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Locality data for some chrysophyte cysts

by

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This report is preliminary and has not been reviewed for conformity with U. S. Geological Survey editorial standards or stratigraphic nomenclature.

Introduction

The locality and provenance data given here for the chrysophyte cysts illustrated in Figures 1-3 supplement a paper by Adam and Mahood entitled "Chrysophyte cysts as potential environmental indicators" (Geological Society of America Bulletin, in press, 1981). The cysts in Figures 1 and 2 were chosen to illustrate a variety of morphologies to accompany a general discussion of their potential as environmental indicators; the cysts in Fig. 3A-C prefer Sphagnum habitats, whereas those in Fig. 3D-H prefer montane lakes.

Locality data

Locality: Triangle Lake, Eldorado County, California.
Latitude: 38° 51' 33.5" N
Longitude: 120° 05' 30" W
Elevation: 2441 meters
Quadrangle: Echo Lake 7.5'
Samples:

Sample 164 is an epiphytic sample that was collected by stripping the algal slime from a dead, submerged, rooted sedge stem taken from about 15 cm of water on the small promontory at the south side of the lake.

Cysts illustrated:
- Figure 1a, Cyst type 299
- Figure 1g, Cyst type 300
- Figure 1h, Cyst type 301

Sample 163 is a bottom sediment sample that was collected from the same place as sample 164 by throwing a small bucket on a rope about 15-20 m out from shore, letting it sink to the bottom, and letting it fill with sediment as it was pulled back to shore. The water depth was estimated as about 3-4 m.

Cysts illustrated:
- Figure 2b, Cyst type 302
- Figure 3e, Cyst type 98
- Figure 3g, Cyst type 172

Locality: Forested bog 1.2 km north-northwest of Osgood Swamp, Eldorado County, California
Latitude: 38° 51' 20.5" N
Longitude: 120° 02' 41" W
Elevation: 1981 meters
Quadrangle: Echo Lake 7.5'
Samples:

Sample 177 is a surface soil sample taken from beneath a forest of lodgepole pines (Pinus murrayana) growing on a boggy, Sphagnum-covered substrate. The site occupies what was apparently a glacial-age lake impounded outside the Tahoe-stage terminal moraine deposited by the glacier that flowed out of the Echo Lakes valley. The surficial organic deposits are only about 2m thick, and are underlain by glacial outwash deposits from a small glacier upstream, on the northeast side of Flagpole Peak. The site is unusual for the Sierra Nevada. The sample was collected in the forested part of the bog, about 20 m south of the small creek that flows along the north side of the bog.

Cysts illustrated:
Figure 1b, Cyst type 303
Figure 1d, Cyst type 304

Locality: Wet meadow above Colby Meadow, Fresno County, California
Latitude: 37° 10'32" N
Longitude: 118° 42'58" W
Elevation: 3017 meters
Quadrangle: Mt. Goddard 15'
Samples:

Sample 109 was collected from a wet meadow beside the John Muir Trail about 0.5 km above the upper end of Colby Meadow. The meadow occupies a closed depression that apparently has some subsurface drainage. Rocks at the edge of the meadow show a waterline that indicates a maximum water depth of nearly a meter, but the depression is dry for long enough in the summer to permit the growth of a dense cover of sedges.

Cysts illustrated:
Figure 1c, Cyst type 305

Locality: Tyee Springs, Skamania County, Washington
Latitude: 45° 52' 33" N
Longitude: 121° 58' 13" W
Elevation: 341 meters
Quadrangle: Wind River 15'
Samples:

Our sample 210 is sample 505 of the Sovereign Diatom Collection of the California Academy of Sciences (Mahood, 1978). The sample was collected on 6 August, 1946; recorded water temperature was 55°F (13°C), and the pH was 6.6. This is the only site where this cyst type has been observed, and this form was the only one observed in the sample.

Cysts illustrated:

Figure 1e, Cyst type 306

Locality: Stagnant pond near Harden Lake, Yosemite National Park, California.
Latitude: 37° 52' 11" N
Longitude: 119° 40' 19" W
Elevation: 2277 meters
Quadrangle: Hetch Hetchy Reservoir 15'
Samples:

Sample 291 is from a pond situated about 100 m north of the east end of Harden Lake, between two moraines of late Wisconsinan (Tioga) age. The pond is stagnant, and the water is dark brown. The sample was collected on 18 August 1979 from sediment exposed on the north side of the pond about 70-80 cm above the water surface. Grass seedlings and a small Ranunculus were growing in the immediate vicinity of the sample.

Cysts illustrated:

Figure 1f, Cyst type 314

Locality: Tamarack pond, Eldorado County, California
Latitude: 38° 50' 40" N
Longitude: 120° 05' 46" W
Elevation: 2265 meters
Quadrangle: Echo Lake 7.5'
The pond is just south of Tamarack Lake, and is connected with the lake by an inlet about 30 cm deep and 5 m wide during high water conditions. As the water level falls after spring snowmelt is complete, the pond becomes isolated from the main part of the lake and stagnates; the water in the pond turns dark brown. The pond is usually completely dry by the end of the summer. The sample was collected on July 15, 1979, with the small bucket; water depth was about 60 cm, and the water was brown.
Samples:
Sample 153
Cysts illustrated:
Figure 2a, Cyst type 307

Locality: Truckee crater, Placer County, California
Latitude: 39° 20' 29" N
Longitude: 120° 05' 44" W
Elevation: 2006 meters
Quadrangle: Martis Peak 7.5'
The site is an ephemeral pond that occupies the crater of a volcanic cone about 8 km due east of Truckee. The sediment is a dense, oxidized clay with admixed pebbles. The floor of the crater appears to be completely covered with standing water in the spring, but dries out during the summer, and supports a dense meadow vegetation. There is a depression near the south end of the meadow, possibly artificial, where water appears to remain much later in the summer than is the case for the rest of the crater floor. The sample was collected at the upper edge of this depression, and consisted of loose, dried plant stems that comprised the top layer of the soil.
Samples:
Sample 314
Cysts illustrated:
Figure 2c, Cyst type 308
Figure 2h, Cyst type 309

Locality: Summit Lake, Fresno County, California
Latitude: 37° 25' 49" N
Longitude: 118° 46' 07" W
Elevation: 3627 meters
Quadrangle: Mt. Abbot 15'

The site is a small, shallow lake just north of Mono Pass near the crest of the Sierra Nevada. The lake is above timberline, and there is practically no local vegetation except for some weakly developed meadow around the shores of the lake. The lake is normally perennial, but did dry up completely during the summers during the drought of the late 1970s (J. Yount, oral communication). The sample consists of bottom sediment collected from a depth of about a meter using a small bucket on a rope.

Samples:

Sample 219

Cysts illustrated:

Figure 2d, Cyst type 310
Figure 3h, Cyst type 214

Locality: Lake George, Mammoth Lakes, Inyo County, California
Latitude: 37° 36' 08" N
Longitude: 119° 00' 36" W
Elevation: 2746 meters
Quadrangle: Devils Postpile 15'
Samples:

Sample 288 was collected about 15-20 m from shore at a water depth of 5-6 m using the small bucket.

Cysts illustrated:

Figure 2e, Cyst type 311
Figure 2f, Cyst type 312

Locality: Harden Lake, Yosemite National Park, California, bottom sediment
Latitude: 37° 52'08" N
Longitude: 119° 40'31" W
Elevation: 2286 meters
Quadrangle: Hetch Hetchy East 15'
Samples:

Sample 223 was collected on 18 August 1979 from a depth of 5-6 m by lowering a small bucket from a raft near the center of the lake. The lake has a very small drainage area, and is unusual for the Sierra Nevada in that it does not normally overflow.

Cysts illustrated:

Figure 2g, Cyst type 313

Locality: Haypress Meadows, El Dorado County, California
Latitude: 38° 51' 7" N
Longitude: 120° 6' 10" W
Elevation: 2505 meters
Quadrangle: Echo Lake 7.5'
The site is a small perched bog at the lower (bottom) end of Haypress Meadows. The cysts found in the sample have been illustrated by Adam (1980).
Samples:
Sample 28
Cysts illustrated:
Figure 3a, Cyst type 155

Locality: Wrights Lake Meadow, El Dorado County, California
Latitude: 38° 51' 8" N
Longitude: 120° 13' 31" W
Elevation: 2116 meters
Quadrangle: Pyramid Peak 7.5'
The site is a marshy meadow above the inlet to Wrights Lake. The sediment consists of about 1.5 m of organic sediments underlain by glacial rock flour.
Cysts illustrated:
Figure 3b, Cyst type 160

Locality: Harden Lake Meadow, Yosemite National Park, California
Latitude: 37° 53' 41" N
Longitude: 119° 40' 39" W
Elevation: 2285 meters
Quadrangle: Hetch Hetchy East 15'
Samples:
Sample 115
The site is a wet meadow nested between moraines just south of Harden Lake. The site and the cysts found there have been described by Adam (1981). Sample 115 is from the modern surface; the site is fenced and is used for grazing for pack animals.
Cysts illustrated:
Figure 3c, Cyst type 296

Locality: Upper Echo Lake, El Dorado County, California
Latitude: 38° 50' 40" N
Longitude: 120° 4' 40" W
Elevation: 2268 meters
Quadrangle: Echo Lake 7.5'

The site is an open-water lake near the south end of Lake Tahoe. The samples were taken from a 493-cm long core recovered from beneath about 15 meters of water near the western end of the lake. Cysts from several samples have been described by Adam and Mahood (1979).

Samples:

Sample 2, 55 cm below top of core
Cysts illustrated:
Figure 3f, Cyst type 114

Sample 4, 241 cm below top of core
Cysts illustrated:
Figure 3d, Cyst type 45

REFERENCES CITED

Adam, D. P., 1980, Scanning electron micrographs of modern chrysomonad cysts from Haypress Meadows, El Dorado County, California: U. S. Geological Survey Open-File Report Number 80-1235, 15 p.

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Adam, D. P., and Mahood, A. D., 1979, Chrysomonad cysts from Upper Echo Lake, El Dorado County, California: U. S. Geological Survey Open-file Report Number 79-1461, 21 p.

Mahood, A. D., 1978, The Harry E. Sovereign Collection of Northwest Pacific Diatoms: Proceedings of the California Academy of Sciences, v. 41, p. 339-343.

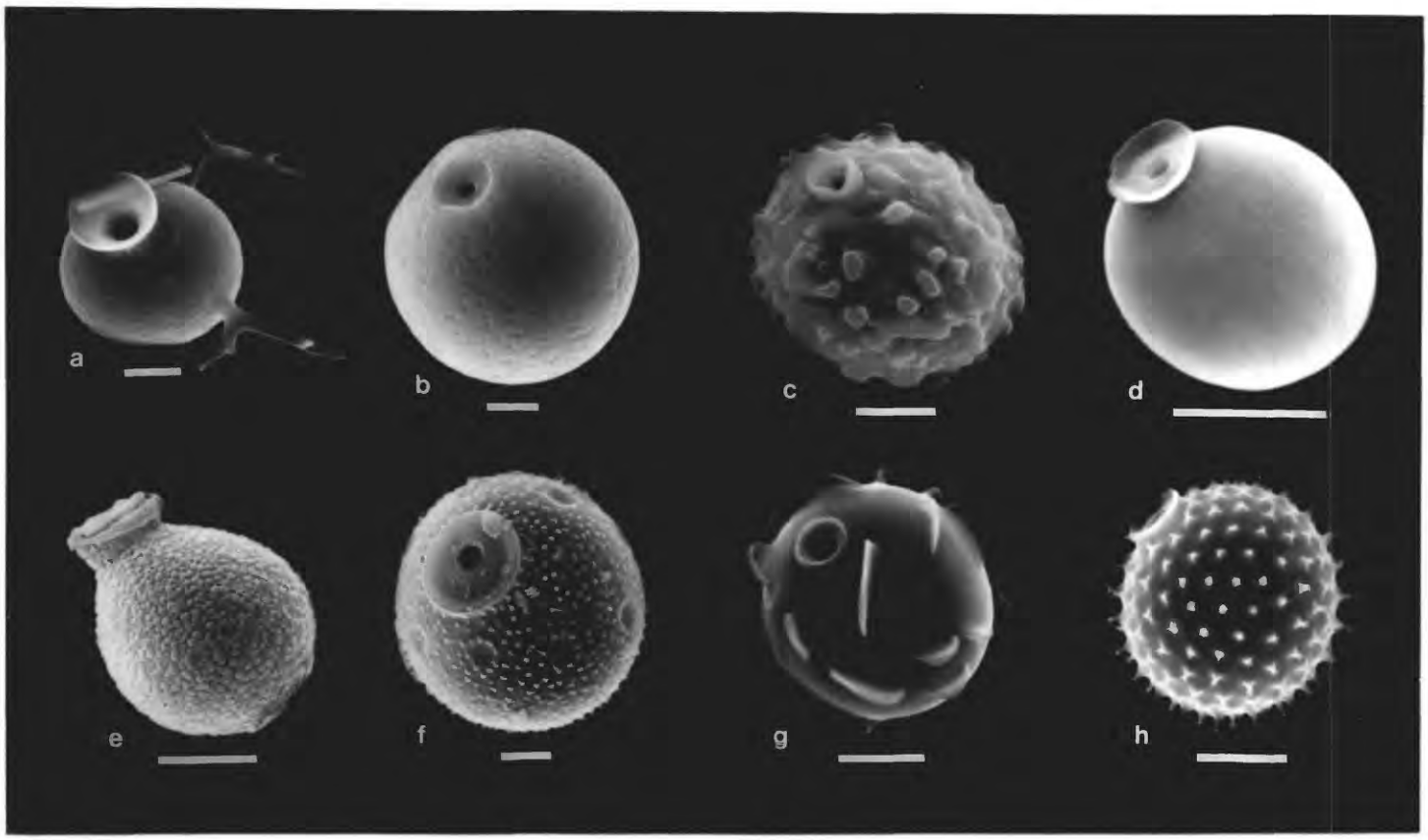

Fig. 1. Scanning electron micrographs of chrysophyte cysts. Locality data and description of environments are given in the text. Each scale bar represents a length of 3 micrometers. General localities: California: a, g, h: Triangle Lake, El Dorado County; b, d: Forested bog 1.2 km north-northwest of Osgood Swamp, El Dorado County; c: Wet meadow above Colby Meadow, Fresno County; f: Stagnant pond north of Harden Lake, Yosemite National Park; Washington: e: Tyee Springs, Skamania County.

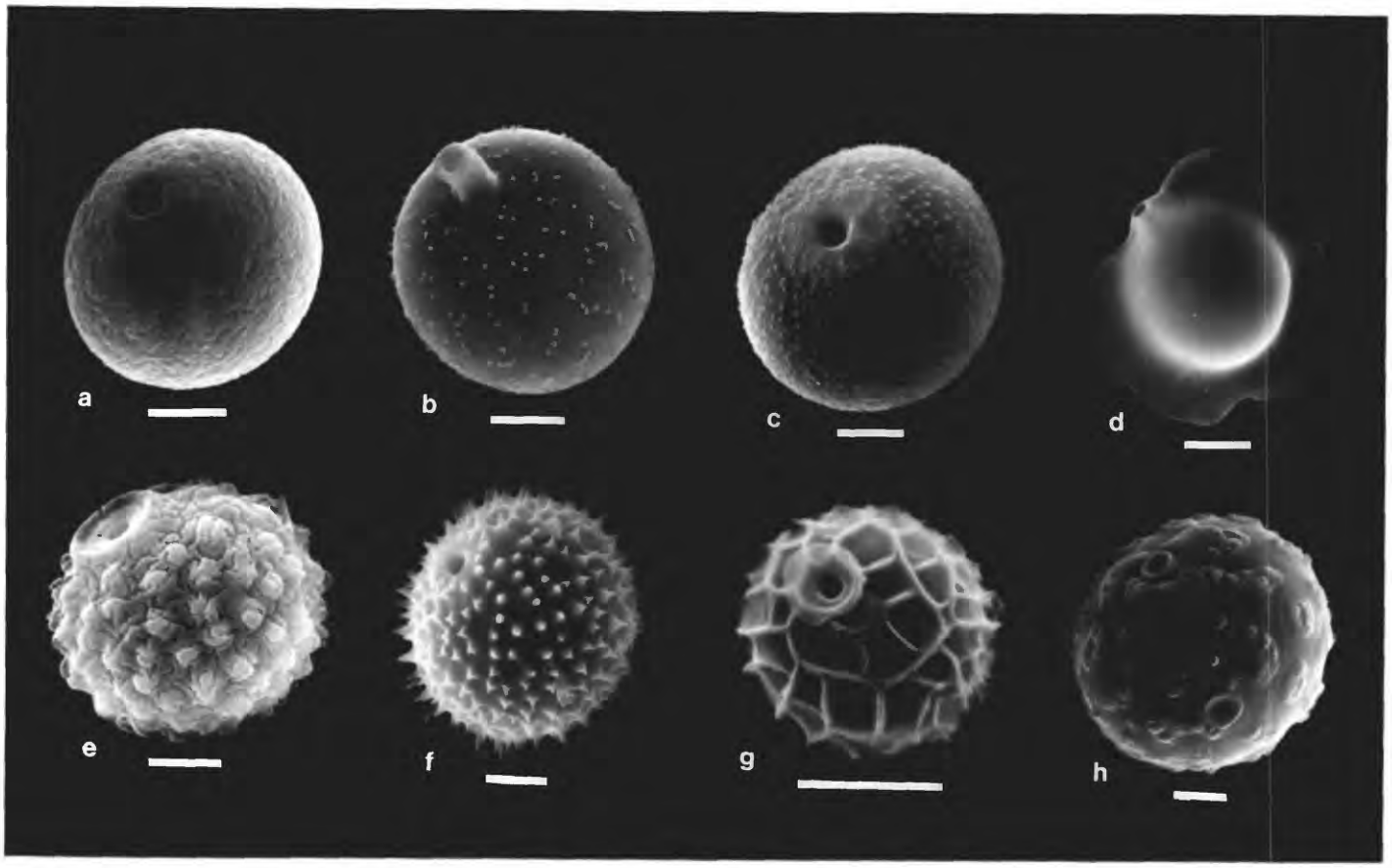

Fig. 2. Scanning electron micrographs of chrysophyte cysts. Locality data and description of environments are given in the text. Each scale bar represents a length of 3 micrometers. General locality data: California: a: Tamarack pond, El Dorado County; b: Triangle Lake, El Dorado County; c, h: Truckee Crater, Placer County; d: Summit Lake, Fresno County; e, f: Lake George, Mammoth Lakes, Inyo County; g: Harden Lake, Yosemite National Park.

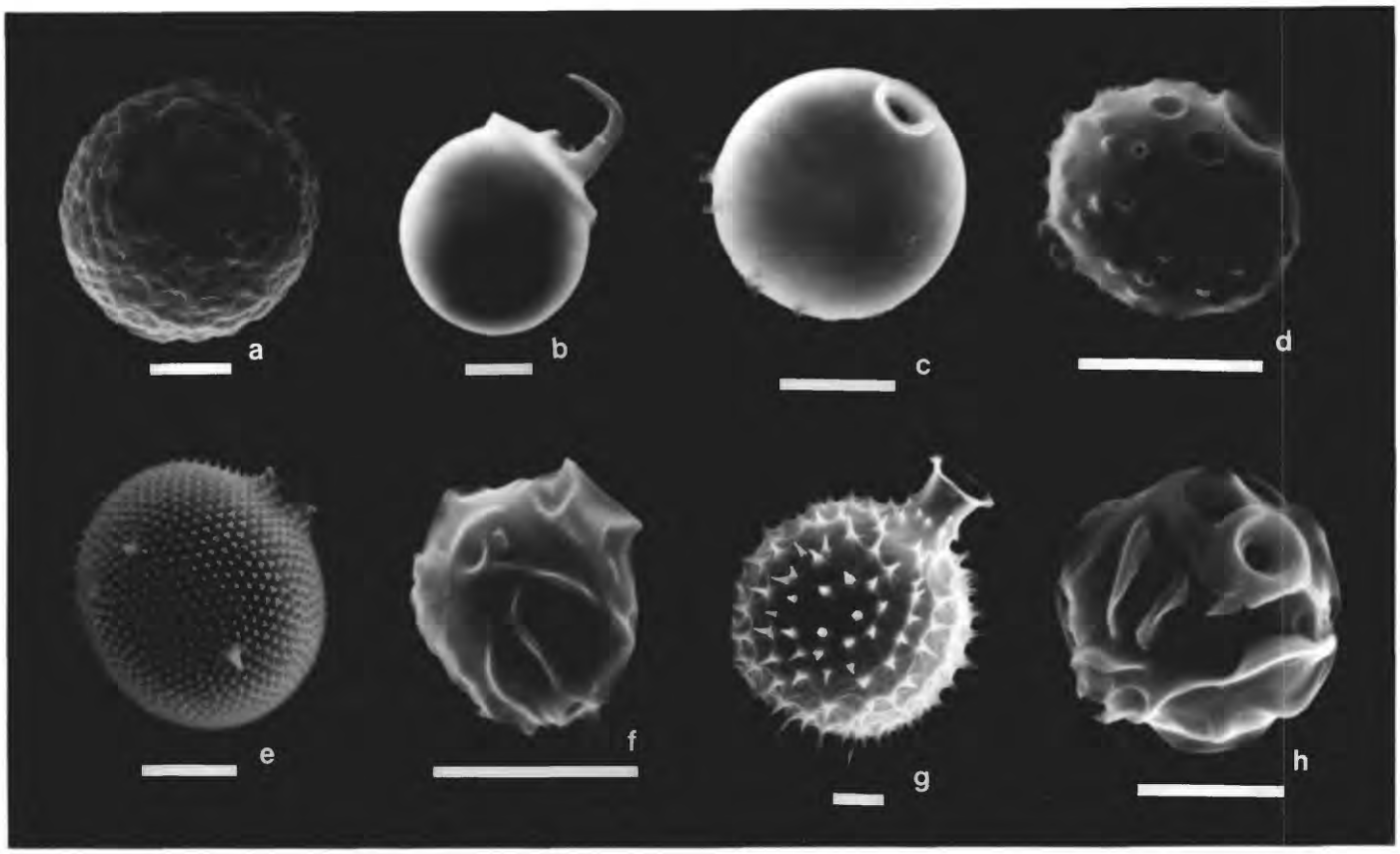

Figure 3. Cyst types with preferred habitats of Sphagnum bogs (A-C) and montane lakes (D-H). Numbers in parentheses are number of samples in which type has been found. Locality data and environmental descriptions for unreferenced sites are given in the text. General locality data: all cysts are from California. A (19 occurrences): Haypress Meadows, El Dorado County (Adam, 1980); B (35): Wrights Lake Meadow, El Dorado County; C (9): Harden Lake Meadow, Tuolumne County (Adam, 1981a); D (20), F (9): Upper Echo Lake, El Dorado County (Adam and Mahood, 1979b); E (21), G (23): Triangle Lake, El Dorado County; H (11): Summit Lake, Fresno County.