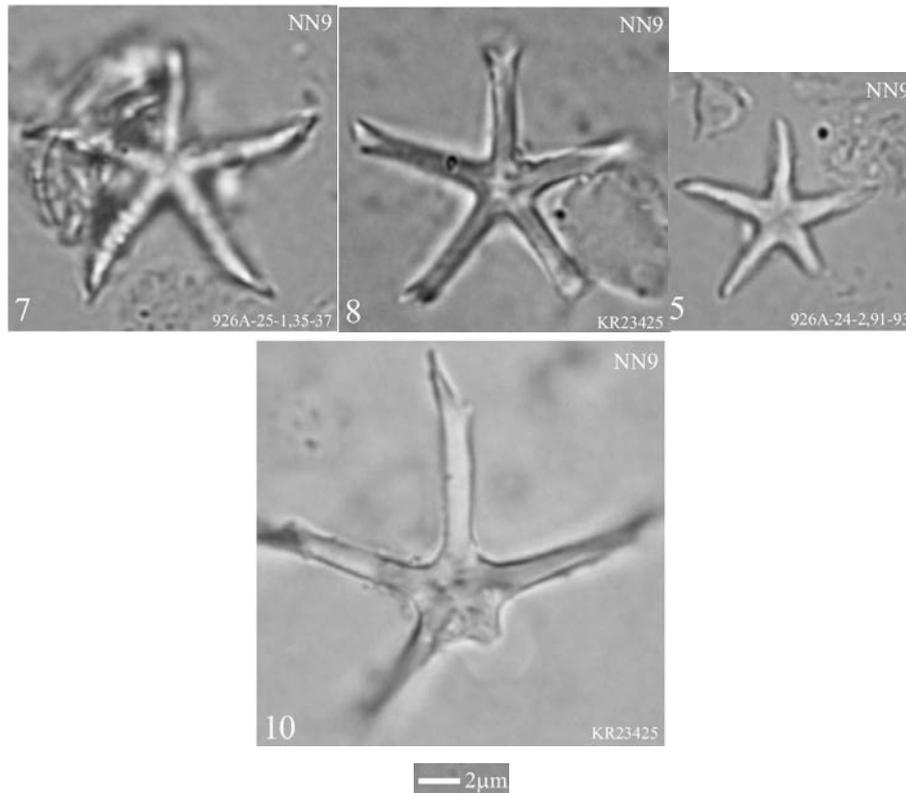


Discoaster hamatus Martini & Bramlette (1963) emend. Browning & Bergen in
Browning et al. (2017)



Pl. 4, figs 5, 7–8, 10

1963 *Discoaster hamatus* Martini & Bramlette, p. 852– 853, pl. 105, figs. 8, 10, 11

Emended Diagnosis: A five-rayed species of *Discoaster* with long arms that sharply bend downward near their terminations with an accompanying small, straight spur.

Remarks: This taxon is emended to restrict it to five-rayed forms. The original description mentioned a size range of 16–20µm. This criterion is critical because Zone NN9 is defined by the total range of *D. hamatus*. The authors have found its total range to be strongly size-dependent (Figure 3). We have chosen to use specimens of *D. hamatus* greater than 15µm to delineate the limits of Zone NN9. The smaller forms (less than 15µm) range stratigraphically higher and lower. These smaller forms of *D. hamatus* can also be difficult to distinguish between five-rayed forms of *D. prepentaradiatus* and *D. bellus* in poorly preserved materials where examination of ray terminations is difficult.

Occurrence: The HO and HRO of *D. hamatus* (>15) have been dated as 9.451Ma and 9.618Ma, respectively, in Leg 154. The HO in GoM calibrates to HRO in Leg 154 dated at 9.618Ma. The total range of *D. hamatus* (>15) is 10.963Ma to 9.451Ma (Table 1) and is used for the boundaries of Zone NN9 (Figure 3). The HO of the smaller variant of *D. hamatus* (<15) is dated in Leg 154 at 9.229Ma (Table 1). Isolated occurrences, likely

reworked, have been noted in the Leg 154 material into Zone NN11b (7.402Ma+/-0.017; 926A-20H-3, 24-25cm). In the GoM, the LO of *D. hamatus* (<15), dated at 11.509Ma in Leg 154 (Table 1), is associated with the top of *D. kugleri* (de Kaenel *et al.*, 2017).

Browning, E., Bergen, J., Blair, S., Boesiger, T. & de Kaenel, E., 2017. Late Miocene to Late Pliocene taxonomy and stratigraphy of the genus *Discoaster* in the circum North Atlantic Basin: Gulf of Mexico and ODP Leg 154. *Journal of Nannoplankton Research*, **37(2-3)**: 189–214.