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Title of article The Mesozoic La Mula Island, Coahuila, Mexico

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TABLE A.

Modal Analyses of Granitic Rocks

Sample Number

	PM2	PM4	PM7	PM12	PM15	PM21	PM23
Quartz	14.0	18.1	20.1	18.2	22.1	18.4	27.0
Plagioclase	36.6	29.6	43.8	38.0	33.0	40.7	45.8
K-feldspar	30.9	41.4	2.05	25.2	32.0	28.5	9.6
Hornblende	14.7	7.5	16.9	12.3	7.8	4.6	8.3
Biotite	0.4	0.6	11.7	2.8	1.1	5.3	7.4
Sphene	1.7	1.8	2.2	1.3	1.0	1.5	0.18
Opaque	0.9	0.8	1.7	1.2	0.4	0.7	1.2
Apatite	0.5	0.18	0.18	0.19	0.17	0.3	0.5
Chlorite	0.3		1.4	0.10	0.5		
Epidote	0.08			0.5	1.8	0.09	tr
Zircon			tr				
Calcite				0.3	tr		
Rutile					tr		tr
Number of Points Counted	1195	1109	1123	1047	1156	1100	1130
Color Index	18.6	10.9	34.1	18.4	12.8	12.5	17.6
Name (Location)	Quartz Monzonite (Cerritos)	Granite (Cerritos)	Tonalite (Cerritos)	Granite (Cerritos)	Granite (Cerritos)	Granite (Cerritos)	Grano-diorite (Cerritos)

TABLE A.

Modal Analyses of Granitic Rocks (continued)

Sample Number

	PM27	PM36	PM40	PM41	OI5	SF2
Quartz	20.8	22.1	17.7	18.4	10.4	27.1
Plagioclase	59.9	35.6	36.1	38.9	55.7	46.6
K-feldspar	0.4	29.9	33.0	31.0	6.3	17.5
Hornblende	16.4	6.2	8.7	6.5	13.6	3.0
Biotite		3.2	2.4	3.4	12.6	4.1
Sphene	2.0	1.2	0.5	0.9	0.7	0.5
Opaque	0.19	1.0	0.8	0.6	tr	0.6
Apatite	0.3	0.5	0.3	0.4	0.2	0.1
Chlorite	0.09					
Epidote		0.4	0.4		0.5	0.5
Zircon			0.10			
Calcite						
Rutile						
Number of Points Counted	1070	1121	992	1034	1014	1000
Color Index	19.0	12.5	13.2	11.8	27.6	8.8
Name (Location)	Tonalite (W. of Cerritos)	Granite (Cerritos)	Granite (Cerritos)	Granite (Cerritos)	Quartz Monzo-diorite (N. of Mina)	Grano-diorite (El Fuste)

TABLE B.

Modal Analyses of Porphyritic Dikes

Sample Number

	PM1	PM9	PM19	PM29	PM35
Quartz	8.8	9.6	8.4	4.0	15.0
Plagioclase	57.2	42.4	44.5	50.5	52.5
K-feldspar	8.0	22.0	7.2	18.0	9.0
Hornblende	18.2	12.6	33.1	12.0	9.5
Biotite	7.0	11.9	4.2		10.0
Sphene	0.9	0.8	1.1	1.0	1.5
Opaque	tr	0.6	1.5	1.5	2.0
Apatite		0.1	tr	tr	tr
Chlorite					
Epidote		tr		13.0	0.5
Calcite		tr	tr		
Number of Points Counted	229	773	264	200	200
Color Index	26.1	26.0	39.9	27.5	23.5
Name (Location)	Quartz Micromonzo-diorite (Cerritos)	Quartz Micromonzo-diorite (Cerritos)	Quartz Micromonzo-diorite (Cerritos)	Quartz Micromonzo-diorite (W. of Cerritos)	Quartz Micromonzo-diorite (N. of Mina)

TABLE B.

Modal Analyses of Porphyritic Dikes (continued)

Sample Number

	PM3	PM10A	PM10B	PM20
Quartz	5	6.8	3.0	2.3
Plagioclase	60	56.0	37.5	68.1
K-feldspar	3.5	1.4	0.5	3.2
Hornblende	26	15.5	44.0	22.7
Biotite	2.0	16.4	13.5	
Sphene	1.0	2.7	1.5	
Opaque	2.5	1.4	tr	2.8
Apatite		tr		
Chlorite				
Epidote	tr			0.9
Calcite	tr	tr		
Number of Points Counted	200	219	200	216
Color Index	31.5	36.0	59.0	26.4
Name (Location)	Quartz Microdiorite (Cerritos)	Quartz Microdiorite (Cerritos)	Quartz Microdiorite (Cerritos)	Microdiorite (Cerritos)

TABLE B.

Modal Analyses of Porphyritic Dikes (continued)

Sample Number

	PM24	PM31	PM32	PM43
Quartz	1+	1.5	3.7	0.9
Plagioclase	60	45.9	65.7	58.9
K-feldspar	<5			0.14
Hornblende	35+	39.0	22.7	32.9
Biotite	<5	11.2		1.7
Sphene	1		0.8	0.4
Opaque	1	tr	7.0	5.1
Apatite	<1	1.0		
Chlorite	<1		tr	tr
Epidote	<1	1.5	tr	tr
Calcite	tr		tr	
Number of Points Counted	200 (phenos only)	205	242	714
Color Index	≈40	52.7	30.5	40.1
Name (Location)	Microdiorite (Cerritos)	Microdiorite (Mina)	Quartz Microdiorite (Mina)	Microdiorite (Cerritos)

TABLE B.

Modal Analyses of Porphyritic Dikes (continued)

Sample Number

	PM1	PM9	PM19	PM29	PM35
% Phenocrysts	45.9	35.8	23.9	6.0	15.5
Qtz.	2.1			2.0	2.0
Plag.	27.9	15.7	20.9	1.5	12.0
K-fsp.		2.3		0.5	
Hbl.	12.0	12.0	3.0	2.0	1.5
Bio.	3.9	5.8			
% Matrix	54.1	64.2	76.1	94.0	84.5
Qtz.	6.7	9.6	8.4	2.0	13.0
Plag.	29.3	26.7	23.6	49.0	40.5
K-fsp.	8.0	19.7	7.2	18.0	9.0
Hbl.	6.2	0.58	30.1	10.0	8.0
Bio.	3.1	6.1	4.2		10.0
Other	0.9	1.5	2.6	15.0	4.0
Name (Location)	Quartz Micromonzo-diorite (Cerritos)	Quartz Micromonzo-diorite (Cerritos)	Quartz Micromonzo-diorite (Cerritos)	Quartz Micromonzo-diorite (W. of Cerritos)	Quartz Micromonzo-diorite (N. of Mina)

TABLE B.

Modal Analyses of Porphyritic Dikes (continued)

Sample Number

	PM3	PM10A	PM10B	PM20
% Phenocrysts	9.0	9.5	15.5	8.0
Qtz.	2.5		1.0	
Plag.	4.5	8.5	9.5	5.5
K-fsp.				
Hbl.	1.5	1.0	5.0	2.5
Bio.	0.5			
% Matrix	91	90.5	84.5	92.0
Qtz.	2.5	6.8	2.0	2.3
Plag.	55.5	47.5	28.0	62.6
K-fsp.	3.5	1.4	0.5	3.2
Hbl.	24.5	14.5	39.0	20.2
Bio.	1.5	16.3	13.5	
Other	3.5	4.1	1.5	3.7
Name (Location)	Quartz Microdiorite (Cerritos)	Quartz Microdiorite (Cerritos)	Quartz Microdiorite (Cerritos)	Microdiorite (Cerritos)

TABLE B.

Modal Analyses of Porphyritic Dikes (continued)

Sample Number

	PM24	PM31	PM32	PM43
% Phenocrysts	6.0	5.9	4.3	14.2
Qtz.	1.0	0.5	0.4	0.6
Plag.	5.0	4.9	3.9	6.3
K-fsp.				
Hbl.	tr	0.5	tr	5.6
Bio.				1.7
% Matrix	94	94.1	95.7	85.8
Qtz.	?	1.0	3.3	0.3
Plag.	55	41.0	61.8	52.6
K-fsp.	<5			0.14
Hbl.	35	38.5	22.7	27.3
Bio.	<5	11.2		
Other	<5	2.5	7.8	5.5
Name (Location)	Microdiorite (Cerritos)	Microdiorite (Mina)	Quartz Microdiorite (Mina)	Microdiorite (Cerritos)

TABLE C.

Modal Analyses of Aplite-Leucogranite-Pegmatite

Sample Number

	PM5A	PM5B	PM11	PM13	PM14	PM34
Quartz	23.5	32.5	35.8	33.0	24.2	30.4
Plagioclase	34.0	33.5	21.2	32.5	42.8	33.2
K-feldspar	42.0	32.5	41.0	33.5	26.7	36.4
Hornblende		tr				
Biotite	tr	0.5	0.6	0.5	4.2	tr
Muscovite	tr	tr				
Sphene		0.5	0.4	0.5	1.3	tr
Opaque	0.5	0.5	0.4	tr	0.4	tr
Apatite		tr				tr
Allanite		tr	tr			
Chlorite			0.2			
Zoisite			0.1			
Epidote			0.3		0.4	
Number of Points Counted	200	200	1009	200	236	250
Color Index	0.5	1.5	2	1.0	6.3	0
Name (Location)	Aplite (Cerritos)	Leucogranite (Cerritos)	Aplite (Cerritos)	Pegmatite-Aplite (Cerritos)	Aplite (Cerritos)	Aplite (N. of Mina)

TABLE D.

Modal Analyses of Xenolith, Microdiorite, and Lineated Microdiorite

Sample Number

	PM8	PM6	PM17	PM25	PM28	PM37
Quartz	8.6	0.9	1.0	1	2	<5
Plagioclase	57.2	56.1	59.7	60	60	55
K-feldspar	1.0	0.6	6.0	<5		<5
Hornblende	25.3	36.4	18.9	5	30	30
Biotite	1.0	3.5	7.0	30	<5	10
Sphene	2.0	0.6	4.0	<5	<5	<5
Opaque	0.19	1.6	2.5	<5	<5	<5
Apatite	0.10	0.12	1.0	<5	<5	
Chlorite						
Epidote	4.5			<5	<5	<5
Calcite	0.3	0.12		<5		
Clay				<5		
Number of Points Counted	1052	854	201	none*	none*	none*
Color Index	33.1	42.2				
Name (Location)	Xenolith (Cerritos)	Microdiorite (Cerritos)	Microdiorite (Cerritos)	Microdiorite (Cerritos)	Microdiorite (W. of Cerritos)	Microdiorite (Cerritos)

*Grain size is too fine for meaningful point counts. Estimates are visual and imprecise.

TABLE E.

Chemical Analyses

Major Oxides, wt. %

Sample No.	OI5	PM4	PM21	PM23	PM11	PM8
SiO_2	53.70	63.35	64.45	64.75	72.15	55.60
Al_2O_3	14.58	14.27	13.82	14.56	13.76	15.76
TiO_2	1.28	0.77	0.60	0.67	0.18	0.82
Fe_2O_3	2.28	2.19	2.64	2.30	1.11	2.31
FeO	7.04	3.52	3.44	3.20	1.28	5.24
MgO	5.92	2.64	2.72	2.53	0.24	4.98
CaO	7.23	3.98	3.82	4.23	1.31	6.96
Na_2O	2.42	2.91	2.68	2.93	2.71	3.61
K_2O	1.70	4.31	3.51	2.95	6.23	1.61
MnO	0.16	0.08	0.20	0.11	0.02	0.17
P_2O_5	0.56	0.39	0.34	0.25	0.06	0.20
CO_2	0.18	0.22	0.16	0.15	0.15	0.22
H_2O+	2.54	1.09	1.42	0.99	0.48	2.17
H_2O-	0.12	0.10	0.06	0.04	0.05	0.10
SUM	99.71	99.82	99.86	99.66	99.73	99.75
	Quartz Monzodiorite	Granite	Granite	Granodiorite	Aplite	Xenolith

TABLE D.

Modal Analyses of Xenolith, Microdiorite, and Lineated Microdiorite
(continued)

Sample Number

	PM38	PM42A	PM42B	PM18	PM26	PM39
Quartz	11.9	10				8.8
Plagioclase	45.1	50	55	55	30	59.0
K-feldspar	0.15		<1	<5	<5	0.5
Hornblende	30.0	18	20	35	55	10.2
Biotite	10.0	17	20	5	10	18.3
Sphene	1.9	<5	<5	<5		1.3
Opaque	0.15	<5	<5	<5	<5	1.7
Apatite	0.3	<5	<5	<5	<5	
Chlorite						
Epidote	0.5	<5				
Calcite	tr	<5				0.16
Clay						
Number of Points Counted	670	none*	none*	none*	none*	611
Color Index	42.9					31.5
Name (Location)	Microdiorite (Cerritos)	Microdiorite (Cerritos)	Microdiorite (Cerritos)	Lineated Microdiorite (Cerritos)	Lineated Microdiorite (Cerritos)	Lineated Microdiorite (Cerritos)

*Grain size is too fine for meaningful point counts. Estimates are visual and imprecise.

TABLE E.

Chemical Analyses (continued)

Major Oxides, wt. %

Sample No.	PM6	PM38	PM39	PM9	PM43
SiO_2	55.15	57.50	61.35	61.60	61.05
Al_2O_3	17.95	15.96	15.78	15.06	16.74
TiO_2	0.80	0.94	0.70	0.64	0.69
Fe_2O_3	2.71	2.02	2.69	2.02	2.28
FeO	4.88	4.96	4.32	4.44	4.16
MgO	3.79	4.72	3.08	3.24	2.62
CaO	6.75	6.65	4.75	4.91	5.22
Na_2O	3.73	3.02	2.84	2.96	3.41
K_2O	1.56	1.96	1.88	3.11	1.86
MnO	0.13	0.10	0.09	0.10	0.08
P_2O_5	0.28	0.24	0.19	0.27	0.20
CO_2	0.24	0.18	0.32	0.35	0.13
H_2O+	1.59	1.48	1.75	1.38	1.18
H_2O-	0.11	0.04	0.06	0.05	0.05
SUM	99.67	99.77	99.80	100.13	99.67
	Microdiorite	Microdiorite	Lineated Microdiorite	Porphyritic Quartz Micro-monzodiorite	Porphyritic Microdiorite

TABLE E.

Chemical Analyses (continued)

Normative Mineralogy

Sample No.	OI5	PM4	PM21	PM23	PM11	PM8
Q	8.22	18.13	23.07	23.41	29.42	6.34
Or	10.05	25.47	20.74	17.43	36.82	9.51
Ab	20.48	24.62	22.68	24.79	22.93	30.55
An	23.90	13.15	15.31	17.86	5.16	22.04
Di	5.85	2.16	0.33	0.44		7.94
Hy	21.12	9.06	10.13	9.16	1.77	15.22
Mt	3.31	3.18	3.83	3.33	1.61	3.35
Il	2.43	1.46	1.14	1.27	0.34	1.56
Ap	1.33	0.92	0.81	0.59	0.14	0.47
Cc	0.41	0.50	0.36	0.34	0.34	0.50
C					0.67	
	Quartz Monzodiorite	Granite	Granite	Granodiorite	Aplite	Xenolith

TABLE E.

Chemical Analyses (continued)

Normative Mineralogy

Sample No.	PM6	PM38	PM39	PM9	PM43
Q	6.79	10.86	22.12	16.67	17.75
Or	9.22	11.58	11.11	18.38	10.99
Ab	31.56	25.56	24.03	25.05	28.86
An	27.63	24.21	20.30	18.62	23.77
Di	2.05	4.93		1.44	
Hy	14.09	15.44	12.39	12.98	11.29
Mt	3.93	2.93	3.90	2.93	3.31
Il	1.52	1.79	1.33	1.22	1.31
Ap	0.65	0.57	0.45	0.64	0.47
Cc	0.55	0.41	0.73	0.80	0.30
C			1.63		0.41
	Microdiorite	Microdiorite	Lineated Microdiorite	Porphyritic Quartz Micro-monzodiorite	Porphyritic Microdiorite

TABLE E.

Chemical Analyses (continued)

Trace elements, ppm

Sample No.	OI5	PM4	PM21	PM23	PM11	PM8
B	15	42	19	28	9	41
Ba	980	1150	830	920	1150	340
Co	26	5	12	15	<5	26
Cr	27	37	<10	23	<10	<10
Cu	115	160	49	65	362	242
La	57	62	28	17	29	<10
Li	19	17	24	19	7	21
Ni	82	20	26	33	<5	65
V	140	130	70	90	21	160
Y	32	21	13	12	11	14
Zn	165	125	110	130	68	210
Zr	240	320	81	210	170	80
Rb	97*	150	111*	84*	220*	105
Sr	756*	350	557*	639*	277*	497
Pb	19	23	24	34	46	29
Rb/Sr	0.13	0.43	0.20	0.13	0.79	0.21

Major oxide analyses were done by Kan Ramlal, the University of Manitoba. He reports the following standard deviations for replicate analyses: 0.20 for SiO_2= 59.60; 0.13 for Al_2O_3 = 9.34; 0.03 for Fe_2O_3 (total) = 10.08; 0.04 for FeO = 10.92; 0.10 for MgO = 4.04; 0.07 for CaO = 10.22; 0.01 for K_2O = 2.69; 0.05 for Na_2O = 4.20; 0.01 for MnO = 0.41; 0.02 for TiO_2 = 0.48; 0.06 for H_2O (total); 0.12 for Co_2 = 1.15; 0.01 for P_2O_5 = 0.20. Trace elements were done by Oiva Joensuu, University of Miami. Rb, Sr, Pb, and Zn were done by atomic absorption spectrometry and all other trace elements were by optical emission spectrography.

*Isotope dilution data (Table 7)

TABLE E.

Chemical Analyses (continued)

Trace elements, ppm

Sample No.	PM6	PM38	PM39	PM9	PM43
B	26	12	15	12	22
Ba	360	820	580	1200	660
Co	21	14	<5	20	11
Cr	45	190	80	70	32
Cu	132	97	195	48	94
La	10	10	10	62	28
Li	20	26	28	19	24
Ni	51	70	52	65	32
V	190	290	220	120	190
Y	11	<5	<5	23	16
Zn	145	125	130	133	120
Zr	140	320	220	16	190
Rb	91	69	80	103	96*
Sr	840	550	540	570	578*
Pb	17	29	21	29	37
Rb/Sr	0.11	0.13	0.15	0.18	0.17