|  |  |
| --- | --- |
| Cyst species(paleontological name) | Dinoflagellate theca (biological name) |
| **Autotrophic** |  |
| *Achomosphaera* spp*.* | ? *Gonyaulax* sp. Indet. |
| *Bitectodinium spongium*  | unknown |
| *Bitectodinium tepikiense* | *Gonyaulax spinifera* |
| *Impagidinium* spp. | *Gonyaulax* sp. Indet. |
| *Impagidinium aculeatum* | *Gonyaulax* sp. Indet. |
| *Impagidinium strialatum* | *Gonyaulax* sp. Indet. |
| *Impagidinium paradoxum* | *Gonyaulax* sp. Indet. |
| *Lingulodinium machaerophorum* | *Lingulodinium polyedra* |
| *Nematosphaeropsis labyrinthus* | *Gonyaulax spinifera* complex |
| *Operculodinium centrocarpum*  sensu Wall & Dale 1966 | *Protoceratium reticulatum* |
| *Operculodinium aguinawense* | *?Protoceratium* sp*.* |
| *Operculodinium israelianium* | *?Protoceratium* sp*.* |
| *Pyxidinopsis reticulata* | *Gonyaulacaceae undif.* |
| *Polysphaeridium zoharyi* | *Pyrodinium bahamense* |
| *Spiniferites belerius* | *Gonyaulax scrippsae, G. spinifera* complex |
| *Spiniferites ramosus* | *Gonyaulax scrippsae, G. spinifera* complex |
| *Spiniferites bentorii* | *Gonyaulax digitalis, G. spinifera* complex |
| *Spiniferites delicatus* | *Gonyaulax spinifera* complex |
| *Spiniferites pachydermus* | *Gonyaulax spinifera* complex |
| *Spiniferites hyperacanthus* | *Gonyaulax spinifera* complex |
| *Spiniferites bulloideus* | *Gonyaulax scrippsae, G. spinifera* complex |
| *Spiniferites mirabilis* | *Gonyaulax spinifera* complex |
| *Spiniferites* spp. | *Gonyaulax* complex |
| *Spiniferites* type 1. | *Gonyaulax* complex |
| *Tectadodinium pellitum* | *Gonyaulax spinifera* complex |
| *Tuberculodinium vancampoae* | *Pyrophacus steinii* |
| ----- | *Pentapharsodinium dalei* |
| **Heterotrophic** |  |
| ----- | *Archaeperidinium saanichi* |
| *Dubridinium* spp. | Diplopsalid group |
| ----- | *Gymnodinium* spp*.* |
| ----- | *Polykrikos kofoidii*  |
| ----- | *Polykrikos schwartzii*  |
| ----- | *Polykrikos cf. kofoidii* |
| *Brigantedinium* spp. | *?Protoperidinium* spp. |
| *Brigantedinium cariacoense* | *Protoperidinium avellana* |
| *Brigantedinium simplex* | *Protoperidinium conicoides* |
| *Echinidinium aculeatum*  | *Protoperidinium* sp. indet. |
| *Echinidinium delicatum* | *Protoperidinium* sp. indet. |
| *Echinidinium* cf. *zonneveldiae* | *Protoperidinium* sp. indet. |
| *Echinidinium granulatum* | *Protoperidinium* sp. indet. |
| *Echinidinium transparantum* | *Protoperidinium* sp. indet. |
| *Echinidinium* spp. | *Protoperidinium* sp. indet. |
| *Lejeunecysta oliva* | *Protoperidinium* sp. indet. |
| *Lejeunecysta sabrina* | *Protoperidinium* sp. indet. |
| *Lejeunecysta* spp*.* | *Protoperidinium* sp. indet. |
|  ----- | *Protoperidinium americanum* |
|  ----- | *Protoperidinium nudum* |
|  ----- sensu Wall and Dale 1968 | *Protoperidinium oblongum*  |
| *Protoperidinium* spp. | *Protoperidinium* spp. indet. |
| *Quinquecuspis concreta* | *Protoperidinium leonis* |
| *Selenopemphix nephroides* | *Protoperidinium* sp. indet. |
| *Selenopemphix undulata* | *Protoperidinium* sp. indet. |
| *Selenopemphix quanta* | *Protoperidinium conicum* |
| *Stelladinium reidii* | *Protoperidinium compressum* |
| *Trinovantedinium applanatum* | *Protoperidinium pentagonum* |
| *Trinovantedinium variabile* | *Protoperidinium* sp. indet. |
| *Votadinium calvum* | *Protoperidinium oblongum* |
| *Votadinium spinosum* | *Protoperidinium claudicans* |
| Cyst type A | unknown |
| Cyst type F | unknown |
| Spiny brown cysts | *?Protoperidinium* sp. indet. |
|  |  |
|  |  |

**Auxiliary Material**

**Table S1**

**Table Caption**

Taxonomic citation of dinoflagellate cysts identified in this study. Thecate equivalents are taken from *Head* [1996], *Zonneveld* [1997], *Zonneveld and Jurkschat* [1999], *Marret and Kim* [2009], *Matsuoka et al.,* [2009], *Verleye et al.* [2011] and *Mertens et al.* [2012].

**Text**

Cysts of *Polykrikos* *kofoidii* and *Polykrikos* *schwartzii* follow the nomenclature of *Matsuoka et al.* [2009]. All dinoflagellate cysts were identified to the species level where possible, however due to morphological similarities and unfavourable orientation it was not always possible, and some cyst taxa are grouped together. *Brigantedinium* spp. consists of *Brigantedinium cariacoense*, *Brigantedinium simplex,* and other round brown cysts, as archeopyles were not always observed due to unfavourable orientations or folding. *Selenopemphix quanta* and cyst of *Protoperidinium nudum* are grouped together as these two cyst species show a high degree of morphological similarity. Cyst type A has been previously identified by studies in the Northeast Pacific [e.g. *Radi et al.*, 2007; *Limoges et al.,* 2010]. Other spiny brown cysts of unknown affinity were placed in the spiny brown (SBC) category.

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