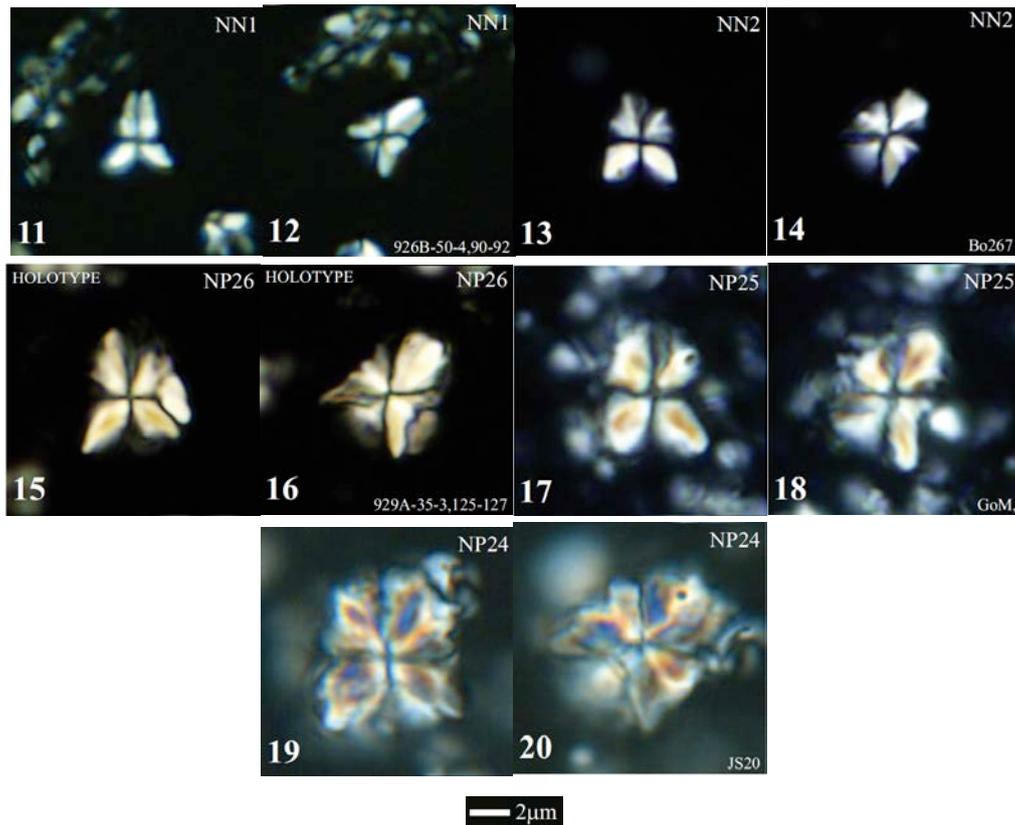


Sphenolithus apoxis Bergen & de Kaenel in Bergen et al. (2017)



Pl. 2, figs 11–20

1960 *Nannoturbella moriformis* Brönnimann & Stradner (*pro parte*), p. 368, figs. 14–15, *non* figs. 11–13, 16.

1971 *Sphenolithus dissimilis* Bukry & Percival (*pro parte*), p. 140, pl. 6, fig. 8, *non* figs. 7 & 9.

1997 *Sphenolithus dissimilis* Bukry & Percival 1971; Maiorano & Monechi, pl. 1, figs. 9–10.

Derivation of name: from Greek *apoxis*, meaning tapering off.

Diagnosis: Paleogene to Early Miocene conical sphenolith with a compound apical spine.

Description: Small to large, elongate conical sphenolith with a compound apical spine. The apical spine exhibits a sweeping extinction upon rotation; its termination is rounded. The three cited specimens and five illustrated herein have height to width ratios of 1.16–1.35; the relatively long apical spine (height spine to base ratio 0.75– 0.91) and reduced lateral element cycles (height upper to lower quadrant ratio measured in XPL (0.30–0.75) are considered diagnostic). Size: 4.0–8.4µm (holotype: L = 6.0µm; W = 4.8µm).

Remarks: *Sphenolithus apoxis* has been illustrated under *S. moriformis* and *S. dissimilis*; the confusion with *S. dissimilis* is caused by a specimen illustrated (fig. 8) alongside the holotype (fig. 7) by Bukry and Percival (1971). *Sphenolithus dissimilis* has “shoulders”,

which are created by its cylindro-conical shape and the width differences between its base and spine. *Sphenolithus apoxis* has uniform taper (i.e. conical shape) and is not shouldered. *Sphenolithus apoxis* has a longer spine and reduced upper basal quadrants (lateral cycle elements) relative to *S. abies*. The two species do not co-occur and their stratigraphic ranges are separated by an estimated 3.7 million years in the Leg 154 research. *Sphenolithus apoxis* has been referred to as “*S. cf. procerus* (tapered)” in the BP GoM lexicon.

Holotype: Pl. 2, figs 15–16.

Type locality: ODP Leg 154, Hole 929A, Ceará Rise, western equatorial Atlantic.

Type level: Sample 35–3, 125–127cm (23.155Ma), Zone NP26, Upper Oligocene.

Occurrence: This species ranges from the Lower Eocene (NP11) to Lower Miocene (NN4). In Leg 154, the HO of *S. apoxis* is dated at 17.347Ma and its HFO at 17.425Ma (Table 1). In the GoM, the observed HO is coincident in age to the HFO in Leg 154. The HO of larger variants ($> 8\mu\text{m}$) of *S. apoxis* may serve as a proxy for the HO of *S. pseudoradians* near the terminal Lower Oligocene and within Zone NP24; both extinctions have been dated at 28.092Ma in Leg 154 (see Table 1).

Bergen, J., de Kaenel, E., Blair, S., Boesiger, T. & Browning, E., 2017. Oligocene-Pliocene taxonomy and stratigraphy of the genus *Sphenolithus* in the circum North Atlantic Basin: Gulf of Mexico and ODP Leg 154. *Journal of Nannoplankton Research*, **37(2–3)**: 77–112.