The oxalate-carbonate pathway of *Brosimum alicastrum* Sw.; Moraceae.

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The oxalate-carbonate pathway (OCP) is a biogeochemical process involving plants, fungi and bacteria that transforms atmospheric CO_2 into $CaCO_3$. However, until now the process has only been studied in acidic soil environments adjacent to species that have limited food-production potential. This study used an experimental approach to evaluate an OCP associated with *Brosimum alicastrum*, a Neotropical species that produces significant quantites of food (*ca.* 70–200 kg-seeds yr^{-1}), in the calcareous soils of Haiti and Mexico. Enzymatic analysis of various tissues from *B. alicastrum* indicated that the species produces significant amounts of calcium oxalate (5.97 % D.W.) at all sample sites. Oxalotrophy, the bacterial metabolism of calcium oxalate that leads to the precipitation of $CaCO_3$, was also confirmed with microbiological analyses in both countries. The typical localised alkalinisation and identification of secondary carbonate associated with the OCP was obscured at most sample sites by high concentrations of lithogenic carbonate and total calcium (>7 g kg^{-1}), except at Ma Rouge, Haiti. Soils adjacent to subjects in Ma Rouge presented a localised increase in $CaCO_3$ concentration (5.9 %) and pH (0.63). Findings in Ma Rouge, coupled with observations of root-like secondary carbonate deposits in Mexico, strongly imply that the OCP can also occur in calcareous soils. Thus, this study confirms that the OCP acts in calcareous soils, adjacent to species with significant food-production potential, and could play a fundamental and un-accounted role in the global calcium-carbon coupled cycle.