**Supplementary File 2: CP29 chlorophyll composition determined in previous work.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chl #  PDBID | PSII type | Res  (Å) | 601\*a | 602 | 603 | 604 | 606 | 607 | 608 | 609 | 610 | 611 | 612 | 613 | 614 | 615\* | 616a |
| plants |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3PL9 | Monomer | 2.8 | - | a | a | a | b | b | b | a | a | a | a | a | b | a | - |
| 5XNM | C2S2M2 | 3.2 | a | a | a | a | b | b | b | a | a | a | a | a | a | - | a |
| 5XNL | C2S2M2 | 2.7 | a | a | a | a | b | b | b | a | a | a | a | a | b | - | a |
| 7OUI | C2S2M2 | 2.8 | a | a | a | a | b | b | b | a | a | a | a | a | - | a | a |
| 3JCU | C2S2 | 3.2 | a | a | a | a | b | b | b | a | a | a | a | a | - | - | a |
| 6YP7 | C2S2 | 3.8 | - | a | a | a | b | b | b | a | a | ab | - | a | - | - | - |
| alga |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6KAD | C2S2M2L2 | 3.4 | a | a | a | a | b | b | b | a | a | a | a | a | - | - | a |
| 6KAF | C2S2M2L2 | 3.7 | a | a | a | a | b | b | b | a | a | a | a | a | - |  | a |
| 6KAC | C2S2 | 2.7 | - | a | a | a | b | b | b | a | a | - | - | - | - | - | - |
| 7PI0 | C2S2comp | 2.4 | - | a | a | a | b | b | b | a | a | - | a | - | - | - | - |
| 7PI5 | C2Sstr | 2.8 | - | a | a | a | b | b | b | a | a | a | a | a | - | - | - |

\* - These chlorophylls occupy mutually exclusive positions.

a – Chl numbering from PDBID: 5XNM

b – large positional shift (chain R, residue 310 in 6YP7).