

Illustrations of
Plant Microfossils
From the Yazoo Clay
(Jackson Group, Upper Eocene)
Mississippi

GEOLOGICAL SURVEY PROFESSIONAL PAPER 643-E



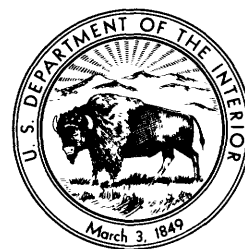
Illustrations of
Plant Microfossils
From the Yazoo Clay
(Jackson Group, Upper Eocene)
Mississippi

By ROBERT H. TSCHUDY and SHARON D. VAN LOENEN

CONTRIBUTIONS TO PALEONTOLOGY

GEOLOGICAL SURVEY PROFESSIONAL PAPER 643-E

*An assemblage of Yazoo Clay palynomorphs is
illustrated and discussed briefly; tentative
taxonomic identifications are made
to the generic level*



UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1970

UNITED STATES DEPARTMENT OF THE INTERIOR

WALTER J. HICKEL, *Secretary*

GEOLOGICAL SURVEY

William T. Pecora, *Director*

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 50 cents (paper cover)

CONTENTS

	Page
Abstract.....	E1
Introduction.....	1
Source of material.....	1
Age and stratigraphic position of samples.....	1
The Yazoo pollen and spore assemblage.....	2
References.....	2
Index.....	5

ILLUSTRATIONS

[Plates follow index]

	Page
PLATES 1-5. Yazoo pollen and spores.	
FIGURE 1. Index map showing sample localities.....	E2



CONTRIBUTIONS TO PALEONTOLOGY

ILLUSTRATIONS OF PLANT MICROFOSSILS FROM THE YAZOO CLAY (JACKSON GROUP, UPPER EOCENE), MISSISSIPPI

By ROBERT H. TSCHUDY and SHARON D. VAN LOENEN

ABSTRACT

This publication illustrates a pollen and spore assemblage from the marine Yazoo Clay of Mississippi. The late Eocene age of the formation is well established by mollusks and Foraminifera. Figures on each plate are supplied with provisional generic identification. Many of the species have not previously been illustrated.

INTRODUCTION

U.S. Geological Survey palynologists have accumulated many palynological assemblages of diverse ages from type or well-documented sample localities. We anticipate that this material eventually will be the subject of detailed taxonomic treatment. The present publication is intended as a means of presenting some of these data in a condensed, preliminary form.

The usefulness of palynological assemblages for stratigraphic determinations and for laboratory reference has been amply demonstrated in a series of papers published by the Canadian Geological Survey, as listed by Barss (1967). These assemblages serve to make information immediately available that would otherwise be unavailable until such time as a full systematic treatment could be accomplished. This publication, like the papers of the Canadian Geological Survey, is designed primarily for laboratory reference and is in no way intended as a substitute for thorough taxonomic treatment. It is a tentative guide to the preliminary identification of the more common species present in the assemblage. No attempt was made to record all the rare species that were present in the material.

SOURCE OF MATERIAL

The Yazoo Clay, named from exposures in the bluff of the Yazoo River at Yazoo City, Miss., is a marine unit consisting of blue-green to blue-gray calcareous, glauconitic, fossiliferous, silty clay and clay. It has an average thickness of about 450 feet and attains a maximum thickness of about 525 feet in southwestern Hinds

County, Miss. (Moore, 1965). The Yazoo outcrop belt forms what is known as the Jackson Prairie in Mississippi. It also crops out in Alabama and Louisiana. Priddy (1960) stated: "Despite the broad belt of outcrops of the Yazoo Formation, good exposures of the Yazoo Clay are rare." We were fortunate in obtaining good sample material from the following localities:

Core hole at the type locality, SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 32, T. 12 N., R. 2 W., Yazoo County, Miss.

Core depth 64 feet, USGS Paleobotanical locality D3697-B.

Core depth 140 feet, USGS Paleobotanical locality D3697-A. (See Moore and others, 1964, p. 13.)

Core hole AF-40, 25 feet north of east-west gravel road in SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 5, T. 7 N., R. 1 W., Hinds County, Miss.

Core depth 26 feet, USGS Paleobotanical locality D3698-B.

Core depth 44 feet, USGS Paleobotanical locality D3698-A.

The above samples were supplied through the courtesy of the Mississippi Geological Survey.

Jackson Ready-Mix Concrete-Light Aggregate Quarry, SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 36, T. 7 N., R. 1 W., Hinds County, 7 miles west-southwest of Madison, Miss. (Priddy, 1960, p. 40, and Moore, 1965, pl. 1).

Surface sample 10 feet below top, USGS Paleobotanical locality D3699-B.

Surface sample 30 feet below top, USGS Paleobotanical locality D3699-A.

The location of these samples is shown in figure 1.

AGE AND STRATIGRAPHIC POSITION OF THE SAMPLES

The Jackson Group in Mississippi consists of the Moodys Branch Formation and the overlying Yazoo Clay. The Jackson Group was first differentiated from other Eocene rocks by Conrad (1855), who also de-

scribed the molluscan fossils. Harris and Palmer (1945), in a monograph on the Jackson mollusks, provided additional data, which support a late Eocene age for the Jackson Group. Foraminiferal and ostracode microfossil evidence also supports a late Eocene age for the Yazoo Clay and its equivalents (Deboo, 1965). Apparently there is no question concerning the age of this unit.

The Yazoo Clay, according to Mellen (1940), conformably overlies the Moodys Branch Formation and conformably underlies the Forest Hill Sand. The Forest Hill is of Oligocene age; however, Priddy (1960) stated: " * * * the Yazoo-Forest Hill contact is definitely recognizable in a few places but indefinite in most. There can be no doubt as to the disconformable relation in Test Holes 7 and 8 where non-marine strata overlie calcareous marine clays. However, on the surface the contact is difficult to find where (1) non-marine Forest Hill clays lie on Yazoo Clays which had been leached before Forest Hill deposition, and (2) where aprons of rain-washed Forest Hill sands or silts hide the contact

in gullied areas." The conformable-gradational Moodys Branch-Yazoo contact was also indicated by Moore (1965).

The stratigraphic position of the samples is summarized as follows:

D3697-A	-----	48 feet above base.
B	-----	124 feet above base.
D3698-A	-----	18 feet below top.
B	-----	Top.
D3699-A	-----	30 feet below top.
B	-----	10 feet below top.

THE YAZOO POLLEN AND SPORE ASSEMBLAGE

Pollen and spore species found in the Yazoo material are shown on plates 1-5. Samples D3697-B and D3699-A yielded the most diverse assemblages and the best preserved specimens; consequently, most of the photographed specimens are from these two samples. All the Yazoo samples yielded abundant marine hystrichospheres and dinoflagellates. These, however, are not included on the plates.

The generic identifications given in the plate descriptions are believed to be reliable but are subject to the constant revision that palynological nomenclature is undergoing at present. With few exceptions, no attempt is made to indicate species.

The plate descriptions include the locality number and a number in parentheses. The latter is the number of the slide on which that particular specimen is found. The slides and the microscope coordinates for each of the photographed specimens are on file in the USGS Denver Palynological Laboratory.

REFERENCES

- Anderson, R. Y., 1960, Cretaceous-Tertiary palynology, eastern side of the San Juan Basin, New Mexico: New Mexico Bur. Mines and Mineral Resources Mem. 6, 58 p.
- Barss, M. S., 1967, Illustrations of Canadian fossils—Carboniferous and Permian spores of Canada: Canada Geol. Survey Paper 67-11, 94 p.
- Conrad, T. A., 1855, Observations on the Eocene deposit of Jackson, Mississippi, with descriptions of thirty-four new species of shells and corals: Acad. Nat. Sci. Philadelphia Proc. 7, p. 257-263 (reprinted, 1939, Am. Paleontology, v. 24, no. 86, 19 p.).
- Deboo, P. B., 1965, Biostratigraphic correlation of the type Shubuta Member of the Yazoo Clay and Red Bluff Clay with their equivalents in southwestern Alabama: Alabama Geol. Survey Bull. 80, 84 p.
- Engelhardt, D. W., 1964, Plant microfossils from the Eocene Cockfield Formation, Hinds County, Mississippi: Mississippi Geol. Econ. and Topog. Survey Bull. 104, p. 65-95.
- Harris, G. D., and Palmer, K. V., 1946-47, The Mollusca of the Jackson Eocene of the Mississippi Embayment (Sabine River to the Alabama River): Bull. Am. Paleontology, v. 30, no. 117, pt. 1, Bivalves, 206 p.; pt. 2, Univalves p. 207-563.

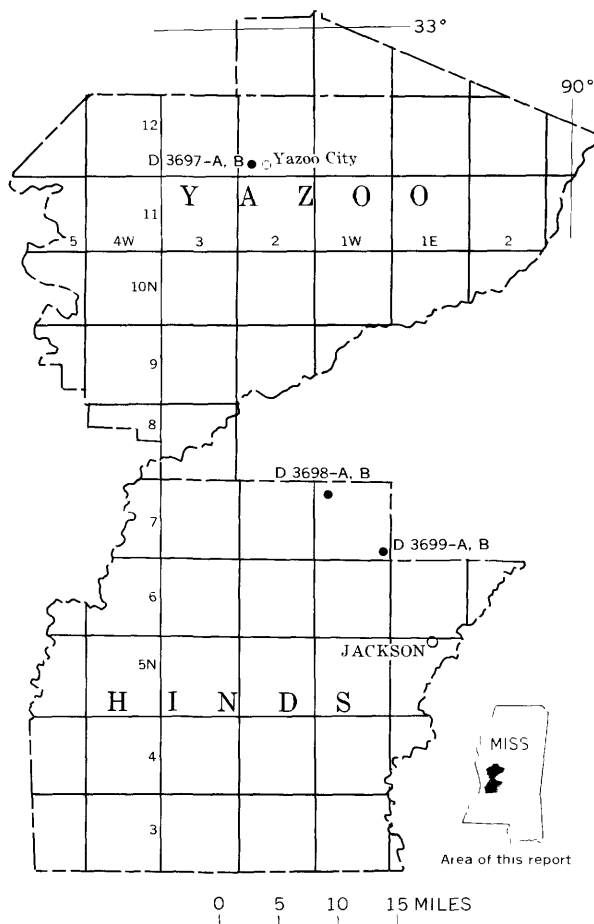


FIGURE 1.—Index map showing sample localities in Yazoo and Hinds Counties, Miss.

- Kedves, Miklos, 1960. Études palynologiques dans le bassin de Dorog: Pollen et Spores, v. 2, no. 1, p. 89-118.
- Mellen, F. F., 1940. Yazoo County mineral resources: Mississippi State Geol. Survey Bull. 39, 132 p.
- Moore, W. H., 1965. Hinds County geology: Mississippi Geol. Econ. and Topog. Survey Bull. 105, p. 21-145.
- Moore, W. H., Parks, W. S., and Kern, M. K., 1964. Type localities sampling program: Mississippi Geol. Econ. and Topog. Survey Bull. 104, p. 7-32.
- Potonié, Robert, 1934. Zur Mikrobotanik der Kohlen und ihrer Verwandten. II, Zur Mikrobotanik des eocänen Humodils des Geiseltals: Preuss. Geol. Landesanstalt, Inst. Paläeobot. und Petrographie Brennsteine, Arb., v. 4, p. 25-125.
- Potonié, Robert, Thomson, P. W., and Thiergart, Friedrich, 1951. Zur Nomenklatur und Klassifikation der neogenen Sporomorphae (Pollen und Sporen): Geol. Jahrb., v. 65, p. 35-69.
- Priddy, R. R., 1960. Madison County geology: Mississippi State Geol. Survey Bull. 88, 123 p.
- Raatz, G. V., 1937. Mikrobotanisch-stratigraphische Untersuchung der Braunkohle des muskauer Bogens: Preuss. Geol. Landesanstalt, Abh., Neue Folge, 183, 48 p.
- Steeves, M. W., and Barghoorn, E. S., 1959. The pollen of *Ephedra*: Harvard Univ., Arnold Arboretum Jour., v. 40, no. 3, p. 221-255.
- Stover, L. E., Elsik, W. C., and Fairchild, W. W., 1966. New genera and species of early Tertiary palynomorphs from Gulf Coast: Kansas Univ. Paleont. Contr., Paper 5, p. 1-11.
- Thomson, P. W., and Pflug, Hans, 1953. Pollen und Sporen des mitteleuropäischen Tertiärs: Palaeontographica, sec. B., v. 94, 138 p.
- Tsukada, Matsuo, 1964. Pollen morphology and identification III—Modern and fossil tropical pollen with emphasis on Bombacaceae: Pollen et Spores, v. 6, no. 2, p. 393-462.
- Wolff, Herbert, 1934. Mikrofossilien des pliocänen Humodils der Grube Freigericht bei Dettlingen a. M. und Vergleich mit älteren Schichten des Tertiärs sowie posttertiären Ablagerungen: Preuss. Geol. Landesanstalt, Inst. Paläeobot. und Petrographie Brennsteine, Arb., v. 5, p. 55-86.

INDEX

[Italic numbers indicate major references]

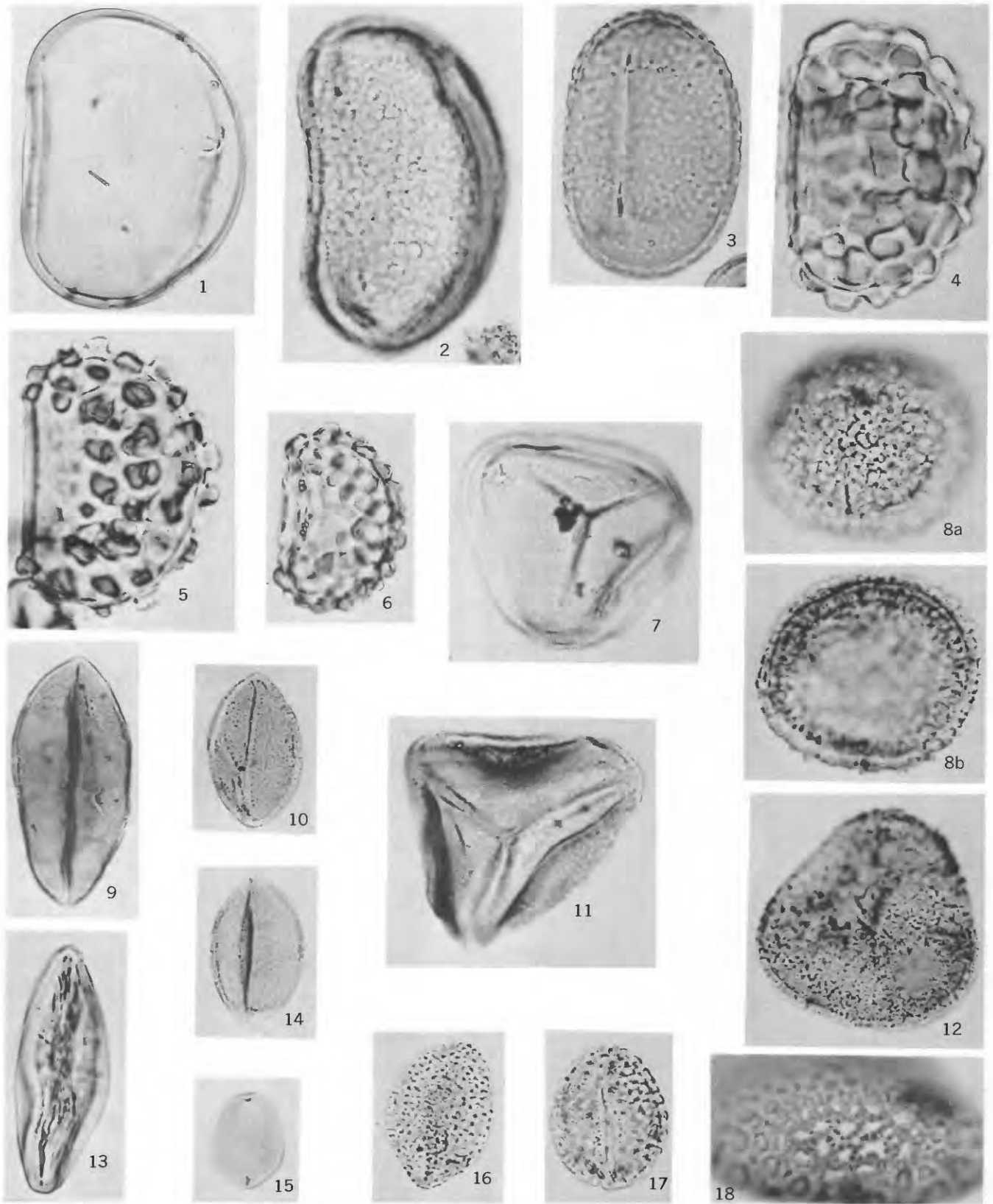
	Page		Page
<i>Abietinaepollenites</i>	pl. 2	<i>Monocolpopollenites nupharoides</i>	pl. 2
sp.....	pl. 2	<i>Monosulcites</i> sp.....	pl. 1
Age and stratigraphic position of the samples.....	E1	<i>Monulcipollenites confossus</i>	pl. 2
<i>Alnipollenites verus</i>	pl. 3	Moodys Branch Formation.....	E1
sp.....	pl. 3	<i>Multiporopollenites</i> sp.....	pl. 3
<i>Alnus</i> sp.....	pl. 3		
Anacardiaceae.....	pl. 4	<i>Nothofagus</i> sp.....	pl. 3
<i>Araliaceoipollenites</i>	pl. 4	<i>nupharoides</i> , <i>Monocolpopollenites</i>	pl. 2
<i>Araucariacites</i> sp. 1.....	pl. 2	Nymphaeaceae.....	pl. 2
<i>Betulaceoipollenites</i> sp.....	pl. 3	<i>Osmundacidites</i>	pl. 1
<i>Bombacacidites</i> sp.....	pl. 5		
		<i>Paliurus triplicatus</i>	pl. 3
Caprifoliaceae.....	pl. 4	<i>Parthenocissus</i>	pl. 5
<i>Carya</i> sp.....	pl. 3	<i>plicatus</i> , <i>Triatriopollenites</i>	pl. 3
<i>Caryapollenites simplex</i>	pl. 3	<i>Pollenites ventosus</i>	pl. 4
sp.....	pl. 3	<i>Polyporopollenites</i> sp.....	pl. 3
<i>confossus</i> , <i>Monulcipollenites</i>	pl. 2	<i>pseudodentatus</i> , <i>Microfoveolatosporis</i>	pl. 1
<i>coryloides</i> , <i>Momipites</i>	pl. 2		
<i>Cupaneidites</i> sp.....	pl. 4	<i>Rhoipites</i> sp.....	pl. 4, 5
<i>Cupuliferoipollenites</i> sp.....	pl. 4		
<i>Cyathidites</i> sp.....	pl. 1	<i>Sapotaceoidae pollenites</i> sp.....	pl. 5
		<i>simplex</i> , <i>Caryapollenites</i>	pl. 3
<i>dilatatus</i> , <i>Triatriopollenites</i>	pl. 3	Source of material.....	E1
<i>Duplopollis</i> sp.....	pl. 4	<i>Spondias</i>	pl. 4
		Stratigraphic position and age of the samples.....	E1
<i>Engelhardtiodites microcoryphaeus</i>	pl. 3	<i>Symplocoiipollenites</i> sp.....	pl. 5
sp.....	pl. 3		
<i>Ephedra</i> sp.....	pl. 1	<i>Tiliaepollenites</i> sp.....	pl. 5
		Triangular spore.....	pl. 1
Forest Hill Sand.....	E2	<i>Triatriopollenites dilatatus</i>	pl. 3
<i>Gleicheniidites</i> sp.....	pl. 1	<i>plicatus</i>	pl. 3
<i>Granulatisporites</i>	pl. 1	sp.....	pl. 3
		<i>Tricolpopollenites</i> sp.....	pl. 4
<i>hiatus</i> , <i>Inaperturopollenites</i>	pl. 2	<i>Tricolporites</i> sp.....	pl. 4, 5
		<i>Tricolporopollenites marcodurensis</i>	pl. 5
<i>Ilexpollenites</i> sp.....	pl. 4	<i>triplicatus</i> , <i>Paliurus</i>	pl. 3
<i>Inaperturopollenites hiatus</i>	pl. 2	Triporate pollen.....	pl. 2
		<i>Triporopollenites</i> sp.....	pls. 2, 3
Jackson Prairie.....	E1	<i>Trivestibulopollenites</i> sp.....	pl. 3
<i>Juglanspollenites</i> sp.....	pl. 3		
		<i>Ulmipollenites undulosus</i>	pl. 3
<i>Laevigatosporites</i> sp.....	pl. 1	sp.....	pl. 3
<i>Liliacidites</i> sp.....	pl. 1	<i>undulosus</i> , <i>Ulmipollenites</i>	pl. 3
<i>Lonicera</i>	pl. 4		
		<i>rentosus</i> , <i>Pollenites</i>	pl. 4
<i>marcodurensis</i> , <i>Tricolporopollenites</i>	pl. 5	<i>Verrucatosporites</i> sp.....	pl. 1
<i>microcoryphaeus</i> , <i>Engelhardtiodites</i>	pl. 3	Vitaceae.....	pl. 5
<i>Microfoveolatosporis pseudodentatus</i>	pl. 1		
<i>Momipites</i>	pl. 3	Yazoo pollen and spore assemblage.....	E2
<i>coryloides</i>	pl. 2		
sp.....	pl. 2		

PLATES 1-5

PLATE 1

[Magnification \times 1,000 unless otherwise indicated]

		<i>Locality and slide Nos.</i>
FIGURE	1. <i>Laevigatosporites</i> sp.....	D3699-A (3)
	2. <i>Verrucatosporites</i> sp.....	D3697-B (1)
	3. <i>Microfoveolatosporis</i> cf. <i>M. pseudodentatus</i> Engelhardt 1964.....	D3699-A (3)
	4. <i>Verrucatosporites</i> sp.....	D3697-B (1)
	5. <i>Verrucatosporites</i> sp.....	D3699-A (4)
	6. <i>Verrucatosporites</i> sp.....	D3699-A (3)
	7. <i>Cyathidites</i> sp.....	D3699-A (3)
	8a. <i>Osmundacidites</i> , high focus showing laesurae.....	D3697-B (1)
	8b. Same specimen, low focus.	
	9. <i>Monosulcites</i> sp.....	D3699-A (1)
	10. <i>Monosulcites</i> sp.....	D3699-A (3)
	11. <i>Gleicheniidites</i> sp.....	D3699-A (1)
	12. Triangular spore of <i>Granulatisporites</i> type.....	D3699-A (4)
	13. <i>Ephedra</i> sp. (type A of Steeves and Barghoorn 1959).....	D3697-B (1)
	14. <i>Monosulcites</i> sp. (probably same sp. as fig. 10).....	D3697-B (1)
	15. <i>Monosulcites</i> sp.....	D3699-A (3)
	16. <i>Liliacidites</i> sp.....	D3697-B (1)
	17. <i>Liliacidites</i> sp.....	D3699-A (3)
	18. <i>Liliacidites</i> sp. (same species as fig. 17, magnified \times 2,000 to show structure of reticulum).....	D3699-A (1)



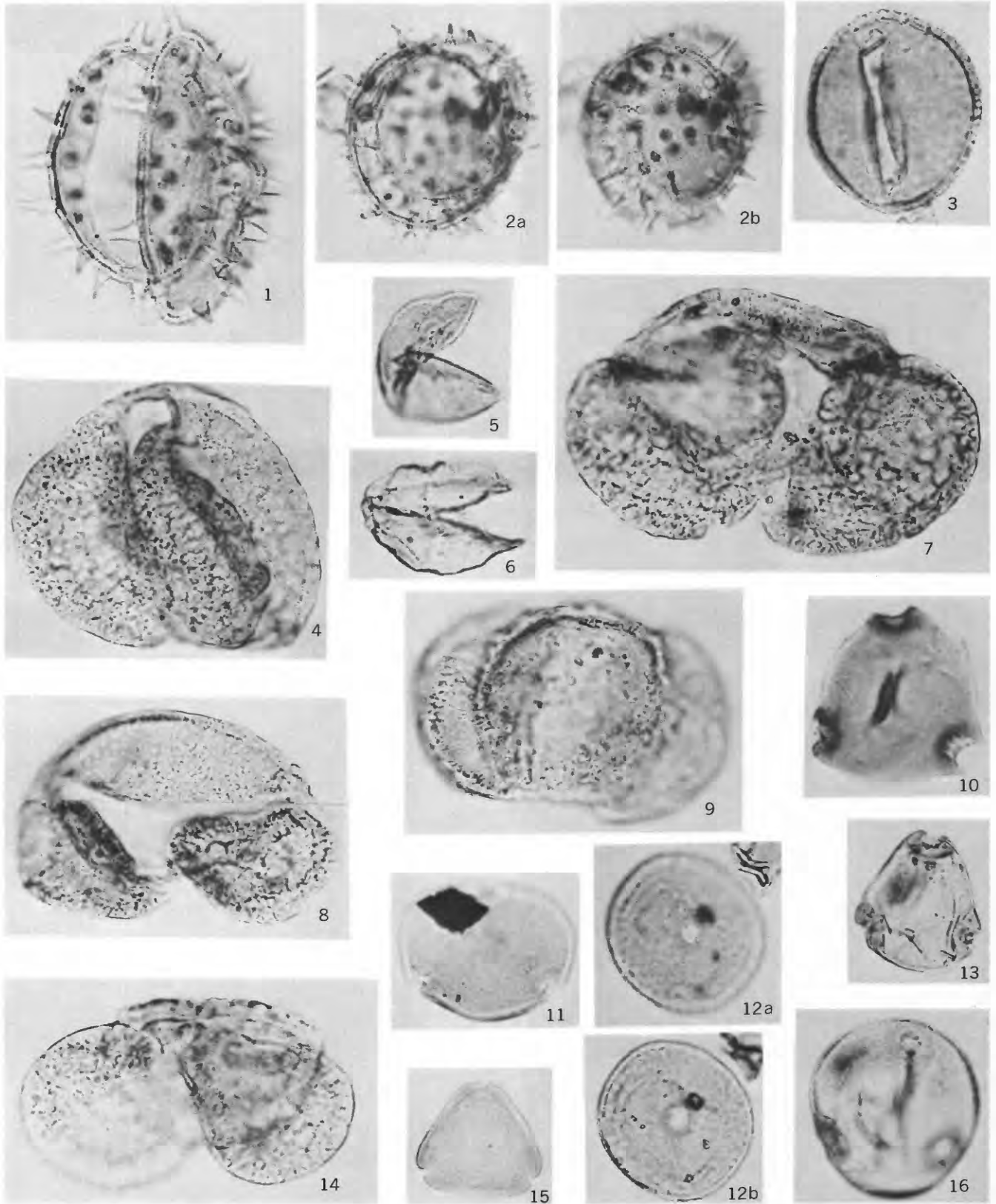
YAZOO POLLEN AND SPORES

PLATE 2

[Magnification $\times 1,000$]

Locality and slide Nos.

FIGURE 1. Nymphaeaceae (see <i>Monocolpopollenites nupharoides</i> Kedves 1960)-----	D3697-B (1)
2a. Nymphaeaceae, same species as fig. 1, low focus.-----	D3699-A (3)
2b. Nymphaeaceae, same specimen as fig. 2a, high focus.	
3. ? <i>Araucariacites</i> sp. 1.-----	D3699-A (3)
4. <i>Abietinaepollenites</i> sp. (Diploxyton type)-----	D3697-B (1)
5. <i>Inaperturopollenites</i> cf. <i>I. hiatus</i> (R. Potonié) Thomson and Pflug 1953.-----	D3699-A (3)
6. <i>Inaperturopollenites</i> cf. <i>I. hiatus</i> (R. Potonié) Thomson and Pflug 1953.-----	D3697-B (2)
7. <i>Abietinaepollenites</i> sp. (Diploxyton type)-----	D3699-A (4)
8. <i>Abietinaepollenites</i> sp. (Diploxyton type)-----	D3699-A (4)
9. <i>Abietinaepollenites</i> sp. (Diploxyton type)-----	D3697-B (1)
10. Triporate pollen.-----	D3697-B (2)
11. <i>Triporopollenites</i> sp.-----	D3697-B (1)
12a. <i>Monulcipollenites</i> cf. <i>M. confossus</i> Fairchild, in Stover, Elsik, and Fairchild 1966. High focus.-----	D3699-A (3)
12b. Same specimen as fig. 12a. Low focus.	
13. <i>Triporopollenites</i> sp.-----	D3699-A (3)
14. <i>Abietinaepollenites</i> (Diploxyton type)-----	D3697-B (1)
15. ? <i>Momipites</i> sp. (See <i>M. coryloides</i> Wode. 1933, in Englehardt 1964)-----	D3697-B (1)
16. <i>Triporopollenites</i> sp.-----	D3699-A (4)

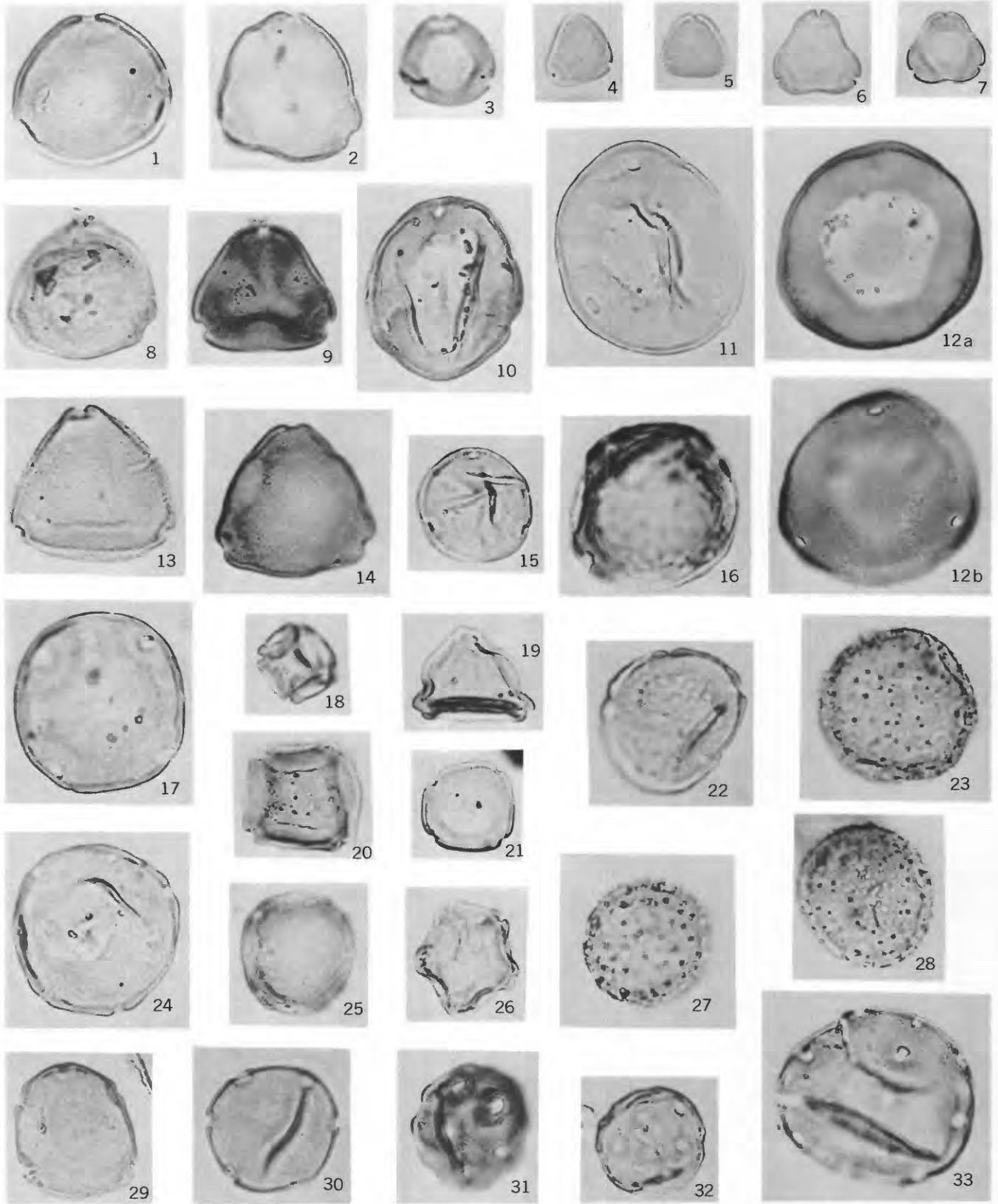


YAZOO POLLEN AND SPORES

PLATE 3

[Magnification $\times 1,000$]

FIGURE		<i>Locality and slide Nos.</i>
1.	<i>Triatriopollenites</i> sp.-----	D3697-B (2)
2.	<i>Triatriopollenites</i> sp.-----	D3699-A (3)
3.	? <i>Engelhardtiodites</i> cf. <i>E. microcoryphaeus</i> (Potonié) Potonié, Thomson, and Thiergart 1950. (See Engelhardt 1964.)-----	D3699-A (3)
4.	<i>Triatriopollenites</i> sp.-----	D3699-A (3)
5.	<i>Engelhardtiodites</i> sp.-----	D3699-A (3)
6.	<i>Triatriopollenites</i> cf. <i>T. dilatus</i> Fairchild in Stover, Elsik, and Fairchild 1966.-----	D3699-A (4)
7.	<i>Triatriopollenites</i> sp.-----	D3699-A (3)
8.	? <i>Betulaceoipollenites</i> sp.-----	D3699-A (3)
9.	<i>Triatriopollenites</i> sp. cf. <i>T. plicatus</i> Thomson and Pflug 1953.-----	D3699-A (1)
10.	<i>Carya</i> sp. or <i>Caryapollenites</i> sp.-----	D3699-A (3)
11.	<i>Carya</i> sp. or <i>Caryapollenites</i> sp. cf. <i>C. simplex</i> (Potonié) Raatz 1937.-----	D3697-B (1)
12a.	<i>Carya</i> sp. or <i>Caryapollenites</i> sp. Low focus.-----	D3699-A (1)
12b.	Same specimen as fig. 12a. High focus.	
13.	<i>Triporopollenites</i> sp.-----	D3699-A (3)
14.	<i>Triatriopollenites</i> sp.-----	D3699-A (1)
15.	<i>Triporopollenites</i> sp.-----	D3699-A (3)
16.	<i>Ulmipollenites</i> sp.-----	D3699-A (1)
17.	<i>Polyporopollenites</i> sp. (?four-pored <i>Caryapollenites</i>)-----	D3699-A (3)
18.	<i>Alnus</i> sp. or <i>Alnipollenites</i> sp. cf. <i>A. verus</i> (R. Potonié) ex. R. Potonié 1934.-----	D3699-A (3)
19.	<i>Trivestibulopollenites</i> sp. cf. <i>Paliurus triplicatus</i> Anderson 1960.-----	D3697-B (1)
20.	<i>Alnus</i> sp. or <i>Alnipollenites</i> sp.-----	D3697-B (2)
21.	<i>Polyporopollenites</i> sp. (cf. pl. 2, fig. 15 ? <i>Momipites</i>)-----	D3699-A (3)
22.	<i>Ulmipollenites</i> sp.-----	D3699-A (3)
23.	?Aff. <i>Nothofagus</i> sp.-----	D3697-B (2)
24.	<i>Multiporopollenites</i> sp.-----	D3697-B (1)
25.	<i>Ulmipollenites</i> sp. cf. <i>U. undulosus</i> Wolff 1934 (see Engelhardt 1964).-----	D3699-A (3)
26.	<i>Alnus</i> sp. or <i>Alnipollenites</i> sp.-----	D3697-B (1)
27.	?Aff. <i>Nothofagus</i> sp.-----	D3699-A (3)
28.	?Aff. <i>Nothofagus</i> sp.-----	D3699-A (3)
29.	<i>Juglanspollenites</i> sp.-----	D3699-A (3)
30.	<i>Juglanspollenites</i> sp.-----	D3699-A (4)
31.	<i>Multiporopollenites</i> sp.-----	D3699-A (1)
32.	<i>Multiporopollenites</i> sp.-----	D3699-A (3)
33.	<i>Multiporopollenites</i> sp.-----	D3699-A (1)

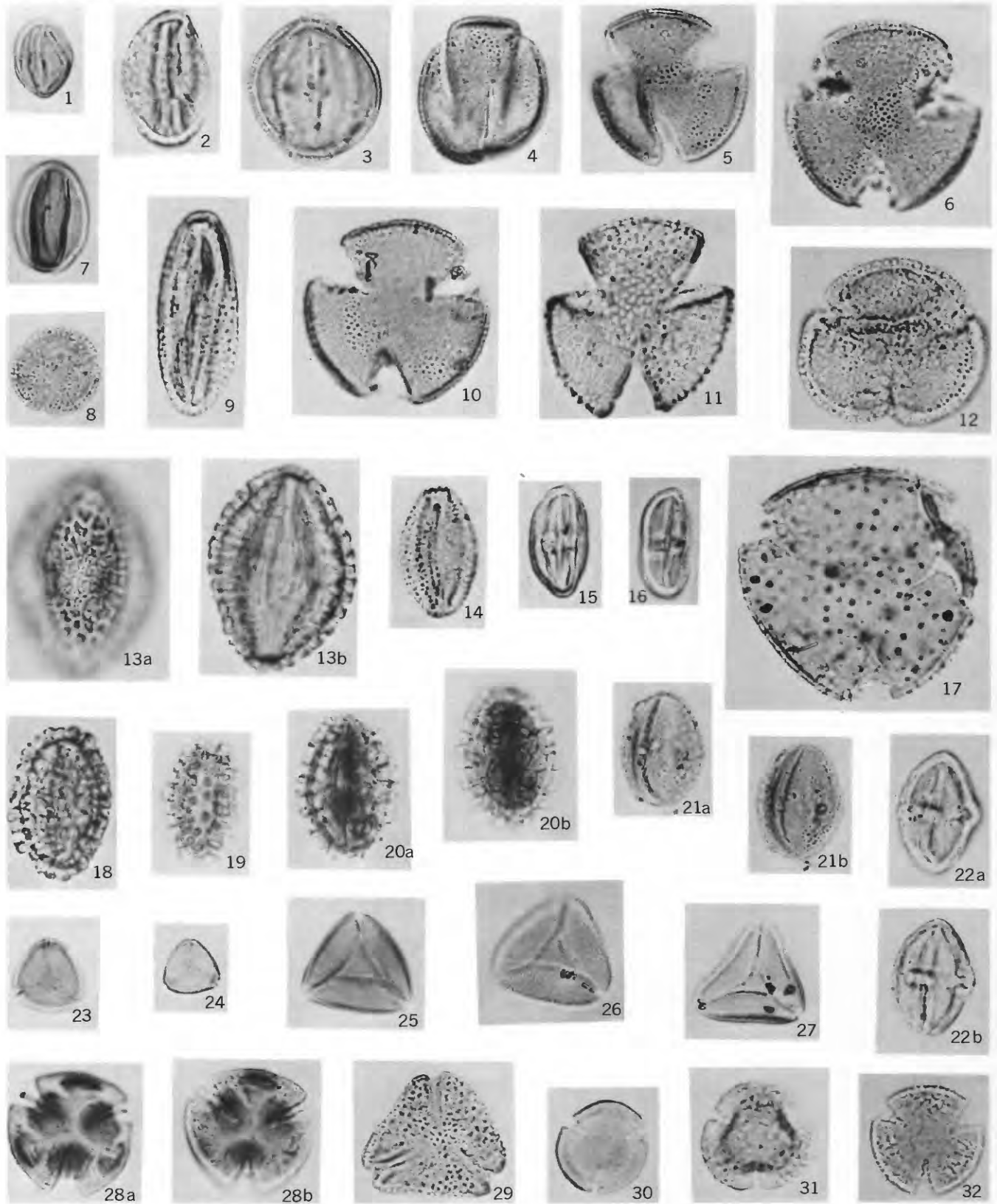


YAZOO POLLEN AND SPORES

PLATE 4

[Magnification \times 1,000]

FIGURE		<i>Locality and slide Nos.</i>
1.	<i>Tricolpopollenites</i> sp.-----	D3699-A (3)
2.	<i>Tricolpopollenites</i> sp.-----	D3697-B (1)
3.	<i>Tricolpopollenites</i> sp.-----	D3697-B (1)
4.	<i>Tricolpopollenites</i> sp.-----	D3697-B (1)
5.	<i>Tricolpopollenites</i> sp. (figs. 3-5, probably the same species)---	D3697-B (1)
6.	<i>Tricolpopollenites</i> sp.-----	D3699-A (4)
7.	<i>Tricolpopollenites</i> sp.-----	D3697-B (1)
8.	<i>Tricolpopollenites</i> sp.-----	D3699-A (3)
9.	<i>Tricolpopollenites</i> sp.-----	D3697-B (2)
10.	<i>Tricolpopollenites</i> sp. Same species as fig. 6-----	D3699-A (3)
11.	<i>Tricolpopollenites</i> sp.-----	D3697-B (2)
12.	<i>Tricolpopollenites</i> sp.-----	D3697-B (2)
13a.	<i>Tricolpopollenites</i> sp. High focus-----	D3697-B (1)
13b.	Same specimen as fig. 13a. Low focus.	
14.	<i>Tricolpopollenites</i> sp.-----	D3699-A (3)
15.	<i>Cupuliferoipollenites</i> sp.-----	D3697-B (1)
16.	<i>Cupuliferoipollenites</i> sp.-----	D3697-B (1)
17.	<i>Tricolpopollenites</i> sp. aff. Caprifoliaceae cf. <i>Lonicera</i> -----	D3699-B (4)
18.	<i>Ilexpollenites</i> sp.-----	D3697-B (1)
19.	<i>Ilexpollenites</i> sp.-----	D3699-A (3)
20a.	<i>Tricolporites</i> sp. Low focus-----	D3697-B (1)
20b.	Same specimen as fig. 20a. High focus.	
21a.	<i>Rhoipites</i> sp. High focus-----	D3699-A (3)
21b.	Same specimen as fig. 21a. Low focus.	
22a.	<i>Tricolporites</i> sp. (? <i>Araliaceoipollenites</i>) Low focus-----	D3697-B (1)
22b.	Same specimen as fig. 22a. High focus.	
23.	<i>Cupaneidites</i> sp.-----	D3699-A (3)
24.	<i>Cupaneidites</i> sp.-----	D3699-A (3)
25.	<i>Duplopollis</i> sp.-----	D3699-A (1)
26.	<i>Duplopollis</i> sp.-----	D3699-A (4)
27.	<i>Duplopollis</i> sp.-----	D3699-A (4)
28a.	<i>Tricolporites</i> sp. High focus-----	D3697-B (1)
28b.	Same specimen as fig. 28a. Low focus.	
29.	<i>Tricolporites</i> sp. (? <i>Anacardiaceae</i> cf. <i>Spondias</i> . See Tsukada 1964.)-----	D3699-A (3)
30.	<i>Tricolporites</i> sp. (cf. <i>Pollenites ventosus</i> Potonié 1934)-----	D3699-A (3)
31.	<i>Tricolporites</i> sp.-----	D3697-B (2)
32.	<i>Tricolporites</i> sp.-----	D3699-A (3)

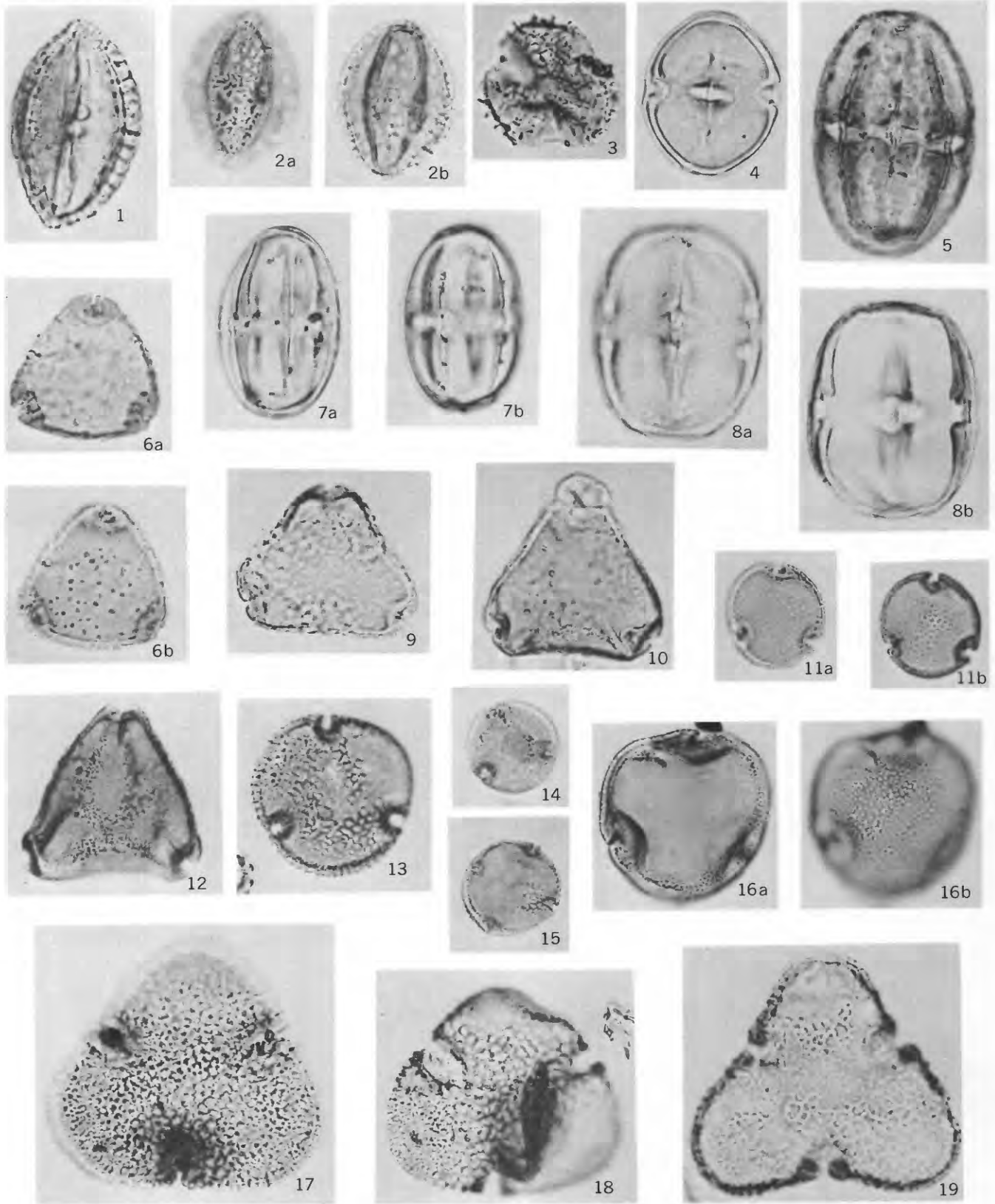


YAZOO POLLEN AND SPORES

PLATE 5

[Magnification $\times 1,000$]

	<i>Locality and slide Nos.</i>
FIGURE 1. <i>Tricolporites</i> sp. (See <i>Tricolporopollenites marcodurensis</i> Thomson and Pflug 1953; cf. Vitaceae, <i>Parthenocissus</i> .)	D3697-B (1)
2a. <i>Rhoipites</i> sp. High focus	D3699-A (3)
2b. Same specimen as fig. 2a. Low focus.	
3. <i>Tricolporites</i> sp.	D3699-A (4)
4. <i>Sapotaceoidaepollenites</i> sp.	D3697-B (1)
5. <i>Tricolporites</i> sp.	D3699-A (3)
6a. <i>Symplocoipollenites</i> sp. Low focus	D3699-A (3)
6b. Same specimen as fig. 6a. High focus.	
7a. <i>Sapotaceoidaepollenites</i> sp. High focus	D3699-A (3)
7b. Same specimen as fig. 7a. Low focus.	
8a. <i>Sapotaceoidaepollenites</i> sp. High focus	D3697-B (1)
8b. Same specimen as fig. 8a. Low focus.	
9. <i>Symplocoipollenites</i> sp.	D3697-B (1)
10. <i>Symplocoipollenites</i> sp.	D3697-B (1)
11a. <i>Tiliaepollenites</i> sp. High focus	D3699-A (3)
11b. Same specimen as fig. 11a. Low focus.	
12. <i>Symplocoipollenites</i> sp.	D3699-A (1)
13. <i>Tiliaepollenites</i> sp.	D3699-A (4)
14. <i>Tiliaepollenites</i> sp.	D3699-A (3)
15. <i>Tiliaepollenites</i> sp. Probably the same species as fig. 14, but possessing four apertures	D3699-A (3)
16a. <i>Tiliaepollenites</i> sp. Low focus	D3699-A (4)
16b. Same specimen as fig. 16a. High focus.	
17. <i>Bombacacidites</i> sp.	D3699-A (4)
18. <i>Bombacacidites</i> sp.	D3699-A (4)
19. <i>Bombacacidites</i> sp.	D3697-B (2)



YAZOO POLLEN AND SPORES

