



## **Fossil plants indicate that the most significant decrease in atmospheric CO<sub>2</sub> happened prior to the Eocene-Oligocene boundary**

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A unique stratigraphic sequence of fossil leaves of *Eotrigonobalanus furcinervis* (extinct trees of the beech family, Fagaceae) from central Germany was utilized to derive an atmospheric pCO<sub>2</sub> record with multiple data points spanning the late middle to late Eocene, two sampling levels which may be earliest Oligocene, and two samples from later in the Oligocene. Using the stomatal proxy, which relies on the inverse relationship between pCO<sub>2</sub> and leaf stomatal density, we show that a ~40% decrease in pCO<sub>2</sub> preceded the large shift in marine oxygen isotope records that characterizes the Eocene-Oligocene climate transition. The results endorse the theory that pCO<sub>2</sub> drawdown was the main forcer of the Eocene-Oligocene climate change, and a 'tipping point' was reached in the latest Eocene, triggering the plunge of the Earth System into icehouse conditions.