The glyco-barcode of micro-algae

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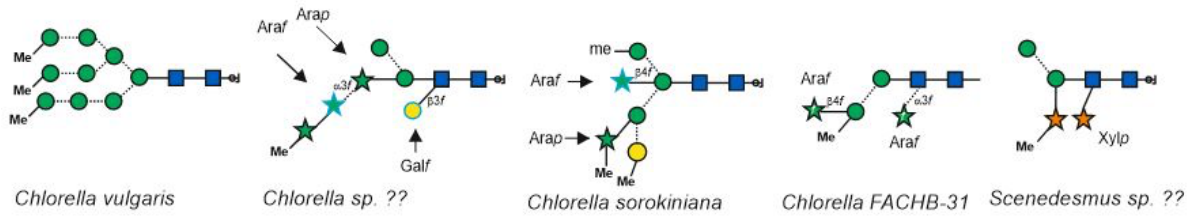
All land plants, more exactly, all tracheal plants, come to do with a highly conserved set of N-glycan features that is found in ferns, needle trees, grasses, fruits and flowers. Only two of the few glyco-genes required for decoration of complex-type N-glycans are unique to plants. In striking contrast, (micro)-algae present a fascinating variety of N-glycan structures – as if they wanted to compensate for their often inconspicuous appearance. A dozen or more of unique structure patterns occur in commercial samples of *Chlorella*-clade algae, many more unique structures in members of the geni *Scenedesmus, Acutodesmus, Desmodesmus* and the well-known *Chlamydomonas* accompanied by again unique patterns and in the red alga *Porphyromonas sp.*. The example of the *Chlorella*-clade indicates that glycan patterns provide a much clearer distinction of strains or species than the inherently continuous changes of DNA sequence. The data to be shown was initially acquired by MALDI-TOF MS. In several cases, LC-ESI-MS with porous graphitic carbon (PGC) as the stationary phase allowed further distinction of isobaric N-glycans. While full structural elucidation of this ever-growing number of novel glycans is elusive, MALDI-TOF MS collection with retention-time normalized PGC chromatography data appears as a promising tool for unambiguous strain characterization. This is a necessity for novel food regulations, technological research and last but not least, consistent taxonomy.



Examples of N-glycan structures from Chlorella-like microalgae

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