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SEVEN NEW SPECIES OF UNASSIGNED PLANT MICROFOSSILS FROM THE DES MOINES SERIES OF IOWA*

L. R. WILSON AND R. M. KOSANKE

The coals of the Des Moines Series of Iowa contain an abundance of unassigned plant microfossils and in this report a few of the more diagnostic new types are described. At the present time little can be stated concerning the vertical distribution of these microfossils but preliminary work has shown that some are definitely restricted to certain strata and should become useful horizon markers as more information is accumulated.

In 1940, Wilson and Coe described eleven new species of unassigned plant microfossils from the Des Moines Series of Iowa. Several of these have since been transferred to other genera by Schopf, Wilson, and Bental (1944).

The specimens that constitute the types of species described here are in the collection of the senior author.

The authors wish to express their appreciation to Dr. Theodor Just, University of Notre Dame, for checking the construction of the new specific names used in this paper.

Genus CALAMOSPORA S. W. B., 1944.

Spores radial, trilete; spherical or subspherical; size 40 microns to several hundred microns; spore coat relatively thin 2-15 microns thick, usually collapsed with taper pointed folds, translucent, colorless or yellowish to light brown; ornamentation usually absent, but may be present in minute granuli in proximal pyramic areas; trilete rays simple or slightly lipped, in length approximately one-third the diameter of the spore. Affinity: Calamariaceae, pteridophytic.

CALAMOSPORA STRAMINEA sp. nov. (Fig. 1)

Spherical, diameter 30-45 microns, smooth, translucent, colorless to yellow; wall 3 microns thick; compression folds frequent, taper pointed; trilete rays extend about one-half the distance to the edge of the spore.

Holotype: Slide No. 276P. Circle 2. Angus Coal Company mine, two miles northeast of Oskaloosa, Mahaska County, Iowa. Des Moines Series, Pennsylvanian System.

Genus CIRTRIRADITES Wilson and Coe, 1940.

Spores, radial, trilete; moderately flattened with a strongly projecting equatorial flange; the flange may assume a triangular or circular outline; spore body is circular or slightly triangular in transverse view; diameter 40-100 microns including flange; spore coat 3-5 microns thick, translucent, colorless to yellow-brown; ornamentation

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on spore body oriented radially as ridges or somewhat reticulate, or surface smooth, granulose or finely punctate; ornamentation on flange frequently ridged and radial in arrangement, may possess one or two concentric bands of irregular thickening; pyramic areas are essentially similar in ornamental pattern to distal surfaces; trilete rays well developed to equator, frequently a thickening continues from the end of the trilete ray to the edge of the flange; lips are usually well demarcated and raised above the spore body; suture line attenuate but distinct; flange usually broad, frequently more than the total spore diameter, thinner than spore body wall and more translucent; interradian flange width frequently less than that opposite the rays; margin often minutely to coarsely serrate. Affinity: probably lycopodial.

CIRRATRIRADITES FLABELLIFORMIS sp. nov. (Fig. 6)

Circular to slightly triangular in transverse view, somewhat flattened; total diameter 75-80 microns, spore body diameter 42-45 microns, flange 10-15 microns wide; ornamentation of spore body irregularly rugose; flange smooth, wavy, folded and of varying width, frequently torn, edge entire or minutely serrate.

Holotype: Slide No. 269P. Circle 2. Angus Coal Company mine, two miles northeast of Oskaloosa, Mahaska County, Iowa. Des Moines Series, Pennsylvanian System.

Genus *FLORINITES* S. W. B., 1940.

Symmetry, apparently bilateral, broadly elliptical in outline due to the form of the bladder; spore body more spherical and nearly enclosed by bladder; when compressed, spore body is marked by numerous sharp angular folds, bladder very slightly folded; bladder length 70-210 microns, width 50-145 microns; spore body diameter 30-110 microns; bladder membrane approximately 1 micron thick, expanded on all sides of the spore body except for a small area (distal?) where it is attached; bladder reticulation internal and frequently prominent, exterior smooth or finely granulose or rugose, translucent, colorless to yellow; spore body wall approximately 2 microns thick, smooth or slightly granulose, less translucent than bladder, yellow to brown; trilete structure (when discernible) probably vestigial. Affinity: gymnospermic.

FLORINITES ELEGANS sp. nov. (Fig. 3)

Elliptical, length 180-210 microns, width 130-145 microns; spore body slightly elliptical, diameter 100-105 microns; bladder reticulation prominent; spore body only slightly granulose; compression folds of spore body prominent.

Holotype: Slide No. 279P. Circle 1. Angus Coal Company mine, two miles northeast of Oskaloosa, Mahaska County, Iowa. Des Moines Series, Pennsylvanian System.

Genus *PUNCTATI-SPORITES* (Ibrahim, 1933) emend. S. W. B., 1944.

Spores radial, trilete; spherical or subspherical in transverse plane, may be slightly triangular and show slight shortening of the axial

dimension; size 45-85 microns in mean diameter; spore-coat approximately 3 microns thick except in species where ornamentation is prominent; ornamentation various, laevigate, punctate, rugose, reticulate, or apiculate; length of trilete rays variable but not reaching distal side of spore, lips not prominent nor highly ornamented. Affinity: possible pteridophytic or pteridospermic.

PUNCTATI-SPORITES DECORUS sp. nov. (Fig. 7.)

Spherical or subspherical; diameter 60-67 microns; wall 1.5 microns thick, yellow to light brown, translucent, folds, when present, are taper pointed, ornamentation subechinate and scattered, spines 1.5-4.5 microns in length and acute.

Cotypes: Slides 262P. Circle 1 and 267P. Angus Coal Company mine, two miles northeast of Oskaloosa, Mahaska County, Iowa. Des Moines Series, Pennsylvanian System.

PUNCTATI-SPORITES SULCATUS sp. nov. (Fig. 4.)

Triangular to round in transverse view, usually very flat; diameter 30-40 microns; wall ornamented with a dense coarse irregular reticulation which frequently covers the spore body so completely that only minute areas exist between; some of the reticulations may end in pronounced verrucose processes; spores yellow to light brown; trilete rays reaching the equator; lips not modified.

Cotypes: Slides No. 265P. Circle 1 and No. 266P. Angus Coal Company mine, two miles northeast of Oskaloosa, Mahaska County, Iowa. Des Moines Series, Pennsylvanian System.

Genus *RAISTRICKIA* S. W. B., 1944.

Spores radial, trilete; spherical or subspherical in transverse plane, may be slightly triangular; size 50-90 microns in diameter; spore coat 2-6 microns thick; ornamentation evenly verrucose or spinose; spines generally heavy, scarcely tapering, blunt, abruptly truncate, or slightly partate, when verrucose the prominences resemble spinose structures but shorter; trilete rays variable in length, generally inconspicuous, lips unornamented. Affinity: probably pteridospermic.

RAISTRICKIA ACULEOLATA sp. nov. (Fig. 5.)

Spherical spinose, diameter of spore body 50-60 microns; spines oblong, tapering or slightly irregular; points blunt, irregular, or slightly partate, 7-9 microns long, 4-5 microns wide; trilete rays 15-20 microns simple, indefinite and usually imperceptible.

Holotype: Slide No. 264P. Circle 1. Angus Coal Company mine, two miles northeast of Oskaloosa, Mahaska County, Iowa. Des Moines Series, Pennsylvanian System.

Genus *TRIQUITRITES* Wilson and Coe, 1940.

Spores radial, trilete; oval to elliptical in vertical plane, distal side sometimes slightly more inflated than the proximal; in transverse plane, corners rounded or truncate subangular and sometimes extended, sides slightly convex to concave in profile, folds infrequent; diameter 22-70 microns; spore coat of variable thickness, thickest on

the angles opposite trilete rays, thinnest in central distal and inter-radial areas; ornamentation absent, granulose or widely verrucose, angular areas sometimes more highly ornamented, emphytic ornamentation nearly alike on proximal and distal surfaces; trilete rays extend nearly to margin of spore body cavity; lips usually not prominent, but may be thickened and well demarcated. Affinity: uncertain.

TRIQUITRITES EXIGUUS sp. nov. (Fig. 2.)

Triangular, angles truncate or protruding, sides straight or slightly concave; diameter 22-30 microns; width of arcuate thickening 3-6 microns, length 9-15 microns; ornamentation absent; color yellow, arcuate areas darker.

Holotype: Slide No. 269. Circle 3. Angus Coal Company mine, two miles northeast of Oskaloosa, Mahaska County, Iowa. Des Moines Series, Pennsylvanian System.

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LEGEND TO ILLUSTRATIONS

- Fig. 1. *Calamospora straminea* sp. nov.
Fig. 2. *Triquitrites exiguus* sp. nov.
Fig. 3. *Florinites elegans* sp. nov.
Fig. 4. *Punctati-sporites sulcatus* sp. nov.
Fig. 5. *Raistrickia aculeata* sp. nov.
Fig. 6. *Cirratiradites flabelliformis* sp. nov.
Fig. 7. *Punctati-sporites decorus* sp. nov.

