, 2005, Kovács 2002). Bands are placed around the trunk, their waved surfaces facing the trunk and covering the whole perimeter of the tree, as if a kind of artificial bark. When sampling, the whole belt is removed from the trunk and placed into a plastic bag. The collection of the animals living on and under the bark is carried out in a laboratory. It can be considered that it is a difficulty (fault) of the method that the animals dwelling between the band and the bark – primarily in the summer period – can quickly escape when the belt is removed, therefore the fast and co-ordinated work of several collectors is needed when removing the trap bands. The vacuum sampler might be an efficient method for collection from the bark (Nicolai 1986), and the sifting as well (Sebestyén 1996).

Numerous collectors used the manual method, which means surveying the surface of the bark. This, of course is influenced by the structure of the bark (Nicolai 1986, Hansen 1992, Sebestyén 1996). Scraping the bark off the trunks and branches: the essence of this method is that by disbarking the tree, the spiders dwelling between the bark layers and in the bottom surface of the bark can be collected with little effort and in large number both in terms of specimen and species. In the case of some tree species (e.g. *Platanus hybrida*), the bark layers can easily be removed, placed in plastic bags, then the surface of the trunk can be brushed and it can be placed along with the bark layers into the bag. The height of collection from the bark also significantly influences the results, which is well demonstrated by the trunk trap captures carried out at different heights (Simon 1995). He was able to establish stratocoenoses or assemblage characteristics to a layer, from the soil to the canopy of Scots pine. The sampling methods, the studied tree species according to sampling sites and the publications by the referenced authors are presented in Table 1. No detailed description is provided on the individual trap types employed by the authors, this can be found in the given publications.

As an addition, it can be mentioned that in case of collection by the beating method often employed for collection from foliage, numerous spider species might be sampled, which primarily dwell on the bark of the branches, instead of the foliage. In the case of these samples, according to the microhabitat choice, it can be established (assumed) whether a species dwells on the bark. The canopy spraying is a similar method. Although it can be assumed that like the beating method, the bark-dwelling species are also under-represented in the samples, in a small number, however, they still might be present (Benfatto *et al*. 1992).

Table 1. Sampling methods in the individual publications, studied tree species and survey locations (details on methods and locations can be found in the given publications).

Publication	Sampling method(s)	Investigated tree(s)	Sampling site(s) Locality
Bogya *et al.* 1999	corrugated cardboard trap band	apple tree, pear tree	Nagykovácsi (Hungary)
Hansen 1992	hand colletion	london planetree	Venezia (Italy)
Horváth, Szinetár 1998, 2002 and Horváth *et al.* 2001, 2004, 2005	corrugated cardboard trap band	black pine	Szombathely, Velem, Bozsok, Debrecen, (Hungary)
Koponen 1996	"new" branch trap	english oak	7 different localities (SW-Finland)
Koponen *et al.* 1997	"new" branch trap	english oak	7 different localities (SW-Finland)
Koponen 2004	"new" branch trap and tree eclector	english oak	Ruissalo (SW-Finland)
Koslinska 1967	scraping the bark off the trunks and branches	apple tree	Kraków, Lódź (Poland)
Kovács 2002	corrugated cardboard trap band	english oak, european beech, scots pine	8 different localities in West Hungary
Kubcová, Schlaghamerský 2002	tree eclector	english oak	Lednice, Soutok (Czech Republic)
Malten 1994	tree eclector	white willow	Magdeburg (Germany)
Nicolai 1986	hand collection, vacuum sampler, arboreal photo-eclector	camperdown elm, english oak, european beech, planetree maple, silver birch, white willow	Marburg (Germany)
Pekár 1999	corrugated cardboard trap band	apple tree, pear tree	Horoměřice, Doksany (Czech Republic)
Rinne *et al.* 1998	"new" branch trap	english oak	7 different localities (SW-Finland)
Sebestyén 1996	corrugated cardboard trap band, hand collection, bark sifting	london planetree	12 different localities (Hungary)
Simon 1995	tree eclector	scots pine	Grunewald, Eberwalde (Germany)
Weiss 1995	"modified pitfall traps"	norway spruce	Nationalpark Bayerischer Wald (Germany)

Owing to the differences in the collection methods, the collections are comparable to a certain extent only. Endeavours were made to draw conclusions and make reference to works where the statistical evaluation of standardised samplings was ensured.

Results and Discussion

Evaluation and summary of the surveys carried out on the tree trunks and branches

According to the results of the publications hereby examined, a total of 298 spider species can be indicated as inhabiting the bark of different tree species in Europe. This accounts for about a quarter of the European spider fauna. This extremely high species number shows that although the majority of the spiders was of accidental occurrence, the spiders are present on the bark for shorter or longer periods, therefore the presence of species characteristic to other microhabitats should also be reckoned with. The more balanced microclimate, diverse bark structure and the high number of hiding places can also be considered an advantageous condition in the case of the trees. The tree trunks provide a willy-nilly landing strip for the ballooning species or those using the aerial dispersal. Certainly, this is the reason for the occurrence of mature forms of small species, dwelling mostly on the ground; however, this presence is presumably of a short duration only. Moreover, the bark is rich in potential prey animals, fulfilling by this the role of an advantageous feeding place in case of a temporary stay (Horváth *et al.* 2005). The fallen, decayed old trunks have to be mentioned separately. Such works were also examined (Weiss 1995, Kubcová, Schlaghamerský 2002). In such cases the trunks are in close proximity to the ground, their moss and lichen cover might be more developed than in the case of living and upright tree trunks, thence on these trunks the ground-dwelling species settle in a much greater number, which is well demonstrated by the work of Weiss (1995).

Classification the bark-dwelling spiders into types according to the strength (closeness) of the relationship

Wunderlich's (1982) study is still a determinant publication in the European literature. He used the categories on which our study is also based.

Real or exclusive bark-dwellers (E): spider species which, as microhabitat specialists, live on or under the bark. They can be found on the bark throughout the year. It is characteristic for them to have mature forms for most of the year or even continuously. Their adaptation to the microhabitat could result in well-distinguishable morphological signs.

Facultative bark-dwellers (F1, F2): species which use tree trunks and branches as typical but not exclusive microhabitats with permanent or seasonal character. Rocks, cracks in rocks, artificial walls may also be typical habitats of these species. Spider species dwelling on trees and choosing the bark as a dwelling place for the winter are also classified into this category. This is characteristic primarily for those dwelling in the foliage of deciduous trees. In the case of facultative bark-dwellers we considered it necessary to establish two further sub-categories in order to indicate the frequency of the facultative relationship. F1 is a closer relationship that can be observed more frequently, while F2 is a rareer one, however, it indicates spider-tree species relationships observed by several authors and in several instances.

Accidental species (A): The species are listed here regardless of their occurrence frequency. They are species for which other microhabitats mean the typical habitat or such which have no specific habitat preference. In the case of these species it is presumed that the time of stay on the bark is short, however, it is very difficult to study or demonstrate it.

These categories can certainly be stated more precisely based on new data gathered on the species. There are rare species for which – owing to the low population number – no reliable knowledge

on the microhabitat selection is at our disposal. Apendix 1. includes all species demonstrated from trees together with their short phenological, habitat selection characterisation as well as literature references. Data on 298 spider species were obtained while examining 29 publications, books, and theses. Based on the evaluation of the relationship between the spiders and the bark, the distribution of categories is as follows: 65% of the total species number was constituted by accidental species. In other species, a relationship of different strength and various habitat preferences can be stated. Twenty-four species were classified (8% of the total number of species) into the real bark-dwelling species. Seventy-nine species can be deemed as facultative bark-dwellers. Out of this, 50 species were ranked into the F1 type (17%), while 29 species (10%) were ranked into the F2 type according to the collections, reference literature and own experiences.

Taxonomic notes

Several authors draw attention to the great and striking morphological similarity between *Clubiona genevensis* L. Koch, 1866 and *Clubiona leucaspis* Simon, 1932, and to the possibility of a misidentification (Malten 1984, Nentwig *et al*. 2003, Weiss, oral communication). The habitats of the two species are largely different. *C. genevenis* is a ground-dwelling species of dry sandy lands, whereas *C. leucaspis* is a typical bark-dwelling species. Following Simon's (1932) description, Di Franco (1993) published a drawing of *C. leucaspis,* as well as on the biology of the species from lemon plantations in Sicily. In our opinion the drawing in Figure 12/b on page 56 in Sterghiu (1985), also published by Nentwig *et al.* (2003), is not of *C. genevensis* but of *C. leucaspis*. Likewise, we assume that the occurrence of *C. genevensis* on trunks and barks is mistakenly reported and stands for the rather similar *C. leucaspis*, cf. Sterghiu (1985), Heimer, Nentwig (1991), Simon (1995).

Spider assemblages

Based on survey results of other tree species and geographical locations, we can formulate the following statements concerning the bark-dwelling spider assemblages:

i) In samples from tree trunks, generally irrespective of the tree species and location, the widespread bark-dwelling spider species dominate (Appendix 1). Well-recognisable adaptation phenomena, which can be observed in bark-dwelling spiders, provide evidence for the evolution of species living on or under the bark. This process is a sequential evolution, in which the relationship between the plant and the arthropod living on it is essentially asymmetric, i.e. not of a coevolutionary type, rather, the animals follow the evolution of the host plant without significantly affecting it (Jermy 1987). Adaptations of bark-dwelling spiders can be seen in morphology, phenology, and physiology. One of the morphological adaptations is the typical body shape observable in many species (e.g. Araneidae: *Nuctenea umbratica* (Clerck, 1757); Philodromidae: *Philodromus margaritatus* (Clerck, 1757), *Philodromus fuscomarginatus* (De Geer, 1778); Thomisidae: *Coriarachne depressa* (C. L. Koch, 1837)). The body of these species is characteristically flattened, which well reflects an adaptation to modes of living between the bark layers or under the bark. This adaptation can be coupled with colour adaptations. *Philodromus fuscomarginatus*, for example, blends well with its reddish-brown coloration into the phloem layer of Scots pine (*Pinus sylvestris*), which is the almost exclusive habitat of this philodromid spider. *Philodromus margaritatus* with its dark colours blends well into the surface of trees with darker bark, and can thus hide from predators, mainly birds, which feed on it. The most important of the phenological adaptations is that many exclusive bark-dwelling species are eurychron, i.e. adults and juveniles can be found all year-round, or diplochron, i.e., the species has two reproductive periods annually. Reproduction throughout the entire year or throughout a substantial part of the year is made possible by the higher and more even temperature under the bark.

ii) In the case of a given tree species significant differences can be found within a more restricted region – even within a city. In urban sampling areas with strongly polluted air a number of species are missing (e.g. *Clubiona pallidula* (Clerck, 1757)) or are represented by a smaller population size (e.g. *Moebelia penicillata* (Westring, 1851)) which, in the garden suburb samples are dominant species on the same tree species (Horváth *et al.* 2001).

iii) The altitude has also an important role in the formation of a bark-dwelling spider assemblage of a given area. In mountain areas some species appear (e.g. *Segestria senoculata* (Linnaeus, 1758), *Clubiona corticalis* (Walckenaer, 1802), *Amaurobius fenestralis* (Ström, 1768), etc.) which do not occur in urban or lowland biotopes (Horváth, Szinetár 1998, 2002).

iv) Occurrence frequency may characteristically change within a genus with geographical latitude. The species *Segestria bavarica* C. L. Koch, 1843 is primarily Southern European, while *Segestria senoculata* is more widespread in Central and Northern Europe; the former species occurring northwards only in cities with warmer climate. In Southern Europe the third species of the genus, *Segestria florentina* (Rossi, 1790) may also appear under the bark (Hansen 1992).

v) Summer and winter assemblages show significant differences even in the bark of a single tree species. In winter the foliage-dwelling species migrate in a large number to the bark for wintering. On the other hand, in summer, only the real bark-dwelling and the accidental species can be found on the trunk, resulting characteristic differences (Horváth, Szinetár 2002, Horváth *et al.* 2001).

As a summary, it can be stated that the majority of real bark-dwelling species are not associated to special tree species nor to a given bark structure (*Philodromus margaritatus, Clubiona leucaspis, Segestria senoculata, Marpissa muscosa* (Clerck, 1757)). On the other hand, facultative bark-dwelling species show significant differences; the tree species with similar structure (within a given geographical latitude) can be characterised by similar spider assemblages (for example black pine↔scots pine) (Appendix 1). Despite this, with the change of geographical latitude a given tree species exhibits significant differences.

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Обзор върху паяците (Araneae), обитаващи кората на дърветата в Европа

К. Синетар, Р. Хорват

(Резюме)

Направен е преглед на информацията за паяците, обитаващи кората на дърветата в Европа. До момента са установени 298 вида под кората на различни видове дървета (*Pinus nigra*, *Picea abies*, *Fagus sylvatica* и др.). Високият брой на видовете се определя от случайно срещащи се, временно пребиваващи и постоянно живеещи под кората видове. По отношение на живеещите под кората паяци могат да се очертаят няколко зависимости: 1) при подкоровите популации доминират широко разпространените паяци, независимо от дървесния вид и местообитание; 2) в случаите на единични дървесни видове, значителни разлики във видовия състав на подкоровите съобщества могат да се наблюдават в по-малки райони, като например територията на един град; 3) надморската височина играе важна роля при формирането на съобществата на подкоровите паяци; 4) честотата на срещане се изменя в зависимост от географската ширина; 5) видовият състав на подкоровите паяци се изменя сезонно, дори и в единични дървесни видове. Значителни разлики са установени между летните и зимните сборове.

Appendix 1. List of spiders sampled on tree trunks, under and on bark of trees in Europe (nomenclature after Platnick 2005). **C** – Connection with bark: **E** – Exclusive bark-dwelling species, **F** – Facultative bark-dwelling species, **A** – Accidental species. Microhabitat preferences based on the quoted literature and own data (cf. Buchar, Ruzicka 2002, Heimer, Nentwig 1991, Loksa 1969, 1971, Roberts 1995). The tree species investigated: *Acer campestre* – Field Maple; *Acer pseudoplatanus* – Planetree Maple; *Aesculus hyppocastaneum* – Horse chesnut; *Alnus glutinosa* – European Alder; *Betula pendula* – Silver birch; *Carpinus betulus* – European Hornbeam; *Fagus sylvatica* – European Beech; *Picea abies* – Norway Spruce; *Pinus nigra* – Black Pine; *Pinus sylvestris* – Scots Pine; *Platanus hybrida* – London Planetree; *Prunus avium* – Wild Cherry Tree; *Pyrus communis* – Pear Tree; *Pyrus malus* – Apple Tree; *Quercus robur* – English Oak; *Salix alba* – White Willow; *Ulmus glabra* – Camperdown Elm

Species	C	Season	Tree	References	Microhabitat preferences
1	2	3	4	5	6
Segestriidae					
Segestria bavarica C. L. Koch, 1843	F1	all year	*Fagus sylvatica*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	Hansen 1992; Simon 1995; Sebestyén 1996; Horváth, Szinetár 1998, 2002; Horváth *et al*. 2001, 2005; Kovács 2002	under tree bark, in fissures on rock walls
S. florentina (Rossi, 1790)	F1	all year	*Platanus hybrida*	Hansen 1992	under tree bark, holes in walls, in houses
S. senoculata (Linnaeus, 1758)	F1	all year	*Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris Quercus robur*	Wunderlich 1982; Simon 1995; Weiss 1995; Koponen 1996; Horváth, Szinetár 1998, 2002; Rinne *et al*. 1998; Kovács 2002; Horváth *et al*. 2005	forests, rocks, under tree bark, in fissures on rock walls, under stones
Dysderidae					
Dasumia canestrini (L. Koch, 1867)	A	III-IX.	*Platanus hybrida*	Hansen 1992	among leaf litter, under tree bark
Harpactea hombergi (Scopoli, 1763)	F1	V-XI.	*Pinus nigra*, *Pinus sylvestris*	Simon 1995; Horváth, Szinetár 1998, 2002; Horváth *et al*. 2005	forests, under tree bark, under stones
H. rubicunda (C. L. Koch, 1838)	F1	II-X.	*Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*	Wunderlich 1982; Sebestyén 1996; Horváth, Szinetár 1998, 2002; Pekár 1999; Horváth *et al*. 2001, 2004, 2005; Kovács 2002	under stones, under tree bark, in houses
Oonopidae					
Oonops domesticus Dalmas, 1916	F1	all year	*Platanus hybrida*	Hansen 1992	under bark, in houses
Tapinesthis inermis (Simon, 1882)	F1	all year	*Platanus hybrida*	Hansen 1992	under bark, in houses

Appendix 1. Continued.

1	2	3	4	5	6
Mimetidae					
Ero aphana (Walckenaer, 1802)	A	summer	*Platanus hybrida*	Hansen 1992	on vegetation in forests and open habitats
E. furcata (Villers, 1789)	F1	summer	*Picea abies*, *Pinus sylvestris*, *Quercus robur*	Simon 1995; Weiss 1995; Rinne *et al*. 1998; Kubcová, Schlaghamerský 2002	on vegetation in various forests and open habitats
Uloboridae					
Hyptiotes paradoxus (C. L. Koch, 1834)	A	VII-X.	*Pinus sylvestris*	Simon 1995	on lower branches of coniferous trees
Theridiidae					
Achaearanea lunata (Clerck, 1757)	F1	early summer	*Picea abies*, *Pinus sylvestris*, *Platanus hybrida*	Hansen 1992; Simon 1995; Weiss 1995; Sebestyén 1996	on lower trunks and branches of trees
A. riparia (Blackwall, 1834)	F1	V-VII.	*Pinus nigra*, *Platanus hybrida*, *Pyrus malus*	Sebestyén 1996; Pekár 1999; Horváth, Szinetár 2002; Horváth *et al*. 2005	on rock walls, on tree trunks in open habitats and in parks
A. simulans (Thorell, 1875) (syn. *Theridion simulans*)	F2	V-IX.	*Platanus hybrida*, *Quercus robur*	Nicolai 1986; Hansen 1992; Kubcová, Schlaghamerský 2002	bushes and trees
Anelosimus vittatus (C. L. Koch, 1836) (syn. *Theridion vittatum*)	F1	V-VII.	*Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	Koslinska 1967; Nicolai 1986; Simon 1995; Sebestyén 1996; Horváth, Szinetár 1998, 2002; Pekár 1999; Horváth *et al*. 2001, 2004; Kubcová, Schlaghamerský 2002	edge, park, on bushes in orchards, on and under bark in winter period (X-IV.)
Dipoena melanogaster (C. L. Koch, 1837)	F2	V-VIII.	*Pinus nigra*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	Sebestyén 1996; Horváth, Szinetár 1998; Bogya *et al*. 1999; Horváth *et al*. 2001; Kubcová, Schlaghamerský 2002	on herbs, on bushes, on trees (mainly in coniferous forests)
D. torva (Thorell, 1875)	E	summer	*Pinus sylvestris*, *Quercus robur*	Simon 1995; Kubcová, Schlaghamerský 2002; Koponen 2004	on tree bark and branches
Crustulina guttata (Wider, 1834)	A	summer	-	Wunderlich 1982	among low vegetation and detritus in dry places, rarely on bark

Appendix 1. Continued.

1	2	3	4	5	6
Enoplognatha latimana Hippa, Oksala, 1982	A	summer	*Pyrus malus*	Bogya *et al*. 1999	on vegetation, in orchards
E. mordax (Thorell, 1875)	A	summer	*Platanus hybrida*	Sebestyén 1996	in sandy areas
E. ovata (Clerck, 1757)	F2	summer	*Picea abies*, *Pinus sylvestris*, *Pyrus malus*, *Quercus robur*	Simon 1995; Weiss 1995; Koponen 1996; Pekár 1999; Kubcová, Schlaghamersky 2002	on herb vegetation and bushes in forest habitats
Keijia tincta (Walckenaer, 1802) (syn. *Theridion tinctum*)	F1	I-VI.	*Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	Hansen 1992; Simon 1995; Koponen 1996; Sebestyén 1996; Koponen *et al*. 1997; Horváth, Szinetár 1998, 2002; Rinne et al. 1998; Bogya *et al*. 1999; Pekár 1999; Horváth *et al*. 2001, 2004, 2005; Kovács 2002; Kubcová, Schlaghamerský 2002	on bushes and trees in various forests
Lasaeola tristis (Hahn, 1833) (syn. *Dipoena tristis*)	F2	V-VII.	*Pinus nigra*, *Quercus robur*	Koponen 1996; Rinne *et al*. 1998; Horváth, Szinetár 2002	on low vegetation in open habitats
Neottiura bimaculata (Linnaeus, 1767) (syn. *Theridion bimaculatum*)	A	V-VI.	*Pyrus malus*	Bogya *et al*. 1999; Pekár 1999	on different plants in open and forest habitats
N. suaveolens (Simon, 1879) (syn. *Theridion suaveolens*)	A	?	*Pyrus malus*	Bogya *et al*. 1999	on vegetation in xerothermic habitats
Paidiscura pallens (Blackwall, 1834) (syn. *Theridion pallens*)	A	IV-V.	*Fagus sylvatica*, *Pinus sylvestris*, *Quercus robur*	Nicolai 1986; Simon 1995; Koponen 1996; Koponen *et al*. 1997; Rinne *et al*. 1998	on bushes and trees in light forests and their edges
Robertus lividus (Blackwall, 1836)	A	all year	*Picea abies*, *Pinus sylvestris*, *Quercus robur*	Simon 1995; Weiss 1995; Kubcová, Schlaghamerský 2002	in various forests and open habitats, under stones and detritus
R. scoticus Jackson, 1914	A	summer	*Picea abies*	Weiss 1995	in mountain spruce forests, in moss

Appendix 1. Continued.

1	2	3	4	5	6
Steatoda bipunctata (LINNAEUS, 1758)	F1	all year	*Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	WUNDERLICH 1982; SIMON 1995; WEISS 1995; KOPONEN 1996; SEBESTYÉN 1996; KOPONEN *et al.* 1997; HORVÁTH, SZINETÁR 1998, 2002; RINNE *et al.* 1998; BOGYA *et al.* 1999; HORVÁTH *et al.* 2001, 2004, 2005; KOVÁCS 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	forests, buildings, under tree bark, in hollow trees, in houses
S. castanea (CLERCK, 1757) (syn. *Teutana castanea*)	F1	spring	*Pyrus communis*, *Pyrus malus*	PEKÁR 1999	under bark, in and around houses, occasionally a field in orchards
S. grossa (C. L. KOCH, 1838)	A	all year	*Platanus hybrida*	HANSEN 1992	in and around houses, occasionally a fields
S. triangulosa (WALCKENAER, 1802)	A	autumn	*Pinus nigra*, *Platanus hybrida*	HANSEN 1992; HORVÁTH, SZINETÁR 2002	in and around houses occasionally a fields
Theridion blackwalli O. P.-CAMBRIDGE, 1871	F2	V-VII.	*Pinus nigra*, *Platanus hybrida*, *Quercus robur*	SEBESTYÉN 1996; HORVÁTH, SZINETÁR 1998, 2002; HORVÁTH *et al.* 2001, 2004, 2005; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	on tree trunks in floodplain forests, on edges, in parks
T. familiare O. P.-CAMBRIDGE, 1871	A	summer	*Platanus hybrida*, *Pyrus malus*	KOSLINSKA 1967; HANSEN 1992	in and near houses, under stones
T. impressum L. KOCH, 1881	A	V-VII.	*Pinus nigra*, *Pyrus malus*	HORVÁTH, SZINETÁR 1998; PEKÁR 1999; HORVÁTH *et al.* 2001	on vegetation in all open habitats, in winter period (I-IV) also on bark
T. melanurum HAHN, 1831 (syn. *Theridion denticulatum*)	F2	early summer	*Platanus hybrida*, *Pyrus malus*	KOSLINSKA 1967; HANSEN 1992; SEBESTYÉN 1996	in houses and in forests, under bark in urban habitats
T. mystaceum L. KOCH, 1870	E	V-VII.	*Betula pendula*, *Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	WUNDERLICH 1982; NICOLAI 1986; HANSEN 1992; SIMON 1995; WEISS 1995; KOPONEN 1996; SEBESTYÉN 1996; HORVÁTH, SZINETÁR 1998, 2002; RINNE *et al.*. 1998; HORVÁTH *et al.*. 2001, 2004, 2005; KOVÁCS 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	forests, on tree trunks (mainly in coniferous forests)

Appendix 1. Continued.

1	2	3	4	5	6
T. nigrovariegatum Simon, 1873	A	summer	*Pyrus malus*	Bogya *et al.* 1999	on vegetation and on rocks
T. pinastri L. Koch, 1872	F1	VI-VII.	*Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	Hansen 1992; Simon 1995; Bogya *et al.* 1999; Pekár 1999; Kubcová, Schlaghamerský 2002; Horváth *et al.* 2005	on solitary trees and in forests, (mainly on coniferous), in winter period on and under bark
T. varians Hahn, 1833	A	VI-VII.	*Picea abies*, *Pinus sylvestris*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	Koslinska 1967; Nicolai 1986; Simon 1995; Weiss 1995; Rinne *et al.* 1998; Pekár 1999; Kubcová, Schlaghamerský 2002	on bushes and trees in various habitats, in orchards
Linyphiidae					
Abacoproeces saltuum (L. Koch, 1872)	A	all year summer	*Pinus sylvestris*	Simon 1995	among leaf litter in different forests
Agyneta conigera (O. P.-Cambridge, 1863)	A	V-VII.	*Quercus robur*	Rinne *et al.* 1998	among moss und grass in wet habitats
Anguliphantes angulipalpis (Westring, 1851)	A	IX-V.	*Pinus sylvestris*	Simon 1995	among grass and leaf litter in dry and semi-humid forests
Araeoncus humilis (Blackwall, 1841)	A	all year	*Picea abies*, *Pinus sylvestris*, *Pyrus malus*, *Quercus robur*	Hansen 1995; Weiss 1995; Bogya *et al.* 1999; Kubcová, Schlaghamerský 2002	in various open habitats
Asthenargus helveticus Schenkel, 1936	A	?	*Picea abies*	Weiss 1995	among leaf litter and detritus in semi-humid forests
Bathyphantes gracilis (Blackwall, 1841)	A	all year	*Quercus robur*	Wunderlich 1982; Rinne *et al.* 1998; Kubcová, Schlaghamerský 2002	in wet meadows and various open and forest habitats
B. nigrinus (Westring, 1851)	A	all year	*Quercus robur*	Kubcová, Schlaghamerský 2002	among vegetation in various semi-humid and humid habitats
B. parvulus (Westring, 1851)	A	all year	*Quercus robur*	Kubcová, Schlaghamerský 2002	among vegetation in various open and forest habitats
Centromerus pabulator (O. P.-Cambridge, 1875)	A	X-IV.	*Pinus sylvestris*	Simon 1995	in spruce forests, and in various mountain habitats

Appendix 1. Continued.

1	2	3	4	5	6
C. silvicola (Kulczyński, 1887)	A	?	*Picea abies*	Weiss 1995	among moss in beech and in spruce forests
C. similis Kulczyński, 1894	A	?	*Pyrus malus*	Bogya *et al.* 1999	among leaf litter in semi-humid forests
C. sylvaticus (Blackwall, 1841)	A	XI-IV.	*Picea abies*, *Pinus sylvestris*, *Quercus robur*	Simon 1995; Weiss 1995; Kubcová, Schlaghamerský 2002	among moss and detritus in various open and forest habitats
Ceratinella brevis (Wider, 1834)	A	V-VI.	*Pinus sylvestris*	Simon 1995	in moss, leaf litter, detritus in forest habitats
C. major Kulczynski, 1894	A	?	*Pinus sylvestris*	Simon 1995	among detritus in various forests
Diplocephalus cristatus (Blackwall, 1833)	A	all year	*Platanus hybrida*	Hansen 1992	at ground level in various open habitats
D. helleri (L. Koch, 1869)	A	summer	*Picea abies*	Weiss 1995	in very humid mountain habitats
D. latifrons (O. P.-Cambridge, 1863)	A	all year	*Picea abies*	Weiss 1995	among wet leaf litter and in detritus in forests
D. picinus (Blackwall, 1841)	A	all year	*Quercus robur*	Kubcová, Schlaghamerský 2002	among wet leaf litter and in detritus in forests
Diplostyla concolor (Wider, 1834)	A	all year	*Picea abies*, *Pinus sylvestris*	Simon 1995; Weiss 1995	in leaf litter and in detritus in forests and in open habitats
Drapetisca socialis (Sundevall, 1833)	E	autumn	*Acer pseudoplatanus*, *Betula pendula*, *Fagus sylvatica*, *Picea abies*, *Pinus sylvestris*, *Quercus robur*, *Salix alba*, *Ulmus glabra*	Wunderlich 1982; Nicolai 1986; Simon 1995; Weiss 1995; Koponen 1996; Koponen *et al.* 1997; Rinne *et al.* 1998; Kubcová, Schlaghamerský 2002	on tree bark in both decidious and coniferous forests
Entelecara acuminata (Wider, 1834)	A	summer	*Pinus sylvestris*, *Quercus robur*	Simon 1995; Kubcová, Schlaghamerský 2002	on bushes and trees in various habitats

Appendix 1. Continued.

1	2	3	4	5	6
E. berolinensis (Wunderlich, 1969)	E	summer autumn	*Pyrus communis*	Wunderlich 1982	on bark
E. congenera (O. P.-Cambridge, 1879)	A	early summer	*Picea abies*, *Pyrus malus*	Weiss 1995; Bogya *et al.* 1999	on coniferous trees and bushes
E. erythropus (Westring, 1851)	A	summer	*Pyrus malus*, *Quercus robur*	Rinne *et al.* 1998, Pekár 1999; Kubcová, Schlaghamerský 2002	among moss and grass, on bushes and trees in various habitats, in cultural landscapes
Erigone atra Blackwall, 1833	A	all year	*Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	Simon 1995; Weiss 1995; Sebestyén 1996; Bogya *et al.* 1999; Horváth, Szinetár 2002; Kubcová, Schlaghamerský 2002	wide range of open habitats
E. dentipalpis (Wider, 1834)	A	all year	*Picea abies*, *Platanus hybrida*, *Quercus robur*	Hansen 1992; Weiss 1995; Kubcová, Schlaghamerský 2002	among grass in wide range of open habitats
Erigonella hiemalis (Blackwall, 1841)	A	?	*Picea abies*	Weiss 1995	among moss and detritus in various open and forest habitats
Gnathonarium dentatum (Wider, 1834)	A	autumn - spring	*Quercus robur*	Kubcová, Schlaghamerský 2002	among detritus and on vegetation in very humid habitats
Gonatium rubellum (Blackwall, 1841)	A	summer	*Picea abies*	Weiss 1995	in mountain spruce forests
Gongylidium rufipes (Linnaeus, 1758)	A	autumn - spring	*Quercus robur*	Kubcová, Schlaghamerský 2002	on herbs and bushes in very humid forests
Helophora insignis (Blackwall, 1841)	A	late autumn and winter	*Quercus robur*	Koponen 1996; Rinne *et al.* 1998	juveniles on tree branches, adults on low vegetation in forests
Hylyphantes graminicola (Sundevall, 1830)	A	early summer	*Quercus robur*	Rinne *et al.* 1998	on bushes in forests and on their edges

Appendix 1. Continued.

1	2	3	4	5	6
Hypomma cornutum (BLACKWALL, 1833)	F2	early summer	*Pyrus malus*, *Quercus robur*	KOSLINSKA 1967; KOPONEN 1996; KOPONEN *et al.* 1997; RINNE *et al.* 1998; KOVÁCS 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002; KOPONEN 2004	on various vegetation in wetlands, on bushes and trees, on bark
Kratochviliella bicapitata MILLER, 1938	F1	?	*Picea abies*, *Ulmus glabra*	WUNDERLICH 1982; NICOLAI 1986; WEISS 1995	among stones and detritus and on bark of trees in semi-humid habitats
Labulla thoracica (WIDER, 1834)	A	all year	*Picea abies*	WEISS 1995	among roots at foot of tree trunks, on rock walls
Lepthyphantes leprosus (OHLERT, 1865)	A	all year	*Quercus robur*	KOPONEN 1996	among stones and in cellars
L. minutus (BLACKWALL, 1833)	E	all year	*Picea abies*, *Pinus sylvestris*, *Quercus robur*	WUNDERLICH 1982; SIMON 1995; WEISS 1995; KOPONEN 1996; KOPONEN *et al.* 1997; RINNE *et al.* 1998; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	on and under tree bark, in hollow trees in forest habitats
Linyphia triangularis (CLERCK, 1757)	A	VIII-XI.	*Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	HANSEN 1992; SIMON 1995; KOPONEN 1996; RINNE *et al.* 1998; HORVÁTH, SZINETÁR 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	on vegetation in forest edges and in forests
Macrargus boreus HOLM, 1968	A	?	*Quercus robur*	KOPONEN 1996; RINNE *et al.* 1998	on tree branches
Meioneta innotabilis (O. P.-CAMBRIDGE, 1863) (syn. *Agyneta innotabilis*)	E	VIII.	*Acer pseudoplatanus*, *Fagus sylvatica*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*, *Salix alba*, *Ulmus glabra*	WUNDERLICH 1982; NICOLAI 1986; SIMON 1995; KOPONEN 1996; SEBESTYÉN 1996; KOPONEN *et al.* 1997; RINNE *et al.* 1998; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	on tree trunks
Meioneta rurestris (C. L. KOCH, 1836)	A	all year	*Picea abies*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	SIMON 1995; WEISS 1995; SEBESTYÉN 1996; RINNE *et al.* 1998; BOGYA *et al.* 1999; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	in all grassland types

Appendix 1. Continued.

1	2	3	4	5	6
Micrargus georgescuae Millidge, 1975	A	V-X.	*Picea abies*	Weiss 1995	in ground layer of subalpine forests
Microlinyphia impigra (O. P.-Cambridge, 1871)	A	IV-VI.	*Platanus hybrida*	Hansen 1992	on vegetation in wetland habitats
M. pusilla (Sundevall, 1830)	A	spring summer	*Picea abies*, *Platanus hybrida*	Hansen 1992; Weiss 1995	on vegetation in various open habitats
Microneta viaria (Blackwall, 1841)	A	all year	*Pinus sylvestris*	Simon 1995	among leaf litter and detritus in forest habitats
Midia midas (Simon, 1884) (syn. *Lepthyphantes midas*)	E	?	*Platanus hybrida*, *Quercus robur*	Hansen 1992; Kubcová, Schlaghamerský 2002	on and under bark and in hollow trees
Minyriolus pusillus (Wider, 1834)	A	spring	*Picea abies*	Weiss 1995	in moss and lichens in coniferous forests
Mioxena blanda (Simon, 1884)	A	autumn	*Pinus sylvestris*	Simon 1995	in various habitats, under stones on rock steppes
Moebelia penicillata (Westring, 1851) (syn. *Entelecara penicillata*)	E	all year	*Acer pseudoplatanus*, *Betula pendula*, *Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*, *Salix alba*	Koslinska 1967; Wunderlich 1982; Nicolai 1986; Hansen 1992; Simon 1995; Weiss 1995; Koponen 1996; Sebestyén 1996; Koponen *et al.* 1997; Horváth, Szinetár 1998, 2002; Rinne *et al.* 1998; Horváth *et al.* 2001, 2005; Kovács 2002; Kubcová, Schlaghamerský 2002; Koponen 2004	on tree trunks, on tree bark
Mughiphantes pulcher (Kulczyński, 1881) (syn. *Lepthyphantes pulcher*)	A	III-X.	*Picea abies*	Weiss 1995	on rock walls and on tree trunks
Neriene clathrata (Sundevall, 1830)	F2	all year	*Platanus hybrida*, *Quercus robur*	Hansen 1992; Kubcová, Schlaghamerský 2002	among leaf litter and detritus in forest habitats, under bark of old trees
N. emphana (Walckenaer, 1842)	A	VI-VIII.	*Pyrus communis*	Pekár 1999	on shrubs and dry tree branches in forests

Appendix 1. Continued.

1	2	3	4	5	6
N. montana (CLERCK, 1757)	F2	IV-VI.	*Quercus robur*	KOPONEN 1996; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	on bushes, tree trunks in floodplain forests
N. peltata (WIDER, 1834)	A	IV-VIII.	*Quercus robur*	RINNE *et al.* 1998	on bushes in semi-humid forests
Obscuriphantes obscurus (BLACKWALL, 1841)	A	VI-IX.	*Quercus robur*	RINNE *et al.* 1998	on shrubs and herb vegetation in various open and forest habitats, on coniferous trees
Oedothorax apicatus (BLACKWALL, 1850)	A	summer autumn	*Pyrus malus*	BOGYA *et al.* 1999	at ground level in various open habitats
O. retusus (WESTRING, 1851)	A	V-X.	*Quercus robur*	KUBCOVÁ, SCHLAGHAMERSKÝ 2002	among grass in various medows
Palliduphantes pallidus (O. P.-CAMBRIDGE, 1871)	A	IV-VIII.	*Pinus sylvestris*	SIMON 1995	at ground level in various open and forest habitats
Pelecopsis elongata (WIDER, 1834)	A	winter	*Picea abies*, *Platanus hybrida*	HANSEN 1992; WEISS 1995	among moss and detritus in rocky habitats, in pine forests, sometimes on trunks
P. mengei (SIMON, 1884)	A	all year	*Quercus robur*	KUBCOVÁ, SCHLAGHAMERSKÝ 2002	among detritus in various semi-humid forests
P. radicicola (L. KOCH, 1872)	A	all year	*Pinus sylvestris*	SIMON 1995	in detritus in various forests and heatlands
Pityohyphantes phrygianus (C. L. KOCH, 1836)	A	early summer	*Picea abies*, *Quercus robur*	WEISS 1995; RINNE *et al.* 1998	on branches in the canopy of coniferous trees and on junipers
Porrhomma microphthalmum (O. P.-CAMBRIDGE, 1871)	A	?	*Quercus robur*	KUBCOVÁ, SCHLAGHAMERSKÝ 2002	among grass and leaf litter in various open habitats, sporadically also in forests
P. montanum JACKSON, 1913	A	?	*Pinus sylvestris*	SIMON 1995	among leaf litter in humid forests
P. oblitum (O. P.- CAMBRIDGE, 1871)	F1	?	*Pinus sylvestris*, *Quercus robur*	KOVÁCS 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	in various open and forest habitats, under bark in semi-humid and humid forests

Appendix 1. Continued.

1	2	3	4	5	6
P. pallidum Jackson, 1913	A	?	*Pinus sylvestris*	Simon 1995	at ground level in spruce forests, under stones in scree slopes
P. pygmaeum (Blackwall, 1834)	A	?	*Quercus robur*	Rinne *et al.* 1998	at ground level, on bushes and herb vegetation in wetlands and floodplain forests
Prinerigone vagans (Audouin, 1826)	A	autumn - spring	*Platanus hybrida*	Hansen 1992	among grass in open habitats, in parks
Saloca diceros (O. P.-Cambridge, 1871)	A	autumn - spring	*Picea abies*	Weiss 1995	among leaf litter and detritus in forests
Savignia frontana Blackwall, 1833 (syn. *Savignya frontana*)	A	all year	*Quercus robur*	Koponen *et al.* 1997; Rinne *et al.* 1998	among grass and moss in peat bogs and in marshy forests
Silometopus reussi (Thorell, 1871)	A	all year	*Picea abies*, *Quercus robur*	Wunderlich 1982; Weiss 1995;	among detritus in various mainly semi-humid habitats
Syedra myrmicarum (Kulczyński, 1882)	A	?	*Pinus sylvestris*	Simon 1995	in the nest of ants (*Manica rubida, Formica fusca*)
Tapinocyba affinis Lessert, 1907	A	?	*Picea abies*	Weis, 1995	among moss and detritus in forests
T. pallens (O. P.- Cambridge, 1872)	A	autumn - spring	*Quercus robur*	Rinne *et al.* 1998	among moss and detritus in forests
Tenuiphantes flavipes (Blackwall, 1854) (syn. *Lepthyphantes flavipes*)	A	all year	*Pinus sylvestris*, *Quercus robur*	Simon 1995; Kubcová, Schlaghamerský 2002	among leaf litter and detritus in forests
T. mengei (Kulczyński, 1887) (syn. *Lepthyphantes mengei*)	A	all year	*Pinus sylvestris*	Simon 1995	at ground level in open and forest habitats
T. tenebricola (Wider, 1834) (syn. *Lepthyphantes tenebricola*)	A	III-X.	*Picea abies*, *Quercus robur*	Weiss 1995; Rinne *et al.* 1998	among leaf litter and detritus and under stones in forests
T. tenuis ((Blackwall, 1852) (syn. *Lepthyphantes tenuis*)	A	all year	*Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	Hansen 1992; Simon 1995; Kubcová, Schlaghamerský 2002	among grass in various open and semi-open habitats, often in disturbed habitats

Appendix 1. Continued.

1	2	3	4	5	6
Thyreostenius parasiticus (Westring, 1851)	F1	all year	*Picea abies*, *Pinus sylvestris*, *Pyrus malus*, *Quercus robur*	Wunderlich 1982; Simon 1995; Weiss 1995; Koponen 1996; Bogya *et al.* 1999; Kubcová, Schlaghamerský 2002	in various habitats and stratums, on scree slopes, on walls and often under bark in forest habitats
Tiso vagans (Blackwal, 1834)	A	spring - autumn	*Platanus hybrida*	Hansen 1992	among grass in various grasslands, in orchards and parks
Trematocephalus cristatus (Wider, 1834)	A	summer	*Pinus sylvestris*	Simon 1995	on trees, bushes and herb vegetation in forests and open habitats
Trichoncoides piscator (Simon, 1884)	A	?	*Pyrus malus*	Bogya *et al.* 1999	in leaf litter in mixed forests, in agriculture habitats in orchards, in arable lands
Trichopterna cito (O. P.-Cambridge, 1872)	A	all year	*Platanus hybrida*	Hansen 1992	among grass in various xerothermic open habitats
Troxochorus nasutus Schenkel, 1947	F1	spring - summer	*Picea abies*	Wunderlich 1982; Weiss 1995	among grass and moss, on tree trunks in mountain beech and spruce forests
Walckenaeria acuminata Blackwall, 1833	A	all year	*Pinus sylvestris*	Simon 1995	among detritus in various open and semi-open habitats
W. antica (Wider, 1834)	A	?	*Pinus sylvestris*, *Quercus robur*	Simon 1995; Kubcová, Schlaghamerský 2002	at ground level in various open and forest habitats
W. cucullata (C. L. Koch, 1836)	A	spring - autumn	*Picea abies*, *Pinus sylvestris*	Simon 1995; Weiss 1995	among leaf litter and detritus in forests
W. dysderoides (Wider, 1834)	A	summer	*Pinus sylvestris*	Simon 1995	among moss and detritus in various forest and open habitats
W. obtusa Blackwall, 1836	A	spring - autumn	*Pinus sylvestris*	Simon 1995	among moss and grass in various forests, often in spruce forests

Appendix 1. Continued.

1	2	3	4	5	6
Tetragnathidae					
Metellina merianae (Scopoli, 1763)	A	all year	*Picea abies*	Weiss 1995	in dark, humid spaces, in entrances of caves
Pachygnatha degeeri Sundevall, 1830	A	all year	*Pinus sylvestris*, *Pyrus malus*, *Quercus robur*	Koslinska 1967; Simon 1995; Kubcová, Schlaghamerský 2002	among detritus in various open habitats, often in suburban grasslands and agriculture areas
P. listeri Sundevall, 1830	A	autumn - spring	*Quercus robur*	Kubcová, Schlaghamerský 2002	among leaf litter and grass in wetlands and forests
Tetragnatha dearmata Thorell, 1873	A	VI.	*Quercus robur*	Rinne et al. 1998; Koponen 2004	on vegetation in semi-humid and humid open and forest habitats
T. montana Simon, 1874	A	V-IX.	*Quercus robur*	Kubcová, Schlaghamerský 2002	on herb vegetation in partly shaded wetlands, often in floodplain forests
T. obtusa C. L. Koch, 1837	A	VI-VIII.	*Pinus sylvestris*	Simon 1995	on bushes and solitary trees, not only in semi-humid and humid habitats
T. pinicola L. Koch, 1870	A	V-VI.	*Pinus sylvestris*	Simon 1995	on vegetation in open and forest habitats
Araneidae					
Aculepeira ceropegia (Walckenaer, 1802)	A	early summer	*Pyrus communis*, *Pyrus malus*	Pekár 1999	on herbs and bushes in various open habitats and on forest edges, in orchards
Araneus diadematus Clerck, 1757	A	VIII-IX.	*Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Quercus robur*	Simon 1995; Weiss 1995; Koponen 1996; Horváth, Szinetár 1998, 2002; Rinne *et al.* 1998; Kovács 2002; Kubcová, Schlaghamerský 2002	on herbs, bushes, trees in various open and forest habitats
A. sturmi (Hahn, 1831) (syn. *Atea sturmi*)	A	V-VII.	*Picea abies*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	Simon 1995; Weiss 1995; Sebestyén 1996; Rinne *et al.* 1998; Kubcová, Schlaghamerský 2002	on shrubs and in canopies of trees on forest edges, often on young conifers

Appendix 1. Continued.

1	2	3	4	5	6
A. triguttatus (Fabricius, 1775) (syn. *Araneus triguttata*)	A	V-VI.	*Quercus robur*	Kubcová, Schlaghamerský 2002	on trees in deciduous forests and on forest edges
Araniella alpica (L. Koch, 1869)	A	VI-VIII.	*Picea abies*	Weiss 1995	on trees and bushes in forest and their edges
A. cucurbitina (Clerck, 1757)	A	V-VIII.	*Pinus sylvestris*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	Koslinska 1967; Simon 1995; Koponen 1996; Rinne *et al.* 1998; Pekár 1999; Kubcová, Schlaghamerský 2002	on bushes and trees in all forest and open habitats
A. displicata (Hentz, 1847)	A	V-VII.	*Pinus sylvestris*	Simon 1995	on bushes and trees on forest edges, often on young conifers
Cyclosa conica (Pallas, 1772)	A	IV-VI.	*Picea abies*	Weiss 1995	on bushes and trees in forests, forest edges
C. oculata (Walckenaer, 1802)	A	IV-VII.	*Pyrus malus*	Koslinska 1967	on herb vegetation in wet meadows, sporadic in semi-humid and humid forests
Gibbaranea bituberculata (Walckenaer, 1802)	A	IV-VI.	*Pinus nigra*	Horváth, Szinetár 1998, 2002; Horváth *et al.* 2004	on vegetation in steppes, xerothermic forest margins, in winter period rarely on bark
G. gibbosa (Walckenaer, 1802)	A	V-VI.	*Pinus sylvestris*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	Simon 1995; Pekár 1999; Kubcová, Schlaghamerský 2002	on bushes and trees on xerothermic slopes and in orchards
G. omodea (Thorell, 1870)	A	IV-VI.	*Picea abies*	Weiss 1995	in the canopy of coniferous trees
Hypsosinga pygmaea (Sundevall, 1831)	A	V-VI.	*Pyrus malus*	Bogya *et al.* 1999	on vegetation in open habitats
Larinioides ixobolus (Thorell, 1873)	A	VII-X.	*Pinus nigra*, *Platanus hybrida*	Sebestyén 1996; Horváth *et al.* 2005	on buildings and on trees near water
L. patagiatus (Clerck, 1757)	A	all year	*Platanus hybrida*	Sebestyén 1996	on shrubs and trees on forest edges, near ponds

Appendix 1. Continued.

1	2	3	4	5	6
Mangora acalypha (Walckenaer, 1802)	A	V-VII.	*Pinus nigra*	Horváth, Szinetár 2002	on vegetation in all open habitats and in forest edges
Nuctenea silvicutrix (C. L. Koch, 1835)	E	IV-VIII.	*Picea abies*	Weiss 1995	on conifers on peat bogs
N. umbratica (Clerck, 1757)	F1	all year females VI-VIII. males	*Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	Wunderlich 1982; Hansen 1992; Simon 1995; Koponen 1996; Sebestyén 1996; Koponen *et al.* 1997; Horváth, Szinetár 1998, 2002; Rinne *et al.*. 1998; Horváth *et al.* 2001, 2004, 2005; Kovács 2002; Koponen 2004	forests, buildings, under tree bark, on wooden constructions
Parazygiella montana (C. L. Koch, 1839) (syn. *Zygiella montana*)	A	summer	*Picea abies*	Weiss 1995	on shrubs and lower branches of trees in subalpine forests
Stroemiellus stroemi (Thorell, 1872) (syn. *Zygiella stroemi*)	F1	V-VI.	*Platanus hybrida*, *Quercus robur*	Koponen 1996; Koponen *et al.* 1997; Sebestyén 1996; Rinne *et al.* 1998	on tree trunks and on rocky walls
Zilla dioida (Walckenaer, 1802)	A	IV-V.	*Pinus sylvestris*	Simon 1995	on bushes and lower braches in light forests
Zygiella atrica (C. L. Koch, 1845)	A	summer	*Pinus sylvestris*, *Quercus robur*	Simon 1995; Koponen 1996; Koponen *et al.* 1997; Rinne *et al.* 1998	on shrubs and solitary trees, on various natural and artificial vertical surfaces
Z. x-notata (Clerck, 1757)	F2	summer-autumn	*Platanus hybrida*	Hansen 1992	on wall of houses, on tree trunks and on rocky walls
Lycosidae					
Acantholycosa lignaria (Clerck, 1758)	F2	summer	*Picea abies*	Weiss 1995	on fallen tree trunks, in forests clearings in the mountains
Pardosa agrestis (Westring, 1861)	A	III-IX.	*Pinus sylvestris*, *Pyrus malus*	Simon 1995; Bogya *et al.* 1999	in open habitats, in early stages of succession
P. ferruginea (L. Koch, 1870)	A	VII-IX.	*Picea abies*	Weiss 1995	in mountain spruce forests and meadows
P. lugubris (Walckenaer, 1802)	A	III-IX.	*Picea abies*	Weiss 1995	on ground layer in various forests and their edges

Appendix 1. Continued.

1	2	3	4	5	6
P. prativaga (L. Koch, 1870)	A	IV-IX.	*Quercus robur*	Rinne *et al.* 1998; Kubcová, Schlaghamerský 2002	in underlogged meadows and on marshy pond margins
P. riparia (C. L. Koch, 1833)	A	V-VII.	*Picea abies*	Weiss 1995	on wet meadows and forest clearings
Pirata hygrophilus Thorell, 1872	A	V-IX.	*Quercus robur*	Kubcová, Schlaghamerský 2002	in humid habitats, often in floodplain and in marshy forests
Pisauridae					
Pisaura mirabilis (Clerck, 1757)	A	VII-VIII.	*Pinus sylvestris*, *Pyrus malus*	Simon 1995; Bogya *et al.* 1999	in ground and on herb layer in various open and partly shaded habitats
Agelenidae					
Agelena gracilens C. L. Koch, 1841	A	summer	*Platanus hybrida*	Sebestyén 1996	on bushes in various habitats
A. labyrinthica (Clerck, 1757)	A	VII-X.	*Pinus nigra*, *Pyrus malus*, *Quercus robur*	Bogya *et al.* 1999; Horváth, Szinetár 2002; Kovács 2002	among herb vegetation on various forest edges
Histopona torpida (C. L. Koch, 1834)	A	IV-XI.	*Picea abies*	Weiss 1995	among stones, roots, in hollow trees
Tegenaria agrestis (Walckenaer, 1802)	A	summer-autumn	*Pinus sylvestris*, *Pyrus malus*	Simon 1995; Bogya *et al.* 1999	mainly in ground layer in various dry and open habitats
T. campestris C. L. Koch, 1834	A	V-IX.	*Quercus robur*	Kubcová, Schlaghamerský 2002	among branches of bushes in forests
T. ferruginea (Panzer, 1804)	F2	II-XI.	*Pinus nigra*, *Pinus sylvestris*	Simon 1995; Horváth, Szinetár 1998, 2002; Horváth *et al.* 2001	in hollow trees, under tree bark, in buildings
T. nemorosa Simon, 1916	A	?	*Platanus hybrida*	Hansen 1992	in houses, in dry open habitats, on tree trunks
T. pagana C. L. Koch, 1840	A	?	*Platanus hybrida*	Hansen 1992	in houses, in dry open habitats
T. parietina (Fourcroy, 1785)	A	all year	*Pinus sylvestris*, *Platanus hybrida*	Hansen 1992; Simon 1995	on rock walls, in houses, in dry open habitats
T. silvestris L. Koch, 1872	A	II-X.	*Quercus robur*	Kubcová, Schlaghamerský 2002	under stones in scree slopes in semi-humid and humid forests

Appendix 1. Continued.

1	2	3	4	5	6
Textrix denticulata (Olivier, 1789)	F1	summer	*Pinus sylvestris*	Simon 1995	under stones in scree slopes and under tree bark on forest edges
Cybaeidae					
Cybaeus angustiarum L. Koch, 1868	A	VIII.	*Picea abies*	Weiss 1995	under stones, in wet decaying trunks and tree stumps in shaded forests
Hahnidae					
Cryphoeca silvicola (C. L. Koch, 1834)	F1	autumn - spring	*Picea abies*, *Quercus robur*	Weiss 1995; Rinne *et al.* 1998	under tree bark, among detritus and under stones in mountain forests
Hahnia picta Kulczyński, 1897	E	III-VI.	*Acer campestre*, *Aesculus hyppocastaneum*, *Platanus hybrida*, *Pyrus communis*	Wunderlich 1982; Sebestyén 1996	under tree bark
H. pusilla C. L. Koch, 1841	A	III-XII.	*Quercus robur*	Koponen 1996; Koponen *et al.* 1997; Rinne *et al.* 1998; Kubcová, Schlaghamerský 2002	among moss, leaf litter and detritus in forest habitats
Tuberta maerens (O. P.-Cambridge, 1863)	F1	autumn	*Platanus hybrida*	Hansen 1992	under tree bark and under stones
Dictynidae					
Argenna subnigra (O.P.-Cambridge, 1861)	A	summer -autumn	*Platanus hybrida*	Wunderlich 1982	among grass, leaf litter and under stones in open habitats
Cicurina cicur (Fabricius, 1793)	A	spring - autumn	*Pyrus malus*	Koslinska 1967	in leaf litter and under stones in forests and in open habitats with high humidity
Dictyna arundinacea (Linnaeus, 1758)	A	V-VI.	*Pinus sylvestris*, *Platanus hybrida*	Hansen 1992; Simon 1995	on vegetation in various open habitats

Appendix 1. Continued.

1	2	3	4	5	6
D. civica (LUCAS, 1850)	A	VI-XI.	*Pinus nigra*	HORVÁTH, SZINETÁR 2002	on various sun-exposed vertical surfaces, on walls of houses, on tree trunks in towns
D. major MENGE, 1869	A	early summer	*Pinus sylvestris*	SIMON 1995	on bushes in humid mountain habitats, in peat bogs
D. pusilla THORELL, 1856	A	spring - summer	*Picea abies*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*	KOSLINSKA 1967; SIMON 1995; SEBESTYÉN 1996; KOVÁCS 2002	on tree branches in various forests and their edges
D. uncinata THORELL, 1856	A	V-VIII.	*Pinus nigra*, *Platanus hybrida*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	KOSLINSKA 1967; SEBESTYÉN 1996; PEKÁR 1999; HORVÁTH, SZINETÁR 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	on tree branches on forest edges, in orchards and in gardens
Lathys humilis (BLACKWALL, 1855)	F1	IV-VI.	*Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	WUNDERLICH 1982; HANSEN 1992; HORVÁTH, SZINETÁR 1998, 2002; HORVÁTH *et al.* 2001; KOVÁCS 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	on trees (mainly on coniferous) in forests, and in parks in winter period on and under bark
Mastigusa arietina (THORELL, 1871)	F2	all year	*Quercus robur*	WUNDERLICH 1982	in the nest of ants on xerothermic slopes and forest margins, under bark
Nigma flavescens (WALCKENAER, 1830)	A	V.	*Pinus sylvestris*	SIMON 1995	on foliage mainly in oak forests, on shrubs on forest edges
N. puella (SIMON, 1870)	A	IV-VIII.	*Pinus sylvestris*	SIMON 1995	on bushes
N. walckenaeri (ROEWER, 1951)	F2	VI-X.	*Pinus nigra*, *Platanus hybrida*	SEBESTYÉN 1996; HORVÁTH, SZINETÁR 1998, 2002; HORVÁTH *et al.* 2001	on foliage of trees and bushes, on walls of houses, in winter period on and under bark
Amaurobidae					
Amaurobius erberi (KEYSERLING, 1863)	A	autumn - winter	*Platanus hybrida*	HANSEN 1992	under stones

Appendix 1. Continued.

1	2	3	4	5	6
A. fenestralis (Ström, 1768)	F1	IV-XI.	*Picea abies*, *Pinus nigra*	Wunderlich 1982; Weiss 1995; Horváth, Szinetár 1998, 2002; Horváth *et al.* 2005	under tree bark, in hollow trees, in fissures on rock walls
A. jugorum L. Koch, 1868	A	VI-IV.	*Pinus nigra*	Horváth, Szinetár 2002; Horváth *et al.* 2005	under stones in forest steppes, rock steppes and their edges, on tree trunk
Callobius claustrarius (Hahn, 1833)	A	autumn - spring	*Picea abies*	Weiss 1995	under stones in spruce, beech and scree forests
Coelotes terrestris (Wider, 1834)	A	autumn - spring	*Picea abies*	Weiss 1995	at gruond level in forests
Eurocoelotes inermis (L. Koch, 1855) (syn. *Coelotes inermis*)	A	all year	*Picea abies*	Weiss 1995	at gruond level in forests
Titanoecidae					
Titanoeca schineri L. Koch 1872	A	VI-XI.	*Pyrus malus*	Bogya *et al.* 1999	under stones on rock steppes, on sand dunes
Miturgidae					
Cheiracanthium mildei L. Koch, 1864	F1	V-VI.	*Pinus nigra*, *Platanus hybrida*, *Pyrus malus*	Hansen 1992; Sebestyén 1996; Horváth, Szinetár 1998, 2002; Bogya *et al.* 1999; Horváth *et al.* 2001	on trees, on and in buildings and in various xerotherm open habitats, orchards, in winter under bark
C. oncognathum Thorell, 1871	A	V.	*Quercus robur*	Koponen *et al.* 1997; Rinne *et al.* 1998	on herb vegetation on rock steppes and other xerothermic habitats
Anyphaenidae					
Anyphaena accentuata (Walckenaer, 1802)	F1	V-VIII.	*Alnus glutinosa*, *Carpinus betulus*, *Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Prunus avium*, *Pyrus malus*, *Quercus robur*	Koslinska 1967; Wunderlich 1982; Simon 1995; Koponen 1996; Sebestyén 1996; Koponen *et al.* 1997; Rinne *et al.* 1998; Horváth, Szinetár 1998, 2002; Horváth *et al.* 2001, 2004, 2005; Kovács 2002; Kubcová, Schlaghamerský 2002; Koponen 2004	on leaves and branches of trees in deciduous and mixed forests, winter on and under bark

Appendix 1. Continued.

1	2	3	4	5	6
A. sabina L. KOCH, 1866	A	?	*Platanus hybrida*	HANSEN 1992	on trees
Liocranidae					
Agroeca brunnea (BLACKWALL, 1833)	F2	all year	*Pinus sylvestris*, *Quercus robur*	SIMON 1995; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	in detritus in various forests, at gruond level, on shrubs and on tree trunks
Liocranum rupicola (WALCKENAER, 1830)	F2	III-XII.	*Pinus nigra*	WUNDERLICH 1982; HORVÁTH, SZINETÁR 1998	on sun-exposed scree slopes, in buildings, on vertical surfaces, under bark
L. rutilans (THORELL, 1875)	F2	VI-IX.	-	WUNDERLICH 1982	on sun-exposed scree slopes, under bark
Clubionidae					
Clubiona brevipes BLACKWALL, 1841	F1	IV-VII.	*Fagus sylvatica*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	HANSEN 1992; SIMON 1995; SEBESTYÉN 1996; HORVÁTH, SZINETÁR 1998; HORVÁTH *et al.* 2001; KOVÁCS 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	on tree bark, on bushes in sun-exposed forests and edges
C. caerulescens L. KOCH, 1867	A	V-IX.	*Picea abies*	WEISS 1995	on bushes in semi-humid forests
C. comta C. KOCH, 1839	F2	IV-VII.	*Carpinus betulus*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Quercus robur*	SIMON 1995; KOPONEN 1996; KOPONEN *et al.* 1997; RINNE *et al.* 1998; HORVÁTH, SZINETÁR 2002; KOVÁCS 2002; KUBCOVÁ, SCHLAGHAMERSKÝ2002	on trees (mainly in deciduous forests), among moss, under stones, under bark in winter period on bark
C. corticalis (WALCKENAER, 1802)	E1	IV-IX.	*Pinus nigra*, *Pinus sylvestris*	SIMON 1995; HORVÁTH, SZINETÁR 1998, 2002; HORVÁTH *et al.* 2005	under tree bark, on peat bogs and in semi-humid and humid mountain forests

Appendix 1. Continued.

1	2	3	4	5	6
*C. genevensis** L. Koch, 1866 In case of Hansen (1992) and Simon (1995) – according to self-revision all data are *C. leucaspis* Simon, 1932.		IV-VI.	*Alnus glutinosa*, *Fagus sylvatica*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*, *Prunus avium*, *Quercus robur*	Hansen 1992; Simon 1995; Horváth, Szinetár 1998, 2002; Bogya *et al.* 1999; Horváth *et al.* 2001; Kovács 2002	Notes: *C. genevenis* is a ground-dwelling species of dry sandy lands. See details in text.
C. leucaspis Simon, 1932	E	III-VII.	*Pinus nigra*, *Pinus sylvestris*, *Quercus robur*	Di Franco 1993; Malten 1994; Kovács 2002; Horváth *et al.* 2005	forests, edges, under tree bark, on tree trunks (mainly on coniferous) in winter period on bark
C. marmorata L. Koch, 1866	F1	?	*Pyrus malus*	Bogya *et al.* 1999	on tree bark and on tree branches in deciduous forests and on solitary trees
C. lutescens Westring, 1851	A	V-VIII.	*Quercus robur*	Rinne *et al.* 1998; Kubcová, Schlaghamerský 2002	on herb vegetation and on bushes in various open and forest habitats
C. pallidula (Clerck, 1757)	F1	IV-IX.	*Alnus glutinosa*, *Carpinus betulus*, *Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Prunus avium*, *Quercus robur*	Koponen 1996; Sebestyén 1996; Horváth, Szinetár 1998; Rinne *et al.* 1998, 2002; Horváth *et al.* 2001, 2004, 2005; Kubcová, Schlaghamerský 2002; Kovács 2002; Koponen 2004	on tree trunks (mainly in deciduous forests) often in nests, in winter period under bark
C. reclusa O. P.-Cambridge, 1863	A	female all year, male IV-VIII.	*Picea abies*	Weiss 1995	at ground level and on herb vegetation in wetlands and forest edges
C. stagnatilis Kulczyński, 1897	A	V-X.	*Pinus sylvestris*	Simon 1995	on herb vegetation in wetlands

Appendix 1. Continued.

1	2	3	4	5	6
C. subsultans THORELL, 1875	F1	IV-X.	*Picea abies*, *Pinus sylvestris*, *Quercus robur*	SIMON 1995; WEISS 1995; RINNE *et al.* 1998	under tree bark and among detritus in forest habitats
C. terrestris WESTRING, 1851	F2	all year	*Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*	HANSEN 1992; SIMON 1995; WEISS 1995; HORVÁTH, SZINETÁR 2002	among leaf litter and detritus, under tree bark in various forest habitats
C. trivialis C. L. KOCH, 1843	A	V-IX.	*Picea abies*	WEISS 1995	on bushes in wide range of open habitats
Corinnidae					
Cetonana laticeps (CANESTRINI, 1868)	E	V-VIII.	*Pyrus communis*	WUNDERLICH 1982	on and under bark
Phrurolithus festivus (C. L. KOCH, 1835)	F2	IV-X.	*Pinus nigra*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	HANSEN 1992; PEKÁR 1999; HORVÁTH, SZINETÁR 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	among grass and detritus in various open and forest habitats, sometimes on tree trunks
Zodariidae					
Zodarion hamatum WIEHLE, 1964	A	?	*Platanus hybrida*	HANSEN 1992	?
Gnaphosidae					
Drassodes lapidosus (WALCKENAER, 1802)	A	IV-X.	*Pyrus malus*	BOGYA *et al.* 1999	under stones, on various sun-exposed vertical surfaces in xerothermic habitats
Drassyllus pusillus (C. L. KOCH, 1833)	A	IV-XI.	*Pyrus malus*	BOGYA *et al.* 1999	at ground level in various open habitats
Gnaphosa montana (L. KOCH 1866)	F1	IV-X.	*Picea abies*	WEISS 1995	under bark of fallen trunks and tree stumps in mountain forests
Haplodrassus cognatus (WESTRING, 1861)	E	III-X.	*Quercus robur*	KOPONEN 1996; RINNE *et al.* 1998; KUBCOVÁ, SCHLAGHAMERSKÝ 2002; KOPONEN 2004	under tree bark on solitary trees and forest edges, in hollow trees
Micaria cyrnea BRIGNOLI, 1983	?	?	*Platanus hybrida*	HANSEN 1992	?

Appendix 1. Continued.

1	2	3	4	5	6
M. pulicaria (Sundevall, 1831)	A	spring - early autumn	*Pyrus communis*	Pekár 1999	among grass, moss in various open habitats
M. subopaca Westring, 1861	E	IV-X.	*Fagus sylvatica*, *Pinus nigra*, *Platanus hybrida*, *Pyrus communis*, *Quercus robur*	Wunderlich 1982; Nicolai 1986; Hansen 1992; Koponen 1996; Sebestyén 1996; Koponen *et al.* 1997; Horváth, Szinetár 1998, 2002; Rinne *et al.* 1998; Horváth *et al.* 2001, 2005; Kubcová, Schlaghamerský 2002; Koponen 2004	on solitary trees, on and under bark in various open and forest habitats
Scotophaeus quadripunctatus (Linnaeus, 1758)	F1	II-X.	*Quercus robur*	Wunderlich 1982; Kubcová, Schlaghamerský 2002	under tree bark, in hollow trees in beech, oak and floodplain forests, in houses
S. scutulatus (L. Koch, 1866)	F1	all year	*Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	Wunderlich 1982; Hansen 1992; Sebestyén 1996; Horváth, Szinetár 1998, 2002; Horváth *et al.* 2001, 2004, 2005; Kovács 2002; Kubcová, Schlaghamerský 2002	under tree bark in forests, parks, in buildings and in houses
S. validus (Lucas, 1846)	?	?	*Platanus hybrida*	Hansen 1992	?
Zelotes tenuis (L. Koch, 1866)	?	?	*Platanus hybrida*	Hansen 1992	?
Zoridae					
Zora spinimana (Sundevall, 1833)	A	?	*Picea abies*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	Hansen 1992; Simon 1995; Weiss 1995; Kubcová, Schlaghamerský 2002	in various open and forest habitats, sometimes on tree trunks
Philodromidae					
Philodromus albidus Kulczyński, 1911	F1	early summer	*Platanus hybrida*, *Quercus robur*	Hansen 1992; Kubcová, Schlaghamerský 2002	on shrubs and trees on forest steppes, in oak forests and in orchards
P. aureolus (Clerck, 1757)	F1	IV-VII.	*Fagus sylvatica*, *Pinus nigra*, *Pinus sylvestris*, *Pyrus malus*, *Quercus robur*	Wunderlich 1982; Simon 1995; Horváth, Szinetár 1998, 2002; Bogya *et al.* 1999; Horváth *et al.* 2001, 2004, 2005; Kovács 2002	on shrubs and trees in forest edges and in orchards

Appendix 1. Continued.

1	2	3	4	5	6
P. cespitum (WALCKENAER, 1802)	F1	spring - summer	*Pinus sylvestris*, *Platanus hybrida*, *Pyrus communis*, *Pyrus malus*	HANSEN 1992; SIMON 1995; SEBESTYÉN 1996; BOGYA *et al.* 1999; PEKÁR 1999	on shrubs and trees in forest edges and in orchards
P. collinus C. L. KOCH, 1835	F1	early summer	*Picea abies*, *Pinus sylvestris*, *Platanus hybrida*	WUNDERLICH 1982; HANSEN 1992; SIMON 1995; WEISS 1995	on shrubs and trees in forests, mainly on coniferous trees
P. dispar WALCKENAER, 1826	F2	IV-VII.	*Pinus nigra*, *Pinus sylvestris*, *Quercus robur*	HORVÁTH, SZINETÁR 1998; HORVÁTH *et al.* 2001; KOVÁCS 2002	on vegetation in forests and forest edges
P. emarginatus (SCHRANK, 1803)	E	early summer	*Pinus sylvestris*, *Pyrus malus*	SIMON 1995; BOGYA *et al.* 1999	on tree trunks in coniferous forests
P. fuscomarginatus (DE GEER, 1778)	E	VI-VIII.	*Picea abies*, *Pinus sylvestris*	WUNDERLICH 1982; WEISS 1995; KOVÁCS 2002	on tree trunks in pine forests, on and under bark of *Pinus sylvestris*
P. longipalpis SIMON, 1870	F1	IV-VII.	*Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*	SEBESTYÉN 1996; HORVÁTH, SZINETÁR 1998; BOGYA *et al.* 1999; KOVÁCS 2002	on trees (mainly on coniferous), shrubs and herbs in forests, in forest edges, in parks
P. margaritatus (CLERCK, 1757)	E	V-VIII.	*Alnus glutinosa*, *Carpinus betulus*, *Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	WUNDERLICH 1982; SIMON 1995; SEBESTYÉN 1996; HORVÁTH, SZINETÁR 1998, 2002; PEKÁR 1999; HORVÁTH *et al.* 2001, 2004, 2005; KOVÁCS 2002	on tree trunks and branches in forests and on forest edges
P. praedatus O. P.-CAMBRIDGE, 1871	F1	IV-VII.	*Pinus nigra*, *Quercus robur*	HORVÁTH, SZINETÁR 1998, 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	on herb vegetation and on trees and shrubs (mainly on coniferous) in forests, on forest edges, in parks

Appendix 1. Continued.

1	2	3	4	5	6
P. rufus Walckenaer, 1826	F1	V-VI.	*Carpinus betulus*, *Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Quercus robur*	Simon 1995; Horváth, Szinetár 1998, 2002; Horváth *et al.* 2001; Kovács 2002	on vegetation in various habitats, edges in orchards, in winter period mainly under bark
Tibellus oblongus (Walckenaer, 1802)	A	early summer autumn	*Pyrus communis*, *Pyrus malus*	Bogya *et al.* 1999; Pekár 1999	among grass in various open habitats, also in orchards
Thomisidae					
Coriarachne depressa (C. L. Koch, 1837)	E	V-IX.	*Fagus sylvatica*, *Pinus sylvestris*, *Quercus robur*	Wunderlich 1982; Simon 1995; Kovács 2002	under tree bark in pine forests
Diaea dorsata (Fabricius, 1777)	F1	IV-VI.	*Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Pyrus communis*, *Quercus robur*	Simon 1995; Weiss 1995; Horváth, Szinetár 1998, 2002; Pekár 1999; Kovács 2002; Kubcová, Schlaghamerský 2002	on leaves of bushes and trees in forest habitats, in winter period on and under bark
D. livens Simon, 1876 (syn. *Diaea pictilis*)	F1	IV-VI.	*Pinus nigra*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	Sebestyén 1996; Bogya *et al.* 1999; Horváth, Szinetár 2002; Kubcová, Schlaghamerský 2002	on branches of solitary trees (mainly oak) and on forest edges, in winter period on and under bark
Misumena vatia (Clerck, 1757)	A	V-VII.	*Pyrus malus*	Bogya *et al.* 1999	on flowers in medows, other open habitats
Misumenops tricuspidatus (Fabricius, 1775)	F2	V-VIII.	*Pinus nigra*, *Platanus hybrida*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	Sebestyén 1996; Bogya *et al.* 1999; Pekár 1999; Horváth, Szinetár 2002; Kovács 2002; Horváth *et al.* 2004	on herbs and bushes, on lower branches of trees in semi-open and partly shaded habitats, often in orchards, in winter period on bark
Ozyptila praticola (C. L. Koch, 1837)	F2	III-XII.	*Platanus hybrida*, *Quercus robur*	Hansen 1992; Koponen 1996; Sebestyén 1996; Rinne *et al.* 1998; Kubcová, Schlaghamerský 2002	in various forest habitats, at ground level and also on tree trunks

Appendix 1. Continued.

1	2	3	4	5	6
O. sanctuaria (O. P.-Cambridge, 1871)	A	?	*Platanus hybrida*	Hansen 1992	among grass in dry habitats
Pistius truncatus (Pallas, 1772)	F1	summer	*Fagus sylvatica*, *Picea abies*, *Pyrus malus*, *Quercus robur*	Bogya *et al.* 1999; Kovács 2002; Kubcová, Schlaghamerský 2002	on bushes and lower branches of trees, also on tree trunks on forest steppes and forest edges
Synaema globosum (Fabricius, 1775)	A	V-VII. J: autumn, spring	*Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Quercus robur*	Hansen 1992; Horváth, Szinetár 2002; Kovács 2002; Kubcová, Schlaghamerský 2002	on vegetation (mainly on flowers) in open habitats and on edges
Tmarus piger (Walckenaer, 1802)	F2	early summer	?	Wunderlich 1982	on herb vegetation and on bushes on forest steppes, light forests and their edges
T. stellio Simon, 1875	F1	?	*Pyrus malus*, *Quercus robur*	Bogya *et al.* 1999; Kubcová, Schlaghamerský 2002	on tree trunk in floodplain forests and in orchards
Thomisus onustus Walckenaer, 1805	A	V-VIII.	*Pyrus communis*	Pekár 1999	on flowers in medows and other open habitats
Xysticus acerbus Thorell, 1872	A	IV-V.	*Pyrus malus*	Bogya *et al.* 1999	among grass on xerothermic habitats
X. albomaculatus Kulczyński, 1891	E	spring - autumn	*Pyrus communis*	Wunderlich 1982	on and under bark
X. audax (Schrank, 1803)	F2	spring - early summer	*Picea abies*, *Pinus sylvestris*, *Quercus robur*	Simon 1995; Weiss 1995; Koponen 1996; Rinne *et al.* 1998	on bushes and on herb vegetation in various open and forest habitats
X. cristatus (Clerck, 1757)	A	IV-VI.	*Pinus sylvestris*, *Pyrus malus*	Simon 1995; Bogya *et al.* 1999	among grass in medows and other open habitats, also in fields and in orchards
X. kochi Thorell, 1872	A	summer	*Platanus hybrida*	Sebestyén 1996	among grass and on vegetation in various open habitats, also in fields, orchards and gardens

Appendix 1. Continued.

1	2	3	4	5	6
X. lanio C. L. Koch, 1835	F2	spring - early summer	*Betula pendula*, *Fagus sylvatica*, *Pinus sylvestris*, *Pyrus malus*, *Quercus robur*	Nicolai 1986; Simon 1995; Koponen 1996; Koponen *et al.* 1997; Rinne *et al.* 1998; Bogya *et al.* 1999; Kubcová, Schlaghamerský 2002; Koponen 2004	on shrubs and herb vegetation in forests and their edges, on tree trunks
X. ulmi (Hahn, 1831)	A	VI-VII.	*Pinus sylvestris*, *Platanus hybrida*	Simon 1995; Sebestyén 1996	on vegetation in wet meadows and on marshy pond margins
Salticidae					
Aelurillus v-insignitus (Clerck, 1757)	A	spring - summer	*Picea abies*	Weiss 1995	on soil surface in xerothermic open habitats
Ballus chalybeius (Walckenaer, 1802) (syn. *Ballus depressus*)	F1	summer	*Carpinus betulus*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	Hansen 1992; Simon 1995; Sebestyén 1996; Bogya *et al.* 1999; Kovács 2002; Kubcová, Schlaghamerský 2002	on bushes and among leaf litter in forests, also in canopies and on bark (mainly oak)
Carrhotus xanthogramma (Latreille, 1819)	A	summer	*Pyrus malus*	Bogya *et al.* 1999	on bushes and on trees in rock steppes and in orchards
Dendryphantes rudis (Sundevall, 1833)	F1	V-VIII.	*Pinus nigra*, *Pinus sylvestris*, *Quercus robur*	Simon 1995; Horváth, Szinetár 2002; Kovács 2002; Horváth *et al.* 2005	on branches in coniferous forests and their margins, in winter period on and under bark
Euophrys frontalis (Walckenaer, 1802)	A	spring early summer	*Pinus sylvestris*	Simon 1995	among moss, leaf litter and and under stones in forest habitats
Evarcha falcata Clerck, 1757)	A	V-VII.	*Picea abies*	Weiss 1995	at ground level and on herbs in various open and forest habitats
Heliophanus cupreus (Walckenaer, 1802)	A	spring - summer	*Platanus hybrida*, *Pyrus malus*	Hansen 1992; Bogya *et al.* 1999	at ground level and on herbs in various open and forest habitats
H. dubius C. L. Koch, 1835	A	V-VI.	*Quercus robur*	Rinne *et al.* 1998	on bushes on rock steppes, in pine forests and on xerothermic forest edges

Appendix 1. Continued.

1	2	3	4	5	6
H. flavipes HAHN, 1832	A	spring - summer	*Pyrus malus*	BOGYA *et al.* 1999	on vegetation on various xerothermic open habitats
H. kochi SIMON, 1868	A	?	*Platanus hybrida*	HANSEN 1992	on vegetation on various xerothermic open habitats
H. tribulosus SIMON, 1868	A	V-VI.	*Platanus hybrida*	HANSEN 1992	on vegetation on various xerothermic open habitats, on meadows and on forest edges
Icius hamatus (C. L. KOCH, 1846)	A		*Platanus hybrida*	HANSEN 1992	?
Macaroeris nidicolens (WALCKENAER, 1802)	F1	summer	*Fagus sylvatica*, *Picea abies*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	HANSEN 1992; SEBESTYÉN 1996; HORVÁTH, SZINETÁR 1998, 2002; BOGYA *et al.* 1999; HORVÁTH *et al.* 2001, 2005; KOVÁCS 2002	on branches of trees (mainly coniferous) in xerothermic habitats, in winter period on and under bark
Marpissa muscosa (CLERCK, 1757)	E	IV-X.	*Carpinus betulus*, *Fagus sylvatica*, *Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus communis*, *Pyrus malus*, *Quercus robur*	WUNDERLICH 1982; SEBESTYÉN 1996; HORVÁTH, SZINETÁR 1998, 2002; BOGYA *et al.* 1999; KOVÁCS 2002; HORVÁTH *et al.* 2004, 2005	under tree bark, on the trunks in various open and partly shaded habitats
Pseudeuophrys erratica (WALCKENAER, 1826) (syn. *Euophrys erratica*)	F1	summer	*Pinus nigra*, *Quercus robur*	KOPONEN 1996; HORVÁTH, SZINETÁR 1998; RINNE *et al.* 1998; KOVÁCS 2002; HORVÁTH *et al.* 2005	on bushes, on trees, under bark and on surface of rocks in various open and forest habitats
P. vafra (BLACKWALL, 1867 (syn. *Euophrys vafra*)	A		*Platanus hybrida*	HANSEN 1992	?
Pseudicius encarpatus (WALCKENAER, 1802)	E	V-VIII.	*Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	HANSEN 1992; SEBESTYÉN 1996; HORVÁTH, SZINETÁR 1998, 2002; BOGYA *et al.* 1999; HORVÁTH *et al.* 2001; KOVÁCS 2002; KUBCOVÁ, SCHLAGHAMERSKÝ 2002	under bark of solitary trees and in forests and in orchards, parks, on tree bark
P. epiblemoides CHYZER, KULCZYŃSKI, 1891	E	?	*Quercus robur*	DOBRORUKA, 2001	on trunks of oak

Appendix 1. Continued.

1	2	3	4	5	6
Salticus cingulatus (Panzer, 1797)	F1	summer	*Picea abies*, *Quercus robur*	Weiss 1995; Koponen 1996; Koponen *et al.* 1997; Rinne et al. 1998; Koponen 2004	on tree bark of solitary trees, rarely on walls of houses
S. mutabilis Lucas, 1846	?	?	*Platanus hybrida*	Hansen 1992	?
S. scenicus (Clerck, 1757)	F2	spring -autumn	*Pyrus malus*	Wunderlich 1982; Pekár 1999	on rock walls, on the surface of scree slopes and on walls of houses, on tree trunks
S. unciger (Simon, 1868)			*Platanus hybrida*	Hansen 1992	?
S. zebraneus (C. L. Koch, 1837)	E	V-VI.	*Pinus nigra*, *Pinus sylvestris*, *Platanus hybrida*, *Pyrus malus*, *Quercus robur*	Wunderlich 1982; Hansen 1992; Simon 1995; Sebestyén 1996; Bogya *et al.* 1999; Horváth, Szinetár 2002; Kubcová, Schlaghamerský 2002; Horváth *et al.* 2005	on the trunks and lower branches of trees in various open and forest habitats
Sibianor aurocinctus (Ohlert, 1865) (syn. *Bianor aurocinctus*)	A	spring - autumn	*Pinus sylvestris*	Simon 1995	among short vegetation and stones on rock steppes on xerothermic habitats
Sitticus distinguendus (Simon, 1868)	A	summer	*Pyrus malus*	Bogya *et al.* 1999	among grass on sand dunes, on spoil heaps
S. pubescens (Fabricius, 1775)	A	all year	*Pyrus malus*	Bogya *et al.* 1999	on various sun-exposed vertical surfaces, on rock walls, walls of houses, on tree trunks
S. saxicola (C. L. Koch, 1846)	A	?	*Picea abies*	Weiss 1995	in various habitats, on edges, on rock walls
Synageles hilarulus (C. L. Koch, 1846)	F2	?	*Pyrus communis*	Wunderlich 1982	among grass on rock steppes, on bark
S. venator (Lucas, 1836)	F2	spring - autumn	–	Wunderlich 1982	on vegetation in various open habitats, rarely on bark
Talavera petrensis (C. L. Koch, 1837) (syn. *Euophrys petrensis*)	A	?	*Pinus sylvestris*	Simon 1995	at ground level, in various open and dry habitats, under stones