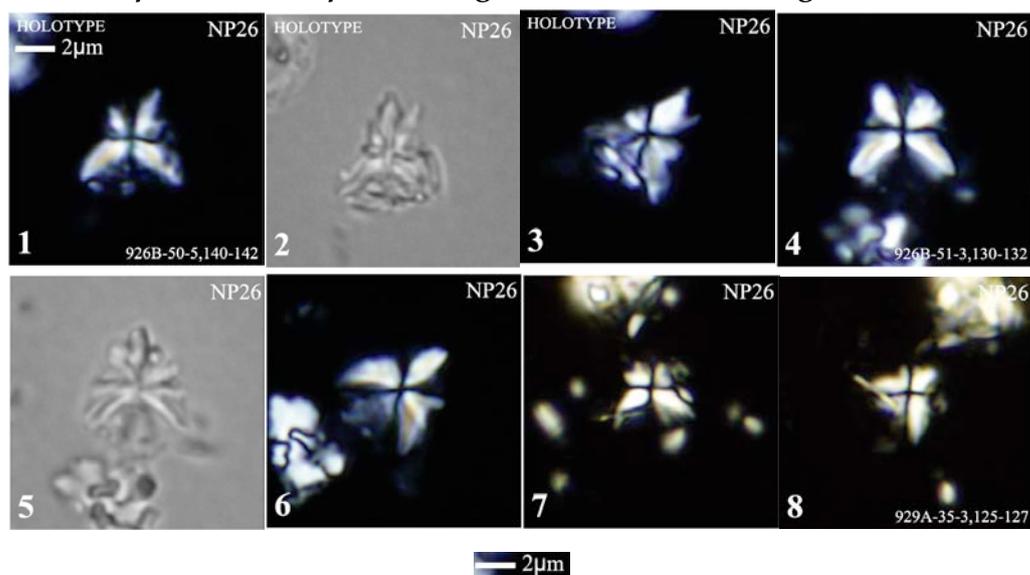


Sphenolithus spinula Bergen & de Kaenel in Bergen et al. (2017)



Pl. 6, figs 1–8

Derivation of name: from Latin *spinula*, diminutive of *spina*, meaning spine.

Diagnosis: Tri-radiate sphenolith with a short monocrystalline spine.

Description: Small to medium conical sphenolith. Specimens are triangular in profile, where length is equal to or slightly less than the width (ratio 0.85–1.0). The monocrystalline apical spine becomes extinct when specimens are aligned with the polarizer. The spine is short, approximately 1/2 of the total length of the specimen (spine to specimen length ratio is 0.46–0.57), and has a pointed distal termination. At 0° to the polarizer, the upper basal quadrants appear shorter than the lower quadrants (1/2 to 3/4 height ratio). The proximal cycle elements flare laterally, where proximal cycle width approximately 1.5–2.0 times the width of the lateral cycle. The proximal surface is concave. L = 2.2–5.4µm; W = 2.6–5.4µm (holotype: 5.2µm x 5.2µm).

Remarks: This taxon differs from both *S. delphix* and *S. microdelphix* by its shorter apical spine. *Sphenolithus bipedis* sp. nov. and *S. neoabies* have flared proximal cycles, but are hemispherical forms with compound apical spines. *Sphenolithus spinula* sp. nov. is distinguished from *S. tintinnabulum* by its flared proximal elements characteristic of the *S. delphix* subgroup. It tends to be larger and broader (length < width) than *S. tintinnabulum*, but there is significant overlap in the size and dimensions of these two species. *Sphenolithus spinula* has been referred to as “*S. delphix* (stumpy)” in the BP GoM lexicon.

Holotype: Pl. 6, figs 1–3.

Type locality: ODP Leg 154, Hole 926B, Ceará Rise, western equatorial Atlantic.

Type level: Sample 50-5, 140–142cm (23.072Ma), Zone NP26, upper Oligocene.

Occurrence: *Sphenolithus spinula* ranges from the Upper Oligocene (NP25) to lowermost Miocene (NN2) in the GoM and Leg 154. It is dated in the Leg 154 research from 25.097Ma (Sample 925A-26-5, 125–126cm; 0.027Ma error) to 21.302Ma (Sample 926B-45-4, 45–46cm; 0.028Ma error).

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.