

cryptogams and Gangamopterids. The latter group are known to be associated with tillites in other regions (South Africa, Plumstead, 1967), and their presence obviously infers a cold to frigid climate. The abundance of lower orders and the knowledge of glaciation in the vicinity also implies a very wet environment.

2. During Black Shales and Coals and Upper Wankie Sandstone deposition - the prevailing macroflora consists of a mixture of vascular cryptogams, and increasing evidence of Protoconifers and Glossopterids. Gangamopterids gradually decrease in abundance which is evidence of amelioration of the climate. The wet conditions obviously continue to prevail, supporting the abundant mixed flora which initially gave rise to the coal and carbonaceous horizons.
3. During Madunahia times, the gradual dominance of pollens, and in particular *Striatiti*, infers the presence of the true *Glossopteris* flora. *Triletes*, *Monocolpates* and non-striate *disaccites* indicate that cryptogams, cycadoginkgooids and protoconifers are well

established in the macrofloral assemblage. The abundance of wind-disseminated gymnospermous pollen and the plant forms associated with them indicate the existence of large gymnospermous woodlands with possibly a smaller percentage of cryptogams living on the edge of the pools and swamps known to exist at that time. The seasonal production of microspores (suspected by Flinthead, 1967) and the deciduous fall of leaves indicates a seasonal change in climate. This view is supported by the growth rings of trees known to occur in correlated horizons. Fluctuation of warm to cold seasons are therefore indicated.

These interpretations must be regarded as tentative, as future basin analysis will give a more reliable set of facts on which to base climatic and ecological conditions. A single borehole core is subject to local ecological and edaphic factors and is thus not reliable for regional analyses.

6. SUMMARY AND CONCLUSIONS

1. The Matabola Flats borehole core, Mid-Zambezi Valley, Rhodesia was sampled for the maceration and extraction of miospores. The borehole core is 1 206 ft deep, and passes through Madumabisa Shales, Upper Wankie Sandstones, Black Shales and Coals, Lower Wankie Sandstones, Dwyka, Siyaxira Sandstones (Basement).
2. A standardised maceration schedule was compiled from a series of experiments on Karoo rocks. 105 samples were processed, of which 45 per cent proved to be productive and in a suitable condition for analysis.
3. Microscopic analysis and a photographic catalogue (in contact print form) were completed. 55 genera and 100 species were described and classified along the lines of the three basic "schools" of systematics whose work has been published in Southern Africa.
4. From the microscopic analysis, quantitative and qualitative results were obtained. From this the microfloral trends of the major miospore taxa were drawn, and the stratigraphic ranges of the individual species compiled.
5. From this synthesized information, a tentative zonal scheme was drawn up for adoption and use in future correlation.

6. It was concluded from palynological evidence that the sequences in the Matabola Flats borehole core were typical of Lower to Middle Gondwana Assemblages.
7. Four miospore assemblages are distinct with three transition zones between them. These were correlated with the Florisones of South Africa (compiled by G.P. Hart, 1967) and coincide (very closely) in all but the Dwyka. This confirms Bond's South African equivalent age proposals for the Rhodesian stratigraphic units, based on other evidence. Other comparisons were drawn in Africa and abroad in Gondwanaland, implying that quantitatively and qualitatively similar microfloral assemblages are known from Madagascar, India, Australia and Antarctica during Lower Gondwana times.
8. Three major climatic phases are presumed to have evolved during the times of the Matabola Flats sedimentation, based on climatic and macrofloral evidence. That climatic changes occurred is confirmed by the microfloral assemblage changes. Climates may be interpreted to a certain degree by the inferred macroplant affinities - the earliest climate supported abundant vascular cryptogams (Triletes) with cold-loving gangamopterid elements (Monosaccites).

During Black Shales and Coals and Upper Mankia Sandstone, the apparent association of Protoconifers (non-striate diacates), Cycado-ginkgooids (Monocolpates) and vascular cryptogams (Triletes) with the consistent appearance of Glossopterid (Striatiti) members indicates a mixed flora existing in what must have been a wet but cool climate following the glacial epoch. The waning of the Gangamopterid (Monosacoides) elements also indicates an ameliorating climate.

During Madumabisa Mudstone times the dominance of pollens, indicating the presence of Protoconifers (non-striate diacates), Glossopterid (Striatiti), Cycado-ginkgooid (Monocolpate) elements, with minor vascular cryptogams (Triletes) in the macrofloral assemblage infers a drier, warmer climate. The fact that these pollens are associated with plants known to be deciduous seasonal distributors of pollen and leaves also infers a distinct seasonal change from warm to cold.

9. The conclusions drawn so far illustrate the potential of palynology in Rhodesia. Gaps exist where horizons are unproductive or too highly carbonaceous to yield satisfactory results. Further work throughout the entire stratigraphic sequence, and study of the microflora at species level can indeed serve to fill in the gaps of knowledge still existing in Southern Africa palynological research today.

7. ACKNOWLEDGEMENTS

The author would like to express her sincere thanks to a number of people for their invaluable help, advice and unstinted support.

On the academic side, much appreciation is extended to Professor G. Bond of the University of Rhodesia, Salisbury, who supplied the material and under whose guidance and encouragement this work was undertaken. To him and his (very willing and able) Technical Assistants, Messrs. Jack and Locke, sincere thanks are extended for the tremendous assistance in initially evolving an extraction technique and processing all the macerated samples. At the University of the Witwatersrand, (Bernard Price Institute of Palaeontology) where this work continued after leaving Salisbury, equally sincere thanks are extended to Dr. E.P. Plumstead, who supervised this work and for her patient and helpful advice. To Dr. A.R.S. Cruikshank much appreciation is owed for his keen interest in this work, and for obtaining a senior bursary in order to assist financially in the latter months of writing. To Mr. J. Anderson, and Dr. E. Pienaar, thanks are due for the initial encouragement in this field of research and subsequent discussion, and likewise thanks are extended to Dr. B.E. Balme, Dr. M. Muir, Dr. B. Owens, Dr. J. Utting, Dr. W.S. Lacey and Dr. E. Kemp for helpful advice via correspondence in the initial stages of this study.

All this was especially appreciated when the work began in Salisbury, Rhodesia, due to limited literature and experience in this branch of research.

Due to the fact that most of this research was conducted at home, it is regarded as pertinent to mention my sincere thanks to all my family for their encouragement and patient understanding.

To my husband in particular, I owe a tremendous debt of gratitude for his strong backing. His help in processing and printing 1 450 photographs at home, and his ready suggestions and advice in all fields have been a great source of encouragement.

Finally, thanks are extended to Mr. J. Weatherall for plate reproductions, to Mrs. E. Stevenson for so ably typing the manuscript of this thesis, and to Mrs. M. Crews for assisting in drafting the charts and figures.

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EXPLANATION OF PLATE 1 - TRILETES (AEVIGATI)

N.B. Magnification x 500 except where stated

N.B. The reference number includes file number, negative number and sample level

No.	Specimen	Reference No. of Section	Notes
1-3	<i>Amphistictoparia ornata</i>	1-24/736/541	Scal. proximal view showing general outline;
		2- 5/7/1008	Proximal view; trilete suture (see also)
		3-14/26/25	Proximal view note thick suture;
4-6	<i>Amphistictoparia ornata</i>	4-15/453/940	Proximal view showing general outline;
	<i>forma alba</i>	5-13/1225/940	Proximal view showing infra-orbital sculpture in thick suture;
	"	6- 3/15/1058	Proximal view specimen folded; note trilete aperture;
7-8	<i>Stictotriletes diversifurca</i>	7-39/1142/653	Proximal view showing general structures;
	"	8-33/974/414	Proximal view showing small dark contact area around trilete suture;
	"	9-26/773/408	Proximal view showing dark contact area around trilete suture;
10-11	<i>Calamospira elicata</i>	10-42/1225/940	Scal-proximal view showing polygonal folding and trilete suture;
	"	11- 8/215/390	Scal-proximal view showing polygonal folding and trilete suture;
12-15	<i>Polthodespora directa</i>	12-41/1216/420	Proximal view, showing general structure, laevigate exine and raised labra along trilete suture;
	"	13-27/628/408	Proximal view, showing general structure, laevigate exine and raised labra along trilete suture;
	"	14-27/806/408	Proximal view, showing general structure, laevigate exine and raised labra along trilete suture;
	"	15-27/687/408	Proximal view, showing general structure, laevigate exine and raised labra along trilete suture;
16-19	<i>A. lobuvarensis</i>	16-22/669/537	Proximal view showing general structure, concave outline, wide labra fringing trilete suture;
	"	17-21/701/537	Proximal view showing general structure, concave outline, wide labra fringing trilete suture;
	"	18-25/875/408	Proximal view showing general structure, concave outline, wide labra fringing trilete suture;
	"	19-37/1019/428	Sub-lateral view.

PLATE 1 - TRILETES (LAEVIGATI)

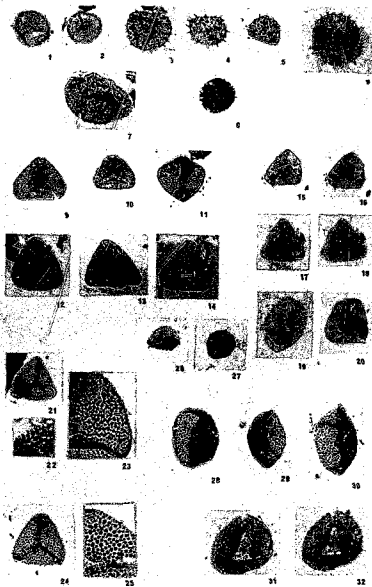


EXPLANATION TO PLATE 2.- TRILITES (APICULAT)

Magnification x 500 except where stated

No.	Name	Reference No. of Specimens	Notes
1-2	<i>Aciculatisporites larvis</i>	1- 5/67/1008 2-30/823/408	Polar view, showing laevigata proximal axine and distal and equatorial congl; Polar view, showing laevigata proximal axine and distal congl;
5-6	<i>Aciculatisporites styliformis</i>	5-20/876/587	Semi-proximal view, showing rounded triangular plates and (P.D.)
		4-15/126/510 5-13/126/540 6-24/715/537	Distal view; irregularly placed congl; Distal view; irregularly placed congl; Semi-proximal view; showing irregular spiral;
7	<i>Aciculatisporites excof. S. Marshalli</i>	7-11/100/333	Lateral view, folded; showing pili and bacilli;
8	<i>Aciculatisporites compactus</i>	8- 1/28/1130	Proximal view showing 5-6 angled lines between distinct warts;
9-16	<i>Granulatisporites testata</i>	9- 3/95/1064	Distal view showing regularly granulate axine;
	"	10- 1/46/1064	Proximal view showing reduced sculpture;
	"	11-12/127/540	Equatorial view showing reduction of sculptural element proximally;
	"	12-46/1158/780	Proximal view, showing laevigata proximal axine, granulate distal axine;
	"	13-38/1041/414	Proximal view showing laevigata proximal axine, granulate distal axine;
	"	14-26/778/408	Proximal view, lobate trilete suture;
	"	15-42/125/540	Proximal focus, laevigata proximal axine;
	"	16-42/123/540	Distal focus, granulate distal axine;
17-20	<i>Microbaculatisporites alveolatus</i>	17-20/853/408	Proximal view partially laevigata proximal axine, micro-baculate distal axine;
	"	18-26/854/408	Distal view; micro-baculate axine;
	"	19-37/1006/520	Equatorial view;
	"	20-36/1137/853	Distal view;
21-23	<i>Verrucosporites sp. cf. V. pseudocircularis</i>	21-26/722/408 22-26/793/408 23-26/794/408	Distal view, showing flat topped, polygonal, regular verrucae; (H.B. x 1000) detail of 21 showing flat topped verrucae; (H.B. x 1000) detail showing polygonal elements faintly joined;
24-25	<i>Verrucosporites nanus</i>	24-45/1270/540 25-26/795/408	Distal view, showing well spaced verrucae; (H.B. x 1000) detail of 24 showing irregular elements;
26-27	<i>Verrucosporites sp. cf. V. pubescens</i>	26-13/378/950	Equatorial view, showing verrucae distal surface, and granulate proximal surface;
28-30	<i>Verrucosporites sp. A.</i>	27- 4/47/975 28-45/1259/540	Proximal view; showing trilete suture; Semi-proximal view showing irregular flattened verrucae;
	"	29-13/123/540	" " " "
	"	30- 8/241/900	" " " "
31-32	<i>Verrucosporites sp. C.</i>	31-26/1127/845 32-30/1126/885	Proximal view with open trilete suture in focus; Proximal view with coarse verrucate sculpture in focus;

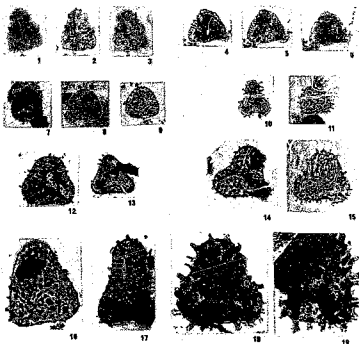
PLATE 2 - TRILETES (APICULATI)



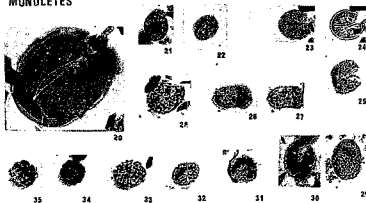
EXPLANATION TO PLATE 3 -- TRILETES (APICULATI) CONTD.

Fig.	Name	Reference No.-of Specimen	Notes
1-6	<u>Belachospora</u> sp.	1-35/1032/414	Sub-polar view, showing proximal "fucular" like labra and row of inter-radial spines;
	"	2-35/1033/414	Sub-laeval, proximal exine;
	"	3-35/1033/414	Sub-apical distal surface;
	"	4-35/1032/414	Sub-polar view; proximal fovea showing raised ridges;
	"	5-35/1034/414	Sub-polar view; proximal exine; 4-6 inter-radial spines within thin flange;
	"	6-35/1033/414	Sub-apical distal exine;
7-9	<u>Anticulastris sinuatus</u>	7-38/1111/426	Proximal view; showing conate sculpture alveolate;
	"	8-44/1330/95	Proximal view;
	"	9-44/1329/95	Proximal view;
10-11	<u>Acanthotriletes tarata-annulatus forma elongata</u>	10-10/300/537	Proximal view; spinate sculpture;
	"	11- 9/282/537	Proximal view;
12-13	<u>Neorastriella</u> sp.	12- 5/208/1064	Distal view; pillate sculpture;
	"	13-10/258/040	Proximal view; proximal setae sculpture reduced;
14-15	<u>Acanthotriletes tarata-annulatus</u>	14-20/606/537	Proximal view; spinate sculpture
	"	15-12/257/537	Proximal view;
16-17	<u>Leptotriletes</u> sp.	16-24/738/541	Proximal view; annate sculpture
	"	17-22/668/537	Proximal view;
18-19	<u>Neorastriella ramosa</u>	18-23/669/537	Distal polar view; spinate bacillate sculpture;
	"	19-23/662/537	Distal sub-polar view;
20	<u>MINULETES</u> <u>Lavialesporites</u> <u>collinsii</u>	20-22/576/537	Proximal view;
21-22	<u>L. sp. 1</u>	21-31/961/420	Proximal view, showing characteristic double fold;
	"	22-37/1075/426	Proximal view;
23-25	<u>Punctatosporites</u> <u>granulatus</u>	23-27/830/408	Terminal view, showing granulate sculpture;
	"	24-27/829/408	Terminal view, showing extent of annolete suture;
26-27	<u>Sphaerosporites</u> sp.	25-37/1071/420	Sub-terminal view;
	"	26-37/1072/420	Distal view; spinate sculpture;
	"	27-37/1072/420	Distal view; showing reduced sculpture and annolete suture;
28	<u>Thyospora thieseni</u>	28-28/846/408	Sub-terminal view, showing verrucate sculpture;
29-35	<u>Thyospora pseudothieseni</u>	29-44/1335/95	Lateral view, showing reticulate sculpture and pseudo cingulate structure;
	"	30-38/1100/426	Terminal view; open annolete suture;
	"	31-37/1080/420	Lateral view;
	"	32-31/895/420	Lateral view;
	"	33-30/905/420	Lateral view;
	"	34-29/897/420	Lateral view;
	"	35-37/1076/420	Lateral view;

PLATE 3 - (APICULATI)



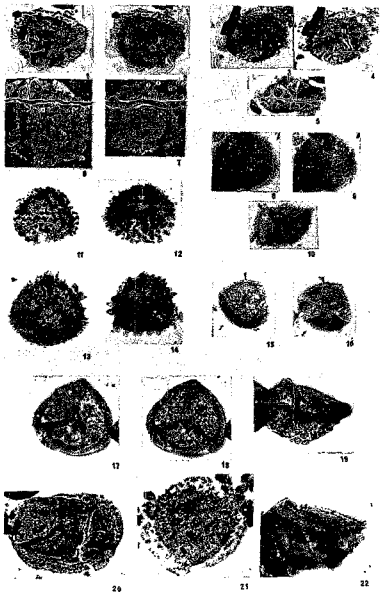
MONOLETES



EXPLANATION TO PLATE 4 - ZONALES

Fig.	Name	Reference No. of Specimen	Notes
3-7	<u>Cirrariadites africanensis</u>	1-26/784/408 2-26/783/408	Proximal view, showing general structure; Proximal view, showing suture length and thin labra;
	"	3-26/795/408	Sub-equatorial view, showing distal cone sculpture;
	"	4-25/795/408	" " " "
	"	5-41/1201/333	Sub-equatorial view; B. & Z. zone distinct;
	"	7-40/1204/333	Proximal view; dentate zone;
8-10	<u>Sundisporites sp. cf. S. vrykatsensis</u>	8-30/922/408	Proximal view; showing sculpture at cave apertures;
	"	9-30/923/408	" " " "
	"	10-30/919/408	Sub-equatorial view;
11-12	<u>Zinifspora bullata</u>	11- 8/238/950	Proximal view, showing bulbous elements;
	"	12- 8/238/950	Distal view, showing bulbous elements;
13-14	<u>Zinifspora renalis</u>	13-42/1246/940	Proximal view, showing separated pointed elements;
	"	14-30/1139/853	Sub-proximal view, showing separated pointed elements;
15-16	<u>Zinifspora eccensis</u>	15-34/1005/414	Distal view showing numerous apiculate elements;
	"	16-34/1006/414	Proximal view, showing reduction in size of sculpture elements;
17-19	<u>Densosporites sp.</u>	17-19/570/537	Proximal view, showing thickened labra and clogellus;
	"	18-19/568/537	Proximal view, showing proximal coarse granulate exine;
	"	19-19/579/537	Equatorial view, showing distal verrucate sculpture;
20-22	<u>Sundisporites novus</u> <u>sp. nova</u>	20-23/745/541	Proximal view, showing sutures extending to midline and fine granulate exine;
	"	21-23/741/541	Distal view, showing cone sculpture;
	"	22-23/752/541	Equatorial view, showing equatorial zone on cave;

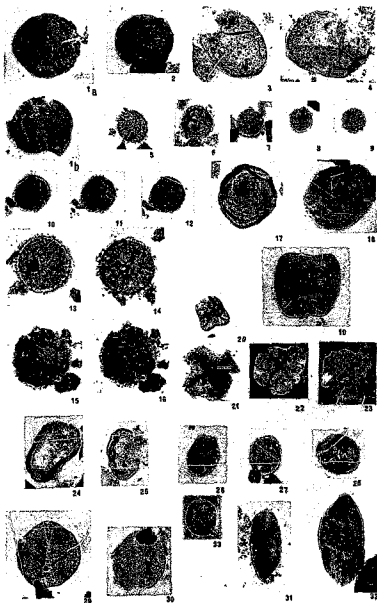
PLATE 4 - ZONALES



EXPLANATION TO PLATE 5 - ALETES: JUNATES: PLECALES

Figs.	Name	Reference No. of Specimen	Notes
1-2	<i>Pilospira callosus</i>	1a-23/690/537	In-aperturate spore with a fractured exine;
	"	1b-21/823/537	" " " " "
	"	2-22/879/537	In-aperturate spore, showing shagreened exine;
3-4	<i>Granulata spicifera</i> sp. nov.	3- 1/17/1130	In-aperturate spore with fractured exine, short irregular folding and fine granulate sculpture;
	"	4- 7/193/1005	" " " " "
5-12	<i>Herrerosphaera collensis</i>	5-35/1047/414	In-aperturate spore, with long oblique exine elements;
	"	6-33/986/414	Note inverted folding;
	Var. 1	7-33/971/414	Note fractured exine;
	"	8-33/975/414	Note possible suture;
	"	9-34/1037/414	Note inverted folding;
	"	10-34/1026/414	Proximal focus of "Hairy" exine;
	"	11-34/1027/414	Equatorial view of "Hairy" exine;
	"	12-34/1028/414	Note directional flow of "Hairy" elements;
13-16	<i>Herrerosphaera collensis</i>	13-25/755/541	In-aperturate spore; proximal focus of "Hairy" exine;
	"	14-25/756/541	Equatorial focus showing "Hairy" elements;
	Var. 2	15-25/761/541	Proximal focus;
	"	16-25/760/541	Equatorial focus, note apparent double wall of exine;
17-18	<i>Circuliserites waagae</i> sp. nova	17-23/684/537	In-aperturate spore, showing concentric rings in exine;
	"	18-19/582/537	" " " " "
19	<i>Tetrasporus</i> sp.	19-35/1125/885	In-aperturate spore, incertae, note quadri-lateral outline with punctate exine;
20-23	<i>Quadriseptites</i> sp. cf. <i>Q. horridus</i>	20- 6/181/1006	Seal-folded tetrad showing granulate exine;
	"	21-14/418/975	Poorly preserved specimen showing granulate exine;
	"	22-45/1269/940	Note sub-lavergate exine (eroded);
	"	23-16/481/975	Note width of crosswalls;
24-25	<i>Marsipolienites</i> sp.	24-41/1202/333	Monocolpate spore; seal-proximal view showing thickened rim;
	"	25-44/1327/95	Note indistinct suture;
26-27	<i>Marsipolienites triradiatus</i> forma <i>triradiatus</i>	26-30/918/508	Monocolpate spore with trilete suture;
	"	27-41/1212/333	" " " " "
28	<i>triradiatus</i>	28-35/1043/414	" " " " "
29-30	<i>Cocconeites newei</i>	29-43/1271/940	Distal focus showing rounded outline and concave suture;
	"	30-44/1328/95	Distal focus, note granulate exine;
31-32	<i>Cocconeites cymbatus</i>	31- 2/32/1064	Distal view, showing elongate outline with narrow parallel elongate sulcus;
	"	32-42/1242/940	" " " " "
33	<i>Marsipolienites triradiatus</i> forma <i>striatus</i>	33-38/1139/853	Distal view, showing faint striations and trilete aperture;

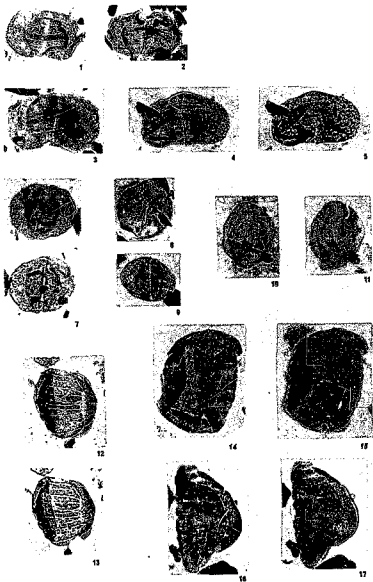
PLATE 5 - ALETES; JUGATES; PLICATES



EXPLANATION TO PLATE 6 - DISSACITES - STRIATITII

Fig.	Name	Reference No. of Specimen	Notes
1-2	<u>Protosphaeroloxypolus elobus</u>	1-28/943/406	Dissacite striate pollen, showing central proximal longitudinal sulcus, framed by thickened lips
3-5	<u>Protosphaeroloxypolus illepidus</u>	2-31/938/408	" " "
		3-35/1040/408	Proximal view, showing narrow transverse distal sulcus;
		4-26/824/408	Equatorial view, showing slight axial distal inclination;
		5-26/825/408	Equatorial view, showing coarse reticulation of sacculi
6-11	<u>Protosphaeroloxypolus elongatus</u>	6-29/858/408	Proximal view, indistinct & elongated central body;
12-17	<u>Protosphaeroloxypolus sp. B.</u>	7-29/857/408	Proximal narrow distal sulcus;
		8-26/781/408	Proximal indistinct oblique striae;
		9-26/812/408	Proximal narrow distal sulcus;
		10-44/1334/95	Proximal indistinct oblique striae;
		11-44/1332/95	Proximal fine infra-reticulation;
		12-44/1306/95	Small-proximal view, showing terminal attachment of sacculi;
		13-44/1307/95	Small-proximal view, showing striation patterns;
		14-24/730/537	Distal view, showing lateral attachments of small sacculi;
		15-24/731/537	Proximal view, showing granulate sculpture on rib axines;
		16-22/664/537	Terminal view, outline of small terminal sacculi;
		17-22/665/537	Terminal view, showing fine infra-reticulation of sacculi;

PLATE 6 - DISACCITES-STRIATITI



EXPLANATION TO PLATE 7 - STRIATUM

Fig.	Name	Reference No. of Specimen	Notes
1-7	<u>Protophloxypinus</u>	1-21/638/639/640/537	Polar view, distal focus showing distal fractured sutures;
	<u>spec. cf. P. corallensis</u>	2-21/636/537	Distal focus, showing clear "in" reticulation of sacci. (x 250/1)
	"	3-21/637/537	Proximal focus showing curved ribs and indistinct central body. (x 250/1)
	"	4-21/644/537	Jorelinal view, showing thickened ribs
	"	5-21/645/537	Jorelinal view, showing lateral sacci attachment
	"	6-22/658/537	Semi-polar view, distal focus
	"	7-22/655/657/537	Proximal focus, showing sub-parallel striations

PLATE 7 - STRIATITI



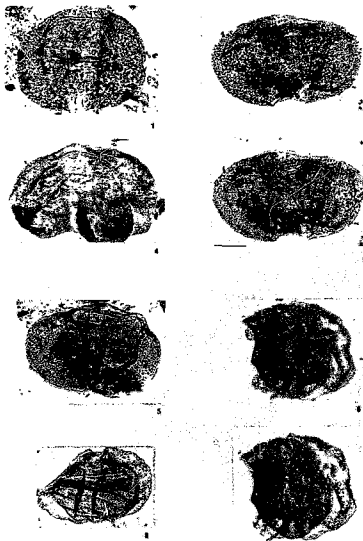
EXPLANATION TO PLATE 2 - STRATIOTE

Fig.	Name	Reference No. of Specimen	Notes
1-4	<u>Protoblastoxenus sp. A</u>	1- 8/218/990	Polar view, proximal focus showing central longitudinal sulcus
	"	2- 6/153/1006	Sub-equatorial view, showing proximal longitudinal sulcus
	"	3- 6/152/1006	Sub-equatorial view, showing coarse infra-reticulation of saculi
	"	4-17/503/975	Equatorial view, showing slight distal inclination
5-8	<u>Protoblastoxenus amolus</u>	5- 4/126/1058	Sub-proximal view, showing distinct crura with parallel fold on proximal caps
	"	6-17/506/975	Distal view, showing strias on distal central body
	"	7-17/505/975	Distal view, shows peripheral folds along distal sacal roots
	"	8-17/501/975	Polar view, showing strias and distal peripheral aural folds

PLATE 8 - STRIATITI



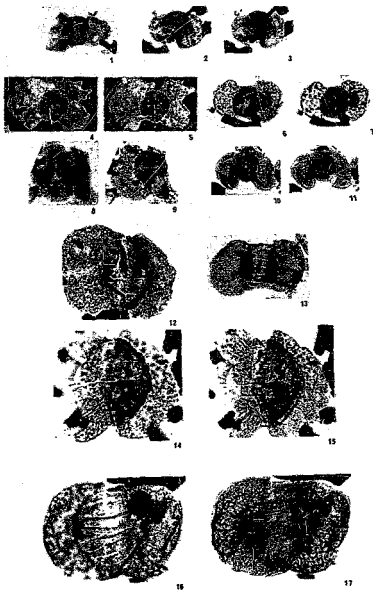
PLATE 8 - STRIATITI



EXPLANATION TO PLATE 9 - STRIATITI

Fig.	Name	Reference No. of Section	Notes
1-3	<u>Striatopodocarpites</u> <u>conspicua</u>	1-30/915/408	Proximal view, showing sub-parallel strias
		2-30/901/408	Distal view, showing distinct central body
		3-30/902/408	Distal view, showing aspect overlapping distal sulcus
4-11	<u>Striatopodocarpites</u> <u>speciosa</u>	4-11/1205/333	Polar view, proximal focus, showing strias and large filary sac
		5-11/1206/333	Polar view, distal focus, showing narrow sulcus
		6-26/832/408	Polar view, distal focus showing narrow distal sulcus
		7-26/831/408	Polar view, proximal focus, showing indistinct strias
		8-30/1116/426	"
		9-30/1117/426	Polar view, distal focus, showing narrow distal sulcus
		10-28/941/408	Sub-polar view, distal focus, showing narrow distal sulcus
		11-28/842/408	Sub-polar view, showing indistinct strias
12-15	<u>Striatopodocarpites</u> <u>rara</u>	12-24/712/537	Distal view, showing sub-parallel strias, marginal crest to proximal cap, distal sulcus narrow due to compression
		13-36/1074/414	Proximal view, showing sub-parallel strias and wide distal sulcus
		14-25/789/541	Proximal view, showing sub-parallel strias and marginal crest
		15-25/789/541	Distal focus, showing indistinctly width of distal sulcus
16-17	<u>Striatopodocarpites</u> <u>conspicua</u>	16-21/947/537	Polar view, proximal focus, showing sub-parallel to sub-parallel strias
		17-21/946/537	Polar view, distal focus, showing indistinct sulcus and coarse infra-reticulation of sac

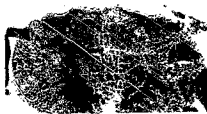
PLATE 9 - STRIATITI



EXPLANATION TO PLATE 10 - SIRIATILL

Fig.	Name	Reference No. of Specimen	Notes
1-6	<u>Strigatocodocarpites</u> <u>rectistriatus</u>	1-21/634/537	Scal-polar view, proximal focus, showing thickened marginal crest to proximal cap;
		2-21/633/537	Scal-polar view, showing caecal structure;
		3-20/604/537	Scal-polar view, proximal focus, showing thickened longitudinal striae with short irregular transverse striae;
		4-23/692/537	Scal-distal view, showing narrow distal orifices and thickened marginal crest to proximal cap;
		5-38/1119/426	Proximal view, partially compressed pollen grain, showing scal-parallel striae;
		6-23/699/537	Scal-polar view, showing general structure;
7-11	<u>Strigatocodocarpites</u> sp. A.	7-22/661/537	Proximal view, showing irregular longitudinal and transverse striae, sacro compressed;
		8-23/705/537	Proximal view, showing general structure (x 200);
		9-29/896/408	Proximal view, showing dorsomedial central body with irregular longitudinal and short transverse striae;
		10-21/891/408	Proximal view, showing compression of sacri;
		11-23/704/705/537	Proximal view, showing irregular longitudinal and short transverse striae; and dorsomedial folds of sacri;

PLATE 10 - STRIATITI



EXPLANATION TO PLATE 31 - STRIATII

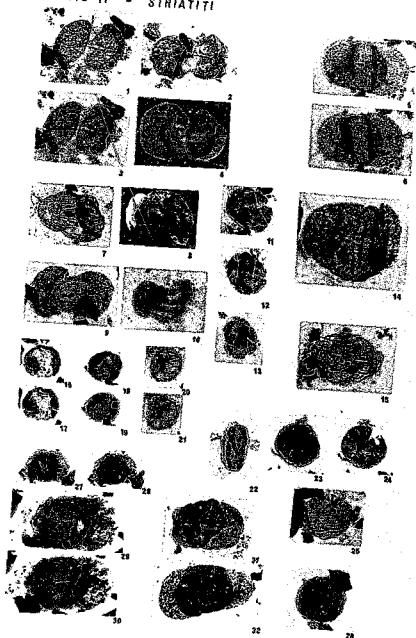
Fig.	Name	Reference No. of Specimen	Notes
1-4	<u>Longicarpus</u> <u>prokaramdenalis</u>	1-44/1309/95	Proximal view, showing central longitudinal sulcus and chasma. Infra-reticulation of sacci;
	"	2-44/1336/95	Proximal view, showing general structure;
	"	3-44/1310/95	Proximal view, showing central longitudinal sulcus with subclavary lateral strias;
	"	4-44/1314/95	Proximal view, showing striae patterns;
5-6	<u>Hemipollenites</u> sp. A.	5-33/980/414	Proximal view, showing oblique to sub-parallel longitudinal striae with long transverse striae;
	"	6-33/978/414	Proximal view, showing broad distal sulcus with peripheral folds at the base of distal saccl roots;
7-8	<u>Striatopollites</u> <u>multistriatus</u>	7-44/1321/95	Semi-polar view, showing small terminally attached sacci and l-a elongate central body;
	"	8-38/999/414	Compressed specimen, semi-polar view, showing small terminally attached sacci;
9-10	<u>Taeniosporites</u> sp. cf. <u>T. novaezealandis</u>	9-26/797/408	Proximal view, showing four broad ribs separated by relatively indistinct wide striae;
	"	10-32/1106/426	Eroded specimen, showing broad ribs;
11-13	<u>Butulapollenites</u> <u>hammondi</u>	11-44/1315/95	Semi-distal view, proximal vent open;
	"	12-44/1318/95	" " " " " "
	"	13-44/1311/95	Semi-distal view;
14	<u>Hemipollenites</u> <u>karameensis</u>	14-20/602/537	Proximal view, showing longitudinal striae with long transverse distal striae fringing a central transverse sulcus;
15	<u>Vittatina</u> <u>africana</u>	15-33/965/414	Proximal view, showing thickened striations;
16-21	<u>Vittatina</u> <u>sinica</u>	16-35/1071/414	Polar view, proximal focus, showing longitudinal striae;
	"	17-35/1070/414	Polar view, distal focus, showing terminal thickened structures;
	"	18-35/1036/414	Polar view, proximal focus, showing longitudinal striae;
	"	19-35/1035/414	Polar view, distal focus, showing rudimentary saccul (infra-pustulate);
	"	20-44/1312/95	Semi-polar view, showing rudimentary terminal saccul;
	"	21-44/1313/95	Semi-polar view, showing longitudinal striae;

Continued...

EXPLANATION TO PLATE II - STRIATITI
(Continued)

Fig.	Name	Reference No. of Specimen	Notes
22-26	<u>Vittetina africana</u>	22-44/1324/414	Downward section, showing continuous striae;
"	"	23-31/948/414	Semi-proximal view, showing transverse and longitudinal striae
"	"	24-31/946/414	Semi-proximal view, showing combination of striae;
"	"	25-21/635/406	Proximal view, showing general structure;
"	"	26-33/977/414	" " "
"	"	27-29/882/406	Proximal view, showing rudimentary (irregular) trilete suture;
27-29	<u>Leptocritus sp.</u>	28-29/883/406	Proximal view, showing sacral attachment;
"	"	28-36/1095/425	Proximal view, showing saccular suture;
29-30	<u>Leptocritus sp.</u>	30-36/1094/425	Proximal view, showing general structure;
"	"	31- 8/246/390	Semi-polar view, with proximal trilete suture and distal peripheral folds along sacral roots;
31-32	<u>Illinites unicus</u>	32- 7/213/1008	Proximal view, showing indistinct proximal trilete suture and distal peripheral folds along sacral roots;

PLATE 11 - STRIATITI



EXPLANATION TO PLATE 12 - HOMOSUCTITI

Fig.	Spec.	Reference No., of Specimen	Notes
1-7	<i>Ellichiptillimites juddoni</i>	1-27/800/985	Proximal view, showing trilobite suture, equatorial peripheral folds below proximal saccus, detachment line and narrow saccal offlap;
	"	2- 2/53/1004	As empty saccus, showing narrow saccal width;
	"	3-10/553/090	Distal view, showing narrow saccal width and equatorial peripheral folds;
	"	4-32/1226/940	Proximal view, showing trilobite suture and sub-equatorial peripheral folds below saccus. Detachment line with overlap equal to offlap;
	"	5- 2/90/1006	Empty saccus, showing broad proximal width of saccus;
	"	6- 2/103/1005	Proximal view, showing narrow trilobite suture and equatorial to sub-equatorial peripheral folds; offlap less than overlap;
	"	7- 2/38/39/1118	Empty saccus, showing relatively broad proximal saccus width;

PLATE 12 - MONOSACCITI



EXPLANATION TO PLATE 12 - MONOSACCITIS

Fig.	Host	Reference No. of Specimen	Notes
1-2	<i>Viridiplanitis indicus</i>	1-18/459/985	Proximal view, showing general structure;
	"	2-7/191/192/1000	"
	"	2-14/402/408/995	Proximal view, showing presaccular folds with sacculus off-lap - equal to over-lap;
	<i>Viridiplanitis apicatus</i>	4-2/4/1084	Empty sacculus, showing pinching effects;
3-10	"	5-2/57/119	Proximal view, showing trileta suture;
	"	5-12/1/110	Distal view of empty sacculus, showing pinching effects;
	<i>Viridiplanitis densus</i>	4-5/64/101	Proximal view, showing dense central body, trileta suture and sub-equatorial pericardial folds below sacculus detachment line;
	"	6-7/166/1006	Distal view, showing general structure, and trillings of sacculus;
(10-12)	"	9-16/547/985	Proximal view, showing intra-punctate scutellum on central body surface;
	<i>Ellipsocites willagoyis</i>	10-43/1264/1265/940	Distal view, showing general structure, sacculus outline entire;
	"	11-4/220/990	Proximal view, showing uneven trileta suture;
	"	12-2/51/1084	Empty sacculus, showing radially pinched infra-ventilation of sacculus margin entire; specimen partially hidden;

PLATE 13 - MONOSACCITI



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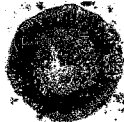
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EXPLANATION TO PLATE 14 - MONOSACCITI

Fig.	Name	Reference No. of Section	Notes
1-2	<u>Petonelaperites novius</u>	1-39/1132/885	Proximal view, showing short gonofolte suture bilateral saccate condition, and infra-punctate sculpture on central body extes;
	"	2-15/420/940	Proximal view, showing equatorial peripheral folds below saccus detachment line;
3	<u>Petonelaperites thomasi</u>	3-14/435/975	Proximal view, showing bilateral monosaccate condition parallel transverse distal peripheral folds, circular proximal peripheral folds and elongated longitudinal proximal suture;
4	<u>Petonelaperites hennelvi</u>	4- 6/177/1006	Proximal view, showing bilateral monosaccate condition, trilobate suture and transversely oval outline of proximal saccus detachment line;
5-6	<u>Florinites eremo</u>	5-24/728/537	Proximal view, showing large folded saccus, small dense central body with indistinct saccus detachment;
	"	6-37/1062/420	Skel-proximal view, showing almost obscured central body and large fleshy saccus;
7-9	<u>Densicollanites indicus</u>	7-25/745/541	Proximal view of folded specimen illustrating coarse saccal infra-sculpture; lies along saccal margin and dense central body;
	"	8-34/10104/414	Polar view, proximal focus, showing granulate sculpture on central body, indistinct proximal equatorial detachment of saccus and faint trilobate suture extending into saccus extes;
	"	9-34/10108/414	Polar view, distal focus, showing complete distal detachment of saccus from central body;
10	<u>Vestigiosporites sp.</u>	10- 1/24/1130	Detail of empty saccus showing disjunct condition with joining lateral bladders: H.B. Differential infra-sculpture;
11	<u>Sahniasaccites sp.</u>	11-24/728/729/537	Detail of empty saccus, showing bilateral monosaccate condition; similar infra-sculpture and structures;

PLATE 14 - MONOSACCITI



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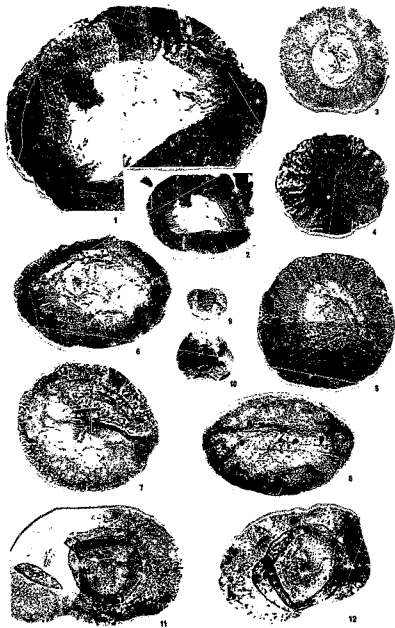
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EXPLANATION TO PLATE 14a - MONOSACCII

x 500 except where stated

Fig.	Name	Reference No. of Specimen	Notes
1-2	<u>Phragmites</u> sp.	1-22/660/662/537	Small-proximal view, showing light central body, dark coarsely structured saccus;
"	"	2-22/663/537	Showing general structure (x 200);
3	<u>Virkkioelliptica</u> <u>whitton</u>	3-20/601/1006	Proximal view, showing central body outline, distinct saccus roots and slight frill in saccus;
4-5	<u>V. radialis</u>	4- 2/58/1064	Proximal view, showing dense triangular central body;
"	"	5- 1/7/2/1130	Proximal view, showing roots in central saccus (empty saccus);
6-8	<u>V. obscurus</u>	6-14/415/416/575	Proximal view, showing trilete suture;
"	"	7-13/1287/68/940	Proximal view, showing trilete suture, saccus infra-structure and indistinct (partial) outline of central body;
"	"	8- 1/2/596	Proximal view, slightly compressed;
9-10	<u>Striemonocarpites</u> sp.	9-34/1025/414	Proximal view of small specimen, showing striate central body;
"	"	10-28/659/408	Proximal view, showing compressed specimen; central body striate;
11-12	<u>Dactyloisporites</u> <u>granulatus</u>	11-22/660/940	Proximal view, showing peripheral folds associated with saccus roots, complete suture and bifurcal organization;
"	"	12-15/456/575	Proximal view, showing outline of central body, peripheral folds associated with saccus roots, complete suture and bifurcal organization;

PLATE 14 a - MONOSACCITI



EXPLANATION TO PLATE 35 - DISACCHARIDIETI

Fig.	Value	Reference No. of Section	Notes
1-2	<i>Platycoccus pallidus</i> (DESCOIX & HART, non. comb.)	1-27/882/408 2-31/996/414	Distal view, showing 2-4 oval central body, concave distal saccul roots; Proximal view, showing diploxyloous outline and longitudinally elongated saccul;
3	<i>Platycoccus</i> sp. cf. <i>P. Obesulus</i> WERT	3-37/1074/426	Distal view, showing distinct central body, large filix saccul and indistinct distal roots;
4	<i>Allisporites</i> sp. cf. <i>pyratus</i>	4-34/1015/414	Proximal view, showing slight diploxyloous, distinct central body and broad distal zones;
5	<i>Allisporites gracilis</i>	5-42/1223/940	Polar view, showing broad distal zone and coarse radially elongated lumen in saccul infra-reticulation;
6-7	<i>Allisporites tenuisporus</i>	6-16/345/940 7-17/510/940	Seal-polar view, showing haploxyloous outline and coarse rounded lumen in saccul infra-reticulation; Polar view, showing broad distal zone; specimen slightly folded;
8-9	<i>Sulcatosporites oratus</i>	8-44/1325/95 9-26/641/408	Seal-distal view, showing narrow sulcus; haploxyloous rounded outline; Distal view, showing narrow sulcus and central body;
10-11	<i>Sulcatosporites splendens</i>	10-31/931/408	Proximal view, showing central body and haploxyloous longitudinally oval outline;
12-13, 15	<i>Yescaspora</i> sp. B.	11-23/871/408 12-25/744/541	Distal view, showing narrow distal sulcus; Polar view, showing (1-2) oval central body (outline touched-up) and distinct lateral bladders;
	"	13-25/762/541	Seal-terminal view, showing terminal attachment of saccul and relatively indistinct saccul roots;
	"	15-34/1019/414	Proximal view, showing (1-2) oval central body, and longitudinal tear in saccul and central body outline;
14	<i>Yescaspora</i> sp. B.	14-37/1067/426	Proximal view, showing dense central bodies and slight diploxyloous outline;
16-18	<i>Sulcatosporites potentillae</i>	16-24/717/716/537 17-26/776/408 18-28/672/408	Distal view, showing indistinct central body, coarse saccul infra-reticulation and distal sulcus; Seal-distal view, showing central body, saccul separating distally and coarse saccul infra-reticulation; Distal view, rounded outline and narrow distal sulcus;

PLATE 15 - DISACCIATRILETI

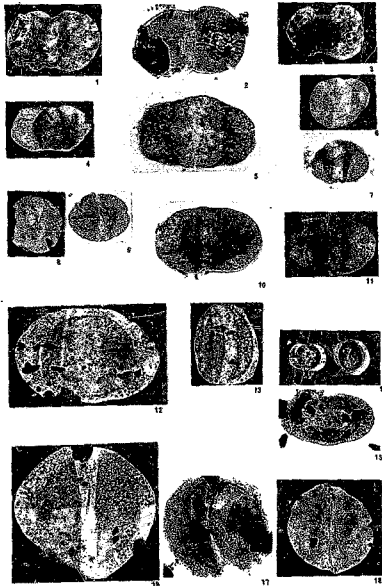
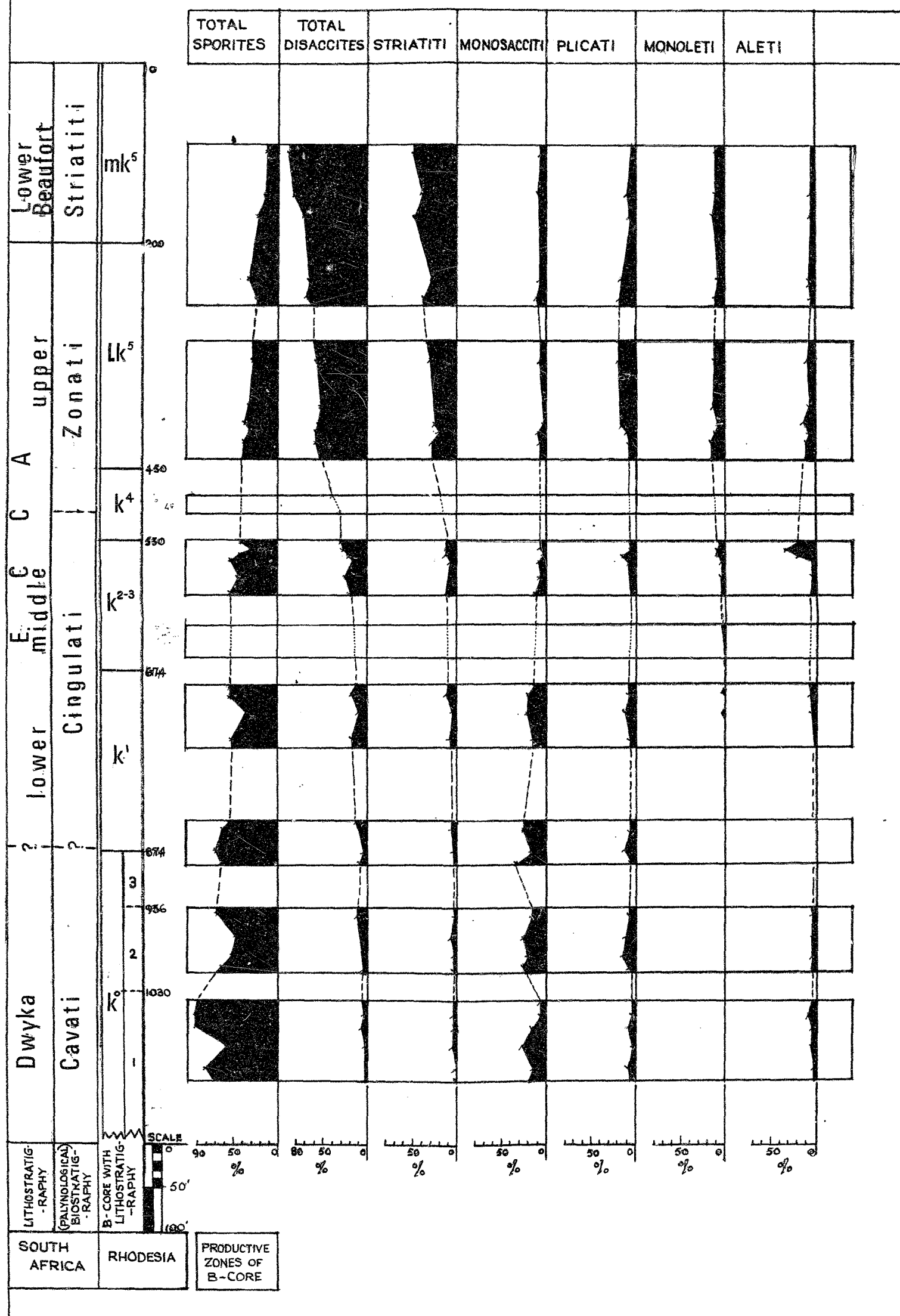


Fig 2

DISTRIBUTION OF MAJOR MIOSPORE TAXA



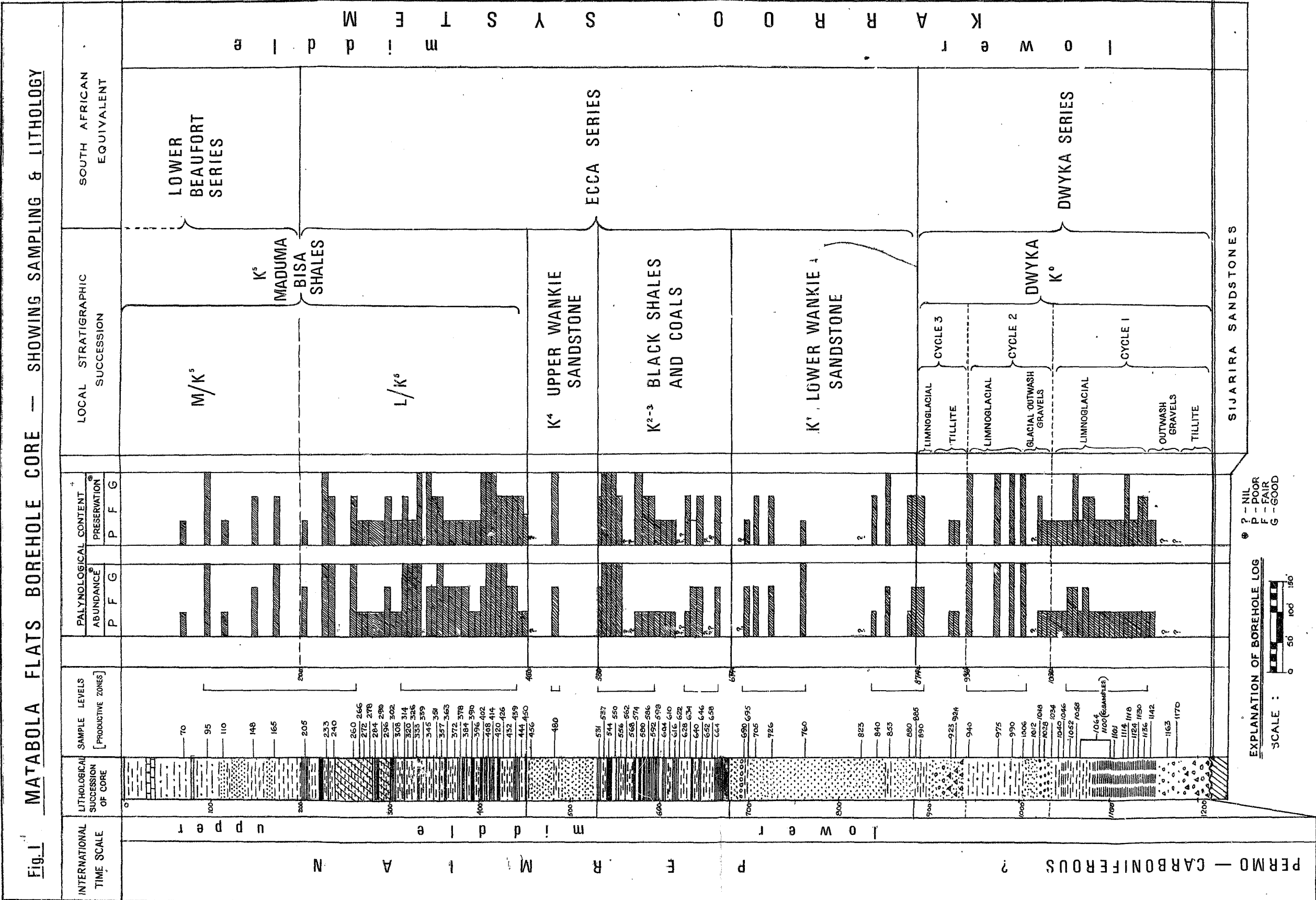


Fig 3

DISTRIBUTION OF GENERA AND SPECIES IN THE MATABOLA BOREHOLE CORE

MAJOR TAXA	DWYKA	LOWER WANKIE SANDSTONE	BLACK SHALES AND COALS	UPPER WANKIE SANDSTONE	MADUMABISA MUDSTONES		S P O R I T E S														A L E T E S		P O L L E N I T E S																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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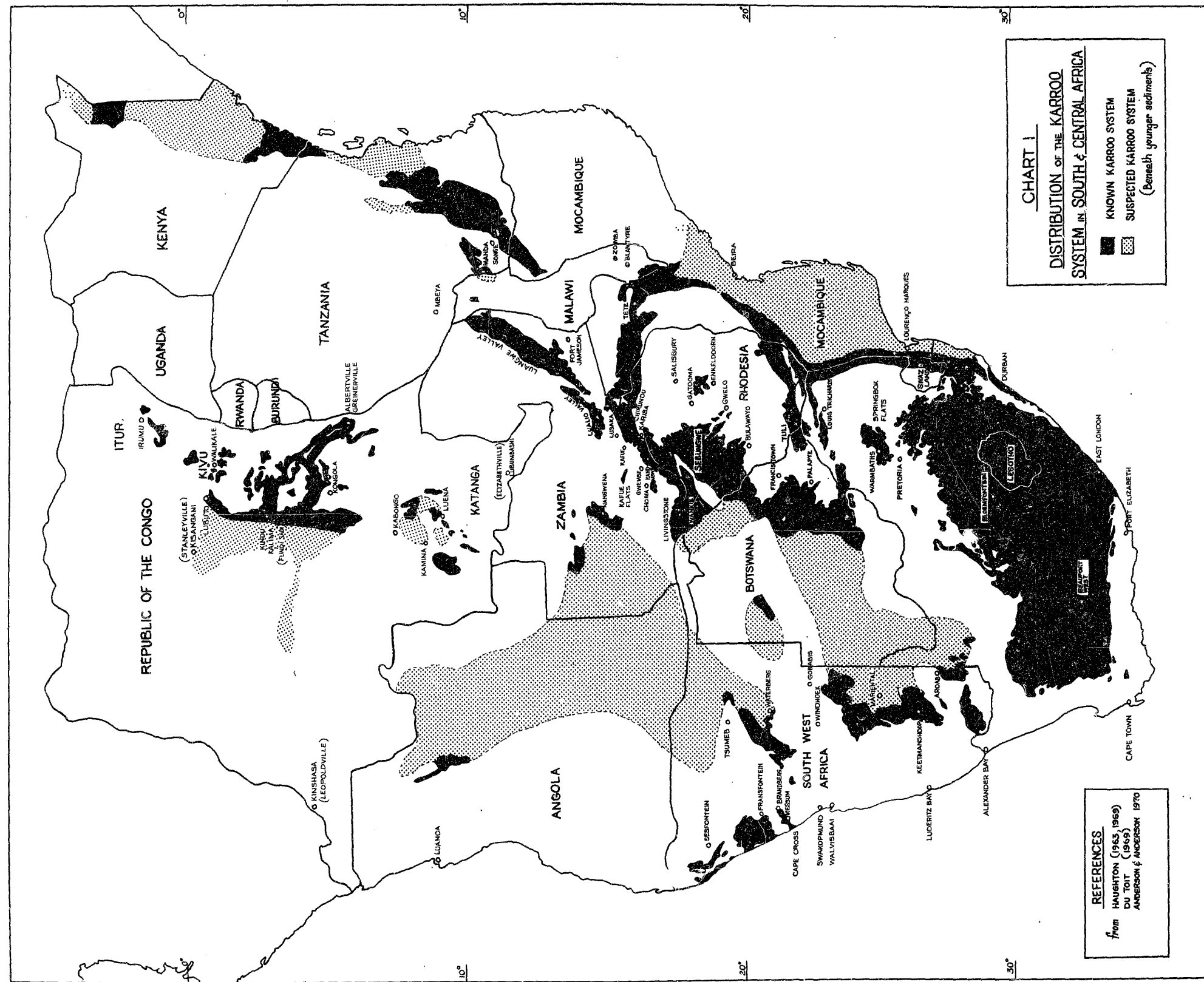


Fig 4

PALYNOLOGICAL ZONES IN THE MATABOLA FLATS BOREHOLE CORE

EQUIVALENT SOUTH AFRICAN FLORIZONE (Hart 1965)				CORE	PROVISIONAL PALYNOLOGICAL ZONES	BROAD QUANTITATIVE PALYNOLOGICAL ZONES - BASED ON AVERAGE PER CENTAGE ABUNDANCE OF MAJOR MIOPORE TAXA	STRATIGRAPHIC RANGES OF SELECTED MIOPORES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Author Falcon R M S (Rosemary Margaret Sarah)

Name of thesis Preliminary Study Of The Karroo Palynology In The Mid-zambezi Basin, Rhodesia. 1972

PUBLISHER:

University of the Witwatersrand, Johannesburg

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