

# Supplementary Material

## Appendix 1. List of occurrences in the main excavation

### Unit 1

#### Bed 1

| Layer | Taxonomy                                                 | Number of specimens, remarks                                 |
|-------|----------------------------------------------------------|--------------------------------------------------------------|
| 1     | <i>Dendrocystites barrandei</i> Bather, 1913             | 99x complete specimens                                       |
| 1     | <i>Echinospaerites</i> sp.                               | 2x                                                           |
| 1     | <i>Homocystites</i> sp.                                  | 1x plate                                                     |
| 1     | Ichnofossils indet.                                      | 2x (1x black one)                                            |
| 1     | <i>Planolites</i> isp.                                   | 1x                                                           |
| 1     | <i>Prionocheilus mendax</i> (Vaněk, 1965)                | 1x cephalon, 1x part of thorax                               |
| 1     | <i>Orthida</i> indet.                                    | 1x                                                           |
| 1     | <i>Aegiromena</i> cf. <i>praecursor</i> (Havlíček, 1952) | 1x                                                           |
| 1     | <i>Praenucula</i> sp.                                    | 1x with <i>Arachnostega</i> isp. on the internal right valve |
| 1     | <i>Skolithos</i> isp.                                    | 1x                                                           |

#### Bed 2

| Layer    | Taxonomy                                                   | Number of specimens, remarks                |
|----------|------------------------------------------------------------|---------------------------------------------|
| 2b       | <i>Arachnostega</i> isp.                                   | 1x                                          |
| 2b       | <i>Aristocystites</i> sp.                                  | 1x isolated plates                          |
| 2b       | <i>Bergaueria</i> ? isp.                                   | 1x                                          |
| 2b       | <i>Dendrocystites barrandei</i> Bather, 1913               | 4x fragments + 3x complete specimens        |
| 2b       | <i>Echinospaerites infaustus</i> Barrande, 1887            | 1x                                          |
| 2b       | <i>Macrocystella</i> sp.                                   | 1x plate                                    |
| 2b       | <i>Planolites</i> isp.                                     | 1x                                          |
| 2b       | <i>Selenopeltis</i>                                        | 1x pleura with spine                        |
| 2a       | <i>Archeoconularia</i> sp.                                 | 1x long fragment of shell                   |
| 2a       | <i>Blyskavomena blyskavensis</i> (Havlíček, 1967)          | 1x                                          |
| 2a       | <i>Drabovia redux</i> (Barrande, 1848)                     | 1x with encrusting bryozoans                |
| 2a       | <i>Hirnantia</i> cf. <i>ulrichi</i> Havlíček, 1951         | 1x                                          |
| 2a       | <i>Drabovia</i> sp.                                        | 1x                                          |
| 2a       | <i>Cekovia</i> ? sp.                                       | 1x                                          |
| 2a       | Cephalopoda + juvenile trilobite ( <i>Cekovia</i> ?)       | 1x                                          |
| 2a       | Cephalopoda indet + <i>Arachnostega</i> isp.               | 1x                                          |
| 2a       | Cephalopoda indet.                                         | 2x fragment                                 |
| 2a       | Crinoidea indet.                                           | 1x isolated columnals                       |
| 2a       | <i>Dendrocystites barrandei</i> Bather, 1913               | 11x disarticulated, 112 complete specimens  |
| 2a       | <i>Echinospaerites infaustus</i> Barrande, 1887            | 1x                                          |
| 2a       | Ichnofossils                                               | 1x                                          |
| 2a       | <i>Macrocystella</i> sp.                                   | 1x plate, 1x stem                           |
| 2a       | <i>Mespilocystites bohemicus</i> Barrande, 1887            | 1x                                          |
| 2a       | Ophiuroidea nov. gen.                                      | 9x                                          |
| 2a       | <i>Primaspis</i> ? sp.                                     | 1x incomplete thorax                        |
| 2a       | <i>Prionocheilus mendax</i> (Vaněk, 1965)                  | 1x pygidium, 1x cheek                       |
| 2a       | <i>Rhombifera</i> ? sp.                                    | 1x                                          |
| 2a       | <i>Sphenotallus</i> sp.                                    | 1x                                          |
| 2 indet. | <i>Vysocania</i> cf. <i>moravecii</i> Pereira et al., 2017 | 1x cranidium filled by <i>Tomaculum</i> sp. |
| 2 indet. | <i>Vysocania</i> cf. <i>moravecii</i> Pereira et al., 2017 | 1x incomplete holaspid cephalon             |
| 2 indet. | <i>Bicuspina multicostellata</i> Havlíček, 1950            | 1x                                          |
| 2 indet. | <i>Archeoconularia</i> sp.                                 | 1x                                          |

### Bed 3 (ichnofossils abundant in both layers)

| Layer | Taxonomy                                                   | Number of specimens, remarks                |
|-------|------------------------------------------------------------|---------------------------------------------|
| 3b    | <i>Aristocystites</i> sp.                                  | 3x                                          |
| 3b    | <i>Archaeoconularia</i> sp.                                | 1x almost complete shell                    |
| 3b    | <i>Orthida</i> indet.                                      | 1x                                          |
| 3b    | <i>Cekovia</i> cf. <i>transfuga</i> (Barrande, 1852)       | 1x incomplete specimen                      |
| 3b    | Crinoidea indet.                                           | 1x                                          |
| 3b    | <i>Dendrocystites barrandei</i> Bather, 1913               | 45x complete specimens, >15 fragments       |
| 3b    | Edrioasteroidea indet.                                     | 1x                                          |
| 3b    | <i>Echinosphaerites infaustus</i> Barrande, 1887           | 1x                                          |
| 3b    | <i>Macrocystella</i> sp.                                   | 1x stem                                     |
| 3b    | Cephalopoda indet. + bryozoans                             | 2x incomplete shells encrusted by bryozoans |
| 3b    | <i>Mespilocystites bohemicus</i> Barrande, 1887            | 1x theca                                    |
| 3b    | <i>Planolites</i> isp.                                     | 1x                                          |
| 3b    | <i>Rhombifera</i> indet.                                   | 1x part of stem                             |
| 3b    | <i>Tropidodiscus</i> ? sp.                                 | 1x                                          |
| 3a    | <i>Archaeoconularia</i> sp.                                | 1x complete + 1x fragmented specimens       |
| 3a    | <i>Aristocystites</i> sp.                                  | 2x complete specimens                       |
| 3a    | <i>Aspidocarpus</i> sp.                                    | 1x complete specimen                        |
| 3a    | Bryozoa indet.                                             | 1x fragment of a colony                     |
| 3a    | <i>Cekovia</i> sp. + <i>Arachnostega</i> isp.              | 1x                                          |
| 3a    | Cephalopoda indet.                                         | 1x fragment                                 |
| 3a    | <i>Cekovia</i> cf. <i>transfuga</i> (Barrande, 1852)       | 1x incomplete specimen                      |
| 3a    | Cephalopoda indet. + <i>Ceramopora vadosa</i> Počta, 1894  | 2x incomplete shells encrusted by bryozoans |
| 3a    | Cephalopoda indet.                                         | 1x incomplete shell                         |
| 3a    | <i>Mespilocystites</i> sp.                                 | 1x theca                                    |
| 3a    | Cystoidea indet.                                           | 1x                                          |
| 3a    | <i>Dendrocystites barrandei</i> Bather, 1913               | 12x disarticulated; 61 complete specimens   |
| 3a    | <i>Drabovia</i> sp.                                        | 2x                                          |
| 3a    | <i>Echinosphaerites infaustus</i> Barrande, 1887           | 2x theca                                    |
| 3a    | <i>Homocystites</i> sp.                                    | 2x plates                                   |
| 3a    | <i>Macrocystella</i> sp.                                   | 2x isolated plate; 3x part of stem          |
| 3a    | <i>Mespilocystites bohemicus</i> Barrande, 1887            | 8x theca                                    |
| 3a    | Ophiuroidea nov. gen.                                      | 1x middle part of a big specimen            |
| 3a    | <i>Planolites</i> isp.                                     | 1x                                          |
| 3a    | <i>Prionocheilus mendax</i> (Vaněk, 1965)                  | 2x pygidium                                 |
| 3a    | <i>Rhombifera bohémica</i> Barrande, 1867                  | 1x, with indeterminable ichnofossil         |
| 3a    | <i>Rusophycus</i> sp.                                      | 1x                                          |
| 3a    | <i>Vysocania</i> cf. <i>moravecii</i> Pereira et al., 2017 | 1x cephalon                                 |

### Bed 4

| Layer | Taxonomy                                      | Number of specimens, remarks          |
|-------|-----------------------------------------------|---------------------------------------|
| 4     | <i>Aegiromena praecursor</i> (Havlíček, 1952) | 1x                                    |
| 4     | <i>Aristocystites</i> sp.                     | 2x plates, 4x complete specimens      |
| 4     | <i>Cekovia</i> sp.                            | 1x entire specimen, 1x pygidium       |
| 4     | Crinoidea indet.                              | 1x fragment of crinoid stem           |
| 4     | <i>Dendrocystites barrandei</i> Bather, 1913  | 30x complete specimens + 5x fragments |
| 4     | Echinodermata indet.                          | 1x isolated plate – indeterminable    |
| 4     | Psammosphaeridae                              | 1x                                    |
| 4     | Ichnofossils                                  | present                               |
| 4     | <i>Mespilocystites</i> sp.                    | 1x                                    |
| 4     | <i>Orthida</i> indet.                         | 10x poorly preserved remains          |

## Unit 2

### Bed 5

| Layer    | Taxonomy                                           | Number of specimens, remarks                     |
|----------|----------------------------------------------------|--------------------------------------------------|
| 5e       | <i>Aristocystites</i> sp.                          | 1x theca                                         |
| 5e       | <i>Dendrocystites</i> sp.                          | 1x specimen + 1x fragment, 6x complete specimens |
| 5e       | <i>Sphenothallus</i> sp.                           | 1x specimen                                      |
| 5d       | Cephalopoda indet.                                 | 1x                                               |
| 5d       | Cystoidea?                                         | 3x specimens                                     |
| 5d       | <i>Dendrocystites barrandei</i> Bather, 1913       | 12x articulated and 6x disarticulated specimens  |
| 5d       | <i>Drabovinella</i> sp.                            | 1x                                               |
| 5d       | Ichnofossils                                       | present                                          |
| 5d       | <i>Rafanoglossa</i> ? sp.                          | 1x                                               |
| 5d       | <i>Macrocystella</i>                               | 1x specimen                                      |
| 5d       | <i>Mespilocystites bohemicus</i> Barrande, 1887    | 1x theca                                         |
| 5c       | <i>Archaeoconularia</i> sp.                        | 1x fragment of theca                             |
| 5c       | <i>Prionocheilus</i> sp.                           | 1x incomplete thorax                             |
| 5c       | <i>Aristocystites</i> sp.                          | 1x                                               |
| 5c       | Orthida indet.                                     | 3x                                               |
| 5c       | <i>Dendrocystites barrandei</i> Bather, 1913       | 2x isolated plates + 1x complete specimen        |
| 5c       | <i>Echinospaerites infaustus</i> Barrande, 1887    | 1x theca                                         |
| 5c       | <i>Mespilocystites bohemicus</i> Barrande, 1887    | 1x theca                                         |
| 5c       | <i>Planolites</i> isp. + indeterminate ichnofossil | 2x                                               |
| 5b       | Ichnofossils                                       | present                                          |
| 5b       | <i>Hirnantia</i> cf. <i>ulrichi</i> Havlíček, 1951 | 1x                                               |
| 5a       | <i>Archaeoconularia</i> sp.                        | 2x                                               |
| 5a       | <i>Dendrocystites barrandei</i> Bather, 1913       | 3x fragments + 2x complete                       |
| 5a       | Ichnofossils                                       | present                                          |
| 5a       | <i>Rafanoglossa</i> ? sp.                          | 1x                                               |
| 5 indet. | <i>Syringomorpha</i> isp.                          | 1x                                               |
| 5 indet. | <i>Teichichnus</i> isp.                            | 1x                                               |

### Bed 6

| Layer | Taxonomy                                              | Number of specimens, remarks                             |
|-------|-------------------------------------------------------|----------------------------------------------------------|
| 6c    | <i>Aristocystites</i> sp.                             | 1x fragment, 1x complete theca + isolated plates         |
| 6c    | <i>Dendrocystites barrandei</i> Bather, 1913          | 39x complete, 14x disarticulated specimens               |
| 6c    | Edriasteroidea indet.                                 | 2x                                                       |
| 6c    | <i>Mespilocystites bohemicus</i> Barrande, 1887       | 1x isolated plate, 1x complete specimen                  |
| 6c    | Ophiuroidea nov. gen.                                 | 1x complete, 1x disarticulated specimens                 |
| 6b    | <i>Aristocystites</i> sp.                             | 1x plate                                                 |
| 6b    | <i>Dendrocystites barrandei</i> Bather, 1913          | 16x complete, 4x + full lens of disarticulated specimens |
| 6b    | Echinodermata indet.                                  | 1x partial stem                                          |
| 6b    | <i>Helmintopsis</i> isp.                              | 2x                                                       |
| 6b    | <i>Homocystites</i> ? sp.                             | 1x proximal part of stem                                 |
| 6b    | <i>Selenopeltis</i> cf. <i>buchi</i> (Barrande, 1846) | 1x pleura                                                |
| 6a    | <i>Dendrocystites barrandei</i> Bather, 1913          | 2x fragments, 3 complete specimens                       |
| 6a    | <i>Archaeoconularia</i> sp.                           | 1x fragment                                              |
| 6a    | Echinodermata indet.                                  | isolated plates                                          |
| 6a    | Ichnofossils                                          | present                                                  |

## Unit 3

### Bed 7

| Layer | Taxonomy                                                                | Number of specimens, remarks                                                        |
|-------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 7e    | <i>Dendrocystites barrandei</i> Bather, 1913                            | 3x complete, 3x slightly disarticulated specimens, numerous fragments               |
| 7e    | <i>Cekovia</i> ? sp.                                                    | 1 x incomplete cephalon filled by organic debris                                    |
| 7d    | <i>Aristocystites</i> sp.                                               | several plates                                                                      |
| 7d    | <i>Dendrocystites barrandei</i> Bather, 1913                            | 26x specimens                                                                       |
| 7d    | <i>Homocystites</i> sp.                                                 | 1x plate                                                                            |
| 7d    | Ophiuroidea nov. gen.                                                   | 3x incomplete specimens                                                             |
| 7c    | No fossils                                                              | no fossils                                                                          |
| 7b    | <i>Dendrocystites</i> sp.                                               | 2x disarticulated specimens                                                         |
| 7b    | <i>Mespilocystites bohemicus</i> Barrande, 1887                         | 1x theca                                                                            |
| 7a    | Cephalopoda indet.                                                      | 1x incomplete shell                                                                 |
| 7a    | <i>Cekovia</i> sp. + <i>Arachnostega</i> isp.                           | 1x incomplete cephalon                                                              |
| 7a    | Cephalopoda indet., <i>Arachnostega</i> isp. & <i>Conchicolites</i> sp. | on the inner surface <i>Arachnostega</i> , on the outward side <i>Conchicolites</i> |
| 7a    | Crinoid columnals                                                       | isolated columnals                                                                  |
| 7a    | <i>Dendrocystites barrandei</i> Bather, 1913                            | 6x complete, 8x + big lens of slightly disarticulated specimens                     |
| 7a    | Diploporita indet.                                                      | 1x plate                                                                            |
| 7a    | <i>Drabovia</i> ? sp.                                                   | 1x shell                                                                            |
| 7a    | Edrioasteroidea indet.                                                  | 1x disarticulated specimen                                                          |
| 7a    | <i>Macrocystella</i> ? sp.                                              | 1x stem                                                                             |

### Bed 8

| Layer | Taxonomy                                     | Number of specimens, remarks              |
|-------|----------------------------------------------|-------------------------------------------|
| 8b    | <i>Aristocystites</i> sp.                    | 3x disarticulated plates                  |
| 8b    | <i>Dendrocystites barrandei</i> Bather, 1913 | 1x complete                               |
| 8b    | Ichnofossils                                 | present                                   |
| 8b    | Ophiuroidea nov. gen.                        | 2x very small (juvenile?) specimens       |
| 8a    | Crinoidea indet.                             | isolated columnals                        |
| 8a    | <i>Dendrocystites barrandei</i> Bather, 1913 | 1x complete + 3x disarticulated specimens |
| 8a    | <i>Homocystites</i> sp.                      | 1x plate                                  |
| 8a    | <i>Macrocystella</i> sp.                     | 1x plate                                  |
| 8a    | Ophiuroidea nov. gen.                        | 1x small specimen                         |

**Rock debris gathered from the measured excavation, impossible to be attributed to a specific layer (not included in the analyses)**

| Layer                                             | Taxonomy                                                    | Number of specimens, remarks               |
|---------------------------------------------------|-------------------------------------------------------------|--------------------------------------------|
| rock debris<br>from the<br>measured<br>excavation | <i>Bicuspina multicostellata</i> Havlíček, 1950             | 2x                                         |
|                                                   | <i>Gelidorthis gemina</i> Havlíček, 1977                    | 1x                                         |
|                                                   | <i>Praenucula</i> sp.                                       | 1x with <i>Arachnostega</i> isp.           |
|                                                   | <i>Nonorios pater</i> (Barrande in Perner, 1903)            | 1x                                         |
|                                                   | <i>Conchicolites confertus</i> (Barrande, 1867) on ?bivalve | 1x                                         |
|                                                   | " <i>Orthoceras</i> " sp. + encrusting bryozoans            | 1x                                         |
|                                                   | <i>Cekovia</i> cf. <i>transfuga</i> (Barrande, 1852)        | 1x incomplete, dorsally flattened specimen |
|                                                   | <i>Cekovia</i> sp.                                          | 4x complete + many fragments               |
|                                                   | <i>Eccoptychile</i> sp.                                     | 1x cephalon                                |
|                                                   | <i>Eccoptychiloides</i> sp.                                 | 3x complete                                |
|                                                   | <i>Prionocheilus mendax</i> (Vaněk, 1965)                   | 12x complete from rock debris              |
|                                                   | <i>Selenopeltis</i> sp.                                     | 1x complete, 1x thorax from rock debris    |
|                                                   | <i>Vysocania</i> cf. <i>moravecii</i> Pereira et al., 2017  | 3x complete + several fragments            |
|                                                   | <i>Anatifopsis</i> sp.                                      | 4x complete specimens                      |
|                                                   | <i>Caleidocrinus multiramus</i>                             | 1x almost complete specimen (broken stem)  |
|                                                   | <i>Echinospaerites infaustus</i>                            | 1x complete theca                          |
|                                                   | <i>Edrioasteroidea</i> indet.                               | 1x incomplete specimen                     |
|                                                   | <i>Glaphocystis</i> cf. <i>globulus</i> Chauvel 1966        | 1x incomplete theca                        |
|                                                   | <i>Hemicystites</i> sp.                                     | 25x articulated specimens                  |
|                                                   | <i>Hexedriocystis</i> sp.                                   | 1x incomplete specimen                     |
|                                                   | <i>Mespilocystites bohemicus</i> Barrande, 1887             | 1x incomplete theca                        |
|                                                   | <i>Rhombifera bohémica</i> Barrande, 1867                   | 1x incomplete theca                        |
|                                                   | <i>Thoralicarpus prokopi</i> Lefebvre et al., 2022          | 1x complete specimen                       |
|                                                   | <i>Arenicolites</i> isp.                                    | 1x                                         |
|                                                   | <i>Zoophycos</i> isp.                                       | 1x                                         |

## Appendix 2. Abundance matrix at the generic level

| Taxonomy                | 1    | 2a          | 2b       | 3a         | 3b         | 4         | 5a       | 5b  | 5c       | 5d        | 5e   | 6a    | 6b        | 6c         | 7a       | 7b  | 7c | 7d  | 7e       | 8a    | 8b       |
|-------------------------|------|-------------|----------|------------|------------|-----------|----------|-----|----------|-----------|------|-------|-----------|------------|----------|-----|----|-----|----------|-------|----------|
| <i>Cekovia</i>          |      | 1           |          | 2          | 1          | 1(1)      |          |     |          |           |      |       |           |            | (1)      |     |    |     | (1)      |       |          |
| <i>Primaspis</i>        |      | 1           |          |            |            |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Prionocheilus</i>    | 1    | 1           |          | 2          |            |           |          |     | 1        |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Selenopeltis</i>     |      |             | 1        |            |            |           |          |     |          |           |      |       | 1         |            |          |     |    |     |          |       |          |
| <i>Stenoparia</i>       |      |             |          | (1)        |            |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Vysocania</i>        |      | (2)         |          | (1)        |            |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Rafanoglossa</i>     |      |             |          |            |            |           | (1)      |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Drabovia</i>         |      | 2           |          | 2          |            |           |          |     |          |           |      |       |           |            | (1)      |     |    |     |          |       |          |
| <i>Drabovinella</i>     |      |             |          |            |            |           |          |     |          | (1)       |      |       |           |            |          |     |    |     |          |       |          |
| <i>Hirnantia</i>        |      | 1           |          |            |            |           |          | (1) |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Orthida</i>          | 1(1) |             |          |            | (1)        | (10)      |          |     | (3)      |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Aegiromena</i>       | 1    |             |          |            |            | 1         |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Bicuspina</i>        |      | 1           |          |            |            |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Blyskavomena</i>     |      | 1           |          |            |            |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| Bryozoa_indet           |      |             |          | 1          | 2          |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Ceramopora</i>       |      |             |          | 1          |            |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Archaeoconularia</i> |      | (2)         |          | (2)        |            |           | (2)      |     | (1)      |           |      | (1)   |           |            |          |     |    |     |          |       |          |
| <i>Sphenothallus</i>    |      | 1           |          |            |            |           |          |     |          |           | 1    |       |           |            |          |     |    |     |          |       |          |
| <i>Mespilocystites</i>  |      | 1           |          | 8          | 1          | 1         |          |     | 1        | 1         |      |       |           | 1(1)       |          | 1   |    |     |          |       |          |
| Crinoid stems           |      | (1)         |          |            | (1)        | (1)       |          |     |          |           |      |       |           |            | (1)      |     |    |     |          | (1)   |          |
| <i>Aristocystites</i>   |      |             | (1)      | 2          | 3          | 4(1)      |          |     | 1        |           | 1    |       | 1         | 1(1)       |          |     |    | (1) |          |       | (1)      |
| Edrioasteroidea         |      |             |          |            | 1          |           |          |     |          |           |      |       |           | 2          | 1        |     |    |     |          |       |          |
| Ophiuroidea nov. gen.   |      | 9           |          | 1          |            |           |          |     |          |           |      |       |           | 1(1)       |          |     |    | 3   |          | 1     | 2        |
| <i>Echinosphaerites</i> | 2    | 1           | 1        | 3          | 1          |           |          |     | 1        | 3         |      |       |           |            |          |     |    |     |          |       |          |
| <i>Homocystites</i>     | (1)  |             |          | (2)        |            |           |          |     |          |           |      |       | (3)       |            |          |     |    | (1) |          | (1)   |          |
| <i>Macrocystella</i>    |      | (1)         | (1)      | (3)        | (1)        |           |          |     |          | (1)       |      |       |           |            | (1)      |     |    |     |          | (1)   |          |
| <i>Rhombifera</i>       |      | 1           |          | 1          | 1          |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Dendrocystites</i>   | 99   | 112<br>(11) | 3<br>(4) | 61<br>(12) | 45<br>(15) | 30<br>(5) | 2<br>(3) |     | 1<br>(1) | 12<br>(6) | 7(1) | 3 (2) | 16<br>(5) | 39<br>(14) | 6<br>(8) | (2) |    | 26  | 3<br>(3) | 1 (3) | 1<br>(1) |
| <i>Aspidocarpus</i>     |      |             |          | 1          |            |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| Psammosphaeridae        |      |             |          |            |            | 1         |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Praenucula</i>       | 1    |             |          |            |            |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Orthoceras</i>       |      | 4           |          | 4          | 2          |           |          |     |          | 1         |      |       |           |            |          | 2   |    |     |          |       |          |
| <i>Tropididiscus</i>    |      |             |          |            | 1          |           |          |     |          |           |      |       |           |            |          |     |    |     |          |       |          |
| <i>Conchicolites</i>    |      |             |          |            |            |           |          |     |          |           |      |       |           |            | 1        |     |    |     |          |       |          |

Brackets indicate the number of incomplete specimens.

## Appendix 3. Results of the statistical tests

Tests of differences between medians (Kruskal-Wallis) and variances (Levene) for the whole assemblage

| Fragmentation                | Units   | Facies | Granulometry |
|------------------------------|---------|--------|--------------|
| Kruskal-Wallis' test ( $p$ ) | 0.06643 | 1      | 0.2058       |
| Levene's test ( $p$ )        | 0.868   | 0.7678 | 0.9972       |

| Taxonomic richness           | Units           | Facies         | Granulometry |
|------------------------------|-----------------|----------------|--------------|
| Kruskal-Wallis' test ( $p$ ) | <b>0.01292</b>  | <b>0.02189</b> | 0.07563      |
| Levene's test ( $p$ )        | <b>0.006067</b> | 0.2663         | 0.638        |

### Pairwise Mann-Whitney test

| Taxonomic richness | U1              | U2     | U3 |
|--------------------|-----------------|--------|----|
| U1                 |                 |        |    |
| U2                 | <b>0.009266</b> |        |    |
| U3                 | <b>0.01937</b>  | 0.9479 |    |

### Pairwise Mann-Whitney test

| Taxonomic richness | F1             | F2 |
|--------------------|----------------|----|
| F1                 |                |    |
| F2                 | <b>0.02516</b> |    |

| Abundance                    | Units          | Facies         | Granulometry   |
|------------------------------|----------------|----------------|----------------|
| Kruskal-Wallis' test ( $p$ ) | <b>0.01155</b> | <b>0.04697</b> | <b>0.04138</b> |
| Levene's test ( $p$ )        | <b>0.02795</b> | 0.1187         | 0.3477         |

### Pairwise Mann-Whitney test

| Abundance | U1             | U2     | U3 |
|-----------|----------------|--------|----|
| U1        |                |        |    |
| U2        | <b>0.01396</b> |        |    |
| U3        | <b>0.01307</b> | 0.5177 |    |

### Pairwise Mann-Whitney test

| Abundance | sand           | mica    | <64 $\mu$ |
|-----------|----------------|---------|-----------|
| sand      |                |         |           |
| mica      | 0.6019         |         |           |
| <64 $\mu$ | <b>0.01558</b> | 0.08705 |           |

### Pairwise Mann-Whitney test

| Abundance | F1             | F2 |
|-----------|----------------|----|
| F1        |                |    |
| F2        | <b>0.04247</b> |    |

| Dominance index              | Units  | Facies | Granulometry    |
|------------------------------|--------|--------|-----------------|
| Kruskal-Wallis' test ( $p$ ) | 0.6253 | 0.3711 | <b>0.005901</b> |
| Levene's test ( $p$ )        | 0.9176 | 0.7916 | 0.4704          |

### Pairwise Mann-Whitney test

| Dominance index | sand            | mica   | <64 $\mu$ |
|-----------------|-----------------|--------|-----------|
| sand            |                 |        |           |
| mica            | <b>0.003167</b> |        |           |
| <64 $\mu$       | 0.0508          | 0.5083 |           |

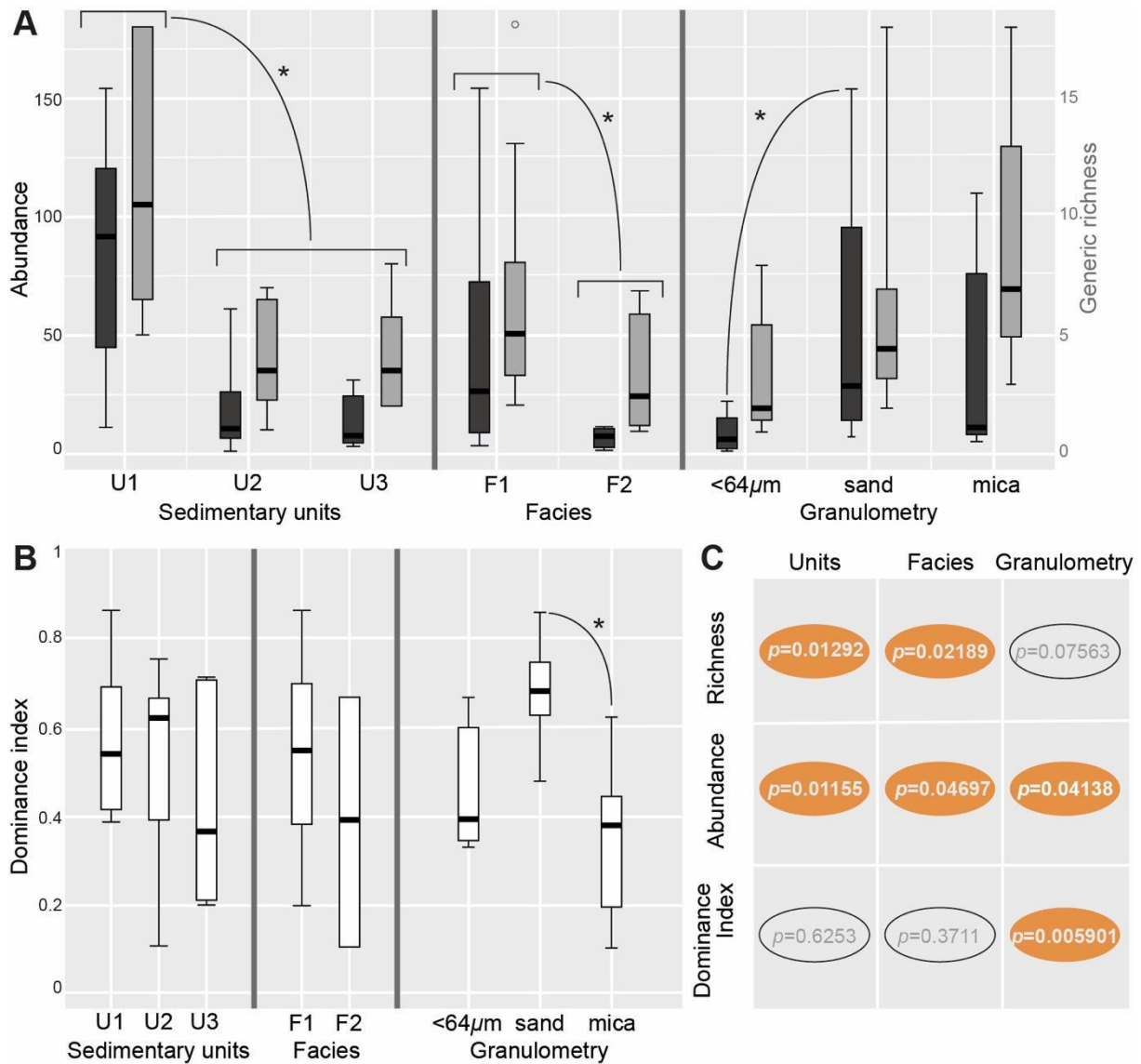


Figure S1. A-B. Boxplots of generic richness, abundance (A) and dominance index (B) in function of tested categories. C. Results of the Kruskal-Wallis test.

Tests of differences between medians (Kruskal-Wallis) and variances (Levene) for the non-allochthonous assemblage

| Taxonomic richness           | Units          | Facies | Granulometry |
|------------------------------|----------------|--------|--------------|
| Kruskal-Wallis' test ( $p$ ) | <b>0.01616</b> | 0.2909 | 0.1353       |
| Levene's test ( $p$ )        | <b>0.01584</b> | 0.3143 | 0.1822       |

#### Pairwise Mann-Whitney test

| Taxonomic richness | U1             | U2     | U3 |
|--------------------|----------------|--------|----|
| U1                 |                |        |    |
| U2                 | <b>0.02546</b> |        |    |
| U3                 | <b>0.01413</b> | 0.3858 |    |

| Abundance                    | Units           | Facies  | Granulometry   |
|------------------------------|-----------------|---------|----------------|
| Kruskal-Wallis' test ( $p$ ) | <b>0.01197</b>  | 0.07185 | <b>0.04492</b> |
| Levene's test ( $p$ )        | <b>0.008257</b> | 0.1165  | 0.2367         |

### Pairwise Mann-Whitney test

| Abundance | U1      | U2     | U3 |
|-----------|---------|--------|----|
| U1        |         |        |    |
| U2        | 0.02    |        |    |
| U3        | 0.01291 | 0.3297 |    |

### Pairwise Mann-Whitney test

| Abundance | sand    | mica   | <64mu |
|-----------|---------|--------|-------|
| sand      |         |        |       |
| mica      | 0.4175  |        |       |
| <64mu     | 0.01529 | 0.1417 |       |

| Dominance index                   | Units  | Facies | Granulometry   |
|-----------------------------------|--------|--------|----------------|
| Kruskal-Wallis' test ( <i>p</i> ) | 0.8093 | 0.4403 | <b>0.02843</b> |
| Levene's test ( <i>p</i> )        | 0.2184 | 0.607  | 0.4872         |

### Pairwise Mann-Whitney test

| Dominance index | sand     | mica   | <64mu |
|-----------------|----------|--------|-------|
| sand            |          |        |       |
| mica            | 0.006488 |        |       |
| <64mu           | 0.3539   | 0.8197 |       |

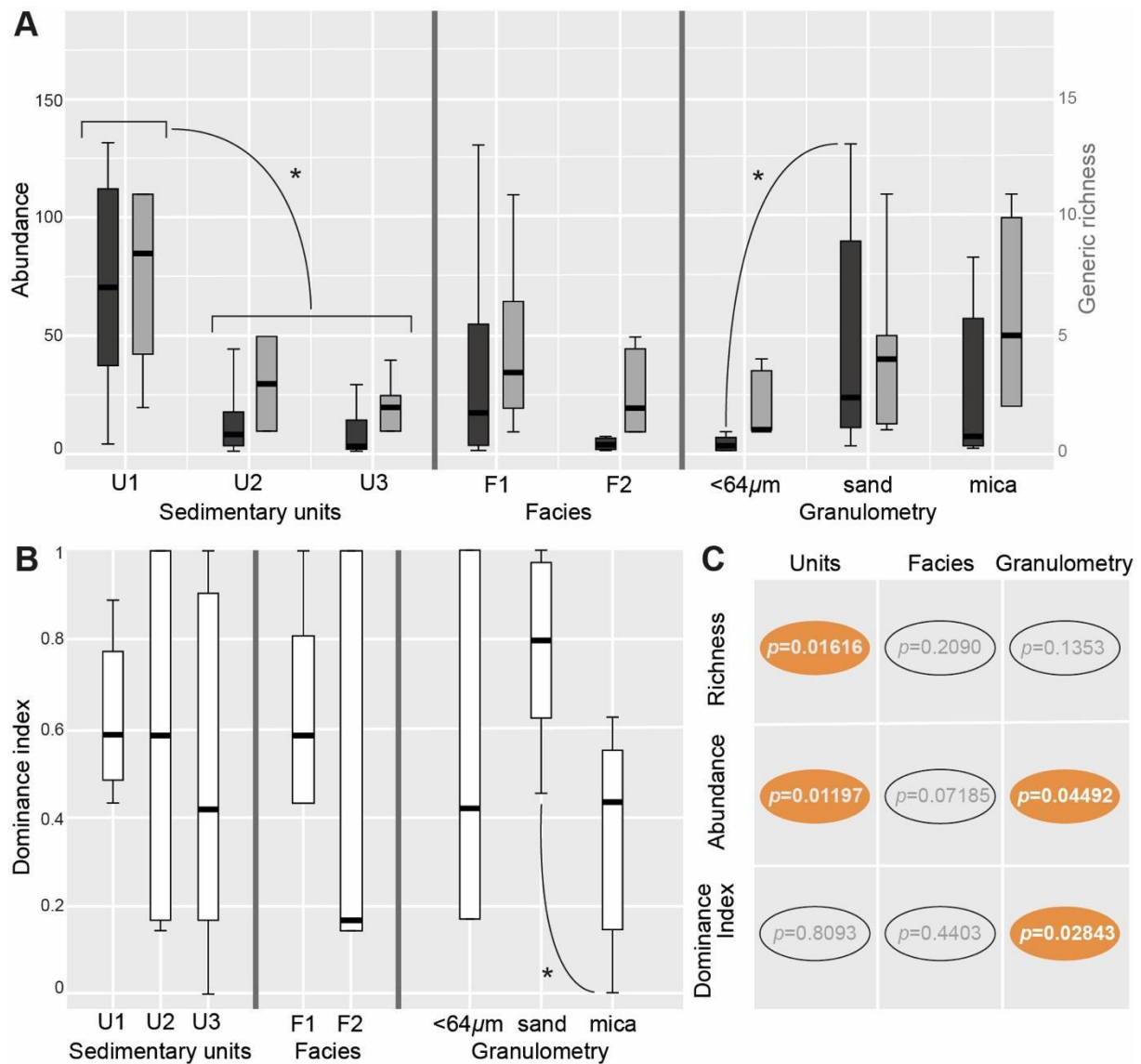


Figure S2. A-B. Boxplots of generic richness, abundance (A) and dominance index (B), among the non-allochthonous assemblages in function of tested categories. C. Results of the Kruskal-Wallis test.

## Appendix 4. Ecological parameters for the genera

| Phylum        | Class           | Taxonomy                | Motility                | Tiering              | Feeding         |
|---------------|-----------------|-------------------------|-------------------------|----------------------|-----------------|
| Arthropoda    | Trilobita       | <i>Cekovia</i>          | Fully, fast             | Surficial            | Predatory       |
| Arthropoda    | Trilobita       | <i>Primaspis</i>        | Fully fast              | Surficial            | Predatory       |
| Arthropoda    | Trilobita       | <i>Prionocheilus</i>    | Fully, fast             | Surficial            | Predatory       |
| Arthropoda    | Trilobita       | <i>Selenopeltis</i>     | Fully, fast             | Surficial            | Predatory       |
| Arthropoda    | Trilobita       | <i>Stenoparia</i>       | Fully, fast             | Surficial            | Predatory       |
| Arthropoda    | Trilobita       | <i>Vysocania</i>        | Fully, fast             | Surficial            | Predatory       |
| Brachiopoda   | Lingulata       | <i>Rafanoglossa</i>     | Facultative, unattached | Semi-infaunal        | Suspension      |
| Brachiopoda   | Rhynochenellata | <i>Drabovia</i>         | Non, unattached         | Surficial            | Suspension      |
| Brachiopoda   | Rhynochenellata | <i>Drabovinella</i>     | Non, unattached         | Surficial            | Suspension      |
| Brachiopoda   | Rhynochenellata | <i>Hirnantia</i>        | Non, unattached         | Surficial            | Suspension      |
| Brachiopoda   | Rhynochenellata | Orthida                 | Non, unattached         | Surficial            | Suspension      |
| Brachiopoda   | Strophomenata   | <i>Aegiromena</i>       | Non, attached           | Surficial            | Suspension      |
| Brachiopoda   | Strophomenata   | <i>Bicuspina</i>        | Non, attached           | Surficial            | Suspension      |
| Brachiopoda   | Strophomenata   | <i>Blyskavomena</i>     | Non, attached           | Surficial            | Suspension      |
| Bryozoa       | Stenolaemata    | Bryozoa indet.          | Non, attached           | Surficial            | Suspension      |
| Bryozoa       | Stenolaemata    | <i>Ceramopora</i>       | Non, attached           | Surficial            | Suspension      |
| Cnidaria      | Scyphozoa       | <i>Archaeoconularia</i> | Non, attached           | Erect                | Suspension      |
| Cnidaria      | Scyphozoa       | <i>Sphenothallus</i>    | Non, attached           | Erect                | Suspension      |
| Echinodermata | Coronoidea      | <i>Mespilocystites</i>  | Non, attached           | Erect                | Suspension      |
| Echinodermata | Crinoidea       | Crinoid indet.          | Non, attached           | Erect                | Suspension      |
| Echinodermata | Diploporita     | <i>Aristocystites</i>   | Non, unattached         | Erect                | Suspension      |
| Echinodermata | Edrioasteroidea | Edrioasteroidea         | Non, attached           | Surficial            | Suspension      |
| Echinodermata | Ophiuroidea     | nov. gen.               | Fully, fast             | Surficial            | Predatory       |
| Echinodermata | Rhombifera      | <i>Echinosphaerites</i> | Non, attached           | Erect                | Suspension      |
| Echinodermata | Rhombifera      | <i>Homocystites</i>     | Non, unattached         | Erect                | Suspension      |
| Echinodermata | Rhombifera      | <i>Macrocystella</i>    | Non, unattached         | Erect                | Suspension      |
| Echinodermata | Rhombifera      | <i>Rhombifera</i>       | Non, unattached         | Erect                | Suspension      |
| Echinodermata | Soluta          | <i>Dendrocystites</i>   | Fully, slow             | Surficial            | Surface Deposit |
| Echinodermata | Stylophora      | <i>Aspidocarpus</i>     | Fully, slow             | Surficial            | Suspension      |
| Foraminifera  | Textulariina    | Psammosphaeridae        | Facultative, unattached | Surficial            | Surface Deposit |
| Mollusca      | Bivalvia        | <i>Praenucula</i>       | Non, attached           | Infauna              | Surface Deposit |
| Mollusca      | Cephalopoda     | <i>Orthoceras</i>       | Fully, fast             | Nektonic or demersal | Predatory       |
| Mollusca      | Gasteropoda     | <i>Tropididiscus</i>    | Fully, slow             | Surficial            | Grazing         |
| Mollusca      | Tentaculitida   | <i>Conchicolites</i>    | Non, attached           | Surficial            | Suspension      |

## Appendix 5. Presence/absence matrix of echinoderm genera in the selected echinoderm-dominated Konzentrat-Lagerstätten

| Class           | Genus                    | Letna Formation | Ouine Inirne Formation | Lower Ktaoua Formation | Postolonnec Formation | Fombuena Formation | Cantera Shale Formation |
|-----------------|--------------------------|-----------------|------------------------|------------------------|-----------------------|--------------------|-------------------------|
| Edrioasteroidea | <i>Agelacrinites</i>     | 1               | 0                      | 0                      | 0                     | 0                  | 0                       |
| Stylophora      | <i>Anatifopsis</i>       | 1               | 1                      | 1                      | 0                     | 0                  | 1                       |
| Edrioasteroidea | <i>Argodiscus</i>        | 1               | 0                      | 0                      | 0                     | 0                  | 0                       |
| Diploporita     | <i>Aristocystites</i>    | 1               | 1                      | 1                      | 1                     | 1                  | 1                       |
| Eocrinoidea     | <i>Ascocystites</i>      | 1               | 1                      | 0                      | 0                     | 0                  | 0                       |
| Stylophora      | <i>Aspidocarpus</i>      | 1               | 1                      | 1                      | 1                     | 0                  | 0                       |
| Diploporita     | <i>Asterocystis</i>      | 0               | 0                      | 1                      | 0                     | 0                  | 0                       |
| Stylophora      | <i>Bohemiaecystis</i>    | 0               | 1                      | 0                      | 0                     | 0                  | 0                       |
| Stylophora      | <i>Barrandeocarpus</i>   | 1               | 0                      | 1                      | 0                     | 0                  | 0                       |
| Crinoidea       | <i>Caleidocrinus</i>     | 1               | 0                      | 0                      | 0                     | 0                  | 0                       |
| Diploporita     | <i>Calix</i>             | 0               | 1                      | 1                      | 1                     | 1                  | 0                       |
| Stylophora      | <i>Detombesicarpus</i>   | 1               | 0                      | 0                      | 0                     | 0                  | 0                       |
| Crinoidea       | <i>Letenocrinus</i>      | 1               | 0                      | 0                      | 0                     | 0                  | 0                       |
| Diploporita     | <i>Codiacystis</i>       | 1               | 0                      | 1                      | 1                     | 0                  | 0                       |
| Stylophora      | <i>Diamphodicystis</i>   | 0               | 1                      | 0                      | 1                     | 0                  | 0                       |
| Soluta          | <i>Dendrocystites</i>    | 1               | 0                      | 1                      | 0                     | 0                  | 1                       |
| Diploporita     | <i>Destombesia</i>       | 0               | 0                      | 1                      | 0                     | 0                  | 0                       |
| Rhombifera      | <i>Deutocystis</i>       | 0               | 0                      | 1                      | 0                     | 0                  | 0                       |
| Rhombifera      | <i>Echinospaerites</i>   | 1               | 1                      | 1                      | 0                     | 1                  | 0                       |
| Diploporita     | <i>Eucystis</i>          | 0               | 0                      | 0                      | 0                     | 1                  | 0                       |
| Stylophora      | <i>Eumitrocystella</i>   | 1               | 1                      | 1                      | 0                     | 0                  | 0                       |
| Diploporita     | <i>Fungocystites</i>     | 1               | 0                      | 0                      | 0                     | 0                  | 0                       |
| Diploporita     | <i>Glaphocystis</i>      | 1               | 0                      | 1                      | 0                     | 0                  | 0                       |
| Rhombifera      | <i>Hadrocystis</i>       | 0               | 0                      | 0                      | 1                     | 0                  | 0                       |
| Edrioasteroidea | <i>Hemicystites</i>      | 1               | 0                      | 0                      | 0                     | 0                  | 0                       |
| Rhombifera      | <i>Heliocrinites</i>     | 0               | 0                      | 1                      | 0                     | 1                  | 1                       |
| Rhombifera      | <i>Hexedriocystis</i>    | 1               | 1                      | 0                      | 0                     | 0                  | 0                       |
| Rhombifera      | <i>Homocystites</i>      | 1               | 0                      | 1                      | 0                     | 0                  | 1                       |
| Crinoidea       | <i>Heviacrinus</i>       | 0               | 0                      | 0                      | 1                     | 0                  | 0                       |
| Diploporita     | <i>Isidalocystis</i>     | 0               | 1                      | 0                      | 0                     | 0                  | 0                       |
| Crinoidea       | <i>Isorophus</i>         | 0               | 1                      | 1                      | 0                     | 0                  | 0                       |
| Crinoidea       | <i>Lichenocrinus</i>     | 1               | 0                      | 0                      | 0                     | 0                  | 0                       |
| Rhombifera      | <i>Macrocytella</i>      | 1               | 0                      | 0                      | 0                     | 0                  | 1                       |
| Diploporita     | <i>Maghrebocystis</i>    | 0               | 0                      | 1                      | 0                     | 1                  | 0                       |
| Coronoidea      | <i>Mespilocystites</i>   | 1               | 1                      | 0                      | 0                     | 1                  | 1                       |
| Stylophora      | <i>Milonicystis</i>      | 0               | 1                      | 0                      | 0                     | 0                  | 0                       |
| Stylophora      | <i>Mitrocystella</i>     | 0               | 1                      | 0                      | 1                     | 0                  | 0                       |
| Edrioasteroidea | <i>Moroccodiscus</i>     | 0               | 1                      | 0                      | 0                     | 0                  | 0                       |
| Diploporita     | <i>Oretanocalix</i>      | 0               | 1                      | 0                      | 0                     | 0                  | 0                       |
| Ophiuroidea     | nov. gen.                | 1               | 1                      | 1                      | 1                     | 0                  | 0                       |
| Diploporita     | <i>Pachycalix</i>        | 0               | 1                      | 0                      | 1                     | 0                  | 0                       |
| Stylophora      | <i>Procothurnocystis</i> | 0               | 1                      | 0                      | 0                     | 0                  | 0                       |
| Diploporita     | <i>Phlyctocystis</i>     | 0               | 1                      | 1                      | 1                     | 0                  | 0                       |
| Rhombifera      | <i>Rhombifera</i>        | 1               | 0                      | 0                      | 0                     | 1                  | 1                       |
| Stylophora      | <i>Scotiaecystis</i>     | 1               | 1                      | 0                      | 0                     | 0                  | 0                       |
| Asterozoan      | <i>Siluraster</i>        | 1               | 0                      | 0                      | 0                     | 0                  | 0                       |
| Edrioasteroidea | <i>Spinadiscus</i>       | 0               | 0                      | 1                      | 0                     | 0                  | 0                       |
| Asterozoan      | <i>Streptaster</i>       | 0               | 0                      | 1                      | 0                     | 0                  | 0                       |
| Asterozoan      | <i>Taeniaster</i>        | 0               | 0                      | 0                      | 1                     | 0                  | 0                       |
| Stylophora      | <i>Thoralicystis</i>     | 1               | 1                      | 1                      | 0                     | 0                  | 0                       |
| Crinoidea       | <i>Ristanocrinus</i>     | 0               | 0                      | 0                      | 0                     | 1                  | 1                       |
| Rhombifera      | <i>Caryocrinites</i>     | 0               | 0                      | 0                      | 0                     | 1                  | 0                       |
| Rhombifera      | <i>Corylocrinus</i>      | 0               | 0                      | 0                      | 0                     | 1                  | 0                       |
| Rhombifera      | <i>Stichocystis</i>      | 0               | 0                      | 0                      | 0                     | 1                  | 0                       |
| Crinoidea       | <i>Fombuenacrinus</i>    | 0               | 0                      | 0                      | 0                     | 1                  | 0                       |
| Crinoidea       | <i>Goyacrinus</i>        | 0               | 0                      | 0                      | 0                     | 1                  | 0                       |