

FOSSIL *PROBOSCIA* SPP. FROM LATE CRETACEOUS TO EARLY OLIGOCENE SEDIMENTS

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Observations on samples from deep-sea cores and terrestrial outcrops of marine origin have revealed the presence of a rich diversity of diatoms assignable to the genus *Proboscia*. Although most of these can be regarded as new species, some of them were previously described as species of *Rhizosolenia*, *Riedelia* and *Clavicula*.

Many Late Cretaceous forms are heavily silicified, with thick longitudinal ridges separated by multiple rows of pores, a tip bearing 1-3 large spinulae and a distinct longitudinal slit (external portion of the rimoportula). Paleocene forms closely resemble those in the Late Cretaceous, although often with a smaller tip, however, Eocene and Early Oligocene forms exhibit a wide range of morphologies, including probosces lacking ridges and tips bearing a ring of small spinulae. Complete basal portions or basal fragments bearing claspers have not been found yet in any of these old sediment samples.

Given the strong curvature, twisted nature and length (>100 µm) of some probosces, it is possible that these species did not possess claspers. However, modern species often have shorter, less-silicified valves in the spring season, so these long, heavily-silicified fossil probosces may represent 'winter' valves. In one Middle Eocene sample from the Central Arctic a monospecific mat of fossilized probosces was observed, suggesting a similar ecology to modern mat-forming *Rhizosolenia* spp. The change in morphology (e.g. loss of ridges, smaller spinulae, shorter probosces) in forms from the Greenhouse to Icehouse suggests that *Proboscia*, like many other diatom genera, reacted to oceanographic and climatic changes across the Eocene-Oligocene boundary.