

LIST OF TABLES	page
1 Occurrence of the planktic and benthic foraminifers in the Suai Formation along Suai and Lembong Road	73
2 Occurrence of the planktic and benthic foraminifers in the Sibuti Formation along Miri-Tinjar Road	77
3 Occurrence of the planktic and benthic foraminifers in the Sibuti Formation along Suai, Niah, Ladang 3 and Kuala Sibuti Road	80
4 Occurrence of the planktic and benthic foraminifers in the Sibuti Formation along Kuala Sibuti, Sibuti outcrop section, Miri-Tinjar and Miri-Bintulu Road	84
5 Occurrence of the planktic and benthic foraminifers in the Lambir Formation along Miri-Bintulu and Miri-Tinjar Road and the Miri Formation along the New Hospital Road	90
6 Distribution of planktic foraminifers from the Northwest Borneo Basin	100

LIST OF FIGURES

1 Geological map of the Northwest Borneo Basin (enclosed in back folder)	
2 Location map of the study area	2
3 Town centres and rivers of Sarawak	3
4 Geological map of Sarawak (modified after Hon, 1992)	4
5 Geological map of the Northwest Sarawak (after Liechti et al, 1960)	7
6 Stratigraphical section across the central Sarawak (after Ho, 1978)	9
7 Stratigraphic subdivision and paleontological zonation in the Tertiary of Sarawak (after Ho, 1978)	10
8 Worksopce of the present investigation	12
9 Global tectonic division (after Hamilton, 1979)	14
10 Plate tectonic elements of South East Asia (after Hutchison, 1989; Rangin et al, 1990 and Metcalfe, 1995)	15
11 Tectonic provinces of the Sarawak and adjoining areas	17
12 Geological map of West Sarawak and Northwest Kalimantan	18
13 Generalized stratigraphy of Sarawak and Northwest Kalimantan	19
14 Geological development of Sarawak and Northwest Kalimantan	20
15 Tuang Schist of the Tuang Formation, Early Cretaceous Melange, West Sarawak. Locality: Km 4, Stephen Road, Kuching	23

16	Lubok Antu Melange. Locality: Batang Ai Dam Road junction, Lubok Antu	23
17	Kayan Sandstone, Isolated Basin unit overlies unconformably the tightly folded Cretaceous Pedawan Formation. Locality: Km 13, Bau-Lundu Road	25
18	Basal conglomerate of the Tatau Formation, Isolated Basin overlies unconformably the tightly folded Bawang Member, Belaga Formation, North Sarawak. Locality: Km 170, Sibu-Bintulu Road	25
19	Development of lithostratigraphy of Northwest Sarawak	28
20	Index of topographic map sheet 1:50,000	30
21	Traversed route map	31
22	Typical bedding sequences of Northwest Borneo Basin	33
23	Massive sandstone bed of the Lambir Formation. Locality: Opposite to Rh. Councilor Pillai, Miri-Tinjar Road	34
24	Sandy alternation of the Lambir Formation. Locality: Km 190.5, Miri-Bintulu Road	34
25	Shaly alternation of the Sibuti Formation. Locality: Km 146.5, Miri-Bintulu Road	35
26	Bounded shale of the Sibuti Formation. Locality: Km 127, Miri- Bintulu Road. Locality: Km 1, North Suai Road	35
27	Route map of the type section of the Suai Formation faulted against the overlying the Sibuti Formation along Suai Road	37
28	Cross section and columnar section of the type section faulted against the overlying the Sibuti Formation along Suai Road	38
29	Massive sandstone interbedded with shaly alternation in the Suai Formation. Locality: Km 1, North Suai Road	39
30	Brecciated mudstone of the Suai Formation. Locality: Km 1, North Suai Road	39
31	Route map (A), cross section (B) and columnar section (C) of the reference section, of the Suai Formation along Bukit Lembong Road	41
32	Route map of the type section of the Sibuti Formation along Miri-Tinjar Road	43
33	Cross section and columnar section of the type section, Sibuti Formation along Miri -Tinjar Road	44
34	Upper boundary stratotype of bounded shale of the Sibuti Formation is conformably overlain by sandy alternation of the Lambir Formation. Locality: Km 174.5, Bintulu-Miri Road	46
35	Subis Limestone Member of the Sibuti Formation. Locality: Batu Niah Town	46
36	Route map of the reference section of the Sibuti	

Formation along Niah Road	47
37 Cross section and columnar section of the reference section of the Sibuti Formation along Niah Road	48
38 Route map (A), cross section (B) and columnar section (C) of the reference section, Sibuti Formation along Ladang 3 Road	49
39 Lithological map of the Gunung Subis area, Subis Limestone Member, the Sibuti Formation	51
40 Interfingering boundary between the Subis Limestone Member and the bounded shale, both of the Sibuti Formation. Locality: Geragok Quarry	52
41 Massive sandstone, Lambir Formation. Locality: Bukit Song, Km 186, Miri-Bintulu Road	52
42 Development of isolated biohermal limestone of the Subis Limestone Member, Sibuti Formation.	53
43 Route map of the type section of the Lambir Formation along Bintulu-Miri Road	55
44 Cross section and columnar section of the type section, of the Lambir Formation along Bintulu-Miri Road	56
45 Fault contact between Lambir and Sibuti Formation. Locality: Sg. Bakas, Miri-Tinjar Road	58
46 Gramunar Fault Zone. Locality: Km 9.8 west Bakong Town along Miri-Tinjar Road	58
47 Route map of the reference section of the Lambir Formation along Miri-Tinjar Road	59
48 Cross section and columnar section of the reference section of the Lambir Formation along Miri-Tinjar Road	60
49 Route map, cross section and columnar section of the type section of the Miri Formation along New Hospital Road	62
50 Sandy alternation of the Miri Formation, Locality: Station 9, New Hospital Road	63
51 Bounded shale of the Miri Formation. Locality: Station 15, New Hospital Road	63
52 Well Number 1. Locality: Canada Hill	65
53 Sandy alternation of Miri Formation. Locality: Miri Hill	65
54 Route map, cross section and columnar section of the reference section, of the Miri Formation along Bintulu-Miri Road at Miri Hill	66
55 Geological map of Miri-Tinjar Road, North Sarawak (after Banda, 1994)	69
56 Sample localities of the planktic foraminiferal analysis in the Sibuti area	70

57	Sample localities of the planktic foraminiferal analysis in NW Sarawak	72
58	Sample localities of the planktic foraminiferal analysis in the Suai and Sibuti Formations, along Suai Road	74
59	Sample localities of the planktic foraminiferal analysis in in the cross and columnar sections of the Suai and Sibuti Formations, along Suai Road	75
60	Sample localities of the planktic foraminiferal analysis in in the Suai Formation, along Bukit Lembong Road	76
61	Sample localities in the Sibuti Formation, along Miri-Tinjar Road	78
62	Sample localities in the cross section and total column of the Sibuti Formation, along Miri-Tinjar Road	79
63	Sample localities in the Sibuti Formation, along Niah Road	81
64	Sample localities in the cross section and total column of the Sibuti Formation, along Niah Road	82
65	Sample localities in the cross section and total column of the Sibuti Formation, along Ladang 3 Road	83
66	Sample localities in the Sibuti outcrop section, Bekenu Junction, Miri-Bintulu Road	86
67	Sample localities in the Entulang outcrop section, Km 37th, Miri-Bintulu Road	87
68	Sample localities in the Sekaloh outcrop section, Km 68th, Miri-Bintulu Road	88
69	Sample localities in the Subis outcrop section, Geragok Quarry	89
70	Sample localities in the Lambir Formation, along Miri-Bintulu Road	91
71	Sample localities in the cross section and total column of the Lambir Formation, along Bintulu-Miri Road	92
72	Sample localities in the Lambir Formation, along Miri-Tinjar Road	93
73	Sample localities in the cross section and total column of the Lambir Formation, along Miri-Tinjar Road	94
74	Sample localities in the cross section and total column of the Miri Formation, along New Hospital Road	95
75	Occurrences of the planktic foraminifers in the samples from the Northwest Borneo Basin	97
76	Occurrences of the planktic foraminifers in the samples in the total column of lithostratigraphic units of the Northwest Borneo Basin	98
77	Index species range chart after Blow (1969) and	

Bolli (1957, 1966) and Kenneth et al (1988)	101
78 Correlation of planktic foraminiferal zonation of the Northwest Borneo Basin with those of Bolli (1957, 1966) and Blow (1969)	101
79 Correlation of planktic foraminiferal zonation and the paleobathymetric changes in the Northwest Borneo Basin	109
80 Schematic outline of the NW Borneo environment units (after Ho, 1978)	110
81 Distribution of sedimentary structures in the total column of the formations in the Northwest Borneo Basin	112
82 Log section of the Suai Formation at the North Suai Road Junction, Bintulu-Miri Road (A) and at BLD Quarry (B)	113
83 Cross lamination in thick sandstone bed of the Suai Formation. Locality: Km 103, Bintulu-Miri Road	114
84 Parallel bedding in thick sandstone bed of the Suai Formation. Locality: North Suai Road Junction	115
85 Cross bedding in thick sandstone bed of the Suai Formation. Locality: Km 103, Bintulu-Miri Road	115
86 Ripple marks in sandstone bed of the Suai Formation. Locality: Km 103, Bintulu-Miri Road	115
87 Log section of the Sibuti Formation at Km 2, Lamaus Road (A) and at Km 1 st , Niah Road (B)	116
88 Mudstone interbedded with limestone in the Suai Formation. Locality: BLD Quarry, North Suai Road	117
89 Slump structures of the bounded shale sequences in the Sibuti Formation. Locality: Km 2, Batu Niah Road	117
90 Ichnogenus <i>Orphiomorpha</i> sp. in the bioturbated sandstone of the Sibuti Formation. Locality: Km 106, Bintulu-Miri	118
91 Cut and fill structures (channeling) in the alternation of shale and sandstone of the Sibuti Formation. Locality: About 2 Km from the junction of Fung Tai Quarry Road, Bintulu-Miri Road	118
92 Bounded shale in the upper part of the Sibuti Formation, Locality: Km 70.5 Bintulu-Miri Road	119
93 Log section of the deltaic sediments at Bukit Song, the Lambir Formation (A) and at Miri Hill, the Miri Formation (B)	120
94 Cross-bedded sandstone beds of the Lambir Formation overlying the bounded shale of the Sibuti Formation. Locality: Entulang outcrop section, Km 37, Bintulu-Miri Road	121
95 Soft sediment deformation in cross-bedded sandstone of the Lambir Formation. Locality: Entulang outcrop section,	

Km 37, Bintulu-Miri Road	122
96 Trough cross bedding sandstone of the Lambir Formation. Locality: Entulang outcrop section, Km 37, Bintulu-Miri Road	122
97 Bioturbated, laminated sandstone of the Lambir Formation. Locality: Km 22, Bintulu-Miri Road	123
98 Gravel deposit in a channelised sandstone of the Lambir Formation. Locality: Km 22, Bintulu-Miri Road	123
99 Large scale cut and fill structure (truncation) in the sandstone of the Lambir Formation. Locality: Bukit Song, Bintulu-Miri Road	124
100 Trough cross bedding sandstone of the Miri Formation. Locality: Miri Hill, Bintulu-Miri Road	124
101 Cut and fill structures (channeling) in mudstone of the Miri Formation. Locality: Miri New Hospital Road	126
102 Herring bone cross bedding sandstone of the Miri Formation. Locality: Miri Hill, Bintulu-Miri Road	126
103 Depositional environment during the early Early Miocene (Top of Cycle I) in Northwest Borneo Basin	127
104 Depositional environment during the mid Early Miocene (Top of Cycle II) in Northwest Borneo Basin	129
105 Depositional environment during the early Mid Miocene (Top of Cycle III) in Northwest Borneo Basin	130
106 Depositional environment during the Mid Miocene (Top of Cycle IV) in Northwest Borneo Basin	132
107 Geotectonic map of Borneo and the surrounding region of Southeast Asia during Early Miocene	133
108 Geotectonic map of Borneo and the surrounding region of Southeast Asia during Middle Miocene	134
109 Regional folding during Late Eocene and Late Miocene- Pliocene in Sarawak	135