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**THE FAUNA OF THE PORT ROYAL MANGAL, KINGSTON,
JAMAICA**

by

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ABSTRACT

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An analysis and a characterization are presented of the Port Royal mangrove fauna. The existing literature on the subject is extensively reviewed and a fauna list is given, comprising all species found in the area. A total of 314 species was recorded. The paper is intended to be a contribution towards an effective management of Caribbean mangals, through an understanding of the total fauna.

Key words: mangrove ecology, Jamaica, conservation, fauna list Port Royal mangal.

INTRODUCTION

An investigation of the development and status of the mangrove ecosystem at Port Royal, Jamaica was undertaken from February, 1988 to September, 1989 (ALLENG 1990a). This area had been studied since at least the 1800's (ANDREWS 1892) and more recently by a number of researchers from the nearby Port Royal Marine Laboratory of the University of the West Indies, which was established in 1955. However, it was found that a comprehensive investigation of the fauna of the swamp had never been undertaken and relatively few taxonomic groups had been studied by these earlier workers.

An attempt was made to collate all the existing published taxonomic ma-

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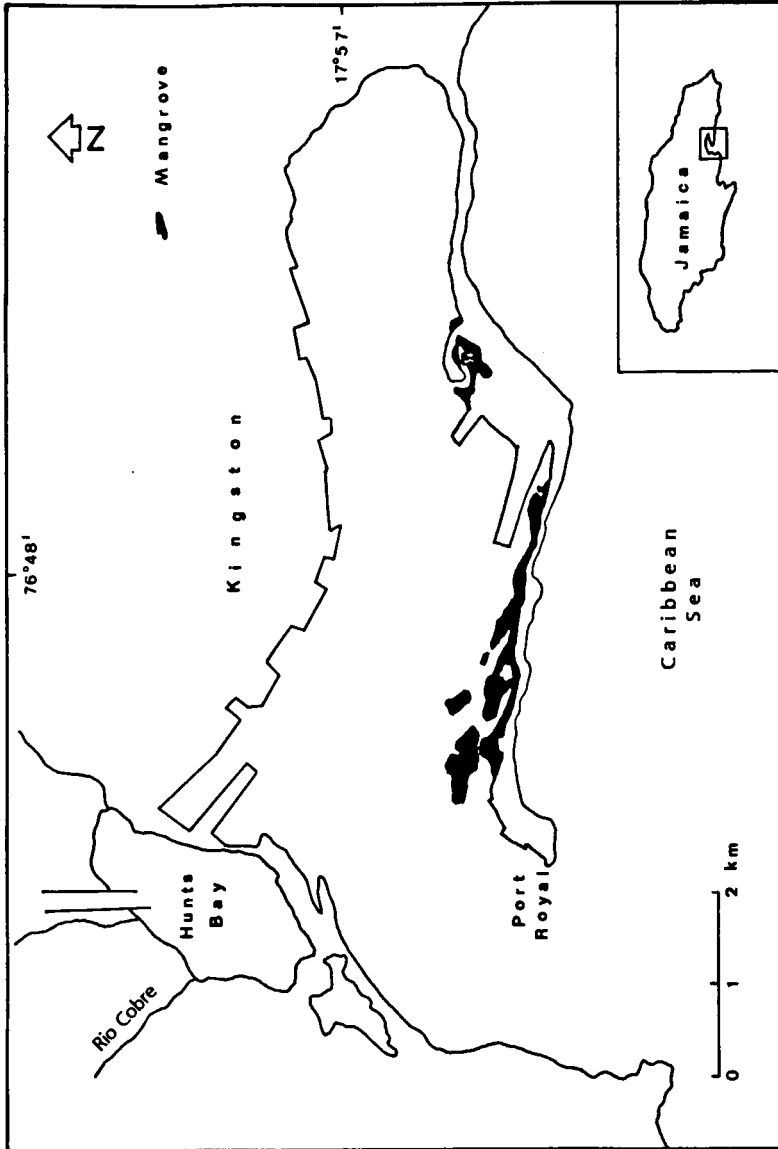


Figure 1. Map of Kingston Harbour and Port Royal, Jamaica.

terial on the area, to upgrade these data with new collections, especially for those groups of animals not previously described, and to produce a faunal list which would aid comparison with other mangrove swamps or mangals. The only comprehensive account of a Caribbean island mangal fauna located was that of BACON (1970, 1977) for the Caroni Swamp, Trinidad. The analysis and characterization of the Port Royal mangrove fauna was thought to be of value, not only to future investigators working out of the Port Royal Marine Laboratory, but to those responsible for managing this natural resource area. Studies by WADE (1976) on the associated Kingston Harbour, by ALLENG & BACON (in press) on ambient water quality and by CHOW & TOLAN (in press) on solid waste suggest that the Port Royal area is subjected to severe pollution stress. A detailed checklist can provide a baseline for understanding any effects of this pollution on the mangrove fauna.

LOCATION

The Port Royal mangal (17° 56' N, 76° 49' W) is a fringe mangrove community type located on the northern shore of the Palisadoes spit (Fig. 1), and forms the southern boundary of Kingston Harbour, Jamaica. The wetland includes 6 ha of mangrove forest, bordered on its southern flank by terrestrial thorn-scrub association. The associated lagoons display saline conditions (annual average range is 28-35‰) with little diurnal change (average diurnal variation is <1‰). The system can at times display brackish (hyposaline) conditions, with salinities reaching as low as 10.9‰ (SIUNG 1976). However, these low salinities occur during extreme flood events and are of relatively short duration.

The study area included a number of sub-habitats:

Rhizophores: These represent the only firm substrate on which sessile animals can attach in the mangal.

Lagoons: The sides of these water bodies drop off sharply in some cases, with the benthic substratum varying from seagrass beds in the shallow areas, to gravel or soft muds covered with algae in the deeper regions.

Trees: These are the aerial parts of the mangroves.

Salinas: These barren areas of mangrove forest have developed similar to

those described by MACNAE & KALK (1962) and BACON (1970), where there has been the dying back of the forest.

Substratum below trees: This includes the muds found below the mangroves.

METHODS

For the fauna list, all existing data on the fauna were accessed in libraries and museum collections in Jamaica, followed by the collection and identification during field studies of animals in groups not previously listed. This included collection of the ichthyofauna using a beam trawl (eleven 3-5 minutes trawls were executed in the lagoons of the mangal), supplemented by the examination of the catches made by fishermen in the swamp. Material was collected by hand from mangrove roots when snorkelling. Birds counts were undertaken on 10 occasions, from a boat or walking along transect lines cut through the mangrove.

REVIEW OF THE LITERATURE

General notes on animals collected in the lagoons of the swamp were given by ANDREWS (1892) but there was no detail on the species. The zooplankton and phytoplankton of adjacent Kingston Harbour have been described by J. GRAHAME (1973, 1976) and S.E. GRAHAME (1977) respectively, and it is likely that some species are common to the confluent mangrove lagoons. The sponge communities on the mangrove rhizophores have been described by HECHTEL (1965). He recorded fourteen common species and four less common species. Six of the fourteen common sponges were growing exclusively in the mangrove environment. Of the cnidarians, *Cassiopea xamachana* was initially described in detail by BIGELOW (1900) and later by HUMMELINCK (1968). FISHER (1973), in an investigation of the shallow water Actiniaria and Corallimorpharia of Jamaica, lists four anemones which were found in the Port Royal mangal, *Bunodeopsis antillensis*, *Bartholomea annulata*, *Diadumene lewcolena* and *Diadumene* sp. In addition, SIUNG (1976) mentioned in a faunal list the presence of *Aiptasia tagetes* and the hydroid *Obelia* sp.. Sabellid annelids present in the area have been described by FISHER (1985), who identified four shallow water species attached to the roots of the red mangrove. Although there were other shallow water annelids present in the area, she concentrated on those most frequently encountered. Of the ctenophores, RANKIN (1956) recorded a new genus of platyctenid ctenophore *Vallidula multiformis* from the lagoons of the swamp.

An indication of the number of benthic species that could be present in the lagoons can be obtained from a study of the pollution ecology of Kingston Harbour by WADE (1976). From his survey of the benthic communities, five distinct level-bottom communities were represented, four of these were mud communities dominated by polychaetes while the fifth, a sandy bottom community, was dominated by the cephalochordate *Branchiostoma* earlier described by McSHINE (1971). All of these communities were diverse, but showed deterioration as a result of organic pollution. However, the study was confined to the harbour region and did not include the benthic communities of the lagoons (<5 metres) of the Port Royal area.

For the crustaceans, STEVEN (1961) worked on the shoaling behavior of the mysid, *Mysidium columbiae*, and the crab fauna has been described by HARTNOLL (1965) and WARNER (1967, 1968, 1969). HARTNOLL recorded seven species of crabs in the mangroves, whereas

WARNER, working mainly on *Aratus pisonii* recorded four additional species in the area. The latter recognised five zones in the swamp: Upper Swamp, Mid-Swamp and a Lower Swamp with Supra-littoral and Sub-littoral zones. All these zones contained characteristic crab faunas except for the Mid-Swamp which was transitional in nature.

CHIN (1990) studied the populations of shallow water penaeid shrimps and callinectid crabs from the south coast of Jamaica, and identified four blue crabs, *Callinectes danae*, *C. exasperatus*, *C. ornatus* and *C. sapidus* in the Plumb Point lagoon of the Port Royal area, together with five shrimp species, *Penaeus brasiliensis*, *P. duorarum*, *P. notialis*, *Sicyonia laevigata* and *Trachypenaeus constrictus*. The insect fauna of the swamp has not been documented but three species of mosquitoes, *Deinocerites cancer*, *Aedes aegypti* and *A. taeniorhynchus* and two species of sandflies, *Culicoides barbosa* and *C. furens* have been recorded in the area (BELKIN *et al.* 1970; CASTLE 1967). In addition, work is in progress on the termites, *Nasutitermes nigriceps*, *Procryoterms coniceps* and *Incisitermes schwarzi* (pers. comm. P. CLARKE and D. JACKSON).

EDMUNDS (1962, 1963) recorded the bivalved gastropod *Berthelinia caribbea* from mangrove-fringed channels of the system, in addition to 13 species of nudibranchs being found on the mangrove roots (EDMUNDS 1964). THOMPSON (1977) further recorded two species of saccoglossans from the area. However, HUMFREY (1975) conducted an extensive research on the molluscs in the Port Royal mangroves. He recorded 64 molluscs in and around the area with 18 species being found directly in the swamp, either in the various lagoons or in channels connecting some of the lagoons to the open sea. Forty-six species were found on the harbour side of the Palisadoes attached to seagrass beds, on wharf pilings or on the seawalls of the Police Training School at Port Royal. In addition SIUNG (1976, 1980) worked on three species of oysters found in abundance in the Port Royal mangroves, *Isognomon alatus*, *Crassostrea rhizophorae* and *Ostrea equestris*. *C. rhizophorae* was dominant in the intertidal zone but *I. alatus* and *O. equestris* were dominant at the subtidal level. SIUNG (1976) further stated that the absence of *O. equestris* from other mangrove sites in Jamaica and its presence in Port Royal may be due to ships bringing it to Kingston Harbour from North America.

FONTAINE (1953a, 1953b, 1953c, 1953d), commenting on the shallow water echinoderms of Jamaica, recorded six species of starfishes, *Astropecten articulatus*, *A. duplicatus*, *Luidia clathrata*, *L. alternata*, *Oreaster reticulatus*, *Linckia guildingii* found directly in the Port Royal area, the brittlestar, *Astrophyton muricatum*, the sea urchins, *Lytechinus variegatus*, *Tripneustes esculentus*, and *Echinometra viridis* and the sea cucumber *Isostichopus badionotus*.

GOODBODY (1960, 1963, 1984) recorded 45 species of ascidians occurring in the littoral and sub-littoral zones in the vicinity of Port Royal. Nineteen species were characteristic of the coral reef area and 16 species were characteristic of the harbour and lagoon area, with 10 species common to both. In the mangrove lagoons of Port Royal, 17 species of ascidians occurred in the sessile communities growing on the *Rhizophora* roots.

SMITH (1950), while seining for fishes along the Palisadoes, recorded 17 species that were common in the area and 7 that were less common or rare. An extensive study of the marine and freshwater fishes of the south coast of Jamaica was undertaken by CALDWELL (1966). He recorded 21 species of marine fishes in the area extending from the mainland connection of the Palisadoes to the Airport on the bay side and 18 species in the mangrove area between the Airport and the town of Port Royal, with 18 species common to both. ROSS (1982) mentioned the occurrence of the juveniles of six reef species of commercial importance in the mangroves of Port Royal: *Acanthurus chirurgus*, *Centropomus undecimalis*, *Euclinostomus argenteus*, *Gerres cinereus*, *Lutjanus apodus* and *L. griseus*. This indicates that the Port Royal Mangal may be an important nursery for these reef species and other commercially important fish, but insufficient work has so far been done on this aspect.

Little work has been published also on the avifauna of the area, where there is a small population of rare birds such as the White Ibis, Glossy Ibis and Clapper Rail, together with other species of birds which nest every year in the swamp (GOODBODY 1964; HARVEY 1986; BACON 1989; ALLENG 1990b).

RESULTS

FAUNAL LIST FOR THE PORT ROYAL MANGAL

Key to Mangal Sub-habitats

T. Trees (including roosting, nesting and flying overhead).— R. Rhizophores.— S. Bentic substratum under open water.— W. Water bodies and channels.— M. Mud below the mangroves.— * Commercially important species.

Phylum: Porifera

Class: DEMOSPONGIAE

<i>Ircinia fasciculata</i> (Pallas)	R.
<i>I. strobilina</i> (Lamarck)	R.
<i>Dysidea fragilis</i> (Montagu)	R.
<i>Darwinella rosacea</i> Hechtel	R.
<i>Haliclona doria</i> De Laubenfels	R.
<i>H. erina</i> De Laubenfels	R.
<i>H. hogarthi</i> Hechtel	R.
<i>Desmapsamma anchorata</i> (Carter)	R.
<i>Iotrochota birotulata</i> (Higgin)	R.
<i>Gelliodes areolata</i> (Wilson)	R.
<i>Adocia implexiformis</i> Hechtel	R.
<i>Pellina coeliformis</i> Hechtel	R.
<i>Sigmadocia caerulea</i> Hechtel	R.
<i>Tedania ignis</i> (Duchassaing & Michelotti)	R.
<i>Microciona microchela</i> Hechtel	R.
<i>Mycale microsigmatosa</i> Hechtel	R.
<i>M. rarispinosa</i> Hechtel	R.
<i>M. laevis</i> (Carter)	R.
<i>Zygomycale parishii</i> (Bowerbank)	R.
<i>Ulosa hispida</i> Hechtel	R.
<i>Halichondria melanodocia</i> De Laubenfels	R.
<i>H. magniconulosa</i> De Laubenfels	R.
<i>Terpios zeteki</i> De Laubenfels	R.
<i>Geodia (Geodia) gibberosa</i> (Lamarck)	R.
<i>G. (Cydonium) sp.</i>	R.

Phylum: Cnidaria	
Class: HYDROZOA	
<i>Obelia</i> sp.	R.
Class: SCYPHOZOA	
<i>Aurelia aurita</i> (Linnaeus)	W.
<i>Dactylometra</i> sp.	W.
<i>Cassiopea xamachana</i> Bigelow	S.
Class: ANTHOZOA	
<i>Aiptasia tagetes</i> (Duchassaing & Michellotti)	R.
<i>Actinostella flosculifera</i> (Lesueur)	R.
<i>Calliactis tricolor</i> (Lesueur)	S.
<i>Diadumene leucolena</i> (Verrill)	R.
<i>Diadumene</i> sp.	R.
<i>Bartholomea annulata</i> (Lesueur)	R.
<i>Bunodeopsis antilliensis</i> Duerden	R.
Phylum: Ctenophora	
Order: <i>Platyctenida</i>	
<i>Vallicula multiformis</i> Rankin	W.
Order: <i>Beroidea</i>	
<i>Beroë</i> sp.	W.
Phylum: Annelida	
Class: POLYCHAETA	
<i>Branchiomma conspersa</i> Ehlers	R.
<i>Pseudobranchia emersonia</i> Jones	R.
<i>Sabella melanostigma</i> Schmarda	R.
<i>Sabellastarte magnifica</i> (Shaw)	R.
<i>Typosyllis corallicola</i> Verrill	R.
<i>Polydora ancistrata</i> Jones	R.
Phylum: Arthropoda	
Sub-phylum: Chelicerata	
Class: ARACHNIDA	
<i>Nephila clavipes</i> Linnaeus	T.
<i>Micrathena</i> sp.	T.
Sub-phylum: Crustacea	
Class: COPEPODA	
<i>Acartia tonsa</i> Dana	W.
<i>Paracalanus</i> sp.	W.
Class: CIRRIPIEDIA	
Family: Balanidae	
<i>Balanus eburneus</i> Gould	R.
<i>B. amphitrite amphitrite</i> Darwin	R.
<i>B. reticulatus</i> Utinomi	R.
<i>B. improvisus</i> "assimilis" Darwin	R.
<i>B. trigonus</i> Darwin	R.
Family: Chthamalidae	
<i>Chthamalus poteus</i> Dando & Southwood	R.

Class: MALACOSTRACA

Order: *Mysidacea*

Mysidium columbiae Zimmer W.

Order: *Decapoda*

Family: Penaeidae

Penaeus brasiliensis Latreille S.

P. duorarum Burkenroad S.

**P. notialis* Pérez-Farfante S.

Trachypenaeus constrictus (Stimpson) S.

Family: Sicyoniidae

Sicyonia laevigata (Stimpson) S.

Family: Palinuridae

**Panulirus argus* (Latreille) S.

Family: Alpheidae

Alpheus sp. S.

Family: Portunidae

Callinectes danae Smith S.

C. exasperatus (Gerstaecker) S.

C. ornatus Ordway S.

**C. sapidus* Rathbun S.

Lupella forceps (Fabricius) S.

Family: Xanthidae

Panopeus herbstii Milne Edwards S.

Eurytium limosum (Say) S.

Family: Grapsidae

Pachygrapsus gracilis (De Saussure) S.

Goniopsis cruentata (Latreille) M.

Sesarma ricordi Milne Edwards M.

S. curacaoense De Man M.

Aratus pisonii (Milne Edwards) T.R.M.

Family: Gecarcinidae

Uca rapax (Smith) M.

U. thayeri Rathbun M.

**Ucides cordatus* (Linnaeus) M.

Sub-phylum: **Uniramia**

Class: INSECTA

Order: *Orthoptera*

Orocharis sp. T.

Order: *Isoptera*

Incisitermes schwarzi Banks T.

Procryptotermes corniceps Synder T.

Nasutitermes nigriceps Holmgren T.

Order: *Coleoptera*

Polycesta olivieri Waterhouse T.

Chrysobothris tranquebarica (Gmelin) T.

Alloxaxis spinosus Arnett T.

Order: *Diptera*

Deinocerites cancer Theobald M.

<i>Aedes aegypti</i> (Wiedemann)	W.
<i>A. taeniorhynchus</i> Linnaeus	M.
<i>Culicoides barbosai</i> Wirth & Blanton	M.
<i>C. furens</i> (Poey)	M.
Order: <i>Lepidoptera</i>	
<i>Precis evarete zonalis</i> Felder & Felder	T.
Psychidae: Bag-worm moth larvae	T.
Order: <i>Hymenoptera</i>	
<i>Polistes major</i> Beauvois	T.
Phylum: <i>Mollusca</i>	
Class: <i>GASTROPODA</i>	
Family: <i>Fissurellidae</i>	
<i>Lucapina sowerbii</i> Sowerby	S.
<i>Diodora cayenensis</i> (Lamarck)	S.
<i>D. viridula</i> Lamarck	S.
<i>D. variegata</i> Sowerby	S.
Family: <i>Trochidae</i>	
<i>Tegula fasciata</i> (Born)	S.
Family: <i>Turbinidae</i>	
<i>Astraea tecta</i> (Solander)	S.
Family: <i>Neritidae</i>	
<i>Nerita fulgurans</i>	R.
Family: <i>Lucinidae</i>	
<i>Phacoides pectinatus</i> (Gmelin)	S.
<i>P. muricatus</i> (Spengler)	S.
<i>Anodontia alba</i> Link	S.
Family: <i>Chamidae</i>	
<i>Chama congregata</i> Conrad	S.
<i>C. sarda</i> Reeve	S.
<i>C. florida</i> Lamarck	S.
<i>C. macerophylla</i> (Gmelin)	R.S.
<i>C. sinuosa</i> Broderip	R.S.
<i>Pseudochama radians</i> Lamarck	R.S.
Family: <i>Cardiidae</i>	
<i>Trachycardium muricatum</i> (Linnaeus)	S.
<i>T. isocardia</i> (Linnaeus)	S.
<i>Papyridea soleniformis</i> (Bruguière)	S.
<i>Americardia media</i> (Linnaeus)	S.
Family: <i>Veneridae</i>	
<i>Antigona listeri</i> Gray	S.
<i>A. rigida</i> Dillwyn	S.
<i>Chione cancellata</i> (Linnaeus)	S.
<i>C. granulata</i> (Gmelin)	S.
<i>Pitar albida</i> (Gmelin)	S.
<i>P. fulminata</i> (Menke)	S.
Family: <i>Littorinidae</i>	
<i>Littorina angulifera</i> (Lamarck)	T.R.
Family: <i>Modulidae</i>	

<i>Modulus modulus</i> (Linnaeus)	S.
Family: Potamididae	
<i>Batillaria minima</i> (Gmelin)	S.R.
Family: Epitoniidae	
<i>Opalia crenata</i> (Linnaeus)	S.
<i>O. pumilio</i> Mörch	S.
<i>Epitonium lamellosum</i> (Lamarck)	S.
Family: Calyptraeidae	
<i>Crepidula aculeata</i> (Gmelin)	S.
Family: Strombidae	
<i>Strombus pugilis</i> Linnaeus	S.
Family: Cymatiidae	
<i>Cymatium muricinum</i> (Röding)	S.
Family: Muricidae	
<i>Murex pomum</i> Gmelin	S.
<i>M. brevisfrons</i> Linnaeus	S.
<i>M. woodringi</i> Clench & Farfante	S.
<i>Thais deltoidea</i> Lamarck	S.
<i>T. haemastoma floridana</i> Conrad	S.
Family: Magilidae	
<i>Coralliophila aberrans</i> (Adams)	S.
Family: Melongeniidae	
* <i>Melongena melongena</i> Linnaeus	S.
Family: Nassariidae	
<i>Nassarius vibex</i> Say	S.
Family: Olividae	
<i>Olivella perplexa</i> Olsson	S.
Family: Bullidae	
<i>Bulla striata</i> Bruguière	S.
Family: Atyidae	
<i>Haminoea antillarum</i> (d'Orbigny)	S.
Family: Ellobiidae	
<i>Tralia ovula</i> (Bruguière)	S.
<i>Melampus coffeus</i> (Linnaeus)	M.R.
<i>Melampus morile</i> (Bruguière)	M.R.
<i>Detracia bullaoides</i> (Montagu)	M.R.
Family: Juliidae	
<i>Berthelinia caribbea</i> Edmunds	S.
Family: Stiliferidae	
<i>Stilifer vanellus</i> Marcus	S.
Family: Elysiidae	
<i>Elysia cauze</i> Marcus	S.
<i>E. nisbeti</i> Thompson	S.
Family: Eubranchidae	
<i>Capellinia conicla</i> Marcus	S.
Family: Cuthonidae	
<i>Catriona maua</i> Marcus & Marcus	S.
<i>C. perca</i> Marcus	S.
<i>C. tina</i> Marcus	S.

<i>Selva rubra</i> Edmunds	S.
Family: Facelinidae	
<i>Palisa papillata</i> Edmunds	S.
<i>Phidiana lynceus</i> Bergh	S.
<i>Learchis poica</i> Marcus & Marcus	S.
Family: Favorinidae	
<i>Favorinus auritulus</i> Marcus	S.
<i>Godiva rubrolineata</i> Edmunds	S.
<i>Dondice occidentalis</i> (Engels)	S.
Family: Aeolidiidae	
<i>Spurilla neapolitana</i> (delle Chiaje)	S.
<i>Berghia coerulescens</i> (Laurillard)	S.
Class: BIVALVIA	
Family: Arcidae	
<i>Arcopsis adamsi</i> Dall	S.
<i>Anadara chemnitzii</i> (Philippi)	S.
<i>A. notabilis</i> (Röding)	S.
<i>A. transversa</i> (Say)	S.
<i>A. ovalis</i> (Bruguère)	S.
Family: Mytilidae	
<i>Modiolus americanus</i> (Leach)	S.
<i>Brachidontes citrinus</i> (Röding)	R.S.
<i>B. exustus</i> (Linnaeus)	R.S.
Family: Isognomonidae	
* <i>Isognomum alatus</i> Gmelin	R.S.
<i>I. bicolor</i> Adams	R.S.
Family: Pinnidae	
<i>Atrina seminuda</i> (Lamarck)	S.
<i>A. serrata</i> (Sowerby)	S.
Family: Plicatulidae	
<i>Plicatula gibbosa</i> Lamarck	S.
Family: Ostreacea	
<i>Ostrea fons</i> Linnaeus	R.
* <i>Crassostrea rhizophorae</i> (Guilding)	S.
Family: Dreissenidae	
<i>Mytilopsis domingensis</i> (Récluz)	S.
Family: Diplodontidae	
<i>Diplodonta punctata</i> (Say)	S.
Family: Tellinidae	
<i>Tellina georgiana</i> Dall	S.
<i>T. punicea</i> Born	S.
Family: Semelidae	
<i>Semele proficua</i> (Pulteney)	S.
<i>S. purpurascens</i> (Gmelin)	S.
Family: Sanguinolariidae	
<i>Tagelus divisus</i> (Spengler)	S.
Family: Corbulidae	
<i>Corbula caribaea</i> d'Orbigny	S.
<i>C. aequivalvis</i> Philippi	S.

Class: SCAPHOPODA

Family: Dentaliidae

Dentalium antillarum Orbigny S.

D. didymun Watson S.

Phylum: **Bryozoa**

Family: Vesiculariidae

Zoobotryon verticillatum (delle Chiaje) R.

Family: Bugulidae

Bugula neritina (Linnaeus) R.

Phylum: **Echinodermata**

Class: ASTEROIDEA

Astropecten articulatus (Say) S.

A. duplicatus Gray S.

Luidia clathrata (Say) S.

L. alternata (Say) S.

Echinaster echinophorus (Lamarck) S.

Oreaster reticulatus (Linnaeus) S.

Linckia guildingii Gray S.

Class: OPHIUROIDEA

Astrophyton muricatum (Lamarck) S.

Ophiotrix angulata (Say) S.R.

Class: ECHINOIDEA

Lytechinus variegatus (Lamarck) S.

Tripneustes esculentus (Leske) S.

Echinometra viridis (Agassiz) S.

Class: HOLOTHUROIDEA

Isostichopus badionotus (Selenka) S.

Synaptula hydriformis (Lesueur) S.

Phylum: **Chordata**

Sub-phylum: **Tunicata**

Ascidia nigra Savigny R.

A. interrupta Heller R.

Ecteinascidia turbinata Herdman R.

Perophora bermudensis Berrill R.

Clavelina oblonga Herdman R.

Rhodosoma turcicum Savigny R.

Herdmania momus Savigny R.

Microcosmus exasperatus Heller R.

Diplosoma listerianum (Milne & Edwards) R.

Symplegma viride Herdman R.

Polyclinum constellatum Savigny R.

Botrylloides nigrum Herdman R.

Eudistoma olivaceum (Van Name) R.

Styela partita (Stimpson) R.

Sub-phylum: **Vertebrata**

Class: PISCES

Chondrichthyes

Family: Dasyatidae

Urolophus jamaicensis (Cuvier) W.*Aetobatis narinari* (Euphrasen) W.

Osteichthyes

Family: Elopidae

Megalops atlanticus Cuvier & Valenciennes W.

Family: Clupeidae

Harengula humeralis (Cuvier) W.*H. pensacolatae* Goode & Bean W.*H. jaguana* Poey W.*Opisthonema oglinum* (LeSueur) W.

Family: Chaetodontidae

Chaetodon capistratus Linnaeus W.

Family: Poeciliidae

Gambusia sp. W.

Family: Cyprinodontidae

Cyprinodon jamaicensis (Fowler) W.

Family: Engraulidae

A. hepsetus (Linnaeus) W.*A. parva* (Meek & Hildebrand) W.*A. byolepis* (Evermann & Marsh) W.

Family: Atherinidae

Atherinomorbus stipes (Müller & Troschel) W.

Family: Monacanthidae

Stephanolepis setifer (Bennett) W.*Myroplius punctatus* Lütken W.

Family: Belonidae

Strongylura marina (Walbaum) W.*S. notata* (Poey) W.

Family: Holocentridae

Holocentrus ascensionis (Osbeck) W.

Family: Syngnathidae

Hippocampus reidi Ginsburg W.*Syngnathus rousseau* Kaup W.

Family: Centropomidae

Centropomus undecimalis (Bloch) W.

Family: Serranidae

Serranus flaviventris (Cuvier & Valenciennes) W.*S. tabacarius* (Cuvier & Valenciennes) W.

Family: Grammistidae

Rypticus saponaceus (Bloch & Schneider) W.

Family: Carangidae

Chloroscombrus chrysurus (Linnaeus) W.*Caranx latus* Agassiz W.*Oligoplites saurus* (Bloch & Schneider) W.

Family: Scombridae

<i>Scomberomorus cavalla</i> (Cuvier)	W.
Family: Lutjanidae	
<i>Lutjanus analis</i> Cuvier & Valenciennes	W.
<i>L. griseus</i> (Linnaeus)	W.
<i>L. synagris</i> (Linnaeus)	W.
<i>L. jocu</i> (Bloch & Schneider)	W.
<i>L. apodus</i> (Walbaum)	W.
<i>Ocyurus chysurus</i> (Bloch)	W.
Family: Pomadasyidae	
<i>Haemulon bonariense</i> Cuvier & Valenciennes	W.
<i>H. plumieri</i> (Lacépède)	W.
<i>H. parrai</i> (Desmarest)	W.
Family: Gerreidae	
<i>Diapterus rhombeus</i> (Cuvier)	W.
<i>Eucinostomus argenteus</i> Baird & Girard	W.
<i>Gerres cinereus</i> (Walbaum)	W.
Family: Mugilidae	
<i>Mugil curema</i> Cuvier & Valenciennes	W.
Family: Sparidae	
<i>Archosargus rhomboidalis</i> (Linnaeus)	W.
Family: Sciaenidae	
<i>Odontoscion dentex</i> (Cuvier & Valenciennes)	W.
<i>Stellifer colonensis</i> Meek & Hildebrand	W.
Family: Scaridae	
<i>Sparisoma aurofrenatum</i> (Cuvier & Valenciennes)	W.
<i>Scarus croicensis</i> Bloch	
Family: Gobiidae	
<i>Bathygobius soporator</i> (Cuvier & Valenciennes)	W.
<i>Lophogobius cyprinoides</i> (Pallas)	W.
Family: Blennidae	
<i>Paraclinus fasciatus</i> (Steindachner)	W.
<i>Dinematichthys cayorum</i> Evermann & Kendall	W.
Family: Sphyraenidae	
<i>Sphyraena barracuda</i> (Walbaum)	W.
Family: Acanthuridae	
<i>Acanthurus chirurgus</i> (Bloch)	W.
Family: Tetraodontidae	
<i>Sphoeroides testudineus</i> (Linnaeus)	W.
<i>S. nephelus</i> (Goode & Bean)	W.
<i>S. eulepidotus</i> Metzelaar	W.
Family: Diodontidae	
<i>Chilomycterus antennatus</i> (Cuvier)	W.
Family: Soleidae	
<i>Trinectes inscriptus</i> Gosse	W.
Family: Bothidae	
<i>Bothus lunatus</i> (Linnaeus)	W.

Class: AVES

Family: Pelecanidae

<i>Pelecanus occidentalis</i> Linnaeus	T.
Family: Ardeidae	
<i>Egretta alba</i> (Linnaeus)	T.
<i>E. thula</i> (Molina)	T.
<i>Dichromanassa rufescens</i> (Gmelin)	T.
<i>Bubulcus ibis</i> (Linnaeus)	T.
<i>Ixobrychus exilis</i> (Gmelin)	T.
<i>Nyctanassa violacea</i> (Linnaeus)	T.
<i>Nycticorax nycticorax</i> (Linnaeus)	T.
<i>Ardea herodias</i> Audubon	T.
<i>Florida caerulea</i> (Linnaeus)	T.
<i>Butorides virescens</i> (Linnaeus)	T.
<i>Hydranassa tricolor</i> (Gosse)	T.
Family: Fregatidae	
<i>Fregata magnificens</i> Matthews	T.
Family: Threskiornithidae	
<i>Plegadis falcinellus</i> (Linnaeus)	T.
<i>Eudocimus albus</i> (Linnaeus)	T.
Family: Cathartidae	
<i>Cathartes aura</i> (Linnaeus)	T.
Family: Pandionidae	
<i>Pandion haliaetus</i> (Gmelin)	T.
Family: Rallidae	
<i>Rallus longirostris</i> Ridgeway	T.
Family: Charadriidae	
<i>Arenaria interpres</i> (Linnaeus)	T.
<i>Squatarola squatarola</i> (Linnaeus)	T.
Family: Recurvirostridae	
<i>Himantopus himantopus</i> (Müller)	T.
Family: Scolopacidae	
<i>Tringa flavipes</i> (Gmelin)	T.
<i>Tringa melanoleuca</i> (Gmelin)	T.
<i>Catoptrophorus semipalmatus</i> (Gmelin)	T.
<i>Crocethia alba</i> (Pallas)	T.
Family: Laridae	
<i>Sterna dougalli</i> Montagu	T.
<i>S. hirundo</i> Linnaeus	T.
<i>S. albifrons</i> (Lesson)	T.
<i>S. maxima</i> Boddaert	T.
<i>Larus atricilla</i> Linnaeus	T.
Family: Columbidae	
<i>Zenaida asiatica</i> (Linnaeus)	T.
Family: Parulidae	
<i>Mniotilta varia</i> (Linnaeus)	T.
<i>Dendroica petechia</i> (Gosse)	T.
<i>Seiurus noveboracensis</i> (Gmelin)	T.
Family: Alcedinidae	
<i>Ceryle alcyon</i> (Linnaeus)	T.
Family: Trochilidae	

<i>Anthracothorax mango</i> (Linnaeus)	T.
Family: Mimidae	
<i>Mimus gilvus</i> Hellmayr & Seilern	T.
Class: MAMMALIA	
Family: Muridae	
<i>Rattus</i> sp. probably <i>norvegicus</i>	T.
Family: Delphinidae	
<i>Tursiops truncatus</i> (Montague)	W.
Family: Viverridae	
<i>Herpestes auropunctatus</i> Hodgson	T.

DISCUSSION

The production of the faunal list for the area has its importance in the sphere of general ecology and management of wetlands in the insular Caribbean. There is a lack of comprehensive lists which facilitate comparison between systems in the Caribbean, although some aspects, such as the invertebrate root fauna, have received extensive treatment.

The faunal assemblage of the Port Royal mangal is diverse, with a total of 314 species recorded. It is dominated by animals typical of mangrove systems found in Western Tropical Atlantic regions as described by RÜTZLER (1969) and LOPEZ *et al.* (1988). The presence of the echinoderms *Ophiothrix angulata*, *Luidia* sp. and *Echinometra viridis* and the absence of a distinct freshwater element, indicate a predominantly high salinity, marine fauna. Thus the aquatic fauna is more closely comparable with that of marine systems such as Boqueron Bay, Puerto Rico (MATTOX 1969) than that of the predominantly estuarine areas as Caroni Swamp, Trinidad (BACON 1970).

Only 37 species of birds were recorded in the mangal. The avifauna was composed largely of seabirds (Pelicanidae, Fregatidae, Laridae) and wading birds (Ardeidae, Scolopacidae, Charadriidae), with few species of passerines. The lack of tidal mud flats and shallow water environments accounts for the paucity of small waders and probing birds. Furthermore, the water in the lagoons is too deep for herons and ibises, the numerous species using the area largely for roosting and nesting. The sparseness of the avifauna here, as in the rest of Jamaica, is also partly a function of the distance from the continent. A comparison with the Caroni Swamp, Trinidad

(190 species), which is close to the South American sub-continent and which also displays a greater number of sub-habitats demonstrates the effects of these factors.

One problem with compiling a list of species is that the mangrove ecosystem includes not only mangrove trees and their rhizophores but lagoons with seagrass beds, mud and gravel substrata and free connections to the adjacent Kingston Harbour. Colonisation of the mangal is largely opportunistic by species found also in other habitats; none of the species having been found only in association with mangroves at Port Royal. As suggested by other authors (MACNAE & KALK 1962), it is possible to recognise a mangrove fauna only in terms of an association of a large number of species found most commonly and most abundantly in such environments. The composite fauna will vary from one site to another depending on the relative proportions of marine, estuarine or freshwater species, as shown by the comparison with Caroni Swamp, where the freshwater element is stronger. The only predominantly freshwater animals recorded regularly in the Port Royal mangal were two species of Cyprinodontiformes; the salinity tolerance of these species is being investigated further.

In addition, the faunal list for the area is in part an historical document recording the animals found in the Port Royal mangal over the last 100 years. There is the possibility that some elements of the fauna recorded in earlier publications are no longer present in the area, especially as changes in the ecosystem are known to have occurred (ALLENG 1990a).

For effective management of Caribbean mangals to take place, evaluation of wetland products, such as wildlife resources and fisheries, and wetland attributes, such as biological diversity, depends on an understanding of the total fauna. The differences which appear to exist between mangrove systems in different islands and different parts of the coast of any one island (BACON & ALLENG 1992) must be borne in mind when adopting management strategies developed for any one location. At present these differences are poorly documented and more research is needed to improve on this situation.

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