Diatoms in cytologic specimens of aquatic animals – Part II, dermal, respiratory, and gastric samples

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**Figure 1.** Diatoms in cytologic samples of Florida manatees (*Trichechus manatus latirostris*) in A, C, D, F, G, J–L, bottlenose dolphins (*Tursiops truncatus*) in B, E, I, and a seahorse (*Hippocampus erectus*) in H. Wright–Giemsa stain. ×100 objective (except F; ×20). (A) navicularoid benthic diatom; skin contamination of urine sediment; wet mount. (B) *Nitzschia* sp.; gastric fluid direct smear. (C) *Navicula* sp.; nasal swab. (D) *Tursiocola* spp. in teat fluid cytospin preparation with heterophilic inflammation; diatom phagocytized by heterophil consistent with incidental finding. (E) *Nitzschia* sp.; gastric fluid direct smear. (F) *Tursiocola* spp. and pennate diatoms; skin scraping. (G) *Amphora* sp.; nasal swab. (H) pennate diatom; skin scraping. (I) centric diatom; gastric fluid direct smear. (J) *Tursiocola* sp.; skin scraping. (K) *Tursiocola* sp.; skin scraping (cleaned). (L) *Tursiocola* sp.; skin scraping (SEM).

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Diatoms are a common finding in cytologic samples of aquatic animals,\(^1\) and it is necessary to differentiate these microbiota from parasite ova or protozoa. Although it may be sufficient for the clinician to identify these organisms simply as diatoms, diatomists are keenly interested in finer levels of distinction and seek to identify diatom taxa to individual species. The identification of diatom taxa to the species level is often not possible with cytologic samples and can only be accomplished by detailed examination of the ornamentation of the silica cell wall of these organisms using light microscopy and in some cases scanning electron microscopy (Figure 1K, L). This requires further processing of a sample to remove all organic material. Some diatom species, (e.g., *Pseudo-nitzschia* spp.) can form harmful algal blooms and produce the biotoxin domoic acid.\(^2\) The cytologic detection of toxigenic diatoms in gastrointestinal tract samples is neither sensitive nor specific. Differentiation between the similar *Nitzschia* sp. requires scanning electron microscopy for identification. When combined with clinical signs, the quantification of the toxin by HPLC or ELISA in feces or urine is used to make the diagnosis of biotoxin exposure.

Diatoms in cytologic specimens may be unique epizooic taxa new to discovery (Figure 1K, L), or they may be established taxa of known habitats or geography that may be used to infer the origins of migrating aquatic animals. For an excellent introduction to diatom biology and diversity, see *The Diatoms*\(^3\); for a reference of photomicrographs of marine benthic diatom taxa, see *Diatom Flora of Marine Coasts* I.\(^4\)

References