

Texture, Carbonate Content and Component Composition of Mauritius Beach Sands, Indian Ocean

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ABSTRACT

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Samples collected from beaches bordering the southern, southeastern, western and northwestern shores representing swell (windward) and non-swell (leeward) dominated environments of the island of Mauritius were studied in order to define grain size, carbonate content and component composition. The results indicated that the sediments are coarse to medium sands ($M_z = 0.28$ to 1.97ϕ), well to moderately well sorted ($\sigma_1 = 0.50$ to 0.72ϕ) and symmetrical to negatively skewed (0.05 to -0.30 ski) along the windward beaches, while they are coarse to fine sands ($M_z = 0.53$ to 2.16ϕ), well to moderately sorted ($\sigma_1 = 0.49$ to 0.91ϕ) and symmetrical to negatively skewed (0.12 to -0.29 ski) along the leeward beaches. Coarsest grain size was recorded at the southern part of the island where the beach is more exposed to the open ocean swell waves while the sediments were fine grained along the leeward (western) beaches and in the regions partly protected by reefs. Beach sands are composed mainly of foraminiferal tests which vary from 45 to 91.6%. The discoloured foraminiferal tests in the backshore region of Pointe aux Sables beach on the western shore and at Souillac and Baie du Cap along the southern shore reflect a relict source [Holocene age(?)], probably containing grains reworked from nearby anaerobic environments. The carbonate content of the beaches ranges from 94 to 99% indicating the biogenic nature. However, the non-biogenic fraction, besides rock fragments and feldspars is composed predominantly of olivine, followed by opaques (ilmenite and magnetite), pyroxenes and amphiboles and indicates a volcanic rock source.

ADDITIONAL INDEX WORDS: *Mauritius beach sands, sediment texture, carbonate content, component composition.*

INTRODUCTION

The volcanic island of Mauritius (Figure 1), which is about 1865 km² in area, lies in the Indian Ocean south of 20°S lat. and about 800 km east of Madagascar. A detailed account of its physiography, general geology, and coral distribution has been presented by earlier workers (WALKER and NICOLAYSEN, 1954; McDOUGALL and CHAMALAUN, 1969; MONTAGGIONI, 1974; BAXTER, 1975, 1976; FAURE and MONTAGGIONI, 1976; MONTAGGIONI and MAHÉ, 1980; UPTON, 1982). However, not much information is available on the beaches bordering the island. Hence an attempt has been made in this communication to describe the textural characteristics, carbonate content, skeletal and mineral composition of recent sands from windward (swell) and leeward (non-swell) shores of the island of Mauritius.

STUDY AREA

Geological Setting

Mauritius was built up during three main dome building phases originating at the southern end of the Mascaraean Plateau (McDOUGALL and CHAMALAUN, 1969) giving rise to the Older, Intermediate, and Younger Series. The Older Series composes a highly differentiated transitional basalt-trachyte suite consisting of ankaramite, oceanite, olivine basalts, feldsparphyric basalts, hawaiiite, and mugearite. The Intermediate and Younger Series consist entirely of basic lavas, viz, alkali olivine basalts, basanites, and nephelinites. In general, the mineralogical composition of these rock types comprises plagioclase, olivine, clinopyroxene, titanomagnetite, kaersutite, apatite, rutile, nepheline, ferroaugite as major constituents, while aegirine augite, aenigmatite, anorthoclase, and fayalite form the groundmass (BAXTER, 1975, 1976;

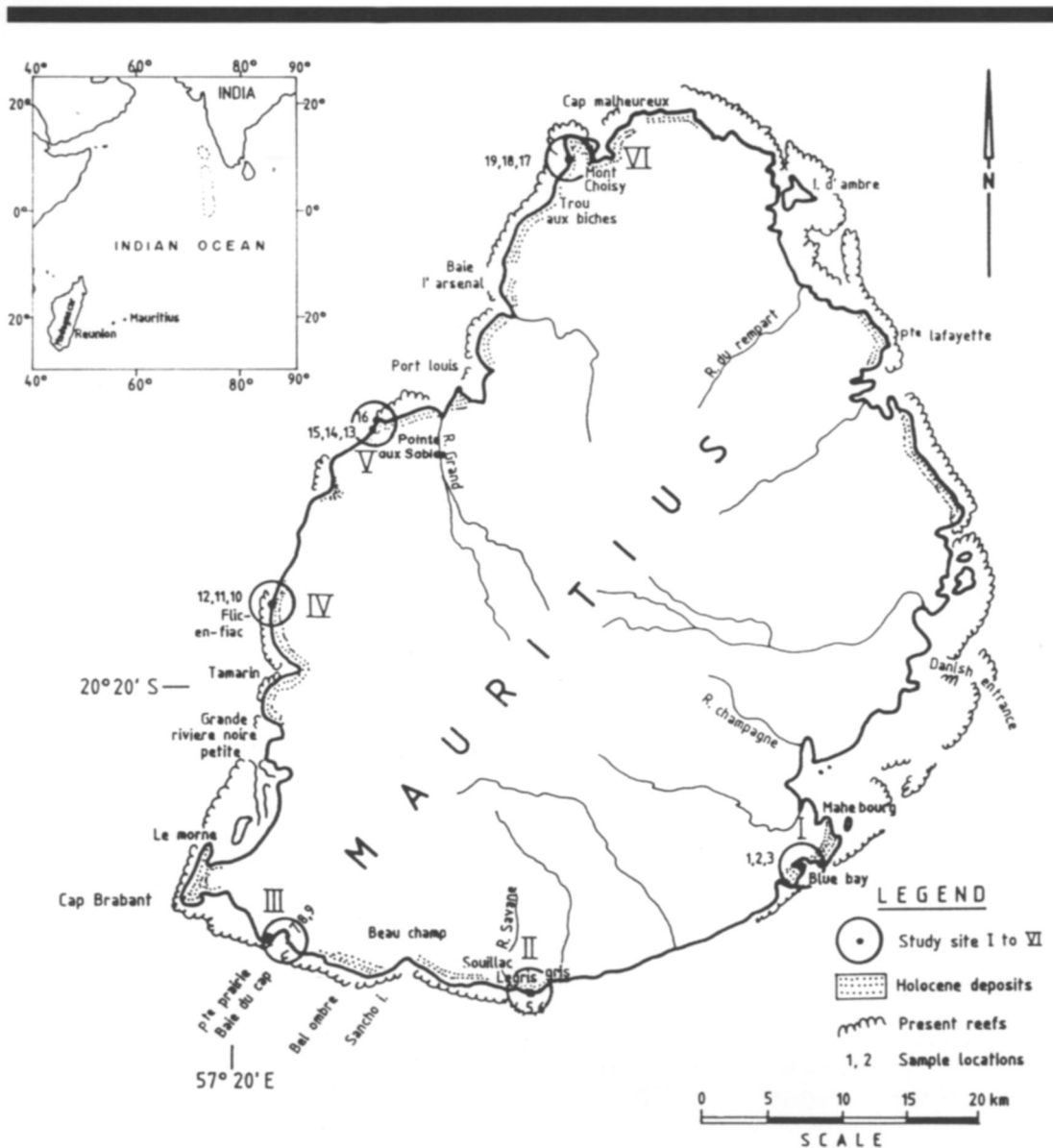


Figure 1. Map showing location of study sites along with sampling locations. The distribution patterns of Holocene deposits and reefs shown in this figure are after MONTAGGIONI (1974). Inset shows location of Mauritius Island in the Indian Ocean.

UPTON, 1982). K-Ar dating by McDOUGALL and CHAMALAUN (1969) has established the time span of the series as 7.8 to 5.5, 3.5 to 1.9, and 0.7 to 0.17 Ma.

The northern part of the island is a plain while the centre is a plateau rising to a height of about 670 m and bordered by low mountain

remnants of a large volcano. The south of the island is largely mountainous.

The island is surrounded by a large submarine platform (maximum width 25 km), allowing the development of extensive coral reefs (MONTAGGIONI, 1974). The reefs which are discontinuous, delineate a series of lagoons,

broader on the east coast (up to ~ 7.5 km) than on the west, with an average depth of about 1 to 2 m. The lagoon sediments range in size from coarse gravel to fine sands and are composed mainly of broken fragments of corals, calcareous algae, foraminifera, echinoderms, gastropods and crustaceans (PICHON, 1971; MONTAGGIONI and MAHÉ, 1980).

The island of Mauritius is characterised by a crenulate coastline (Figure 1a), exposed to widely varying wave activity. The southwest coast of the island is made up of basaltic rocks while the remaining parts of the coast is largely covered by carbonate sands with corals, molluscan shells and to a lesser extent echinoderm debris and foraminifera. However, in the vicinity of the river mouths, fine-grained sediments derived from the river basins prevail. Intertidal notches and beach rock also occur at places. During the last glacial regression, an

extensive complex of aeolianites formed along the southern and eastern parts of the island. Reef banks and reef platforms occur southwest of Blue Bay and at Souillac, respectively. Most of the reef tracts, which grew to a height of 6 m above present sea level, and their main geomorphological features appear to have evolved during the Holocene transgression (MONTAGGIONI, 1974).

Environmental Factors

The climate of Mauritius is tropical in summer and subtropical in winter. Rainfall occurs mostly between January and May, while from September to November rainfall is usually low. Annual rainfall varies between 1000 mm on the west coast to more than 1500 mm on the southeast coast. The central plateau receives about 5000 mm of rain. Numerous streams, often flow-



Figure 1a. Photograph showing crenulate coastline, Mont Choisy.

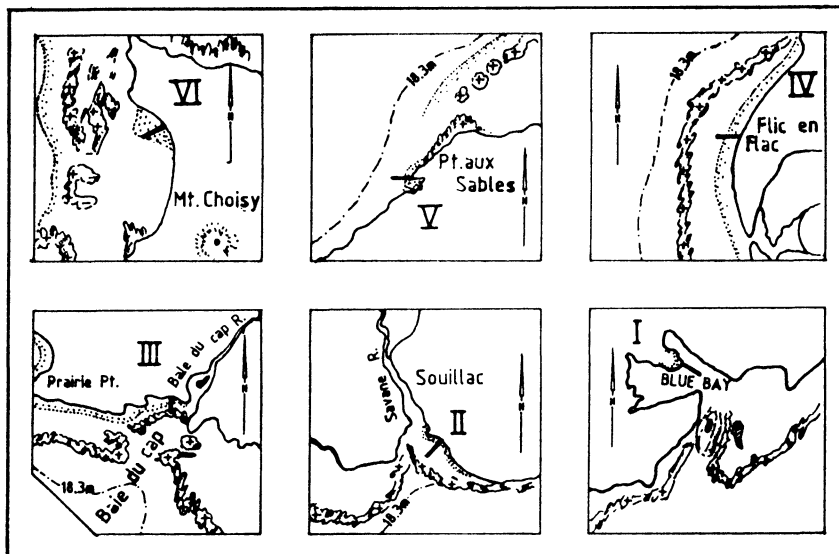


Figure 2. Environmental setting of the studied beaches together with sampling transects.

ing through deep ravines, discharge either directly into the ocean or through lagoons. During heavy rains, these streams become torrents. Southeast trade winds blow most of the year, but mainly during the cool season (May to October). Thus, the SE swell waves generated by these trade winds prevail during the above period. Although the west coast between Cap Brabant and Cap Malheureux is protected against the SE swells (PICHON, 1971), swell waves generated by the westerly winds of the south latitudes (STODDART, 1971a) after undergoing refraction and diffraction may probably be effective in giving rise to changes in shoreline morphology and the associated sediments. Apart from trade winds, tropical storms and depressions accompanied by strong winds, high rainfall and heavy swell affect the region during the hot season (November to April). This area experiences semi-diurnal tides in microtidal range with a spring tidal range of 0.6 m.

MATERIAL AND METHODS

Sediment Sampling and Analyses

Sediment samples were collected within the inter-tidal zone—the region between the berm and the low water mark of the beaches border-

ing the bays, beaches directly exposed to open ocean swells, and beaches experiencing differential shelter from the existing offshore reefs of the Mauritius island (Figures 2 and 3; Table 1) in February 1981 (KARISIDDAIAH, 1985). Three samples from each of the beaches (Table 1) were obtained by pressing a plastic core-liner of 5 cm internal diameter into the beach face. The upper 4 cm thick sediment column was sampled, after removing the top few layers (lag deposit), following the methodology described in VEERAYYA (1972), VEERAYYA and VARADACHARI (1975), and RAMANA MURTY *et al.* (1986).

In the laboratory, samples were analyzed for their particle size distribution at 0.5 ϕ interval following the standard method of sieving (KRUMBEIN and PETTIJOHN, 1938). From these data, grain size parameters, viz, mean grain size, standard deviation and skewness of the sediments were calculated using the formulae of FOLK and WARD (1957).

The total carbonate content (which includes the carbonates of calcium and magnesium) in the samples was estimated by dilute acid digestion method of MOLNIA and PILKEY (1972). In order to understand the relative abundance of the various carbonate sediment constituents within the coastal environments one represen-

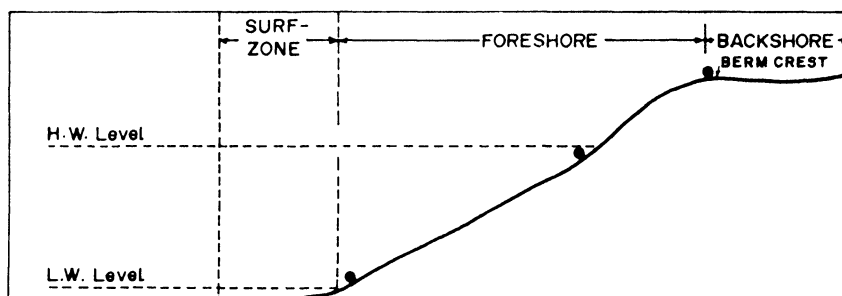


Figure 3. Schematic cross-sectional profile showing the terminology of the beach adopted; dots indicate sampling locations.

tative sample from each beach was selected and studied under a binocular microscope. In addition, 2 samples, one each from berm/backshore region of Baie du Cap and Pointe aux Sables were also studied, as they contained black shells. Thirteen coarse fraction components were identified and their percentages computed. In addition, heavy minerals were separated from the acid treated 0.25 to 0.125 mm (2-3 ϕ) and 0.125 to 0.063 mm (3-4 ϕ) size fractions of five representative samples using standard bromoform heavy liquid technique. Subsequently, the heavy and light mineral fractions were weighed and their weight percent determined; then the heavy minerals were mounted on slides for identification and counting under a petrographic microscope.

RESULTS AND DISCUSSION

Texture

An examination of grain size data of Mauritius beach samples calculated on weight percentage basis has shown that they consist of negligible to 8% of pebble-granule size particles. Concentration of this material is relatively high at Souillac, Blue Bay and Baie du Cap along the southern shores and at Flic en Flac on the west. The concentration decreases to ~ 2% at Pointe aux Sables; it decreases further at Mont Choisy to < 0.2%.

Grain size distribution data indicate that the berm/backshore is composed of 1 or 2 modes in the coarser grain size viz pebble-granule grades. At Baie du Cap, the apparently more exposed beach along the southern shore, it is composed of a third mode in medium sand

grade. Major mode generally lies in coarse to fine sand grades, with greater percent of material in very coarse to fine sand grades. The foreshore (HW and LW) sediments have mostly two minor modes in pebble-granules and a major mode in very coarse to fine sand grades. The sediments at Souillac are mainly composed of very coarse to medium sands while those at Baie du Cap are in coarse to medium sand grades. Beaches along the (non-swell) western shores of the island contain higher percent of medium to fine sands than those along the swell dominated southern shores where very coarse to medium/fine sands prevail (Figure 4). These variations have been very well reflected in the grain size parameters.

Table 1 shows that the sediments of the beaches under investigation are coarse to fine sands ($M_z = 0.28$ to 2.16ϕ), well to moderately sorted ($\sigma_1 = 0.49$ to 0.91ϕ ; $av: 0.65 \phi$) and positively to negatively skewed (0.12 to -0.29 ski). The majority of the samples are medium sand grade, and moderately well sorted and near-symmetrical to negatively skewed. The coarsest grain size is encountered at Souillac beach on the windward (southern) side of the island of Mauritius where the sands from the foreshore are typically the coarsest among all the samples studied and reflect the nearness to source *i.e.*, the river Savane and reefs and the available higher wave energies in the immediate offshore region due to open ocean swells. Examination of coarse fraction (> 0.063 mm) shows that skeletal components which are concentrated in larger size grades occur in abundance at this location. Besides, volcanic-rock fragments presumably derived from the Savane river basin occur in appreciable percentages

Table 1. Grain Size Characteristics and Carbonate Content of Mauritius Beach Sands along with Environmental Features.

Area	Environmental Features	Sample No.	Location	Grain Size Parameters			Carbonate %
				Mean Grain Size $M_z \phi$	Std. Dev $\tau \phi$	Skewness Ski	
Blue Bay	Bay-side beach, a sheltered environment, protected from offshore reefs which are situated 1.5 km away from the shore.	1	B	1.97	0.69	- 0.0347	99.47
		2	HW	1.37	1.29	- 0.3020	99.20
		3	LW	1.62	0.72	- 0.1273	98.70
Souillac	A partly sheltered environment; reefs are located approximately 0.2 km away from the shore.	4	B	0.36	0.65	- 0.0913	98.80
		5	HW	0.28	0.50	0.0440	99.10
		6	LW	0.52	0.53	- 0.2119	99.25
Baie du Cap	A sheltered environment, protected from SW, SE swells by reefs while exposed to southerly swells.	7	B	1.13	0.64	- 0.1689	94.40
		8	HW	1.02	0.63	0.0465	93.90
		9	LW	0.94	0.52	- 0.2700	94.50
Flic en Flac	A convex seaward shore sheltered by reefs nearly 0.5 km away.	10	B	1.83	0.49	0.1178	99.25
		11	HW	1.23	0.91	0.0609	99.10
		12	LW	0.53	0.88	0.0708	98.60
Pointe aux Sables	Exposed to open ocean swells from W and NW. Reefs are present on the northern side of the beach.	16	BKS	1.48	0.88	0.0476	99.65
		13	B	0.79	0.70	- 0.1121	98.60
		14	HW	1.82	0.59	- 0.1510	99.65
Mont Choisy	Gently sloping offshore topography; isolated reefs are present about 0.5 km away from the shore.	15	LW	2.02	0.54	- 0.0885	99.85
		17	B	1.75	0.67	- 0.1427	99.15
		18	HW	2.16	0.52	- 0.2938	99.35
		19	LW	1.32	0.62	0.0298	98.75

BKS—Backshore, B—Berm crest, HW—High Water, and LW—Low Water mark.

(Table 2) which may also have given rise to larger mean size. In contrast, the sediments of Pointe aux Sables and Mont Choisy beaches on the western and northwestern (leeward) side of the island of Mauritius are relatively fine grained and have the smallest mean size (higher M_z values), while the sediments of Baie du Cap and Flic en Flac beaches have their mean size in between. The sediments show relatively good sorting at coarser as well as finer mean size (Table 1). The near symmetrical skewed distribution reflects a single major size grade (Figure 4). The offshore regions of these beaches are either apparently devoid of reefs or the reefs occur too far offshore to provide sediment for the beach (Table 1). Because of the presence of reefs at shallower depths, some part of incoming wave energy gets dissipated over the reefs. Nevertheless, residual waves and waves uninterrupted by the reefs propagate over the prevailing (shallow?) offshore topography between the reefs and the beach for a longer time before they break, and give rise to better sorted sediments. However, the sediments of the bay-side beach at Blue Bay in the southeastern side of Mauritius island are also relatively fine grained, and probably indicate the low wave energy environment, being partly sheltered from wave action and farther from the

open ocean energy environment. Therefore, the somewhat better sorted nature of these carbonate sands suggests that though some of the beaches as mentioned earlier, are partly sheltered by the reefs located at different distances from the direct wave attack (Table 1), receive wave energy sufficient enough to generate swash-backwash action for sorting out the present day shore sands. The grain size data across the beach, in general, reveal that the sediments at the low water mark are relatively coarse grained. The coarse grain size and less well sorted nature of some samples could be due to the presence of a mixture of several size material ranging from pebble-granule to coarse silt grades (Figure 4). Such a wide range, atypical grain size parameters have also been recorded along the beaches of Diego Garcia (STODART, 1971b).

Carbonate Content

Table 1 also shows that these sediments are mainly composed of calcium carbonate grains. The carbonate content of the Mauritius beaches ranges from 94 to over 99%, the highest values being recorded at Pointe aux Sables, Blue Bay, Souillac, Flic en Flac and Mont Choisy. As mentioned earlier, the beach sands at Baie du Cap

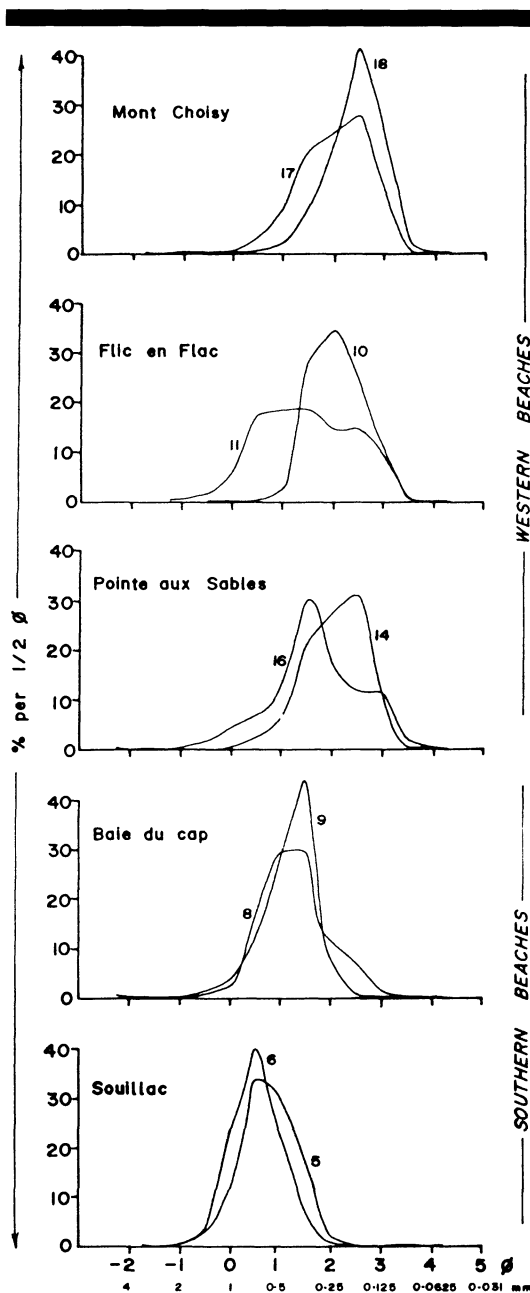


Figure 4. Size-frequency distribution of representative samples from southern and western shores of Mauritius Island. Numbers in the graphs indicate sampling stations.

and Pointe aux Sables contain a few percentage of terrigenous material. Also the berm samples at Blue Bay and Souillac do contain terrigenous components but of insignificant amount. These

sands are virtually pure carbonates and may be classified as calcareous (biogenic) sands following the classification of EMERY *et al.* (1952).

Constituent Grains and Skeletal Components

These sands consist of foraminifera, sponge spicules, pteropods, bryozoans, corals, worm tubes, bivalves, gastropods, echinoid spines, algae, rock fragments, and black shells of dead organisms (Table 2). In general, foraminifera are by far the largest component encountered at all the sites investigated with a percentage variation of 45.7 to 91.6%. They show wide variation per gram of sediment. Of the foraminifera, *Amphistegina lessoni* is a dominant one at Pointe aux Sables constituting more than 90% of total fauna, and abundance of this species is probably due to transport by water currents far from their natural habitat. Contrastingly the backshore sediments (sample 16) collected a little north of this transect (Figure 1) near the Grande river are characterised by very poor percentage of foraminifera (45.7%), the lowest recorded in these beaches. This shows that (1) the present day foraminifera prevailing in the adjoining beach and the offshore region do not get transported vigorously to the uppermost reaches of the beach, and (2) also the dilution effect of the Grande river on the abundance of fauna.

At all these beaches, excepting in Blue Bay, the skeletal components are typically black, or buff coloured. Blackening *i.e.* discolouration in a range of shades from black to greyish black, is largely confined to foraminiferal species of *Quinquiloculina*, *Amphistegina*, *Marginopora*, and *Peneroplis*; also worm tubes, molluscs and coralline algae. The factors giving rise to blackening of material in different environmental settings have been presented by PILKEY *et al.* (1969). The blackening of shells might have been caused due to the reducing environmental conditions which normally occur in modern muddy nearshore environment (MAIKLEM, 1967; MILLIMAN and EMERY, 1968; PILKEY *et al.*, 1969). Considerable quantity (Table 3) of black shells comprising molluscan and foraminiferal tests noticed along the Mauritius shores suggests that the sediment includes grains reworked from nearby anaerobic environment (L. MONTAGGIONI, pers. comm.), the

Table 2. Abundances of Different Constituent Grains and Skeletal Components from Mauritius Beach Sands

Area	Blue Bay	Souillac	Baie du Cap		F ^o en Flac	Pt aux S		Mt Choisy
Sample No.,	2	5	7	8	11	14	16	18
No. of Foraminifera/gm	107	276	752	120	172	361	64	92
	percent							
Foraminifera	70.39	70.0	61.8	54.5	66.2	91.6	45.7	50.0
Gastropods	4.60	7.2	7.0	14.5	15.4	1.0	20.0	24.5
Pteropods	9.87	1.3	6.3	3.6	—	0.8	—	8.2
Bivalves	0.67	0.3	2.6	5.5	1.5	0.5	—	2.0
Bryozoans	—	2.8	4.3	5.5	—	2.8	—	2.0
Echinoid spines	7.9	2.0	6.3	5.5	6.1	1.3	2.3	2.0
Worm tubes	—	2.0	4.3	5.5	4.7	0.3	8.6	6.0
Sponge spicules (?)	—	—	—	—	3.1	—	—	—
Algae	6.57	3.6	4.9	5.5	3.1	1.0	—	4.1
Corals	—	2.5	—	—	—	—	5.7	—
Rock fragments	—	3.6	tr	—	—	0.8	2.8	tr
Black shells	—	4.1	2.5	tr	tr	tr	14.3	1.1

tr—traces

Table 3. Heavy Mineral Components in Fine Sand (2–3 ϕ ; 0.25–0.125 mm) and Very Fine Sand (3–4 ϕ ; 0.125–0.063 mm) Fractions of Mauritius Beaches

Area	Sample No.	Size Fraction in ϕ	Minerals %				
			Olivine	Pyroxenes	Amphiboles	Opaques	Unknowns
Souillac	6	2–3	32.4	9.7	10.2	32.3	15.0
		3–4	47.7	3.2	19.0	23.9	6.3
Baie du Cap	9	3–4	43.7	14.3	12.3	21.0	8.6
		2–3	50.7	13.5	9.6	22.7	3.4
Flic en Flac	11	3–4	45.9	14.6	9.6	26.7	3.0
		2–3	53.5	0.5	14.0	21.0	10.8
Pointe aux Sables	13	3–4	19.6	8.1	16.0	44.4	12.0
		2–3	54.4	1.2	6.0	27.2	11.2
	16	3–4	38.9	11.9	11.5	31.0	6.8

For sample locations and positions, see Figure 1 and Table 1.

location of which is not possible to indicate due to the paucity of data on environmental conditions.

Volcanic Rock-derived Components

The heavy minerals in 0.25–0.125 mm (2–3 ϕ) size fraction range from 0.001 to 0.01% of the bulk sample, while in 0.125–0.063 mm (3–4 ϕ) size fraction they constitute 0.003 to 0.05%. In these fractions the heavy minerals range from 66 to 84% and 81 to 89%, the maximum being present at Pointe aux Sables (backshore). The heavy mineral assemblage is characterised by olivine, pyroxenes, amphiboles, opaques (ilmenite, magnetite), and unknowns. Some of

their characteristic features and abundances (Table 3) are described briefly below:

Olivine: Olivine dominates the heavy mineral percentage. It ranges from 20–55%, maximum being present in the fine sand fraction. Olivine is relatively more on the western side beaches than in the south. It occurs as irregular and fractured grains.

Pyroxenes: Pyroxenes comprising mostly of aegirine range from < 1 to 15%, being relatively more at Baie du Cap and Flic en Flac beaches. Augite is present but its abundance is scarce.

Amphiboles: Amphiboles percentage var-

ies from 10–20. They are more at Pointe aux Sables, Souillac, and Baie du Cap regions. Both basaltic hornblende and hornblende occur in these sediments. The former is brown to black while the latter is pale yellow to light green and exhibit fibrous nature with inclusions.

Opaques: Opaques mostly ilmenite and magnetite and their altered derivatives range from 20 to 45%. Their percentage is more on the Pointe aux Sables beach while their occurrence is fairly uniform at the other beaches.

Light minerals: The light minerals consisting mostly feldspars, in general, range from 10 to 35%, the highest being present at Souillac. They are mostly concentrated in the fine sand fraction.

The detrital mineral assemblage dominated by olivine, followed by opaques, pyroxenes, amphiboles together with feldspars indicates the characteristic terrigenous source, largely reflecting a volcanic rock source. The sharp angular detrital material relative to the fairly smooth, polished and often subrounded carbonate components of the beaches suggests their limited transportational history.

SUMMARY

The salient features of the investigations on Mauritius beach sands are summarised below.

(1) Windward (swell dominated) beaches along the southern shores of the island are composed of relatively higher percentage of coarser grain size particles, compared to the leeward (non-swell) beaches on the west. The former are characterized by coarse-medium, well-moderately well sorted and symmetrical to negatively skewed, while the latter are composed of coarse-fine, well-moderately sorted and symmetrical to negatively skewed distributions.

(2) The beach sands are mainly made up of CaCO_3 (93–99%), the leeward beaches along the western shores being relatively rich. These sands are predominantly composed of foraminifera, gastropods, pteropods, bryozoans, and echinoid spines, foraminifera being dominant. Typical discolouration ranging from black to greyish black of foraminifera species *Quinquiloculina*, *Amphistegina*, *Marginopora*, and *Penetroplis* suggest a relict source, presumably grains reworked from anaerobic environments.

(3) The association of terrigenous components consisting of olivine, pyroxenes, amphiboles, opaques, besides feldspars reflects a nearby volcanic source.

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□ RESUMEN □

Muestras acumuladas sobre las playas que bordean las costas del Sur, Sudeste, Oeste y Noroeste representando el oleaje (barlovento) y el no-oleaje (sotavento) dominante en los alrededores de la Isla de Mauricio son estudiados en orden a definir el tamaño del grano, carbonato contenido y composición de sus componentes. Los resultados revelaron que los sedimentos a barlovento de las playas son de gruesos a arenas medianas ($M = 0.28$ a 1.97ϕ), bien a moderadamente bien clasificados ($G = 0.50$ a 0.72ϕ) y simétricos a negativamente sesgados (0.05 a -0.30 ski), mientras que a sotavento de gruesas a arenas finas ($M = 0.53$ a 2.16ϕ), bien a moderadamente bien clasificados ($G = 0.49$ a 0.91ϕ) y simétricos a negativamente sesgado (0.12 a -0.29 ski). El tamaño de los granos más gruesos es encontrado en la parte sur de la isla donde la playa está expuesta al oleaje de las olas del océano abierto, mientras los sedimentos son más finos en las playas a sotavento (oeste) y en las regiones protegidas por los arrecifes. Las arenas de la playa están compuestas principalmente por restos foraminíferos que varían desde 45 a 91.6%. Los restos foraminíferos decolorados en la región posterior costera de la playa Pointe aux Sables en la costa Oeste y en Souillac y Baie du Cap en la costa Sur, reflejan una fuente antigua (Edad Holocena), probablemente contengan granos elaborados en medios ambientes anaeróbicos cercanos. El carbonato contenido de las playas varía desde 94 a 99% indicando la naturaleza biogénica. No obstante, la fracción no-biogénica, además de los fragmentos de roca y feldspatos está compuesta predominantemente de olivina, seguido por ilmenita y magnetita, piroxenos y anfíboles e indican una fuente de roca volcánica.—*Department of Water Sciences, University of Santander, Santander, Spain.*

□ RÉSUMÉ □

Etude la granulométrie, les teneurs en carbonates et la composition mineralogique d'échantillons provenant de sites en position d'abri ou non, situés sur le littoral S, SE, W et NW de l'île Maurice. Le long des plages exposées, les sédiments sont grossiers à moyens, le triage moyen est bon, les courbes granulométriques sont symétriques ou d'asymétrie négative. Le long des plages abritées, les sédiments sont grossiers à fins, les autres caractéristiques demeurent inchangées. Les sédiments à grains les plus grossiers ont été trouvés au Sud, là où l'exposition aux vagues est la plus forte; les plus fins, sur la côte Ouest, en des zones bien protégées par des récifs. Les sables des plages sont principalement constitués de tests de Foraminifères (45 à 91%) dont certains, décolorés, pourraient être le reliquat d'une source Holocène. Les teneurs en carbonates biogènes sont comprises entre 94 et 99%. La fraction non biogène, outre des fragments de roche et des feldspaths est composée en majorité d'olivine, puis d'opacques (manétite, ilmenite), de pyroxènes et d'amphiboles d'origine volcanique.—*Catherine Bressolier, EPHE, Montrouge, France.*

□ ZUSAMMENFASSUNG □

Proben von den südlichen, südöstlichen, westlichen und nordwestlichen Stränden der Insel Mauritius, welche dünungs- (Luv) und nicht-dünungsabhängige (Lee) Auslagen repräsentieren, wurden untersucht, um Korngrößen, Karbonatgehalt und Zusammensetzung zu studieren. Die Ergebnisse offenbaren, daß die Sedimente grob bis mittelgrob ($M_z = 0,28$ bis $1,97 \phi$) und gut bis mäßig gut ($\sigma_1 = 0,05$ bis $0,72 \phi$) sortiert und symmetrisch bis negativ schräg verteilt ($0,05$ bis $-0,30$ ski) an den luvgelegenen Stränden sind, während die leegelegenen grobe bis feine Sande ($M_z = 0,53$ - $2,16 \phi$), gut bis mäßig sortiert ($\sigma_1 = 0,49$ - $0,91 \phi$) und symmetrische bis negativ schräge Verteilung ($0,12$ bis $-0,29$ ski) aufweisen. Die größten Korngrößen wurden im Südteil der Insel gefunden, wo die Strände mehr der offenen Ozeandünung ausgesetzt sind, während an den leeseitigen (westlichen) Stränden und im Schutze von Riffen feinere Sedimente auftreten. Strandsande bestehen meist aus Foraminiferen-Bruchstücken (zwischen 45 und 91.6%). Die farblosen Foraminiferenschalen der backshore-Region von Pointe aux Sable im Westen und bei Souillac und der Baie du Cap im Süden deuten auf Reliktsedimente (Holozän?), welche möglicherweise aus sauerstoffarmem Milieu in der Nachbarschaft aufgearbeitet wurden. Der Karbonatgehalt der Strände reicht von 94 bis 99% und deutet darauf hin. . . .—*Dieter Kelletat, University Essen, Federal Republic of Germany.*