

**Table S3:** Morphology of coccoid and sarcinoid genera belonging to the Ulvophyceae.

|                              | <i>Solotvynia</i>         | <i>Desmochloris</i>                                                 | <i>Chlorocystis</i>                                  | <i>Halochlorococcum</i>                | <i>Sykidion</i>                   | <i>Ignatius</i>                | <i>Symbiochlorum</i>                  | <i>Symbiosphaera</i> |
|------------------------------|---------------------------|---------------------------------------------------------------------|------------------------------------------------------|----------------------------------------|-----------------------------------|--------------------------------|---------------------------------------|----------------------|
| <b>cell shape</b>            | spherical forming tetrads | broadly ellipsoidal -<br>spherical forming<br>packages of 2-8 cells | spherical - subspherical                             | spherical - subspherical               | spherical - slightly<br>flattened | spherical - saccate<br>ovoidal | broadly ellipsoidal -<br>spherical    | spherical            |
| <b>cell size</b>             | 8-13 µm                   | 6-12 µm                                                             | 12-25 (-40) µm                                       | 30-40 (-50) µm                         | 8-19 µm                           | 12-25 µm                       | 14-27 µm                              | 12-25 µm             |
| <b>nucleus</b>               | 1                         | 1                                                                   | 1                                                    | 1                                      | 1                                 | 1                              | 1                                     | 1                    |
| <b>chloroplast</b>           | parietal lobated          | cup-shaped with incisions                                           | reticulated                                          | reticulated                            | cup-shaped                        | parietal lobated               | hollow sphere with<br>perforations    | reticulated          |
| <b>pyrenoid</b>              | 1(- several)              | 1                                                                   | 1                                                    | 1                                      | 1                                 | 1(- several)                   | 2-7                                   | 1                    |
| <b>zoospores</b>             | +                         | +                                                                   | +                                                    | +                                      | +                                 | +                              | +/-                                   | +                    |
| <b>number of flagella</b>    | 4                         | 2                                                                   | 4                                                    | 4                                      | 2                                 | 4                              | 4                                     | 4                    |
| <b>number of species</b>     | 1                         | 3                                                                   | 6                                                    | 1                                      | 3                                 | 1                              | 1                                     | 1                    |
| <b><i>Codiolum</i>-stage</b> | -                         | -                                                                   | + ( <i>C. cohnii</i> )                               | +                                      | -                                 | -                              | -                                     | -                    |
| <b>phylogenetic status</b>   | resolved                  | resolved                                                            | resolved                                             | unresolved                             | resolved                          | resolved                       | resolved                              | unresolved           |
| <b>reference</b>             | this study                | Darienko <i>et al.</i> [9]                                          | Kornmann & Sahling [6]<br>Darienko <i>et al.</i> [9] | Kornmann & Sahling [6]<br>Dangeard [7] | Darienko <i>et al.</i> [9]        | Bold & MacEntree [10]          | this study<br>Gong <i>et al.</i> [13] | Moewus [5]           |