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Ants collected during 2006 Polish expedition to Kyrgyzstan (Hymenoptera: Formicidae)

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Abstract. Altogether fifty ant species have been collected during the expedition of the Zoological Institute, University of Wrocław, Poland. Three taxa, *Temnothorax semenovi* (Ruzsky, 1903), *Tetramorium feroxoide* Dlussky & Zabelin 1985, and *Tetramorium sulcinode* Santschi, 1927 proved to be new records for the Kyrgyz ant fauna. Two further *Tetramorium* species with unclear status, belonging to *Tetramorium caespitum*/*impurum* complex and a possibly undescribed *Plagiolepis* Mayr, 1861 are also reported to occur in Kyrgyzstan. A list of collected species along with localities is given. Several species are commented upon. A total of 111 ant species are now recognized from the country.

Key words: entomology, faunistics, ants, Formicidae, new records, Kyrgyzstan.

INTRODUCTION

The first comprehensive review of the ant fauna of Kyrgyzstan was carried out by Tarbinsky (1976), in which he described several new taxa, provided keys for species and detailed information about distribution and ecology. Later, Tarbinsky (1996) published another contribution with a new checklist for the Kyrgyz ant fauna, introducing many nomenclatorial changes. Recently, a critical checklist of ant species known from Kyrgyzstan has been published (Schultz et al. 2006), where authors gave a summary of the recent nomenclatorial changes rising from modern taxonomic revisions as well as recorded new species resulting in total of 106 known from the country. Later, two

taxonomic studies concerning Palaearctic species have been published (Csősz et al. 2007, Seifert & Schultz 2008), including species found in Central Asia and Kyrgyzstan. These studies changed the status of some names in Schultz et al. (2006) and are commented upon in individual species accounts.

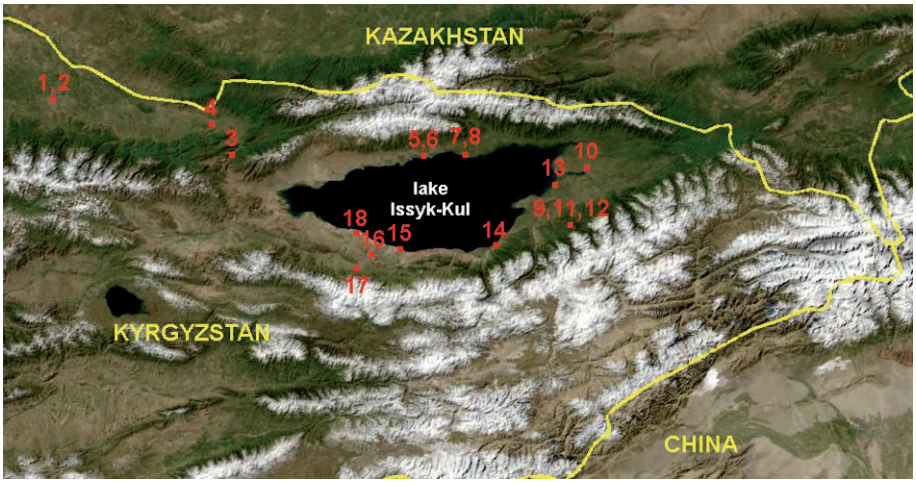
The status of many species in the Kyrgyz fauna is still uncertain and many new names are expected to be added to the list in the future. Multidisciplinary approaches reveal high cryptic diversity in ants (Seifert 2009), and it is likely that taxa listed here under names of European forms will change their status.

The Polish expedition to Kyrgyzstan was carried out by researchers and students of the Department of Biodiversity and Evolutionary Taxonomy, Zoological Institute, University of Wrocław, Poland. During twelve days, from June 6th to June 18th 2006, the team collected natural history specimens in several sites in Kyrgyzstan, mostly located in the northeastern part of the country - the Issyk-Kul region.

LIST OF COLLECTING SITES

The sites are plotted on the map (Fig. 1.) and the species occurrence is presented in table 1. Coordinates are in Decimal Degrees.

1. Bishkek reg., Bishkek city, 42.87°, 74.60°, 770 m, leg. L. & M.L. Borowiec;
2. Bishkek reg., Beshkungei n. Bishkek, 42.85°, 74.60°, 800 m, leg. L. & M.L. Borowiec;
3. Chuy reg., Boomskoie Uschelie, c. 160 km E of Bishkek, 42.60°, 75.85°, 2300 m, leg. L. & M.L. Borowiec;
4. Chuy reg., Chuyskaia Dolina, c. 96 km E of Bishkek, 42.78°, 75.69°, 1120 m, leg. L. & M.L. Borowiec;



1. Map of northeastern part of Kyrgyzstan. Numbers correspond to collecting sites described in the text. Created using NASA WorldWind 1.4 freeware

5. Issyk-Kul reg., Cholpon-Ata distr., Bosteri, Issyk-Kul coast, 42.65°, 77.18°, 1600 m, leg. L. & M.L. Borowiec;
6. Issyk-Kul reg., Cholpon-Ata distr., hills N of Bosteri, 42.65°, 77.18°, 1600-1700 m, leg. L. & M.L. Borowiec;
7. Issyk-Kul reg., Cholpon-Ata distr., Grigorevka, 42.65°, 77.47°, Kungei Alatau, 2200 m, leg. L. & M.L. Borowiec;
8. Issyk-Kul reg., Cholpon-Ata distr., Grigorevka, 42.65°, 77.47°, Kungei Alatau, 1700 m, leg. L. & M.L. Borowiec;
9. Issyk-Kul reg., Kyzyl-Suu distr., vicinity of Dzhetyoguz curort, 42.30°, 78.20°, Tian-Shan, Terskej Alatau, 1880 m, leg. L. & M.L. Borowiec;
10. Issyk-Kul reg., Karakol distr., Mikhaylovka, Issyk-Kul lake, 42.61°, 78.33°, 1640 m, leg. L. & M.L. Borowiec;
11. Issyk-Kul reg., Kyzyl-Suu distr., forest and subalpine meadows south of Dzhetyoguz curort, 42.00°, 78.20°, Tian-Shan, Terskej Alatau, 2500 m, leg. R.J. Pomorski, L. & M.L. Borowiec;
12. Issyk-Kul reg., Kyzyl-Suu distr., semidesert hills north of Dzhetyoguz curort, 42.30°, 78.20°, Tian-Shan, Terskej Alatau, 1880 m, leg. L. & M.L. Borowiec;
13. Issyk-Kul reg., Kyzyl-Suu distr., Chyrak n. Karakol, Issyk-Kul lake, 42.48°, 78.10°, 1660 m, leg. L. & M.L. Borowiec;
14. Issyk-Kul reg., Kyzyl-Suu distr., Kichi-Dzhargylchak, Issyk-Kul coast, 42.20°, 77.690°, 1670 m, leg. L. & M.L. Borowiec;
15. Issyk-Kul reg., Bokonbaevo distr., Ton, Issyk-Kul lake, 42.17°, 77.03°, 1620 m, leg. L. & M.L. Borowiec;
16. Issyk-Kul reg., Bokonbaevo distr., Ak Say, Ak-Say riv. valley, 42.13°, 76.83°, 1820-1850 m, leg. L. & M.L. Borowiec;
17. Issyk-Kul reg., Bokonbaevo distr., Konur-Olen lake, n. Toguz-Bulak, 42.08°, 76.73°, 2000 m, leg. L. & M.L. Borowiec;
18. Issyk-Kul reg., Bokonbaevo distr., Kara Kyl lake, 10 km N of Kyzyl Tuu, 42.25°, 76.73° 1600 m, leg. L. & M.L. Borowiec.

ALPHABETICAL LIST OF COLLECTED SPECIES
(species new to Kyrgyzstan in bold)

Bothriomyrmex kusnezovi Emery, 1925
Camponotus buddhae Forel, 1892
Camponotus herculeanus (Linnaeus, 1758)
Camponotus interjectus Mayr, 1877
Cardiocondyla ulianini Emery, 1889
Cataglyphis aenescens (Nylander, 1849)
Crematogaster bogojawlenskii Ruzsky, 1905
Crematogaster subdentata Mayr, 1877
Formica candida F. Smith, 1878

Formica exsecta Nylander, 1846

The status of Kyrgyz populations of this species is unclear. They have been regarded as representing a distinct species, *Formica mesasiatica* Dlussky, 1964 (Tarbinsky 1976, Seifert 2000). Seifert (2000) noted incomplete morphological discrimination and the need for clarification of this issue. In the critical checklist of the Kyrgyz fauna, Schultz et al. (2006) excluded *F. mesasiatica* and listed *F. exsecta* only. In a later paper Schultz & Seifert (2007) treated the taxon as '*Formica exsecta* and *mesasiatica*', noting that multidisciplinary approach suggests that *mesasiatica* is a synonym of *exsecta* but the formal synonymy is postponed to a later contribution. Goropashnaya et al. (2007) presented mtDNA-based phylogeography of *Formica exsecta*, concluding that Kyrgyz samples form a weakly divergent clade within *F. exsecta* haplotypes. No formal synonymy has been hitherto published.

Formica cf. *frontalis* Santschi, 1919

This taxon has already been reported by Schultz et al. (2006) without any further comment. Probably the specimens collected in Kyrgyzstan represent a distinct and undescribed *Formica* species (Bernhard Seifert, pers. comm.), possibly included in *Formica truncorum* in earlier reports.

Formica cf. *lemani* Bondroit, 1917

Formica litoralis Kuznetsov-Ugamsky, 1926

Formica lusatica Seifert, 1997

It seems that specimens identified here as *lusatica* in fact represent a species complex. The *rufibarbis*-group of species is being currently revised by Bernhard Seifert and Roland Schultz (R. Schultz & B. Seifert pers. comm.).

Formica pratensis Retzius, 1783

Formica sanguinea Latreille, 1798

Lasius alienus (Förster, 1850)

Lasius flavus (Fabricius, 1782)

Lasius neglectus Van loon, Boomsma et Andrásfalvy, 1990

Lasius niger (Linnaeus, 1758)

Leptothorax acervorum (Fabricius, 1793)

Leptothorax cf. *muscorum* (Nylander, 1846)

The species related to *Leptothorax muscorum* represent a complex widespread in North America and Eurasia with many published names and ill-defined species boundaries (Creighton 1950, Brown 1955, Radchenko 1995, Ward 2005). Radchenko (1995) treated Asian varieties described under *muscorum* as synonyms but it is likely that more than three - *L. gredleri* Mayr, 1855, *L. muscorum* and *L. oceanicus* (Kuznetsov-Ugamsky, 1928) - species of the group are present in the Palaearctic. The species collected in Kyrgyzstan differ from the European populations of both *L. muscorum* and *L. gredleri* in head sculpturing.

Messor denticulatus Santschi, 1927

Messor marikovskii Arnol'di, 1970

Messor rufus Santschi, 1923

Messor cf. *structor* (Latreille, 1798)

With regard to taxonomy, the group of species morphologically close to *Messor structor* is insufficiently known and likely to represent a complex of cryptic species (Schlick-Steiner et al. 2006b). At this point we avoid assigning any name to our specimens.

Myrmica dshungarica Ruzsky, 1905
Myrmica lacustris Ruzsky, 1905
Myrmica rubra (Linnaeus, 1758)
Myrmica saposhnikovi Ruzsky, 1904
Myrmica schencki Viereck, 1903
Myrmica tobiasi Radchenko et Elmes, 2004
Pheidole pallidula (Nylander, 1849)
Plagiolepis cf. *dlusskyi* Radchenko, 1996

This species is morphologically close to *Plagiolepis dlusskyi* from Armenia, but may represent a distinct species. The genus *Plagiolepis* is in a need of revision and we refrain from describing this species as new until the taxonomy of the genus is in a better state.

Plagiolepis pallescens Forel, 1889
Plagiolepis taurica Santschi, 1920
Polyergus rufescens (Latreille, 1798)
Proformica epinotalis Kuznetsov-Ugamsky, 1927
Proformica mongolica (Emery, 1901)
Proformica splendida Dlussky, 1965

Among collected specimens that key out (Dlussky 1969) as *P. splendida* there are two forms. One series shows clearly darker pigmentation, and was collected in a very moist habitat (17).

Tapinoma emeryanum Kuznetsov-Ugamsky, 1927
Tapinoma erraticum (Latreille, 1798)
Temnothorax oxianus (Ruzsky, 1905)
***Temnothorax semenovi* (Ruzsky, 1903)**

Species hitherto known to occur in W Kazakhstan, Turkmenistan and Uzbekistan (Dlussky & Soyunov 1988) is now reported from Kyrgyzstan.

Temnothorax cf. *tuberum* (Fabricius, 1775)

The specimens collected during our expedition key out to *Temnothorax tuberum* using Radchenko (1994). However, they show clear distinction from Central European samples, differing in characters such as head sculpturing and pigmentation. As the *Temnothorax* ants are predisposed to strong microgeographical differentiation and the recent research revealed unexpectedly high cryptic diversity in European forms (Seifert 2006), it is plausible our specimens belong to different species than European *T. tuberum*.

Tetramorium caespitum/*impurum* complex

The species related to *Tetramorium caespitum* (Linnaeus, 1758) represent a complex of sibling species recently recognized using multidisciplinary approach (Schlick-Steiner et al. 2006a). Besides *T. caespitum* and *T. impurum* (Förster, 1850), several species

have been recognized without formal descriptions, to which preliminary letter codes have been assigned. Hitherto only an electronic source for the identification of the species is available (STEINER et al. 2006). The boundaries and phylogeography of the species are now the subject of detailed additional investigations (B. SCHLICK-STEINER & F. STEINER, pers. comm.). Preliminary identifications of the specimens collected in Kyrgyzstan revealed occurrence of sp. C and sp. D, however, it is possible that other species of the group are present as well.

Tetramorium chefketi FOREL, 1911

The name *Tetramorium turcomanicum* SANTSCHI, 1921, reported from Kyrgyzstan by SCHULTZ et al. (2006) was found to be a junior synonym of *T. chefketi* FOREL, 1911 by CSŐSZ et al. (2007).

***Tetramorium feroxoide* DLUSSKY & ZABELIN, 1985**

This species is reported from Kyrgyzstan for the first time.

Tetramorium inerme MAYR, 1877

***Tetramorium sulcinode* SANTSCHI, 1927**

This species was revived from a junior synonymy of *T. turcomanicum* by CSŐSZ et al. (2007). The authors of that revision examined specimens from Afghanistan, Turkmenistan and Pakistan and this record represents the first for the fauna of Kyrgyzstan.

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2. Hills north of Beshkungei near Bishkek (locality 2). The ant species encountered in this steppe habitat with *Eremurus* stands include *Bothriomyrmex kusnezovi*, *Camponotus interjectus*, *Crematogaster bogojavlenskii*, *Messor denticulatus*, *Pheidole pallidula*, and *Tetramorium chefketi*. 3. Hills north of Bosteri (locality 6). Among other ant species present in this species-rich locality we found three species of *Proformica* (*P. epinotalis*, *P. mongolica*, *P. splendida*), *Tapinoma emeryanum* and *Tetramorium sulcinode*

4. Near Grigorievka at 2200 m. a.s.l. (locality 7). *Formica* cf. *lemani*, *Myrmica dschungarica* and *M. saposhnikovi* were present in this mountain meadow habitat with *Formica* cf. *frontalis* found at the forest edge.
5. South of Dzhetyoguz curort, Terskej Alatau (locality 11). In this boreal-montane zone of Tian Shan we encountered *Camponotus herculeanus*

6. Chyrak at the Issyk-Kul lake coast (locality 13). Ant species collected in this habitat include *Formica exsecta*, *Lasius niger* and *Myrmica tobiasi*. 7. The shore of Konur-Olen lake near Toguz-Bulak (locality 17) – a moist habitat with mounds of *Formica candida*

8. Ton village at the Issyk-Kul shore (locality 15). This desert habitat with *Ephedra* shrubs was home to, among others, *Messor marikovskii*, *Temnothorax oxianus* and *T. semenovi*. 9. Ak-Say river valley (locality 16). In this valley we collected mostly species common to dry habitats, such as *Cataglyphis aenescens*, *Messor* cf. *structor*, *Formica litoralis*

Tab. 1. List of collected species with occurrence. Species commented in text are marked with an asterisk and those reported as new for the country are in bold. Numbers above correspond to collecting sites described in the text.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Bothriomyrmex kusnezovi		x																
Camponotus buddhae		x													x			
Camponotus herculeanus											x							
Camponotus interjectus		x																
Cardiocondyla ulianini	x																	
Cataglyphis aenescens		x		x		x				x	x	x	x		x	x		x
Crematogaster bogojawlenskii		x																
Crematogaster subdentata	x																	
Formica candida																	x	
*Formica exsecta**										x	x		x					
Formica cf. *frontalis**							x											
Formica cf. *lemani*							x				x	x						
Formica litoralis		x			x					x	x	x		x	x	x	x	
*Formica lusatica**	x	x	x		x			x		x	x	x	x					
Formica pratensis					x	x					x	x	x					
Formica sanguinea					x													
Lasius alienus					x	x		x		x	x							
Lasius flavus							x				x	x						
Lasius neglectus	x																	
Lasius niger						x				x	x		x					
Leptothorax acervorum							x											
Leptothorax cf. *muscorum**							x											
Messor denticulatus		x		x														
Messor marikovskii															x			
Messor rufus									x									
Messor cf. *structor**	x	x		x	x	x					x	x	x	x	x	x		x
Myrmica dshungarica							x				x	x				x		
Myrmica lacustris						x			x	x								
Myrmica rubra	x					x			x	x								x
Myrmica saposhnikovi							x											
Myrmica schencki						x		x	x									
Myrmica tobiasi	x				x	x			x	x			x					x
Pheidole pallidula		x																
Plagiolepis cf. *dlusskyi**															x			
Plagiolepis pallescens				x														
Plagiolepis taurica	x	x		x		x		x							x	x		x
Polyergus rufescens											x							

Table 1 (cont.)

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Proformica epinotalis		x				x												
Proformica mongolica		x				x									x			
*Proformica splendida**						x									x		x	
Tapinoma emeryanum						x						x						
Tapinoma erraticum		x						x										
Temnothorax oxianus															x			
Temnothorax semenovi*															x			
Temnothorax cf. *tuberum**						x							x					
*Tetramorium caespitum/ impurum**	x			x	x	x		x		x		x	x		x	x	x	
*Tetramorium chefketi**		x																
Tetramorium feroxoide*				x														
Tetramorium inerme				x											x			
Tetramorium sulcinode*				x		x												