# GEOLOGIC NOTES 

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CHECK LIST OF WACCAMAW AND CROATAN (PLIOCENE ?) MACROFOSSILS
OF NORTH AND SOUTH CAROLINA
By
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## INTRODUCTION

The present list has grown dut of a biostratigraphic study df the waccamam and Croatan deposits initiated by the author in 1959. The dbuective of this study, which is sponsored by grants from the National Sgience Foundation, is to determine as precisely as possible the age, stratigraphic relationships, and depositional environments df the Duplin, Waccamaw, Croatan and Pamlico depdosits.

Previously the most gomplete published lists of Waccamam macrofossils were those df Dall (1892), Canu and Bassler (1923) and Gardner (1943). These lists are ingomplete and at least the nomenclature of the mollusks has needed reviSION FOR SOME TIME.

Preliminary to compilation of this list, all available pertinent literature was studied and all collegtions of Waccamal and Croatan macrdfossils presently housed in the U.S. National Museum mere examined. In addition, large collections Were made from each fossiliferous unit of every know and accessible dutcrop of the Waccamaw and Crdatan depdsits. These collegtions were studied closely and relative abundance data for all assemblages from each outcrop have been determined.

The author has attempted to eliminate obvidus gynonyms, and to bring the nomenclature up to date. It is obvidus that eventually even more species ull be added to this list, especially from subsurface collections now being examined. Also, a few species recorded in the literature and contained in exigting collections undoubtedly have been overldoked. Partially counterbalancing these probable additions is the likelihood that some of the species included in the list subsequently will PROVE TO 日E CONSPECTFIC.

Such lists as this are vital to successful and accurate biostratigraphic analyses of the late Neggene deposits of the Atlantic Coastal Plain and similar lists for dther formations are well under may. it is hoped to compile eventually under dne cover a catalogue of all the Neogene macrofossils of Eastern United States.

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THE FDLLDWING CDMPILATIDN SHOWS THE NUMBER DF SPECIES AND SUBSPECIES FDR EACH DF THE MAUDR TAXA INGLUDED IN THE CHEGK LIST:

| Porifera |
| :---: |
| ANTHDZDA |
| Bryozoa |
| Pelecypoda |
| GASTROPDDA |
| Scaphordia |
| Cirripedia |
| EGHINDIDEA |

EXPLANATION

## DISTRIBUTIDN

M
TW

NCW

C

R

CITATIDNS
D

D
$\stackrel{L}{M}$
M

```
SCW WACCAMAW DF SOUTH CARDLINA DUTSIDE DF THE TYPE AREA.
Late Midcene (mainly Duplin).
Type Waccamaw, Waccamaw River, Horry County,
    South Cardlina.
Waccamaw dF South Cardlina dutside dF the
    TYPE AREA.
    Waccamaw df North Carolina (not the Crdatan
        df the Neuse River area).
Type Crdatan of Neuse River area, Ndrth
    CARDLINA.
Recent df Atlantic and Gulf Coastal areas.
```

Collected and identified by Du bar but
SPECIMENS NDT IN PLACE.
Cdlegeted and identified by Du Bar. All
SPECIMENS IN PLACE.
Recdrded in the literature (see bibliograrhy).
In U. S. Natidnal Museum collectidns.
Placed behind citatidn indicates doubtful
DCCURRENCE DUE TO LACK DF STRATIGRAPHIC
EVIDENGE, DR DOUBTful IDENTIFICATIDN.

MACROFAUNAL CHECK LIST
Gedlogic Distributidn
SPECIES $\quad M$ TW SCW NCW C R

PORIFERA
?CLIONE SP.
D D
D

ANTHOZOA

SEPTASTRAEA CRASSA HOLMES L D D ?D

BRYOZOA

```
AImulosia aculeata Canu &
```

BASSLER
AMPHIBLESTRUM CONSTRICTUM
ULRICH \& BASSLER
L L
L L.
L
Cellepora maculata (Aldrich \& BASSLER)
CYCLDCOLPDSA PERFDRATA CANU \& BASSLER
Cygloperiella rubra canu \&
BASSLER
Dakaria paruipordsa Canu \& BASSLER
DISCOPRORELLA DENTICULATA
(CONRAD)
ElEETRA MONOSTAGHYS BUSK
FLDRIDINA PARVICELLA CANU \& BASSLER
Gemel iporella asper Canu \& BASSLER
Gemelliporella vorax Canu \& BASSLER
HEMISEPTELLA PLANULATA CANU \& BASSLER
Holoporella gicornis Canu \& BASSLER
Hol oporella drbifera Canu \& BASSLER
MENBRANIPORA LACROIXI AUDOUIN
Membrendoecium grande Canu BASSLER
METRARABDOTOS AURICULATUM CANU \& BASSLER
MIGROPORELLA TESSELLATA TUOMEY \& HOLMES
Puellina crassilabiata Canu \& BASSLER
SCHIZDPDDRELLA ACULEATA CANU BASSLER
SCH! ZOPODRELLA MARGINATA CANU BASSLER
SMITTINA TRISPINDSA JOHNSTON L
SPATHIPORA LONGIRIMA CANU \& BASSLER
Tretocygloecia avellana canu Bassler

| Abra aequalis (Say) | L | DL | D | DML | DL | L |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ALIGENA AEQUATA (CDNRAD) | L |  |  | DL | L |  |
| AMUSIUM MORTDNI (RAVENEL) | L | DL | L | DL |  |  |
| ? AMUS IUM SP. |  | D |  |  |  |  |
| AnADARA CAELATA (Conrad) |  | M? |  |  |  |  |
| ANADARA GAROLINENS IS CDNRAD | L |  |  |  | L |  |
| ANADARA LIENOSA (SAY) | L | DL | D | DML | ? L |  |
| AnAdara ovalis (Bruguiere) |  |  |  |  | L | L |
| Anadara plicatula Conrad | L |  |  | L |  |  |
| ANADARA PLICATURA CONRAD | L |  |  |  | L |  |
| $\frac{\text { ANADARA }}{\text { HOLMES) }} \frac{\text { RAGA }}{\text { M }}$ (TUDMEY \& |  | D | DL | L |  |  |
| AnAdARA SCALARINA (HEILPRIN) |  |  |  | L |  |  |
| ANADARA SCALARIS (CONRAD) | L |  |  | L |  |  |
| ANADARA STAMINEA (SAY) |  |  |  | $?$ |  |  |
| ANADARA SUBSINUATA (Conrad)? |  |  |  | L | DL |  |
| ANADARA TRANSVERSA |  |  |  |  |  |  |
| IMPRDCERA (CDNRAD) | L | DL | D | DML | DL |  |
| $\frac{\text { ANADARA TRANSVERSA }}{\text { AEQUICDSTATA }} \text { (CONRAD) }$ |  | L |  |  | L |  |
| AnADARA SP. A |  |  | D |  |  |  |
| ANADARA $3 P$. |  |  |  | D | D |  |
| ANISDDONTA SP. |  |  |  |  | D |  |
| $\frac{\text { ANISOTHYRIS }}{\text { DPLIQUA GABE }} \text { GF. A. }$ |  |  |  |  | L | L |
| ANOMIA SIMPLEX D'ORBIGNY | L | DL | D | DML | DL | L |
| ? ANDMIA SP. |  | D |  |  |  |  |
| AFCA SYMMETRICA CONAAD |  |  |  | ? |  |  |
| ARCA UNDULATA SAY |  |  |  |  | ? |  |
| Astarte gastanea Say |  | $?$ |  |  |  |  |
| Astahte concentrica Conrad | DL | L |  | DML |  |  |
| ASTARTE CONCENTRICA BELLA | L | DL | D | D | DL |  |
| ASTARTE GONGENTRIGA GONRADI | L |  |  | L |  |  |
| ASTARTE SP. CF. A. <br> HERFDRDENSIS CONAAD |  |  | D |  |  |  |
| ASTARTE N. ${ }^{\text {PP.? }}$ |  |  |  |  | L |  |
| ATRINA HARAISI DALL | L |  |  | ? M |  |  |
| ATRINA SP. CF. A. HARRIS: DALL |  | D |  |  |  |  |
| Bornia bladenensis Gardner |  |  |  | L |  |  |
| BDRNIA IRIANGULA DALL | L |  |  | L | L |  |
| BRACHIDDONTES RECURVUS |  |  |  |  |  |  |
| (Rafinesque) |  |  |  | L |  | L |
| BRACHIDDONTES SP. |  |  |  |  | L |  |
| CARLITA ARATA (CONRAD) | DL | DL | D | DML | DL |  |
| CARDITA CDLUMBIANA (GARDNER) |  |  |  | L |  |  |
| CARDITA GRANULATA (SAY) | DL | DL | D | DML | DL |  |
| CARDITA PEAPLANA (CONRAD) | DL | DL |  | DL | DL | L |

SPECIES $\quad M$ TW SCW NCW C R
Gardita perplana abbreviata
CDNRAD
CARpITA IRIDENTATA (SAY) DL DL D DML DL L
CARDIIA TRIDENTATA
DECEMCOSTATA (CONRAD) L L L
Cardium sp.
Caryocorbula barrattiana. (C. B. AdAMs)

|  | D | DL | DML |  | L |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | L | D | DL | DL | L |
| L | D | D | DL | DL |  |
| DL | DL | D | DL | L | L |
|  | L | DML | DL |  |  |
| DL | D | D | D | D | L |
| DL | D |  |  |  |  |
| L | DL | D | DML | DL | DML |
| L | DL | D | D |  |  |
|  | D | DML | L |  |  |
|  |  |  |  |  |  |

CARYOCORBLLA INAEQUALIS (SAY)L
CAByocobrula sp.
Chama congregata Conrad
CHAMA GARDNERAE OLsson \& harbison
Chama macrophylla Gmelin
CHIONE GANGELLATA (LINNÉ)
ChIDNE GRTBRARIA (CONRAD)
CHIONE GRUS (HOLMES)

Chione pygmaea (Lamarck)
CHLAMYs COMPAR.1.is (TUOMEY \& HOLMES)

L
ChLAMYS EBOREUS GENESCENS ( $\mathrm{D}_{\mathrm{A}} \mathrm{LL}$ )
Chamys ERNESTSMITHL (TUCKER)
CHLAMYS SP. AFF: C. EYERGLADENSIS
(Mansfield)
Chlamys gibbus (LinNé) ? DL L L
CHLAMYS LRBADIANS (LAMARGK) ?DL L
CHLAMYS SP. CF. C. SENTIS Reeve
ChLAMYS SOLABOIDES (HEILPRIN) CORBICULA DENSATA CONRAD CBABSINELLA DUPLINIANA. DALL L
Crassinella lunulata Conrad dL

|  | $L$ |  |
| :--- | :--- | :--- |
| $D L$ | $D L$ |  |
| $D L$ | $L$ |  |
| $D L$ | $D L$ |  |
| $D L$ | $L$ | $L$ |

Crassosibea yuginlica (Gmelin)
CMMINGIA TEL NNDIDES (CONRAD)
Cyrtopleura arcuata (Conrad)
CYRTOPLEURA COSTATA (LinNe)
dinocardiúm robustum


| Species | M | TW | SCW | NCH | C | B |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DIVARIGELLA QUADRISULGATA |  |  |  |  |  |  |
| D'ORBIGNY | L | L |  | DL | L | L |
| Dovax emmonsi Dall | L |  |  | ML |  |  |
| DONAX EMMONS I PREAEQU/LWBRATA |  |  |  |  |  |  |
| GARDNER | L |  |  | L |  |  |
| Donax fossor Say | DL | DL | D | DL. | DL |  |
| DONAX VARIABILIS SAY ? |  |  |  |  |  |  |
| DOSINIA ELEGANS CONRAD | L | L | D | DL |  | L |
| EGHINDCHAMA CDRNUIA |  |  |  |  |  |  |
| ENSIS DIRECTUS CONRAD | L | DL | D | DML | DL | L |
| ENSITELLOPS COMPRESSA |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Ervilia lata Dall | L |  |  | L |  |  |
| $\frac{\text { ERVILIA }}{\text { GARATA }} \frac{\text { RADIATA }}{\text { ENER }}$ | L |  |  | L |  |  |
| Erycina cardi.Inensils Dall | L |  |  | L | L |  |
| EUCRASSATELLA SPECLOSA |  |  |  |  |  |  |
| A. ADAMS | DL | DL | D | DL | L | L |
| Eugrassatella sp. A |  |  |  | D |  |  |
| FOSSULARCA ADAMSI (DALL) | L | D | D | DL | L | L |
| PFOSSULARCA SP. D |  |  |  |  |  |  |
| GARI WAGNERI (DALL) | L |  | L | D |  |  |
| Gemma magna dall | DL | DL | D | DL | DL |  |
| GEMMA MAGNA INSULCATA |  |  |  |  |  |  |
| Gemma trigona Dall | L |  |  | L | L |  |
| GLygymeris aberbans Nicol L |  |  |  |  |  |  |
| $\frac{\text { GLYCYMERIS AMERICANA. }}{(D E F R A N C E)}$ | DL | DML | D | DML | L | L |
| GLYGYMERIS DUPLINENSIS. DALL DL |  |  |  |  |  |  |
| $\frac{\text { GLYGYMER,IS LAEVIS (TUOMEY }}{\& \text { HDLMES) }}$ |  |  | $? \mathrm{~L}$ |  |  |  |
| GLYCYMERIS PECTINAIA (GMELIN) |  | DL | D | DML | L | L |
| GLYCYMERIS REELEXA SAY ? |  |  |  |  |  |  |
| GPULDIA METASTPIAJA (CONRAD) HIATELEA ARCTICA (LINNE) | DL | DL | D | $\begin{aligned} & \mathrm{DML} \\ & M \end{aligned}$ | DL | L |
| JULIACORBULA SCUIATA |  |  |  |  |  |  |
| ABIDSA GANALICHLATA SAY |  |  |  |  |  |  |
| WAgnerianum OLSSDN \& |  |  |  |  |  |  |
| Harbison |  |  | D |  |  |  |
|  |  |  |  |  |  |  |
| $\frac{\text { AEYICARPIUM SUBLLNEAIUM }}{\text { (CONRAD) }}$ | DL | DL |  | DML |  |  |
| LAEVICARDIUM SP. D |  |  |  |  |  |  |
| LEPTON KURTZLL DALL |  | L |  |  |  |  |
| IMA SP. |  |  | D |  |  |  |
| MACDMA CAROLINENSLS GARDNER \& ALDRICH | ? D | L |  | L |  |  |

SPECIES
Macrocallista sp. cf. M. maculata linne
Macrogallista nimbosa SOLANDER
Mactra brasilliana Lamarck
Mactra eragilis precursor GARDNER
MARTESIA CUNEIEORMIS (SAY)
MERCENARIA CAMPECHIENSIS (GMELIN)
Mercenaria campechiensis GARDLINENS IS (CONRAD)
MERCENARIA CAMPIEGIENSIS RILEY: (CONRAD)
MERCENARIA MERCENARIA (Linne)
Mercenarla mercemarla MORTONA (CONRAD)
MERCENARIA SP.
MODIOLA DEMISSUS DILLWYN
MODIOLUS DUCATELI CONRAD
MODIOLUS SP .
Montacuia petropolitana Dall
MULINIA CDNGESTA CONRAD
MULINIA CONGESTA MAGNOLIANA ( $\mathrm{D}_{\mathrm{A}} \mathrm{LL}$ )
Mulinia laierabis Say
MYA ARENARIA LINNE
Myselica eladenens.IS Gardner
MYSELLA MA JORINA GARDNER
MYSELLA STANTON1 (DALL)
MYSELLA VELAINI GARDNER
$\overline{\text { MYSELLA }}$ SP. $A$
MYTILUS SF.
Noetia limula (Conrad)
NOETIA LIMULA PLATYURA DaLL
Noetia palmerae (MacNeil)
NOETIA PDNDERDSA (SAY)
NOETIA TILLENSIS (MACNEIL)
NoETIA variabilis. (MacNeil)
NoETIA VARIABILIS QUADRATA
MacNeil
NoETIA SP.
Nucula proxima Say
NUCULA PRDXIMA IRUNCULUS. DALL
Nuculana acuta Confad
OSTREA COMPRESS.ROSIRA SAY L OSTREA SP. CF. O. DISPARJLIS Conrad
$M$ TW SCW NCW C

D D
DL D
?
L
DL D L
L
D D
DL L L
L
L
? L L
?
D
L
DL ? ?
DL ? L
$\underset{\mathrm{L}}{\mathrm{DL}} \quad \mathrm{DL} \quad \underset{\mathrm{DL}}{\mathrm{DML}} \quad \mathrm{DL} \quad \mathrm{L}$

DL
${ }_{L}^{L}$
L
DL $\quad \stackrel{\mathrm{D}}{\mathrm{L}} \mathrm{L}$

L
$L \quad ? L \quad L \quad L$

DL
DL DML DL DML D.
?
$\begin{array}{llllll}D L & D M & D & D M L & D L & L\end{array}$

| SPECIES | M | TW | SCW | NCW | C | B |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ostrea meridionalis Heilprin (PRDBABLY REWORKED) |  | ?L |  |  | ? |  |
| Ostrea percrassa Conrad |  |  |  | ? |  |  |
| OSTREA SGULPTURATA CONRAD | DL | DML | D | DML | DL |  |
| OSTREA SUBSPATULA FOREES |  |  |  | ? M |  |  |
| OSTREA GAGCAMA ENSIS GARDNER |  |  |  | L |  |  |
| OSTREA SP. |  | D |  | D |  |  |
| PANDORA CRASgIDENS CONRAD | L |  |  | L |  |  |
| PANDORA NAYLCULOLDES |  |  |  |  |  |  |
| GARDNER |  |  |  | L |  |  |
| Pandora $\frac{\text { IUDMEy }}{\text { ALDRICH }}$ Gardner \& | L |  |  | L | DL |  |
| ?PANDORA SP. |  | D | D |  |  |  |
| PANOPE ELORIDANA HEILPRIN |  |  | D | DL |  |  |
| PANOPE GOLDEUSSL WAGNER |  |  |  |  | DL |  |
| Paramya subioyaia Conrad | L | L |  |  | L | L |
| $\begin{aligned} & \text { PARASIARIE SP- CFO P. } \\ & \text { IRLQUEIRA (CONRAD) } \end{aligned}$ |  |  |  |  | L |  |
| PETRIC,OLA GABOLCNENSLSA | L |  | L | L |  |  |
| $\frac{\text { PETRI COLA GRINNELLI }}{\text { OLSS ON }}$ |  |  | L |  |  |  |
| PETRICOLA sP. |  |  |  |  | D |  |
| PHACDIDES ANADONTA (SAY) | L | L | D | DML | L | L |
| PHACOIDES CDSTATA (CONRAD) |  | ? |  |  | ? |  |
| PHACDIDES CRENULATUS |  |  |  |  |  |  |
| (CONRAD) | L | ? L |  | L | ? |  |
| $\frac{\text { PHAGOIDES MULTILINEATUS }}{\text { (TUOMEY \& HOLMES) }}$ | L | DL | DL | DL | DL | L |
| Phacoides $\underset{\text { subspassula }}{\text { ? }}$ (Conrad) |  |  | D. |  |  | L |
| Phacoides radians (Conrad) | L | DL |  | DML | L | L |
| $\frac{\text { PACOTDES }}{\text { TRISULCATUS }}$ | DL | DL | D | DL |  |  |
| $\begin{aligned} & \text { PHACDIDES IRISULCATUSS } \\ & \text { MULTISTRIATUS (CONRAD) } \end{aligned}$ | DL |  |  | ML | - |  |
| PHAGOTDES YACCAMAMENSLS |  | D | D | DML | D |  |
| PHACDIDES EACCAMAMENS, IS |  |  |  |  |  |  |
| DELANDENSIS MANSFIELD |  |  |  |  | L |  |
| PHACDIDES SP. |  |  |  | D |  |  |
| Pinna carnea Gmelin |  | L |  |  |  | L |
| PITAR CHIDNEFORMLS GARDNER |  |  |  | ? |  |  |
| PITAR SAYANA (CONRAD) | L | DL | D | DL | DL |  |
| Plicatula marginaja Say | DL | DL | D | DML | L |  |
| PORONYA SP. |  |  | L |  |  |  |
| Rangia clathrodonta Conrad | L |  |  | DM | L |  |
| RANGIA CUNEATA (GRAY) |  |  |  |  | L |  |
| ROCELLARIA HIANS Spengler |  |  |  |  | L | L |
| Rocelliaria sp. |  |  |  |  | ? |  |
| SEMELE BELLA Conrad |  |  |  | ?L |  |  |
| SEMELE BELLASTRIATA (CONRAD) |  | DL |  | DL | L | L |


| SPECIEA | M | T | SCW | NCW | C | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SEMELE LEANA DALL |  | ? |  |  |  |  |
| SEMELE NUCULDIDES (CONRAD) | L |  |  | DM |  | L |
| SEMELE PROFICUA PULTNEY |  |  |  | ? |  | L |
| SEMELE SUBQYATA ALIA GARDNER |  |  |  | D? |  |  |
| SEMELE (SEMELINA) SP. |  | D |  |  |  |  |
| SEMELE OP. |  |  | D |  |  |  |
| SOLEN Y YRLDLS SAY |  |  |  | L |  | L |
| SPHENLA SP. CF. S. DUBIA |  |  |  |  | L |  |
|  |  | DL | DL | DL | D | L |
| SPISULA BUBPARILIS CONRAD | L |  |  |  | L |  |
| SPISULA 8P. |  | D |  |  | D |  |
| SPPRTELLA GALPIX GARDNER | L |  |  | L |  |  |
| $\frac{\text { SPORTELLA }}{(C O N R A D)}$ | L | L |  | L | L |  |
| SPDORTELLA GIBBERDSA GARDNER |  |  |  | L |  |  |
| SPDRTELLA PROTEXTA (CONRAD.) | L |  |  | L | L | L |
| SPDRTELLA MACCAMAEENSIS |  |  |  |  |  |  |
| GARDNER |  |  |  | L |  |  |
| Strigilla flexuosa Say | L |  |  | DL |  |  |
| TAGELUS DIVISUS SPENGLER |  |  |  |  | L |  |
| TAGELUS PLEBEIUS (SPENGLER) | DL | L |  | ML |  |  |
| TAGELUS PLEBEIUS |  |  |  |  |  |  |
| CARDLINENSIS (CONRAD) |  |  |  | L |  |  |
| Tellina aequistriata Say | L |  |  |  | L | L |
| TELLINA ALTERNATA SAY |  |  |  | ? ${ }^{\text {d }}$ | L | L |
| TELLINA ARCTATA CONRAD | ? ${ }^{\text {L }}$ | ? |  |  |  |  |
| TELLINA DUPLINIANA DALL | L | DL | D | DML | DL |  |
| TELLINA MACILENTA DALL | L |  |  | L |  |  |
| TELLINA SAY! (DESHAYES) |  | ? DL | L | L | DL | L |
| TELLINA TENELLA (VERRILL) |  | L |  |  |  | L |
| Tellina scapha dall |  |  |  | M |  |  |
| TELLINA SP.A |  |  |  | D |  |  |
| TELLINA SP. B |  |  |  | D |  |  |
| Thracia transversa H. C. Lea | L |  |  | L |  |  |
| $\frac{\text { TRACHYCARDIUM EMMONSI }}{\text { (CONRAD) }}$ |  | L |  | DL | L |  |
| Trachrcardium dedalium Dall |  |  |  | L |  | L |
| Trachrcardium 3P. |  | D | D | D |  |  |
| IRANSENELLA CARDLINENSIS |  |  |  |  |  |  |
| Dall | DL | D | D | DL | L |  |
| ?Transenella sp. |  | D | D |  |  |  |
| TRIGONIOGARDIA COLUMBA |  |  |  |  |  |  |
| (HEILPRIN) | D |  |  | L |  |  |
| VERTICORDIA EMMONS I CONRAD | L | DL | D | L |  |  |
| YOLDIA LIMATULA SAY |  |  |  |  | DL | $L$ |
| Yoldia laevis (Say) | L |  |  | L |  |  |
| YOLDIA SP. |  |  |  |  | L |  |

## GASTROPDDA



| SPECIES | M | TH | SCW | NCW | C | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Cancelilaria conradiana dall |  | L |  | D |  | L |
| CANCELLARIA VENUSTA TUOMEY |  |  |  |  |  |  |
| \& HOLMES | L | L |  |  |  |  |
| CANTHARUS SP. |  | DL |  |  | L |  |
| CERITHIOPS IS ABFUPTA WATSON |  | D? |  |  |  | L |
| CERITHIOPSIS EMERSONI |  |  |  |  |  |  |
| Persubulata Gardner | L |  | PL | $L$ |  |  |
| CERITHIDPSIS SP. |  |  |  |  | L |  |
| CERITHIUM MUSCARUM SAY |  |  |  | L |  | L |
| CIRGULUS (TSUPRA-NITIDUS WOOD |  |  |  |  |  |  |
| $\begin{aligned} & \text { SUB. SP.) ORBIGNYI } \\ & (F \mid S H E R) \end{aligned}$ | L | DL |  | L |  | L |
| Circulus SP. |  |  |  |  | L |  |
| CLATHRODRILLIA EBENINA (DALL) |  | D |  |  |  | L |
| CLATHR,DRILLLA EBUR (REEVE) |  | L |  |  |  | L |
| CLATHRDDRILLIA TUBERCULATA |  |  |  |  |  |  |
| $\frac{\text { CLA.YATULA }}{(O L G S O N)}$ | L |  |  | $t$ |  |  |
| COCHL IOLEPIS CONGAVA (H. S. |  |  |  |  |  |  |
| COCHL OLEP.1S SP. AFF. C. |  |  |  |  |  |  |
| COCHLIDLEPIS SP. A |  | D |  |  |  |  |
| CONUS ADVERSARIUS CONRAD | DL | DL |  | DML |  |  |
| CONUS JASPIDEUS GMELIN | ? | DL |  | DML |  | L |
| CRASSISPIRA PERRUGATA (DALL) ?D L |  |  |  |  |  |  |
| CREPIDULA ACULEATA (GMELIN) | D | L | D | D | $L$ | L |
| CREPIDULA ACULEATA CDSIATA |  |  |  |  |  |  |
| Crepidula gonyexa Say |  | L |  |  | L |  |
| CREPIDULA FDRNICATA (LINNE) | DL | DL | D | DL | DL | L |
| CREPIDULA FORNICATA PONDEROSA |  |  |  |  |  |  |
| Crepidula plana Say | L | L | ? ${ }^{\text {d }}$ | DL | L | L |
| CRUCIRULUM AUR,ICULUM GMELIN | D | D | D | DM |  | L |
| CRUCLBULUM STRIATUM SAY |  | L |  |  |  | L |
| CRYOTURRIS CERINELLA (DALL) |  |  |  | L |  |  |
| CRYDTURRIS MAGNOLIANA CHARIESSA |  |  |  |  |  |  |
| GARDNER |  |  |  | L |  |  |
| CYMATOSYRINX LUNATA LEA | L | L |  | L |  |  |
| CYMATOSYRINX SIMPSONI (DALL) |  |  |  | L |  | L |
| Daphnella elata Dall |  | L |  | L |  | L |
| Didianema carolinae Gardner |  |  |  | DL |  |  |
| DIDDORA CARDITELLA DALL |  |  |  | DML |  |  |
| DIODORA SP. CF. D. CALODSAENSIS |  |  |  |  |  |  |
| DI ODORA CAYENENSIS (LAMARGK) |  | $L$ |  |  | DL | L |
| DIodora floridiana Gardner |  |  |  | ? |  |  |
| D1, DDORA NUCULA DALL | DL | D | D | DML |  |  |
| "Drillial abundans Conrad |  | L |  | M |  |  |
| "DRILLIA" APMANITOMA OXIA |  |  |  |  |  |  |


| SPEECIES | $\underline{M}$ | IW | SCW | NCW | C | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | L |  |  | L | L |  |
| "DRILLiA" SP. AFF. D. SUMTERENS,IS GARDNER |  |  |  |  |  |  |
|  | L |  |  |  | L |  |
| "Drithla ${ }^{\text {asp. }}$ |  | D |  | D |  |  |
| Epibcymia multicarinata |  |  |  |  |  |  |
| Stimpani | L |  | D | D | D |  |
| EPitonium angulatum (Say) |  | L |  |  | L | L |
| $\frac{\text { EP:TONIUM }}{(D E \text { ANTILLARUM }}$ |  |  |  |  | L |  |
| Epitionium multistriatum (Say |  | L |  |  |  | L |
| EPITONIUM RUPIGOLA (KURTZ) |  |  |  |  | DL | L |
| EPITONIUM Pratit Gardner | L |  |  | ? |  |  |
| Epitonium gayanum Dall? |  | D |  |  | DL |  |
| Epitonium jurriculum (Somerb |  |  |  |  |  |  |
| Erato mavgeriae Gray | L | L |  |  |  |  |
| Eupleura caudata (Say) |  | L |  | L | D | L |
| EUPLEURA SP. |  |  |  |  | L |  |
| FASG, IOLARIA APICINA DALL | DL | L | D | DML | DL |  |
| EAS,CIOLARIA CRONLYENSIS |  |  |  | L |  |  |
| Easciolaria elegans Emmons | L | L |  |  |  |  |
| FABCIDLARIA PAPILLOSA |  |  |  |  |  |  |
| ACMENSIS SMITH |  |  |  | L |  |  |
| EASC,IDLARIA RHOMOOIDEA | L |  |  | ? |  |  |
| Fasciolaria sparrowi Emmons | L |  |  | M ? |  |  |
| Ficus Paprratia (SAY) |  |  | D | DL |  | L |
| $\frac{\text { FOSSARUS }_{\text {ADAMS }} \text { ANOMALA }}{\text { AD }} \text { (C.B. }$ |  | D |  |  |  |  |
| Fusinus sp. AFF. F. |  |  |  |  |  |  |
| agqualis Emmons <br> Fusinus caloosaensis | L. |  |  | L. |  |  |
| HEILPRIN |  | L |  | DML |  |  |
| Fusinus sp. cF. E. |  |  |  |  |  |  |
| CAROLINENSIS DALL |  |  | L |  |  |  |
| Fuginus sp. A |  |  |  | D |  |  |
| ?FUSINUS SP . |  |  | D |  |  |  |
| GEMOPHOS MAXWELLI OLSSON \& |  |  |  |  |  |  |
| Harbison |  |  | L |  |  |  |
| Gemophos imnctus (Conrad) |  |  |  | D |  |  |
| G1, 昌ERULINA OVULIEORMIS |  |  |  |  |  |  |
| d'0rbigny |  | L |  |  |  |  |
| Glyphostoma scoptes Dall |  |  |  | L |  |  |
| IIHycythara psila (Bush) |  |  |  | L |  |  |
| KURTZ,IELLA GERINA (KURTZ \& |  | L |  | ? |  |  |
| Kurtziella eritima (Bush) | DL | L |  |  | L |  |
| KURT2IELLA SP. GF. K. |  |  |  |  |  |  |
| LIMONTELLA DALL |  | D |  |  |  |  |
| Kuriziella stelcata Stearns |  |  |  | L |  |  |
| KURT2IELLA SP. |  | D |  | D |  |  |


| SPEECIES | M | TH | SCW | NCM | C | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LEMINITIINA GRANIFERA (SAY) | L | ? | D | DL | L |  |
| LIOTIA GAROLINIANA DALL |  | L |  |  |  |  |
| LIOTIA GEMMA TDUMEY \& Holmes | L | D |  | DML |  | L |
| LIDTIA PERGEMMA GARDNER | L | DL |  | DL | L | L |
| LUNATIA HERDS (SAY) |  | ? |  |  |  | ? |
| LUNATIA INTERNUS (SAY) |  |  |  | DL |  |  |
| MACROMPHALINA PIERRDT GARDNER |  |  |  | L |  |  |
| MANGELIA SIMPSDNI DALL |  |  |  | M |  |  |
| MARGINELLA AUREDCINCTA STEARN | * L | D | D |  | D |  |
| MARGINELLA DENTICULATA |  |  |  |  |  |  |
| Conrad | L | L |  |  |  | L |
| $\frac{\text { MELANELLA }}{(C D N T R A I N E)}$ |  | L |  |  |  | L |
| $\frac{\text { MELANELLA }}{\text { ADAMS }}$ JAMAICENSIS C. B. |  | L |  |  | DL | L |
| Melanella $\mathrm{sP}^{\text {P }}$ |  | D | D |  | L |  |
| MITRA WANDOENSIS HOLMES | L | L |  |  | L | L |
| Mitrella lumata (Say) | L | L | L | DL |  | L |
| MITRELLA PROFUNDI DALL |  | L |  |  |  | L |
| MITRELLA PRDFUNDI PERMAGNA |  |  |  |  |  |  |
| DALL |  | L |  |  |  |  |
| MITRELLA YAGGAMAYENSIS |  |  |  |  |  |  |
| GARDNER |  |  |  | L |  |  |
| MUREX BREYIFRONS LAMARCK |  | D |  |  |  | L |
| MUREX CELLULOSUS (CONRAD) | L |  |  | M |  | L |
| MUREX PDMUN GMELIN |  |  |  | L |  | L |
| MURICOPS IS OSTREARUM CONRAD | ? 1 | DL |  |  |  | L |
| NASSARINA GLYPTA BUSH | L |  |  | L |  | L |
| NASSARINA SP. |  | D |  | D | D |  |
| NASSARIUS ACUTA (SAY) |  | L |  |  | DL | L |
| NASSARIUS ARATA (SAY) | L | L |  |  |  |  |
| $\frac{\text { NASSARIUS CALOOSAENS IS }}{\text { (DALL) }}$ | L | L |  | L |  |  |
| $\frac{\text { NASSARIUS CALODSAENSIS }}{\text { CDRNELLUM }} \text { (OLSSDN)}$ | L | L |  | L |  |  |
| Nassarius consensa (Ravenel) | L | DL |  | DML | ?DC | L |
| NASSARIUS IRRDRATA (CONRAD) | L | D | D | DM | L |  |
| NA,SSARIUS IBOGRAMMA (DALL) |  |  |  | ? DL |  |  |
| NASSARIUS JDHNSONI (DALL) |  |  |  | L |  |  |
| NASSARIUS LAPENOTIERI (DALL) |  |  |  | L |  |  |
| NASSARIUS NEOGENENSIS |  |  |  |  |  |  |
| (GARDNER \& ALDR\|CH) | L |  |  | L |  |  |
| Nassarius pasoleta (SAy) |  | L |  | ? DL | L |  |
| NASSARIUS PORCINA (SAY) | L | L | L | DM | L |  |
| NASSARIUS SGALASPIRA |  |  |  |  |  |  |
| (CONRAD) | L |  |  | DML |  |  |
| Nassarius sexdentata (Conrad) |  |  |  | DL |  |  |
| NASSARIUS TRIVITTATA (SAY) |  |  |  | L | DL | L |
| NASSARIUS VIBEX (SAY) | L |  |  | DL | DL | L |
| NASSARIUS \%ILMINGTONENSIS |  |  |  |  |  |  |
| Gardner |  |  |  | ? L |  |  |
| Nassarius zeta Gardner |  |  |  | L |  |  |

Nas.sarius sp. indet. (like N. SGALASPIRA (CONRAD)

NASSARIUS 3P. A
NAT,IGA CANRENA (LINNÉ)
$\begin{array}{ll} & \\ & \\ & L \\ & D \\ & \\ & D L \\ & D\end{array}$
NISO LNTERRUPTA AEGLEES Bush
Niso Dallil Gardner
NISO SP. GF. N. DALLI
Gardner
ODOSTOMIA IMPRESSA SAY
ODOSTOMIA SEMINUDA C. B. ADAMs
ODOSTOMIA SP. GF. O.
STIMPSONI BARTSCH
D D
Oliva sayana Ravenel
OLIVELLA MUT,ICA (SAY)
OLIVELLA NITIDULA DILLWYN


PISANIA NUX DALL
POLINICES DUPLICATUS (SAY)
?POLINICES SP.
Prunum apicinum (Menke)
PRUNUM APIGINUM BPREALLI,S
VERRILL
Prunum bellum (Conrad)
Prunum sp. GF. P. BELLUM (Conrad)

PSEUDONEPTUNEA MULTANGULA
(PHILIPPI)
$\frac{\text { PTERORHYTIS }}{\text { PTERORHYTIS }} \frac{\text { CONRADI }}{\text { ELUYIANA DALL }}$
L

Pybamidella arenosa Conrad
RETUSA GANALICULATA (SAY)
$\begin{array}{llllll}\mathrm{DL} & \mathrm{DL} & \mathrm{D} & \dot{\mathrm{DL}} & \mathrm{DL} & \mathrm{L}\end{array}$
Betusa canaliculata vavghan. GARDNER
Rimula garolinianum Dall L
RINGICULA ELORIDANA DALL D
RINGICULA SP.
RISSDA GERAEA Dall
L
RISSDINA HARPA Gardner
Rubellatoma rubella (Kurtz
\& STIMPSON)
SAYELLA SP. CF. S. FUSCA
(C. B. AdAms)
$\begin{array}{lllllll}\text { S.gAPHELLA OBTUSA } & \text { (EMMONS) } & L & L & & D M & L \\ \text { SEILA ADAMSI (H. C. Leas) } & L & \mathrm{DL} & \mathrm{D} & \mathrm{DL} & \mathrm{DL} & \mathrm{L}\end{array}$

SPEC,IES
SIGARETUS MULTIPLICATUS DALL SOLARIORBIS UNDULA DALL
?SOLARIORBIS SP.
STRDMBIFDRMIS BARTSCHI
GARDNER \& ALDRICH
STROMEIFORMIS BIGONICA GARDNER
STROMBIFDRMIS SP. AFF. S.
DALLI GARDNER \& ALDRICH
STRDMBIFDRMIS 3P. A
SYNTOMODRILLIA LIS3OTROPIS SGISSURATA DALL
TECTONACTICA PUSILLAA (SAY) TEINDSTDMA SMI,KRON GARDNER
TEREBRA CDNGAVA SAY TEREBRA DISLOCATA SAY
TEREBRA NEGLECTA EMMONS
TEREBRA PROTEXTA (CONRAD)
TEREBRA SP.
TRICOLIA PULCHELLA C. B.
ADAMS
TRIPHORA NIGROCINGTA C. B. ADAMS

L

TRIVIA PEDICULUS (LINNÉ) L TRIVIA SUFFUSA GRAY
TROPHON LEPIDOTA (DALL)
TURED CRENULATUS GMELIN
TURBDNILLA FRAGILIS DALL
TUREONILLA INTERRUPTA
Tuomey \& holmes
TURBON,ILLA MULTICOSTATA
C. B. ADAMS

TURBONILLA RETIGULATA C. B. ADAMS
TURBONILLLA (CHEMNITZIA) SP.
TURBONILLA SP.
TUREONILLA SP.
TURBONILLA SPP.
IURRITELLA DUPLINENSIS
GARDNER \& ALDRICH L
TURRITELLA SUBANNULATA
HEILPRIN L
TURRITELLA YARIABILIS SAY L
?TURRITELLA SP
UROSALPINX PERRUGATA (CONRAD)
UROSALPINX SP. AFF.
PERRUGATUS CONRAD
URDSALPINX STIMPSONI GARDNER L
UROSALPINX TROSSULA (CONRAD) L
UROSALPINX SP.
?UROSALPINX SP.
VERMICULARIA "SPIRATA"
$(P H|L| P P \mid) \quad D L$
XENOPHORA CONCHYLI OPHORA
BORN

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DL DL DL L
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D DL
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## SCAPHOPODA

CADULUS THALLUS CONRAD

## CADULUS SP.

DENTALIUM ANTILLARUM $D^{\prime}$ ORBIGNY
DENTALIUM WACCAMAWENSE GARDNER
DENTAL_UM SP.

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D

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L

L

CIRHIPEDIA
BALANUS 3P. D D D D

## ECHINOIDEA

CASSIDULUS SP. D
?MELLITA 8P.

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