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Adeline Kerner, Regine Vignes

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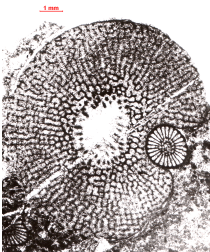
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Knowledge Base with Xper3 in Paleontology: Calculated Descriptors Offer New Functionalities

Adeline Kerner¹ & Régine Vignes-Lebbe²

¹ CR2P, UMR7207 MNHN-UPMC-CNRS, Sorbonne Université kerner@mnhn.fr

² ISYEB, UMR 7205, CNRS-MNHN-UPMC-EPHE, Sorbonne Université



Xper 3

- Web platform that
 - manages descriptive data
 - provides interactive identification keys
- Used for various taxonomic groups.
- Well adapted for identification in paleontology, because fossils are often incomplete and unsuitable for identification by means of classical dichotomous keys.
- Compatible with TDWG's Structured Descriptive Data (SDD) format.
- Descriptive model with three descriptor types:
 - categorical (i.e., qualitative or intervals)
 - numerical (continuous data)
 - calculated (logical combination of other descriptors).

Xper3 interface and SDD export

See <http://www.xper3.com>

Paleontological example: archaeocyaths ?

- 1st animal reef-builder
- Oldest calcified-sponges
- Exclusively Cambrian fossils

Time scale (<http://www.earth-time.org/trollart.html>)

Schematic morphology:

- 2 walls
- 1 intervallum
- Vertical elements
- Horizontal elements
- Links between intervallum elements

See <http://www.infosyslab.fr/archaeocyatha/>

Calculated descriptors

- New type of descriptors
- Automatically computed from other descriptors by using logical operators.
- Do not exist in SDD format => exported as categorical descriptors, losing the origin of the values.

Terminology

- Reconstruct the literature terminology from a set of more detailed descriptors.
- Example: "cambroid pores":
(Shape: simple or polygonal) AND (Repartition: regular distribution) AND (Repartition type: random)

Example of cambroid pores

Phylogeny

- Express the data in a new way.
- Example: for phylogenetic purpose, simple tumuli is equivalent to the combination of three detailed descriptors expressed for identification: (Presence of bumps: present) AND (Number of perforation: simple) AND (Direction of bump perforation: simple) AND (Direction of bump perforation: downwardly opening).

Character 11. Presence of carcass bumps: None (0), Multiperforate tumuli (1), Simple tumuli (2), Pustulae (3).

Multilingual identification key

- Create a consistent multilingual interactive identification key.
- => All translations are computed from a single language set of knowledge.
- Example: here, the English version is the original dataset and the French one is a mirror. When you modify the description of a species in the English version, the French one changes automatically.