

Paleontological interpretations of crater processes and infilling of syn-impact sediments from the Chesapeake Bay impact structure

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Supplemental Materials

History of Cretaceous Palynomorph Biozonation

Using onshore sediments, Brenner (1963) recognized four pollen assemblage zones and Doyle and Robbins (1975) noted five pollen assemblage zones in different temporal subsets of the (?)Valanginian to Turonian time range. Both studies subdivided the second oldest zone into three subzones. Using offshore sediments, Bebout (1981) also noted five pollen assemblage zones through this time range, but assigned their respective ages somewhat differently and used different index taxa to define his zones. Christopher (1979) produced a third biostratigraphic zonation (using outcropping strata in New Jersey) that overlapped only the youngest of these ages (Cenomanian and Turonian); he also used an independent set of index pollen taxa to define his zones. These various zonations and age assignments are summarized briefly here; they are presented in sequential assemblage zones, numbered upward by these authors from that Early Cretaceous biostratigraphic zone most frequently recognized in the middle Atlantic Coastal Plain (i.e., Zone I).

These authors proposed that Zone I assemblages were either more restricted in age (Barremian to Aptian; Brenner, 1963, p. 33) or less restricted (Barremian to (?)lower Albian; Doyle and Robbins, 1975, p.52-54). Bebout (1981, p.180-182) divided Zone I-equivalent assemblages into two assemblage zones: the *Callialasporites* sp. 4-*Cicatricosisporites australiensis* zone (Barremian) and the *Auritulinasporites deltaformis-Cerebropollenites mesozoicus* zone (Aptian).

Zone II palynological assemblages were accepted by all authors to be Albian exclusively. Brenner (1963) originally divided his Zone II palynomorph assemblages into subzone II-A (early Albian; 1963, p. 34) subzone II-B-1 (Albian; 1963, p.33), and subzone II-B-2 (Albian; 1963, p.33). Doyle and Robbins (1977, p. 54) later placed Brenner's subzone II-A into the the early to middle Albian, Brenner's subzone II-B into the "middle and early late Albian" (1977, p. 57), and a new subzone II-C into the latest Albian (1977, p.58). Bebout (1981, p.178-180) assigned all Zone II-equivalent assemblages into one assemblage zone, his *Coronatispora valdensis-Trilobosporites humilis* zone.

Recently, Hochuli et al. (2006) proposed that the Lower Cretaceous/ Upper Cretaceous boundary (i.e., the Albian/Cenomanian stage boundary) be placed within Zone II, between Subzones II-B and II-C. They based their analyses on a European stratigraphic sequence that they suggest is more complete than the corresponding chronostratigraphic sequence in eastern North America. Accordingly, they consider the Subzone II-C and Zone III pollen assemblage zones to be Cenomanian in age. Our age determinations for Subzone II-C follow the original (older) suggested age, with the

acknowledgement that additional research well may corroborate a younger age assignment for Subzone II-C.

Zone III assemblages were accepted as early Cenomanian in age by Doyle and Robbins (1977, p. 64), Christopher (1979), and Bebout (1981). However, Bebout (1981, p. 161, 176) proposed that his *Perinopollenites elatoides-Vitreisporites pallidus* zone included the entire Cenomanian, not just the early part, and suggested that those strata that included younger portions of that assemblage zone were unzoned or absent in onshore stratigraphic sequences.

Zone IV palynomorph assemblages were proposed to be middle-to-late Cenomanian in age by Christopher (1979, p. 101), who assigned them to his *Complexiopolis-Atlantopollis* zone. Doyle and Robbins (1977, p. 66) recognized Zone IV palynomorph assemblages as mid-Cenomanian to possibly early Turonian. Bebout (1981) assigned Christopher's (1979) *Complexiopolis-Atlantopollis* zone to the Cenomanian-Turonian boundary interval, and suggested that it was (in its younger part) equivalent to Bebout's new *Atlantopollis verrucosa-Phyllocladidites inchoatus* zone of Turonian age.

Zone V assemblages were proposed to be "middle Turonian to possibly Coniacian" in age by Christopher (1979, p. 104-105), who assigned them to the *Complexiopolis exigua-Santalacites minor* zone. Doyle and Robbins (1977, p. 68) more broadly assigned zone V assemblages as "post-early Turonian, pre-late Santonian." Bebout (1981, p. 174) proposed an assemblage zone, the *Complexiopolis funiculus-Nevesisporites semisclaris* zone, of Coniacian age to be intermediate in position between zone IV and zone V assemblages. Bebout (1981, p. 172) additionally proposed that Christopher's zone V assemblages (*Complexiopolis exigua-Santalacites minor* zone) were equivalent to the lower part of Bebout's *Dicotetradites* sp. 2-*Pseudoplicapollis longiannulata* zone, and reinterpreted their age to be entirely Santonian.

Several important studies (Robbins et al., 1975; Bebout, 1981; Doyle, 1982; Brenner, in Hansen, 1982) reported on several less completely understood palynomorph assemblages that pre-date Atlantic Coastal Plain Zone I palynomorph assemblages in their entirety. These assemblages were recovered from the deep subsurface to the northeast (offshore) and to the north (onshore) of the impact site, respectively. Bebout (1981, p. 182) reported on palynomorph assemblages from some of the oldest Cretaceous units (pre-Zone I) yet known from this region (unnamed offshore sediments, Berriasian to Hauterivian), and zoned them as the *Rogalskisporites cicatricosus* zone (Berriasian) and the *Trilobosporites bernissartensis-Trilobosporites domitus* zone (Valanginian and Hauterivian). Robbins et al. (1975) similarly noted pre-Zone I assemblages from three deep wells in eastern Maryland and eastern Virginia, but did not fully resolve their ages. Doyle (1982) reported on yet-older assemblages (mid-Berriasian) from a deep onshore core taken approximately 72 km north of the Eyreville corehole, in eastern Maryland (D.O.E. Crisfield Airport No. 1 Well, Somerset County). Hansen (1982) named the subsurface unit that hosted those oldest palynological assemblages the Waste Gate Formation, and assigned it to the base of the Potomac Group. Doyle's pollen and spore samples from the Crisfield site spanned the 1256-1264 m depth interval; they comprise the oldest known Cretaceous assemblages in proximity to the impact site.

Still other zonations of the strata discussed above, or time-equivalent strata, exist for the western Atlantic region. For example, Cretaceous nonmarine palynology of the subsurface in Delaware has been recently described by McLaughlin (2006), following the

pollen zone revisions suggested by Hochuli et al. (2006). Otherwise, those zonations are either more applicable to units found much farther away from the impact site (e.g., Williams, 1975), differentiate fewer zones through this chronostratigraphic interval (Habib, 1977) or are based on dinocyst biostratigraphy exclusively (Aurisano, 1989).

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Table 1. Terrestrial palynomorph occurrences from isolated sediment clasts in the Eyreville Core (450-529 m depth)

Depth (m) >		
Sample (shaded samples essentially are barren of palynomorphs)	FAD*	LAD*
<i>Abietinaepollenites</i> Potonié 1951		R6467 PA
<i>Aequitriradiites spinulosus</i> (Cookson and Dettman) Cookson and Dettman 1961	pre Zone I	274.02 451.88
<i>Ajatipollis</i> sp. A of Doyle and Robbins (1977)	III	R6467 GA 452.4
<i>Alisporites</i> sp. of Daugherty (1941)		R6467 DA 458.77
<i>Apiculatisporis babsae</i> Brenner 1963	II	R6467 DB 462.02
<i>Appendicisporites dentimarginatus</i> Brenner 1963		R6467 GC 467.65
<i>Appendicisporites potomacensis</i> Brenner 1963		R6467 DC 477.64
<i>Appendicisporites segmentus</i> Brenner 1963	II	R6467 GE 485.01
<i>Appendicisporites tricornutatus</i> Weyland & Griefeld 1953		R6467 GG 486.25
<i>Appendicisporites</i> Weyland and Krieger 1953		R6467 DD 500.51
<i>Araucaracites australis</i> Cookson 1947	Early J?	R6467 OF 501.33
<i>Araucaracites</i> sp. Cookson 1947	Early J?	R6467 GL 505.05
<i>Atlantopollis verrucosa</i> (Groot and Groot) Goczan, Groot, Krutzsch, and Paclova 1967	IV	R6467 DH 507.3
<i>Auritulinaspores deltaformis</i> Burger 1966		R6467 GK 511.8
<i>Calillasporites dampieri</i> (Balme) Sukh Dev 1961	Early J?	R6467 DO 516.22
<i>Calillasporites tribolatus</i> (Balme) Sukh Dev 1961	Early J?	R6467 GL 520.44
<i>Calillasporites</i> sp. 4 of Norris (1969)		R6467 DH 528.67
<i>Ceratosporites parvus</i> Brenner 1963	II	
<i>Cerebropollenites mesozoicus</i> (Couper) Nilsson 1958		X
<i>Cicatricosporites aralicus</i> (Bolkhovitina) Brenner 1963	pre Zone I	
<i>Cicatricosporites australiensis</i> (Cookson) Potonié 1956		X
<i>Cicatricosporites pubbeckensis</i> Norris 1969	pre Zone I	
<i>Cicatricosporites dorogensis</i> Brenner 1963	I	
<i>Cicatricosporites hallei</i> Delcourt & Sprumont 1955		X X X
<i>Cicatricosporites patapscoensis</i> Brenner 1963	II-B	
<i>Cicatricosporites potomacensis</i> Brenner 1963		X
<i>Cicatricosporites subrotundus</i> Brenner 1963	II-B	
<i>Cicatricosporites</i> Potonié and Gellelich 1932	I	
<i>Cingulatisporites distavenuculosus</i> Brenner 1963	pre-Zone I	
<i>Cingulatisporites</i> Thompson 1956		X
<i>Clevatipollenites hughesi</i> Couper 1958	I	
<i>Complexipollis funicularis</i> Tschudy 1973	IV	
<i>Complexipollis</i> sp. K Christopher 1979	IV	
<i>Complexipollis</i> sp. O Christopher 1979	IV	
<i>Concavisporites junienensis</i> Balme 1957	I	
<i>Concavisporites variverrucatus</i> Brenner 1963	I	
<i>Concavisporites</i> sp. 1 of Bebout (1981)	pre-Zone I	Zone II-C?
<i>Converrucosporites exquisitus</i> Singh 1971		
<i>Converrucosporites proxigranulatus</i> Brenner 1963		X X
<i>Corallina meyeriana</i> (Klaus) Venkatachala & Goczan 1964 emend Cornet & Traverse 1975	LateTr	late K
<i>Corallina torosus</i> (Reissinger) Klaus 1960 emend. Cornet & Traverse 1975	LateTr	late K
<i>Coronatisporites valdensis</i> (Couper) Dettman 1963		X X
<i>Cyatridites</i> sp. 10 of Bebout (1981)		
<i>Cycadopites</i> Wodehouse 1933 ex Wilson and Webster 1946	LateTr	?
<i>Densospores microrugulatus</i> Brenner 1963		X X
<i>Densospores pernatus</i> Couper 1958		X X
<i>Ephedrites patapscoensis</i> Brenner 1963	II-B	II-B
<i>Ephedrites virginianaensis</i> Brenner 1963		
<i>Eucommidites troedssonii</i> Erdtman 1948	Jurassic	Campanian
<i>Ephedrites</i> Bolkhovitina 1953		
<i>Exesipollenites tumulus</i> Balme 1957	Jurassic	?
<i>Genus D</i> sp. A Christopher 1979	V	?
<i>Gleicheniidites apilobatus</i> Brenner 1963	I	?
<i>Gleicheniidites circinoides</i> (Cookson) Brenner 1963		
<i>Gleicheniidites seronicus</i> Ross 1949		X X
<i>Gleicheniidites</i> sp. 2 of Bebout (1981)		
<i>Granulatisporites dalivi</i> Cookson 1958	Neocomian	Albian
<i>Ischyrosporites crateris</i> Balme 1957	Neocomian	Aptian
<i>Kukupisporites pseudoreticulatus</i> Couper 1958	I	II?
<i>Kuyilisporites lunaria</i> Cookson & Dettman 1958	I	II?
<i>Laracordites magnus</i> (Potonié) Potonié et al. 1950		
<i>Leptolepidites psorosorus</i> Norris 1969		
<i>Liliacites dividus</i> (Pierce) Brenner 1963	II	II
<i>Lycopodiaceidites amblofveolatus</i> Brenner 1963		
<i>Lycopodiaceidites irregularis</i> Brenner 1963	II	II
<i>Lycopodiaceidites triangularis</i> Brenner 1963		
<i>Lycopodiumsporites dentimuratus</i> Brenner 1963		
<i>Matonisporites excavatus</i> Brenner 1963	II	II-B
<i>Matonisporites</i> Couper 1958	Tr	K
<i>Monsulicites</i> sp.	Tr	K
<i>Parvisaccites amplius</i> Brenner 1963	I	?
<i>Parvisaccites radiatus</i> Brenner 1963	pre-Zone	Cenomanian
<i>Penetratrapites mollis</i> Hedlund & Norris 1968	upper II-B	?
<i>Perinopolites elatoides</i> Couper 1958	Jurassic	early K
<i>Peromonoletes peroreticulatus</i> Brenner 1963		
<i>Pterofletes pannuceus</i> (Erdtman) ex Couper 1953	II	II
<i>Phyllococidites microreticulatus</i> Brenner 1963		
<i>Podocarpidites epistratus</i> Brenner 1963	II-B	II-B?
<i>Podocarpidites potomacensis</i> Brenner 1963		
cf. ? <i>Pseudopicopollis cuneata</i> Christopher 1979	V	V
<i>Psilatrlletes circumundulatus</i> Brenner 1963	I	II?
<i>Reticulatisporites</i> sp. 2 of Bebout (1981)		
" <i>Reticulopites</i> " <i>fragosus</i> (Couper) Brenner 1963	II-B	?
" <i>Reticulopites</i> " <i>georgensis</i> Brenner 1963	II-B	?
" <i>Reticulopites</i> " <i>geranioides</i> (Couper) sensu Brenner (1963)	upper II-B	II-C
" <i>Reticulopites</i> " <i>proximilis</i> (Couper) Brenner 1963	II-B	?
" <i>Reticulopites</i> " <i>vermirinus</i> Brenner 1963	II-B	II-C
" <i>Reticulopites</i> " <i>virgeus</i> (Groot et al. 1961) Brenner 1963	II-B?	Cenomanian
<i>Rugubivesiculosites reductus</i> Pierce 1961	II-B	Cenomanian
<i>Rugubivesiculosites rugosus</i> Pierce 1961	II-C	?
<i>Striatopollis</i> sp. B of Doyle and Robbins (1977)	upper III	?

Table 1. Terrestrial palynomorph occurrences from isolated sediment clasts in the Eyreville Core (450-529 m depth, cont'd).

Depth (m) >		
Sample (shaded samples essentially are barren of palynomorphs)	FAD*	LAD*
<i>Taurocuposites reduncus</i> (Bolkhovitina) Stover 1962	mid-J	Senonian
<i>Taurocuposites segmentatus</i> Stover 1962	Neocomian	Albian
<i>Taurocuposites spackmani</i> Brenner 1963	upper II-B	?
cf. <i>Triclopites albiensis</i> Kemp of Doyle and Robbins (1977)	II-C	III?
cf. <i>Triclopites barrandei</i> Paclova 1971 of Doyle and Robbins (1977)	III	?
<i>Triclopites micromorphus</i> (Groot & Penny) Burger 1970	upper II-B	?
<i>Triclopites minimus</i> (Brenner) Dettman 1973	II-B	?
<i>Triclopites nemegii</i> Paclova 1971	III	?
cf. <i>Triclopites vulgaris</i> (Pierce) Paclova 1971 of Doyle and Robbins (1977)	III	?
<i>Tricolopollenites crassimurus</i> (Groot & Penny) Singh 1971	II-A	?
<i>Tricolopollenites minutus</i> Brenner 1963	II	II?
cf. <i>Tricolporodites bohemicus</i> Paclova 1971 of Doyle and Robbins (1977)	III	?
cf. <i>Tricolporodites minimus</i> Paclova 1971 of Doyle and Robbins (1977)	III	?
aff. <i>Tricolporodites</i> sp. B of Doyle and Robbins (1977)	III	?
aff. <i>Tricolporodites</i> sp. C of Doyle and Robbins (1977)	III	III?
<i>Tricolporollenites</i> sp. A of Wolfe et al. (1975)	upper III	?
aff. <i>Tricolporollenites</i> sp. A of Doyle and Robbins (1977)	III	?
' <i>Tricolporollenites</i> sp. D' per Doyle and Robbins (1977)	IV	IV?
<i>Tricolporollenites</i> sp. E of Doyle and Robbins (1977)	III	?
<i>Trilobospores</i> <i>crassus</i> Brenner 1963	II-B	II-B?
<i>Trilobospores</i> <i>marylandensis</i> Brenner 1963	pre-Zone I	II-C
? <i>Trilobospores</i> sp. 1 of Bebout (1981)		
? <i>Trilobospores</i> sp. 2 of Bebout (1981)		
<i>Triporopollenites</i> sp. A Christopher 1979	V	?
<i>Tuberostriletes montuosus</i> Doring 1964		
unknown algal sp.		
<i>Vitreisporites pallidus</i> (Reissinger) Nilsson 1958	Pleisto	Recent
<i>Carya</i> sp.	Pleisto	Recent
<i>Castanea</i> sp.	Pleisto	Recent
<i>Compositae</i>	Pleisto	Recent
<i>Corisimpollenites maii</i> Krutsch 1970	Oligocene	?
<i>Corylus cornuta</i>	Pleisto	Recent
<i>Ilex</i> sp.	Pleisto	Recent
<i>Juglans</i> sp.	Pleisto	Recent
<i>Larix laricina</i>	Pleisto	Recent
<i>Liquidambar</i> sp.	Pleisto	Recent
<i>Lycopodium</i> sp.	?Pliocene	Recent
<i>Picea</i> sp.	Pleisto	Recent
<i>Pinus</i> sp.	?Pliocene	Recent
<i>Quercus</i> sp.	Pleisto	Recent
<i>Sarcobatus</i> sp.	Pleisto	Recent
<i>Ulmus</i> sp.	Pleisto	Recent
Estimated biostratigraphic zone range >		
Estimated clast age >		
Sample designation >		
Minimum species diversity observed >		
16	16	16
R6467 PA	Oligocene to Pleistocene	?
R6467 GA		
R6467 DA		
R6467 DB		
R6467 GC		
R6467 DC	late Albian to e. Cenomanian	Zone II C-II?
R6467 GE	early Cenomanian	Zone III
R6467 GG	mid-to-late Albian	Zone II B
R6467 DD	mid-to-late Albian	Zone II B
R6467 OF	mid-to-late Albian	Zone II B
R6467 GJ	mid-to-late Albian	Zone II B
R6467 DF	mid-to-late Cenomanian	Zone IV
R6467 OE	mid-to-late Cenomanian	
R6467 GK		
R6467 DG		
R6467 GL		
R6467 DH	mid-to-late Albian	Zone II B

*Range limits per Brenner (1963), Wolfe (1976), Doyle and Robbins (1977), Christopher (1979), and Bebout (1981);
FAD is first appearance datum, LAD is last appearance datum

Table 1. Terrestrial palynomorph occurrences from isolated sediment clasts in the Eyreville Core (530-599 m depth, cont'd.)

Depth (m) >		FAD*	LAD*	
Sample (shaded samples essentially are barren of palynomorphs)				
<i>Taurocuposrites reducens</i> (Bolkhovitina) Stover 1962	mid-J	Senonian	R6467 GM	531.29
<i>Taurocuposrites segmentatus</i> Stover 1962	Neocomian	Albian	R6467 DI	537.08
<i>Taurocuposrites spackmani</i> Bremer 1963	upper II-B?		R6467 DL	538.02
cf. <i>Tricolpites alberensis</i> Kemp of Doyle and Robbins (1977)	II-C	III?	R6467 GP	547.21
cf. <i>Tricolpites barrandei</i> Pacłtova 1971 of Doyle and Robbins (1977)	III	?	R6467 GQ	550.64
<i>Tricolpites micromurus</i> (Groot & Penny) Burger 1970	upper II-B?		R6467 GR	552.16
<i>Tricolpites minutus</i> (Brenner 1973)	II-B?		R6467 DK	555.33
<i>Tricolpites nemejci</i> Pacłtova 1971	III	?	R6467 GW	565.43
cf. <i>Tricolpites vulgaris</i> (Pierce) Pacłtova 1971 of Doyle and Robbins (1977)	III	?	R6467 GX	566.14
<i>Tricolpopollenites crassimurus</i> (Groot & Penny) Singh 1971	II-A	?	R6467 GY	567.56
<i>Tricolpopollenites minutus</i> Brenner 1963	II	II?	R6467 HA	570.86
cf. <i>Tricolporoidites bohemicus</i> Pacłtova 1971 of Doyle and Robbins (1977)	III	?	R6467 HD	575.33
cf. <i>Tricolporoidites minimus</i> Pacłtova 1971 of Doyle and Robbins (1977)	II-C	?	R6467 OC	577.56
aff. <i>Tricolporoidites</i> sp. B of Doyle and Robbins (1977)	III	?	R6467 DL	577.79
aff. <i>Tricolporoidites</i> sp. C of Doyle and Robbins (1977)	III	III?	R6467 HF	581.03
<i>Tricolporopollenites</i> sp. A of Wolfe et al. (1975)	upper III	?	R6467 HG	586.47
aff. <i>Tricolporopollenites</i> sp. A of Doyle and Robbins (1977)	III	?	R6467 HI	591.86
* <i>Tricolporopollenites</i> sp. D* per Doyle and Robbins (1977)	IV	IV?	R6467 HK	596.35
<i>Tricolporopollenites</i> sp. E of Doyle and Robbins (1977)	III	?	R6467 HL	598.22
<i>Trilobosporites crassus</i> Brenner 1963	II-B	II-B?		
? <i>Trilobosporites</i> sp. 1 of Bebout (1981)	pre-Zone I	II-C		
? <i>Trilobosporites</i> sp. 2 of Bebout (1981)			X	
<i>Triporopollenites</i> sp. A Christopher 1979	V	?		X
<i>Tuberostriates montuosus</i> Doring 1964				
unknown algal sp.				
<i>Vitreisporites pallidus</i> (Reissinger) Nilsson 1958	Pleisto	Recent		
<i>Carya</i> sp.	Pleisto	Recent		
<i>Castanea</i> sp.	Pleisto	Recent		
Compositae	Pleisto	Recent		
<i>Corsinipollenites maii</i> Krutsch 1970	Oligocene	?		
<i>Corylus cornuta</i>	Pleisto	Recent		
<i>Ilex</i> sp.	Pleisto	Recent		
<i>Juglans</i> sp.	Pleisto	Recent		
<i>Larix laricina</i>	Pleisto	Recent		
<i>Liquidambar</i> sp.	Pleisto	Recent		
<i>Lycopodium</i> sp.	?Pliocene	Recent		
<i>Picea</i> sp.	Pleisto	Recent		
<i>Pinus</i> sp.	?Pliocene	Recent		
<i>Quercus</i> sp.	Pleisto	Recent		
<i>Sarcobatus</i> sp.	Pleisto	Recent		
<i>Ulmus</i> sp.	Pleisto	Recent		
Estimated biostratigraphic zone range >		?		
Estimated clast age >				
Sample designation >				
Minimum species diversity observed >		3		
		R6467 GM	early Cretaceous	
		R6467 DI		
		R6467 DL		
		R6467 GP		
		R6467 GQ		
		2	Zone I B	
		R6467 GR	mid-to-late Albian	
		R6467 DK		
		15	R6467 GW	Apelian to early Albian
		R6467 HD		Zone I A?
		15	R6467 OC	Zone II B-II?
		R6467 OC	mid Albian-e. Cenomanian	
		R6467 OC		
		R6467 DL		
		R6467 HF		
		R6467 GQ		
		R6467 GY		
		R6467 HA	early Aptian	Zone I
		R6467 HD		
		25	R6467 OC	
		33	R6467 OC	
		R6467 OC	mid Albian-e. Cenomanian	Zones II B, III, & V
		R6467 DL		
		R6467 HF		
		R6467 GQ		
		R6467 HG	m. Albian-Turonian	
		21	R6467 HG	
		R6467 HI		
		20	R6467 HK	Zone I B
		28	R6467 HL	early V-to-late Cenomanian
				Zones III & IV

*Range limits per Brenner (1963), Wolfe (1976), Doyle and Robbins (1977), Christopher (1979), and Bebout (1981);

FAD is first appearance datum, LAD is last appearance datum

Table 1. Terrestrial palynomorph occurrences from isolated sediment clasts in the Eyreville Core (600-852 m depth, cont'd.)

Depth (m) >				
Sample (shaded samples essentially are barren of palynomorphs)	FAD*	LAD*		
<i>Taurocuposrites reducens</i> (Bolkovitina) Stover 1962	mid-J	Senonian	R6467 HN	602.22
<i>Taurocuposrites segmentatus</i> Stover 1962	Neocomian	Albian	R6467 HP	608.27
<i>Taurocuposrites spackmani</i> Brenner 1963	upper II-B	?	R6467 HY	639.3
cf. <i>Tricolpites alberensis</i> Kemp of Doyle and Robbins (1977)	II-C	III?	R6467 IC	654.95
cf. <i>Tricolpites barrandei</i> Pachtova 1971 of Doyle and Robbins (1977)	III	?	R6467 DO	678.64
<i>Tricolpites micromurus</i> (Groot & Penny) Burger 1970	upper II-B	?	R6467 IH	685.74
<i>Tricolpites minutus</i> (Brenner 1963)	II-B	?	R6467 IK	703.81
<i>Tricolpites nemejci</i> Pachtova 1971	III	?	R6467 IL	708.13
cf. <i>Tricolpites vulgaris</i> (Pierce) Pachtova 1971 of Doyle and Robbins (1977)	III	?	R6467 IM	711.85
<i>Tricolpopollenites crassimurus</i> (Groot & Penny) Singh 1971	II-A	?	R6467 IQ	748.41
<i>Tricolpopollenites minutus</i> Brenner 1963	II	II?	R6467 IS	753.21
cf. <i>Tricolporoidites bohemicus</i> Pachtova 1971 of Doyle and Robbins (1977)	III	?	R6467 IT	760.34
cf. <i>Tricolporoidites minimus</i> Pachtova 1971 of Doyle and Robbins (1977)	II-C	?		
aff. <i>Tricolporoidites</i> sp. B of Doyle and Robbins (1977)	III	?		
aff. <i>Tricolporoidites</i> sp. C of Doyle and Robbins (1977)	III	III?		
<i>Tricolporopollenites</i> sp. A of Wolfe et al. (1975)	upper III	?		
aff. <i>Tricolporopollenites</i> sp. A of Doyle and Robbins (1977)	III	?		
* <i>Tricolporopollenites</i> sp. D* per Doyle and Robbins (1977)	IV	IV?		
<i>Tricolporopollenites</i> sp. E of Doyle and Robbins (1977)	III	?		
<i>Trilobospores crassus</i> Brenner 1963	II-B	II-B?		
? <i>Trilobospores</i> sp. 1 of Bebout (1981)	pre-Zone I	II-C		
? <i>Trilobospores</i> sp. 2 of Bebout (1981)				
<i>Triporopollenites</i> sp. A Christopher 1979	V	?		
<i>Tuberostriates montuosus</i> Doring 1964				
unknown algal sp.				
<i>Vitreisporites pallidus</i> (Reissinger) Nilsson 1958	Pleisto	Recent	X	
<i>Carya</i> sp.	Pleisto	Recent		
<i>Castanea</i> sp.	Pleisto	Recent		
Compositae	Pleisto	Recent		
<i>Corsinipollenites maii</i> Krutsch 1970	Oligocene	?		
<i>Corylus cornuta</i>	Pleisto	Recent		
<i>Ilex</i> sp.	Pleisto	Recent		
<i>Juglans</i> sp.	Pleisto	Recent		
<i>Larix laricina</i>	Pleisto	Recent		
<i>Liquidambar</i> sp.	Pleisto	Recent		
<i>Lycopodium</i> sp.	?Pliocene	Recent		
<i>Picea</i> sp.	Pleisto	Recent		
<i>Pinus</i> sp.	?Pliocene	Recent		
<i>Quercus</i> sp.	Pleisto	Recent		
<i>Sarcobatus</i> sp.	Pleisto	Recent		
<i>Ulmus</i> sp.	Pleisto	Recent		
Estimated biostratigraphic zone range >				
Estimated clast age >				
Sample designation >	FAD*	LAD*		
Minimum species diversity observed >	20	4	1	3
	R6467 HN	m. Albian-e. Ceromanian	?	Zone II B to III
	R6467 HP	Mesozoic	?	
	R6467 HY	unknown	?	
	R6467 IC			
	R6467 DO	? Berriasian-e. Albian?	?	pre-Zone I to I?
	R6467 IH			
	R6467 IK			
	R6467 IL	mid-Albian to Turonian	?	Zone II B-V
	R6467 IM	mid-to-late Mesozoic		
	R6467 IQ			
	R6467 IS			
	R6467 IT			
	R6467 IU	? Berriasian-Albian?	preZone I-H?	
	R6467 JV	mid-to-late Albian	Zone II B	
	R6467 JA	mid-to-late Albian	Zone II B	
	R6467 JC	Albian to early Albian	Zone I - I A?	
	R6467 JF			
	R6467 JJ			
	R6467 JM	mid-to-late Albian	Zone II B	
	R6467 JM			
				12

*Range limits per Brenner (1963), Wolfe (1976), Doyle and Robbins (1977), Christopher (1979), and Bebout (1981).
FAD is first appearance datum, LAD is last appearance datum

Table 1. Terrestrial palynomorph occurrences from isolated sediment clasts in the Eyreville Core (853-1461 m depth, cont'd.).

Depth (m) >			FAD*	LAD*	
Sample (shaded samples essentially are barren of palynomorphs)					
<i>Taurocuposites reducens</i> (Bolkovitina) Stover 1962	mid-J	Senonian	RS467 JO	971.68	
<i>Taurocuposites segmentatus</i> Stover 1962	Neocomian	Albian	RS467 JO	873.88	
<i>Taurocuposites spackmani</i> Brenner 1963	upper II-B?		RS467 JR	884.61	
cf. <i>Tricolpites alberensis</i> Kemp of Doyle and Robbins (1977)	II-C	III?			
cf. <i>Tricolpites barrandei</i> Paclova 1971 of Doyle and Robbins (1977)	III	?			
<i>Tricolpites micromurus</i> (Groot & Penny) Burger 1970	upper II-B?				
<i>Tricolpites minutus</i> (Brenner 1973)	II-B?				
<i>Tricolpites nemejci</i> Paclova 1971	III	?			
cf. <i>Tricolpites vulgaris</i> (Pierce) Paclova 1971 of Doyle and Robbins (1977)	III	?			
<i>Tricolpopollenites crassimurus</i> (Groot & Penny) Singh 1971	II-A	?			
<i>Tricolpopollenites minutus</i> Brenner 1963	II	II?			
cf. <i>Tricolporoidites bohemicus</i> Paclova 1971 of Doyle and Robbins (1977)	III	?			
cf. <i>Tricolporoidites minimus</i> Paclova 1971 of Doyle and Robbins (1977)	II-C	?			
aff. <i>Tricolporoidites</i> sp. B of Doyle and Robbins (1977)	III	?			
aff. <i>Tricolporoidites</i> sp. C of Doyle and Robbins (1977)	III	III?			
<i>Tricolporopollenites</i> sp. A of Wolfe et al. (1975)	upper III	?			
aff. <i>Tricolporopollenites</i> sp. A of Doyle and Robbins (1977)	III	?			
* <i>Tricolporopollenites</i> sp. D* per Doyle and Robbins (1977)	IV	IV?			
<i>Tricolporopollenites</i> sp. E of Doyle and Robbins (1977)	III	?			
<i>Trilobospores crassus</i> Brenner 1963	II-B	II-B?			
? <i>Trilobospores</i> sp. marylandensis Brenner 1963	pre-Zone I	II-C			
? <i>Trilobospores</i> sp. 1 of Bebout (1981)				X	
? <i>Trilobospores</i> sp. 2 of Bebout (1981)				X	
<i>Triporopollenites</i> sp. A Christopher 1979	V	?		X	
<i>Tuberostriates montuosus</i> Doring 1964				X	
unknown algal sp.					
<i>Vitreisporites pallidus</i> (Reissinger) Nilsson 1958	Pleisto	Recent			
<i>Carya</i> sp.	Pleisto	Recent			
<i>Castanea</i> sp.	Pleisto	Recent			
Compositae	Pleisto	Recent			
<i>Corsinipollenites maii</i> Krutsch 1970	Oligocene	?			
<i>Corylus cornuta</i>	Pleisto	Recent			
<i>Ilex</i> sp.	Pleisto	Recent			
<i>Juglans</i> sp.	Pleisto	Recent			
<i>Larix laricina</i>	Pleisto	Recent			
<i>Liquidambar</i> sp.	Pleisto	Recent			
<i>Lycopodium</i> sp.	?Pliocene	Recent			
<i>Picea</i> sp.	Pleisto	Recent			
<i>Pinus</i> sp.	?Pliocene	Recent			
<i>Quercus</i> sp.	Pleisto	Recent			
<i>Sarcobatus</i> sp.	Pleisto	Recent			
<i>Ulmus</i> sp.	Pleisto	Recent			
Estimated biostratigraphic zone range >					
Estimated clast age >					
Sample designation >	FAD*	LAD*			
Minimum species diversity observed >	4	3	9	13	25

*Range limits per Brenner (1963), Wolfe (1976), Doyle and Robbins (1977), Christopher (1979), and Bebout (1981);
FAD is first appearance datum, LAD is last appearance datum



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