DIATOMS, INCLUDING SALT-WATER TAXA, FROM SOUTHWESTERN OKLAHOMA

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Sixty-eight taxa of diatoms (algae, Bacillariophyta) are reported from winter collections in Jackson and Tillman Counties. Of these, 30 are reported as new records for Oklahoma and 36 are usually considered halophilic.

Few papers concern diatoms in Oklahoma. Lohman (1), reported 37 taxa of diatoms from diatomite deposits in Beaver County. Maloney (2) and Leake (3) reported diatoms in a stream and in small lakes in central Oklahoma. Koch and Risser (4) reported an algal flora that included many diatoms from a small limestone stream in south-central Oklahoma. Cain (5) discussed soil algae in northern Texas; however, I am aware of no studies concerning diatoms in or near the southwestern corner of Oklahoma. This paper reports the presence of diatoms, including some salt-water taxa, in the Red River drainage in southwestern Oklahoma.

MATERIAL AND METHODS

On December 22, 1973, grab samples of algae were collected in Jackson and Tillman Counties. Samples 202, 207, and 209 were taken from the Red River in Jackson County at the Oklahoma State Highway Route 34 bridge, where State Highway 5 crosses the Salt Fork of the Red River, and in Tillman County, where State Highway 5 crosses the North Fork of the Red River, respectively. Gypsum Creek (#206; R21W, T1S, Section 21) and an unnamed creek (#205; R22W, T1S, Section 30) were smaller streams also sampled in Jackson County.

Samples were preserved in 70 per cent isopropyl alcohol, and cleaned in 30 per cent hydrogen peroxide after the manner of Van der Werff (6). Cleaned frustules were strewn onto a #1, 18 mm^2 coverslip, and mounted in Hyrax. Diatom species were identified at 1000x with a microscope. Most diatom nomenclature followed Patrick and Reimer (7). The nomenclature of Hustedt (8), and Elmore (9) was followed for species of *Cymbella*, *Amphora*, and the Nitzschiaceae and Surirellaceae. Identification of *Gomphonema* species were according to Mayer (10). Strip counts of more than 300 diatoms from each slide were made, so that the relative proportions of various diatom species in each sample might be obtained. In addition, each slide was completely scanned to locate and identify any diatom species that did not appear in the counts (Table 1). All diatom slides examined will be placed in the diatom herbarium at Ohio State University.

TABLE 1. *Diatom species collected from southwestern Oklahoma*[a]

Species Present	Collection Sites 202	205	206	207	209	Halophile
**Achnanthes hauckiana* Grun.	—	—	—	—	P[b]	yes
Achnanthes minutissima Kütz	—	P	—	—	—	
**Amphiprora alata* (Ehr.) Kütz.	A[f]	C[e]	R[c]	C	A	yes
Amphora ovalis Kütz. (incl. vars.)	U[d]	—	—	R	R	
**Amphora salinarum* W. Sm.	U	—	R	—	—	yes
Bacillaria paradoxa Gmel.	R	—	R	R	A	yes
Biddulphia laevis Ehr.	—	—	—	R	U	yes
**Caloneis amphisbaena* (Bory) Cl.	P	—	—	P	P	yes
**Caloneis amphisbaena* var. *subsalsa* (Donk.) Cl.	—	—	—	P	P	yes
Caloneis bacillum (Grun.) Cl.	P	—	—	—	—	
**Caloneis schumanniana* (Grun.) Cl.	—	—	—	R	R	yes
Caloneis ventricosa (Ehr.) Meist. (incl. vars.)	R	U	—	—	—	
Coscinodiscus rothii var. *subsalsa* (Juhl.-Dannf.) Hust.	—	—	—	P	—	yes

Species Present	Collection Sites 202	205	206	207	209	Halophile
Cyclotella meneghiniana Kütz. (incl. *C. striata* (Kütz.) Grun.)	C	R	—	U	U	yes
**Cylindrotheca gracilis* (Bréb) Grun.	R	R	—	—	—	yes
**Cymbella triangulum* Hust.	—	P	—	—	—	
Cymbella ventricosa Ag.	—	U	—	—	—	
**Diploneis smithii* (Bréb. ex W. Sm.) Cl.	—	—	—	P	—	yes
Gomphonema olivaceum (Lyngbye) Kütz.	—	—	—	R	—	
Gomphonema montanum Schum.	—	P	—	R	—	
Gomphonema parvulum (Kütz.) Rabh.	—	R	—	—	—	
Gomphonema spp.	—	R	—	—	—	
**Gyrosigma spencerii* var. *curvula* (Grun.) Reim.	R	P	C	—	P	yes
Gyrosigma sp. (large striae)	—	—	R	—	—	
Melosira varians C. A. Ag.	—	—	—	—	P	
**Navicula capitata* var. *hungarica* (Grun.) Ross	—	—	—	U	P	yes
Navicula cryptocephala Kütz. (incl. var. *veneta* (Kütz.) Grun.)	—	—	A	C	C	yes
Navicula cuspidata (Kütz.) Kütz.	—	—	—	—	P	
Navicula decussis Östr. (?)	—	—	—	R	—	
**Navicula ilopangoensis* Hust.	U	—	—	—	—	yes
Navicula lanceolata (Ag.) Kütz.	P	C	U	R	R	yes
Navicula mutica Kütz. var. (?)	R	—	P	—	—	
**Navicula notha* Wallace	R	—	P	—	—	
**Navicula pygmaea* Kütz.	R	—	—	—	P	yes
Navicula salinarum Grun.	—	P	C	R	—	yes
**Navicula santaecrucis* Östr.	U	—	U	—	C	yes
**Navicula spicula* (Hickie) Cl.	—	—	R	—	—	yes
Navicula symmetrica Patr.	R	R	—	R	—	yes
Navicula tripunctata (O. F. Mull.) Bory (incl. var. *schizomeroides* Patr.)	U	R	U	R	R	yes
Neidium sp.	—	P	—	—	—	
Nitzschia acicularis (Kütz.) W. Sm.	R	A	C	U	—	yes
Nitzschia apiculata (Greg.) Grun.	U	C	C	A	U	yes
**Nitzschia capitellata* Hust. (?)	R	U	C	C	A	yes
**Nitzschia clausii* Hantz.	R	—	—	—	—	
Nitzschia dissipata (Kütz.) Grun.	—	R	—	—	—	
Nitzschia denticula Grun.	—	—	—	P	—	
**Nitzschia dubia* W. Sm.	R	—	—	—	—	
Nitzschia fonticola Grun.	R	—	—	P	—	
Nitzschia frustulum (Kütz.) Grun.	R	U	R	C	C	
**Nitzschia hungarica* Grun.	R	U	—	U	—	yes
**Nitzschia kutzingiana* Hilse (?)	U	—	—	—	—	
**Nitzschia obtusa* var. *scalpelliformis* Grun.	R	P	—	—	—	
Nitzschia palea (Kütz.) W. Sm.	C	C	P	U	—	
**Nitzschia sigma* (Kütz.) W. Sm.	—	R	—	R	—	yes
Nitzschia tryblionella Hantzsch	—	P	—	—	—	
**Nitzschia tryblionella* var. *debilis* (Arn. ex Grun.) Mayer	C	—	P	P	—	yes
Nitzschia spp.	—	—	—	U	R	
Pinnularia sp.	—	—	P	—	—	
**Pleurosigma delicatulum* W. Sm.	—	—	—	U	—	yes
Rhopalodia gibberula (Ehr.) O. Mull.	—	R	—	R	—	yes
Surirella ovalis Bréb. var. (?)	U	C	—	C	R	yes
Surirella ovata Kütz.	—	U	—	R	R	
**Surirella striatula* Turp.	—	P	U	U	—	yes
**Synedra fasciculata* (Ag.) Kütz	—	—	—	—	C	yes
**Synedra minuscula* Grun.	—	—	R	R	U	
Synedra ulna (Nitzsch.) Ehr. (incl. vars.)	R	U	—	—	—	
**Thalassiosira fluviatilis* Hust.	—	R	P	P	—	yes
**Tropidoneis lepidoptera* (Greg.) Cl.	—	—	—	P	—	yes

[a] Asterisk denotes new to Oklahoma.
[b] P = present in sample, but not in counted material.
[c] R = rare, less than one per cent of sample.
[d] U = uncommon, from one to five per cent of sample.
[e] C = common, from five to twenty per cent of sample.
[f] A = abundant, over twenty per cent of sample.

RESULTS AND DISCUSSION

Sixty-eight taxa of diatoms, of which 30 are new to Oklahoma, are reported (Table 1). Especially interesting is the presence of 36 diatom taxa that are usually associated with brackish waters, or with waters of high mineral content. All of the taxa listed as abundant or common in Table 1, with the possible exception of *Nitzschia frustulum* and *Nitzschia palea*, are thought to be more abundant in brackish than in fresh water (7, 11, 12, 13). In addition, several species, including *Cylindrotheca gracilis, Navicula ilopangoensis, Navicula pygmaea, Navicula spicula, Thalassiosira fluviatilis*, and *Tropodoneis lepidoptera* are thought to be estuarine or marine forms (7, 11, 12, 13). High salinities of from 1-10 ppt of chloride ions have been reported for surface waters in western Oklahoma (14, 15). Chloride may not be the only factor which favors the presence of the various diatoms found in this region because many other dissolved solids also occur in waters of the Red River in southwestern Oklahoma (16).

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