# Influence of coccolithogenesis on coccolith size and size distribution


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The biometry is a very common tool within the calcareous nannofossil community, helping to differentiate species, recognise stratigraphic intervals or identify paleoceanographic events. Concerning paleoceanographic aspects, a reduction of size of coccoliths is often argued to be linked to an environmental stress. However, some species have a large variation of coccolith sizes within a coccosphere questioning the reliability of this tool. This study discusses the variation of size of coccoliths within a cell life cycle. Those biological observations are used to set a numerical growth model and discuss the coccoliths size distribution. The results shows that 1) a cell can produce small and large coccoliths depending on when the coccolith is produced during the life cycle; 2) a direct correlation between coccolith size and cell size is true only at the time of the coccolithogenesis; 3) a coccolith in a coccosphere could be a relic of a previous life cycle and 4) coccolith size distribution may not be normally distributed. All those observations remind that the biometry is a powerful tool only if applied with a strict methodology.