

Stygofauna Mundi: groundwater crustacean fauna

Goal

For WP4 T4.4: In order to integrate several datasets on groundwater crustacean fauna (in particular molecular dataset obtained from previous European projects), there was a need to get a proper taxonomic backbone, e.g., the one that is provided in the book *Stygofauna Mundi* (Botosaneanu, 1986). The coverage is worldwide.

Results

Names, distribution by the ecoregions and by the habitats (both as defined in *Stygofauna Mundi*) were extracted for all crustacean taxa. Morphological data, available in one group, were also digitized.

A dedicated database structure was elaborated under MS-Access (Fig. 1), with a proper encoding front-end (Fig. 2). A shapefile of the ecoregions (Fig. 3) was realized to be made available through the BioFresh portal.

In addition, the distribution by country was completed in two steps (by computation from the ecoregions and the distribution statements in the book), and by a visual scrutiny. The statuses Native, Endemic, Questionable were assigned by computation. The details of the procedure were reported during the 2nd Project Meeting in Montserrat (21-25 February 2011).

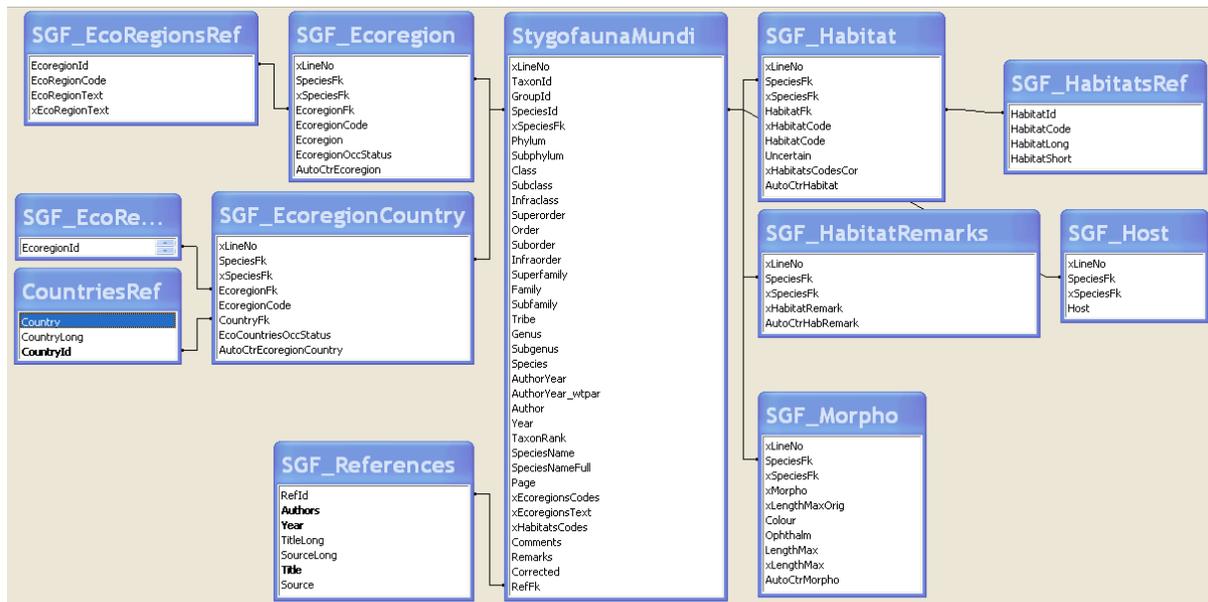


Figure 1. - Database structure to store the taxonomic and distribution data from *Stygofauna Mundi*.

Holsinger, J.R., 1986. Holarctic Crangonyctid Amphipods. In Botosaneanu, L. (ed.), *Stygofauna Mundi*, pp. 535-549.

pl Arthropoda sph Crustacea c Malacostraca sc Eumalacostraca spo Peracarida o Amphipoda so Gammaridea io

spf f Crangonyctidae sf t sg

SGF Species No Genus **Crangonyx** Species **antennatus**

6 Author Packard, 1881 Year 1881

GroupId 22 SpeciesId 1980 TaxonId LineNo 20 Page 542 Corrected Comments On Remarks On -1 Taxon Rank Species

Species locations and countries LocationCodes VIII 1, 3

VIII 1	N	Caves over a wide part of the southern Appalachians in Alabama, Georgia, Tennessee and Virginia, U.S.A.	VIII 1	E	USA
VIII 3	N	Caves over a wide part of the southern Appalachians in Alabama, Georgia, Tennessee and Virginia, U.S.A.	VIII 3	E	USA

SpeciesHabitats HabCodes C, B, T

B	Vadose zone of caves with gours filled with percolating water.
C	Epiphreatic zone in a cave system.
T	Karst springs.

SpeciesMorpho

Comments Remarks

US states to be assigned to ecoregions.

SpeciesName Crangonyx antennatus SpeciesNameFull Crangonyx antennatus Packard, 1881

Figure 2. – Encoding front-end for *Stygofauna Mundi*.

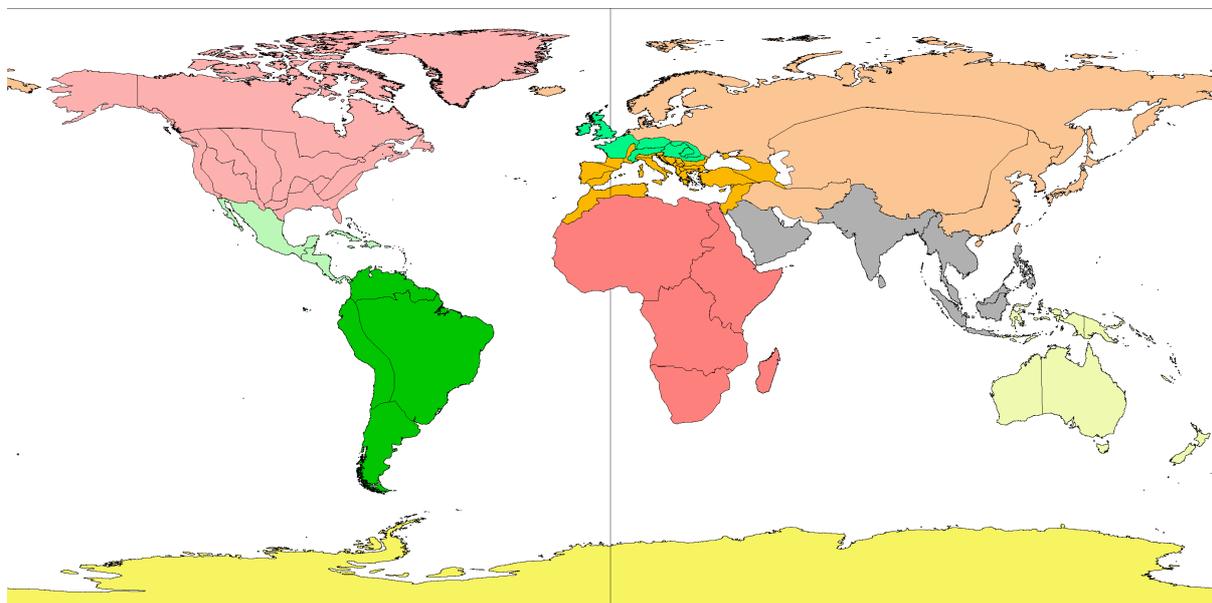


Figure 3. – Shapefile of the ecoregions defined in *Stygofauna Mundi* (F. Malard, UCBL).

The number of species and subspecies encoded are shown in table 1: 36 groups and 2,338 species-group taxa in total, with 2,839 assignments in 120 ecoregions, 2,816 in 158 countries, 3,328 in 32 habitats.

The database and the metadata will be available on the portal by the end of April after some overall country assignment review.

Table 1. – Statistics of data encoding for groundwater Crustaceans groups.

Group chapter	Page Nb	Species Nb	%
36	270	2338	
Ostracoda	14	121	5,3%
Copepoda: Cyclopoida	14	156	6,8%
Copepoda: Harpacticoida	15	453	19,6%
Syncarida	16	158	6,8%
Mysidacea	5	23	1,0%
Isopoda: Cirolanidae	10	45	2,0%
Isopoda: Sphaeromatidae	5	40	1,6%
Isopoda: Asellota: Aselloidea (+)	31	317	13,8%
Isopoda: Asellota: Janiroidea	8	82	3,5%
Isopoda: Microcerberidea	7	58	2,4%
Amphipoda: Gammarid grouping	7	40	1,7%
Amphipoda: Melitid grouping	10	120	4,2%
Amphipoda: Niphargus-group	21	267	11,6%
Amphipoda: Holarctic Crangonyctid Amphipods	15	130	5,8%
Amphipoda: Bogidiellidae	7	70	3,0%
Amphipoda: Ingolfiellidea	4	27	1,1%
Decapoda	27	124	5,4%
Other groups	54	107	4,1%

Possible improvements

- Refinement of the structure if necessary (countries, classification) and the encoding interface (remove the unnecessary fields)
- Exporting, georeferencing and incorporating of species records in the European distributional database of groundwater crustaceans
- Cross-tables with other ecoregion systems (WWF Freshwater Ecosystems of the World, Limnofauna)

Further actions

- Within BioFresh: Publication of the Stygofauna Mundi database (make it available, and a scientific paper). Note that the images (under pdfs) and the OCR MS-Word versions of the relevant chapters could be made available but then copyrights issues should be addressed.
- Outside BioFresh: Launch an international initiative for updating the Stygofauna Mundi database (International Society of Subterranean Biology)

Some results from the database

The table 2 shows the percentage of endemism per continent. It remains still at region and country level (not shown). It is an indication that countries have a clear responsibility for the conservation of the groundwater fauna. It shows also that most part of the world are badly explored compared to Europe, for a fauna that have some importance in the water cycle.

Table 2. – Percentage of endemics in the continents (E%). E: number of endemics; N: number of natives; Q: Number of questionable.

Continent	E%	E	N	Q
Africa and islands	84.7%	166	27	3
Mediterranean	66.9%	801	393	3
Western and central Europe	48.8%	164	172	
Northeastern Eurasia	85.7%	191	32	
South Asia	93.4%	57	3	1
Oceania	89.0%	73	9	
North America	79.1%	238	63	
Central America and Caribbean	88.8%	230	29	
South America	93.4%	114	8	

References

Botosaneanu, L. (ed.), 1986. *Stygofauna Mundi*. A faunistic, distributional, and ecological synthesis of the world fauna inhabiting subterranean waters (including the marine interstitial). Leiden, The Netherlands: Brill, E.J. And Dr. W. Backhuys, 740p.