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Millipedes and centipedes from eastern France (Myriapoda: Chilopoda, Diplopoda)

Von JÖRG SPELDA

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Abstract

The present paper provides a summary of the authors records between 1991 and 2000 in eastern France (departments Bas Rhin, Belfort, Doubs, Haute-Saone, Haut-Rhin, Moselle, Vosges). It provides coordinates for previously published records, especially those of BIGLER (1913), too.

Keywords: faunistics, coordinates

Zusammenfassung

Hundert-und Tausendfüßerfunde von Ostfrankreich (Myriapoda: Chilopoda, Diplopoda). Die vorliegende Arbeit gibt eine Zusammenstellung der Hundert- und Tausendfüßernachweise des Autors zwischen 1991 und 2000 im östlichen Frankreich (Departements Bas Rhin, Belfort, Doubs, Haute-Saone, Haut-Rhin, Moselle, Vosges). Zudem werden die bisher publizierten Fundorte aus diesem Gebiet, vorzugsweise von BIGLER (1913) stammend, georeferenziert.

Introduction

The millipede and centipede fauna of eastern France is poorly known. As these area is far away from Paris, the center of French scientists, it has never been investigated thoroughly by French myriapodologist. The records we have from this area originate mainly from German and Swiss scientists, especially Walter Bigler, who covered the southern and central Vosges Mountains in his thesis on millipeds (BIGLER 1913).

During my biogeographic survey of the millipede and centipede fauna of southwestern Germany, the close French departements Haut-Rhin, Bas-Rhin, Belfort, Doubs, Haute-Saone, Haut-Rhin and Moselle have been sampled for comparsional purpose. Four excursions have been made from 1991 to 2000. The first excursion (7. & 8.10.1991) was a common project with my colleague Ariane Pedrolí-Christen and had the discovery of *Rhymogona* Cook, 1896 material on focus. This material served the base for both of our investigations on this genus (PEDROLÍ-CHRISTEN & SCHOLL 1996, SPELDA 1999). The bodies of the animals, except for the gonopods and vulvae, were taken by Pedrolí-Christen for genetic studies. The removed gonopods and vulvae were divided between both of us and had been used for the morphometric studies of myself a few years later (SPELDA 1999). The other millipedes and centipedes taken on that excursion have been investigated by myself solely. Their records are shown on the maps of SPELDA (1999). During the other three excursions I was accompanied by members of my family. The next excursion (11. & 12.10.1996) focused again the southern Vosges Mountains but included also sites of the French Jura, such as the area around the caves of Mouthier-Haute-

Pierre. These caves are famous for inhabiting endemic cave animals (beetles like *Royerella villardi*, *Trichaphaenops sollaudi*, see SPELDA 1996; millipedes like *Boreoiulus simplex*, see BRÖLEMANN 1923) and we hoped to find other interesting endemic millipedes in this area. The results of this 1996 excursion are also shown on the maps of SPELDA (1999), while the other two excursions took part after the appearance of this thesis. They had both been single day excursions. On 29.10.1999 the northern Vosges Mountains, and on 29.10.2000 the central Vosges Mountains have been visited to close the gap existing between the southern Voges Mountains and the Pfälzer Wald of Rhineland-Palatine. The four excursion included the visit of classical localities of BIGLER (1913), such as “Servafälle bei Natzweiler” [cascades de la Serva].

Beside these four excursions another sample from the department Vosges was given to me by my colleague Roland Molenda (Basel) for identification (for details see MOLENDEN 1996), and on 17.04. 1993 one site of the department Bas-Rhin was sampled by myself and my wife Ute.

Material and Methods

The localities are listed in two categories:

1. Localities which have been visited by myself or from where the material has been determined.

2. Localities from where the material was determined by other people.

The localities are listed in latitudinal and longitudinal order from north to south and from west to east. A short name (toponym) is given to each locality, which indicates the locality under the listed species and in the maps. The second list includes all French localities of BIGLER (1913), even those not mentioned in SPELDA (1999). As these localities have now different French names and it is often difficult to find them on maps, their present name is given as addition in squared brackets.

Localities

localities of material determined by the author (Fig. 1)

- Wissembourg (49.0416°N, 7.8825°E): Bas-Rhin, 3 km SE Bobenthal, 4 km WNW Wissembourg, 180-250m, 17.04.1993, leg. Jörg & Ute Spelda
- Vieux-Lixheim (48.7952°N, 7.1202°E): Moselle, 2 km NW Vieux-Lixheim, 10 km WNW Phalsbourg, 200-350m, 29.10.1999, leg. Jörg & Ute Spelda
- Col de Saverne (48.7554°N, 7.3305°E): Bas-Rhin, Col de Saverne 1 km NW Ottersthal, 3 km NW Saverne, 300-410m, 29.10.1999, leg. Jörg & Ute Spelda
- Saverne (48.7463°N, 7.4125°E): Bas-Rhin, 3 km E Saverne, 3 km NW Waldolwisheim, 150-250m, 29.10.1999, leg. Jörg & Ute Spelda
- Dabo (48.6394°N, 7.295°E): Bas-Rhin, street to Roßkopf, Col du Schleif, N Engenthal, 4 km SE Dabo, 29.10.2000, leg. Jörg & Maria Spelda
- Abreschviller (48.6195°N, 7.1284°E): Moselle, 1 km WSW Grand Soldat, 3 km SE Abreschviller, 29.10.2000, leg. Jörg & Maria Spelda
- Nideck (48.5851°N, 7.2841°E): Bas-Rhin, W castle of Nideck, 5 km NW Oberhaslach, 29.10.2000, leg. Jörg & Maria Spelda
- Le Donon (48.5108°N, 7.1530°E): Bas-Rhin, 1 km SW Le Donon, 6 km NW Schirmeck, 29.10.2000, leg. Jörg & Maria Spelda
- Servafälle (48.4329°N, 7.2568°E): Bas-Rhin, N cascades de la Serva, 1 km S Natzwiller, 6 km SE Schirmeck, 29.10.2000, leg. Jörg & Maria Spelda



Fig. 1: Localities of material determined by the author in eastern France.

- Champ du Feu (48.4293°N, 7.306°E): Bas-Rhin, street crossing 4 km NE Champ du Feu, 3 km NW Le Hohwald, 29.10.2000, leg. Jörg & Maria Spelda
- Andlau (48.3931°N, 7.4112°E): Bas-Rhin, 1 km NW Andlau, 3 km SW Barr, 29.10.2000, leg. Jörg Spelda
- La Glacière (48.1000°N, 6.9666°E): Vosges, "La Glacière" 8 km NE Gérardmer, 8 km SSW Fraize, 680m, 6.10.1988-23.10.1992, leg. Roland Molenda (MOLEND, 1996)
- Linthal (47.9692°N, 7.1236°E): Haut-Rhin, Lautenbach-Linthal, 8 km NW Guebwiller, 7.10.1991, leg. Jörg Spelda & Ariane Pedrolí-Christen

- Lautenbach (47.9384°N, 7.0913°E): Haut-Rhin, valley of Lauch 5 km W Lautenbach, 10 km WNW Guebwiller, 11.10.1996, leg. Jörg & Ute Spelda
- Grand Ballon (47.9039°N, 7.0940°E): Haut-Rhin, Grand Ballon, 9 km W Guebwiller, 11.10.1996, leg. Jörg & Ute Spelda
- Col Amic (47.8804°N, 7.1290°E): Haut-Rhin, Col Amic, 7 km WSW Guebwiller, 11.10.1996, leg. Jörg & Ute Spelda
- Col des Croix (47.8677°N, 6.7204°E): Haute-Saone, 2 km NW Col des Croix, 5 km WSW Fresse-sur-Moselle, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- La Haut du Them (47.8568°N, 6.7311°E): Haute-Saone, NE La Haut du Them, 5 km SW Fresse-sur-Moselle, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Rimbach (47.8206°N, 6.9435°E): Haut-Rhin, Rimbach-pres-Masevaux, 6 km NW Masevaux, 7.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Annegray (47.8170°N, 6.5510°E): Haute-Saone, S Annegray, 3 km N Ecromagny, 13 km E Luxeuil-les-Bains, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Ballon d'Alsace 1 (47.8170°N, 6.8360°E): Belfort, 1 km SW Ballon d'Alsace, 8 km NNE Giromagny, 1100m, 11.10.1996, leg. Jörg & Ute Spelda
- Sewen (47.8097°N, 6.8870°E): F: Haut-Rhin, 1 km WNW Sewen, 9 km NNE Giromagny, 7.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Servance (47.8079°N, 6.6236°E): Haute-Saone, 1 km NW St. Hilaire, 4 km W Servance, 7 km NE Melisey, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Ecromagny 1 (47.8043°N, 6.5564°E): Haute-Saone, 1 km N Ecromagny, 13 km E Luxeuil-les-Bains, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Wegscheid (47.8007°N, 6.9543°E): Haut-Rhin, N Kirchberg-Wegscheid, 5 km NW Masevaux, 7.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Ballon d'Alsace 2 (47.7989°N, 6.8279°E): Belfort, brook valley 3 km SSW Ballon d'Alsace, 6 km N Giromagny, 900m, 11.10.1996, leg. Jörg & Ute Spelda
- St. Hilaire (47.7934°N, 6.6155°E): Haute-Saone, 1 km SW St. Hilaire, 2 km NNE Belonchamp, 6 km NE Melisey, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Ballon d'Alsace 3 (47.7934°N, 6.8440°E): Belfort, 3 km S Ballon d'Alsace, 6 km NNE Giromagny, 940-950m, 7.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Ecromagny 2 (47.7771°N, 6.5618°E): Haute-Saone, 1 km S Ecromagny, 12 km NE Lure, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Larmet (47.7626°N, 6.6827°E): Haute-Saone, Larmet 2 km ENE Fresse, 8 km ENE Melisey, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Melisey (47.7536°N, 6.5860°E): Haute-Saone, 1 km E Melisey, 11 km NE Lure, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Masevaux (47.7463°N, 6.9946°E): Belfort, 3 km S Masevaux, 2 km NE Rougemont-le-Chateau, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Plancher Bas (47.7300°N, 6.7284°E): Haute-Saone, 2 km N Plancher Bas, 15 km NNW Belfort, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Lomont (47.6159°N, 6.6223°E): Haute-Saone, 1 km SE Lomont, 12 km SE Lure, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Médière (47.4764°N, 6.6155°E): Doubs, 3 km NE Médière, 15 km WSW Montbéliard, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- L'Isle-sur-le-Doubs (47.4293°N, 6.5740°E): Doubs, 2 km S L'Isle-sur-le-Doubs, 19 km SW Montbéliard, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen

- Glainans (47.4039°N, 6.5873°E): Doubs, 3 km N Glainans, 20 km SW Montbéliard, 8.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen; 12.10.1996, leg. Jörg & Ute Spelda
- Mambouhans (47.3840°N, 6.6322°E): Doubs, 2 km NW Mambouhans, 2 km WSW Hyémondans, 18 km SW Montbéliard, 08.10.1991, leg. Jörg Spelda & Ariane Pedroli-Christen
- Baumes-les-Dames (47.3695°N, 6.3756°E): Doubs, 2 km SW Autechaux, 2 km NE Baumes-les-Dames, 12.10.1996, leg. Jörg & Ute Spelda
- Mouthier-Haute-Pierre (47.0235°N, 6.2857°E): Doubs, Gorges de Nouailles 1 km SSE Mouthier-Haute-Pierre, 14 km NNW Pontarlier, 12.10.1996, leg. Jörg & Ute Spelda

localities of material determined by other persons (Fig. 2)

- Straßburg (48.5833°N, 7.754°E): Bas-Rhin, Straßburg, [Strasbourg, 130-140m,] 1913 or earlier (BIGLER 1913)
- Servafälle (48.4329°N, 7.2568°E): Bas-Rhin, Servafälle bei Natzweiler [cascades de la Serva], 1913 or earlier (BIGLER 1913)
- Hochfeld (48.3985°N, 7.2506°E): Bas-Rhin, Hochfeld [Champ du Feu], 1100m, 1913 or earlier (BIGLER 1913)
- Schlucht (48.0652°N, 7.0189°E): Haut-Rhin, Schlucht im Elsaß [Col de la Schlucht], 1120m, 1927 or earlier (VERHOEFF 1928)
- Münstertal (48.0525°N, 7.1075°E): Haut-Rhin, Münstertal in den Vogesen [Valleé de Munster], 1929 or earlier (VERHOEFF 1929)
- Günsbachtal (48.0507°N, 7.1747°E): Haut-Rhin, Günsbachtal bei Münster im Elsaß, 1913 or earlier (BIGLER 1913)
- Riedweier (48.038°N, 7.0135°E): Haut-Rhin, Riedweier am Hohneck, 1913 or earlier (BIGLER 1913)
- Münster (48.038°N, 7.1317°E): Haut-Rhin, Münster im Elsaß [Munster], 1910 or earlier (VERHOEFF 1910a); Münster im Elsaß, 600m, 1928 or earlier (VERHOEFF 1928)
- Schloßwald (48.038°N, 7.1317°E): Haut-Rhin, Münster im Elsaß, Schloßwald, 1913 or earlier (BIGLER 1913)
- Fischbrödle (48.0235°N, 7.0215°E): F: Haut-Rhin, Fischbrödle, 1913 or earlier (BIGLER 1913)
- Breitenbach (48.0217°N, 7.0994°E): Haut-Rhin, Breitenbach, 1913 or earlier (BIGLER 1913)
- Sondernach (47.9963°N, 7.0698°E): Haut-Rhin, Sondernach, 1913 or earlier (BIGLER 1913)
- Fechtal (47.98°N, 7.0645°E): Haut-Rhin, Fechtal (oberhalb Sondernach), 1913 or earlier (BIGLER 1913)
- Zinnköpfe (47.9637°N, 7.2419°E): Haut-Rhin, Zinnköpfe near Rouffach, 1996-1997, leg. & det. Heiko Bellmann
- Rouffach (47.9583°N, 7.301°E): Haut-Rhin, Rouffach, 1910 or earlier (VERHOEFF 1910b); 1912 or earlier (VERHOEFF 1912a)
- Klinzkopf (47.9492°N, 7.0537°E): Haut-Rhin, Klinzkopf, 1913 or earlier (BIGLER 1913)
- Niederlauchen (47.9438°N, 7.1129°E): Haut-Rhin, Niederlauchen, 1913 or earlier (BIGLER 1913)
- Lauchtal (47.9384°N, 7.0913°E): Haut-Rhin, Lauchtal, 1913 or earlier (BIGLER 1913)
- Gebweiler (47.9057°N, 7.215°E): F: Haut-Rhin, Gebweiler [Guebwiller], 1913 or earlier (BIGLER 1913)
- Großer Belchen (47.9039°N, 7.094°E): F: Haut-Rhin, Großer Belchen [Grand Ballon], 1913 or earlier (BIGLER 1913)

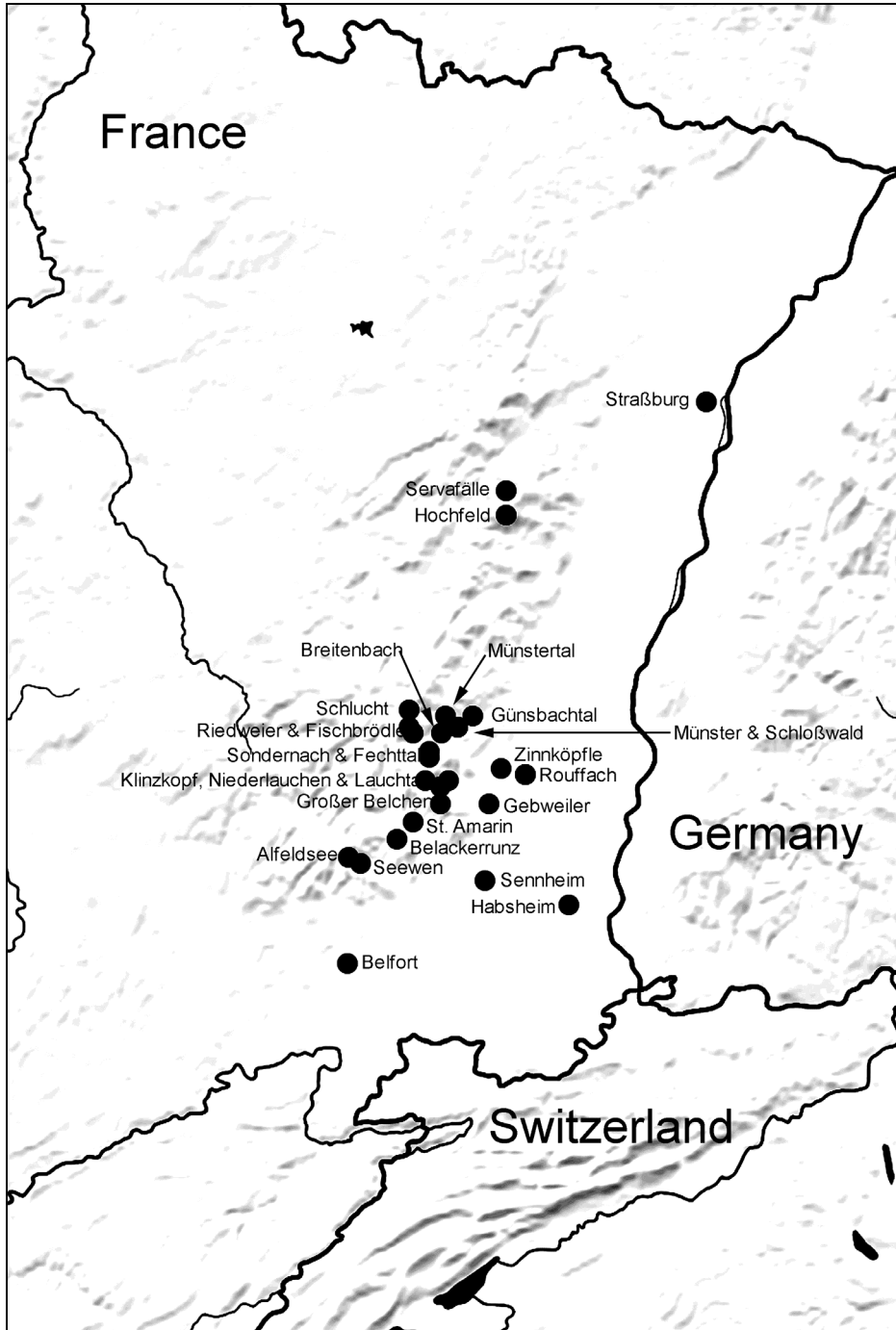


Fig. 2: Localities of material determined by other authors in eastern France.

- St. Amarin (47.8713°N, 7.0268°E): Haut-Rhin, St. Amarin, 1912 or earlier (VERHOEFF 1912b)
- Belackerrunz (47.8423°N, 6.9838°E): Haut-Rhin, Belackerrunz (Thannertal), 1913 or earlier (BIGLER 1913)
- Alfeldsee (47.8170°N, 6.8655°E): Haut-Rhin, Alfeldsee [Lac d'Alfeld], 1913 or earlier (BIGLER 1913)
- Seewen (47.8097°N, 6.8951°E): Haut-Rhin, Seewen [Sewen], Seewener See [Lac de Sewen], 1913 or earlier (BIGLER 1913)

- Sennheim (47.7753°N, 7.2069°E): Haut-Rhin, zwischen Sennheim [Cernay] und Lutterbach [Lutterbach Reiningue] nahe Mühlhausen, 1900 or earlier (VERHOEFF 1900)
- Habsheim (47.7300°N, 7.4166°E): Haut-Rhin, Habsheim [230-310m], 1913 or earlier (BIGLER 1913)
- Belfort (47.6322°N, 6.8629°E): Belfort, Belfort, Laubwald, 1913 or earlier (BIGLER 1913)

Species

Chilopoda

Lithobiida

- Lithobius aeruginosus* L. Koch, 1862: Glainans (1 ♂, 12.10.1996)
- Lithobius agilis* C. L. Koch, 1847: Saverne (1 ♀), Abreschviller (2 ♀♀)
- Lithobius crassipes* L. Koch, 1862: Le Donon (2 ♀♀), Servafälle (1 ♀), Grand Ballon (1 ♂, 2 ♀♀)
- Lithobius forficatus* (Linnaeus, 1758): Col de Saverne (1 ♀), Le Donon (1 ♂), Servafälle (2 juv. ♂♂), Andlau (2 ♂♂), La Glacière (1 ♂, 3 ♀♀), Grand Ballon (3 ♂♂, 1 ♀), Lautenbach (1 ♂), Ecomagny 1 (1 ♂), Ballon d'Alsace 1 (1 ♂), Masevaux (1 ♀), Lomont (1 ♂), Médière (1 ♀)
- Lithobius macilentus* L. Koch, 1862: Le Donon (1 ♀), Servafälle (1 juv. ♂, 1 juv. ♀), La Glacière (1 ♀), Grand Ballon (1 ♂), Col Amic (1 ♀)
- Lithobius melanops* Newport, 1845: Abreschviller (1 ♀)
- Lithobius mutabilis* L. Koch, 1862: Servafälle (1 ♀), Linthal (1 ♀)
- Lithobius muticus* C. L. Koch, 1847: Ballon d'Alsace 3 (1 ♀)
- Lithobius piceus* L. Koch, 1862: Baumes-les-Dames (1 ♀), Mouthier-Haute-Pierre (1 ♂)
- Lithobius pygmaeus* Latzel, 1880: Servafälle (1 ♂)
- Lithobius subtilis* Latzel, 1880: Ballon d'Alsace 1 (2 ♂♂)
- Lithobius tricuspis* Meinert, 1872: Saverne (3 ♂♂), Dabo (1 ♀), Servafälle (2 ♂♂, 2 ♀♀, 1 juv. ♂), Andlau (3 ♂♂, 1 ♀, 1 juv. ♂, 1 juv.), La Glacière (2 ♀♀), Lautenbach (1 ♀), Col Amic (1 ♀), Ballon d'Alsace 2 (1 ♂), Baumes-les-Dames (1 ♂), Mouthier-Haute-Pierre (1 ♂)

Scolopendrida

- Cryptops hortensis* Leach, 1815: Masevaux (1 ad.), Glainans (1 ad., 12.10.1996)
- Cryptops parisi* Brölemann, 1920: Wissembourg (1 ad.), Col de Saverne (1 juv.), Abreschviller (5 ad.), Andlau (6 ad.)

Geophilida

- Clinopodes linearis* (C.L. Koch, 1835): Andlau (2 ♂, 1 ♀, 1 juv. ♀), Masevaux (1 juv.)
- Geophilus electricus* (Linnaeus, 1758): Glainans (1 ♀, 12.10.1996)
- Geophilus studeri* Rothenbühler, 1899: Grand Ballon (1 ♀)
- Henia vesuviana* (Newport, 1845): Glainans (1 ♂, 12.10.1996)
- Necrophloeophagus flavus* (De Geer, 1778): Col des Croix (1 ♂)
- Schendyla nemorensis* (C.L. Koch, 1837): Abreschviller (1 ♀), St. Hilaire (1 ♀)
- Strigamia acuminata* (Leach, 1814): Wissembourg (1 ♂), Servafälle (1 ♀), La Glacière (1 ♂), Linthal (1 ♂, 1 ♀), Glainans (1 ♀, 8.10.1991), Mouthier-Haute-Pierre (1 ♂)
- Strigamia crassipes* (C. L. Koch, 1835): Münster (1 ♀), Melisey (1 ♀)

Diplopoda

Glomerida

- Glomeris undulata* C.L. Koch, 1844 var. *conspersa* C.L. Koch, 1847: Linthal (1 ♂, 1 ♀), Lautenbach (4 ♀♀), Col Amic (1 ♀), Glainans (1 ♀, 8.10.1991; 2 ♀♀, 12.10.1996), Mouthier-Haute-Pierre (2 ♂♂, 3 ♀♀, 1 juv.)
- Glomeris intermedia* Latzel, 1884: Col de Saverne (5 ♂♂, 6 ♀♀), Saverne (2 ♂♂, 2 ♀♀), Abreschviller (2 ♂♂), Dabo (4 ♂♂, 1 ♀), Servafälle (2 ♂♂, 5 ♀♀, 2 juv. ♂♂, 2 juv. ♀♀), Andlau (2 ♂♂, 4 ♀♀), Linthal (1 ♂, 1 ♀), Grand Ballon (3 ♂♂, 2 ♀♀), La Haut du Them (1 ♂, 1 ♀), Col des Croix (1 ♀), Col Amic (3 ♂♂, 1 ♀), Masevaux (3 ♂♂, 6 ♀♀), Médière (2 ♂♂), Glainans (3 ♂♂, 2 ♀♀, 12.10.1996), Baumes-les-Dames (1 ♂), Mouthier-Haute-Pierre (1 ♀)
- Glomeris marginata* (Villers, 1789): Col de Saverne (1 ♂, 5 ♀♀), Saverne (2 ♀♀), Le Donon (1 ♂), Andlau (2 ♂♂), Linthal (1 ♀), Lautenbach (1 ♂, 1 ♀), Grand Ballon (1 ♂), La Haut du Them (4 ♂♂, 1 ♀), St. Hilaire (1 ♀), Masevaux (3 ♂♂, 4 ♀♀), Plancher Bas (1 ♂, 4 ♀♀), Médière (1 ♂, 2 ♀♀), L'Isle-sur-le-Doubs (1 ♂), Glainans (2 ♂♂, 12.10.1996)

Chordeumatida

- Chordeuma sylvestre* C.L. Koch, 1847: La Glacière (5 ♀♀), Linthal (5 ♀♀), La Haut du Them (1 ♀), Col des Croix (1 ♀), Ballon d'Alsace 2 (1 ♀), St. Hilaire (1 ♂, 4 ♀♀), Lomont (1 ♀), L'Isle-sur-le-Doubs (2 ♀♀), Glainans (1 ♂, 1 ♀, 1 juv. 8.10.1991; 2 ♂♂, 5 ♀♀, 12.10.1996), Baumes-les-Dames (3 ♂♂, 3 ♀♀, 6 juv.), Mouthier-Haute-Pierre (3 ♀♀)
- Craspedosoma rawlinsii alsaticum* (Verhoeff, 1910): Wissembourg (2 ♂♂, 5 ♀♀), Col de Saverne (2 ♂♂, 2 ♀♀), Abreschviller (4 ♂♂, 12 ♀♀), Dabo (1 ♂, 1 ♀), Le Donon (1 ♂), Nideck (6 ♂♂, 10 ♀♀), Servafälle (5 ♂♂, 4 ♀♀), Andlau (3 ♂♂, 2 ♀♀), Linthal (8 ♂♂, 3 juv., rev. Hauser), Lautenbach (4 ♂♂, 3 ♀♀, 1 juv.), Sewen (2 ♂♂, 3 ♀♀, 1 juv. ♂, rev. Hauser), Servance (1 ♂), St. Hilaire (2 ♂♂, 2 ♀♀, rev. Hauser), Masevaux (10 ♂♂, 4 ♀♀, 3 juv., rev. Hauser), Médière (1 ♂), Mouthier-Haute-Pierre (2 ♂♂, 1 ♀, 3 juv.)
- Craspedosoma taurinorum* Silvestri, 1898: Col des Croix (1 ♂, rev. Hauser), Annegray (2 ♂♂, 1 ♀, rev. Hauser)
- Craspedosoma* sp.: Champ du Feu (1 ♀), La Haut du Them (3 juv.), Plancher Bas (1 juv.), L'Isle-sur-le-Doubs (1 juv.), Mambouhans (1 ♀, 1 juv.)
- Helvetiosoma helveticum* (Verhoeff, 1900): Mouthier-Haute-Pierre (1 ♂)
- Melogona gallica* (Latzel, 1884): Andlau (1 ♀), La Glacière (1 ♂)
- Mycogona germanica* (Verhoeff, 1892): Dabo (1 ♂, 4 ♀♀), Le Donon (1 ♀), La Glacière (10 ♂♂, 9 ♀♀, 2 juv.), Lautenbach (2 ♂♂, 2 ♀♀), Col des Croix (1 ♀), Ballon d'Alsace 3 (1 ♀)
- Orthochordeumella fulva* (Rothenbühler, 1899): Lautenbach (1 ♀), Ballon d'Alsace 2 (1 ♂, 5 ♀♀), Baumes-les-Dames (1 ♂, 7 ♀♀), Mouthier-Haute-Pierre (2 ♂♂, 2 ♀♀)
- Rhymogona hessei* (Ravoux, 1935): Lomont (5 ♂♂, 2 ♀♀), Médière (6 ♂♂, 2 ♀♀), Glainans (4 ♂♂, 9 ♀♀, 12.10.1996), Baumes-les-Dames (2 ♂♂, 4 ♀♀)
- Rhymogona montivaga alemannica* (Verhoeff, 1910): Linthal (4 ♂♂, 4 ♀♀), Lautenbach (6 ♂♂, 2 ♀♀), La Haut du Them (2 ♀♀), Ballon d'Alsace 2 (4 ♂♂, 3 ♀♀, 1 juv.), Masevaux (3 ♂♂, 2 ♀♀)
- Rhymogona montivaga montivaga* (Verhoeff, 1894): Mouthier-Haute-Pierre (7 ♂♂, 9 ♀♀)
- Xylophageuma zschokkei* Bigler, 1912: Dabo (4 ♂♂, 7 ♀♀), Le Donon (2 ♂♂, 1 ♀), Nideck (1 ♂, 3 ♀♀), Servafälle (1 ♂, 1 ♀), Champ du Feu (1 ♂), Col des Croix (3 ♂♂, 1 ♀), La Haut du Them (1 juv. ♂), Annegray (1 ♂, 1 ♀), Ecomagny 1 (1 ♀), Ballon d'Alsace 2 (9 ♂♂, 9 ♀♀, 1 juv.), St. Hilaire (1 ♂), Ballon d'Alsace 3 (6 ♂♂, 2 ♀♀, 1 juv.), Ecomagny 2 (2 ♀♀), Lomont (1 juv. ♂)

Julida

Allainulus nitidus (Verhoeff, 1891): Saverne (1 ♂, 1 ♀), Le Donon (1 juv. ♂), Servafälle (1 ♂, 1 ♀), Andlau (1 ♂, 1 ♀♀, 1 juv. ♂, 1 juv. ♀), Linthal (1 ♀), Masevaux (1 ♂, 3 ♀♀), Médière (1 ♀), Glainans (1 ♀, 12.10.1996), Baumes-les-Dames (1 ♂, 6 ♀♀), Mouthier-Haute-Pierre (1 ♀)

Blaniulus guttulatus (Bosc, 1792): Wegscheid (2 juv. ♂♂)

Cylindroiulus punctatus (Leach, 1815): Saverne (2 ♀♀), Rimbach (9 ♂♂, 7 ♀♀)

Julus scandinavicus Latzel, 1884: Saverne (1 ♂), Abreschviller (12 ♂♂, 7 ♀♀, 1 juv. ♂, 13 juv. ♀♀), Dabo (1 ♀), Le Donon (1 ♂, 1 ♀), Servafälle (2 ♀♀), Andlau (1 ♂, 3 ♀♀), La Glacière (1 ♀), Lautenbach (1 ♀), Sewen (1 ♂), St. Hilaire (1 ♀), Larmet (3 ♂♂, 1 ♀), Melisey (2 ♀♀), Glainans (1 ♀, 12.10.1996)

Leptoiulus simplex (Verhoeff, 1894): La Glacière (1 ♂), Glainans (1 ♀), Baumes-les-Dames (1 ♂)

Tachypodoiulus niger (Leach, 1815): Vieux-Lixheim (1 ♀), Saverne (1 ♂, 3 ♀♀, 1 juv. ♀), Abreschviller (2 ♂♂, 2 ♀♀), Servafälle (1 ♂, 3 ♀♀, 1 juv. ♂, 1 juv. ♀), Linthal (1 ♂, 1 juv. ♂), Lautenbach (1 ♂, 3 ♀♀, 1 juv. ♂), La Haut du Them (1 ♂), Rimbach (2 ♀♀, 9 juv. ♂♂, 17 juv. ♀♀), Sewen (1 ♂), Ballon d'Alsace 2 (2 ♀♀), St. Hilaire (1 ♀, 1 juv. ♂), Ballon d'Alsace 3 (1 juv. ♀), Larmet (1 ♀), Melisey (2 juv. ♀♀), Masevaux (3 ♀♀), Plancher Bas (9 ♂♂, 10 ♀♀, 5 juv. ♂♂, 4 juv. ♀♀), Médière (1 ♂, 3 ♀♀), L'Isle-sur-le-Doubs (2 ♀♀, 2 juv. ♂♂), Glainans (1 juv. ♀, 8.10.1991; 1 ♂, 3 ♀♀, 12.10.1996), Baumes-les-Dames (3 ♀♀, 1 juv. ♂), Mouthier-Haute-Pierre (2 ♀♀)

Polydesmida

Polydesmus angustus (Latzel, 1884): Saverne (2 ♂♂, 1 ♀), Le Donon (2 ♀♀), Servafälle (1 ♀), Linthal (2 ♂♂, 2 ♀♀), Lautenbach (3 ♂♂), Grand Ballon (1 ♂), Col Amic (2 ♂♂, 2 ♀♀), Col des Croix (1 ♀), La Haut du Them (4 ♂♂, 3 ♀♀, 4 juv. ♂♂, 5 juv. ♀♀), Annegray (1 ♀), Ballon d'Alsace 1 (2 ♂♂, 4 ♀♀), Wegscheid (1 ♀), Ballon d'Alsace 3 (2 ♀♀), Ecomagny 2 (1 ♀), Masevaux (3 ♂♂, 2 juv. ♂♂), Médière (1 ♀), Glainans (2 ♀♀, 12.10.1996), Baumes-les-Dames (2 ♂♂, 1 ♀), Mouthier-Haute-Pierre (7 ♂♂, 4 ♀♀)

Polydesmus helveticus Verhoeff, 1894: Linthal (18 ♂♂, 4 ♀♀), Lautenbach (20 ♂♂, 4 ♀♀, 5 juv. ♀♀), Médière (3 ♂♂, 1 ♀), Glainans (1 ♂, 3 ♀♀, 8.10.1991; 4 ♂♂, 6 ♀♀, 12.10.1996), Baumes-les-Dames (6 ♂♂), Mouthier-Haute-Pierre (8 ♂♂, 16 ♀♀)

Polydesmus testaceus C.L. Koch, 1847: Rimbach (1 ♀)

Discussion

Eastern France is still a little-known area in respect of millipeds and centipeds. The latter group is distinctly less known, because there has been no former comprehensive treatment and centipeds are not as easy to collect as millipeds, as these agile animals do often escape. Although 21 species have been recorded, most of them are represented from one or two samples only. Therefore it is premature to discuss distribution patterns. Four species (*Lithobius forficatus*, *L. macilentus*, *L. tricuspis* and *Strigamia acuminata*) seem to be quite common in the investigated area, as they have been found in five or more samples. *Henia vesuviana*, a remarkable thermophilic species, has been discovered at Rouffach by VERHOEFF (1912), cited simply as “Elsaß” in VERHOEFF (1934). It was recently rediscovered at the nearby Zinnköpfler by BELLMANN (in litt., 1997) and in the Jura (see above).

Millipeds have been collected in much larger numbers than centipeds and together with the work of BIGLER (1913) some distributional tendencies can be extracted. 23 species and subspecies have been recorded during the present investigation. Five species (*Haasea flavescens* (Latzel, 1884), *Boreoiulus tenuis* (Bigler, 1913), *Enantiulus nanus* (Latzel, 1884), *Leptoiulus bertkaui*

(Verhoeff, 1896) and *Ommatoiulus sabulosus* (Linnaeus, 1758) recorded in previous papers haven't been recollected. *Boreoiulus tenuis* has been originally described from Fechtal (BIGLER 1913) and is difficult to find because of its small size. *Leptoiulus bertkaui* is difficult to record without the help of pitfall traps, probably because it hides in deep crevices during daytime. It has been found by BIGLER (1913) at three localities: Servafälle, Lauchtal and Sewen. *Ommatoiulus sabulosus* is famous for its mass occurrence between Cernay and Lutterbach Reiningue, documented by VERHOEFF (1900). It has also been found at Günsbachtal by BIGLER (1913). *Enantiulus nanus* has been recorded by BIGLER (1913) at four localities (Servafälle, Schloßwald, Lauchtal, Sewen)

Among the pill millipeds not only the species *Glomeris intermedia* and *G. marginata*, widespread in France, occur in the investigated area, but also *G. undulata*. The latter seems to be restricted to the Jura and the southern Vosges Mountains. The family Chordeumatidae is represented by four species, of which *Chordeuma sylvestre* was the most common. This species and *Orthochordeumella fulva* have their main focus in the southern Vosges Mountains and the Jura, while *Mycogona germanica* inhabits rather the northern parts of the Vosges Mountains. In the investigated area the genus *Craspedosoma* Leach, 1915 is (mainly) represented by the subspecies *C. rawlinsii alsaticum*. This subspecies has recently been revalidated by HAUSER (2004), who has seen several of the samples (see above). He also recorded *C. taurinorum* among the material at his disposal. This is surprising as this species does not occur in the Swiss Jura but in the Alps much more eastward (PEDROLI-CHRISTEN 1993). Maybe labels have been confused. According to the results of PEDROLI-CHRISTEN (1993) the *Helvetiosoma*-species *H. helveticum* (Verhoeff, 1900), *H. alemannicum* Verhoeff, 1911, *H. jurassicum* Verhoeff, 1911 and *H. cornigerum* Bigler, 1913 are regarded as belonging to a single species, thus *Helvetiosoma helveticum* is the correct name. It is another species difficult to find. It has not yet been recorded from France (BRÖLEMANN 1935) but from nearby localities in Switzerland. Its occurrence at Mouthier-Haute-Pierre confirms this area as a centre of rare species. Of the genus *Rhymogona* three (sub)species have been found. The central and southern Vosges Mountains and the northern part of the Jura are inhabited by *R. montivaga alemannica*, the central Jura and the area to the west by *R. hessei* and in the southern Jura *R. montivaga montivaga* occurs. *Xylophageuma zschokkei* has been found quite common in the Vosges Mountains and the area to the south, in contrast to its congener *X. vomrathi* in the Black Forest, which is much more difficult to record. Another representative of the family Haaseidae, *Haasea flavescens*, has been found by BIGLER (1913) at the Klinzkopf. *Tachypodoiulus niger* was the most common julid during the own investigations, both in individuals and samples. *Allainulus nitidus* and *Julus scandinavicus* were also quite common. The polydesmids are mainly represented by *Polydesmus angustus*. *P. helveticus* was also quite common in the southern part of the investigated area. It is remarkable that *P. denticulatus*, which is the most common polydesmid in the Black Forest has not been found in the Vosges Mountains. But as the samples contained many juvenile *Polydesmus*, and *P. denticulatus* is mature in summer but not in autumn, it is quite probable, that only the late time of the excursions is responsible for that.

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