Consequences of the advance in *Fridericia* taxonomy for our knowledge of Czech and Slovak enchytraeid faunas

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An up-to-date list of *Fridericia* species occurring in the Czech and Slovak Republics is presented, based on new information on the taxonomy of the genus *Fridericia* (Enchytraeidae), in particular its recent revision, on records published after the last publication of such a list in 1988, and on the author's new records until spring 2005 from Moravia, the eastern part of the Czech Republic. The Czech fauna includes at least 29 *Fridericia* species, the occurrence of another 7 species awaits final confirmation based on future investigation of additional live specimens. For Slovakia published records of 13 species can be considered rather reliable.

Keywords: Enchytraeidae, *Fridericia*, Czech Republic, Slovak Republic.

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Introduction

With 197 nominal species of which 89 have been recognized as valid in the recent revision of the genus (Schmelz, 2003), *Fridericia* is the largest genus of Enchytraeidae. Most of the valid species have been reported from Europe. The genus reaches highest species-richness and a dominant position in terms of abundance in soils that are neither too acidic nor too dry (cf. Graefe and Schmelz, 1999; Jänsch and Römbke, 2003). The identification of *Fridericia* species has been considered particularly difficult. The influential monograph of Nielsen and Christensen (1959) and its supplements (Nielsen and Christensen, 1961, 1963) listed all-together 64 valid *Fridericia* species and subspecies, 33 of which had been reported from Europe (species descriptions were given for 19 species only, all known to occur in Europe). While the species identity of many records before the publication of that monograph can be questioned, the monograph itself included some errors regarding *Fridericia* taxonomy (Schmelz, 2003). Further it has to be assumed that many researchers attempted to match their specimens with one of the species described in the monograph, assuming that its species account was more or less exhaustive, at least for Europe. This approach was supported by the assumption that intraspecific variability was high in this genus or in enchytraeids in general. The high number of *Fridericia* species described since the publication of this monograph and its supplements has further blurred the picture; until the revision in 2003 it was necessary to have a collection of many separate species descriptions to identify *Fridericia* species with some confidence.

In using enchytraeids for bioindication of soil conditions, it has been repeatedly proposed not to discriminate this genus on the species level as long as we do not understand better the apparently similar site preferences of individual *Fridericia* species (e.g. Jänsch and Römbke, 2003; Jänsch et al., 2005). However, it is for sure desirable to further explore the species composition of *Fridericia* assemblages as these can differ substantially between sites, indicating some bioindicative potential of individual species. The above-mentioned revision as well as some other recent papers (e.g. Rota et al., 1998) have set new standards of *Fridericia* taxonomy providing a most needed tool for ecological work on this group.

The catalogue of enchytraeid species of then Czechoslovakia published by Chalupský (1988) included 23 species of the genus *Fridericia*. Of those, 17 were reported from the Czech Republic (all had been recorded in Bohemia but only 6 in the historic territory of Moravia including the small Czech part of Silesia) and 15 from Slovakia (the reader interested in the original species records is referred to this catalogue for references). Later papers of Chalupský added two species to the Czech fauna, both recorded in Bohemia

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(Chalupský, 1992, 1994); one of these had been previously recorded in Slovakia (Chalupský, 1988).

The present contribution gives an up-to-date overview of the *Fridericia* fauna of the Czech and Slovak Republics by reviewing Chalupský's species list in light of the recent taxonomic development and by including own records (published and unpublished, until spring 2005) from the Czech Republic.

Material and methods

The *Fridericia* species list given in Chalupský's catalogue (Chalupský, 1988) was updated by records published later from Czechia and Slovakia based on records until spring 2005 (Chalupský, 1991, 1992, 1993, 1994, 1995; Guoth and Žuffa, 1988; Schlaghamerský, 2002, 2005, in press; Schlaghamerský and Kobetičová, 2005, 2006; Šídová and Schlaghamerský, 2006). Most of these species records have been published based on samplings conducted in southern and south-eastern Moravia since the year 2000 by me and my students. Further, my yet unpublished records from the same time period and study area (including one site farther north on the Bečva river in central Moravia) have been included. All records were reviewed in light of the revision of the genus by Schmelz (2003).

Results and discussion

An updated and annotated list of *Fridericia* species recorded within the borders of the present Czech and Slovak Republics is given in Table 1 (including the names of authors and years of publication of the species descriptions). In total, this table includes 43 species names, including those that are considered invalid or questionable in terms of taxonomic validity or occurrence in at least one of the two countries considered. Of the *Fridericia* species listed in Chalupský's catalogue, six were declared nomina dubia in the recent revision: *F. bulbosa*, *F. leydigi*, *F. paranemoralis*, *F. polychaeta*, *F. variata*, and *F. zykoffi* (Schmelz, 2003, see also on correct spelling and year of publication of *F. zykoffi*). The occurence of the latter three within then Czechoslovakia had also been questioned by Chalupský (1988). *Fridericia gracilis* is now considered a junior synonym of *F. minor* (the latter not listed by Chalupský, 1988). The actual identity of the specimens reported from Czechia as *F. aurita* remains unclear as the investigation of Chalupský's mounted specimens from Bohemia by Schmelz (2003) did not lead to a clear conclusion (this might also raise some questionmarks regarding the record from Slovakia; my own record from south-eastern Moravia was based on a single specimen and not fully reliable). Another two species (*F. bisetosa* and *F. perrieri*) are valid sensu Nielsen and Christensen (1959), whereas older records have to be considered questionable (Schmelz, 2003). However, more recent and trustworthy records from Czechia are available. In another five cases (*F. antensteineri, F. gamotheca, F. globuligera, F. maculatiformis, F.* cf. *monochaeta*, and *F. reducata*) the species record has to be considered preliminary; I would need to investigate more live specimens to be absolutely sure about their identity. In the first case, Schmelz (2003) declared the species a nomen dubium due to the insufficiently detailed description, however, I had encountered the corresponding specimens (fitting the description very well) before the above-mentioned revision. The record of *F. gamotheca* was published by Chalupský (1994) with a questionmark added to the species name; thus Chalupský had considered his identification preliminary (I have not encountered the species). In the case of *F.* cf. *monochaeta*, the investigated specimens belong either to this or to a related, hitherto undiscribed species, which requires further study (see also Šídová and Schlaghamerský, this volume).

Conclusions

Based on sampling conducted since 2000 in southern Moravia I have confirmed the occurrence of 10 species reported before from the Czech Republic (of which 5 were new for Moravia), and recorded another 11 species new for Czech fauna (two of which had been reported before from Slovakia and one for Czechoslovakia without any details on the locality). The identity of another five species awaits final confirmation. Thus there are at least 29 *Fridericia* species in the Czech Republic. The occurrence of another 7 is rather probable, although there are still doubts about their actual species identity. This amounts to 36 species for the Czech fauna, not counting *F. bulbosa*, *F. leydigi* and *F. paranemoralis*, three species considered valid when recorded (now nomina dubia) while other, similar species were often yet unknown. For Slovakia the occurrence of 13 species seems rather undoubted (including *F. aurita*, some doubts about its actual identity might be appropriate, see above), whereas the identity of one additional species, reported as *F. variata*, is unclear. Unfortunately, enchytraeids have not been studied in Slovakia in the last decades. Most of my own research has been conducted in the White Carpathians close to the Slovak border and most of the newly reported species thus probably occur in Slovakia as well.

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Table 1. List of species reported from the Czech and Slovak Republics with comments of taxonomic status and number of localities (for Czechia broken down into Bohemia and Moravia); records of the author and his collaborators since 2000 (Moravia only) are given in the right collumn (number of localities), those not known before from former Czechoslovakia are printed bold, those reported before from Slovakia but new for Czechia are underlined. Preliminary identification is indicated by "?" behind the species name; species given as "cf." indicate (sub)species potentially new to science, assigned to the closest described species; records reported for a territory without details on localities are given as "+", records reported for then Czechoslovakia not even assigned to a distinct part of the country given as "?".

Fridericia gen. (Enchytraeidae)	Valid species (Schmelz, 2003)	Czech Republic before 2000		Slovakia	Records since 2000 (CZ: Moravia)
		Bohemia	Moravia		
F. alata Nielsen et Christensen, 1959	valid	2		7	
F. anomala Košel, 1975	valid			1	
***F. antensteineri*?** Bauer, 1996	nomen dubium				1
F. aurita Issel, 1905	valid (identity of Czech material?)	3		1	1
F. cf. ***auritoides*** Schmelz, 2003	valid				1
F. benti Schmelz, 2002	valid				2
F. bisetosa (Levinsen, 1884)	valid sensu N. & Ch., 1959	5	1	20	many
F. bulboides Nielsen et Christensen, 1959	valid	3		5	many
F. bulbosa (Rosa, 1887)	nomen dubium	1		9	
F. callosa (Eisén, 1878)	valid	1			
F. christeri Rota et Healy, 1999	valid				many
F. connata Bretscher, 1902	valid	2		5	many
F. cylindrica Springett, 1971	valid				1
F. deformis Möller, 1971	valid				3
F. discifera Healy, 1975	valid				1
F. galba (Hoffmeister, 1843)	valid (aggregate?)	4	3	11	many
F. gamotheca? Issel, 1905	valid	1			
***F. globuligera*?** Rota, 1995	valid	1			2
F. gracilis von Bülow, 1957 – see *F. minor*!	junior synonym				
F. hegemon (Vejdovský, 1878)	valid	9		+	2
F. isseli Rota, 1994	valid				many
F. lenta Schmelz, 2003	valid				2
F. leydigi (Vejdovský, 1878)	nomen dubium	2	+	5	1
F. maculata Issel, 1905	valid			7	2
***F. maculatiformis*?** Dósza-Farkas, 1972	valid				1
F. minor Friend, 1913	valid	2			
F. cf. ***monochaeta*** Rota, 1995	valid				1
F. nemoralis Nurminen, 1970	valid	2			many
F. paranemoralis Dósza-Farkas, 1982	nomen dubium	1			
F. paroniana Issel, 1904	valid	2		11	many
F. perrieri (Vejdovský, 1878)	valid sensu N. & Ch., 1959	11	1	4	some
F. polychaeta Bretscher, 1900	nomen dubium	?	?	?	
F. ratzeli (Eisén, 1904)	valid (aggregate?)	10	1	9	many
***F. reducata*?** Dósza-Farkas, 1974	valid				1
F. rendsinata Dósza-Farkas, 1972	valid				2
F. semisetosa Dózsa-Farkas, 1970	valid				many
F. singula Nielsen et Christensen, 1961	valid	2			
F. striata (Levinsen, 1884)	valid	?	?	?	1
F. sylvatica Healy, 1979	valid	2			2
F. tubulosa Dózsa-Farkas, 1972	valid			5	2
[*F. variata* Bretscher, 1902]	nomen dubium			1	
F. waldenstroemi Rota et Healy, 1999	valid				2
[*F. zykoffi* Vejdovský, 1904]	nomen dubium	?	?	?	
Total number of valid species		17	4	13	29

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