## ***Emiliania huxleyi***:

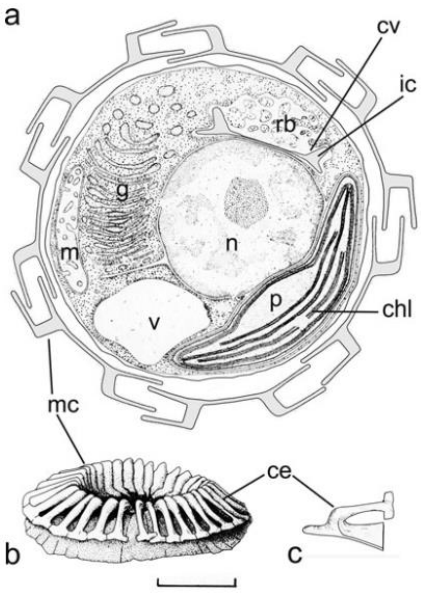


**Fig. 8** Schematic drawing *Emiliania huxleyi*: (**a**) transverse section of whole cell showing the chloroplast (*chl*), coccolith vesicle (*cv*), Golgi body (*g*), immature coccolith (*ic*), mature coccolith (*mc*), mitochondrion (*m*), nucleus (*n*), pyrenoid (*p*), reticulate body (*rb*), vacuole (*v*), (**b**) single mature coccolith showing elements arranged in an oval ring, (**c**) calcite element (*ce*) of a coccolith. Scalebar 1 µm

*Emiliania huxleyi* is a important model species for coccolithophyceae and haptophytes in general. They are quite small (4-5 µm in diameter) and have 10-15 coccoliths in a single layer and also frequently more in additional layers. The life cycle is well studied and 3 stages has been observed: a coccolith bearing diploid stage, a haploid organic-scale and flagellate bearing stage and a diploid non-motile naked stage, all of which can reproduce asexually. The coccolith bearing diploid stage and the haploid stage may be part of a heteromorphic life cycle but as of now, no sexual reproduction has been observed. Analysis of the genome does not only show a surprising coding capacity but also a great genetic variation which might indicate that there are several true species. This genetic variation has been seen not only between morphologic types but within them. There have also been some correlations found both between the concentration of $CO_2$ and the ability to create more Rubisco (,which in turn heightens Pmax (the maximum photosynthetic ability)) as well as Pmax and calcification rate. *E. huxleyi* is also known to produce massive algae blooms that can span over 200'000 square kilometres. It's success in blooming is thought to be because of physiological traits like the fact that photosynthesis is not inhibited by high irradiance, an efficient phosphate acquisition system allows for both inorganic and organic phosphate to be taken up. *E. huxleyi* can tolerate nitrogen depletion better than most diatoms, and efficient metabolic recycling of nitrogen. Even though it doesn't often bloom in iron-deficient regions it also has a method for that where it can substitute iron-containing enzymes for other forms that bind alternative metals yet function essentially the same. *E. hyxleyi* blooms have a very characteristic look where the coccolith sheds cause a turbid and milky look that sometimes be seen from space. These blooms can also sustain big populations of zooplankton and they will usually continue to grow until they starve before being lysed by animal-like viruses. There are also theories about a haploid-diploid life cycle where the bloom represents a diploid state that can produce motile, haploid cells with flagella that can work as a back-up population always ready to start a new bloom somewhere else.

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