



Nationalpark Gesäuse GmbH
Fachbereich Naturschutz & Forschung

Identification of copepods and amphipods in springs of the National Park Gesäuse - Period 2019-2020 - Final report

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This study deals with copepod and amphipod crustaceans collected during year 2018 (received in 2020) and year 2020 (received in 2021). In 2019 a single sample was collected.

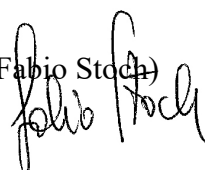
Samples sorted in laboratory under a stereomicroscope included material of copepod and amphipod crustaceans (18 samples: 8 in 2018 and 10 in 2020), while those sorted by the collectors in the field included material of amphipods only (5 samples: 1 in 2019 and 4 in 2020).

The specimens were sorted from vials under a Zeiss stereomicroscope; selected specimens were transferred in a drop of glycerine, dissected, and mounted on microscopic slides sealed with epoxids. The material was identified under a Zeiss compound microscope equipped with Nomarski Interferential Contrast. All the specimens present in the vials were counted and preserved in 75° ethanol with 10% glycerol in vials (each vial including specimens from a site in each sampling date) for future taxonomic studies, properly labelled. Some specimens were retained in absolute ethanol.

Thanks to funds made available by the Université libre de Bruxelles, molecular analyses were performed on specimens collected in the Nationalpark and properly preserved, allowing to establish their specific status (*Niphargus salzburgensis*); they cannot be identified using morphology alone.

Sixteen species were found; the number of specimens identified amounts to **1,414** in 23 samples (566 for 2018 and 848 for 2020). Additionally, some specimens were juveniles (copepodids) of harpacticoid copepods, which cannot be identified (110 specimens, 67 in 2018, 43 in 2020).

Rome, 15 December 2021

(dr. Fabio Stoch)


ANNEXES

Note: All complete datasets with counts and details are included in two Excel sheets (2018 and 2020 samples), delivered to the spring project coordinator, dr. Reinhard Gerecke. A screenshot of the sheets is reported in the annexes below.

Annex 1: List of the sixteen species identified in the 23 samples

Copepoda Calanoida

Arctodiaptomus alpinus (Imhof, 1885): 2 samples, 10 specimens

Copepoda Cyclopoida

Acanthocycloips vernalis (Fischer, 1853): 2 samples, 5 specimens

Eucyclops serrulatus (Fischer, 1851): 3 samples, 524 specimens

Megacyclops viridis (Jurine, 1820): 1 sample, 4 specimens

Paracyclops imminutus Kiefer, 1929: 4 samples, 59 specimens

Copepoda Harpacticoida

Attheyella (*Attheyella*) *wierzejskii* (Mrázek, 1893): 6 sites, 134 specimens

Bryocamptus (*Rheocamptus*) *zschokkei* (Schmeil, 1893): 1 sample, 15 specimens

Bryocamptus (*Rheocamptus*) *tatrensis* (Minkiewicz, 1916): 7 samples, 183 specimens

Bryocamptus (*Echinocamptus*) *echinatus* (Mrázek, 1893): 9 samples, 129 specimens

Bryocamptus (*Arcticocamptus*) *cuspidatus* (Schmeil, 1893): 3 samples, 41 specimens

Bryocamptus (*Arcticocamptus*) *rhaeticus* (Schmeil, 1893): 3 samples, 4 specimens

Hypocamptus brehmi (Douwe 1922): 1 sample, 1 specimen

Moraria (*Moraria*) *alpina* Stoch, 1998: 2 samples, 63 specimens

Pilocamptus pilosus (Douwe, 1910): 1 sample, 1 specimen

Malacostraca Amphipoda

Gammarus fossarum Koch, 1836: 5 samples, 179 specimens

**Niphargus salzburgensis* Schellenberg, 1935: 10 samples, 62 specimens

* Groundwater, blind species identified on DNA basis using ITS1 and 2 genes; see the publication:

Stoch F., Christian E., Flot J.-F., 2020. Molecular taxonomy, phylogeny and biogeography of the *Niphargus tatrensis* species complex (Amphipoda, Niphargidae) in Austria. *Organism Diversity & Evolution*, 20: 701-722.

Annex 2: Species identified, and specimens counts (collection year: 2018)

	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse
	GSENG	GSENG	USTAWA	PSEE	PSEEQ	KANZL	BUTTER	WAW04
Arten	19/04/18	15/07/18	18/07/18	18/07/18	18/07/18	17/07/18	17/07/18	17/07/18
<i>Arctodiaptomus alpinus</i>				5	5			
<i>Acanthocyclops vernalis</i>			2					
<i>Eucyclops serrulatus</i>					497			
<i>Bryocamptus (Rheocamptus) zschokkei</i>			15					
<i>Bryocamptus (Rheocamptus) tatrensis</i>							18	
<i>Bryocamptus (Echinocamptus) echinatus</i>			1				4	
<i>Bryocamptus (Arcticocamptus) cuspidatus</i>			9					4
<i>Bryocamptus (Arcticocamptus) rhaeticus</i>						1		2
<i>Hypocamptus brehmi</i>			1					
<i>Niphargus salzburgensis</i>	1	1						

Annex 3: Species identified, and specimens counts (collection year: 2020)

Sorting under stereomicroscope:

	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse	lochschwa
	DAWAGRA	GEISS-Q	KALB	LEO 1	LEOMO	PULVER 2	PULVER 3	SCHEU 1	SCHEU 2	WAMALO
Arten	24/07/20	23/07/20	07/08/20	25/07/20	25/07/20	26/07/20	26/07/20	24/07/20	24/07/20	24/07/20
<i>Acanthocyclops vernalis</i>					3					
<i>Eucyclops serrulatus</i>							9			18
<i>Megacyclops viridis</i>									4	
<i>Paracyclops imminutus</i>	2		1				33	23		
<i>Attheyella (Attheyella) wierzejskii</i>	43	3	19		1	29	39			
<i>Bryocamptus (Rheocamptus) tatrensis</i>				138		11	2	11	2	1
<i>Bryocamptus (Echinocamptus) echinatus</i>	3	1	1	28		18	5	68		
<i>Bryocamptus (Arcticocamptus) cuspidatus</i>								28		
<i>Bryocamptus (Arcticocamptus) rhaeticus</i>			1							
<i>Moraria (Moraria) alpina</i>				1	62					
<i>Pilocamptus pilosus</i>			1							
<i>Gammarus fossarum</i>						38	78		32	
<i>Niphargus salzburgensis</i>	1					6	3		30	

Field sorting only:

	Gesäuse	Gesäuse	Gesäuse	Gesäuse	Gesäuse
	BERTL	GEISS-W	JOTRA6	HAIMI	HIMAQ
Arten	26/07/20	23/07/20	26/07/20	16/09/19	23/07/20
<i>Gammarus fossarum</i>	22		9		
<i>Niphargus salzburgensis</i>	10	5		1	4