

ANT FAUNA OF TISZA RIVER BASIN (HYMENOPTERA: FORMICIDAE)

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Abstract

Ants represent one of the most detailed studied groups in the Tisza River Basin. The myrmecological survey of the river basin is rooted back to the 1960s. The ant fauna, consisting of 64 species, is relatively poor, because of the severe inundations, especially in the so-called flood area, which is not protected by dikes against floods. Dikes, although being artificial sites, are rich ant habitats, contributing to the distribution of grassland species. On the basis of the number of occupied habitats, the common-rare species transition is smooth, and the semi-log rank-frequency curve shows the typical picture of a heterogeneous collection. In the PcoA ordination scattergram, only the grassland and forest ant species are segregated, the binary faunistical data are not sensitive enough to distinguish finer habitat preferences.

Introduction

The ant fauna of the Tisza River is rather well documented. The very first data on Tisza ants are by Zilahi-Sebess within the framework of the series „Das Leben der Tisza” organized by Gábor Kolosváry (Bába et al 1962). From the middle of 1960s, in a series of papers, Gallé and his co-workers published faunistical and ecological data on the myrmecofauna of the Tisza region (Gallé 1966a, 1966b, 1967, 1969, 1972a, 1972b, 1975, 2002, Gallé and Gausz 1968, Gallé et al 1992, 1995, 2000). Besides them, Kocsis (2001) gave ecological and faunistical data in her thesis on ants of habitat islands, especially tumuli, in the floodplain of the river.

According to Somfai's (1959) key, the Hungarian ant fauna counted 66 species at the end of the fifties. As a result of the intensive taxonomical research during the last decades, revisions and books have been published on Middle-European ants (Seifert 1988a, 1988b, 1991, 1992, 1996, Agosti and Collingwood 1987a, 1987b, Czechowski et al. 2002) and in a more recent checklist, Gallé et al (1998) enumerated 101 known ant species from Hungary. Since then the publications by Csósz (2000, 2001, 2003), Csósz and Markó (2004, 2005), Csósz and Seifert (2003), Csósz and Tartally (1998), Csósz et al. (2001, 2002) have even increased the species list of the Carpathian Basin and now it approaches 150 species. On basis of these publications, a

lot of species names, published twenty-forty years ago, are not valid any more and in several cases the specimens themselves had to be reidentified if it was possible.

In her PhD thesis, Kovács employed the recent, valid nomenclature and gave an extensive survey on Tisza ants from 58 habitats along the river (Kovács 2001). The recent myrmecological expeditions, study trips and ecological state assessments have also contributed to the knowledge of the ant fauna of Tisza River regions (e. g. Gallé 2002).

Material and methods

The collection of ants was made with three methods: (1) Hand collection. This method was applied as an additional sampling procedure to the other two subsequent samplings. (2) Nest quadrat sampling. This was employed by Gallé in his former studies (Gallé 1966b, 1967, 1969, 1972b, Gallé and Gausz 1968). He used quadrates of sizes from 1x1 to 5x5 m, excavated the surface of quadrates to the depth of about 15-20 cm and counted the ant nests. (3) Pit-fall traps. We used plastic jars of 60 mm diameter and 100 mm depth filled with ethylene glycol. At least ten traps were applied at each sampled habitat and the traps worked at least one week. Other sampling techniques (e.g. counting ants on trees, baits etc.) were also used, but very rarely.

In some cases the material of the original, ecological sampling is not available, therefore we could not revise some published data, e.g. *Myrmica lobicornis* Nyl. *Formica gagates* Latreille, *Leptothorax acervorum* F. and *Lasius mixtus* Nyl. from Upper-Tisza region (Gallé 1966a, 1966b, Gallé and Gausz 1968) and *Myrmica rugulosoides* For. from Tiszafüred (Gallé 1972b). For this reason, we excluded these data from the list below.

In the enumeration of the localities of ant species, in accordance with the other chapters of this volume, we employ the following abbreviations and marks. Regions: **I.** Upper-Tisza/Tisa; **II.** Middle-Tisza; **III.** Lower-Tisza/Tisa. Tributaries: **IV.** Túr River; **V.** Szamos/Someş River; **VI.** Kraszna/Crasna River; **VII.** Bodrog River; **VIII.** Sajó/Slana River, Hernád/Harnard River, Takta River; **IX.** Zagyva River; **X.** Körös/Criş River, **X.1.** Berettyó/Barcău; **X.2.** Sebes-Körös/Crişul Repede, **X.3.a.** Fekete-Körös/ Crişul Negru, **X.3.b.** Fehér-Körös/ Crişul Alb, **X.4.** Hortobágy; **XI.** Maros/Mureş River; **XII.** Béga/Bega. (If a river belongs to more than one country (e.g. Rumania and Hungary), we give the names in both languages.) Countries: RO: Rumania; SMN: Serbia and Montenegro; without country code: Hungary. (L): left side, (R): right side of the river in question.

The known localities of the ant species is given as exactly as it is possible, in the majority of the cases on habitat level. We employed also the classical phytosociological names of the Braun-Blanquet classification where it was possible. Some plant formation names have changed since the time of collections. In those cases, when the original plant formation type was split and the newer names are not certain, we use the former ones, e.g. formerly almost all the floodplain softwood forests were regarded as *Salicetum albae-fragilis* and we use this name, although recently they were split into three, *Senecionii sarracenicii-Populetum albae*, *Carduo crispipopulatum nigrae* and *Leucojo aestivi-Salicetum albae* (see Borhidi 2003).

In the former publications on Tisza Basin ants, Gallé (1966a, 1966b, 1967, Gallé and Gausz 1968 etc.) and Markó (1997) applied the so-called ecofaunistic categories, originally introduced by Pittioni (Pittioni and Schmidt 1942, 1943) and adopted to the Hungarian Hymenoptera fauna by Móczár (1953). On this basis there are three bigger classes of species, xerotolerant-thermophilous (“eremophilous”), mesophilous (“intermediary”) and hypothermophilous-hygrophilous (“hylophilous”), respectively. Each category has two further sub-classes on the basis of the tolerance spectrum of the species in question, i.e. eurytopic (“euryoecic”) and stenotopic (“stenoecic”). In the case “intermediary” species we used also the sub-category “hypereuryoecic” for extreme eurytopic (ubiquist) species. Although this - otherwise useful - classification is out of use, for comparison with the former publications, we apply the categories in brackets when describe the ecological requirements of the individual species.

In the middle of the eighteenth century, the Tisza basin was artificially regulated and the former floodplain was divided by dikes into an area that is more or less regularly inundated by the floods and the other one which is protected by the dikes against inundations. Hereafter we use the names for these two sites “floodplain” and “protected floodplain”, respectively.

Results

List of species

Ponera coarctata (Latreille, 1802)

General remarks: This is a Southern European species of Mediterranean biogeographical type. The ecological requirements of this species are not exactly known. On the basis of the data from the Tisza basin it is mesoxerophilous, (between euryoecic eremophilous and stenoecic intermediary). Along Tisza River it occurs in dike slope meadows, tumuli and open forests in the protected floodplain. The distribution of *P. coarctata* along the river is mainly restricted to the southern and middle part of valley. As it has very small and hidden colonies, presumably more widely distributed than it has been recorded.

Localities: II. Tiszafüred: dike slope meadow (L)(1969); Tiszafüred: Tiszaörvény, dike slope meadow (L)(1969, 1970, Gallé 1972b); Kisköre: dike slope meadow (L) (Gallé 1969); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicolae* (L) (Kovács 2001).

III. Felgyő: Labodár, protected floodplain, young oak forest (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001).

X.3.a. Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, ash forest (2003, 2004, Szász 2005).

XI. RO: Secusgiu: Munar, Bezdin, dike slope meadow (L)(2000).

Hypoponera punctatissima (Roger 1859)

General remarks: Introduced species of tropical origin. The only locality is in Szentes in a greenhouse, where it reached enormously high density and during the nuptial flight the numerous and painfully stinging females made the work impossible. At the same site an outdoor population overwintered, too, in a heap of fermenting half-artificial soil.

Locality: III. Szentes: protected floodplain, greenhouse.

Manica rubida (Latreille 1802)

General remarks: A high-mountain (stenoecic hylophilous) species, which is absent from the most of the habitats of Tisza River Basin. The only known occurrence is in Rumania.

Localities: X.2. RO: Șuncuiuș (Markó 1997).

XI. RO: Valea Rece, meadow (1999); RO: M. Calimani: Ilva stream valley (1999).

Myrmica rubra (Linnaeus, 1758)

(= *Myrmica laevinodis* Nyl.: Gallé 1966a, Gallé and Gausz 1968)

General remarks: A species with wide distribution thorough the northern part of Palaearctic. This is a eurytopic, moderately hygrophilous species (“euryoecic hylophilous”) and a typical ant for floodplain forests, wet meadows and peat bogs in the Upper-Maros/Mures region in Rumania. It can tolerate the inundation and the colonies can survive by floating on the water surface.

In the former papers on the Hungarian ant fauna this species was referred to as *Myrmica laevinodis* Nylander 1846 (e.g. Somfai 1959, Gallé 1966b, 1981, 1986, Gallé and Gausz 1968).

Localities: I. Kisar: floodplain, orchard (L)(2002); Kisar: floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2002); Vásárosnamény: Gergelyugornya, Bagiszeg, floodplain, hardwood forest (R)(2002, Gallé and Gausz 1968); Vámosatya: Bockerek, protected floodplain, hardwood forest (R)(2002); Tiszakarád: floodplain softwood forest (R)(1964); Tiszadob (L) (1963, Gallé 1966b); Tiszadob: Taktaköz, protected floodplain, by Szelepi backwater (R)(1963, Gallé 1966b); Tiszadob: Taktaköz, dike slope meadow (R)(1963); Tiszadob: Taktaköz, floodplain, alfalfa plantation (R)(1963); Tiszadob: Taktaköz, floodplain, softwood forest (R)(1963); Tiszalúc: Kocsordos, protected floodplain, meadow (R)(1994); Tiszalúc: Kocsordos, dike slope meadow exposed to floodplain (R)(1994); Tiszalúc: Kocsordos, dike slope meadow (R)(1994); Tiszalúc: Kocsordos, protected floodplain, oak forest (R)(1994).

II. Besenyszög: Szórópuszta: floodplain, softwood forest, *Salicetum albae-fragilis*(R)(2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003); Tizsakürt: Arboretum, by a channel (L)(1966); Tizsakürt: floodplain, meadow (L)(1966).

III. Lakitelek: Tőserdő, wet meadow, *Agrosti-Alopecuretum pratensis* (R) (Kovács 2001); Lakitelek: Tőserdő, *Thelypteridi-Alnetum* (R) (Kovács 2001); Lakitelek: Tőserdő, floodplain hardwood forest (R) (Kovács 2001); Mindszent: floodplain, softwood forest (L)(2004); Baks: Ányás, protected floodplain, softwood forest (R)(2004); Dóc: Bibicháti-erdő, protected floodplain, oak forest (R) (Kovács 2001); Algyő: Sasér (Gallé 1966b); Algyő: Sasér: floodplain, softwood forest, *Salicetum albae-fragilis*(2004); Szeged: Tápé, Vesszős, floodplain meadow (Gallé 1966b); Szeged: Tápé, Vesszős, dike slope meadow, *Alopecuretum pratensis* (R) (1965); Szeged: Tápé, Vesszős, floodplain softwood forest (Gallé 1966b); Tiszasziget: floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2004).

V. RO: Ticău: sandy riverbank (1996) (Markó 1999); RO: Arduzel: oak forest (1996) (Markó 1999).

X.2. RO: The Dragan Creek (Markó 1997); RO: Şaulia (Markó 1997); RO: Bologa (Markó 1997); RO: Ciucea (Markó 1997); RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997); RO: The Criş Strait (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, ash forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, mixed forest (2003, 2004, Szász 2005).

XI. RO: Voslobeni: peat bog, *Carici stellulatae (echinatae)-Sphagnetum*, *Carici rostratae-Sphagnetum* and *Carici flavae-Eriophoretum* (L)(1999); RO: Voslobeni: sedge meadow, *Caricetum rostratae* (L)(1999); RO: Voslobeni: moorland bushy forest (1999); RO: Sălviţa: Softwood floodplain forest (2002); RO: Voslobeni: roadside (1999); RO: Ciobotani, riverside, meadow (1999); RO: Secusigiu: Munar, Bezdin, floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain, hardwood forest (L)(2000); RO: Secusigiu: Munar, Bezdin, Tábor-erdő, protected floodplain, hardwood forest (L)(2000); Makó: Landor, floodplain, softwood forest, *Salicetum albae-fragilis* with *Fraxinus* (L) (Kovács 2001); Szeged: Vetyehát, floodplain, poplar forest *Salicetum albae-fragilis* (L) (Kovács 2001).

Myrmica ruginodis Nylander, 1846

General remarks: This is one of the most hygrophilous (“stenoecic hylophilous”) *Myrmica* species in the Carpathian Basin with North Palaearctic distribution. One of the ant species of Tisza region, the distribution of which is promoted by the habitat-corridor effect of two components (i.e. floodplain meadows and forests) of the sigma communities forming zonation complex along the river. This is mainly forest species by the Tisza River, but at the Upper-Maros region it occurs also in wet meadows and peat bogs.

Localities: I. Kisar: floodplain, orchard (L)(2002); Kisar: floodplain, softwood forest, *Salicetum albae-fragilis* (L) (2002); Vámosatya: Bockerek, protected floodplain, hardwood forest (R)(2002).

II. Besenyszög: Szórópuszta: floodplain, softwood forest, *Salicetum albae-fragilis*(R)(2003); Besenyszög: Szórópuszta: floodplain, hardwood forest, *Quercus robur*(R)(2003); Rákóczifalva: floodplain meadow (L) (2003).

III. Szentes: floodplain, softwood forest, *Salicetum albae-fragilis* (L) (L) (2004); Mindszent: floodplain, softwood forest (L) (2004); Baks: Ányás, protected floodplain, softwood forest (R)(2004); Tiszasziget: floodplain, hardwood forest (L) (2004).

X.2. RO: The Criş Strait (Markó 1997); RO: Cheresig (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, virgin oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (2003, 2004, Szász 2005).

XI. RO: Voslobeni: peat bog, *Carici stellulatae (echinatae)-Sphagnetum*, *Carici rostratae-Sphagnetum* and *Carici flavae-Eriophoretum* (L) (1999); RO: Voslobeni: sedge meadow, *Caricetum rostratae* (L) (1999); RO: Voslobeni: moorland bushy forest (L) (1999); **XI.** RO: Voslobeni: stone mine (1999); RO: Voslobeni: roadside (1999); RO: Valea Rece, meadow (1999); RO: M. Calimani: Ilva stream valley (1999).

Myrmica rugulosa Nylander, 1849

General remarks: One of the rarer *Myrmica* species of the river basin. A meso-thermophilous ant species (“euryoecic intermediary”) of Euro-Siberian distribution. While it occurs in open habitats in the northern part of Europe (cf. Gallé 1991, Czechowski et al 2002) in the Tisza region it was collected from open softwood floodplain forests.

Localities: **I.** Kisar: floodplain, orchard (L) (2002); Tiszaszalka: dike slope meadow (R)(2002).

III. Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Mindszent: floodplain, softwood forest (L) (2004); Baks: Ányás, protected floodplain, softwood forest (R)(2004); Hódmezővásárhely: Körtvélyes, Babos-erdő, 45 years old oak forest in the floodplain (L)(1996); Hódmezővásárhely: Körtvélyes, Petres-erdő, softwood floodplain forest (L)(1996); Hódmezővásárhely: Körtvélyes, Hunyadi-halom, floodplain meadow, *Alopecuretum pratensis* (L)(1996); Hódmezővásárhely: Körtvélyes, Tére-parti tölgyes, 70 years old oak forest in the floodplain (L)(1996).

XI. RO: Ciobotani, riverside, degraded meadow (1999); RO: M. Calimani: Ilva stream valley (1999); Maroslele: Vetyehát, floodplain, planted hybrid poplar forest (R)(2001).

Myrmica gallieni Bondroit, 1920

General remarks: A stenotopic hygrophilous (“stenooecic hylophilous”) species of wet meadows, marshes and floodplain forests along the river valley. Relatively rare ant in the Carpathian Basin of Euro-Siberian general distribution type.

Localities: I. Kisar: floodplain, softwood forest, *Salicetum albae-fragilis* (L) (2002); Tiszalúc: Kocsordos, protected floodplain, softwood edge (R)(1994); Taktaharkány: protected floodplain, meadow (R)(1994).

III. Lakitelek: Tőserdő, wet meadow, *Agrosti-Alopecuretum pratensis* (R) (Kovács 2001); Szegvár: dike slope meadow (Kovács 2001); Mindszent: Kurca-rét, wet meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Mindszent: Kurca-rét, dry meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Babos-erdő, floodplain, oak forest (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Petres-erdő, floodplain forest, *Populus alba* (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Barci-rét, wet meadow (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Tére-part, floodplain, old oak forest (L)(1996) (Kovács 2001).

X.3.a. Gyula: Mályvád, protected floodplain, grassland (1996, 1997).

XI. Makó: Landor, floodplain softwood forest, *Salicetum albae-fragilis* with *Fraxinus* (L) (Kovács 2001); Szeged: Vetyehát, dike slope meadow *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001).

Myrmica hellenica Forel 1913

General remarks: This species is known from the Balkans and other localities in Southern and Central Europe. Data also exist from Switzerland, Germany, Poland and even Finland (Czechowski et al 2002). The eastern distribution of this species is not known (cf. Seifert 1988a).

Locality: X.2. RO: The Criş Strait (Markó 1997).

Myrmica sabuleti Meinert, 1861

General remarks: This is also Euro-Siberian species with eurytopic mesophilous (“euryoecic intermediary”) ecofaunistical character. One of the commonest *Myrmica* species in the Hungarian Great Plain, occurring in forests and wet grasslands.

Localities: I. Tizzaszalka: dike slope meadow (R)(2002); Eperjeske: protected floodplain, pasture (L)(2002).

II. Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003); Rákóczifalva: dike slope meadow (L)(2003); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicola* (L) (Kovács 2001); Cserkeszölő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agropyretum intermedii* (L) (Kovács 2001); Tizsakürt: Arboretum, by a channel (L)(1966); Tiszalúc: Kocsordos, protected floodplain, meadow (R)(1994); Tiszalúc: Kocsordos, dike slope meadow exposed to floodplain (R)(1994); Taktaharkány: protected floodplain, meadow (R)(1994); Tiszalúc: Kocsordos, protected floodplain, meadow at the dike; Tiszalúc: Kocsordos, protected floodplain, meadow at the dike.

III. Lakitelek: Tőserdő, *Thelypteridi-Alnetum* (R) (Kovács 2001); Szentes: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér; degraded meadow,

Cynodonti-Poetum angustifoliae (R) (Kovács 2001); Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Baks: Ányás, protected floodplain, softwood forest (R)(2004); Baks: Ányás, floodplain, forest, *Salicetum albae-fragilis* (R)(2004); Baks: Ányás, protected floodplain, meadow (R)(2004); Szeged: Tápé, Vesszős, floodplain meadow (Gallé 1966b); Mindszent: Kurca-rét, dry meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Pusztaszer: Újmajor, protected floodplain, old oak forest (R) (Kovács 2001); Pusztaszer: Büdösszék, saline meadow, *Lepidio-Puccinellietum limosae, Camphorosmetum annuae* (R) (Kovács 2001); Szeged: Tápé, Vesszős, protected floodplain, grassland (R)(1965); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1966).

X.3.a. Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, ash forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (2003, 2004, Szász 2005).

XI. Szeged: Vetyehát, floodplain, poplar forest *Salicetum albae-fragilis* (R) (Kovács 2001); Szeged: Vetyehát, protected floodplain, weedy meadow (R) (Kovács 2001).

Myrmica salina Ruzsky, 1905

General remarks: Since it had been confused with *Myrmica sabuleti* for a long time, its distribution is not well-known, probably a Euro-Siberian species. This *Myrmica* species prefers grasslands with harder soil and a typical ant of the saline meadows.

Localities: I. Tiszaszalka: dike slope meadow (R)(2002); Eperjeske: protected floodplain, pasture (L)(2002); Tiszalúc: Kocsordos, protected floodplain, meadow (R)(1994); Tiszalúc: Kocsordos, dike slope meadow (R)(1994); Taktaharkány: protected floodplain, meadow (R)(1994); Taktaharkány: dike slope meadow ((R)(1994); Tiszalúc: dike slope meadow exposed to the protected floodplain (R)(1994); Tiszalúc: Kocsordos, protected floodplain, meadow at the dike.

II. Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: floodplain meadow (L) (2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003).

III. Lakitelek: Tőserdő, wet meadow, *Agrosti-Alopecuretum pratensis* (R) (Kovács 2001); Szentés: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár, Vidre-ér; degraded meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-*

Arrhenatheretum (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Mindszent: Kurca-rét, wet meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Mindszent: Kurca-rét, dry meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Baks: Ányás, protected floodplain, meadow (R)(2004); Hódmezővásárhely: Körtvélyes, Barci-rét, wet meadow (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Hunyadi-halom, floodplain meadow, *Alopecuretum pratensis* (L)(1996); Ópusztaszer: Baksi-pusztá, Hosszúhát, protected floodplain, loess pasture (R) (Kovács 2001); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1965).

V. RO: Vetis: sandy riverbank (1996) (Markó 1999).

XI. RO: Dobra: hillside, meadow; RO: Sálvica: softwood forest; RO: Sálvica: floodplain, meadow; RO: Sálvica: protected floodplain, wet meadow; RO: Sálvica: floodplain, meadow with *Salix cinerea* bushes; Szeged: Vetyehát, protected floodplain, weedy meadow (R) (Kovács 2001).

Myrmica scabrinodis Nylander, 1846

(= *Myrmica rugulosoides* Forel, Gallé 1967, Gallé and Gausz 1968)

General remarks: A Euro-Siberian, eurytopic hygrophilous (“euryoecic hylophilous”) ant species. Although its typical habitats are wet grasslands, it was found in floodplain forests, too.

Localities: I. Kistar: floodplain, orchard (L)(2002); Vásárosnamény: Gergelyugornya, dike slope meadow, *Alopecuretum pratensis festucetosum pseudovinae* (R)(1967); Vásárosnamény: Gergelyugornya, Bagiszeg, floodplain, hardwood forest (R)(2002); Tiszaszalka: dike slope meadow (R)(2002).

II. Besenyszög: Szórópuszta: floodplain, softwood forest, *Salicetum albaefragilis*(R)(2003); Tizsakürt: dike slope meadow, *Alopecuretum pratensis Arrhenatherum elatius* facies (L)(1967).

III. Lakitelek: Töserdő, wet meadow, *Agrosti-Alopecuretum pratensis* (R) (Kovács 2001); Lakitelek: Töserdő, floodplain hardwood forest (R) (Kovács 2001); Mindszent: Kurca-rét, wet meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Baks: Ányás, protected floodplain, softwood forest (R)(2004);.

X.3.a. Gyula: Mályvád, protected floodplain, virgin oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005).

XI. RO: Voslobeni: peat bog, *Carici stellulatae (echinatae)-Sphagnetum*, *Carici rostratae-Sphagnetum* and *Carici flavae-Eriophoretum* (L)(1999); RO: Voslobeni: wet meadow, *Molinietum coeruleae* (L)(1999); RO: Voslobeni: sedge meadow, *Caricetum rostratae* (L)(1999); RO: Voslobeni: wet pasture, *Agrostio-Deschampsietum caespitosae* (L)(1999); RO: Voslobeni: drier pasture, *Agrostio-Festucetum rubrae* (L)(1999); RO: Ilia: dike slope meadow (2002); RO: Dobra: hillside, meadow; RO: Voslobeni: roadside (1999).

Myrmica vandeli Bondroit 1920

General remarks: A very rare, stenotopic hygrophilous (“stenoecic hylophilous”) species, which is restricted to the wet meadows and peat bogs at the Upper-Maros/Mures region in Rumania.

Localities: XI. RO: Voslobeni: peat bog, *Carici stellulatae (echinatae)-Sphagnetum*, *Carici rostratae-Sphagnetum* and *Carici flavae-Eriophoretum* (L)(1999); RO: Voslobeni: wet meadow, *Molinietum coeruleae* (L)(1999); RO: Voslobeni: sedge meadow, *Caricetum rostratae* (L)(1999); RO: Voslobeni: wet pasture, *Agrostio-Deschampsietum caespitosae* (L)(1999).

Myrmica specioides Bondroit, 1918

(= *Myrmica sancta* Karaw.: Gallé 1972b)

General remarks: On the basis of known distribution so far, a European species of thermophilous (“euryoecic eremophilous”) ecofaunistical character. This is one of the most typical ants for loess grasslands, tumuli and dike slope meadows of loess-like vegetation.

Localities: II. Tiszafüred: Tiszaörvény, dike slope meadow (L)(1969, 1970, Gallé 1972b); Besenyszög: Szórópuszta: floodplain, softwood forest, *Salicetum albae-fragilis*(R)(2003); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicolae* (L) (Kovács 2001); Cserkeszőlő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agrophyretum intermedii* (L) (Kovács 2001).

III. Szentes: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Szentes: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár: dike slope meadow (R)(1973); Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Ópusztaszer: Baksi-puszta, Hosszúhát, protected floodplain, loess pasture (R) (Kovács 2001); Pusztaszer: Büdösszék, saline meadow, *Lepidio-Puccinellietum limosae*, *Camphorosmetum annuae* (R) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Tömörkény: Aranyhalom, protected floodplain, tumulus, steppe-meadow (R) (Kovács 2001); Baks: Ányás, protected floodplain, meadow (R)(2004); Mártély: dike slope meadow (L)(1971); Hódmezővásárhely: Körtvélyes, Hunyadi-halom, floodplain meadow, *Alopecuretum pratensis* (L)(1996).

XI. Maroslele: Vetyehát, protected floodplain, pasture (R)(2001).

Myrmica schencki Emery, 1895

General remarks: A Palaearctic species, which is restricted to the southern part of Siberia in Asia. Although mesophilous, it is rather stenotopic (“stenoecic intermediary”) species, the characteristic habitats of which are the wind furrows between the sand dunes in the Hungarian Great Plain. Rare along Tisza River.

Localities: I. Tiszalúc: Kocsordos, dike slope meadow exposed to floodplain (R)(1994); Tiszalúc: Kocsordos, dike slope meadow (R)(1994); Tiszalúc: Kocsordos, protected floodplain, meadow at the dike.

III. Szentés: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001).

XI. RO: Voslobeni: drier pasture, *Agrostio-Festucetum rubrae* (L)(1999).

Messor structor (Latreille, 1798)

General remarks: A thermophilous-xerotolerant (“stenoecic eremophilous”), Mediterranean species. In the Tisza valley, it occurs on the dike-tops, typically in *Schlerochloo-Polygonetum avicularis* vegetation and on tumuli in the protected floodplain. The distribution of *Messor structor* is supported by its stripe-like habitats (dikes) and stepping stones (tumuli). As a southern element, absent from the Upper-Tisza district. On the basis of our present knowledge of the taxonomical state of the genus *Messor* in Hungary, we regard all *Messor* records by the Tisza as *structor*, but a taxonomic revision of the Central European *Messor* species (in preparation by Markó and Csósz) could reveal more species.

Localities: II. Tiszafüred: Tiszaörvény, dike slope meadow (L)(1970, Gallé 1972b); Tizsakürt: top of dike, *Schlerochloo-Polygonetum avicularis* (L)(Gallé 1967); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicola* (L) (Kovács 2001); Cserkeszőlő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agrophyretum intermedii* (L) (Kovács 2001).

III. Szentés: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Szentés: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár, top of dike, *Schlerochloo-Polygonetum avicularis* (R)(1973 and Gallé 1966b); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Algyő (R)(Gallé 1966b); Algyő: Sasér top of dike, *Schlerochloo-Polygonetum avicularis* (R)(Gallé 1966b); Algyő: top of dike, *Schlerochloo-Polygonetum avicularis* (R)(1965); Szeged: Nagyfa (L)(Gallé 1966b); Szeged: Tápé, Vesszős, top of dike, *Schlerochloo-Polygonetum avicularis* (R)(Gallé 1966b); Szeged: dike slope meadow and top of dike, *Schlerochloo-Polygonetum avicularis* (R)(Gallé 1966b).

X.2. RO: Ciucea (Markó 1997); RO: Vadu Crişului (Markó 1997).

Solenopsis fugax (Latreille, 1798)

(= *Diplorhoptrum fugax* Latreille: Markó 1999)

General remarks: Central and southern European species, the eastern distribution border of which reaches western Siberia. Extreme eurytopic (“hypereuryoecic intermediary”) grassland species, which is fairly common everywhere by the Tisza River. As a considerable part of the ant collections were made by pitfall trap sampling, which method is not sensitive to such underground species like *Solenopsis*, we can suppose even more localities than given below. Similarly to the former species, a taxonomic revision could split this species into two or more.

Localities: I. Tiszaszalka: dike slope meadow, *Alopecuretum pratensis ranunculetosum acris* (R)(Gallé and Gausz 1968); Tiszaszalka: protected floodplain, meadow (R)(Gallé and Gausz 1968); Vásárosnamény: Gergelyiugornya, dike slope meadow, *Alopecuretum pratensis festucetosum pseudovinae* (R)(1967); Tiszakarád: floodplain (R)(1964, Gallé 1966b); Tiszadob (R)(1963, Gallé 1966b); Tiszadob: Taktaköz, floodplain (R)(1963, Gallé 1966b); Tiszalúc: Kocsordos, protected floodplain, meadow (R)(1994); Tiszalúc: Kocsordos, protected floodplain, hill-top, dry meadow (R)(1994); Tiszalúc: Kocsordos, protected floodplain, softwood edge (R)(1994); Tiszalúc: Kocsordos, dike slope meadow exposed to floodplain (R)(1994); Tiszalúc: Kocsordos, dike slope meadow (R)(1994); Taktaharkány: protected floodplain, meadow (R)(1994); Taktaharkány: dike slope meadow ((R)(1994); Tiszalúc: dike slope meadow exposed to the protected floodplain (R)(1994); Tiszalúc: Kocsordos, protected floodplain, meadow at the dike.

II. Tiszafüred: dike slope meadow (L)(1969); Tiszafüred: Tiszaörvény, dike slope meadow (L)(1969, 1970, Gallé 1972b); Kisköre: dike slope meadow (L) (Gallé 1969); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003); Tizsakürt: dike slope meadow, *Alopecuretum pratensis Arrhenatherum elatius* facies (L)(1967); Tizsakürt: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L)(1966, see Gallé 1967); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicola* (L) (Kovács 2001); Cserkeszölő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agropyretum intermedii* (L) (Kovács 2001).

III. Szentés: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Szentés: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár: dike slope meadow (R)(1973); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér; degraded meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Várháti gyeplő, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Tömörkény:

Aranyhalom, protected floodplain, tumulus, steppe-meadow (R) (Kovács 2001); Ópusztaszer: Baksi-puszta, Hosszúhát, protected floodplain, loess pasture (R) (Kovács 2001); Pusztaszer: Csikójárás, protected floodplain, pasture, *Salvio-Festucetum rupicolae* (R) (Kovács 2001); Pusztaszer: Büdösszék, saline meadow, *Lepidio-Puccinellietum limosae*, *Camphorosmetum annuae* (R) (Kovács 2001); Baks: Anyás, protected floodplain, softwood forest (R)(2004); Baks: Anyás, protected floodplain, meadow (R)(2004); Mártély: dike slope meadow (L)(1971); Dóc: protected floodplain, *Festuca pseudovina* and *Alopecurus pratensis* meadow (R) (Kovács 2001); Algyő: dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Gallé 1966b); Algyő: Sasér, dike slope meadow (R)(Gallé 1966b); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1965, Gallé 1966b).

V. RO: Someş-Odorhei: sandy riverbank (1996) (Markó 1999); RO: Vetiş: sandy riverbank (1996) (Markó 1999).

X.2. RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997); RO: Vadu Crişului (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, dike slope meadow (2003, 2004, Szász 2005).

XI. Ro: Lunca Bradului (1999); RO: Ilia: wooded pasture (2002); RO: Ilia: dike slope meadow (2002); RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Maroslele: Vetyehát, dike slope meadow (R)(2001); Szeged: Vetyehát, protected floodplain, weedy meadow (R) (Kovács 2001).

Myrmecina graminicola (Latreille 1802)

General remarks: An ant species with disrupted distribution pattern in Europe and in the Far East, but the taxonomic status of the latter form is questionable (Czechowski et al 2002). Mesophilous (“stenoecic intermediary”) species, which lives in dike slope meadows, tumuli and other habitats covered by mesophilous and xerotolerant grassy vegetation and occasionally in floodplain forests.

Localities: I. Tiszadob: Taktaköz, floodplain (R)(1963, Gallé 1966b); Taktaharkány: protected floodplain, meadow (R)(1994); Taktaharkány: protected floodplain, meadow (R)(1994).

II. Tiszafüred: Tiszaörvény, dike slope meadow (L)(1970, Gallé 1972b); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicolae* (L) (Kovács 2001); Cserkeszőlő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agropyretum intermedii* (L) (Kovács 2001).

III. Szentes: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain

meadow, *Agropyretum repentis* (L) (Kovács 2001); Mindszent: Kurca-rét, dry meadow, *Carici-Alopecuretum pratensis* (Kovács 2001); Pusztaszer: Újmajor, protected floodplain, old oak forest (R) (Kovács 2001).

V. RO: Arduzel: oak forest (1996) (Markó 1999).

X.3.a. Gyula: Mályvád, protected floodplain, virgin oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, ash forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (2003, 2004, Szász 2005).

XI. Szeged: Vetyehát, floodplain, poplar forest *Salicetum albae-fragilis* (R) (Kovács 2001).

Leptothorax unifasciatus (Latreille, 1798)

(= *Leptothorax tuberum unifasciatus* Latr.: Gallé and Gausz 1968)

General remarks: Eurytopic species with slight hygrophilous requirements (“euryoecic hylophilous”), which is found in deciduous and coniferous forests in Hungary. As the majority of forests are exposed to severe inundations in the flood area of Tisza River, their ant fauna is rather poor, as a rule. In addition, the richness of the arboricolous ant fauna of these forests could be underestimated because of the pitfall sampling. Therefore, there are only a few known localities of *Leptothorax unifasciatus* and the ecologically related species.

Localities: II. Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur*(L)(2003).

III. Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Baks: Ányás, floodplain, forest, *Salicetum albae-fragilis* (R)(2004); Mindszent: floodplain, cleared forest (L)(2004).

X.2. RO: Șuncuiuș (Paraschivescu and Arcașu 1976, cited by Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, oak forest (1996, 1997); Gyula: Marói erdő, protected floodplain oak forest (1996, 1997).

Leptothorax interruptus (Schenck, 1852)

General remarks: A forest species in Hungary, which is not common in the Great Hungarian Plain. The general geographic distribution is similar to *L. unifasciatus*, but it does not reach the Caucasus.

Localities: III. Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001).

Leptothorax crassispinus Karavaiev, 1926

(= *Leptothorax nylanderii* Forel: Gallé 1966a, Markó 1999)

General remarks: As it had been regarded as *Leptothorax nylanderii* (Förster, 1850) later on as *Leptothorax slavonicus* Seifert, 1996, the distribution type

and especially the ecological character of this species is not sure. It seems that the geographic range of this species is in the central and eastern part of Europe. It is one of the commonest forest ants in the Great Hungarian Plain, the majority of the *Leptothorax* individuals collected on the forest soil surface belong to this species. Its occurrence is restricted along the Tisza River because of the frequent inundations.

Localities: I. Kistar: floodplain, orchard (L)(2002).

II. Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003).

III. Lakitelek: Töserdő, floodplain hardwood forest (R) (Kovács 2001); Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Petres-erdő, floodplain forest, *Populus alba* (L) (Kovács 2001); Dóc: Bibicháti-erdő, protected floodplain, oak forest (R) (Kovács 2001); Algyő: Sasér, mixed floodplain forest (R) (Kovács 2001).

V. RO: Arduzel: oak forest (1996) (Markó 1999).

X.3.a. Gyula: Marói erdő, oak forest (1996, 1997); Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, ash forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (2003, 2004, Szász 2005).

XI. Maroslele: Vetyehát, floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2001).

***Leptothorax affinis* Mayr, 1855**

General remarks: The typical habitats of this Euro-Caucasian species are the scattered willow trees in the meadows and occasionally the open forests in the floodplains and protected floodplains by Tisza River.

Localities: II. Kesznyéten: Inérhát, protected floodplain, meadow with scattered willow trees (R)(1994, 1995).

X.3.a. Gyula: Marói erdő, oak forest (1996, 1997); Gyula: Mályvád, protected floodplain, oak forest (1996, 1997).

XI. RO: Secusgiu: Munar, Bezdin, floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2000).

***Stenammina debile* Förster, 1850**

General remarks: The classical locality of this species is oak forest, very rare along the Tisza River.

Localities: V. RO: Someş-Odorhei: sandy riverbank (1996) (Markó 1999); RO: Arduzel: oak forest (1996) (Markó 1999).

X.3.a. Gyula: Marói erdő, oak forest (1996, 1997); Gyula: Mályvád, protected floodplain, oak forest (1996, 1997).

Cardiocondyla sahlbergi Forel, 1913

General remarks: A very rare species in the Carpathian Basin with only one known locality. Since the time it was collected, the habitat was destroyed.

Locality: III. Szeged, dike slope, road-side (R)(1992).

Tetramorium caespitum (Linnaeus, 1758)

General remarks: A Palearctic, eurytopic (“hypereuryoecic intermediary”), species, which is perhaps the most common ant in the Carpathian Basin. In the Tisza district, the dike tops (with *Schlerochloo-Polygonetum avicularis* ecotones), dike slopes with open weedy vegetation, tumuli and secondary successional grasslands are the most frequent habitats of *Tetramorium caespitum*.

Localities: I. Tizzaszalka: dike slope meadow (R)(2002); Vámosatya: Bockerek, protected floodplain, hardwood forest (R)(2002); Tizzaszalka: dike slope meadow, *Alopecuretum pratensis ranunculetosum acris* (R)(Gallé and Gausz 1968); Tizzaszalka: protected floodplain, meadow (R)(Gallé and Gausz 1968); Vásárosnamény: Gergelyugornya, dike slope meadow, *Alopecuretum pratensis festucetosum pseudovinae* (R)(1967); Tizsakarád: floodplain (R)(1964, Gallé 1966b); Tizsadorb (R)(1963, Gallé 1966b); Tizsadorb: Taktaköz, floodplain (R)(1963, Gallé 1966b); Tizsalúc: Kocsordos, protected floodplain, hill-top, dry meadow (R)(1994); Tizsalúc: Kocsordos, protected floodplain, softwood edge (R)(1994); Tizsalúc: Kocsordos, dike slope meadow exposed to floodplain (R)(1994); Tizsalúc: Kocsordos, dike slope meadow (R)(1994); Tizsalúc: Kocsordos, protected floodplain, meadow at the dike; Tizsalúc: Kocsordos, protected floodplain, meadow at the dike.

II. Tiszafüred: Tiszaörvény, dike slope meadow (L)(1970, Gallé 1972b); Kisköre: dike slope meadow (L) (Gallé 1969); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003); Rákóczifalva: floodplain meadow (L) (2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003); Tizsakürt: top of dike, *Schlerochloo-Polygonetum avicularis* (L)(1966 see Gallé 1967); Tizsakürt: dike slope meadow, *Cynodonti-Poetum angustifoliae* and *Alopecuretum pratensis* (L) (1966); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicola* (L) (Kovács 2001); Cserkeszölő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agrophyretum intermedii* (L) (Kovács 2001).

III. Szentes: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Szentes: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár: dike slope meadow (R)(1973); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér; degraded meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum*

repentis (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Tömörkény: Aranyhalom, protected floodplain, tumulus, steppe-meadow (R) (Kovács 2001); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Ópusztaszer: Baksi-pusztá, Hosszúhát, protected floodplain, loess pasture (R) (Kovács 2001); Pusztaszer: Büdösszék, saline meadow, *Lepidio-Puccinellietum limosae*, *Camphorosmetum annuae* (R) (Kovács 2001); Mindszent: Kurca-rét, wet meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Mindszent: floodplain, cleared forest (L)(2004); Mindszent: floodplain, softwood forest (L)(2004); Baks: Ányás, floodplain, forest, *Salicetum albae-fragilis* (R)(2004); Baks: Ányás, protected floodplain, meadow (R)(2004); Mártély: dike slope meadow (L)(1971); Algyő: dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Gallé 1966b); Algyő: Sasér, dike slope meadow (R)(Gallé 1966b); Szeged: Nagyfa (L)(Gallé 1966b); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(Gallé 1966b); Szeged: dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(Gallé 1966b); Mindszent: Kurca-rét, dry meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Pusztaszer: Újmajor, protected floodplain, old oak forest (R) (Kovács 2001); Dóc: protected floodplain, *Festuca pseudovina* and *Alopecurus pratensis* meadow (R) (Kovács 2001); Tiszasziget: floodplain, hardwood forest (L)(2004).

V. RO: Letca: sandy riverbank (1996) (Markó 1999); RO: Someș-Odorhei: sandy riverbank (1996) (Markó 1999); RO: Ticău: sandy riverbank (1996) (Markó 1999); RO: Arduzel: oak forest (1996) (Markó 1999); RO: Vetiș: sandy riverbank (1996) (Markó 1999).

X.2. RO: The Dragan Creek (Markó 1997); RO: Șaulia (Markó 1997); RO: Ciucea (Markó 1997); RO: Șuncuiuș (Paraschivescu and Arcașu 1976, cited by Markó 1997); RO: Vadu Crișului (Markó 1997); RO: Aleșd (Markó 1997); Fughiu (Markó 1997); RO: Oradea (Paraschivescu and Arcașu 1976, cited by Markó 1997); RO: Cheresig (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, virgin oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, meadow (2003, 2004, Szász 2005); Gyula: Mályvád, dike slope meadow (2003, 2004, Szász 2005).

XI. RO: Voslobeni: stone mine (1999); RO: Valea Rece, meadow (1999); Ro: Ciobotani, riverside, meadow (1999); Ro: Ciobotani, riverside, degraded meadow (1999); RO: Lunca Bradului (1999); RO: Ilia: wooded pasture (2002); RO: Ilia: dike slope meadow (2002); RO: Dobra: hillside, meadow; RO: Sălvica: floodplain, meadow; RO: Sălvica: protected floodplain, wet meadow; RO: Sălvica: floodplain, meadow with *Salix cinerea* bushes; RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, protected floodplain, wet meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain, hardwood forest (L)(2000); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Maroslele: Vetyehát, floodplain meadow, *Alopecuretum pratensis* (R)(2001); Maroslele: Vetyehát, dike slope meadow (R)(2001); Maroslele: Vetyehát, protected floodplain, pasture (R)(2001); Szeged:

Vetyehát, dike slope meadow *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szeged: Vetyehát, protected floodplain, weedy meadow (R) (Kovács 2001).

Tetramorium impurum (Förster 1850)

General remarks: Formerly almost all ants belonging to the genus *Tetramorium* were regarded as *T. caespitum* and *T. impurum* was expected only from mountains higher than found in Hungary. Present inventories revealed that this species is not rare in lower altitudes and even in towns (Csősz, personal communication). It was a surprise to find this species by the Tisza River and the color of the specimens collected at the Upper-Tisza region is not typical for *impurum*, either. For the distribution of *T. impurum*, there are only European data.

Localities: I. Tizzaszalka: dike slope meadow (R)(2002); Eperjeske: protected floodplain, pasture (L)(2002).

XI. RO: Voslobeni: meadow (1999);.

Anergates atratulus (Schenck 1852)

General remarks: A Euro-Siberian species. Its localities range from sand-dune habitats to flood areas, from the whole area of Hungary within the Carpathian Basin, but it is regarded as a rare species. The reason could be that as a workerless parasite, it is more difficult to collect than other ants with different biology.

Localities: I. Tiszalúc: Kocsordos, protected floodplain, hill-top, dry meadow (R)(1994); Tiszalúc: Kocsordos, dike slope meadow exposed to floodplain (R)(1994).

Dolichoderus quadripunctatus (Linnaeus, 1758)

General remarks: Southern Euro-Siberian arboricolous and thermophilous (“euryoecic eremophilous”) species occurring almost everywhere in the Carpathian Basin. It is one of the most common tree living ants in Hungary.

Localities: I. Kisar: floodplain, orchard (L)(2002); Vásárosnamény: Gergelyugornya, Bagiszeg, floodplain, hardwood forest (R)(Gallé and Gausz 1968); Tiszalúc: Kocsordos, protected floodplain, oak forest (R)(1994).

II. Kisköre: floodplain forest (L) (Gallé 1969); Besenyszög: Szórópuszta: floodplain, softwood forest, *Salicetum albae-fragilis*(R)(2003); Besenyszög: Szórópuszta: floodplain, hardwood forest, *Quercus robur*(R)(2003); Besenyszög: Szórópuszta: floodplain, hybrid poplar plantation (R)(2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003); Rákóczifalva: dike slope meadow (L)(2003).

III. Lakitelek: Tóserdő, floodplain hardwood forest (R) (Kovács 2001); Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Szentés: floodplain, softwood forest, *Salicetum albae-fragilis* (L) (2004); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Pusztaszer: Újmajor, protected floodplain, old oak forest (R) (Kovács 2001); Mindszent: floodplain, poplar plantation (L)(2004). Mindszent: floodplain, softwood forest (L)(2004); Baks: Anyás, protected floodplain, softwood forest (R)(2004); Baks: Anyás, floodplain, forest,

Salicetum albae-fragilis (R)(2004); Dóc: Bibicháti-erdő, protected floodplain, oak forest (R) (Kovács 2001); Hódmezővásárhely: Babos-erdő, floodplain, oak forest (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Petres-erdő, floodplain forest, *Populus alba* (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Tére-part, floodplain, old oak forest (L) (Kovács 2001); Algyő: floodplain forest, *Salicetum albae-fragilis* (R)(1965, 2004, Gallé 1966b); Algyő: Sasér, floodplain forest, *Salicetum albae-fragilis* (R)(Gallé 1966b); Algyő: Sasér, mixed floodplain forest (R)(1965, Kovács 2001); Szeged: Nagyfa: floodplain forest, *Salicetum albae-fragilis* (L)(Gallé 1966b); Tiszasziget: floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2004); Tiszasziget: floodplain, hardwood forest (L)(2004).

V. RO: Arduzel: oak forest (1996) (Markó 1999).

X.3.a. Gyula: Mályvád, protected floodplain, virgin oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, ash forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (1996, 1997, 2003, 2004: Szász 2005).

XI. RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, protected floodplain, wet meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain, hardwood forest (L)(2000); RO: Secusigiu: Munar, Bezdin, Tábor-erdő, protected floodplain, hardwood forest (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain meadow (L)(2000); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Makó: Landor, floodplain, *Salicetum albae-fragilis* with *Fraxinus* (L) (Kovács 2001); Maroslele: Vetyehát, floodplain, hardwood forest, *Fraxino pannonicæ-Ulmetum* with planted oak, *Quercus robur*(R) (2001); Maroslele: Vetyehát, floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2001); Szeged: Vetyehát, floodplain, poplar forest *Salicetum albae-fragilis* (R) (Kovács 2001); Szeged: Vetyehát, floodplain, old poplar tree (R)(1965).

Liometopum microcephalum (Panzer, 1798)

General remarks: Rather stenotopic (“stenoecic eremophilous”) ant with South and Central European distribution. Its northernmost occurrence in Central Europe is in Czech Republic (Omelkova et al 2005). The distribution pattern of *L. microcephalum* is scattered in the Carpathian Basin. This dendrophilous ant is well associated with *Quercus robur* oak forests (e.g. of *Covallario-Quercetum* and *Festuco-Quercetum* phytosociological types) in the Great Hungarian Plain and with karst bush forests in Sub-Mediterranean regions.

Localities: I. Túrístvándi: Rókás legelő (2002); Tiszadob: food plain oak forest (1994); Tiszadob: castle park (1994, 1995).

X.3.a. Gyula: Mályvád, protected floodplain, virgin oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (2003, 2004, Szász 2005); Gyula: Marói erdő, oak forest (1996, 1997).

XI. Makó: Landor, floodplain, *Salicetum albae-fragilis* with *Fraxinus* (L) (Kovács 2001); RO: Secusigiu: Munar, Bezdin, floodplain, hardwood forest (L)(2000).

Tapinoma ambiguum Emery, 1925

(= *Tapinoma erraticum* Latr.: Gallé 1966b, Gallé and Gausz 1968)

General remarks: Mediterranean species, which prefers the dry and warm habitats (“euryoecic eremophilous”). Typical in the Sub Mediterranean grasslands, dike slope of southern exposure, tumuli and harder soil wind furrows between sand dunes. In the most cases it co-occurs with *Tetramorium caespitum*.

Localities: I. Tiszaszalka: dike slope meadow (R)(1967, 2002); Tiszalúc: Kocsordos, dike slope meadow (R)(1994).

II. Rákóczi-falva: dike slope meadow (L)(2003); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicola* (L) (Kovács 2001)

III. Lakitelek: Tőserdő, wet meadow, *Agrosti-Alopecuretum pratensis* (R) (Kovács 2001); Szentes: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Szentes: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér; degraded meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Várháti gyep, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Mindszent: Kurca-rét, wet meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Mindszent: Kurca-rét, dry meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Mindszent: floodplain, cleared forest (L)(2004); Ópusztaszer: Baksipusztá, Hosszúhát, protected floodplain, loess pasture (R) (Kovács 2001); Baks: Ányás, protected floodplain, meadow (R)(2004); Dóc: protected floodplain, *Festuca pseudovina* and *Alopecurus pratensis* meadow (R) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Szeged: Tápé, Vesszős, dike slope meadow (R)(1965).

X.3.a. Gyula: Mályvád, dike slope meadow (2003, 2004, Szász 2005).

XI. Maroslele: Vetyehát, dike slope meadow (R)(2001); Maroslele: Vetyehát, protected floodplain, pasture (R)(2001); Szeged: Vetyehát, floodplain, poplar forest *Salicetum albae-fragilis* (R) (Kovács 2001); Szeged: Vetyehát, protected floodplain, weedy meadow (R) (Kovács 2001).

Tapinoma erraticum (Latreille, 1798)

General remarks: Southern European ant species. Its life history and ecological requirements are similar to the former one.

Localities: I. Tiszaszalka: dike slope meadow (R)(2002); Eperjeske: protected floodplain, pasture (L)(2002); Tiszalúc: Kocsordos, dike slope meadow

exposed to floodplain (R)(1994); Tiszalúc: Kocsordos, dike slope meadow (R)(1994); Tiszalúc: Kocsordos, protected floodplain, meadow at the dike.

II. Cserkeszőlő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agropyretum intermedii* (L) (Kovács 2001); Tiszafüred: dike slope meadow (L)(1969).

III. Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001).

X.2. RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997);

X.3.a. Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, meadow (1996, 1997, 2003, 2004, Szász 2005); Gyula: Mályvád, dike slope meadow (2003, 2004, Szász 2005).

XI. RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain, hardwood forest (L)(2000); Szeged: Vetyehát, dike slope meadow *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001).

Plagiolepis pygmaea (Latreille, 1798)

General remarks: Termophilous-xerotolerant (“stenoecic eremophilous”) species, with Southern European distribution. Along the Tisza valley, it is typical for the dry grasslands with high soil temperature in the summer (e.g. dike slopes with southern and eastern exposure, tumuli). In the sand-dune areas *P. pygmaea* is replaced by *P. vindobonensis*.

Localities: **II.** Rákóczifalva: dike slope meadow (L)(2003); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicolae* (L) (Kovács 2001); Cserkeszőlő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agropyretum intermedii* (L) (Kovács 2001); Tizsakürt: dike slope meadow (L)(1966); Tiszafüred: dike slope meadow (L)(1969).

III. Szentes: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Szentes: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér; degraded meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Algyő: dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Gallé 1966b); Algyő: Sasér, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(Gallé 1966b); Szeged: Nagyfa (L)(Gallé 1966b); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1965, Gallé 1966b); Szeged: dike slope meadow (R)(Gallé 1966b); SMN: Senta (Zenta)(R)(Gallé 1966b).

X.2. RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, dike slope meadow (2003, 2004, Szász 2005).

XI. RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Maroslele: Vetyehát, dike slope meadow (R)(2001); Szeged: Vetyehát, dike slope meadow *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001).

Plagiolepis vindobonensis Lomnicki, 1925

General remarks: Both its ecological requirements and life history are similar to that of the former species, but *P. vindobonensis* occurs also in sand dunes. Formerly, in the sixties no *Plagiolepis* sp. was known from the Upper-Tisza district (cf. Gallé 1966a, Gallé and Gausz 1968), in 2002, however we found *P. vindobonensis* in two localities there. The Tizzaszalka habitat was just the same as it had been sampled in 1967 (Gallé and Gausz 1968), and as the sampling efforts were comparable in the two periods, it probably colonized at Upper Tisza during the last decades.

Localities: I. Tizzaszalka: dike slope meadow (R)(2002); Kisar: floodplain, orchard (L)(2002); Tiszalúc: Kocsordos, protected floodplain, softwood edge (R)(1994); Taktaharkány: protected floodplain, meadow (R)(1994); Tiszalúc: dike slope meadow exposed to the protected floodplain (R)(1994).

II. Tiszafüred: dike slope meadow (L)(1969); Tiszafüred: Tiszaörvény, dike slope meadow (L)(1970, see Gallé 1972b); Tizsakürt: dike slope meadow, *Alopecuretum pratensis Arrhenatherum elatius* facies (L)(1967); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003).

III. Szentés: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Felgyő: Labodár: dike slope meadow (R)(1973); Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Tömörkény: Aranyhalom, protected floodplain, tumulus, steppe-meadow (R) (Kovács 2001); Pusztaszer: Csikójárás, protected floodplain, pasture, *Salvio-Festucetum rupicola* (R) (Kovács 2001); Pusztaszer: Büdösszék, saline meadow, *Lepidio-Puccinellietum limosae, Camphorosmetum annuae* (R) (Kovács 2001); Ópusztaszer: Baksi-puszta, Hosszúhát, protected floodplain, loess pasture (R) (Kovács 2001); Mártély: dike slope meadow (L)(1971); Dóc: protected floodplain, *Festuca pseudovina* and *Alopecurus pratensis* meadow (R) (Kovács 2001); Szeged: Algyő, Vesszős., protected floodplain grassland (R) (1965).

X.3.a. Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, dike slope meadow (2003, 2004, Szász 2005).

Prenolepis nitens (Mayr, 1852)

General remark: The only locality of this species is by the Szamos/Somes River.

Locality: RO: Arduzel: oak forest (1996) (Markó 1999).

Camponotus truncatus (Spinola, 1808)

General remarks: Southern Palaearctic, thermophilous (“euryoecic eremophilous”) species, which occurs in floodplain forests, scattered trees in meadows or lonely trees, also in the protected floodplains.

Localities: I. Barabás: Lónyai-erdő, protected floodplain, oak forest (R) (2001); Kisar: floodplain, orchard (L)(2002); Tiszadob: Taktaköz, floodplain orchard (R)(1963, Gallé 1966a).

II. Pusztataskony: protected floodplain: pine forest (L)(Gallé 1969).

III. Lakitelek: Tőserdő, *Thelypteridi-Alnetum* (R) (Kovács 2001); Lakitelek: Tőserdő, floodplain hardwood forest (R) (Kovács 2001); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Szeged: Nagyfa (L)(Gallé 1966b); Tiszasziget: floodplain, hardwood forest (L)(2004).

V. RO: Arduzel: oak forest (1996) (Markó 1999).

X.3.a. Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (2003, 2004, Szász 2005); Gyula: Marói erdő, oak forest (1996, 1997).

XI. Makó: Landor, floodplain, *Salicetum albae-fragilis* with *Fraxinus* (L) (Kovács 2001); Maroslele: Vetyehát, floodplain, hardwood forest, *Fraxino pannonicae-Ulmetum* with planted oak, *Quercus robur*: (R)(2001); Maroslele: Vetyehát, floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2001).

Camponotus ligniperda Latreille, 1802

General remarks: An ant species with European distribution. In Hungary this is a typical mountain ant, exceptional in the plain, therefore very rare at Tisza valley.

Localities: X.2. RO: The Dragan Creek (Markó 1997); RO: Ciucea (Markó 1997).

Camponotus herculeanus Linnaeus, 1758

General remarks: Boreo-mountain ant species found in the highest mountains in the Carpathian Basin. Its ecological tolerance is narrower than that of *C. ligniperda* (“stenoecic hylophilous”). There is only one recorded locality in the Tisza basin, at Körös/Criş River.

Localities: X.2. RO: Ciucea (Markó 1997).

XI. RO: M. Calimani: Ilva stream valley (1999).

Camponotus vagus (Scopoli, 1763)

General remarks: Thermophilous and xerotolerant (“euryoecic eremophilous”) ant species with rather restricted Euro-Siberian distribution. In the Carpathian Basin it is common in warm and dry habitats, e.g. southern slope of the

mountains and especially in sand-dune forest edges etc. At the floodplains of Tisza River it is very rare.

Localities: II. Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur*(L)(2003).

III. Tiszasziget: floodplain, hardwood forest (L)(2004).

Camponotus fallax (Nylander, 1856)

(= *Camponotus caryae* Fitch.: Gallé 1966b)

(= *Camponotus caryae fallax* Latr.(sic!): Gallé and Gausz 1968)

(= *Camponotus caryae* Fitch. var. *fallax* Nyl.: Gallé 1969)

General remarks: “Euryoecic eremophilous” species with European or Euro-Siberian distribution. This species, nesting in the holes of dead tree branches, is associated with woodlands and meadow-like habitats with scattered trees along Tisza valley.

Localities: I. Kisar: floodplain, orchard (L)(2002); Tiszaszalka: dike slope meadow near the softwood forest (R)(1967).

II. Kesznyéten: Inérhát, protected floodplain, meadow with scattered allow trees (1994, 1995); Kisköre: floodplain forest (L) (Gallé 1969); Besenyszög: Szórópuszta: floodplain, hardwood forest, *Quercus robur*(R)(2003); Cserkeszölő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agropyretum intermedii* (L) (Kovács 2001).

III. Lakitelek: Tőserdő, floodplain hardwood forest (R) (Kovács 2001); Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Pusztaszer: Újmajor, protected floodplain, old oak forest (R) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Tére-part, floodplain, old oak forest (L) (Kovács 2001); Szeged: Tápé, Vesszős, (R)(Gallé 1966b); Szeged: Tápé, Vesszős, protected floodplain, *Salix alba* (R)(Gallé 1966b).

V. RO: Arduzel: oak forest (1996) (Markó 1999).

X.3.a. Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (1996, 1997, 2003, 2004, Szász 2005); Gyula: Marói erdő, oak forest (1996, 1997).

XI. Makó: Landor, floodplain, *Salicetum albae-fragilis* with *Fraxinus* (L) (Kovács 2001); Szeged: Vetyehát, floodplain, poplar forest *Salicetum albae-fragilis* (R) (Kovács 2001).

Camponotus piceus (Leach, 1825) / ***Camponotus atricolor*** (Nylander, 1849)

(= *Camponotus lateralis* Ol.: Gallé 1967)

(= *Camponotus lateralis* Ol. var. *piceus* Leach.: Gallé 1969)

(= *Camponotus lateralis piceus* Leach.: Gallé 1972b)

General remarks: Formerly all *Camponotus* species belonging to the *lateralis* group were referred to as *C. piceus* or formerly as *C. lateralis* var. *piceus* from the Tisza region. As it has been evident that at least a part of *Camponotus* specimens of this group belongs to *C. atricolor* species from Hungarian localities

(Seifert 1996) we can suppose that the majority of formerly identified specimens are *C. atricolor*. As a part of the materials collected or observed decades ago is not available, here we treat these two species together. By recent samplings, however, in almost all cases we found only *atricolor*. Both species are of southern distribution and euryoecic eremophilous, but their exact distribution is not known because of the former confusions. We have not had record of either species in the northernmost localities by the Tisza River (i.e. Upper-Tisza district).

Localities: II. Kisköre: dike slope meadow (L) (Gallé 1969); Tizsakürt: dike slope meadow, *Alopecuretum pratensis Arrhenatherum elatius* facies (L)(1967); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicolae* (L) (Kovács 2001).

III. Szentés: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Ópusztaszer: Baksi-puszta, Hosszúhát, protected floodplain, loess pasture (R) (Kovács 2001); Dóc: protected floodplain, *Festuca pseudovina* and *Alopecurus pratensis* meadow (R) (Kovács 2001).

X.2. RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997); RO: Oradea (Paraschivescu and Arcaşu 1976, cited by Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, dike slope meadow (2003, 2004, Szász 2005).

XI. RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Maroslele: Vetyehát, protected floodplain, pasture (R)(2001).

Camponotus atricolor (Nylander, 1849)

Known localities so far: II. Tiszafüred: dike slope meadow (L)(1969); Tiszafüred: Tiszaörvény, dike slope meadow (L)(1970, see Gallé 1972b); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003); Tizsakürt: dike slope meadow (L)(1966); Tizsakürt: floodplain, *Populus alba* trunk (L)(1966).

Camponotus aethiops (Latreille, 1798)

General remarks: South-European, thermophilous (“euryoecic eremophilous”) species. Although occurring in the “warm” habitats in the Hungarian Great Plain, it is more typical for the Sub-Mediterranean rocky grasslands and bush-forests.

Locality: X.2. RO: Oradea (Paraschivescu and Arcaşu 1976, cited by Markó 1997).

Lasius fuliginosus (Latreille, 1798)

General remarks: A Palaearctic, dendrophilous species with thermomesophilous (“euryoecic eremophilous”) ecofaunistic character. As the flood threatens its big colonies, it is not so widespread species along Tisza River as it could be expected on the basis of its commonness in the Great Hungarian Plain.

Localities: I. Kisar: floodplain, orchard (L)(2002); Vásárosnamény: Gergelyugornya, Bagiszeg, floodplain, hardwood forest (R)(Gallé and Gausz 1968); Tiszadob: Taktaköz, floodplain orchard (R)(1963, Gallé 1966a); Tiszadob: Taktaköz, protected floodplain, by a backwater (R)(1963, Gallé 1966b).

II. Kesznyéten: Inérhát, protected floodplain, meadow with scattered willow trees (R)(1994, 1995); Tiszafüred: floodplain softwood forest, *Salix alba* trunk (L)(1969).

III. Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Mindszent: floodplain, poplar plantation (L)(2004); Pusztaszer: Újmajor, protected floodplain, old oak forest (R) (Kovács 2001); Dóc: Bibicháti-erdő, protected floodplain, oak forest (R) (Kovács 2001); Szeged: Algyő-Vesszős, protected floodplain, willow trunk (R)(1965); Szeged: Tápé, Vesszős, protected floodplain, willow trunk (R)(1965).

X.2. RO: Bologa (Markó 1997); RO: Ciucea (Markó 1997); RO: The Criş Strait (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, oak forest edge (1996, 1997); Gyula: Mályvád, protected floodplain, oak forest (2003, 2004, Szász 2005).

XI. RO: Secusigiu: Munar, Bezdin, floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain, hardwood forest (L)(2000); Maroslele: Vetyehát, floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2001).

Lasius niger (Linnaeus, 1758)

General remarks: According to Seifert’s revision and keys (Seifert 1992, 1996), the formerly distinguished two “black” Middle-European *Lasius* species (*L. niger* and *L. alienus*) are split into five and the former “*niger*” is divided into two species. After the separation of *niger* and *platythorax* (Seifert 1991), it has become clear that both species occur by the Tisza River, *niger* prefers wetter grasslands and one of the commonest ant species in dike slope meadows, whereas *platythorax* is mostly a woodland ant, but both of them are found in other habitats, too. *Lasius niger* is a Palaearctic and eurytopic (“hypereuryoecic intermediary”) species.

Localities: I. Kisar: floodplain, orchard (L)(2002); Kisar: floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2002); Tiszaszalka: dike slope meadow (R)(1967, 2002); Vásárosnamény: Gergelyugornya, dike slope meadow, *Alopecuretum pratensis festucetosum pseudovinae* (R)(1967); Vámosatya: Bockerek, protected floodplain, hardwood forest (R)(2002); Eperjeske: protected floodplain, pasture (L)(2002); Tiszaszalka: dike slope meadow, *Alopecuretum pratensis*

ranunculetosum acris (R)(Gallé and Gausz 1968); Tiszaszalka: protected floodplain, meadow (R)(Gallé and Gausz 1968); Tiszakarád: floodplain, agricultural field, sunflower plantation (R)(1964); Tiszadob (R)(1963, Gallé 1966b); Tiszadob: Taktaköz, dike slope meadow (R)(1963, Gallé 1966b); Tiszadob: Taktaköz, floodplain, softwood forest (R)(1963); Tiszalúc: Kocsordos, protected floodplain, meadow (R)(1994).

II. Tiszafüred: dike slope meadow (L)(1969); Tiszafüred: Tiszaörvény, dike slope meadow (L)(1970, see Gallé 1972b); Kisköre: floodplain meadow (L) (Gallé 1969); Kisköre: dike slope meadow (L) (Gallé 1969); Pusztataskony: protected floodplain: pasture (L)(Gallé 1969); Besenyszög: Szórópuszta: floodplain, hybrid poplar plantation (R)(2003); Besenyszög: Szórópuszta: floodplain, softwood forest, *Salicetum albae-fragilis*(R)(2003); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003); Rákóczifalva: floodplain meadow (L) (2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003); Tizsakürt: dike slope meadow, *Cynodonti-Poetum angustifoliae* and *Alopecuretum pratensis* (L) (Gallé 1967); Tizsakürt: floodplain forest, *Salicetum albae-fragilis* (L) (1966); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicolae* (L) (Kovács 2001); Cserkeszölő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agropyretum intermedii* (L) (Kovács 2001).

III. Lakitelek: Töserdő (R)(Gallé 1966b); Lakitelek: Töserdő, wet meadow, *Agrosti-Alopecuretum pratensis* (R) (Kovács 2001); Szentes: Kurca, floodplain, wet meadow (L)(2004); Szentes: floodplain, softwood forest, *Salicetum albae-fragilis* (L) (2004); Felgyő: Labodár: dike slope meadow (R)(1973); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér; degraded meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Várháti gyeplő, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Mindszent: Kurca-rét, wet meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Mindszent: Kurca-rét, dry meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Mindszent: floodplain, cleared forest (L)(2004); Mindszent: floodplain, poplar plantation (L)(2004); Mindszent: floodplain, softwood forest (L)(2004); Pusztaszer: Csikójárás, protected floodplain, pasture, *Salvio-Festucetum rupicolae* (R) (Kovács 2001); Baks: Ányás, protected floodplain, softwood forest (R)(2004); Baks: Ányás, protected floodplain, meadow (R)(2004); Baks: Ányás, floodplain, forest, *Salicetum albae-fragilis* (R)(2004); Mártély: dike slope meadow (L)(1971); Hódmezővásárhely: Körtvélyes, Barci-rét, wet meadow (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Hunyadi-halom, floodplain meadow, *Alopecuretum pratensis* (L)(1996); Dóc: Bibicháti-erdő, protected floodplain, oak forest (R) (Kovács 2001); Algyő: dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Gallé 1966b); Algyő: Sasér, dike slope meadow (R)(Gallé 1966b); Algyő: Sasér: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004);

Szeged: Nagyfa (L)(Gallé 1966b); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1965, 1966, Gallé 1966b); Szeged: Tápé, Vesszős, floodplain, river bank (R)(1965); Szeged: dike slope meadow (R)(Gallé 1966b); Tiszasziget: floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2004); Tiszasziget: floodplain, hardwood forest (L)(2004).

V. RO: Letca: sandy riverbank (1996) (Markó 1999); RO: Someş-Odorhei: sandy riverbank (1996) (Markó 1999); RO: Ticău: sandy riverbank (1996) (Markó 1999); RO: Arduzel: oak forest (1996) (Markó 1999); RO: Vetiş: sandy riverbank (1996) (Markó 1999).

X.2. RO: The Dragan Creek (Markó 1997); RO: Şaulia (Markó 1997); RO: Bologa (Markó 1997); RO: Ciucea (Markó 1997); RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997); RO: The Criş Strait (Markó 1997); RO: Vadu Crişului (Markó 1997); Fughiu (Markó 1997); RO: Oradea (Paraschivescu and Arcaşu 1976, cited by Markó 1997); RO: Cheresig (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, meadow (2003, 2004, Szász 2005); Gyula: Mályvád, dike slope meadow (2003, 2004, Szász 2005).

XI. RO: Voslobeni: wet meadow, *Molinietum coeruleae* (L)(1999); RO: Voslobeni: sedge meadow, *Caricetum rostratae* (L)(1999); RO: Voslobeni: wet pasture, *Agrostio-Deschampsietum caespitosae* (L)(1999); RO: Voslobeni: drier pasture, *Agrostio-Festucetum rubrae* (L)(1999); RO: Voslobeni: stone mine (1999); RO: Voslobeni: roadside (1999); RO: Valea Rece, meadow (1999); Ro: Ciobotani, riverside, meadow (1999); Ro: Ciobotani, riverside, degraded meadow (1999); Ro: Lunca Bradului (1999); RO: M. Calimani: Ilva stream valley (1999); RO: Ilia: wooded pasture (2002); RO: Ilia: dike slope meadow (2002); RO: Dobra: hillside, meadow; RO: Sălviţa: softwood forest; RO: Sălviţa: floodplain, meadow; RO: Sălviţa: protected floodplain, wet meadow; RO: Sălviţa: floodplain, meadow with *Salix cinerea* bushes; RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, protected floodplain, wet meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain meadow (L)(2000); Makó: Landor, floodplain, *Salicetum albae-fragilis* with *Fraxinus* (L) (Kovács 2001); Maroslele: Vetyehát, floodplain, planted hybrid poplar forest (R)(2001); Maroslele: Vetyehát, floodplain meadow, *Alopecuretum pratensis* (R)(2001); Maroslele: Vetyehát, dike slope meadow (R)(2001); Maroslele: Vetyehát, protected floodplain, pasture (R)(2001); Szeged: Vetyehát, floodplain, poplar forest *Salicetum albae-fragilis* (R) (Kovács 2001); Szeged: Vetyehát, dike slope meadow *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szeged: Vetyehát, protected floodplain, weedy meadow (R) (Kovács 2001).

Lasius platythorax Seifert, 1992

(= *Lasius niger* L., Gallé 1967, Gallé and Gausz 1968)

General remarks: Forest species, which occasionally occurs also in grasslands. Its general distribution is not well known. On the basis of its distribution in

the Tisza River valley, it has a eurytopic hygrophilous (“euryoecic hylophilous”) character.

Localities: I. Kisar: floodplain, orchard (L)(2002); Kisar: floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2002); Vásárosnamény: Gergelyugornya, Bagiszeg, floodplain, hardwood forest (R)(2002); Tiszaszalka: dike slope meadow (R)(2002); Vámosatya: Bockerek, protected floodplain, hardwood forest (R)(1967, 2002); Tiszadob: Taktaköz, dike slope meadow (R)(1963).

II. Besenyszög: Szórópuszta: floodplain, softwood forest, *Salicetum albae-fragilis*(R)(2003); Besenyszög: Szórópuszta: floodplain, hardwood forest, *Quercus robur*: (R) (2003); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: floodplain meadow (L) (2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003); Tizsakürt: dike slope meadow, at the arboretum (L)(1966).

III. Lakitelek: Tőserdő, *Thelypteridi-Alnetum* (R) (Kovács 2001); Lakitelek: Tőserdő, floodplain hardwood forest (R) (Kovács 2001); Szentes: Kurca, floodplain, wet meadow (L)(2004); Szentes: floodplain, softwood forest, *Salicetum albae-fragilis* (L) (2004); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Pusztaszer: Újmajor, protected floodplain, old oak forest (R) (Kovács 2001); Mindszent: floodplain, cleared forest (L)(2004); Mindszent: floodplain, poplar plantation (L)(2004); Baks: Ányás, protected floodplain, meadow (R)(2004); Hódmezővásárhely: Babos-erdő, floodplain, oak forest (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Petres-erdő, floodplain forest, *Populus alba* (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Tére-part, floodplain, old oak forest (L) (Kovács 2001); Dóc: Bibicháti-erdő, protected floodplain, oak forest (R) (Kovács 2001).

V. RO: Arduzel: oak forest (1996) (Markó 1999).

X.2. RO: The Dragan Creek (Markó 1997); RO: Bologa (Markó 1997); RO: Ciucea (Markó 1997); RO: The Criş Strait (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, virgin oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, ash forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, old oak forest (2003, 2004, Szász 2005).

XI. RO: Valea Rece, meadow (1999); RO: Secusigiu: Munar, Bezdin, floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2000); RO: Secusigiu: Munar, Bezdin, Tábor-erdő, protected floodplain, hardwood forest (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain meadow (L)(2000); Maroslele: Vetyehát, floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2001).

Lasius alienus (Förster, 1850)

General remarks: As the *L. alienus* species complex was divided into three species by Seifert (1992), the formerly published “*alienus*” could refer to as either *L. psammophilus* or *L. paralienus* besides “real” *L. alienus*. It seems that *L. alienus* occurs mainly in dike slope meadows and dry grasslands along the river, but it is not as common as *L. paralienus*. Transpalaeartic, thermophilous (“euryoecic eremophilous”) species.

Localities: I. Tiszadob (R)(1963, Gallé 1966b); Tiszadob: Taktaköz, floodplain (R)(1963, Gallé 1966b).

II. Tiszafüred: Tiszaörvény, dike slope meadow (L)(1969, 1970, Gallé 1972b); Tizsakürt: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L)(Gallé 1967); Rákóczifalva: protected floodplain meadow (L)(2003).

III. Lakitelek: Töserdő (R)(Gallé 1966b); Szentes: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Mindszent: floodplain, cleared forest (L)(2004); Felgyő: Labodár: dike slope meadow (R)(1973); Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Algyő: Sasér, mixed floodplain forest (R) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Petres-erdő, softwood floodplain forest (L)(1996).

X.2. RO: Bologna (Markó 1997); RO: Ciucea (Markó 1997); RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997); RO: The Criş Strait (Markó 1997).

XI. RO: Voslobeni: drier pasture, *Agrostio-Festucetum rubrae* (L)(1999); RO: Voslobeni: stone mine (1999); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Szeged: Vetyehát, dike slope meadow *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001).

Lasius paralienus Seifert, 1992

General remarks: The distribution type and the ecofaunistical character of this species are not well known. On the basis of its distribution in the river valley it seems to be eurytopic mesophilous (“euryoecic eremophilous”). This is a typical ant of the drier dike slope meadows, tumuli and grasslands on loess soil.

Localities: II. Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003); Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicola* (L) (Kovács 2001); Cserkeszőlő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agrophyretum intermedii* (L) (Kovács 2001); Tizsakürt: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L)(1966).

III. Szentes: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Szentes: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér; degraded meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Mindszent: Kurca-rét, wet meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Pusztaszer: Újmajor, protected floodplain, old oak forest (R) (Kovács 2001); Pusztaszer: Csikójárás,

protected floodplain, pasture, *Salvio-Festucetum rupicolae* (R) (Kovács 2001); Pusztaszer: Büdösszék, saline meadow, *Lepidio-Puccinellietum limosae, Camphorosmetum annuae* (R) (Kovács 2001); Ópusztaszer: Baksi-puszta, Hosszúhát, protected floodplain, loess pasture (R) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Tömörkény: Aranyhalom, protected floodplain, tumulus, steppe-meadow (R) (Kovács 2001); Dóc: protected floodplain, *Festuca pseudovina* and *Alopecurus pratensis* meadow (R) (Kovács 2001).

X.3.a. Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, dike slope meadow (2003, 2004, Szász 2005).

XI. RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, protected floodplain, wet meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain, hardwood forest (L)(2000); RO: Secusigiu: Munar, Bezdin, Tábor-erdő, protected floodplain, hardwood forest (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain meadow (L)(2000); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Maroslele: Vetyehát, protected floodplain, pasture (R)(2001); Szeged: Vetyehát, dike slope meadow *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001).

Lasius emarginatus (Olivier, 1791)

General remarks: A Ponto-Mediterranean, stenoeccic eremophilous species, which is much more frequent in the Mediterranean and Sub-Mediterranean regions than in the Carpathian Basin. There are only few localities from Rumania.

Localities: **X.2.** RO: The Dragan Creek (Markó 1997); RO: Șuncuiuș (Paraschivescu and Arcașu 1976, cited by Markó 1997); RO: The Criș Strait (Markó 1997); RO: Aleșd (Markó 1997); Fughiu (Markó 1997); RO: Oradea (Paraschivescu and Arcașu 1976, cited by Markó 1997).

Lasius brunneus (Latreille, 1798)

General remarks: Central and southern European species with eurytopic intermediary ecofaunistical character. Along Tisza River, this is a common species in the forests not much affected by floods.

Localities: **I.** Vásárosnamény: Gergelyiugornya, Bagiszeg, floodplain, hardwood forest (R)(Gallé and Gausz 1968); Tiszalúc: Kocsordos, protected floodplain, oak forest (R)(1994).

II. Tiszafüred: Tiszaörvény, floodplain orchard, apple tree (L)(1970); Kesznyéten: Inérhát, protected floodplain, meadow with scattered willow trees (R)(1994, 1995); Besenyszög: Szórópuszta: floodplain, softwood forest, *Salicetum albae-fragilis*(R)(2003); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur*.(L)(2003).

III. Lakitelek: Tőserdő, *Thelypteridi-Alnetum* (R) (Kovács 2001); Lakitelek: Tőserdő, floodplain hardwood forest (R) (Kovács 2001); Szegvár: dike slope meadow,

Alopecuro-Arrhenatheretum (L) (Kovács 2001); Csanytelek: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Mindszent: floodplain, cleared forest (L)(2004); Baks: Ányás, protected floodplain, softwood forest (R)(2004); Hódmezővásárhely: Körtvélyes, Petres-erdő, floodplain forest, *Populus alba* (L) (Kovács 2001); Algyő: Sasér: protected floodplain, poplar tree (R)(1965); Algyő: Sasér: floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2004); Tiszasziget: floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2004).

V. RO: Ticău: sandy riverbank (1996) (Markó 1999); RO: Arduzel: oak forest (1996) (Markó 1999).

X.2. RO: Șuncuiuș (Paraschivescu and Arcașu 1976, cited by Markó 1997); RO: The Criș Strait (Markó 1997); RO: Oradea (Paraschivescu and Arcașu 1976, cited by Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, oak forest (1996, 1997).

XI. Makó: Landor, floodplain, *Salicetum albae-fragilis* with *Fraxinus* (L) (Kovács 2001).

Lasius flavus (Fabricius, 1781)

General remarks: Transpalearctic, mesophilous (“euryoecic intermediary”) species, which is not so common in the grasslands along Tisza River, as we could expect on the basis of its general distribution and commonness in the habitats of same character. The pitfall trap sampling technique, widely used in the myrmecological survey of Tisza River district, probably causes an underestimation of the distribution of this species.

Localities: I. Tiszaszalka: dike slope meadow, *Alopecuretum pratensis ranunculetosum acris* (R)(Gallé and Gausz 1968); Tiszaszalka: protected floodplain, meadow (R)(Gallé and Gausz 1968); Vásárosnamény: Gergelyugornya, dike slope meadow, *Alopecuretum pratensis festucetosum pseudovinae* (R)(1967); Tiszakarád: dike slope meadow (R)(1964).

II. Tiszafüred: Tiszaörvény, dike slope meadow (L)(1969, 1970, Gallé 1972b); Tiszakürt: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L)(Gallé 1967).

III. Lakitelek: Töserdő (R)(Gallé 1966b); Felgyő: Labodár: dike slope meadow (R)(1973); Algyő: Sasér, dike slope meadow (R)(Gallé 1966b); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1965).

V. RO: Ticău: sandy riverbank (1996) (Markó 1999).

X.2. RO: The Dragan Creek (Markó 1997); RO: Șuncuiuș (Paraschivescu and Arcașu 1976, cited by Markó 1997).

XI. RO: Voslobeni: peat bog, *Carici stellulatae (echinatae)-Sphagnetum*, *Carici rostratae-Sphagnetum* and *Carici flavae-Eriophoretum* (L)(1999); RO: Voslobeni: wet meadow, *Molinietum coeruleae* (L)(1999); RO: Voslobeni: moorland bushy forest (1999); RO: Voslobeni: drier pasture, *Agrostio-Festucetum rubrae* (L)(1999); RO: Valea Rece, meadow (1999); RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Maroslele: Vetyehát, floodplain, hardwood forest, *Fraxino pannonicarum-Ulmetum* with

planted oak, *Quercus robur* (R)(2001); Maroslele: Vetyehát, floodplain, softwood forest, *Salicetum albae-fragilis* (R)(2001).

Lasius umbratus (Nylander, 1846)

General remarks: Almost all the former data on this species proved to be *Lasius balcanicus*. The record by Körös/Criş River (Paraschivescu and Arcaşu 1976) is also from the period before Seifert's revision of the subgenus *Chthonolasius* (Seifert 1988) therefore its occurrence is questionable.

Locality: X.2. RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997).

Lasius balcanicus Seifert, 1988

(= *Lasius affinis* Schenck: Gallé 1966b, 1972b)

(= *Lasius umbratus* Nyl.: Gallé 1972b)

General remarks: On the basis of Seifert's revision (Seifert 1988) Gallé's former data on *Lasius affinis* refer to *L. balcanicus* in the majority of cases. On some occasions, however, in the absence of sexuals, we can regard this species as the most probable because of the identification difficulties. As pitfall traps are used to sample ants in most cases, the distribution, commonness and density of this underground species is probably underestimated, similarly to *L. flavus*.

Localities: II. Tiszafüred: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L)(1969).

III. Kengyel: Széphalom, protected floodplain, tumulus, *Salvio-Festucetum rupicola* (L)(Kocsis 1991); Nagytöke: Akác-halom, protected floodplain, tumulus (Kocsis 1991); Tömörkény: protected floodplain, tumulus (Kocsis 1991); Algyó: dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1965); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1965); Szeged: Tápéi rét, dike slope meadow (L)(1966).

XI. RO: M. Calimani: Ilva stream valley (1999).

Formica exsecta Nylander, 1846

General remarks: *F. exsecta* is Northern Palaearctic, stenotopic hygrophilous ("stenoecic hylophilous") species and a mountain ant in the Carpathian Basin. From the few localities by the rivers of Tisza water system, the most typical one is at Voslobeni, where *F. exsecta* form huge polycalic supercolonies of one square kilometer or even larger total area.

Localities: X.2. RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997); RO: The Criş Strait (Markó 1997).

XI. RO: Voslobeni: drier pasture, *Agrostio-Festucetum rubrae* (L)(1999-2004).

Formica sanguinea Latreille, 1798

General remarks: Southern Palaearctic species, eurytopic intermediary. At the Tisza valley it is a grassland species of dike slope meadows and tumuli.

Localities: I. Tizsakarád: floodplain (R)(1964, Gallé 1966b); Tizsador (R)(1963, Gallé 1966b); Tizsador: Taktaköz, dike slope meadow (R)(1963).

II. Tiszafüred: dike slope meadow (L)(1970); Kisköre: dike slope meadow (L) (Gallé 1969).

III. Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Mártély: dike slope meadow (L)(1971); Algyő: dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Gallé 1966b); Algyő: Sasér, dike slope meadow (R)(Gallé 1966b); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(Gallé 1966b); Szeged: dike slope meadow (R)(Gallé 1966b).

XI. RO: Valea Rece, meadow (1999); Ro: Ciobotani, riverside, degraded meadow (1999)

Formica fusca Linnaeus, 1758

General remarks: As a moderate hygrophilous (“euryoecic hylophilous”) species, *Formica fusca* is one of the typical ants of the forests in the Great Hungarian Plain. Although widely distributed (Transpalaearctic) and fairly common, it is rather rare in the floodplain forests of Tisza River, probably because of its sensitivity to the inundations.

Localities: II. Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003).

III. Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Dóc: Bibicháti-erdő, protected floodplain, oak forest (R) (Kovács 2001).

X.2. RO: Oradea (Paraschivescu and Arcaşu 1976, cited by Markó 1997).

XI. RO: M. Calimani: Ilva stream valley (1999); Szeged: Vetyehát, floodplain, poplar forest *Salicetum albae-fragilis* (R) (Kovács 2001).

Formica rufibarbis Fabricius, 1804

General remarks: A thermo-mesophilous (“euryoecic eremophilous”) species of European distribution. Its humidity requirements are higher than that of the sibling species, *F. cunicularia*. Typical habitats are dike slope meadows, but it also occurs in floodplain meadows and even in open forests.

Localities: I. Kistar: floodplain, softwood forest, *Salicetum albae-fragilis* (L)(2002); Vásárosnamény: Gergelyiugornya, dike slope meadow, *Alopecuretum pratensis festucetosum pseudovinae* (R)(1967); Tizsaszalka: dike slope meadow (R)(2002); Tizsalúc: Kocsordos, protected floodplain, meadow (R)(1994); Tizsalúc: Kocsordos, protected floodplain, hill-top, dry meadow (R)(1994); Tizsalúc: Kocsordos, protected floodplain, softwood edge (R)(1994); Tizsalúc: Kocsordos, dike

slope meadow exposed to floodplain (R)(1994); Tiszalúc: Kocsordos, dike slope meadow (R)(1994); Taktaharkány: protected floodplain, meadow (R)(1994); Taktaharkány: dike slope meadow ((R)(1994); Tiszalúc: dike slope meadow exposed to the protected floodplain (R)(1994); Tiszalúc: Kocsordos, protected floodplain, meadow at the dike.

II. Tiszafüred: Tiszaörvény, dike slope meadow (L)(1969, 1970, Gallé 1972b); Tizsakürt: dike slope meadow, *Cynodonti-Poetum angustifoliae* and *Alopecuretum pratensis* (L) (1966 see Gallé 1967); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003); Rákóczifalva: floodplain meadow (L) (2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur* (L)(2003); Cserkeszölő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agrophyretum intermedii* (L) (Kovács 2001).

III. Lakitelek: Tőserdő, wet meadow, *Agrosti-Alopecuretum pratensis* (R) (Kovács 2001); Szentes: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Szentes: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér; degraded meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Várháti gyeplő, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, protected floodplain, young oak forest (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Mindszent: Kurca-rét, wet meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Mindszent: Kurca-rét, dry meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Baks: Anyás, protected floodplain, meadow (R)(2004); Hódmezővásárhely: Körtvélyes, Barci-rét, wet meadow (L) (Kovács 2001); Pusztaszer: Újmajor, protected floodplain, old oak forest (R) (Kovács 2001); Pusztaszer: Csikójárás, protected floodplain, pasture, *Salvio-Festucetum rupicolae* (R) (Kovács 2001); Pusztaszer: Büdösszék, saline meadow, *Lepidio-Puccinellietum limosae*, *Camphorosmetum annuae* (R) (Kovács 2001); Ópusztaszer: Baksi-pusztá, Hosszúhát, protected floodplain, loess pasture (R) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Tömörkény: Aranyhalom, protected floodplain, tumulus, steppe-meadow (R) (Kovács 2001); Dóc: protected floodplain, *Festuca pseudovina* and *Alopecurus pratensis* meadow (R) (Kovács 2001); Algyő: Sasér, top of dike, *Sclerochloa-Polygonetum avicularis* (R)(1965); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1966).

V. RO: Letca: sandy riverbank (1996) (Markó 1999); RO: Arduzel: oak forest (1996) (Markó 1999); RO: Vetis: sandy riverbank (1996) (Markó 1999).

X.2. RO: The Dragan Creek (Markó 1997); RO: Bologna (Markó 1997); RO: Ciucea (Markó 1997); RO: Şuncuiuş (Paraschivescu and Arcaşu 1976, cited by Markó 1997); RO: The Criş Strait (Markó 1997); RO: Aleşd (Markó 1997); RO: Fughiu (Markó 1997); RO: Cheresig (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, young oak forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, white poplar forest (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, meadow (2003, 2004, Szász 2005); Gyula: Mályvád, dike slope meadow (2003, 2004, Szász 2005).

XI. RO: Voslobeni: stone mine (1999); RO: Ilia: wooded pasture (2002); RO: Ilia: dike slope meadow (2002); RO: Dobra: hillside, meadow; RO: Sălvica: floodplain, meadow; RO: Sălvica: protected floodplain, wet meadow; RO: Sălvica: floodplain, meadow with *Salix cinerea* bushes; RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, protected floodplain, wet meadow (L)(2000); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Maroslele: Vetyehát, dike slope meadow (R)(2001); Maroslele: Vetyehát, protected floodplain, pasture (R)(2001); Szeged: Vetyehát, dike slope meadow *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szeged: Vetyehát, protected floodplain, weedy meadow (R) (Kovács 2001).

Formica cunicularia Latreille, 1798

(= *Formica fusca glebaria* Nyl., Gallé and Gausz 1968)

(= *Formica rufibarbis* F., Gallé and Gausz 1968, in part, from the dike slope meadow)

General remarks: Its distribution and ecofaunistic type is similar to *F. rufibarbis*, but more xerotolerant. A common grassland species.

Localities: I. Tizaszalka: dike slope meadow (R)(2002); Vámosatya: Bockerek, protected floodplain, hardwood forest (R)(2002); Eperjeske: protected floodplain, pasture (L)(2002); Tizaszalka: protected floodplain, meadow (R)(Gallé and Gausz 1968); Tizadob: Taktaköz, dike slope meadow (R)(1963); Tizadob: Taktaköz, floodplain, alfalfa plantation (R)(1963); Tizsalúc: Kocsordos, protected floodplain, meadow (R)(1994); Tizsalúc: Kocsordos, protected floodplain, hill-top, dry meadow (R)(1994); Tizsalúc: Kocsordos, protected floodplain, softwood edge (R)(1994); Tizsalúc: Kocsordos, dike slope meadow exposed to floodplain (R)(1994); Tizsalúc: Kocsordos, dike slope meadow (R)(1994); Taktaharkány: protected floodplain, meadow (R)(1994); Tizsalúc: dike slope meadow exposed to the protected floodplain (R)(1994); Tizsalúc: Kocsordos, protected floodplain, meadow at the dike.

II. Tizsakürt: dike slope meadow, at the arboretum (L)(1966); Tizsafüred: dike slope meadow (L)(1969); Tizsafüred: Tiszaörvény, dike slope meadow (L)(1970, Gallé 1972b); Tizsakürt: dike slope meadow, *Alopecuretum pratensis Arrhenatherum elatius* facies (L)(1967); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003); Rákóczifalva: floodplain meadow (L) (2003); Rákóczifalva: protected floodplain, hardwood forest, *Quercus robur*: (L)(2003); Cserkeszölő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agrophyretum intermedii* (L) (Kovács 2001); Tizsakürt: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L)(1966).

III. Szentés: Akác-halom, protected floodplain, tumulus, meadow with black locust trees (L) (Kovács 2001); Szentés: Kántorhalom, protected floodplain, tumulus, meadow (L) (Kovács 2001); Felgyő: Labodár, Vidre-ér; dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Vidre-ér;

degraded meadow, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Mindszent: Kurca-rét, wet meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Mindszent: Kurca-rét, dry meadow, *Carici-Alopecuretum pratensis* (L) (Kovács 2001); Hódmezővásárhely: Körtvélyes, Barci-rét, wet meadow (L) (Kovács 2001); Pusztaszer: Csikójárás, protected floodplain, pasture, *Salvio-Festucetum rupicola* (R) (Kovács 2001); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Tömörkény: Aranyhalom, protected floodplain, tumulus, steppe-meadow (R) (Kovács 2001); Baks: Ányás, protected floodplain, meadow (R)(2004); Szeged: Algyő, Vesszős., protected floodplain grassland (R) (1965); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1965).

V. RO: Letca: sandy riverbank (1996) (Markó 1999); RO: Someș-Odorhei: sandy riverbank (1996) (Markó 1999); RO: Vetiș: sandy riverbank (1996) (Markó 1999).

X.2. RO: Șaulia (Markó 1997); RO: Șuncuiuș (Paraschivescu and Arcașu 1976, cited by Markó 1997); RO: The Criș Strait (Markó 1997); RO: Cheresig (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, meadow (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, dike slope meadow (2003, 2004, Szász 2005).

XI. RO: Voslobeni: wet meadow, *Molinietum coeruleae* (L)(1999); RO: Voslobeni: sedge meadow, *Caricetum rostratae* (L)(1999); RO: Voslobeni: wet pasture, *Agrostio-Deschampsietum caespitosae* (L)(1999); RO: Voslobeni: drier pasture, *Agrostio-Festucetum rubrae* (L)(1999); RO: Voslobeni: stone mine (1999); RO: Voslobeni: roadside (1999); RO: Ilia: dike slope meadow (2002); RO: Dobra: hillside, meadow; RO: Sălvica: softwood forest; RO: Sălvica: floodplain, meadow; RO: Sălvica: protected floodplain, wet meadow; RO: Secusigiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, protected floodplain, wet meadow (L)(2000); RO: Secusigiu: Munar, Bezdin, floodplain, hardwood forest (L)(2000); RO: Secusigiu: protected floodplain, loess hill (L)(2000); Makó: Landor, floodplain, *Salicetum albae-fragilis* with *Fraxinus* (L) (Kovács 2001); Maroslele: Vetyehát, dike slope meadow (R)(2001); Maroslele: Vetyehát, protected floodplain, pasture (R)(2001); Szeged: Vetyehát, dike slope meadow *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szeged: Vetyehát, protected floodplain, weedy meadow (R) (Kovács 2001).

Formica balcanina Petrov & Collingwood, 1993

General remarks: As this species was described slightly more than one decade ago, both its taxonomic status and ecology are vaguely known, although Markó has significantly contributed to the knowledge its general biology and ecology. All the localities are from Rumania, whereas this species is missing from the middle part of the Great Hungarian Plain.

Localities: X.2. RO: Bologa (Markó 1997); RO: Ciucea (Markó 1997); RO: The Criş Strait (Markó 1997); RO: Aleşd (Markó 1997); RO: Fughiu (Markó 1997).

XI. RO: Voslobeni: stone mine (1999); RO: Voslobeni: roadside (1999).

Formica glauca Ruzsky, 1896

General remarks: The status and the distribution of this species are not well known in the Carpathian Basin. There some record from isolated sites besides the Romanian localities given below (e.g. from a dry meadow in a sand-dune area at Gönyű, NW Hungary, Gallé 2005 unpublished).

Localities: XI. RO: Voslobeni: meadow (1999); RO: Voslobeni: roadside (1999); Ro: Lunca Bradului (1999).

Formica lemani Bondroit, 1917

General remarks: A boreo-mountain (“stenoecic hypohilous”) species, which occurs only in the Carpathians and missing from the present area of Hungary.

Localities: XI. RO: Valea Rece, meadow (1999); RO: M. Calimani: Ilva stream valley (1999).

Formica cinerea Mayr, 1853

General remarks: This is a northern species in Europe, which occurs only in the mountains in the Carpathian Basin. *F. cinerea* is a typical species of the early stages of sand-dune succession in Finland and Poland (Gallé 1991, Gallé et al. 1998).

Localities: V. RO: Letca: sandy riverbank (1996) (Markó 1999); RO: Someş-Odorhei: sandy riverbank (1996) (Markó 1999).

Formica truncorum Fabricius, 1804

General remarks: This Tanspalaeartic species had been known as one of the obligate mountain one in Hungary, but in the last two decades we found in the sand-dune forest edges in the extremely dry and hot Kiskunság region (cf. Gallé 1986). Besides the only locality known so far, we expect *F. truncorum* from several other sites from the forests of the protected floodplain at the Upper-Tisza district. In 1963, Gallé (1966a) found few *F. truncorum* workers at Tiszadob region. As no nest was observed, these ants most probable were driven by flood from the nearby mountains,

therefore we cannot regard this species as a resident member of the local myrmecofauna there.

Locality: X.2. RO: The Dragan Creek (Markó 1997).

Formica rufa Linnaeus, 1758

General remarks: This stenotopic hygrophilous (“euryoecic hylophilous”) species of northern Palaearctic distribution, as all mound-building *Formica* spp., is very rare by the Tisza River.

Locality: X.2. RO: Oradea (Paraschivescu and Arcaşu 1976, cited by Markó 1997).

Formica polyctena Förster, 1850

General remarks: The status of this species at Tisza region is the same as that of *F. rufa*.

Localities: I. Vámosatya: Bockerek, protected floodplain, hardwood forest (R)(1967).

V. RO: Vetiş: sandy riverbank (1996) (Markó 1999).

Formica pratensis Retzius, 1783

(= *Formica rufa-pratensis* Retz.: Gallé 1966a, 1966b)

General remarks: The distribution of this species lies in more southern localities than *F. rufa*. *F. pratensis* is the thermophilic (“euryoecic eremophilous”) mound-building ant in Hungary. Interestingly, whereas *F. pratensis* is the most common *Formica* s. str. species in the Great Hungarian Plain, it is almost missing from the terrestrial habitats by the river.

Localities: I. Tiszaszalka: protected floodplain, meadow (R)(Gallé and Gausz 1968).

V. RO: Letca: sandy riverbank (1996) (Markó 1999); RO: Someş-Odorhei: sandy riverbank (1996) (Markó 1999); RO: Arduzel: oak forest (1996) (Markó 1999); RO: Vetiş: sandy riverbank (1996) (Markó 1999).

XI. RO: Dobra: hillside, meadow; RO: Sălvica: floodplain, meadow; RO: Sălvica: protected floodplain, wet meadow.

Polyergus rufescens (Latreille, 1798)

General remarks: This Southern Palaearctic, obligatory parasitic ant species is present almost all grasslands along Tisza River, but not abundant, therefore missing from the samples taken with traditional techniques. Observed host species at the Tisza Basin are *Formica cunicularia*, *F. rufibarbis*, *Camponotus piceus/atricolor* and *Cataglyphis aenescens* in sand dunes areas.

Localities: I. Eperjeske: protected floodplain, pasture (L)(2002); Tiszaszalka: dike slope meadow, *Alopecuretum pratensis ranunculetosum acris* (R)(Gallé and

Gausz 1968); Tiszaszalka: protected floodplain, meadow (R)(Gallé and Gausz 1968); Tizsakarád: floodplain (R)(1964, Gallé 1966b); Tizsador: Taktaköz, floodplain, dike slope meadow (R)(1963, Gallé 1966b).

II. Tiszafüred: Tiszaörvény, dike slope meadow (L)(1969, Gallé 1972b); Rákóczifalva: dike slope meadow (L)(2003); Rákóczifalva: protected floodplain meadow (L)(2003); Cserkeszölő: Cserke-halom (Nádas-halom), protected floodplain, tumulus, *Festuco-Agrophyretum intermedii* (L) (Kovács 2001).

III. Felgyő: Labodár, Várháti gyepek, *Cynodonti-Poetum angustifoliae* (R) (Kovács 2001); Szegvár: dike slope meadow, *Alopecuro-Arrhenatheretum* (L) (Kovács 2001); Szegvár: dike slope meadow, *Cynodonti-Poetum angustifoliae* (L) (Kovács 2001); Szegvár: protected floodplain meadow, *Agropyretum repentis* (L) (Kovács 2001); Szegvár: protected floodplain, dry saline meadow, *Achilleo-Festucetum pseudovinae* (L) (Kovács 2001); Mindszent: floodplain, cleared forest (L)(2004); Tömörkény: Császárné halma, protected floodplain, tumulus, degraded grassland (R) (Kovács 2001); Algyő: dike slope meadow, *Cynodonti-Poetum angustifoliae* (R) (Gallé 1966b); Algyő: Sasér, dike slope meadow (R)(Gallé 1966b); Szeged: Tápé, Vesszős, dike slope meadow, *Cynodonti-Poetum angustifoliae* (R)(1965, see Gallé 1966b, 1967, 2005).

X.2. RO: The Dragan Creek (Markó 1997).

X.3.a. Gyula: Mályvád, protected floodplain, abandoned field (2003, 2004, Szász 2005); Gyula: Mályvád, protected floodplain, meadow (2003, 2004, Szász 2005); Gyula: Mályvád, dike slope meadow (2003, 2004, Szász 2005).

XI. RO: Secusgiu: Munar, Bezdin, dike slope meadow (L)(2000); RO: Secusgiu: protected floodplain, loess hill (L)(2000); Szeged: Vetyehát, protected floodplain, weedy meadow (R) (Kovács 2001).

Analysis of the binary data

Common and rare ant species of the Tisza River Basin

The commonness and rarity of species is an old problem in both ecology and faunistics. Perhaps the most known classical paper in this topic is by Preston (1948), which mainly dealt with within-community commonness and rarity. Since that a lot of works were published on the diversity aspect of these problems (e.g. Pielou 1975, Rosenzweig 1995, Magurran 1988, 2004), the relations between local density and regional distribution (Hanski 1982) and the different causes and background mechanisms of common-rare dichotomy (Papp 1998). More comprehensive treatments of the topic are given by Gaston (1994) and Kunin and Gaston (1997). The most of the common-rare classifications involve different spatio-temporal scales (see in the different chapters in Kunin and Gaston 1997), at least two: local and regional (Hanski 1982) or three ones: local, medium-level and regional (see e.g. Rabinowitz 1982, Rabinowitz et al. 1986). In this chapter it is not our task to give a review of this problem and not even to give a new classification of species based on their commonness and rarity. This is only an attempt to characterize the ant fauna of Tisza River Basin from this point, too.

Perhaps the simplest classification is based on the number of regions or sites where the species in question occurs. A similar approach is employed by Czechowski et al. (2002) on regional level. Applying this approach, it is convenient to give the number of sites (=habitats) where we detected the species in focus. The result by this simple technique gives a smooth transition between common and rare species (Fig. 1) for Tisza ants and the curve by the semi-logarithmic transformation (Fig. 2) shows the well known figure of the heterogeneous collections, which could be explained by the diversity of habitats types where the faunistical samples were taken.

When employing a more precise method, which is based on the semi-quantitative data at habitat (local); landscape and regional levels, we use only those data sets that are resulted by the same sampling technique, in this case, pit-fall traps. We have such data sets from seven habitat complexes.

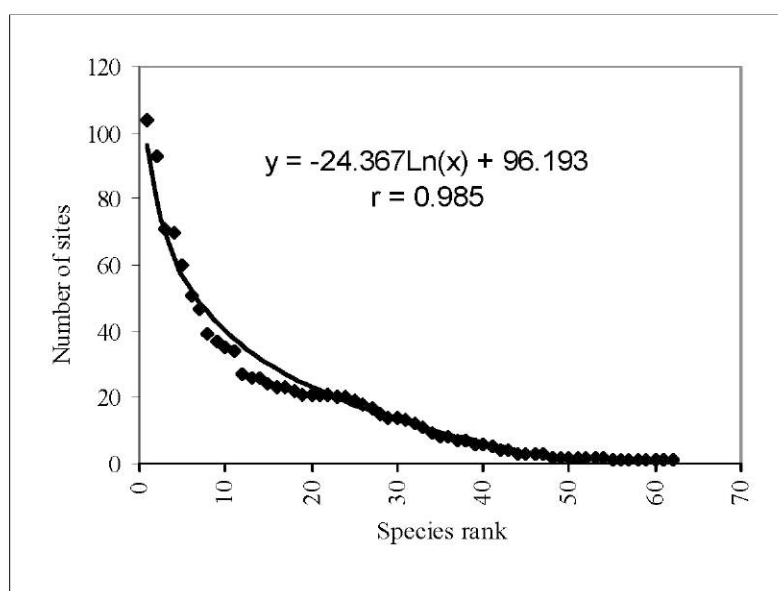


Fig. 1. The rank-frequency curve of the ant species on the basis of the number of occupied habitats. The sequence of the species (from common to rare): *L. niger*, *T. caespitum*, *F. rufibarbis*, *F. cunicularia*, *S. fugax*, *M. rubra*, *D. quadripunctatus*, *M. sabuleti*, *L. platythorax*, *L. paralienus*, *M. salina*, *T. ambiguum*, *P. pygmaea*, *P. rufescens*, *P. vindobonensis*, *C. piceus*, *L. brunneus*, *M. ruginodis*, *M. spectoides*, *M. graminicola*, *L. alienus*, *L. flavus*, *M. scabrinodis*, *C. fallax*, *L. fuliginosus*, *M. structor*, *C. truncatus*, *T. erraticum*, *M. gallienii*, *L. crassispinus*, *F. sanguinea*, *P. coarctata*, *M. rugulosa*, *L. microcephalum*, *L. unifasicatus*, *F. pratensis*, *L. balcanicus*, *F. balcanina*, *M. schencki*, *F. fusca*, *L. emarginatus*, *M. vandeli*, *L. affinis*, *M. rubida*, *S. debile*, *T. impurum*, *F. exsecta*, *A. atratulus*, *C. ligniperda*, *C. herculeanus*, *C. vagus*, *F. glauca*, *F. cinerea*, *F. polyctena*, *H. punctatissima*, *M. hellenica*, *L. interruptus*, *C. sahlbergi*, *P. imparis*, *L. umbratus*, *F. truncorum*, *F. rufa*

In this case, the within habitat (local) frequency of a species is given by the fraction of the occupied traps, the within landscape frequency is based on the relative

number of habitats, where the species occurred within a set of neighbouring habitats (i.e. within a “sigma community” or “landscape”) and the regional distribution is given by the fraction of “landscapes” where the species has been detected within the whole region of Tisza River Basin. The overall frequency of a species is given as the sum of the mean local, mean medium and the regional level frequencies (Table 1).

According to Hanski (1982), if a group or community type follows the core and satellite species theory, there is a correlation between the local abundance and regional distribution. Testing the correlations between local (habitat) and medium (landscape) level frequencies, we obtain five significant correlations out of seven (Table 2).

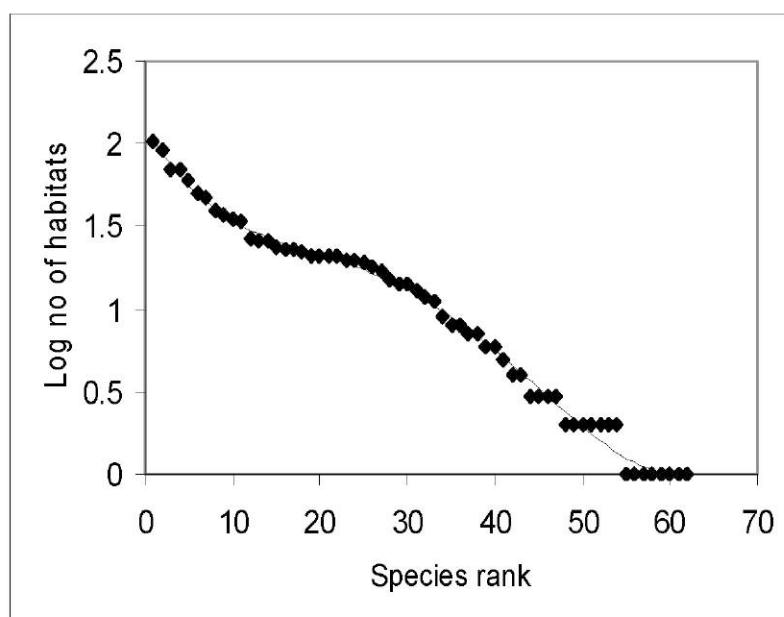


Fig. 2. Semi-log rank-frequency curve of the ant species. The rank sequence is the same as given for Fig. 1.

Table 1. Local, medium (landscape) level, regional, and overall frequencies of the ant species in the Tisza River Basin (continuing in the next page). Only those species are considered, which were collected of the seven sites (see Table 2) with same sampling methods

<i>Species</i>	<i>Local</i>	<i>Landscape</i>	<i>Regional</i>	<i>Total</i>
<i>Lasius niger</i>	0.515	0.743	1	2.258
<i>Formica cunicularia</i>	0.407	0.414	1	1.821
<i>Tetramorium caespitum</i>	0.298	0.361	1	1.66
<i>Formica rufibarbis</i>	0.291	0.366	1	1.656
<i>Lasius platythorax</i>	0.129	0.512	0.857	1.498
<i>Lasius paralienus</i>	0.311	0.172	1	1.483

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<i>Myrmica rubra</i>	0.261	0.331	0.857	1.449
<i>Dolichoderus quadripunctatus</i>	0.158	0.397	0.857	1.412
<i>Myrmica ruginodis</i>	0.221	0.178	0.714	1.113
<i>Tapinoma ambiguum</i>	0.159	0.124	0.714	0.997
<i>Solenopsis fugax</i>	0.096	0.147	0.714	0.957
<i>Camponotus truncatus</i>	0.119	0.113	0.714	0.946
<i>Lasius alienus</i>	0.223	0.151	0.571	0.946
<i>Tapinoma erraticum</i>	0.119	0.176	0.571	0.866
<i>Camponotus piceus/atricolor</i>	0.191	0.092	0.571	0.854
<i>Myrmica sabuleti</i>	0.07	0.207	0.571	0.848
<i>Plagiolepis pygmaea</i>	0.137	0.139	0.571	0.848
<i>Myrmica scabrinodis</i>	0.15	0.269	0.429	0.847
<i>Myrmica specioides</i>	0.12	0.089	0.571	0.781
<i>Polyergus rufescens</i>	0.06	0.141	0.571	0.772
<i>Myrmica rugulosa</i>	0.071	0.117	0.571	0.76
<i>Leptothorax crassispinus</i>	0.059	0.127	0.571	0.758
<i>Myrmica salina</i>	0.12	0.141	0.429	0.69
<i>Lasius fuliginosus</i>	0.035	0.078	0.571	0.684
<i>Lasius flavus</i>	0.062	0.145	0.429	0.636
<i>Lasius brunneus</i>	0.043	0.141	0.429	0.612
<i>Liometopum microcephalum</i>	0.086	0.082	0.429	0.597
<i>Myrmica schencki</i>	0.086	0.08	0.429	0.595
<i>Ponera coarctata</i>	0.054	0.063	0.429	0.545
<i>Plagiolepis vindobonensis</i>	0.026	0.079	0.429	0.534
<i>Camponotus fallax</i>	0.032	0.052	0.429	0.512
<i>Messor structor</i>	0.001	0.001	0.429	0.429
<i>Myrmica gallienii</i>	0.057	0.075	0.286	0.417
<i>Formica fusca</i>	0.044	0.014	0.286	0.344
<i>Camponotus vagus</i>	0.012	0.024	0.286	0.322
<i>Myrmica vandeli</i>	0.038	0.082	0.143	0.263
<i>Myrmecina graminicola</i>	0.022	0.066	0.143	0.23
<i>Leptothorax unifasciatus</i>	0.007	0.041	0.143	0.191
<i>Formica sanguinea</i>	0.001	0.041	0.143	0.184
<i>Leptothorax affinis</i>	0.01	0.016	0.143	0.168
<i>Leptothorax interruptus</i>	0.013	0.011	0.143	0.167
<i>Tetramorium impurum</i>	0.008	0.016	0.143	0.166

(Table 1. cont.)

The computation of the correlations on the whole data set results even bigger and more significant coefficients (Table 3). It means that if a species is locally

abundant it is also common on both landscape and regional level with a great probability.

Out of the most common species, *L. niger*, *F. cunicularia*, *T. caespitum*, *L. paralienus*, *F. rufibarbis*, *T. ambiguum*, and *S. fugax* are grassland ants, living in the dike-side meadows, which form almost continuous habitat stripes along the river basin, promoting the distribution of the mesophilous ant species. In the forest ant fauna the number and frequency of the ground living ant species is low because of the severe inundations (e.g. *M. rubra*, *M. ruginodis*, *L. platythorax*) and the arboricolous ones (e.g. *D. quadripunctatus*, *C. truncatus*, *C. fallax*, *L. brunneus*) are represented almost at the same level, because the employed sampling method is not sensitive to their presence.

Table 2. Correlation between the local abundances and the medium (“landscape”) level frequencies of ant species at seven habitat complexes in the Tisza River Basin

<i>Site</i>	<i>r</i>	<i>p</i>
Upper-Tisza	0.49	0.019
Middle-Tisza	0.31	0.064
Lower-Tisza	0.47	0.034
Mályvád	0.55	0.0061
Voslobeni	0.75	0.0022
Bezdin	0.21	n.s.
Maroslele	0.38	n.s.

Table 3. Correlation between species frequencies at different scales and the comparison of the two frequency measurements employed in this study

<i>Correlation between</i>	<i>r</i>	<i>p</i>
Local and landscape level frequencies	0.81	0.0006
Local+landscape level frequencies and all occupied habitats	0.96	0.00003
Local+landscape level frequencies and regional distribution	0.84	0.0007
Two types of frequency metrics	0.887	0.0003

Ordination of ant species

Ordinating the ant species on the basis of their occurrence in different habitats with Principal Coordinate Analysis, using Jaccard binary distance method, it is clear that there are two well distinguishable species groups in the factor space (Fig. 3), that of the grassland and the forest species, respectively. The latter group can be divided into two, i.e. the ground living ones (upper subgroup in the figure) and the tree ants (lower subgroup in the figure).

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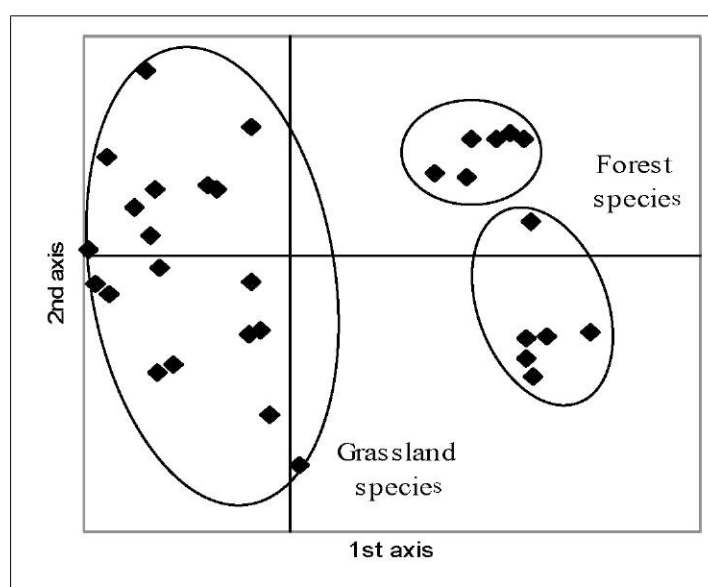


Fig. 3. Ordination of ant species on the basis of their habitat level distribution (PcoA algorithm and Jaccard distance function)

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