

TERRESTRIAL INVERTEBRATE ANIMALS OF THE VIRGIN ISLANDS
NATIONAL PARK, ST. JOHN, U.S.V.I.: AN ANNOTATED CHECKLIST

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October 1987

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ABSTRACT

A list is given of all the terrestrial invertebrates known to occur on St. John, with the exception of the Acarina and Insecta, of which only representative forms are noted. Included are the following: PLATYHELMINTHES (land planarian) - 1; MOLLUSCA (snails and slugs) - 32; ANNELIDA (earthworms) - 1; ONYCHOPHORA (peripatus) - 1; ARTHROPODA, Crustacea (woodlice, beachhoppers, crabs) - 28; Arachnida (scorpions, pseudoscorpions, harvestmen, spiders, etc.) - 120; Myriapoda (centipedes, millipedes, etc.) - 19; Insecta (springtails to wasps) - 30. Descriptions of the higher categories and annotations of about 100 species are provided.

INTRODUCTION

On a small tropical island like St. John, the attention of residents and visitors alike is directed mainly toward the sea, for transportation, for food, and for recreation. Scant notice is given to the land except as it affords sites for buildings and roads and dumps or vantages for views of the water. So, while a rather large amount of effort has been devoted to study of the marine biology in the Virgin Islands, relatively little attention has been paid to the terrestrial flora and fauna. Of course, the larger, conspicuous plants and animals have been surveyed, but very little has been done with the small and inconspicuous, but no less important, organisms. In the conviction that an inventory of the terrestrial invertebrate animals of the Virgin Islands National Park would be interesting and useful to a wide variety of people, I have conducted a survey of these little-known creatures. In the context of this work "terrestrial invertebrates" refers to those animals which are typically found on land, i.e. not in water (sea, pond, stream). For example, the periwinkle snails and the shore crabs are basically aquatic animals, but, because of special adaptations, they are usually encountered, out of the water, on rocks or beach or mud flat.

The following, then, is an annotated list of worms, snails and arthropods known to inhabit the island of St. John. For information about the plants and larger animals, other publications should be consulted, for example:

Jadan - A guide to the natural history of St. John.

MacLean - Reptiles and amphibians of the Virgin Islands.

Philibosian and Yntema - Annotated checklist of the birds, mammals, reptiles and amphibians of the Virgin Islands and Puerto Rico.

Raffaele - A guide to the birds of Puerto Rico and the Virgin Islands.

Woodbury and Weaver - The vegetation of St. John and Hassel Island, U.S. Virgin Islands.

OBSERVING INVERTEBRATES

Some invertebrate animals, such as butterflies, are relatively large and conspicuous and can easily be observed and caught for study. Others, however, such as pseudoscorpions, are tiny and reclusive and are difficult to find.

Many suggestions for locating and collecting insects are given in "Island Insects, Handbook for Insect Study" (Terry-Purdy 1984); these are generally applicable for other invertebrates, as well. However, the simplest and most important method of finding animals is direct search in places where they might be present: on exposed surfaces, in forests and fields, on cliffs and beaches, in and around man-made structures, etc.; under objects such as rocks, logs, boards, and loose bark; in soil, litter, and decomposing vegetation and other organic material. In the National Park, actual collecting is prohibited (except by permission), but animals may be caught and observed and then released, unharmed, back into their preferred habitat. In the interest of conservation, the habitats should be disturbed as little as possible; thus, trees should not be completely stripped of bark and turned rocks and logs should be returned to their original positions.

For those interested in details, specimens of many of the island's animals may be examined in the collections maintained by the National Park Service at the Virgin Islands Biosphere Reserve Center, Lind Point.

THE LIST

The list is based on a survey of literature and on collections made by the author periodically over a span of 13 years (1974-1987). Collected specimens were identified by the author or by others expert in particular groups of animals (see Appendix II).

At the time when work on this list was begun in 1974, there was little available literature dealing directly with the terrestrial invertebrates of St. John. There were only a few, scattered published records of snails (10), isopods (1), crabs (3), scorpions (1), spiders (19), harvestmen (1), millipedes (6), and representatives of only 6 orders of the insects (ca. 100). No records had been published of any onychophoran, annelid, freshwater crustacean, centipede, or representative of most orders of arachnids and insects. Since 1974, additional records have appeared of the occurrence on St. John of onychophora (1), scorpions (2), pseudoscorpions (4), palpigradid (1), spiders (8), amblypygid (1), and insects (14). (References to published reports on terrestrial invertebrate animals on St. John may be found in Appendix V.) The present list includes additional representatives of many of the previously reported groups and first reports for St. John of annelids, freshwater crustacea, schizomid, solpugid, acarina, centipedes, symphylan, and pauropod.

Presented first is a systematic list of terrestrial invertebrates of St. John; the various species are shown in the context of zoological classification. For the order Acarina (class Arachnida) and the class Insecta, only a few representative forms have been included; for all other groups, all species reported or known to occur on St. John have been listed. Following the systematic list is a key to phyla and classes, which will guide the reader to discussions of the larger groups treated herein. Finally, under the appropriate systematic headings are descriptive accounts of representative, important or conspicuous species.

It will be obvious that this list is by no means complete. The results are preliminary, inasmuch as many species still remain to be found and many of those already found have not yet been studied and identified (this is particularly true with respect to the Insecta and the Acarina). It is hoped that the present effort will serve as the basis for continuing study of the terrestrial fauna of the Virgin Islands.

Readers who find errors in the text or have additional information to contribute should feel free to contact the author at: Department of Biology, University of Rochester, Rochester, NY 14627. Information specifically about insects on St. John would be welcomed by Dr. M.A. Ivie, who is actively working on that group of animals in the Virgin Islands; he can be contacted at: Department of Entomology, Montana State University, Bozeman, MT 59717.

SYSTEMATIC LIST OF TERRESTRIAL INVERTEBRATES ON ST. JOHN

PHYLUM PLATYHELMINTHES
CLASS TURBELLARIA

Order Tricladida

Family Rhynchodemidae - Land planarians
Rhynchodemus cf. sylvaticus (Leidy 1851)

PHYLUM MOLLUSCA
CLASS GASTROPODA

Subclass Prosobranchia

Order Archaeogastropoda

Family Helicinidae
Alcudia foviata (Pfeiffer 1853)
Alcudia striata (Lamarck 1822)

Order Mesogastropoda

Family Littorinidae
Littorina angulifera (Lamarck 1822)
Littorina ziczac (Gmelin 1791)
Nodilittorina tuberculata (Menke 1828)
Tectarius muricatus (Linnaeus 1758)

Family Annularidae
Chondropoma newcombiana (C.B. Adams 1849)

Family Cyclophoridae
Megalomastoma petiti Bartsch 1942

Family Truncatellidae
Truncatella scalaris Michaud 1830

Subclass Pulmonata

Order Basommatophora

Family Ellobiidae
Melampus coffeus (Linnaeus 1758)

Order Systellommatophora

Family Veronicellidae
Leidyula kraussi (Férussac 1825)
Leidyula floridana (Leidy 1851)

Order Stylommatophora

Family Ariophantidae

Guppya gundlachi (Pfeiffer 1840)

Family Bulimulidae

Bulimulus guadalupensis (Bruguière 1792)Bulimulus diaphanus (Pfeiffer 1854)Drymaeus virgulatus (Férussac 1822)

Family Camaenidae

Polydontes incertus (Férussac 1823)

Family Ferussacidae

Caecilioides gundlachi (Pfeiffer 1850)Caecilioides consobrinus (Orbigny 1855)

Family Helminthoglyptidae

Hemitrochus nemoralinus (Petit 1836)Plagioptycha euclasta (Shuttleworth 1854)

Family Oleacinidae

Varicella terebraeformis (Shuttleworth 1854)

Family Pupillidae

Gastrocopta pellucida (Pfeiffer 1841)

Family Sagdidae

Hyalosagda subaquila (Shuttleworth 1854)Lacteoluna selenina (Gould 1848)

Family Streptaxidae

Streptaxis glaber Pfeiffer 1850Gulella bicolor (Hutton 1834)

Family Subulinidae

Beckianum beckianum (Pfeiffer 1846)Lamellaxis gracilis (Hutton 1834)Lamellaxis micra (Orbigny 1835)Opeas pumilum (Pfeiffer 1840)Subulina octona (Bruguière 1789)PHYLUM ANNELIDA
CLASS OLIGOCHAETA

Order Haplotaxida

Family Lumbricidae

Lumbricus sp.

Order Amphipoda

Suborder Gammaroidea

Family Talitridae

Platorchestia platensis (Krøyer 1845)Tethorchestia antillensis Bousfield 1984

Order Decapoda

Suborder Reptantia

Family Coenobitidae

Coenobita clypeatus (Herbst 1791)

Family Grapsidae

Grapsus grapsus (Linnaeus 1758)Pachygrapsus transversus (Gibbes 1850)Aratus pisonii (H. Milne-Edwards 1837)Sesarma ricordi H. Milne-Edwards 1853

Family Gecarcinidae

Cardisoma guanhumi Latreille 1852

Family Ocypodidae

Ocypode quadrata (Fabricius 1787)Uca burgersi Holthuis 1967Uca rapax (Smith 1870)

CLASS ARACHNIDA

Order Scorpionida

Family Diplocentridae

Heteronebo yntemai Francke and Sissom 1980

Family Buthidae

Microtityus waeringi Francke and Sissom 1980Centruroides griseus (Koch 1845)

Order Pseudoscorpionida

Family Chthoniidae

Pseudochthonius sp.Paraliochthonius sp.Tyrannochthonius sp.Caribchthonius butleri Muchmore 1976Lechytia sp.

Family Syarinidae

Ideoblothrus sp.Nannobisium sp.

Family Ideoroncidae
Typhloroncus coralensis Muchmore 1979

Family Olpiidae
Pachyolpium sp.
Aphelolpium longidigitatum (Ellingsen 1910)
Novohorus incertus (Beier 1931)

Family Garypidae
Garypus sp.

Family Sternophoridae
Idiogaryops sp.

Family Cheiridiidae
Cheiridium sp.
Neocheiridium sp.

Family Chernetidae
Lustrochernes sp.
Bituberochernes jonensis Muchmore 1979
Dinocheirus altimanus (Ellingsen 1910)
Epactiochernes sp.

Family Cheliferidae
Parachelifer parvus Muchmore 1981

Order Amblypygida

Family Phrynidae
Phrynus longipes (Pocock 1893)

Family Charontidae
Charinides levii Quintero

Order Opilionida

Suborder Laniatores

Family Cosmetidae
Metacynortoides obscura (Banks 1903)

Family Phalangodidae
Stygnomma sp. 1
Stygnomma sp. 2
Kimula sp.
Paraconomma sp.
 Samoinae gen. et sp.
Martibianta virginsulana Silhavy 1973

Order Araneida

Suborder Orthognatha

Family Barychelidae

Obaerarius insulanus Petrunkevitch 1926

Family Ctenizidae

Phaeoclita sp.

Family Dipluridae

Diplura macrura C.L. Koch 1842

Family Theraphosidae

Avicularia laeta (C.L. Koch 1842)Cyrtopholis bartholomei (Latreille 1832)Ischnocolus shoemakeri Petrunkevitch 1926

Suborder Labidognatha

Family Anyphaenidae

Aysha tenuis (L. Koch 1866)

Family Araneidae

Antillognatha lucida Bryant 1945Argiope argentata (Fabricius 1775)Cyclosa oculata (Walckenaer 1802)Eustala sp.Gasteracantha cancriformis (Linnaeus 1758)Gasteracantha tetracantha (Linnaeus 1767)Larinia coamensis Petrunkevitch 1930Lariniacantha crewi (Banks 1903)Leucauge argyra (Walckenaer 1841)Leucauge regnyi Simon 1897Metepeira virginensis Chamberlin and Ivie 1942Nephila clavipes (Linnaeus 1767)Tetragnatha subextensa Petrunkevitch 1930Wixia serrallesi Bryant 1947

Family Caponiidae

Caponina sp.Nops blandus (Bryant 1942)

Family Clubionidae

Corinna abnormis Petrunkevitch 1930Corinna cleonei Petrunkevitch 1926

Family Filistatidae

Filistatoides sp.

Family Gnaphosidae

Camillina elegans (Bryant 1940)Microsa chickeringi Platnick and Shadab 1977Zimiromus muchmorei Platnick and Shadab 1976

- Family Linyphiidae
Grammonota(?) cf. calcarata Bryant 1948
- Family Loxoscelidae
Loxosceles virgo Gertsch and Ennik 1983
- Family Ochyroceratidae
Theotima minutissima (Petrunkevitch 1930)
Theotima sp.
- Family Oecobiidae
Oecobius concinnus Simon 1893
- Family Oonopidae
Heteroonops spinimanus (Simon 1891)
Ischnothyreus peltifer (Simon 1891)
Oonops balanus Chickering 1971
Oonops castellatus Chickering 1972
Oonops ronoxus Chickering 1971
Oonops sp.
Opopaea lutzii Petrunkevitch 1929
Scaphiella kalunda Chickering 1968
Stenoonops lucradus Chickering 1969
Stenoonops nitens Bryant 1942
Stenoonops noctucus Chickering 1969
Stenoonops reductus (Bryant 1942)
- Family Oxyopidae
Hamataliwa sp.
Oxyopes salticus Hentz 1845
- Family Palpimanidae
Otiothops pentucus Chickering 1967
- Family Pholcidae
Micromerys sp.
Modisimus coeruleolineatus Petrunkevitch 1929
Modisimus glaucus Simon 1893
Modisimus montanus Petrunkevitch 1929
Modisimus sexoculatus Petrunkevitch 1929
- Family Salticidae
Beata octopunctata (Peckham and Peckham 1893)
Corythalia iridescens Petrunkevitch 1926
Emathis sp.
Hentzia antillana Bryant 1940
Metacyrba taeniola (Hentz 1845)
3 new genera
- Family Scytodidae
Scytodes fusca Walckenaer 1837
- Family Segestriidae
Ariadna arthuri Petrunkevitch 1926
- Family Selenopidae
Selenops lindborgi Petrunkevitch 1926

Family Sparassidae

- Olios antiguensis (Keyserling 1880)
Stasina portoricensis Petrunkevitch 1930

Family Tetrablemmidae

- Monoblemma muchmorei Shear 1978

Family Theridiidae

- Argyrodes caudatus (Taczanowski 1873)
Argyrodes elevatus Taczanowski 1873
Argyrodes nephilae Taczanowski 1873
Argyrodes obtusus O.P. Cambridge 1880
Argyrodes quasiobtusus Exline and Levi 1962
Chindellum cybele (Bryant 1942)
Coleosoma floridanum (Banks 1900)
Spintharus flavidus (Hentz 1850)
Theridion rufipes Lucas 1846
Thymoites guanicae (Petrunkevitch 1930)

Family Thomisidae

- Misumenops insulanus Petrunkevitch 1930

Family Uloboridae

- Miagrammopes ciliatus Petrunkevitch 1926
Miagrammopes pinopus Chickering 1968

Order Schizomida

Family Schizomidae

- Schizomus portoricensis (Chamberlin 1922)

Order Palpigradida

Family Eukoeneniidae

- Eukoenia berleseii virginea Condé 1984

Order Solpugida

Family Ammotrechidae

- Ammotrechella pallida Muma and Nazario 1971

Order Acarina

Suborder Notostigmata

Family Opilioacaridae

- Opilioacarus sp.

Suborder Metastigmata

Ticks

Family Argasidae

Family Ixodidae

Other suborders include:
 parasitic mites
 spider mites
 velvet mites Trombidium sp.
 beetle mites

CLASS CHILOPODA

Subclass Epimorpha

Order Scolopendromorpha

Family Scolopendridae

Scolopendra alternans Leach 1815

Cormocephalus impulsus Lewis

Otostigmus caraibicus Kraepelin 1903

Family Cryptopidae

Cryptops sp.

Newportia virginensis Lewis

Order Geophilomorpha

Subclass Anamorpha

Order Scutigeroidea

Family Scutigeridae

Scutigera linzei (Wood 1867)

CLASS DIPLOPODA

Subclass Pselaphognatha

Family Lophoproctidae

Lophoturus longisetis (Pocock 1894)

Subclass Chilognatha

Family Stemmiulidae

Prostemmiulus wheeleri (Silvestri 1908)

Family Rhinocricidae

Rhinocricus arboreus (Saussure 1859)

Rhinocricus monilicornis (Porat 1876)

Family Siphonophoridae

Siphonophora albiceps Loomis 1970

Family Paradoxosomatidae

Asiomorpha coarctata (Saussure 1860)

Family Haplodesmidae
Prosopodesmus jacobsoni Silvestri 1910

Family Pyrgodesmidae
Poratioides virginalis Loomis 1970

CLASS SYMPHYLA

Family Scutigereidae
Hanseniella orientalis (Hansen) (?)

CLASS PAUROPODA

Family Pauropodidae
Allopauropus sp.

CLASS INSECTA

Subclass Apterygota
 Order Collembola - Springtails
 Order Thysanura - Silverfish

Family Lepismatidae
Lepisma saccharina (Linnaeus)

Subclass Pterygota

Order Odonata - Dragonflies, damselflies

Family Libellulidae
Erythrodiplax umbrata (Linnaeus 1758)

Order Orthoptera - Grasshoppers, crickets

Family Acrididae
Schistocerca americana (Drury)

Family Gryllidae
Acheta assimilis (Fabricius)

Order Dictyoptera - Cockroaches

Family Blattidae
Periplaneta americana (Linnaeus)

Order Dermaptera - Earwigs

Family Carcinophoridae
Anisolabis maritima (Géné)

- Order Isoptera - Termites
 Family Termitidae
Nasutitermes costalis (Holmgren 1910)
- Order Mallophaga - Chewing lice
 Family Menoponidae
Myrsidea coerebicola Klockenhoff and Schirmers
 1980
- Order Hemiptera - True bugs, love bug
 Family Pyrrhocoridae
Dysdercus andreae (Linnaeus 1758)
- Order Homoptera - Cicadas, plant lice
 Family Aphididae
Aphis sp.
- Order Coleoptera - Beetles
 Family Cerambycidae
Anelaphus nanus (Fabricius 1792)
- Order Neuroptera - Antlions, lace wings
 Family Myrmeliontidae
Myrmeleon insertus Hagen 1861
- Order Lepidoptera - Butterflies, moths
 Family Danaidae
Danaus plexippus (Linnaeus 1758)
 Family Nymphalidae
Dione vanillae (Linnaeus 1758)
 Family Heliconiidae
Heliconius charitonius (Linnaeus 1767)
 Family Pieridae
Ascia monuste (Linnaeus 1764)
 Family Papilionidae
Battus polydamus (Linnaeus 1758)
 Family Hesperidae
Urbanus proteus (Linnaeus 1758)
 Family Arctuidae
Composia sybaris (Cramer 1777)
Horama pretus (Cramer 1777)
 Family Noctuidae
Ascalapha odorata (Linnaeus 1758)

Family Sphingidae
Perigonia lusca (Fabricius 1777)

Order Diptera

Family Culicidae - Mosquitoes
Culex quinquefasciatus Say

Family Ceratopogonidae - Sandflies
Culicoides furens (Poey)

Family Muscidae - House flies
Musca domestica (Linnaeus)

Order Siphonaptera - Fleas

Family Pulicidae
Ctenocephalides canis Rothschild

Order Hymenoptera

Family Formicidae - Ants
Solenopsis geminata (Fabricius)

Family Vespidae - Wasps
Polistes crinitus (Felton 1765)

Family Apidae - Honey bees
Apis mellifera Linnaeus

Family Anthophoridae
Xylocopa mordax Smith 1874

KEY TO PHYLA AND CLASSES OF TERRESTRIAL INVERTEBRATES

- | | | |
|-----|--|----|
| 1. | Body without any evidence of segmentation..... | 2 |
| | Body segmented, at least in part..... | 4 |
| 2. | With a conspicuous calcareous shell.....Snails (Mollusca) | |
| | Without a shell..... | 3 |
| 3. | Large (to 40 mm), flat and broad.....Slugs (Mollusca) | |
| | Small (20 mm or less), round and long..... | |
| |Planarians (Platyhelminthes) | |
| 4. | Without legs.....Annelida | |
| | With legs..... | 5 |
| 5. | 9 or more pairs of legs..... | 6 |
| | 3-7 pairs of legs (Arthropoda, in part)..... | 10 |
| 6. | Body soft and wrinkled; legs stumpy, unjointed..Onychophora | |
| | Body hard surfaced and smooth; legs long and thin, jointed
(Arthropoda, Myriapoda)..... | 7 |
| 7. | 2 pairs of legs on each body segment.....Diplopoda | |
| | 1 pair of legs on each body segment..... | 8 |
| 8. | 15 or more pairs of legs.....Chilopoda | |
| | 12 or fewer pairs of legs..... | 9 |
| 9. | Small (2-10 mm); 12 pairs of legs and simple antennae..... | |
| |Symphyla | |
| | Tiny (0.5-2 mm); 9 pairs of legs and 3-branched antennae... | |
| |Pauropoda | |
| 10. | 3 pairs of legs; wings often present.....Insecta | |
| | 4-7 pairs of legs; wings never present..... | 11 |
| 11. | With slender antennae at front of head.....Crustacea | |
| | Without antennae.....Arachnida | |

NOTE: This key will work for adults of most terrestrial invertebrates on St. John, but not necessarily for young or juvenile forms. Juveniles are nearly always smaller than adults and are immature in many features. The differences in form and habits are particularly striking in the Arthropods, where juveniles may have completely different shapes than adults, with fewer legs (couplets 5, 8, 9, 10) or no legs at all (couplet 4); juveniles of insects never have wings, even when the adults are winged (couplet 10). Knowledge of specialized juvenile forms (larvae, nymphs, caterpillars, grubs, maggots, etc.) must come from other sources.

DESCRIPTIVE ACCOUNTS

Descriptive accounts are given for representative members of each of the higher groups found on St. John. They are not intended to be complete but to provide some understanding of each animal as it may be encountered on the island.

Scientific names are given for all identified forms and, where possible, common names are provided. It must be understood, in connection with the latter, that most invertebrate animals are small, inconspicuous, and of no economic or medical importance, hence have not been recognized and given special names by the general public.

No complete synonymy is given, but the name of the person who first described the species is mentioned and a reference is always provided to allow the reader to obtain additional information about the particular form or a closely related one.

Sufficient information is provided to allow identification of each species in the context of the fauna of St. John. For the larger forms the naked eye will be able to make out the diagnostic features, but for smaller forms a magnifying glass (or even a microscope) may be required.

The habitat of each species is described as far as is known. However, some species tolerate a wide range of conditions, and the record of occurrences is by no means complete. Be prepared for surprises.

General distribution and type locality (TL) are given as available. Localities on St. John are based on collections to the present and indicate where particular forms have been found; most forms can be expected in many other localities as well.

PHYLUM PLATYHELMINTHES

The platyhelminths, or flatworms, include three classes, the freeliving Turbellaria and the parasitic Trematoda and Cestoda. The turbellaria are generally elongate, flattened, wormlike creatures which live in water, both marine and fresh. Their bodies are supple and they usually move by means of cilia or swim by undulations of the body. The freshwater forms of the order Tricladida are known as planarians; these occur on St. John but have not been studied. A few planarians have emerged from the water and have adapted to life on the land, where they live in moist soil and litter; they further protect themselves from desiccation with a covering of mucus. These constitute the land planarians and are sometimes classified in a suborder Terricola. A single land planarian is known from St. John.

LAND PLANARIAN

Rhynchodemus cf. sylvaticus

Fig. 1

R. sylvaticus (Leidy 1851), Ogren 1981:52.

Identification.- A small unsegmented worm, with long, rounded body, narrowly tapering at anterior end, and bearing two large eyes near the tip. Length may be up to 5/8 inch (15-18 mm). Color is brown with two longitudinal dark stripes on the dorsum and sometimes a dark spot near the middle.

Habitat.- Like all land planarians, this form is soft bodied and so must remain in very moist situations. The only specimens known from St. John were found in damp litter, but they should occur under moist logs, boards and stones.

Distribution.- The species, R. sylvaticus was first described from Philadelphia, Pennsylvania and has since been found in various places in the United States and Europe.

Localities on St. John.- Found so far only on the Cinnamon Bay Nature Trail.

PHYLUM MOLLUSCA

Molluscs are soft-bodied, non-segmented animals, usually with a distinct, calcareous shell. They are basically aquatic, occurring in both salt and fresh water. The most obvious molluscs in the waters of the Virgin Islands are snails (class Gastropoda), clams and mussels (class Bivalvia), squids and octopusses (class Cephalopoda) and chitons (class Polyplacophora). A considerable number of snails have become terrestrial around the world and this group is well represented on St. John.

CLASS GASTROPODA

Gastropods, or snails, are distinctive among the Mollusca in having a relatively large, spirally coiled shell into which the animal can retreat. A few gastropods have the shell greatly reduced in size or missing entirely; such soft-bodied forms are generally called slugs. There are very many kinds of snails in the sea around the Virgin Islands, but only a small number on the land. The terrestrial snail fauna is rather diverse, however, being the result of several different invasions of the land. Some, such as periwinkles, are still really sea snails which come out onto the shore temporarily, while the pulmonates are highly adapted for permanent life on dry land. Most terrestrial snails are comparatively small, ranging from 1/16 inch (1.5 mm) to about 1 inch (2.5 cm) in greatest dimension. Some are tall and narrow, while others are flat and broad. Some live in the soil or ground litter while others may be found commonly on shrubs or trees or attached to rocks at the shore.

MANGROVE PERIWINKLE

Littorina angulifera

L. angulifera Lamarck 1822, Warmke and Abbott 1961:53.

Identification.- Shell conical, nearly twice as long as wide; surface nearly smooth, but with fine, spiral grooves. Color variable, from yellowish to reddish to purplish brown, with darker markings. Length up to 1.25 inches (3 cm).

Habitat.- Usually found on prop roots or trunks of red mangroves, where they may climb up to 10 or 15 feet (3-5 m) above the water.

Distribution.- Caribbean area and Florida.

Localities on St. John.- Wherever red mangroves occur.

ZEBRA PERIWINKLE

Littorina ziczac

Fig. 2

L. ziczac (Gmelin 1791), Warmke and Abbott 1961:52.

Identification.- Shell conical, distinctly longer than wide; surface smooth. Color light gray, with a distinctive zigzag pattern of dark transverse markings. Up to 3/4 inch (20 mm) in length and about half as wide.

Habitat.- Like Tectarius muricatus, this marine snail emerges from the sea on rocky shores. It usually does not climb up as high as T. muricatus, and is more often found in the intertidal zone.

Distribution.- Caribbean area and Florida.

Localities on St. John.- Along any rocky shore.

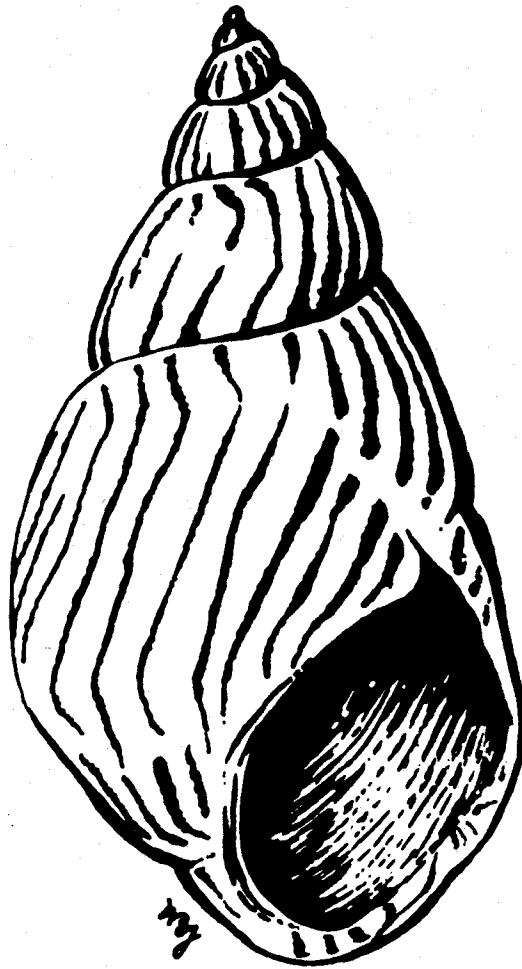


Fig. 2. Zebra periwinkle, Littorina ziczac
(length - 1/2 inch)

BEADED PERIWINKLE

Tectarius muricatus

Fig. 3

T. muricatus (Linnaeus 1758), Warmke and Abbott 1961:54.

Identification.- Shell conical, a little longer than wide, the spire sharp pointed; covered with conspicuous small tubercles arranged in 4 ordered rows around the whorls. Color: background light gray, tubercles white. Up to 7/8 inch (22 mm) in length.

Habitat.- This is a marine snail which emerges from the water to feed. It is usually found during the day firmly attached to rocks or vegetation on rocky shores or beaches. Where much spray is generated by waves (as at Drunk Bay), these snails may move upward as much as 25-30 feet (8-10 m) above the water level.

Distribution.- Caribbean area and Florida.

Localities on St. John.- Along any rocky shore, including rocky, but not sandy, beaches. Empty shells are occasionally inhabited by soldier crabs and so may be carried from the shore far inland.

COMMON PRICKLY-WINKLE

Nodilittorina tuberculata

Fig. 4

N. tuberculata (Menke 1828), Warmke and Abbott 1961:54.

Identification.- Generally similar to Tectarius muricatus but smaller, with darker ground color, and with only 2 rows of relatively larger tubercles. Length up to 1/2 inch (12 mm).

Habitat.- Found on rocky shores along with Tectarius muricatus; but it does not wander as far from the water, usually remaining in the splash zone.

Distribution.- Florida and the Caribbean area.

Localities on St. John.- Any rocky shore.



Fig. 3. Beaded periwinkle, Tectarius muricatus
(length - 5/8 inch)



Fig. 4. Common prickly winkle, Nodilittorina tuberculata
(length - 1/2 inch)

COFFEE BEAN SHELL

Melampus coffeus

Fig. 5

M. coffeus (Linnaeus 1758), Warmke and Abbott 1961:153.

Identification.- Shell cone-shaped, with a long, narrow aperture; nearly twice as long as wide, being widest near the top; surface smooth and shiny but often covered with mud. Color brown, with 2 or 3 light spiral bands. Length up to 3/4 inch (20 mm).

Habitat.- Lives under debris and in the mud of mangrove swamps.

Distribution.- Florida and the West Indies.

Localities on St. John.- Probably in any mangrove swamp, but so far found only on the south shore.

SLUGS

Leidyula kraussi
Leidyula floridana

Fig. 6

L. kraussi (Férussac 1825).

L. floridana (Leidy 1851); Burch 1962:42.

Identification.- Slugs are snails without shells. On St. John there are 2 closely related slugs, which are difficult to distinguish from one another. Both are elongate, flattened, soft bodied, and unsegmented (that is, without any transverse grooves or marks), and have 2 retractable tentacles at the anterior end. Color is gray or tan with a median light line and 2 dark stripes running down the back. The body is covered with a protective coating of slime. Length up to 1.5 inches (40 mm).

Leidyula kraussi is more common than L. floridana, from which it differs in a rougher dorsal surface and a tan or orange, rather than white, median stripe.

Habitat.- In damp litter or under rocks and logs in moist forest.

Distribution.- Caribbean area.

Localities on St. John.- L. kraussi has been found at Catherineberg, Adrian, L'Esperance, Cinnamon-Centerline Trail, and Trunk Bay, while L. floridana is known only from Maho Bay (near the beach).

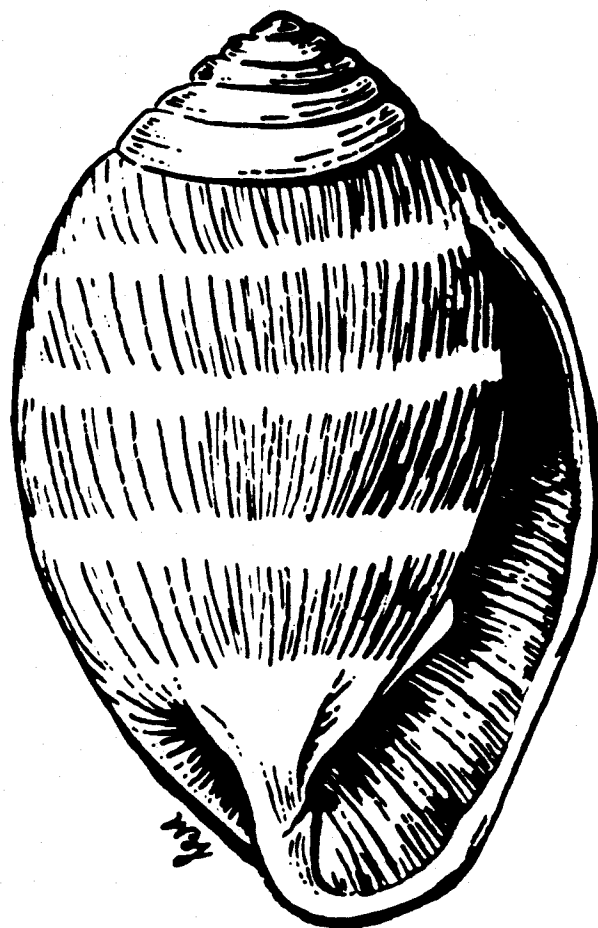


Fig. 5. Coffee bean shell, Melampus coffeus
(length - 1/2 inch)

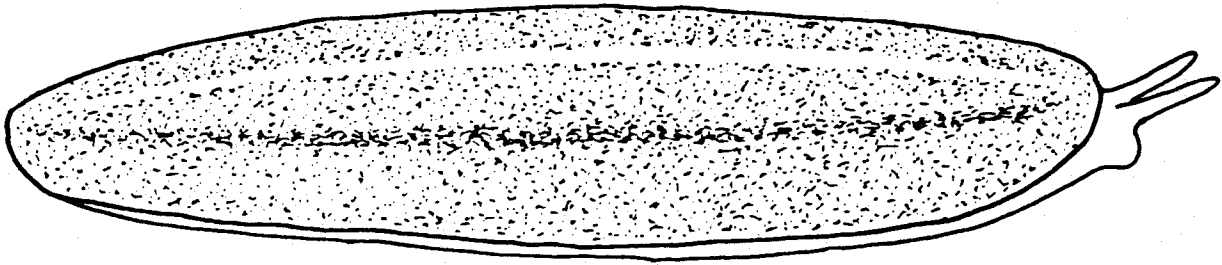


Fig. 6. Slug, Leidyula kraussi
(length - 1 inch)

TALL TREE SNAIL

Bulimulus guadaloupensis

Fig. 7

B. guadaloupensis (Bruguière 1792); see Burch 1962:133-4.

Identification.- Shell conical, twice as long as wide; surface smooth but dull with numerous fine transverse striations. Color light yellowish tan with a single brown spiral band. Length up to 3/4 inch (20 mm).

Habitat.- In open vegetation such as gardens. Has been found in such exposed situations as the steps of the Enighed Library.

Distribution.- Caribbean area.

Localities on St. John.- Uncommon, but widespread over the island.

ROUND TREE SNAIL

Polydontes incertus

Fig. 8

P. incertus (Férussac 1823).

Identification.- Shell flattened, wider than high; surface with transverse rows of very small modules. Color variable, generally light brown with both spiral and transverse darker markings. Height up to 3/4 inch (20 mm), width up to 1 inch (25 mm).

Habitat.- Occurs in moist forest where it is usually found on branches and leaves of vegetation up to 10 or more feet (3-4 m) above the ground. A sign on the Reef Bay Trail points out that these tree snails can be found on the leaves of Anthuriums.

Distribution.- Caribbean area.

Localities on St. John.- Widespread through the moist forest, where it sometimes occurs in large concentrations, with dead shells littering the ground (the dead shells are entirely white, having lost the colored outer layer). Empty shells are sometimes inhabited by small hermit crabs (Coenobita clypeatus), which may then carry them to other habitats.

Note.- This is the snail referred to in Jadan (1979:36) as Liguus fasciatus, which is, however, quite a different snail, found in Florida and Cuba.

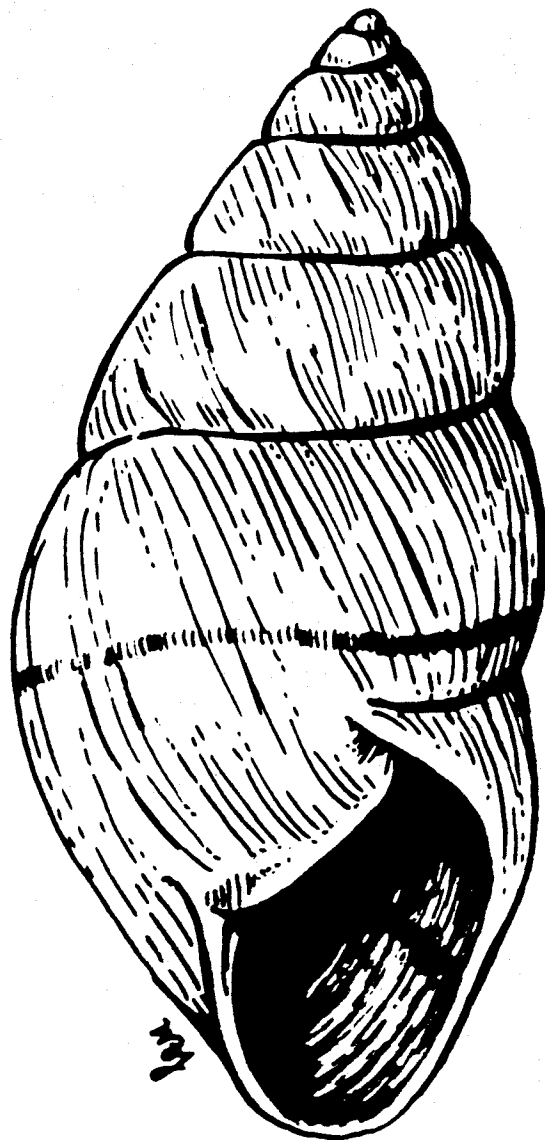


Fig. 7. Tall tree snail, Bulimulus guadaloupensis
(length - 3/4 inch)

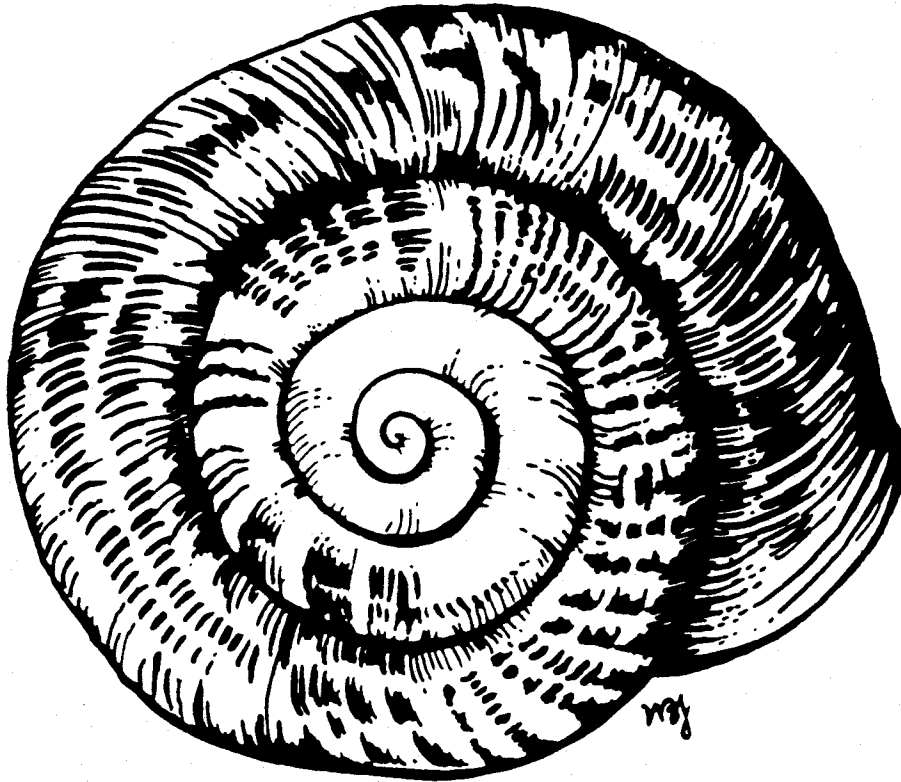


Fig. 8. Round tree snail, Polydontes incertus
(diameter - 1 inch)

PALM SNAIL

Hemitrochus nemoralinus

Fig. 9

H. nemoralinus (Petit 1836); see Lazell 1983:91.

Identification.- Shell flattened, wider than high (see figure); surface smooth, with fine transverse striations. Color translucent, light tan, larger individuals with a double spiral band (brown above, white below). Height up to 3/8 inch (7 mm), width up to 1/2 inch (13 mm).

Habitat.- Usually found on the undersides of the fronds of thatch palms and the leaves of small shrubs in moist forest.

Distribution.- Virgin Islands.

Localities on St. John.- Reef Bay, Lameshur Bay, Bordeaux Mountain, Mamey Peak, Cinnamon Bay; probably throughout the island.

PUPA SNAIL

Gastrocopta pellucida

Fig. 10

G. pellucida (Pfeiffer 1841); see Burch 1962:53.

Identification.- A tiny snail, only about 1.5 mm in length; more or less cylindrical with rounded ends and about twice as long as wide; surface with transverse striations and often covered with dirt.

Habitat.- This little snail lives in the litter and loose soil of the forest floor.

Distribution.- Caribbean area and southern U.S.

Localities on St. John.- Widespread in moist situations.

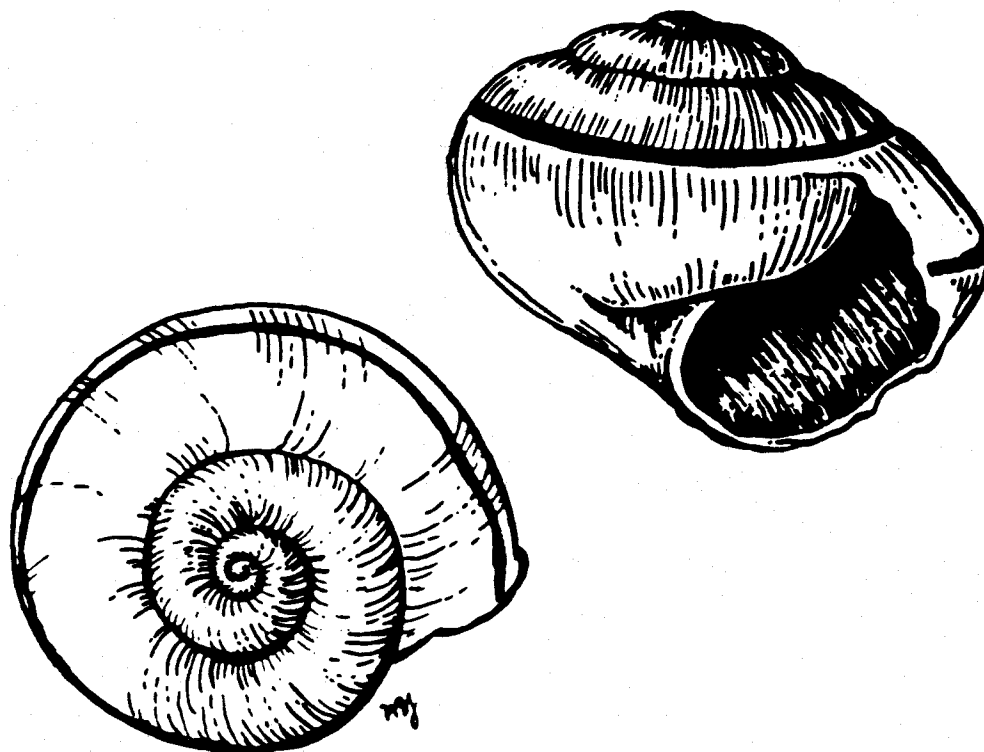


Fig. 9. Palm snail, Hemitrochus nemoralinus
(diameter - 1/2 inch)



Fig. 10. Pupa snail, Gastrocopta pellucida
(length - 1/16 inch)

SLENDER-SPIRED SNAIL

Subulina octona

Fig. 11

S. octona (Bruguière 1789), Burch 1962:123.

Identification.- Shell narrowly conical, high spired, 3-4 times as long as wide; surface transparent, shiny, with delicate transverse striations. Length up to 11/16 inch (17-18 mm).

Habitat.- Common under logs, rocks, boards and other debris on moist ground.

Distribution.- Florida and West Indies.

Localities on St. John.- Throughout the island in appropriate habitats.

WEST INDIAN TOP SHELL or WHELK

Cittarium pica

C. pica (Linnaeus 1758), Warmke and Abbott 1961:43.

Identification.- The shell is heavy and conical or top-shaped; the aperture is large, round and pearly within. Color is grayish white with irregular splotches of purplish black. Height and diameter are about equal and may be as much as 3 or 4 inches (80-100 mm), though the larger ones are very uncommon these days.

Habitat.- This is a marine snail which lives on and among rocks in the intertidal zone, often in areas exposed to heavy wave action. The snails themselves do not come out of the water, but land hermit crabs commonly utilize the empty shells, which may then be carried far inland, sometimes to be abandoned in the forest.

Distribution.- Florida and the Caribbean area.

Localities on St. John.- The living animal may be found along any rocky shore. Shells are seen practically everywhere on the island carried by hermit crabs or lying empty.

Note.- Though this is called "whelk" or "wilk" locally, it is not one of the true whelks, which are North Atlantic forms (see Jadan 1985:19).

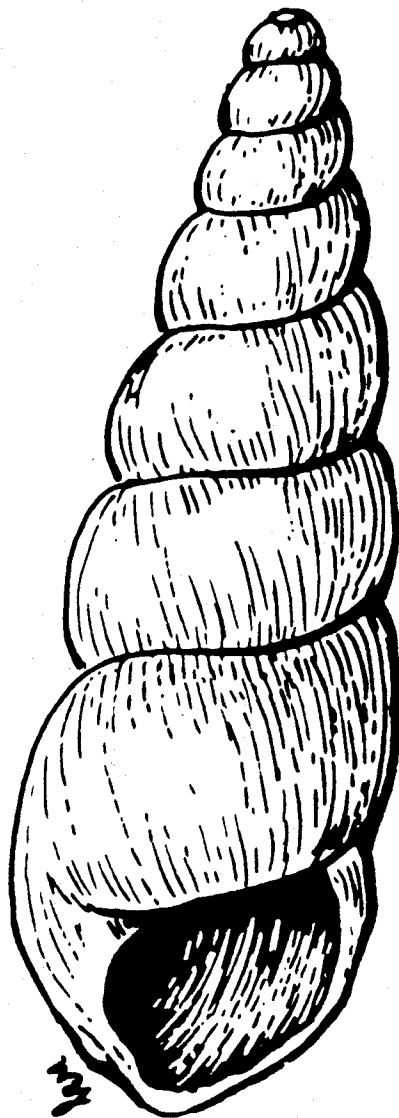


Fig. 11. Slender-spired snail, Subulina octona
(length - 5/8 inch)

MARINE GASTROPOD SHELLS ON LAND

Land hermit crabs or soldier crabs (Coenobita clypeatus) inhabit gastropod shells which they carry around with them to all parts of the island. When a crab dies or is eaten by a predator, its shell will be left wherever that event occurs. Thus, the marine shells used by soldier crabs may come to be distributed widely, far from the sea where they were produced.

Hermit crabs on St. John seem to prefer the shells of the West Indian Top Shell, but other kinds of shells are used as well. The following list is mainly the work of Trawick and Ferretti (1975), with additions from personal observations of the author.

Sea shells carried by land hermit crabs and likely to be abandoned on land.

West Indian Top Shell	<u>Cittarium pica</u>
Green Star Shell	<u>Astraea tuber</u>
Imbricated Star Shell	<u>Astraea tecta</u>
Brown Moon Shell	<u>Polinices hepaticus</u>
Gaudy Cantharus	<u>Cantharus lautus</u>
Tulip Shell	<u>Fasciolaria tulipa</u>
White-Spotted Latirus	<u>Leucozonia ocellata</u>
Chestnut Latirus	<u>Leucozonia nassa</u>
Pitted Murex	<u>Murex cellulosis</u>
Ebony Turret	<u>Crassispira fuscens</u>
Beaded Periwinkle	<u>Tectarius muricatus</u>
Nerites	<u>Nerita sp.</u>

In addition, the white, empty shells of the tree snail, Polydontes incertus, are sometimes utilized and thus may be carried out of original habitats.

PHYLUM ANNELIDA

The annelids, or segmented worms, are common around the world in marine and fresh water and on the land. They are long, usually cylindrical, and composed of many, basically similar segments arranged in a series along the length of the animal. A head region, though present, is not well defined; and the segments do not bear real appendages, though some marine annelids have segmental projections called parapodia. Annelids are all soft-bodied and as a result must live in water or in a humid atmosphere. The class Polychaeta includes the numerous forms found in the sea and in coral reefs, while the classes Oligochaeta and Hirudinea include freshwater and terrestrial forms. The terrestrial oligochaetes are the familiar earthworms, of which a few kinds occur on St. John. No hirudineans, or leeches, are yet known from the Virgin Islands.

EARTHWORMS

Fig. 12

Earthworms are generally easy to recognize. They are long, cylindrical worms, rounded or tapering at the ends; their bodies are segmented, or marked off into more or less equal sections or segments from front to back; they are soft-bodied and covered with mucus or slime; and they move either by bending in any direction or by extending and contracting front to back. There are several kinds of earthworms on St. John, ranging in length from less than an inch to several inches, and ranging in color from light pink to gray.

Being soft-bodied, earthworms must remain in humid environments. They may be found in moist soil or under rocks, logs, boards and other such objects lying on moist soil; they will be most abundant where the soil is rich. Some forms may come out onto the surface of the ground at night, to forage and to mate.

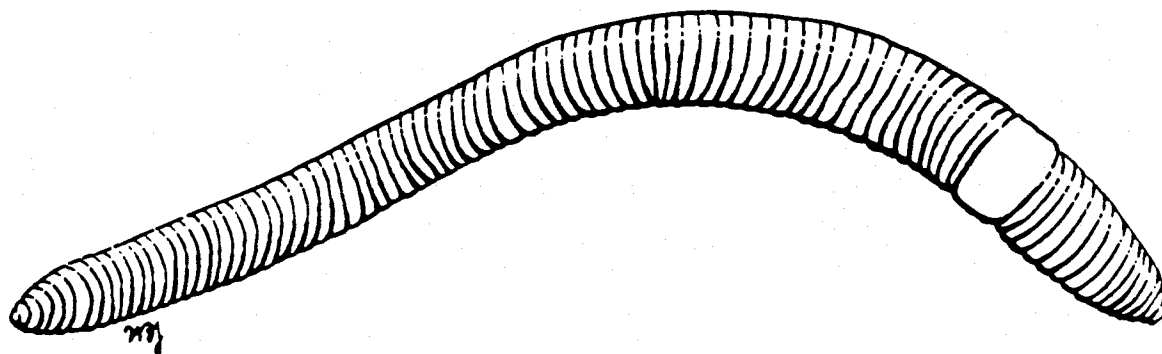


Fig. 12. Earthworm, Lumbricus sp.
(length - 3 inches)

PHYLUM ONYCHOPHORA

The onychophorans are an interesting group of terrestrial animals, sharing characteristics with both the Annelida and the Arthropoda. They are long, cylindrical, caterpillar-like creatures with a pair of short antennae and 20-40 pairs of stumpy legs. They are soft-bodied and live in humid situations in tropical areas. One onychophoran is found on St. John.

Peripatus juliformis danicus

Fig. 13

P. juliformis danicus Bouvier 1900, Peck 1975:349.

Identification.- A long, soft-bodied, caterpillar-like animal with about 30 pairs of stumpy legs; up to 2 inches (5 cm) long; brown.

Habitat.- Moist litter and debris on ground and under logs, and under loose bark on standing dead trees.

Distribution.- This subspecies is known only from St. Thomas, St. Croix, and St. John. TL.- St. Thomas, U.S.V.I.

Localities on St. John.- Reef Bay, Lameshur Bay, Coral Bay, Bordeaux Mountain, Catherineberg, Rustenberg, Adrian, Annaberg, Maho Bay, Cinnamon Bay.

Remarks.- This form is probably specifically distinct from the nominate form, which is from St. Vincent, Windward Islands.

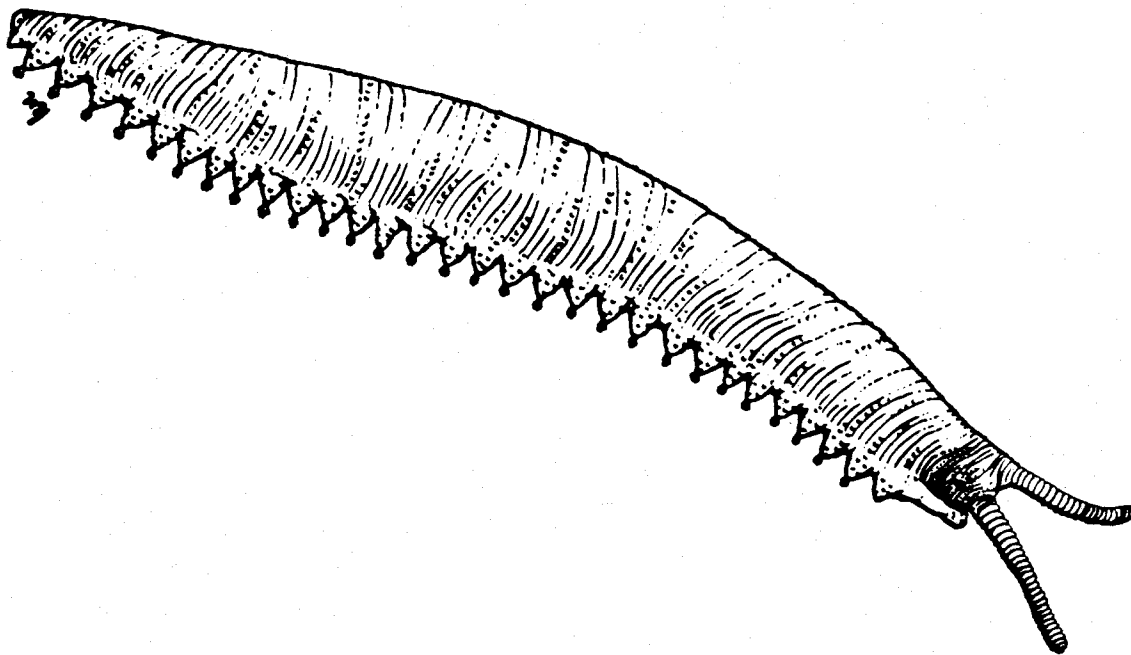


Fig. 13. Peripatus, Peripatus juliformis danicus
(length - 2 inches)

PHYLUM ARTHROPODA

The arthropods or "jointed-legged" animals are, like annelids, basically cylindrical and segmented, but most arthropods have very well defined and functional head, trunk, and tail regions. In addition, they usually possess a distinct pair of appendages on many or all segments; on the head are 1 or 2 pairs of antennae (feelers) and several pairs of mouthparts, while the appendages of trunk and tail are designed for locomotion, respiration, and other uses. Further, the body is usually covered by a more or less thick exoskeleton or cuticle for protection against physical damage and desiccation; the exoskeleton is thinned in appropriate places to form joints so that movement of the body and appendages can occur. Arthropods constitute the largest group of animals on earth (about a million have been described) and the variety of size, body form, habitat, and habits is immense. The phylum is composed of three large, distinct classes, the Crustacea, the Arachnida, and the Insecta, and a heterogeneous group, the Myriapoda, which includes four smaller classes.

CLASS CRUSTACEA

Crustaceans are basically aquatic arthropods, usually with well developed head and thorax, which may be joined into a cephalothorax, and a distinct abdomen or tail region. There are usually two pairs of antennae on the head and 5 or more pairs of legs on the thorax. Often some of the legs or other appendages are modified for swimming and respiration (as gills). The most obvious representatives in the sea around the Virgin Islands are the barnacles, shrimps, lobsters, and crabs. A few crustaceans have become terrestrial, some retaining partial dependence on the sea, some entirely independent of any body of water; these include representatives of the orders Isopoda, Amphipoda, and Decapoda.

Order ISOPODA

Isopoda is a large order of the Crustacea which are found in many habitats in the sea, in fresh water and on land. The terrestrial isopods or woodlice comprise a separate suborder, the Oniscoidea, and are the only large group of terrestrial crustaceans. Woodlice are small to medium-sized crustaceans with the elongate or ellipsoid body distinctly flattened dorsoventrally. Head and abdomen are separate from the large thorax, but do not sharply break the contour of the body as a whole. The first antennae are tiny, and the second antennae are the conspicuous feelers. Each of the seven thoracic segments bears a pair of sturdy legs, which allow the animals to move strongly, and sometimes swiftly. The abdominal appendages are small and modified for respiratory and reproductive functions. Some terrestrial isopods may be over an inch in length (3 cm), but most of those on St. John are less than 2/5 inch (1 cm). Most woodlice are gray or gray-brown, though some may be almost without color. They are herbivores and scavengers and may be found commonly in decaying plant material and litter. The females carry their eggs in special pouches until they hatch and so are not at all dependent on external water for breeding. They are mainly nocturnal and hide during the day under rocks, logs, and the loose bark of trees.

More than a dozen species of woodlice are known to occur on St. John.

SEA ROACH

Ligia baudiniana

L. baudiniana Milne-Edwards 1840, Voss 1980:82.

Identification.- This large isopod is commonly seen on wet rocks or other solid substrates at the sea shore. It is dark gray-brown and flattened and moves rapidly when disturbed, somewhat resembling a roach. However, like all isopods, it has 7 pairs of legs as opposed to the 3 pairs of insects. Body length may be as much as 1 inch (2.5 cm).

Habitat.- It is active just above the water line on or under rocks, boards, pilings, docks, etc. at the sea shore. Though it will drop or run into the water when disturbed, most of its life is spent in moist situations out of the water.

Distribution.- Gulf of Mexico and Caribbean area. TL.- Veracruz, Mexico.

Localities on St. John.- Probably at any rocky shore and on any wooden or concrete structure standing in the water.

WOODLOUSE

Philoscia culebrae

Fig. 14

P. culebrae Moore 1901; Van Name 1936:168.

Identification.- A small isopod with a rather narrow body and shiny surface. Color is purplish brown with numerous light spots and markings so that there is a distinct dark stripe down the back. It runs rapidly when disturbed. Body length may be 1/3 inch (7-8 mm).

Habitat.- These animals are scavengers and may be found commonly in moist litter, in the forest or around the house, chiefly at lower elevations.

Distribution.- Greater Antilles. TL.- Culebra, P.R.

Localities on St. John.- Widespread in damp litter, especially at low elevations.

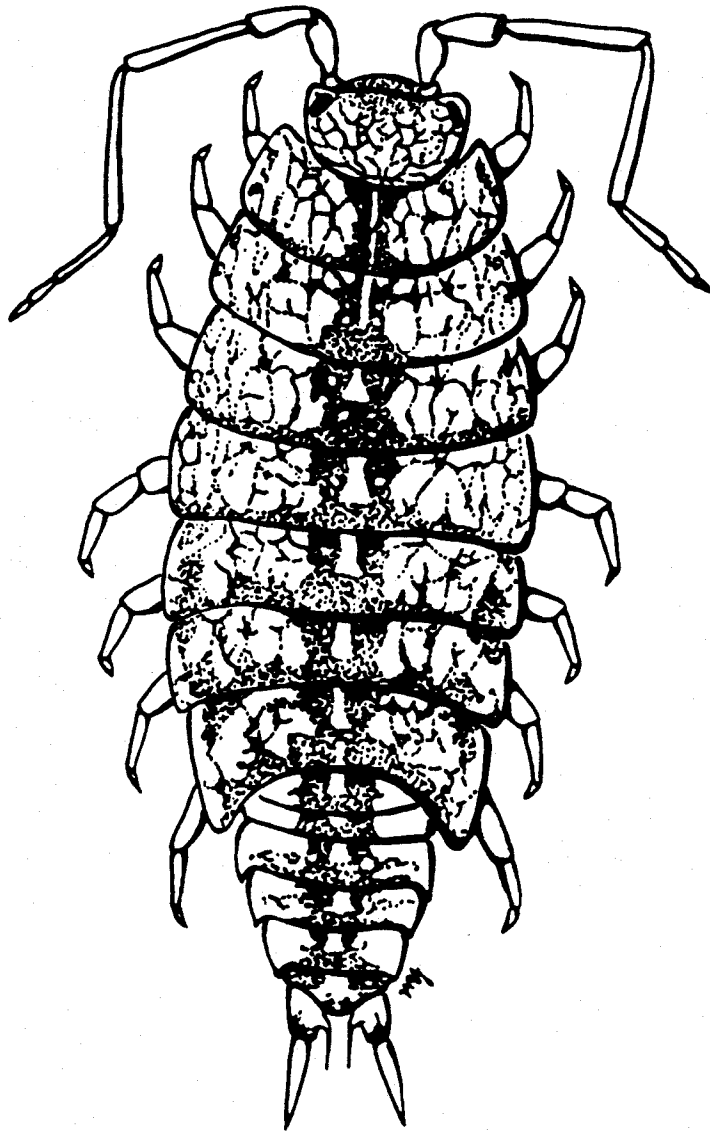


Fig. 14. Woodlouse, Philoscia culebrae
(length - 1/3 inch)

WHITE WOODLOUSE

Leptotrichus panzeri

Fig. 15

L. panzeri (Audouin 1825).

Identification.- A small, rather broad, flattened isopod, with a delicate body, conspicuous black eyes and short legs. Color is white, often with an underlying dark streak down the back. Body length may be up to 1/5 inch (5 mm).

Habitat.- In moist litter.

Distribution.- Mediterranean area and Canary and Cape Verde Islands. Evidently carried to the Caribbean area by man. TL.- Egypt.

Localities on St. John.- Widespread in moist litter.

PILL BUG

Venezillo culebrae

Fig. 16

V. culebrae (Van Name 1936), Van Name 1936:370.

Identification.- This is a medium-sized isopod with a highly arched body. When disturbed it contracts its body from front to back and rolls into a ball for protection, hence the name "pill bug". Color is brownish gray with varied, irregular light markings. Body length may be up to 1/2 inch (12 mm).

Habitat.- It is found in protected places, such as under rocks, logs and bark.

Distribution.- Puerto Rico and the Virgin Islands. TL.- Culebra, P.R.

Localities on St. John.- Reef Bay, Lameshur Bay, Coral Bay, Brown Bay, Maho Bay.

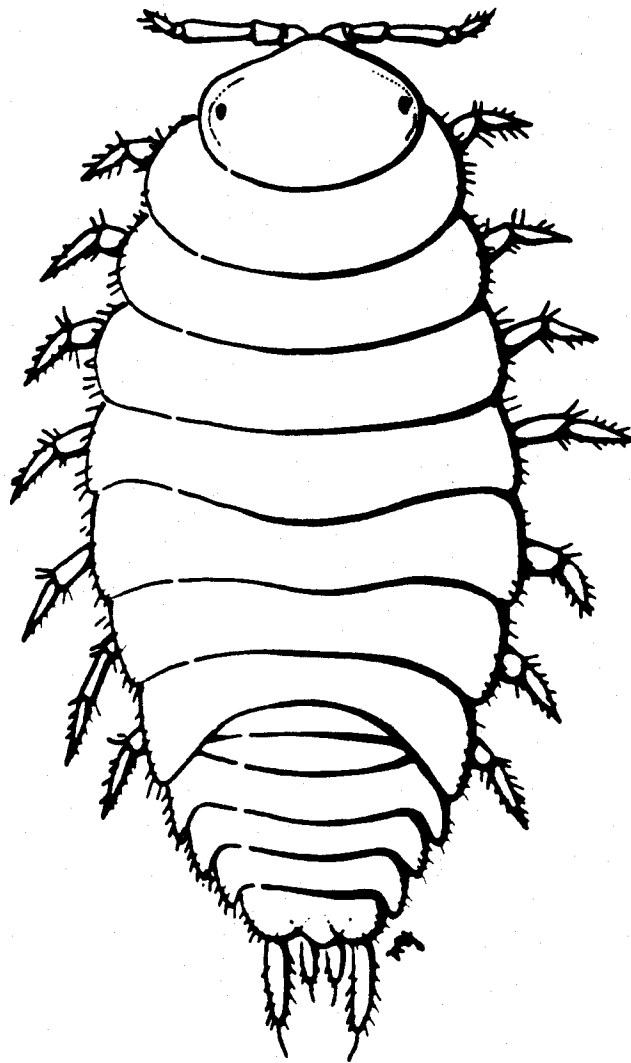


Fig. 15. White woodlouse, Leptotrichus panzeri
(length - 1/5 inch)

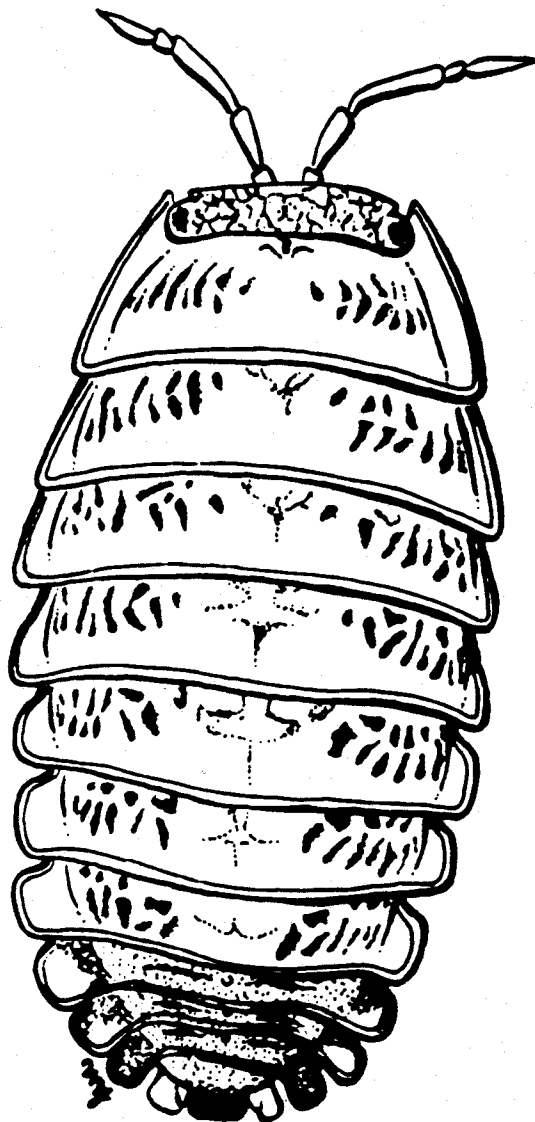


Fig. 16. Pill bug, Venezillo culebrae
(length - 1/2 inch)

Order AMPHIPODA

Amphipoda is another large order of crustaceans, most of which are marine but with many in fresh water and a few on land. The terrestrial amphipods (family Talitridae) include the common beach fleas or sandhoppers and a few more successful land dwellers, the landhoppers. Amphipods are elongate crustaceans which are distinctly flattened from side to side. The head bears two pairs of large antennae, the trunk has 7 pairs of large legs, and the abdomen has smaller appendages modified for swimming, respiration and "hopping." The hop or jump of a beach hopper is accomplished by a sudden backward thrust of the abdomen aided by the last 3 pairs of appendages or uropods. Most terrestrial amphipods are less than 3/4 inch (2 cm) long. They are generally soft bodied and pale in color and are nocturnal in habits, hiding by day under moist seaweed and other debris on the beach. Some may wander some distance from the water, finding shelter in moist places.

Two kinds of beach fleas have been identified on St. John.

BEACH FLEA

Tethorchestia antillensis

Fig. 17

T. antillensis Bousfield 1984:205.

Identification.- This is the larger of the two beach fleas known from St. John, ranging up to 1/2 inch (13 mm) in length. It is very light in color and has two large, dark eyes. It is found higher on the beach than the following species.

Habitat.- Along the shore, under debris and in litter well above the high tide mark.

Distribution.- Yucatan, Greater Antilles, and Florida. TL.- Yucatan Peninsula, Mexico.

Localities on St. John.- Known so far only from Salt Pond, where it is found in litter on the berm between the pond and Salt Pond Bay.

BEACH FLEA

Platorchestia platensis

P. platensis (Krøyer 1845), Bousfield 1973:160, 1982:26.

Identification.- This beach flea is smaller than the previous one, being about 1/3 inch (8 mm) in length. It is similarly very light in color, but the eyes are relatively smaller. It is usually found lower on the beach and is very common.

Habitat.- Along the shore, under seaweed and other debris on the sand and among rocks, in the intertidal or splash zone.

Distribution.- Nearly cosmopolitan.

Localities on St. John.- Along any shore with debris in the intertidal zone.

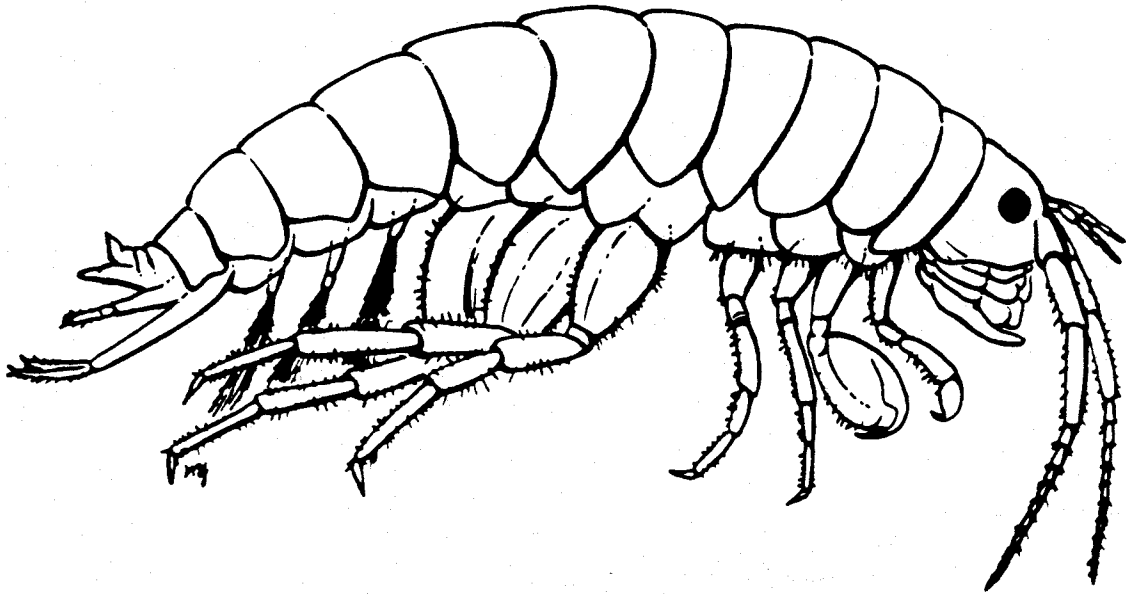


Fig. 17. Beach flea, Tethorchestia antillensis
(length - 1/2 inch)

Order DECAPODA

Decapoda is the largest order of crustaceans and includes the familiar shrimps, crayfish, lobsters, and crabs. Most are marine, but many live in fresh water, and a very few have adapted to life on land. All the terrestrial decapods are crabs. The head bears two pairs of antennae and a pair of stalked eyes. The thorax has 5 pairs of legs, of which the first pair are enlarged chelipeds with claws or pincers. Head and thorax are covered dorsally by a heavy, protective carapace. The abdomen is reduced and highly modified. The 4 pairs of walking legs are large and strong so that most crabs can move rapidly. Terrestrial crabs are variously adapted to land living; some run over rocks at the shore or live in burrows in sand at the beach, while others wander miles from the sea. However, all most return to the sea to lay their eggs or release their young.

LAND HERMIT CRAB

Coenobita clypeatus

C. clypeatus (Herbst 1791), Chace and Hobbs 1969:123, Jadan 1985:22.

Identification.- Hermit crabs are true crabs which are specially adapted to living in the discarded shells of gastropod molluscs (snails). Most live in the sea, but this species, the land hermit crab or soldier crab, spends most of its life on dry land. The crab backs into the cavity of the empty shell, where it is protected against predators and water loss. The legs and claws, especially the huge left claw, occupy the aperture of the shell, where they afford additional protection and can be extended readily for locomotion and feeding. Usually the shell occupied is the West Indian Top Shell or whelk, but the smaller crabs often use shells of several other snails. The size of the hermit crab is best measured by the size of the shell it occupies, which may be up to 3.5 inches (90 mm) in diameter.

Habitat.- The hermit crab is born in the sea but it later comes out onto the land carrying a suitable snail shell. As it grows, it acquires larger and larger shells by finding an empty shell or by evicting another crab from its shell. The animal stores water in the shell to prevent desiccation and so is able to wander far from the sea; water is added from fresh water sources. Adults migrate back to the sea periodically to mate and deposit larvae.

Distribution.- Caribbean area. TL.- West Indies.

Localities on St. John.- They can be found nearly anywhere on the island, from sea level up to the top of Bordeaux Mountain.

SALLY LIGHTFOOT CRAB

Grapsus grapsus

G. grapsus (Linnaeus 1758), Chace and Hobbs 1969:163.

Identification.- This is a fairly large crab with the body nearly round and the walking legs long and flattened. Color of upper surfaces generally dark, varying from reddish brown to black, with bluish lines arching across carapace; lower surfaces lighter and more blue. Molted skeletons, which are occasionally found on rocks, are bright red and white. The body may be up to 2 inches (50 mm) long and the legs may span 8 inches.

Habitat.- This is essentially an intertidal species which frequently crawls out on wet rocks or rocky beaches or sea walls. They are very watchful and scurry away rapidly when disturbed.

Distribution.- Tropical eastern and western Atlantic and eastern Pacific shores. TL.- America.

Localities on St. John.- Any rocky shore.

MANGROVE TREE CRAB

Aratus pisonii

Fig. 18

A. pisonii (H. Milne-Edwards 1837), Chace and Hobbs 1969:172.

Identification.- This crab is easier to identify by its habitat than by its appearance. It is a small crab and so is rather similar in appearance to the juveniles of several larger crabs. However, it is the only one to be found climbing on the prop roots and up the trunks of red mangroves. The body is trapezoidal, widest at the front, the eyes are very well developed, and the legs are broad and flattened. Color is light brown, often with darker markings. Length of body may be up to 1 inch (24 mm).

Habitat.- These crabs live in mangrove swamps. They emerge onto the roots and trunks of the trees and climb up to the leaves on which they feed.

Distribution.- Tropical western Atlantic and eastern Pacific ocean shores. TL.- Antilles.

Localities on St. John.- Noted only at Lameshur Bay, but undoubtedly in other large stands of red mangroves as well.

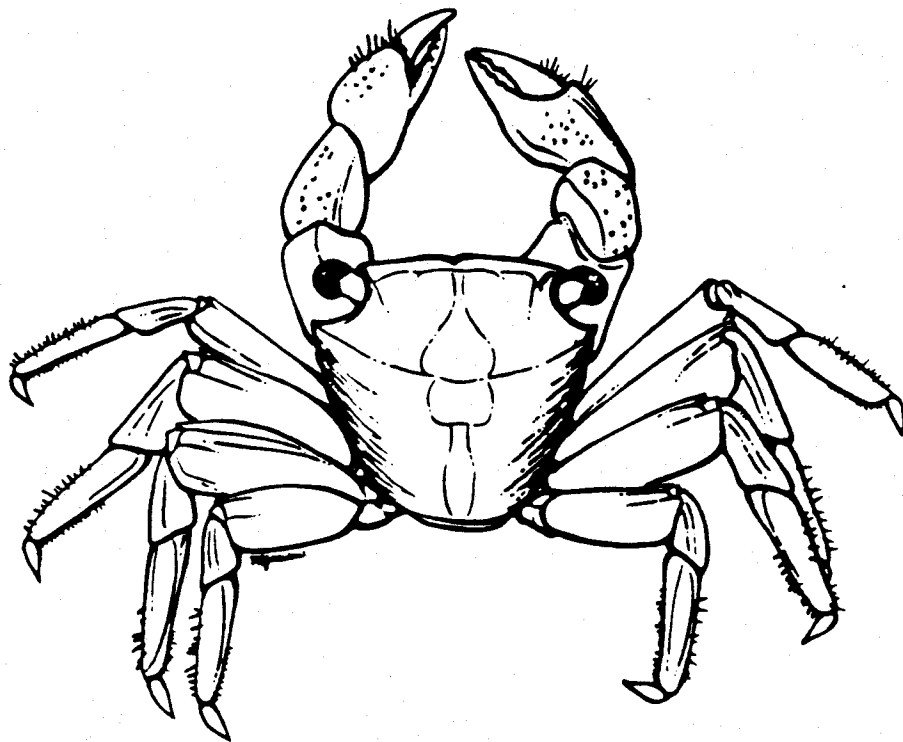


Fig. 18. Mangrove tree crab, Aratus pisonii
(body length - 1 inch)

GREAT LAND CRAB

Cardisoma guanhum

C. guanhum Latreille 1852, Chace and Hobbs 1969:195.

Identification.- The great land crab is easily recognized when seen, because of its large size and habit of living in colonies. Adults may reach a body length of 3 inches or more (75-80 mm) and in suitable mud flats dig numerous holes as much as 8-10 inches in diameter. Color varies considerably; adults are uniformly bluish or gray, while younger individuals may have patterns of tan, pink, violet, or blue.

Habitat.- They usually live in low shaded areas near the sea, where they can dig burrows down to water level.

Distribution.- Gulf of Mexico and Caribbean area and south to Brazil. TL.- Brazil.

Localities on St. John.- Reef Bay, Lameshur Bay, Ram Head.

Note.- These crabs are quite edible and where not protected are regularly hunted for food (cf. Jadan 1979:39).

GHOST CRAB

Ocypode quadrata

O. quadrata (Fabricius 1787), Chace and Hobbs 1969:204.

Identification.- The ghost crab is unmistakable, a medium-sized, very light colored crab scurrying over a sandy beach to disappear into its hole in the sand. Body length may be up to 1.5 inches (40 mm).

Habitat.- Sandy beaches, where the crabs dig burrows near the high tide mark.

Distribution.- Western Atlantic and Caribbean area from New York to Brazil. TL.- Jamaica.

Localities on St. John.- Any sandy beach.

FIDDLER CRAB

Uca burgersi

Fig. 19

U. burgersi Holthuis 1967, Chace and Hobbs 1969:207.

Identification.- The male fiddler crab is unmistakable, a small crab with one relatively huge claw, scurrying about or popping into and out of its burrow on a mud flat. The crab frequently waves the large claw with a "fiddling" motion, thus the name. The female is similar but the claws are much smaller and more equal in size. Color is a muddy tan. The body may be 1/2 inch (12 mm) in length.

Habitat.- Mangrove swamps and mud flats along the shore and around ponds near the sea.

Distribution.- Eastern Caribbean area. TL.- Curaçao.

Localities on St. John.- Lameshur Bay, Europa Bay.

FIDDLER CRAB

Uca rapax

U. rapax (Smith 1870), Chace and Hobbs 1969:214.

Identification.- Much like Uca burgersi but larger and darker. Body length may be as much as 3/4 inch (20 mm).

Habitat.- Mangrove swamps and mud flats near the sea.

Distribution.- Gulf of Mexico and Caribbean area to Brazil. TL.- Panama.

Localities on St. John.- Lameshur Bay, Europa Bay, Reef Bay, Leinster Bay, Francis Bay.

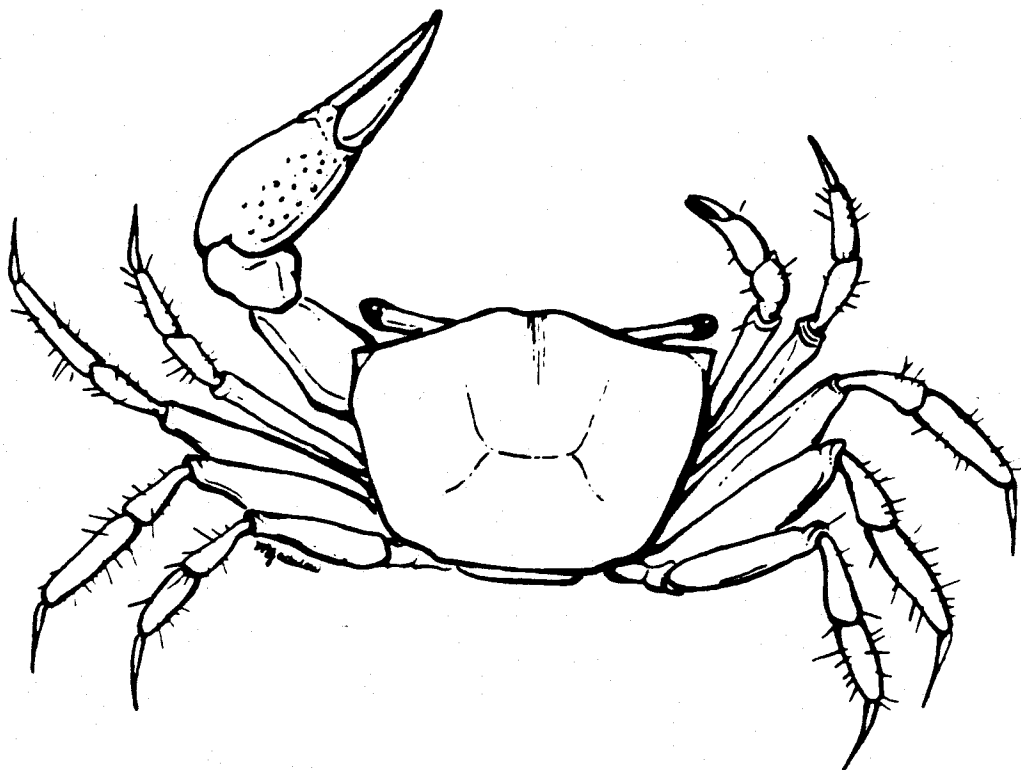


Fig. 19. Fiddler crab, Uca burgersi
(body length 1/2 inch)

CLASS ARACHNIDA

Arachnids are terrestrial arthropods characterized by division of the body into an anterior prosoma or cephalothorax and a posterior opisthosoma or abdomen, which may be broadly joined or separated by a narrow waist or pedicel. The cephalothorax bears 6 pairs of appendages -- anteriorly a pair of chelicerae (feeding appendages), then a pair of pedipalps (variously modified as feelers, pincers, gonopods, or even legs), and 4 pairs of walking legs. Except for some mites, all arachnids are predatory animals and so are to be found where small prey animals are available. With the exception of some spiders, arachnids live in litter or soil or other secluded places and/or are nocturnal in habits and are, therefore, often difficult to find.

Nine of the 11 orders of Arachnida are known to occur on St. John, namely, Scorpionida, Pseudoscorpionida, Amblypygida, Opilionida, Araneida, Schizomida, Palpigradida, Solpugida, and Acarina; no representatives of the Uropygida or the Ricinuleida have yet been found.

SCORPIONS
Order SCORPIONIDA

Scorpions are medium-sized to large arachnids with the cephalothorax broadly joined to the abdomen. The palps are very large and chelate (pincers) and the abdomen is elongated into a slender tail with a sting at the tip. The 8 legs are strong and scorpions can move rapidly. They are nocturnal hunters which hide by day in litter or under rocks or bark. They can be located rather easily at night by illumination with ultraviolet light, which causes them to fluoresce brightly. The sting of a scorpion can be painful but the Virgin Islands species are not dangerous to humans.

Three species of scorpions are known to live on St. John.

Heteronebo yntemai

Fig. 20

H. yntemai Francke and Sissom 1980:5.

Identification.- Small scorpion, up to 1 inch (2.5 cm) in length; with distinctly robust palps; brown.

Habitat.- Beneath rocks on sandy substrate under cover of vegetation near shore and in guts.

Distribution.- St. John, Mingo Cay, U.S.V.I.; Jost Van Dyke, Peter Island, Virgin Gorda, Mosquito Island, B.V.I. TL.- St. John, U.S.V.I.

Localities on St. John.- Great Lameshur Bay, Little Lameshur Bay, Reef Bay, Coral Bay.

Microtityus waeringi

Fig. 21

M. waeringi Francke and Sissom 1980:10.

Identification.- Very small scorpion, just over 1/2 inch (1 cm) in length; palps rather slender; yellowish brown with darker mottling; with distinct tubercle at base of telson.

Habitat.- Beneath rocks and in litter in woods.

Distribution.- St. John and St. Thomas, U.S.V.I. TL.- St. John, U.S.V.I.

Localities on St. John.- Lameshur Bay, Coral Bay, Brown Bay, Windberg, Reef Bay.

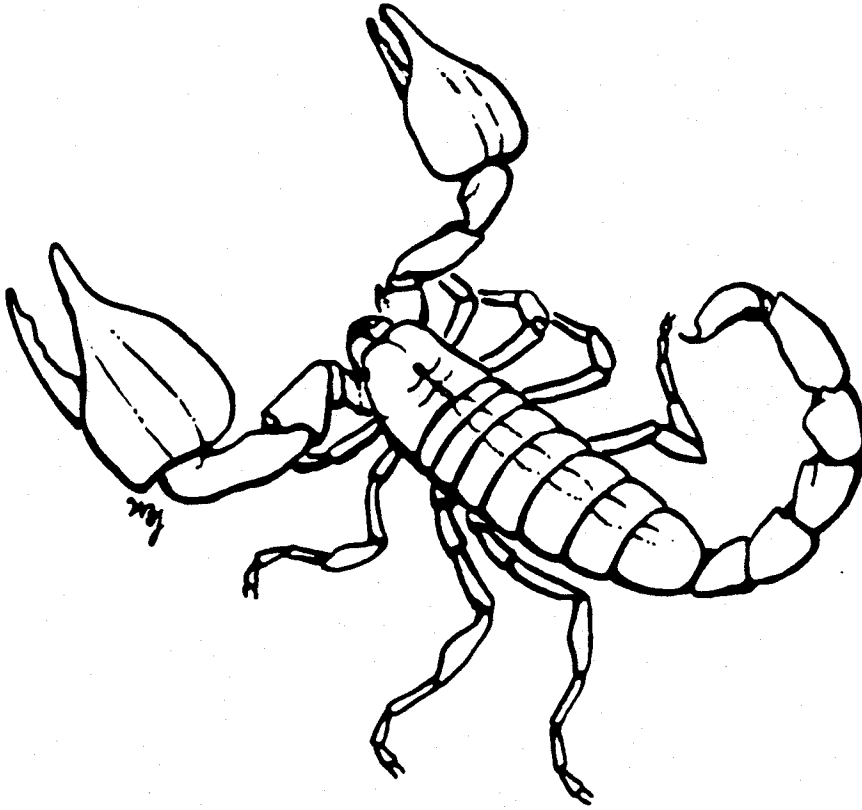


Fig. 20. Scorpion, Heteronebo yntemae
(length - 1 inch)

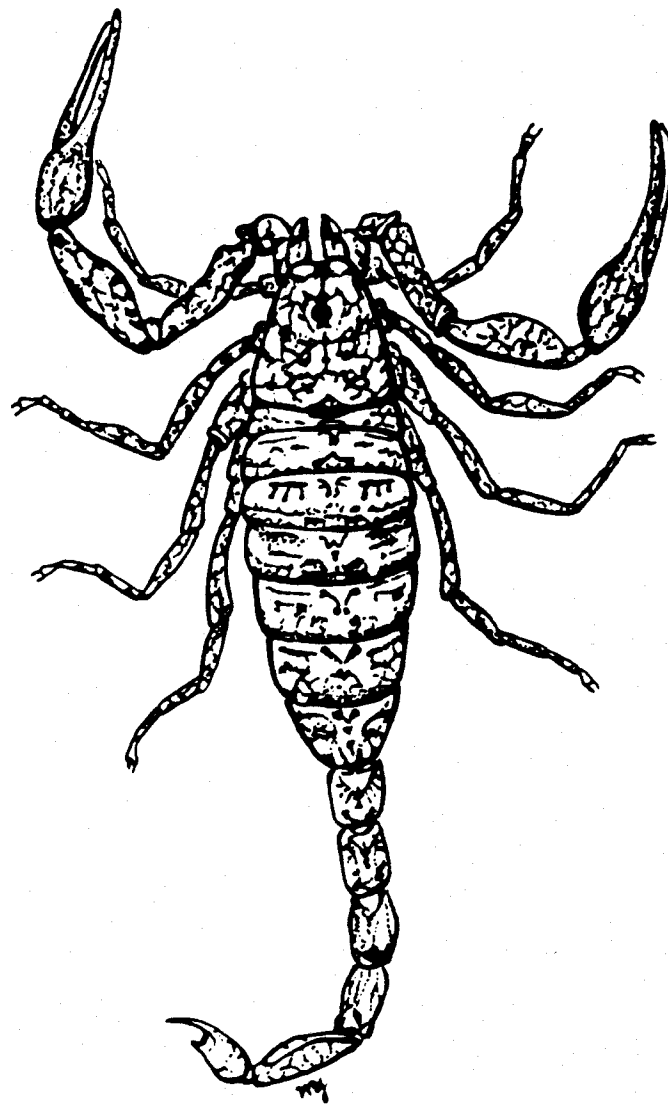


Fig. 21. Scorpion, Microtityus waeringi
(length - 1/2 inch)

Centruroides griseus

Fig. 22

C. griseus (Koch 1845), Francke and Sissom 1980:15.

Identification.- Large scorpion, up to 3 1/2 inches (9 cm) in length; palps rather slender; yellowish brown with darker spots and mottling. Small juveniles of this species might be mistaken for Microtityus waeringi, but the former are lighter in color and less mottled and have no tubercle at the base of the telson.

Habitat.- Usually under loose bark of trees, occasionally in litter, in daytime; at night it hunts over trunk and branches of trees.

Distribution.- American and British Virgin Islands, Culebra. TL.- St. Thomas, U.S.V.I.

Localities on St. John.- Widespread on the island.

Remarks.- This large species can be seen easily in the dark by illumination from an ultraviolet lamp. The name Centruroides dammanni Stahnke (1970) is a synonym of C. griseus; the type locality of C. dammanni is Chocolate Hole, St. John.

Isometrus maculatus

I. maculatus (DeGeer 1778), Francke and Sissom 1980:17.

Identification.- Large scorpion, about as large as Centruroides griseus, but with much more slender palps and tail.

Distribution.- Pantropical. TL.- "America".

Localities on St. John.- Not yet known. This species, which has been spread by man widely through the tropics has been reported from St. Thomas and St. Croix. It might be expected on St. John as well.

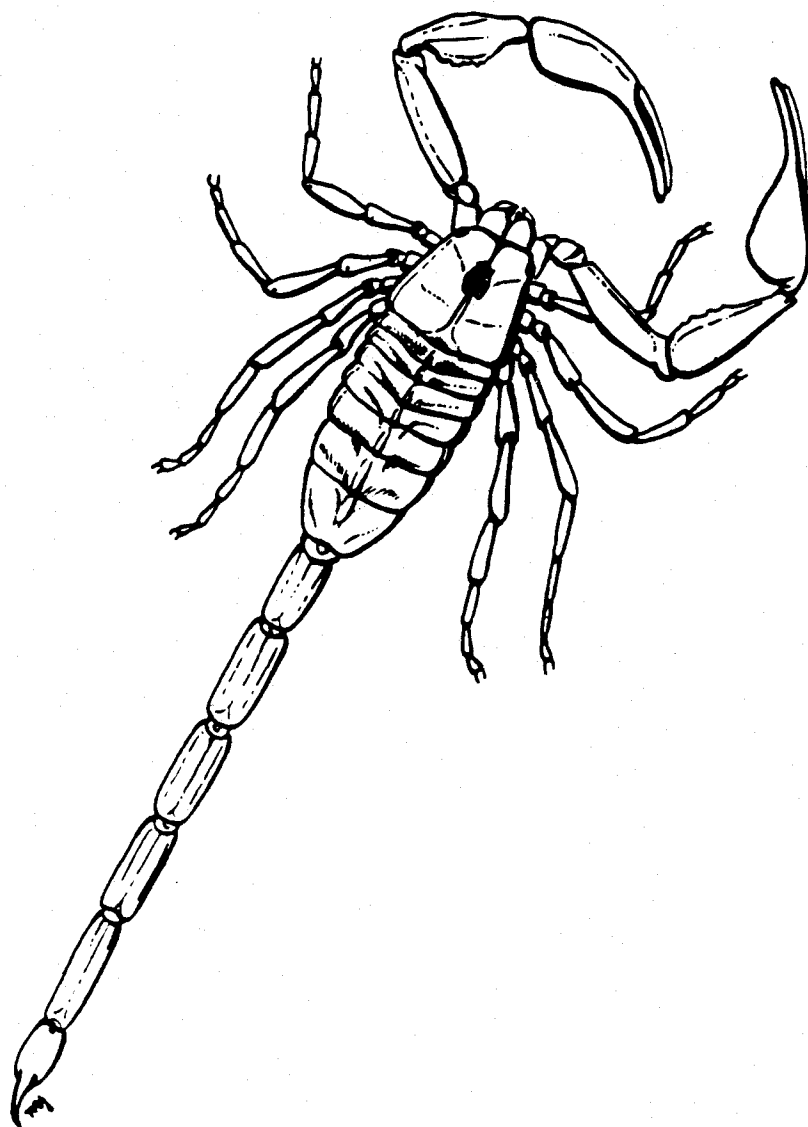


Fig. 22. Scorpion, Centruroides griseus
(length - 3 inches)

Order PSEUDOSCORPIONIDA

Pseudoscorpions, or false scorpions, are small arachnids with a superficial resemblance to scorpions. Like scorpions they have large chelate palps (pincers) but the abdomen is rounded, rather than long and slender, and without a terminal sting. They are, furthermore, only about 1/5 inch (1-5 mm.) in length, while scorpions are usually 3/4 inch (2 cm) or more in length. Pseudoscorpions feed on other arthropods which they immobilize with poison from glands in their pincers. They can be found in litter and soil, or under loose bark and rocks.

At least 20 species, representing as many genera, of pseudoscorpions are known to occur on St. John.

Tyrannochthonius sp.

Fig. 23

T. sp. Muchmore (in prep.).

Identification.- A tiny pseudoscorpion, little more than 1/25 inch (1 mm) in length; with slender appendages and 4 eyes; pale in color.

Habitat.- In moist ground litter, occasionally under stones.

Distribution.- The genus is very widespread and common in the tropics. It has not yet been determined whether this species has been found elsewhere or is unique to the Virgin Islands.

Localities on St. John.- Widespread in moist, rich ground litter.

Caribchthonius butleri

C. butleri Muchmore 1976:353.

Identification.- Small pseudoscorpion, about 1/16 inch (1.5 mm) long; with slender appendages; no eyes present; pale in color.

Habitat.- In moist ground litter, occasionally under stones.

Distribution.- Known only from St. John, U.S.V.I.

Localities on St. John.- Reef Bay, Coral Bay, Windberg, Cinnamon Bay.

Remarks.- This species is the type species of the genus, which is also represented by a species in Belize, Central America.

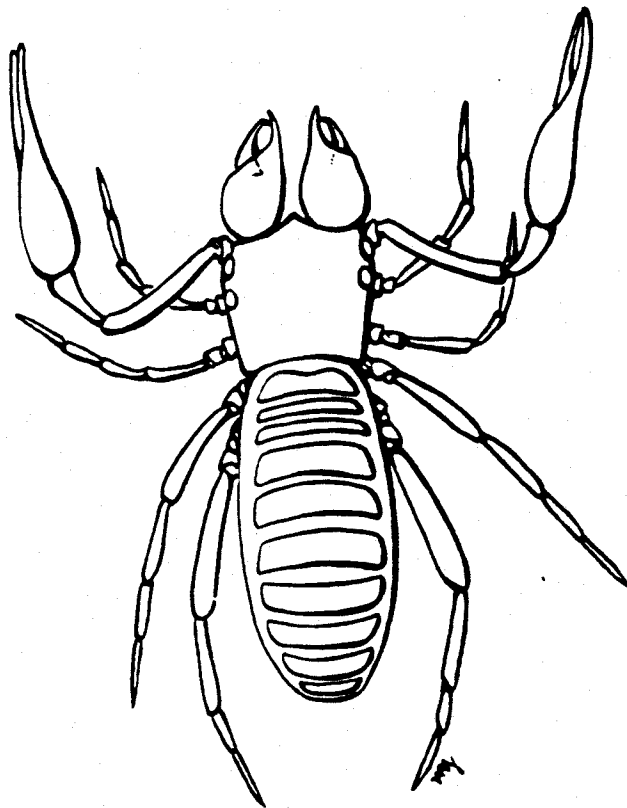


Fig. 23. Pseudoscorpion, Tyrannochthonius sp.
(length - 1/25 inch)

Typhloroncus coralensis

T. coralensis Muchmore 1979b:318.

Identification.- Small pseudoscorpion, about 1/10 inch (2.5 mm) long; rather slender palps; pale in color.

Habitat.- The two known individuals were found under small rocks near a house on a hillside above Coral Bay.

Distribution.- Known only from the type locality, Coral Bay, St. John, U.S.V.I.

Remarks.- This species is the type species of the genus, which is also represented by several large, cave-dwelling species in Mexico.

Pachyolpium sp.

Fig. 24

P. sp. Muchmore (in prep.).

Identification.- A medium-sized pseudoscorpion, about 1/8 inch (2.5-3 mm) in length; fairly robust in body and palps; brown in color, with shiny surface.

Habitat.- Usually found under rocks loosely embedded in the ground, often in dry, but shady situations. They often rest on the undersides of rocks and may be discovered when a rock is turned over.

Distribution.- The genus is widely found around the Caribbean area. This species may be indigenous to St. John or the Virgin Islands.

Localities on St. John.- Found over much of the island, this is one of the most common of the pseudoscorpions.

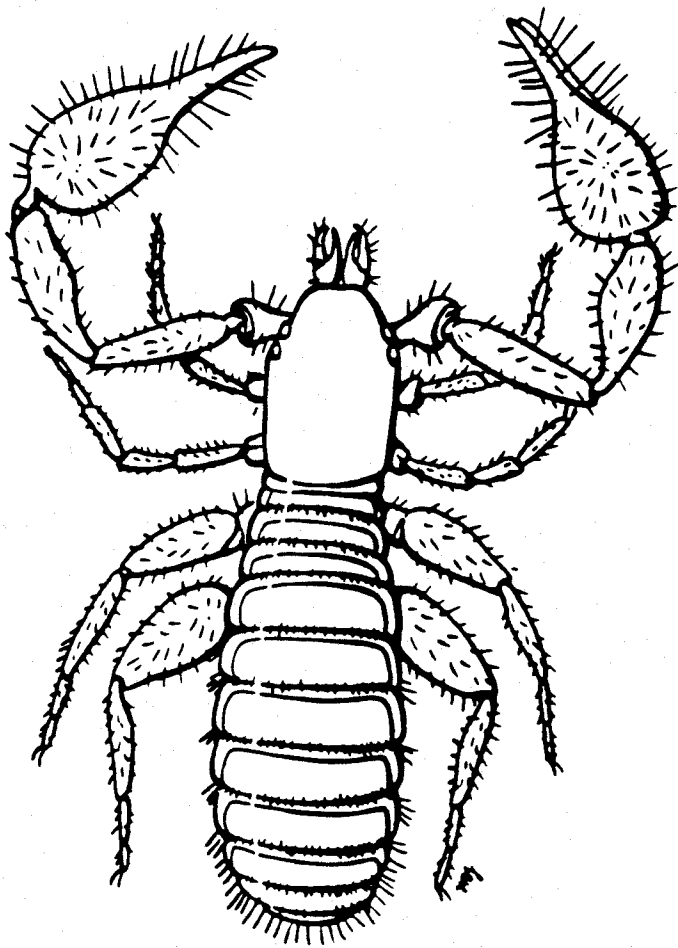


Fig. 24. Pseudoscorpion, Pachyolpium sp.
(length - 1/8 inch)

Garypus sp.

Fig. 25

G. sp. Muchmore (in prep.).

Identification.- A large pseudoscorpion, up to 1/4 inch (6 mm) in length. The palps and legs are long and slender and the body is generally light in color with a pattern of dark spots.

Habitat.- Usually found at the shore, under rocks or boards or in seaweed, just above the water's edge. They evidently tolerate temporary covering by sea water. One specimen was found on a bed in a cabin some distance from the shore, evidently carried there on a towel or clothing.

Distribution.- The genus is represented on tropical and subtropical shores around the world. This species may be indigenous to the Virgin Islands.

Localities on St. John.- Found so far at several places on the south side; probably occurs around the island in suitable habitat.

Bituberochernes jonensis

Fig. 26

B. jonensis Muchmore 1979a:314.

Identification.- Fairly large pseudoscorpion, about 1/5 inch (3.5-5 mm) in length, rather robust; dark brown in color.

Habitat.- Under loose bark on dead trees or logs.

Distribution.- Known only from St. John, U.S.V.I., though a related species is found in Florida, Cuba, and the Cayman Islands.

Localities on St. John.- Reef Bay Trail, Petroglyph area, Lameshur Bay, Coral Bay, Cinnamon Bay.

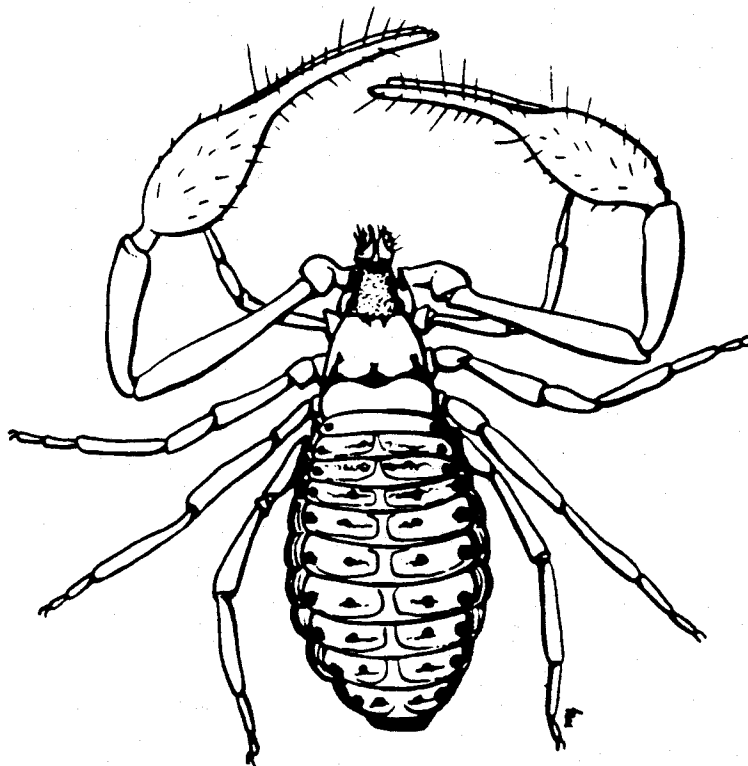


Fig. 25. Pseudoscorpion, Garypus sp.
(length - 1/4 inch)

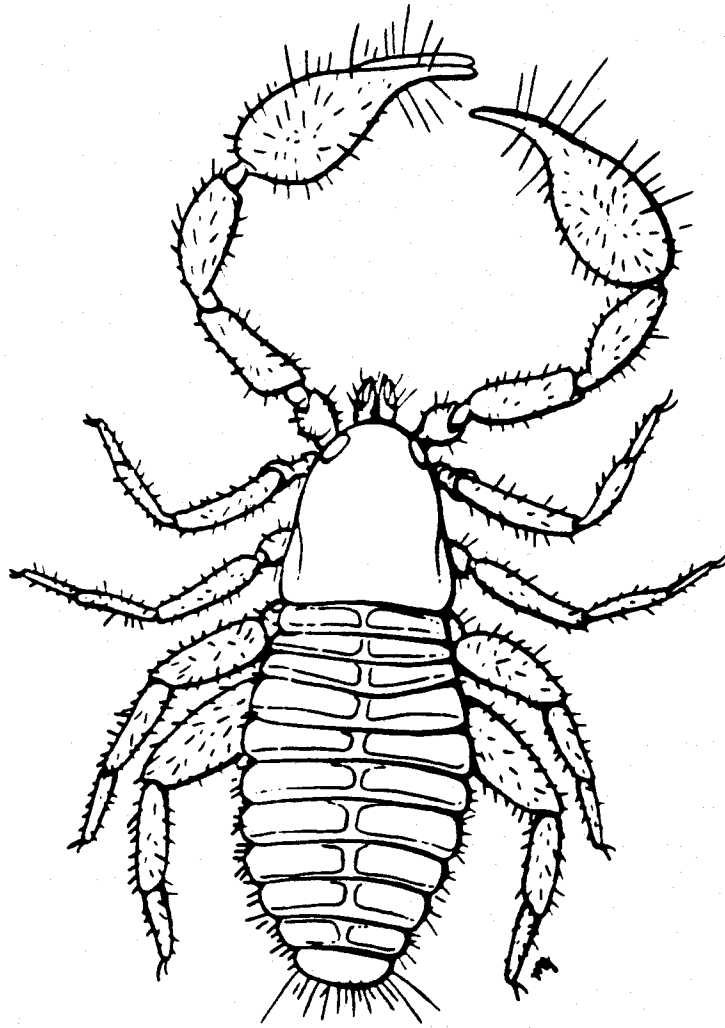


Fig. 26. Pseudoscorpion, Bituberochernes jonensis
(length - 1/5 inch)

Dinocheirus altimanus

D. altimanus (Ellingsen 1910), Muchmore 1988.
synonym: D. magnificus Hoff 1946.

Identification.- Large pseudoscorpion, about 1/4 inch (5-6 mm) in length; palps heavy; dark brown in color.

Habitat.- Between leaves of bromeliads (Tillandsia utriculata) perched in dildo cactus (Cephalocereus royenii) on St. John.

Distribution.- Known from Culebra, St. Thomas, St. John, Buck Island (St. Croix) and British Virgin Islands. The genus is widespread through temperate and tropical America. TL.- St. Thomas, U.S.V.I.

Locality on St. John.- Found so far only on Yawzi Point.

Parachelifer parvus

Fig. 27

P. parvus Muchmore 1981:189.

Identification.- Small pseudoscorpion, about 1/10 inch (2.5 mm) in length; with long slender appendages; brownish.

Habitat.- Under loose bark of living mangrove trees and in litter at base of trees. Also found attached to legs of large long-horned beetles (Cerambycidae).

Distribution.- Known only from St. John, though a similar species is found in the Dominican Republic. The genus is widespread in temperate and tropical America. TL.- St. John, U.S.V.I.

Localities on St. John.- Lameshur Bay, Fortsberg, Coral Bay.

Remarks.- This is the only pseudoscorpion on St. John known to engage in phoretic behavior, that is, attaching to a larger animal so that it is carried from one place to another. Phoresy is, however, common in many other pseudoscorpions elsewhere.

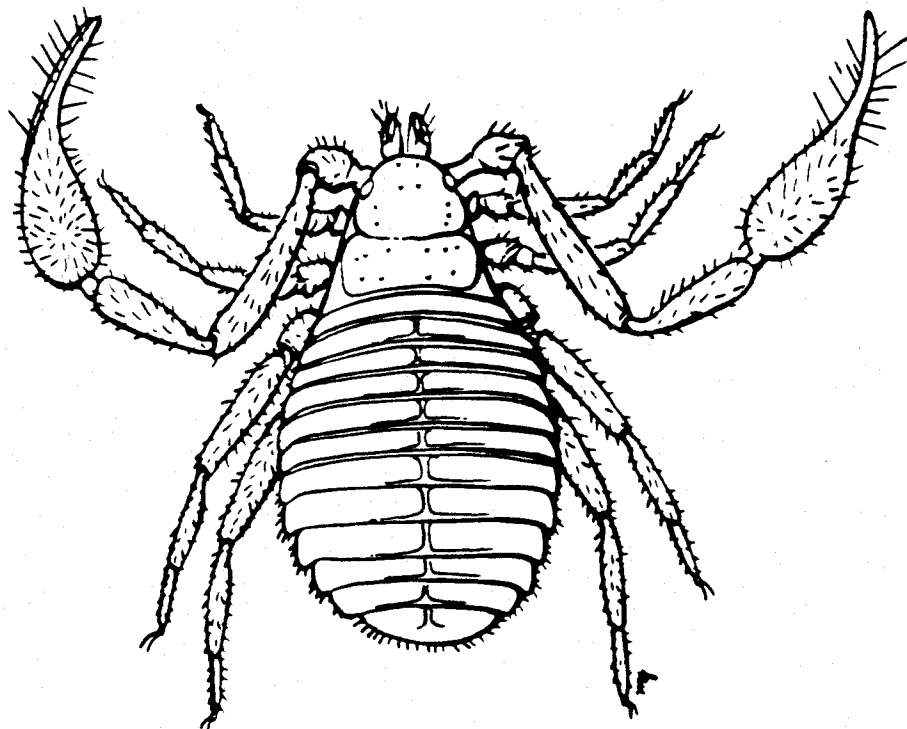


Fig. 27. Pseudoscorpion, Parachelifer parvus
(length - 1/10 inch)

Order AMBLYPYGIDA

Amblypygids are broad, flattened arachnids, bearing resemblance to some spiders. The cephalothorax is large and broader than long and attached to the round abdomen by a narrow waist. The chelicerae are small and unobtrusive but the pedipalps are large, heavy and spiny, and used for grasping prey. The first pair of legs are extremely long, slender, antenna-like sensory structures. The last 3 pairs of legs are not so long and are used for locomotion, which is rather crablike, as the animal can move sideways as well as forward and backward. Amblypygids are nocturnal, and hide by day under rocks, logs, etc. The young ride on the mother for several days after they are hatched.

Two species of amblypygids are known on St. John.

LARGE AMBLYPYGID

Phrynus longipes

Fig. 28

P. longipes (Pocock 1893), Quintero 1981:137.

Identification.- Adults are large flat spider-like arachnids with the special characteristics noted above. The body may be 3/4 inch (20 mm) in length, while the whole animal (measured across the legs) may span 1.5 - 2 inches (40-50 mm). This species is characterized by having a median pair of eyes on a dark tubercle as well as 2 lateral clusters of 3 eyes each. They are usually dark reddish brown; though teneral and young individuals are much lighter, tan.

Habitat.- This species is almost always found under rocks partially embedded in the ground in shaded places. They often remain quiescent after being exposed, but then scuttle away very rapidly.

Distribution.- Hispaniola, Puerto Rico, and the Virgin Islands. TL.- Haiti.

Localities on St. John.- In wooded areas throughout the island.

SMALL AMBLYPYGID

Charinides levii

Fig. 29

C. levii Quintero.

Identification.- This is a small species, with body length of about 1/5 inch (5 mm). It may be mistaken for immature Phrynus longipes, but can be distinguished by the lack of median eyes. It is usually tan in color.

Habitat.- Found in generally damper situations than P. longipes; under rocks and in moist, loose ground litter.

Distribution.- Virgin Islands.

Localities on St. John.- Apparently throughout the island in moist woodlands.

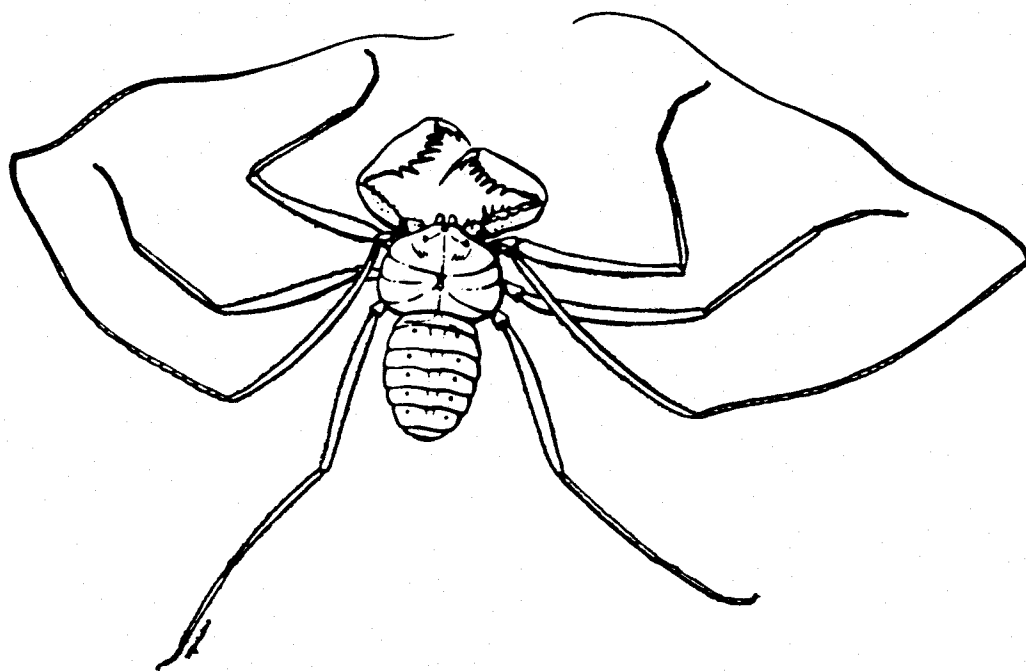


Fig. 28. Large amblypygid, Phrynus longipes
(body length - $3/4$ inch)

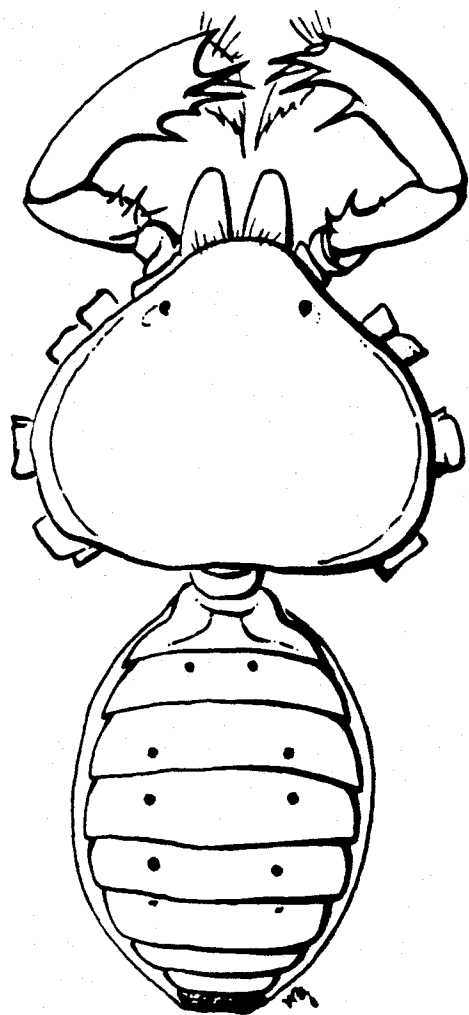


Fig. 29. Small amblypygid, Charinides levii

(shown without legs)

(body length - 1/5 inch)

Order OPILIONIDA

The opilionids, sometimes called harvestmen or daddy-long-legs, are somewhat spider-like, but their bodies are rather rounded with the cephalothorax and abdomen broadly joined. The legs are often long (though there are short-legged forms) and the body is held well up off the ground. The chelicerae are chelate and used for feeding, while the pedipalps are usually little modified and inconspicuous. Tropical forms often have protective spines on body and appendages. Opilionids are nocturnal predators which hide by day in litter or under rocks or logs.

Seven species are known from St. John.

HARVESTMAN

Metacynortoides obscura

Fig. 30

M. obscura (Banks 1903).

Identification.- This is the largest harvestman found on St. John, with body length about 1/4 inch (6 mm). The legs are long, with a span up to 1 inch (25 mm). There are 4 large, erect spines near the posterior end of the body, which is dark brown with a few light, transverse stripes.

Habitat.- It lives in the moist forest, where it hunts by night and hides during the daytime under rocks and logs.

Distribution.- Puerto Rico and the Virgin Islands. TL.- Puerto Rico.

Localities on St. John.- Throughout the forested parts of the island.

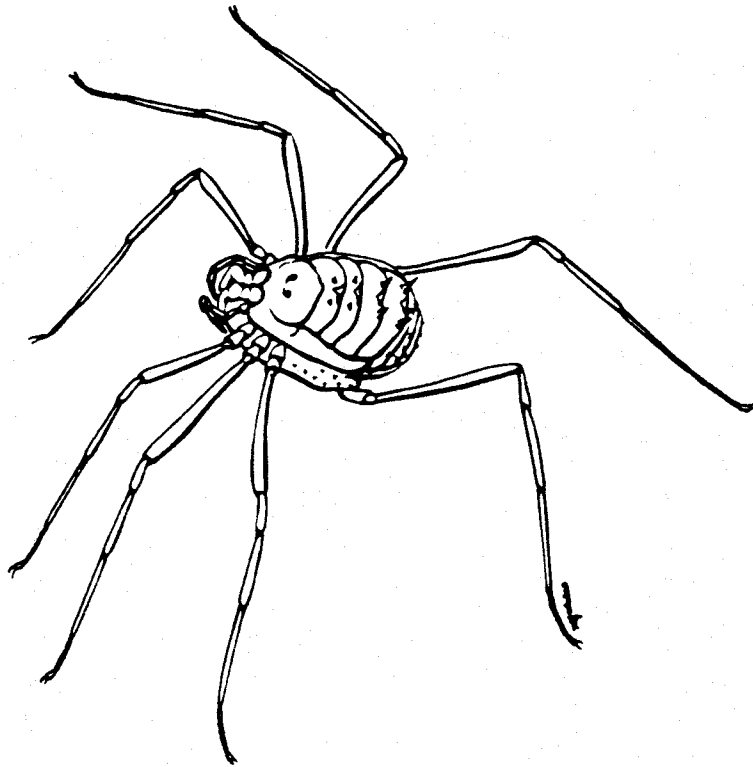


Fig. 30. Harvestman, Metacynortoides obscura
(body length - 1/4 inch)

Paraconomma sp.

Fig. 31

P. sp.; see Goodnight and Goodnight 1942:5.

Identification.- This tiny form has not yet been described and named. However, it is unmistakable because of its small size (body length 1-1.5 mm), short legs, light yellow color, and the absence of eyes. It may be related to P. ovata Goodnight and Goodnight from Puerto Rico.

Habitat.- These tiny opilionids are found most frequently in litter, though they may occasionally be located on the undersides of rocks. They are certainly soil and litter dwelling forms.

Distribution.- Known only from St. John, U.S.V.I.

Localities on St. John.- Throughout the island in wooded areas.

HARVESTMAN

Martibianta virginsulana

M. virginsulana Silhavy 1973:139.

Identification.- Generally similar to Metacynortoides obscura but only half as large, with body length 1/10 inch (2.5 mm) and leg span less than 1/2 inch (10 mm). There are only 3 spines on the dorsum of the body - 2 near the middle and 1 near the posterior end. The body is black, the legs are distinctly banded, and the last 2 segments of the pedipalps are entirely white.

Habitat.- It has been collected from under rocks and in litter in moist forest. Like most other opilionids it probably hides during the day and forages at night.

Distribution.- Known only from St. John. TL.- Cruz Bay, St. John, U.S.V.I.

Localities on St. John.- Cruz Bay, Brown Bay, Coral Bay, Lameshur Bay.

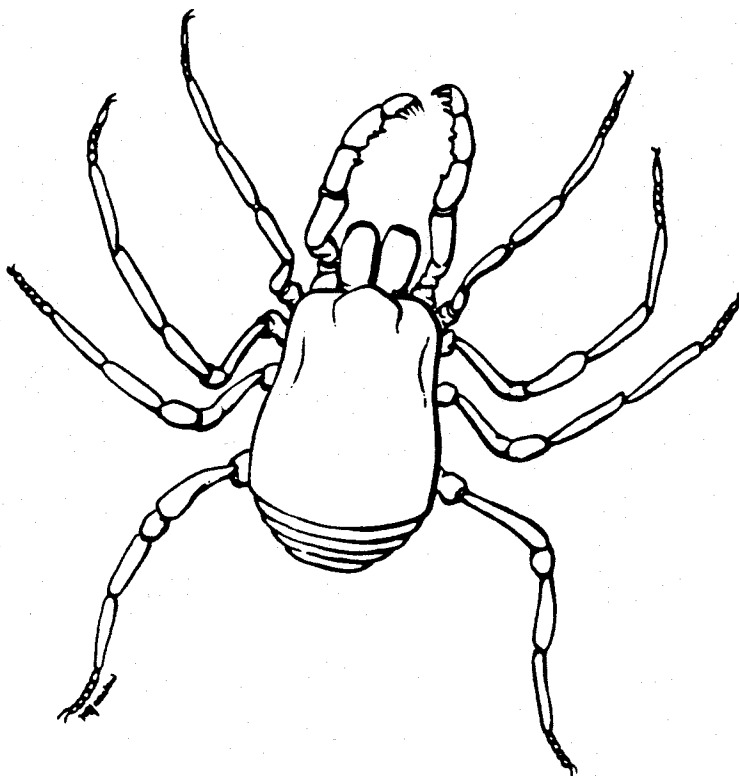


Fig. 31. Harvestman, Paraconomma sp.
(body length - 1/25 inch)

SPIDERS
Order ARANEIDA

Spiders are very active predators having a relatively large cephalothorax with 4 pairs of strong legs and the abdomen attached by a slender waist or pedicel. The pedipalps are small sensory appendages, which in the male are further modified for sperm transfer. The chelicerae are sharp fangs for injection of venom into prey; the bite of only a few spiders is poisonous to humans. Spiders are noted for their ability to produce silk from spinnerets at the end of the abdomen; the silk is used to catch and secure prey and to protect themselves and their offspring. Most spiders are nocturnal and so are not usually encountered, but a few, such as the orb-web spinners, are active during the day and are quite conspicuous.

Over 100 species of spiders certainly or probably occur on St. John.

TARANTULA SPIDER

Cyrtopholis bartholomei

Fig. 32

C. bartholomei (Latreille 1832); see Levi and Levi 1968:21.

Identification.- A large ground-living spider, up to 1 1/2 inches (3.5-4 cm) in length of body. The heavy body and long legs are generally quite hairy, and dark brown in color, with light stripes on the legs.

Habitat.- During the daytime, tarantulas hide in deep burrows in the ground, often in flat clear space beneath large trees. They come out at night to forage for prey.

Distribution.- Lesser Antilles and Virgin Islands. TL.- St. Bartholomew.

Localities on St. John.- Common, especially in flat areas at lower altitudes.

Remarks.- Despite their formidable appearance, tarantulas are not dangerous. They are reclusive and not aggressive, and their venom is not very toxic.

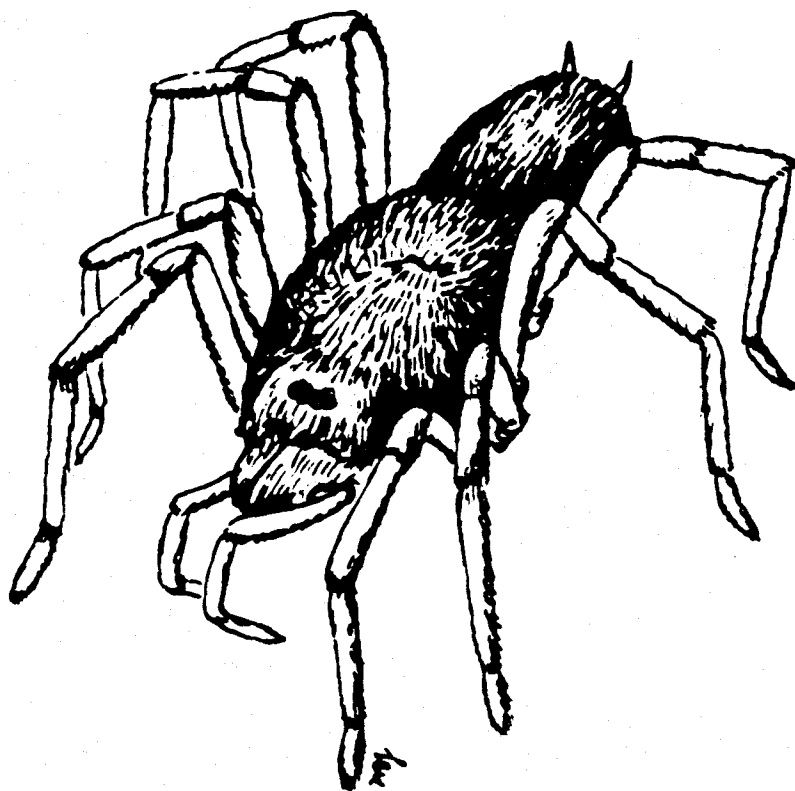


Fig. 32. Tarantula spider, Cyrtopholis bartholomei
(length - 1 1/2 inches)

ORCHARD SPIDER

Leucauge regnyi

L. regnyi Simon 1897; see Levi and Levi 1968:71.

Identification.- A small orb-weaver with body length about 1/3 inch (8-10 mm). The flattened carapace is tan, while the elongated abdomen is silver with brown longitudinal stripes.

Habitat.- The untidy orb webs are more or less horizontal in position and located at the edge of woods, especially near the shore (open mangle).

Distribution.- Eastern Antilles. TL.- St. Vincent.

Localities on St. John.- Lameshur Bay, East End, Annaberg.

GOLDEN SILK SPIDER

Nephila clavipes

Fig. 33

N. clavipes (Linnaeus 1767), Levi and Levi 1968:65, Lubin, in Janzen 1983:745.

Identification.- The female is a large, orb-weaving spider, with body length often greater than 1 inch (30 mm). The abdomen is elongated and noticeably spotted, and the legs bear conspicuous tufts of bristles. The web is large and is strung across wide spaces with heavy, shining, golden threads - hence the name golden-orb spider. Males are much smaller (5-8 mm) and inconspicuous; they can be found on the webs of females along with other, small kleptoparasitic spiders.

Habitat.- Found in woods, where it often places its web across a path or gut. The web is replaced every 2 or 3 days.

Distribution.- Tropical America. TL.- "America".

Localities on St. John.- Usually seen on park trails through forested areas, such as the Reef Bay Trail and the Cinnamon Bay Nature Trail, where a sign calls attention to this spider and its web.

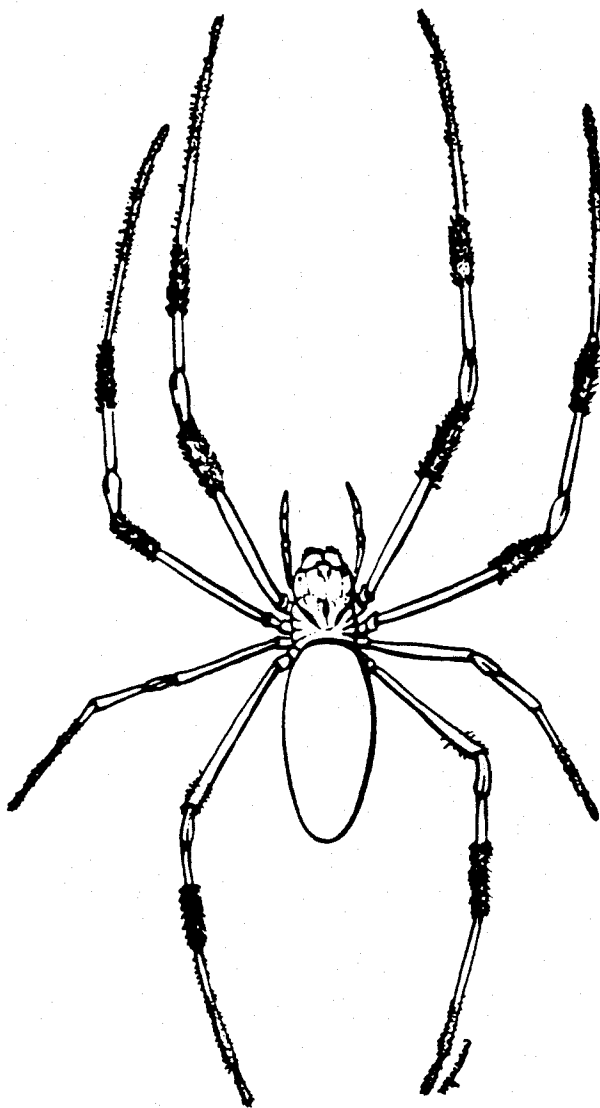


Fig. 33. Golden silk spider, Nephila clavipes, female
(body length - 1 inch)

Order SCHIZOMIDA

Schizomids are small, elongate arachnids with the cephalothorax divided and longer than broad, and the abdomen bearing a short terminal flagellum. The chelicerae are small and the pedipalps leglike. The first pair of legs are attenuated, antenna-like. The last 3 pairs of legs, together with the palps, account for locomotion. These are thin-skinned animals which live in moist litter.

A single species is known from St. John.

SCHIZOMID

Schizomus portoricensis

Fig. 34

S. portoricensis (Chamberlin 1922), Rowland and Reddell 1980:14.

Identification.- This is the only schizomid species known to occur in the Virgin Islands. It looks like a little elongate spider, but with the distinguishing features noted above. It reaches only about 1/2 inch (10-12 mm) in length and is very pale in color.

Habitat.- These are thin skinned animals and are found only in litter which remains moist constantly.

Distribution.- From Florida through the Caribbean area to northern South America. TL.- Puerto Rico.

Localities on St. John.- Collected so far only at Catherineberg and Maho Bay.

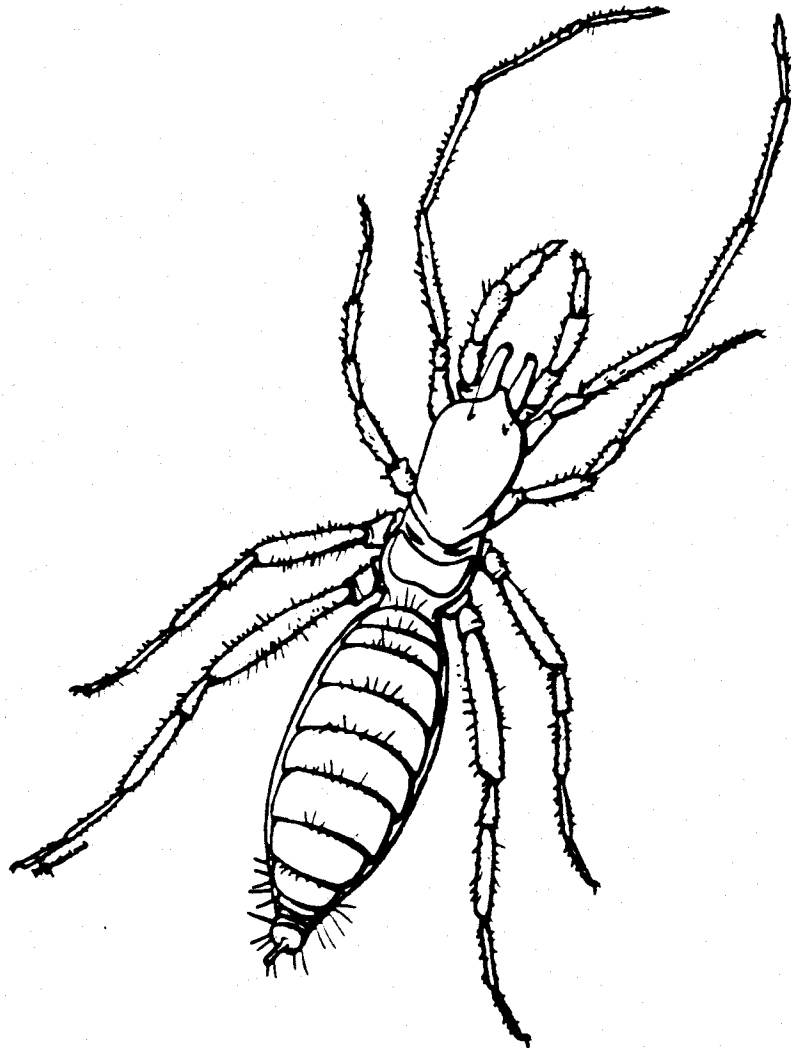


Fig. 34. Schizomid, Schizomus portoricensis
(body length - 1/2 inch)

Order PALPIGRADIDA

Palpigradids or microwhipscorpions are minute arachnids, somewhat spiderlike, but with a long slender flagellum at the end of the abdomen (however, the flagellum is usually broken off in preserved specimens). The chelicerae are chelate, the pedipalps are leglike, and the first legs are long and sensory in function. These animals, which are less than 1/10 inch (2 mm) in length, live in moist litter and soil and under rocks.

One kind of palpigradid is known to occur on St. John.

Eukoenenia berlesei virginea Condé

E. b. virginea Condé 1984:371; see Levi and Levi 1968:140.

Identification as described above. These tiny animals will be found only by microscopic examination of collections made by sifting or Tullgren funnel separation of ground litter. The species, E. berlesei is known to occur around the Mediterranean Sea in Europe and Africa. The subspecies E. b. virginea has been found so far only on St. John, at Calabash Boom and Catherineberg.

Order SOLPUGIDA

Solpugids or windscorpions are medium-sized arachnids characterized by enormous chelate chelicerae or jaws. The pedipalps and the first pair of legs are modified as feelers, while the last 3 pairs of legs are used for locomotion. They run very fast, "like the wind", and capture prey with the chelicerae. They have no poison at all. They are nocturnal and hide very successfully during the day under rocks, etc.

Only a single species is known to occur on St. John.

SOLPUGID

Ammotrechella pallida

Fig. 35

A. pallida Muma and Nazario 1971:509.

Identification.- Only this one species of solpugid is known to occur on St. John. While only juveniles have been collected thus far, it is likely that they belong to this species, which was described from Puerto Rico. They are heavy-bodied arachnids, with shorter legs than the tarantula spiders, and with the special characteristics mentioned above. They may reach 3/4 inch (20 mm) in length and are light brown in color.

Habitat.- Solpugids typically live in very dry areas, hiding under rocks or in burrows during the day and foraging for food at night. The 3 specimens which have been collected were taken in a pitfall trap in zeric scrub near the end of Ram Head.

Distribution.- Puerto Rico and the Virgin Islands. TL Bosque Guanica, Puerto Rico.

Locality on St. John.- Ram Head.

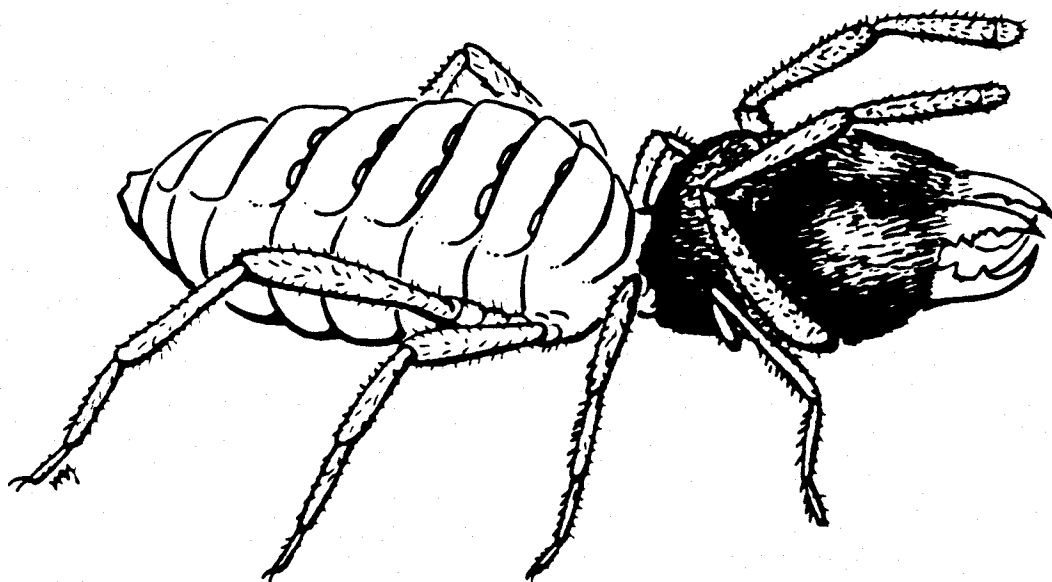


Fig. 35. Solpugid, Ammotrechella pallida
(length - 3/4 inch)

Order ACARINA

The Acarina comprise the mites and ticks, which are characterized by having a body with virtually no indication of segmentation; there is no obvious division between cephalothorax and abdomen and the body is rounded. Chelicerae and pedipalps are small, highly modified mouthparts, while the 8 legs are all used for locomotion. Larvae of mites and ticks have only 6 legs and might be mistaken for insects, but the form of the body and the mouthparts is still distinctive. There are probably more kinds of acarina than of all other arachnids combined and the variation in form and habits is enormous. Most mites are less than 1/25 inch (1 mm) long, while ticks are larger, up to 2/5 inch (1 cm) in length, especially when engorged with food (blood). Most mites are freelifving omnivores or predators, but many are parasitic on a wide variety of plants and animals; all ticks are parasitic on vertebrate animals. Freelifving mites are usually encountered in great numbers in soil and ground litter, while parasitic forms are to be found only on or near their hosts.

The Acarina of St. John have not been collected or studied systematically. Of the 100 or more which probably occur here, only a few conspicuous kinds are noted below.

Opilioacarus sp.

Opilioacarus sp.; see McDaniel 1979:27.

Opilioacarus is a little, long-legged arachnid which bears resemblance to both opilionids and acarines. In general form it looks like a tiny harvestman, with an oval body, the abdomen partially segmented, 2 pairs of eyes, and long running legs. However, it is only about 1/16 inch (1-2 mm) in length and in most details it agrees with other mites, and so is classified as a primitive member of the Acarina.

Opilioacarus is found in dry litter and under stones and other such objects lying on the ground. It has been collected in many locations across St. John.

TICKS

See Levi and Levi 1968:139; McDaniel 1979:96.

Ticks are external parasites of a wide variety of vertebrate animals. They are usually found on the host, where they pierce the skin and feed on blood. The body is oval or pear-shaped and usually about 1/5 inch (4-5 mm) in length before feeding; however, after engorging on blood a female may reach 1/2 to 3/4 inch (1-2 cm) in length.

As mentioned above, ticks are usually found on a host animal, though most of them drop off onto vegetation after feeding. They later reattach to a host when they become hungry again. Most ticks feed on specific animals such as cattle, donkeys, dogs, rats, etc., though many will also attack humans if given the opportunity when they are hungry. Some ticks transmit diseases among animals and humans.

No ticks have been officially reported from St. John, though some are undoubtedly present on the larger animals.

VELVET MITE

Trombidium sp.

Fig. 36

Trombidium sp.; see Levi and Levi 1968:135.

Velvet mites are large for mites, ranging up to 1/8 inch (3 mm) in length. Their bodies are velvety in appearance and to the touch because of a covering of numerous short setae, and they are usually bright red in color. As they are predaceous or parasitic on insects, they are not bothersome to humans.

These mites are not especially common but they are noticeable because of their conspicuous size and color. They are usually found in shaded places.

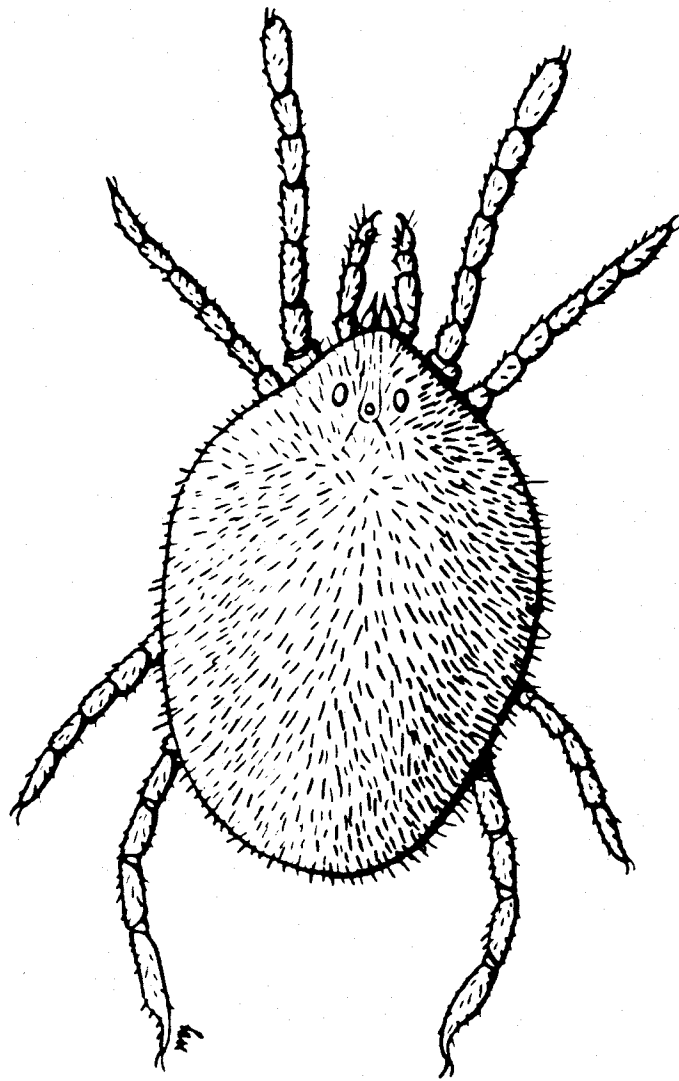


Fig. 36. Velvet mite, Trombidium sp.
(length 1/8 inch)

MYRIAPODA

The term "Myriapoda" signifies "many legs." It does not have formal taxonomic status but is generally applied to those Arthropods which, as adults, have more than 7 pairs of walking legs. Thus, it includes the forms other than Crustacea, Arachnida, and Insecta, namely, Chilopoda, Diplopoda, Symphyla, and Pauropoda. In spite of some resemblances due to the possession of numerous legs, these last four groups are not closely related to one another and so are considered as separate classes of the Arthropoda.

CLASS CHILOPODA

Chilopods, or centipedes, are mostly very elongate, flattened, terrestrial arthropods with one pair of legs on each of the 15 or more trunk segments; some do have a hundred or more legs, as the name "centipede" implies, but most have fewer than that. The legs are usually relatively long (sometimes very long), and centipedes are characteristically fast runners. Like insects and millipedes, centipedes have a pair of antennae on the head. Most Virgin Islands centipedes are an inch (2.5 cm) or less in length but some may be much larger, reaching 6 inches (15 cm) or so. The first pair of legs of centipedes are modified as poison fangs for subduing prey; the bite of a large animal will be painful but usually not dangerous to humans. Centipedes, as active predators, will be found wherever prey (smaller arthropods) are available, in litter, under rocks and bark, etc.

There are probably about 10 species of Chilopoda on St. John. They represent three orders, which can be separated easily as follows:

Scolopendromorpha - rather heavy-bodied; with 21 or 23 pairs of stout legs; from 1 to 6 inches (2.5-15 cm) in length (see Fig. 37). Five species have been identified on St. John.

Geophilomorpha - body long and very slender; with 31 or more pairs of small legs; from 1/2 to 2 1/2 inches (1-6 cm) in length (see Fig. 38). Several species, as yet unidentified, occur on St. John.

Scutigeroformorpha - body short; with 15 pairs of very long, thin legs; from 1/2 to 1 inch (1-2.5 cm) in body length (see Fig. 39). A single species is known on St. John.

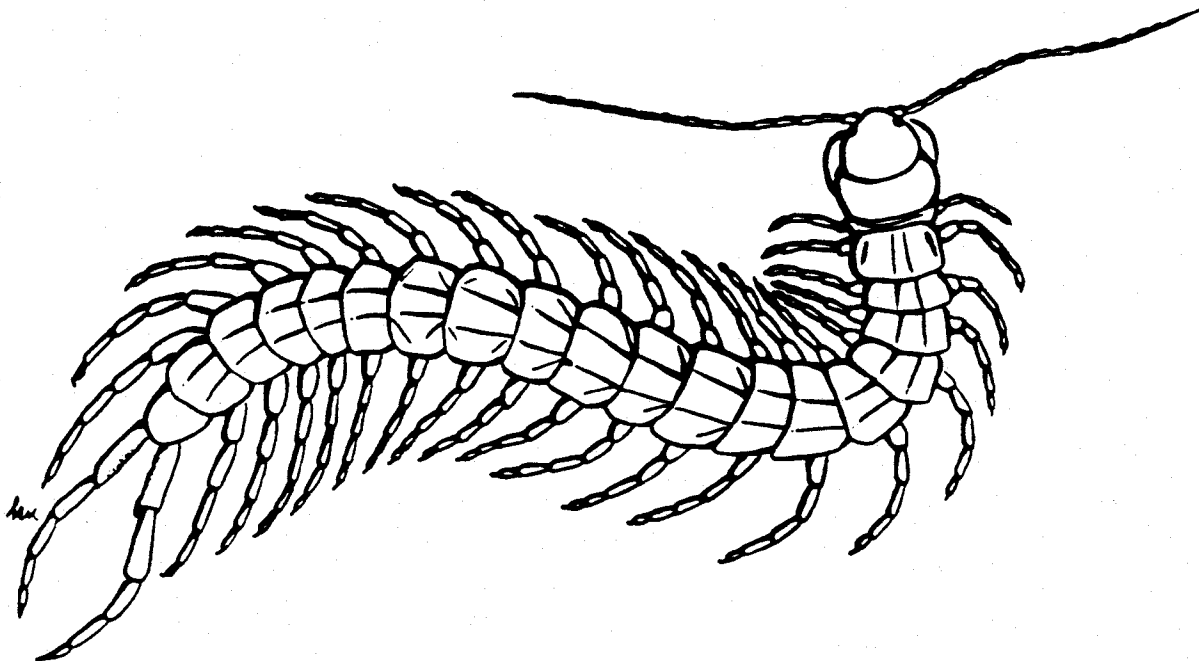


Fig. 37. Scolopendromorph centipede, Scolopendra alternans
(length - 3-6 inches)

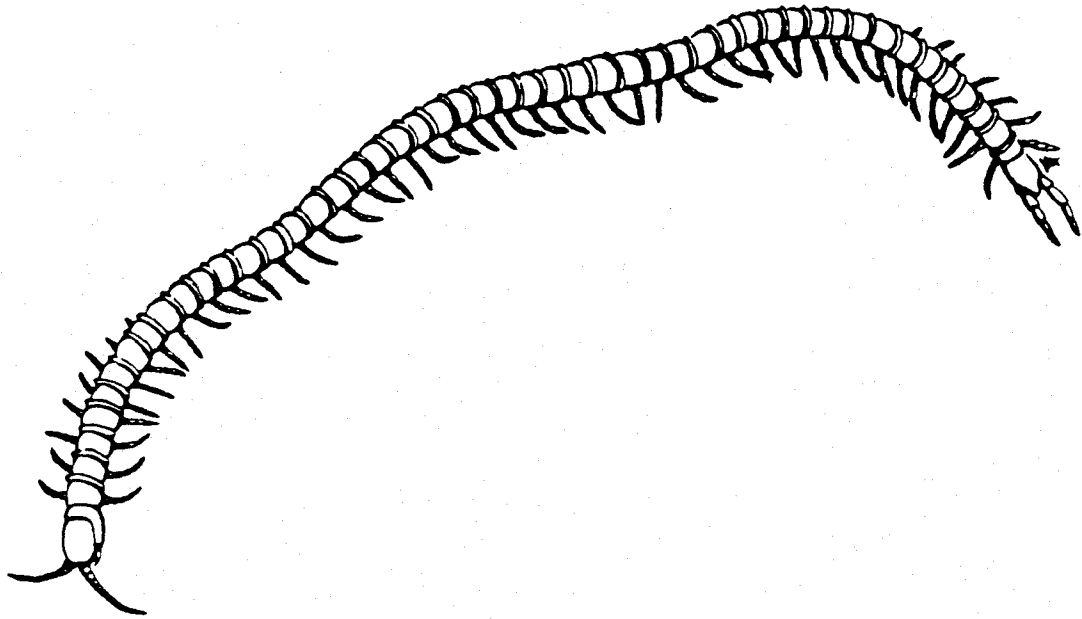


Fig. 38. Geophilomorph centipede
(length - 1 1/2 inches)

SCUTIGEROMORPH CENTIPEDE

Scutigera lincei

Fig. 39

S. lincei (Wood 1867), Würmli 1973:76.

Identification.- This is the only scutigermorph centipede known to occur in the Virgin Islands. It is easily recognized by the possession of 15 pairs of very long, slender legs; body length up to 1 inch (2.5 cm).

Habitat.- In leaf litter and under loose bark, where they hunt prey.

Distribution.- This species is probably widespread around the Gulf of Mexico and the Caribbean Sea. TL.- Texas.

Localities on St. John.- Lameshur Bay, Europa Bay, Bordeaux Mt.

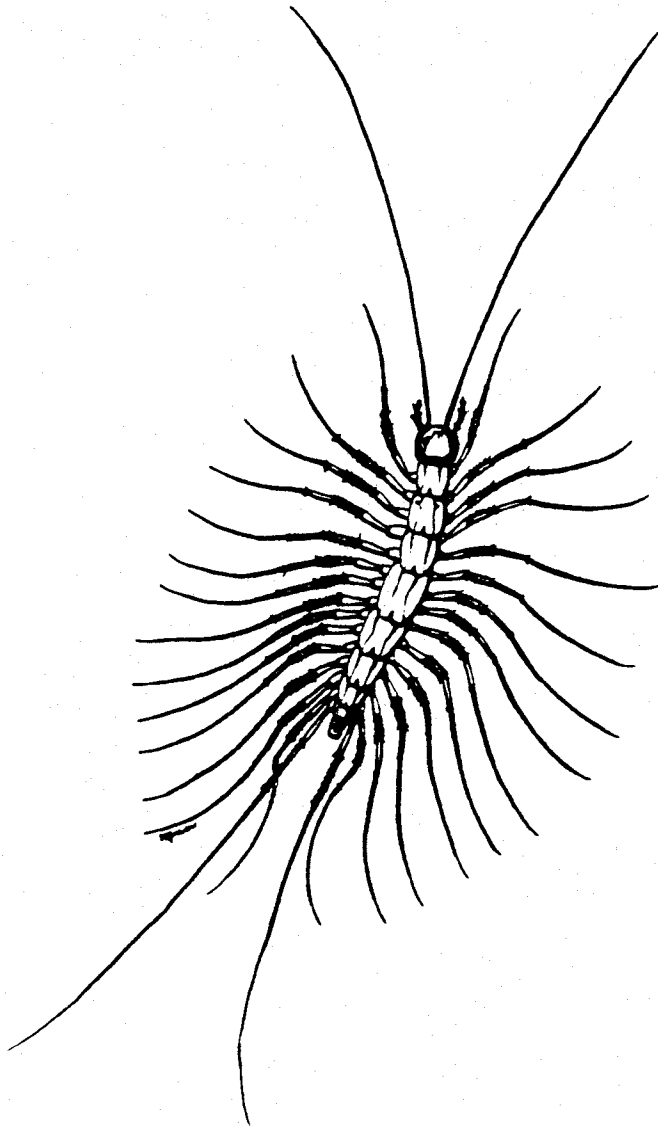


Fig. 39. Scutigermorph centipede, Scutigera lincei
(body length - 1 inch)

CLASS DIPLOPODA

The diplopods, or millipedes, are elongate, cylindrical or flattened, terrestrial arthropods with two pairs of legs on most body segments; they do, therefore, have very many legs but never a thousand as the name implies. The legs are usually relatively short, and millipedes are characteristically slow-paced. Like insects and centipedes, millipedes have a pair of antennae on the head. Most Virgin Islands species are small, less than one inch (2.5 cm) long, though one may reach a length of 3 1/2 inches (9 cm). Millipedes are herbivorous and scavengers, and so are usually found in plant litter.

There are 7 or more species of millipedes on St. John.

Lophoturus longisetis

Fig. 40

L. longisetis (Pocock 1894); see Levi and Levi 1968:147.

Identification.- This tiny millipede is characterized by being covered with a multitude of silvery setae and having a tuft of long setae extending from the posterior end. The body is usually less than 1/5 inch (5 mm) long.

Habitat.- It lives among debris and decaying litter, often in dry situations, and is usually encountered beneath rocks or boards or under the bark of trees or logs.

Distribution.- Eastern Caribbean area. TL.- Mustique Island.

Localities on St. John.- Throughout the island.

Prostemmiulus wheeleri

P. wheeleri (Silvestri 1908), Loomis 1970:132.

Identification.- A medium sized millipede, about an inch (2.5 cm) long; cylindrical in shape and tapering slightly toward the hind end; dark gray, often with a conspicuous light stripe along the back; moves quickly and sometimes "jumps" when caught.

Habitat.- In ground litter and other vegetable debris; often under old boards lying on the ground.

Distribution.- Culebra, P.R.; St. John, U.S.V.I.; and Tortola, B.V.I. TL.- Culebra, P.R.

Localities on St. John.- Widespread over the island.

Remarks.- When disturbed, this millipede secretes a chemical which has a very distinctive odor, to discourage predators.

Rhinocricus arboreus

Fig. 41

R. arboreus (Saussure 1859), Loomis 1970:132

Identification.- Large, conspicuous millipede, up to 3 1/2 inches (9 cm) in length; cylindrical in shape; black; usually found in trees.

Habitat.- Usually seen on trees, but also to be found sheltering under bark of trees and beneath objects on the ground.

Distribution.- Virgin Islands and Puerto Rico; also reported from Antigua. TL.- St. Thomas, U.S.V.I.

Localities on St. John.- Widespread over the island.

Remarks.- This millipede is sometimes called "gongolo". When disturbed or handled, it secretes a brown fluid which has the odor of iodine and stains the skin. The secretion is distasteful to potential predators; it is not generally harmful to humans, but in some it may cause a painful skin reaction, especially if gotten into the eye.

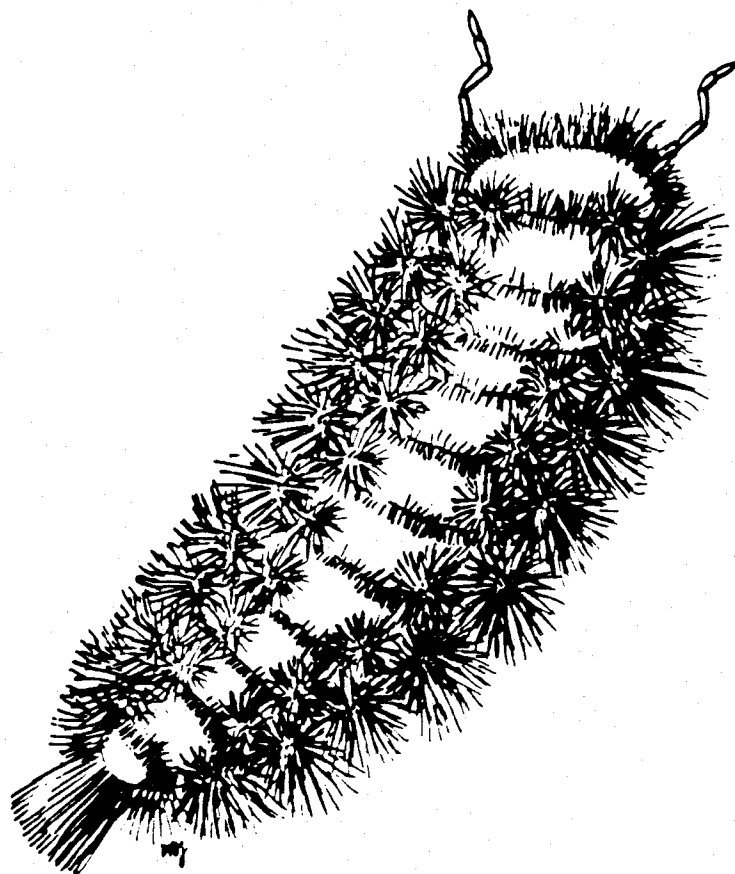


Fig. 40. Millipede, Lophoturus longisetis
(length - 1/6 inch)

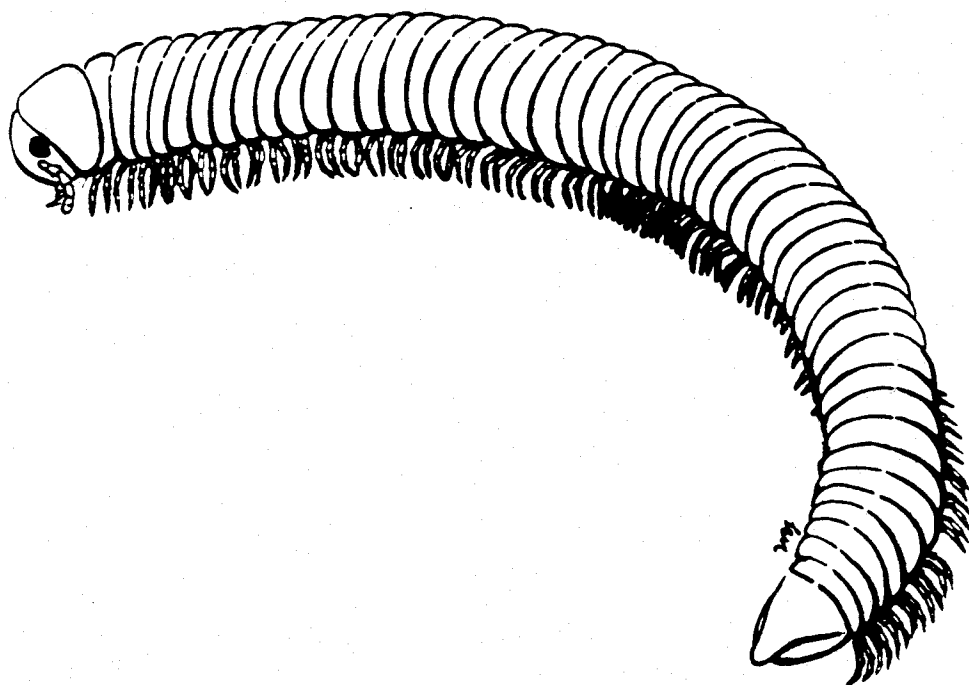


Fig. 41. Arboreal millipede, Rhinocricus arboreus
(length - 3 inches)

Siphonophora albiceps

S. albiceps Loomis 1970:134.

Identification.- This small millipede is easily identified by its pinkish color, white head, and sharply pointed beak. Body length is about 1/3 inch (7-9 mm).

Habitat.- It has been found in litter in the moist forest.

Distribution.- Known only from St. John. TL.- Cinnamon Bay Trail, St. John.

Localities on St. John.- Cinnamon Bay, Carolina, Lameshur Bay.

Asiomorpha coarctata

Fig. 42

A. coarctata (Saussure 1860), Chamberlin and Hoffman 1958:83.

Identification.- A moderately small millipede, about 3/4 inch (2 cm) long. As seen from above, the body is mahogany brown, with conspicuous yellowish lateral keels on each segment.

Habitat.- In and under debris around human habitations.

Distribution.- It has been spread by man widely through the tropics. TL.- Malay Archipelago.

Localities on St. John.- Lameshur Bay, Maho Bay.

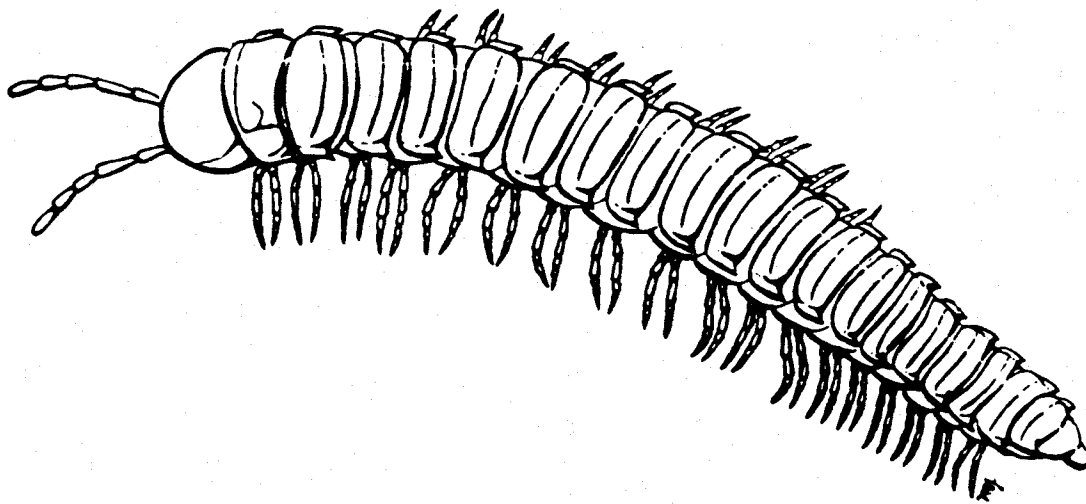


Fig. 42. Millipede, Asiomorpha coarctata
(length - 3/4 inch)

Prosopodesmus jacobsoni

P. jacobsoni Silvestri 1910, Loomis 1970:132.

Identification.- Small, about 1/5 inch (5-6 mm) long; slightly flattened; surface smooth, nearly white.

Habitat.- In moist ground litter.

Distribution.- Has been spread by man widely through the tropics. TL.- Java.

Localities on St. John.- Annaberg, Cinnamon Bay, Hawksnest Bay.

Poratioides virginalis

P. virginalis Loomis 1970:132.

Identification.- Small millipede, about 1/6 inch (4 mm) long; with 19 segments; nearly cylindrical; surface tuberculate, white or pinkish.

Habitat.- In moist litter.

Distribution.- Known only from St. John, U.S.V.I.

Localities on St. John.- Hawksnest Bay, Annaberg, Bordeaux Mountain, Catherineberg.

CLASS SYMPHYLA

Symphylans (Fig. 43) resemble very small centipedes but can be distinguished from that group by the possession of only 12 pairs of legs and the lack of poison fangs. They are white, blind, soft-bodied, and are usually less than 1/4 inch (7 mm) in length. They live in soil and litter where they feed on plant debris.

Two species (not yet positively identified) are known to occur on St. John.

CLASS PAUROPODA

Pauropods are minute myriapods, usually less than 1/25 inch (1 mm) in length. They are characterized by having 9 pairs of legs and unique, branched antennae. Because of their small size they are poorly known. They probably feed on detritus and fungus as they are found in soil and moist litter.

Only a single kind (as yet unidentified) has been found on St. John. None has been recorded from the other Virgin Islands or Puerto Rico.

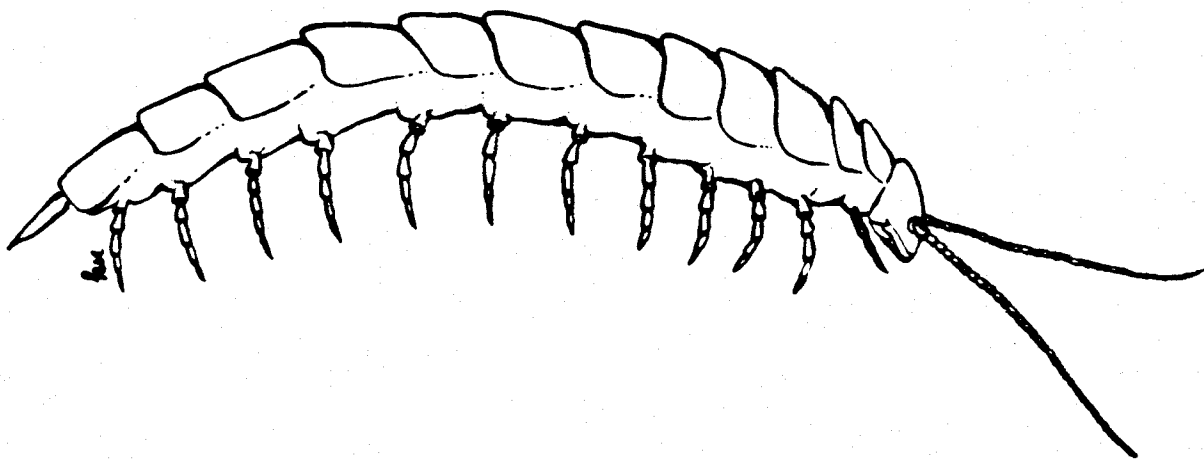


Fig. 43. Symphylan, Hanseniella orientalis
(length - 1/5 inch)

CLASS INSECTA

Insects are terrestrial arthropods, the adults usually characterized by well defined head, thorax and abdominal regions, by a single pair of antennae on the head, and by 3 pairs of legs and 2 pairs of wings on the thorax. They comprise the largest class of arthropods and are exceedingly varied; many parts of the body, including the antennae and wings, may be highly modified and the wings may be lost entirely, but the occurrence of 6 legs is rather constant and diagnostic. The young stages of insects are extremely varied. Some are much like the adults but lack wings (nymphs), while others are nothing like the adults and may look more like worms (larvae).

Because of their variety and their ability to fly, insects are found nearly everywhere on land and in fresh water; but, interestingly, only a few live in the sea.

There are undoubtedly 1000 or more kinds of insects on St. John. However, as they have not yet been well documented here, only a few of the most common and obvious species are listed below. An unpublished list of about 75 insects found on St. John (Curry 1970) is available in the library of the Virgin Islands National Park. A more complete list, covering over 1200 species of insects and applicable in part to St. John, is "The Insect Fauna of St. Croix, United States Virgin Islands" by Miskimen and Bond (1970).

SPRINGTAILS

See Bland 1978:59.

Identification.- Springtails or collembolans are very small wingless insects, most of which have a unique jumping apparatus on the abdomen. A forked structure (furcula) on the fourth abdominal segment folds forward under the body to be held by a catchlike structure (tenaculum) on the third segment; when the furcula is released by the tenaculum, it flips downward and backward, forcing the insect upward and forward. Some springtails can jump 10-15 times their own length, which is 1/5 inch (5 mm) or less. These little insects will usually be recognized simply as tiny creatures springing up and away when they are disturbed.

Habitat.- Springtails are soft-bodied and prefer moist, cool places in soil and litter, where they feed on decaying vegetable matter and other debris. A few of them do eat living vegetation and may cause damage to house plants.

Distribution.- Cosmopolitan.

Localities on St. John.- Ubiquitous in moist soil and litter.

SILVERFISH

Lepisma saccharina

L. saccharina Linnaeus, Bland 1978:63.

Identification.- Silverfish are slender, flattened, wingless insects with long antennae and long abdominal cerci. The body is covered with silvery gray scales, and ranges up to 1/2 inch (13 mm) in length. When disturbed, they move very smoothly and rapidly, "like a fish."

Habitat.- They are usually found in houses where they live in damp areas and around stored food and books. They feed on cereal products, starch, bookbindings, and paper and may be serious pests.

Distribution.- Cosmopolitan, spread by humans.

Localities on St. John.- Probably widespread.

DRAGONFLIES

Dragonflies, also known as "mosquito hawks" or "Auntee Nonnees" (Jadan 1985:38), are commonly seen on St. John, usually flitting across a pool or pond. Several species occur on the island, of various sizes and colors. They all have a long, slim body and a large head with enormous eyes and their long, strong wings are held horizontally out from the thorax. Body length is 1-2 inches (25-50 mm) and wing span may be 2-4 inches (50-100 mm). Some are red, some blue, some green, and some brown.

Habitat.- Dragonflies are usually found close to water, for that is where the eggs are laid and where the young live. The wingless nymphs, or young dragonflies, are grotesque creatures, which crawl around among leaves and other debris in the bottom of pools or ponds, where they catch worms and insects with their great jaws. Adults, with strong wings, may fly far away over open land to hunt their prey, which are flying insects.

AMERICAN GRASSHOPPER

Schistocerca americana

S. americana (Drury), Bland 1978:95.

Identification.- Grasshoppers are usually easily identified as they spring into the air to fly away on rustling wings. Adults have elongate bodies about 1.5 inches (40 mm) in length, strong wings, and large, powerful hind legs. The nymphs are similar but are smaller and lack functional wings.

Habitat.- In grass and other low vegetation in open areas, especially fields and pastures.

Distribution.- Southern U.S. to South America.

Localities on St. John.- Fields and other open areas.

AMERICAN COCKROACH

Periplaneta americana

P. americana (Linnaeus), Bland 1978:106.

Identification.- Nearly everyone knows cockroaches well as household pests. The adult of the American Cockroach is large (up to 1.5 inches or 40 mm), broad and flattened, reddish brown in color, and with well developed wings. Young stages, or nymphs, are smaller and wingless. All are very agile and can easily find shelter in cracks and between objects.

Habitat.- These roaches can live outdoors, but they prefer to occupy our houses, where food and shelter are easy to find.

Distribution.- Cosmopolitan.

Localities on St. John.- Might be found in any house if it has not been fumigated recently.

Note.- Several other roaches may also be found on St. John. They range in color from almost white to black; all are smaller than the American Cockroach. One or two of them may also become house pests, but most live out in the woods and fields where they are scavengers.

SEASIDE EARWIG

Anisolabis maritima

A. maritima (Géné), Bland 1978:110.

Identification.- Earwigs are easily identified by the elongate body and the prominent forceps-like appendages (cerci) at the end of the abdomen. The seaside earwig is fairly large, with a body length up to one inch (25 mm), and is wingless. Color is a shiny brownish-black.

Habitat.- As the name implies, the seaside earwig is found at the shore, under seaweed, boards, and other seashore debris near the high tide mark.

Distribution.- Atlantic, Caribbean, and Pacific coasts.

Localities on St. John.- Any shore with cast up debris.

ARBOREAL TERMITE

Nasutitermes costalis

N. costalis (Holmgren 1910); see Lubin, in Janzen 1983:743.

Identification.- These are the termites which build the large conspicuous nests in trees, with covered trails leading down to the ground for foraging. The animals themselves are about 1/4 inch (5-7 mm) long and are pale yellowish-brown. The workers and soldiers seen most often are wingless, though, on occasion winged reproductives may be seen. Though they are sometimes called "white ants", termites are distinct from the ants, which are in the order Hymenoptera. Termites are pale and soft-bodied and have a broad connection between the thorax and abdomen, while ants are dark and hard-bodied and have a distinct constriction (pedicel) between thorax and abdomen.

Habitat.- The nests are usually found in trees or large cacti or, occasionally, in buildings. As the sign along the Cinnamon Bay Nature Trail points out, termites feed on wood and other dead plant material and thus help to recycle dead into living.

Distribution.- Caribbean area. TL.- Trinidad.

Localities on St. John.- Throughout the island in wooded areas.

BANANAQUIT LOUSE

Myrsidea coerebicola

M. coerebicola Klockenhoff and Schirmers 1980, Williams 1982:27.

Identification.- Very small (1.25-1.5 mm), pale colored, flat bodied, wingless insect; the head is broad, the whole body is about 2 1/2 times longer than broad, and the legs are short and stout.

Habitat.- Lives as a parasite on the body of a bird (Bananaquit), where it feeds on bits of feathers and skin. The flat body allows it to move easily among the feathers.

Distribution.- Reported by Williams from Trinidad, Bequia, and St. John. TL.- Trinidad.

Localities on St. John.- Collected by Williams from Bananaquits taken at Cinnamon Bay, but probably to be found all over the island.

Remarks.- Birds are commonly infested by lice. This species has been found, so far, only on Bananaquits, which, however, also harbor other kinds of lice (Williams 1982). Other kinds of birds will have their own particular kinds of lice. On St. John, no birds other than Bananaquits have been examined for parasites.

LOVE BUG

Dysdercus andreae

D. andreae (Linnaeus 1758); see Bland 1978:152.

Identification.- Love bugs are commonly seen feeding and mating on and under the haiti-haiti or portiatree (Thespesia populnea). It is a handsome, elongate-oval bug, bright red with black legs and bold black markings on the wings. All stages are frequently seen together, from wingless nymphs as small as 1/25 inch (1 mm) to winged adults over 1/2 inch (15 mm) in length. The adults mate hind end to hind end and remain thus paired for long periods, actively going about their other business.

Habitat.- They feed on the seeds of malvaceous plants such as haiti-haiti and wild cotton, and sometimes may occur in great numbers.

Distribution.- Caribbean area.

Localities on St. John.- Around nearly every haiti-haiti tree, on beaches and in basin moist forest.

Note.- Members of the genus Dysdercus are generally called "cotton stainers", because some feed preferentially on cotton where they stain and ruin the fibers. This species may have been a pest of cotton on St. John in bygone days.

These are different from the insects called "love bugs" in Florida, which are a kind of dipteran fly.

PLANT LICE

Aphis sp.

Aphis sp.; see Bland 1978:167.

Identification.- Plant lice or aphids are small, pear-shaped, soft-bodied insects usually seen clustered on stems or leaves of plants. They are mostly less than 1/5 inch (5 mm) in length, may be winged or wingless, and range in color from pale green or pink to black. They feed on plants' juices by means of their piercing and sucking mouthparts; excess fluid from this feeding is excreted through the anus as a sugary, sticky "honeydew", which may coat leaves and drop onto objects below (such as autos). Some ants and other insects may feed on the sugar-rich honeydew.

Habitat.- Aphids feed on a wide range of plants and so are common in most areas. They attack house plants as well as wild plants and may become serious pests if present in large numbers.

THE MONARCH

Danaus plexippus

D. plexippus (Linnaeus 1758), Riley 1975:33.

Identification.- The well-known Monarch butterfly has wings which are reddish-brown with black veins and black margins with numerous small white spots. Wingspan is about 3.5 inches (9 cm).

Habitat.- Usually in open areas. It lays its eggs and the caterpillars feed on milkweeds.

Distribution.- Very widespread. In continental areas the Monarch migrates between breeding and wintering grounds. TL.- Pennsylvania.

Localities on St. John.- Along roads and in open scrubby areas.

GULF FRITILLARY

Dione vanillae

D. vanillae (Linnaeus 1758), Riley 1975:88.

Identification.- Its conspicuous orange-red wings with scattered black spots easily identify the Gulf Fritillary. Wingspan is 2.5-3 inches (7-8 cm).

Habitat.- It is very common at some times of the year in open, sunny places where it sips nectar from a variety of flowers.

Distribution.- Widespread through the warmer parts of the Americas. TL.- "America".

Localities on St. John.- To be found in most any sunny area with flowering plants.

THE ZEBRA

Heliconius charitonius

Fig. 44

H. charitonius (Linnaeus 1767), Riley 1975:85.

Identification.- The Zebra is very common on St. John. Its wings are rather narrow and span about 3 inches (7.5 cm). Body and wings are predominately black with bold yellow stripes, hence the name Zebra.

Habitat.- It is usually seen flitting along trails and in openings in the woodland or feeding on flowers in sunny places at the edge of the forest.

Distribution.- This species, with several subspecies, is found from southern United States through northern South America. TL.- Virgin Islands.

Localities on St. John.- Throughout the island in shaded places. It is pictured and discussed on a sign along the Cinnamon Bay Nature Trail.

GREAT SOUTHERN WHITE

Ascia monuste

A. monuste (Linnaeus 1764), Riley 1975:116.

Identification.- This is one of several white pierids in the Virgin Islands, which are rather variable and therefore difficult to identify precisely. The wings, about 2 inches (5 cm) across, are in males mostly white with narrow black borders. Females are a little larger and have yellowish wings with more black markings.

Habitat.- Usually seen around flowers or in damp places.

Distribution.- Widespread in the warmer parts of the Americas. TL.- Surinam.

Localities on St. John.- Seen singly here and there or in numbers on flowering shrubs or trees.

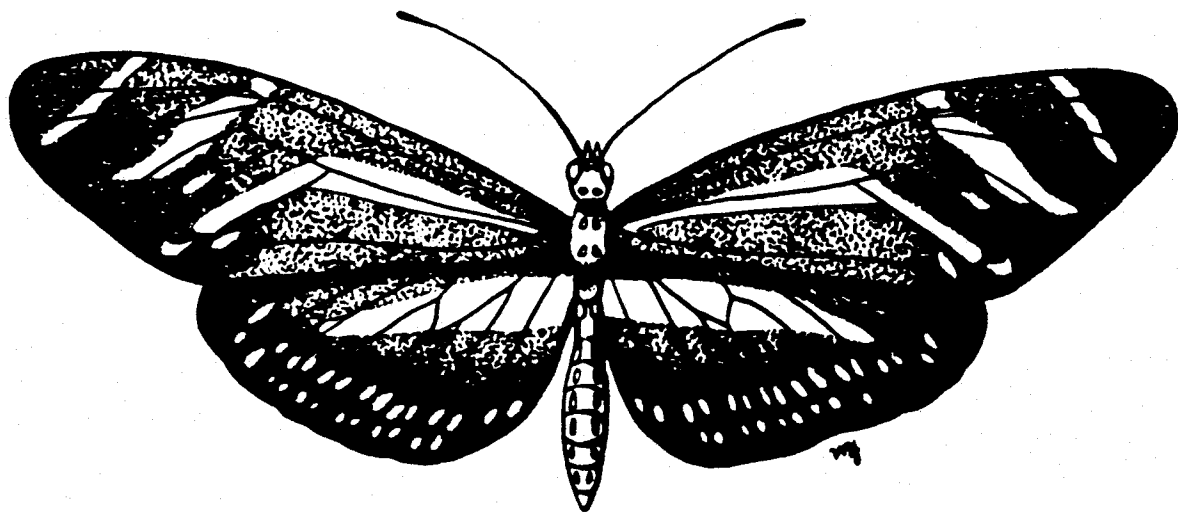


Fig. 44. Zebra butterfly, Heliconius charitonius
(wingspan - 3 inches)

POLYDAMUS SWALLOWTAIL

Battus polydamus

B. polydamus (Linnaeus 1758), Riley 1975:140.

Identification.- The Polydamus Swallowtail is a swallowtail without tails; its general form is similar to other swallowtails and the margins of the hindwings are scalloped, but the usual tails are absent. The wings are nearly black, with triangular yellowish spots near the margins. With a wingspan of up to 4 inches (10 cm), it is probably the largest butterfly on the island.

Habitat.- It is seen in open sunny places where it sips nectar from flowers.

Distribution.- The species as a whole ranges widely over the warmer parts of the Americas. There are many islands subspecies of which B. polydamus thymus occupies the Virgin Islands (TL.- St. Thomas).

Localities on St. John.- Not common, but seen in open fields or gardens.

LONG-TAIL SKIPPER

Urbanus proteus

U. proteus (Linnaeus 1758), Riley 1975:163.

Identification.- This is one of the Skippers, which differ from other butterflies in having stouter bodies and smaller wings and flight habits more like moths. The male Long-tail Skipper has a distinct long, curved tail on the hind wing, which is lacking in the female. Color is generally dark gray-brown and wingspan is 1.5-2 inches (4.5 cm).

Habitat.- They are most often seen flitting erratically (skipping) along shaded trails in the forest.

Distribution.- Widespread in the Americas. TL.- "America."

Localities on St. John.- Common at Lameshur Bay in January.

SYBARITIC BEAUTY

Composia sybaris

C. sybaris (Cramer 1777); see Covell 1984:59.

Identification.- This day-flying moth, with its white-spotted black wings, is unmistakable. It has a wingspan of 2-2.5 inches (5-6.5 cm) and looks much like a butterfly in flight.

Habitat.- It may be encountered during the day feeding on flowering shrubs in open areas.

Distribution.- Caribbean area. TL.- Jamaica.

Localities on St. John.- Throughout the island.

BLACK WITCH

Ascalapha odorata

A. odorata (Linnaeus 1758), Covell 1984:165, Hogue and Janzen, in Janzen 1983:687.

Identification.- The large size, dark wings, and erratic flight make the Black Witch easily identifiable. Wingspan of 5-6 inches (12-15 cm) makes this the largest lepidopteran on the island. Though it is a moth, it is often seen flying during the daytime. At first sight it may be mistaken for a bird or bat as it flits swiftly this way and that.

Habitat.- It inhabits the forest and is encountered along trails and in openings.

Distribution.- Throughout tropical America.

Localities on St. John.- Probably in any forested area.

WASP MOTH

Horama pretus

H. pretus (Cramer 1777); see Covell 1984:77.

Identification.- This little day-flying moth is a good mimic of Polistes wasps (Jack Spaniards). Its long, narrow wings, long legs, body coloration, and manner of flight are all wasp-like. Wing span is about 1.5 inches (3.5 cm).

Habitat.- May be found in bright sunlight, mating and feeding on flowering shrubs and trees. (January).

Distribution.- Caribbean area. TL.- Venezuela.

Localities on St. John.- Annaberg, Coral Bay, Europa Bay.

HALF-BLIND SPHINX

Perigonia lusca

P. lusca (Fabricius 1777), Covell 1984:39.

Identification.- Sphinx or hawk moths are mainly active at night and so are not as conspicuous as those mentioned above. However, they are often attracted to lights and may be found resting nearby on screens or walls. These moths have heavy streamlined bodies and narrow, pointed wings. Because of the high ratio of body weight to wing surface, the wings must move rapidly to keep the moth airborne, and they fly very fast. The Half-Blind Sphinx has a wing span of about 2.5 inches (60 mm); the color is mainly brown with darker patches on the forewing, and yellowish orange patches on the hindwing.

Habitat.- They fly widely through wooded areas, but will be observed mainly around lights.

Distribution.- Tropical America.

Localities on St. John.- May be encountered almost anywhere.

HOUSE MOSQUITO

Culex quinquefasciatus

C. quinquefasciatus Say 1823, Bland 1978:330.

Identification.- Nearly everyone is familiar with mosquitoes as biting pests. The adults, which are usually examined only in a mangled condition, are dainty two-winged insects with slender body, long legs, and a long proboscis (piercing-sucking mouthparts). The wings are clear and span about 1/3 inch (8 mm). In spite of their apparent delicacy, mosquitoes move their wings rapidly, producing a characteristic high-pitched whine.

Habitat.- It is only the female mosquito which bites humans (and other animals) to obtain blood, required for egg production; the male feeds only on nectar and other plant juices. Because the eggs are laid and the larvae and pupae live in shallow, quiet bodies of water, adult mosquitoes are usually found relatively close to water. House mosquitoes breed in the water collected in artificial containers (cans, jars, pots, bird baths, pools, etc.) around human habitations, which they also enter. They are usually active at night, but some may be present during the day in shaded places.

Distribution.- Southern U.S. and the Caribbean and Gulf areas.

Localities on St. John.- Throughout the island.

Note.- When biting, the mosquito injects saliva to prevent clotting of the blood; this saliva then reacts with the animal's tissues to cause inflammation and itching. Some mosquitoes may inject germs and parasites along with the saliva, thus serving to transmit diseases to the animals bitten (e.g. dengue fever and malaria).

SAND FLY

Culicoides furens

C. furens (Poey); see Bland 1978:331.

Identification.- Sandflies are more often felt than seen. Like mosquitoes, they bite and suck the blood of animals, including humans; but unlike mosquitoes, they are very small, with a body length of only about 1/16 inch (1.5 mm). Because of their tiny size and the fact that they are active in dark or shaded locations, they are not usually seen until they bite; hence another name for them, "no-see-ums."

Habitat.- Sandflies live and breed in moist debris around ponds and swampy places. As they are not very strong fliers, they do not fly themselves very far from these habitats. However, the wind may carry them for several hundred yards away from their favored haunts.

Distribution.- Caribbean area.

Localities on St. John.- Around wet lowlands at all times; more widespread in wet weather.

Note.- Sandfly bites are often painful and the subsequent reaction may be severe. The site of the bite usually swells, accompanied by intense itching, and an infected blister may form.

HOUSE FLY

Musca domestica

M. domestica Linnaeus, Bland 1978:350.

Identification.- The common house fly is a familiar human guest in most parts of the world. It is a medium sized, two-winged insect, with a dark body and clear wings. It is about 1/3 inch (8 mm) in length. It has a proboscis (mouthparts) designed for lapping up fluids, and it cannot bite.

Habitat.- The housefly lives around garbage and animal excrement, where it lays its eggs and the larvae (maggots) feed and grow. It is, therefore, very common around human habitations, especially where sanitation is lax.

Distribution.- Cosmopolitan.

Localities on St. John.- Anywhere around humans and large animals.

Note.- Though the housefly does not bite, it may transfer disease germs from garbage and sewage to food.

DOG FLEA

Ctenocephalides canis

C. canis (Curtis), Bland 1978:358.

Identification.- Fleas are probably well known to everyone who has a dog or cat as a pet. Dog fleas, and the closely related cat flea (Ctenocephalides felis), are small, wingless, ectoparasitic insects. They are strongly flattened from side to side and are provided with backward-projecting bristles and spines, both of which allow them to move about freely among the hairs of the host and yet not be dislodged easily. They have piercing-sucking mouthparts, which allow them to feed on the blood of their hosts. Fleas have long, strong legs and are great jumpers; a flea only 1/12 inch (2 mm) long may easily jump over a foot (300 mm). Most fleas are tan or brown in color.

Habitat.- Adult fleas, as described above, live on the bodies of their hosts, which are usually dogs or cats, but may be humans as well. They hide among the fur (or clothing) and periodically bite the host to obtain a meal of blood. The bites may be very irritating to the host, and sometimes diseases are transmitted by fleas. Larval fleas do not usually live on the host animal, but rather in the nest or bedding, where they feed on various kinds of organic debris. When they grow to the adult stage, they jump onto an appropriate host animal as it passes by.

Distribution.- Worldwide, where suitable hosts exist.

Localities on St. John.- Probably on most dogs and cats, and in many houses.

ANTS

Ants in general are relatively easy to identify. The forms usually seen (workers) are wingless, the body is rather slim, and the legs are long; the pedicel, or narrow waist which joins the thorax and abdomen, is unique in ants in that it consists of one or two segments which bear prominent upright projections. Queens and males do have wings, but they are seen only occasionally, when mating occurs.

On St. John there are more than 30 species of ants (Pressick and Herbst 1973), which are quite varied in form and habits and can be found in every terrestrial habitat. They range in size from less than 1/10 inch to almost 1/2 inch (2-10 mm); color ranges from light yellow to black; most live in our houses; some are predaceous, some eat plants, and others are scavengers; some are aggressive and bite or sting fiercely, while others are retiring and inoffensive.

CARPENTER BEE

Xylocopa mordax

X. mordax Smith 1874; see Frankie and Daly, in Janzen 1983:777.

Identification.- Reminiscent of a bumble bee but larger, darker, and less furry (more shiny). Body length 1 inch or more (25-30 mm).

Habitat.- The nests are excavated in dead wood by the female, which forages widely for nectar and pollen.

Distribution.- West Indies. TL.- Dominican Republic.

Localities on St. John.- Throughout the island.

ACKNOWLEDGMENTS

I owe a great debt of gratitude to the personnel of the Virgin Islands National Park for much aid and many kindnesses over the years. Special thanks for special favors go to Superintendents W. Webb and N. Pachta, to Research Biologists R. Brander and C. Rogers, and to J. Riddle, E. Small, R. Jones, and P. Mortensen. For snug accommodations on St. John I am indebted to R. and B. Butler formerly of Coral Bay and to R. Norton and M. and K. Canoy at the Virgin Islands Ecological Research Station. For help with the identifications of the animals collected I depended on many taxonomists, whose names and affiliations are listed in Appendix II. W. Knausenberger of the University of the Virgin Islands and P.A. Godwin of the United States Forest Service offered valuable suggestions concerning the content and organization of the work. I am especially grateful to W. Jackelow for making most of the illustrations, and to J. Carlson, E. White and C. Dishaw for typing and arranging the manuscript. This project was supported in part by grants from the National Science Foundation, the Office of Naval Research, and the National Park Service, in addition to continuing aid from the Department of Biology, University of Rochester.

LITERATURE CITED

- Barnes, R.D. 1980. Invertebrate zoology, 4th ed. Saunders College, Philadelphia. 1089 pp.
- Bland, R.G. and H.E. Jaques. 1978. How to know the insects, 3rd ed. Wm. C. Brown Co., Dubuque, IA. 409 pp.
- Bousfield, E.L. 1973. Shallow-water gammaridean Amphipoda of New England. Cornell Univ. Press, Ithaca, NY. 312 pp.
- Bousfield, E.L. 1982. The amphipod superfamily Talitroidea in the northeastern Pacific region. I. Family Talitridae: systematics and distributional ecology. Natl. Mus. Nat. Sci., Ottawa, Publ. Biol. Oceanogr., 11:1-73.
- Bousfield, E.L. 1984. Recent advances in the systematics and biogeography of landhoppers (Amphipoda: Talitridae) of the Indo-Pacific region. In: Biogeography of the tropical Pacific, ed., F.J. Radovsky, et al.:171-210.
- Bryant, E.B. 1942. Notes on the spiders of the Virgin Islands. Bull. Mus. Comp. Zool, Harvard, 89:317-363.
- Burch, J.B. 1962. How to know the eastern land snails. Wm. C. Brown Co., Dubuque, IA. 214 pp.
- Chace, F.A., Jr. and H.H. Hobbs, Jr. 1969. The freshwater and terrestrial decapod crustaceans of the West Indies with special reference to Dominica. Bull. U.S. Nat. Mus., 292:1-243.
- Chamberlin, R.V. and R.L. Hoffman. 1958. Checklist of the millipeds of North America. Bull. U.S. Nat. Mus., 212:1-236.
- Condé, B. 1984. Palpigrades (Arachnida) d'Europe, des Antilles, du Paraguay et de Thaïlande. Rev. Suisse Zool, 91:369-391.
- Covell, C.V., Jr. 1984. A field guide to the moths of eastern North America. Houghton Mifflin Co., Boston. 496 pp.
- Crabill, R.E. 1960. Centipedes of the Smithsonian-Bredin Expeditions to the West Indies. Proc. U.S. Nat. Mus., 111:167-195
- Francke, O.F. and W.D. Sissom. 1980. Scorpions from the Virgin Islands. Occ. Pap. Mus. Texas Tech Univ., 65:1-19.
- Goodnight, C.J. and M.L. Goodnight. 1942. Phalangids from Central America and the West Indies. Amer. Mus. Novitates, 1184:1-23.
- Humfrey, M. 1975. Sea shells of the West Indies. Taplinger Publ. Co., New York. 351 pp.

- Hurd, P.D., Jr. 1978. An annotated catalog of the carpenter bees (genus Xylocopa Latreille) of the Western Hemisphere (Hymenoptera: Anthophoridae). Smithsonian Institution Press, Washington, DC. 106 pp.
- Ivie, M.A. 1985. Nomenclatorial notes on West Indian Elaphidiini (Coleoptera: Cerambycidae). Pan-Pacific Entomol., 61:303-314.
- Jadan, D. 1985. A guide to the natural history of St. John. E.S.P. Inc., Cruz Bay, St. John, VI. 71 pp.
- Jadan, I. and D. Jadan. 1974. The adventures of Ivan Environman. E.S.P. Inc., Cruz Bay, St. John, VI. 109 pp.
- Janzen, D.H., ed. 1983. Costa Rican Natural History. Univ. of Chicago Press, Chicago. 816 pp.
- Kaston, B.J. 1978. How to know the spiders, 3rd ed. Wm. C. Brown Co., Dubuque, IA. 272 pp.
- Lazell, J.D., Jr. 1983. Rediscovery of the palm snail, Hemitrochus nemoralinus intensus Pilsbury (Cepolinae). Nautilus, 97:91-92.
- Levi, H.W. and L.R. Levi. 1968. Spiders and their kin, A Golden Guide. Golden Press, New York. 160 pp.
- Loomis, H.F. 1934. Millipeds of the West Indies and Guiana collected by the Allison V. Armour Expedition in 1932. Smithson. Misc. Coll., 89(14):1-69.
- Loomis, H.F. 1970. Millipeds of St. John, U.S. Virgin Islands, and a new species from Puerto Rico. Florida Entomol., 53:129-134.
- MacLean, W.P. 1982. Reptiles and amphibians of the Virgin Islands, Macmillan Caribbean, London. 54 pp.
- McDaniel, B. 1979. How to know the mites and ticks. Wm. C. Brown Co., Dubuque, IA. 335 pp.
- Milne, L. and M. Milne. 1980. The Audubon Society field guide to North American insects and spiders. Alfred A. Knopf Inc., New York. 989 pp.
- Miskimen, G.W. and R.M. Bond. 1970. The insect fauna of St. Croix, United States Virgin Islands. New York Acad. Sci. Scientific Survey of Puerto Rico and the Virgin Islands, 13(1):1-114.
- Muchmore, W.B. 1976. Pseudoscorpions from Florida and the Caribbean area. 6. Caribchthonius, a new genus with species from St. John and Belize (Chthoniidae). Florida Entomol., 59:361-367.
- Muchmore, W.B. 1979a. Pseudoscorpions from Florida and the Caribbean area. 8. A new species of Bituberochernes from the Virgin Islands (Chernetidae). Florida Entomol., 62:313-316.

- Muchmore, W.B. 1979b. Pseudoscorpions from Florida and the Caribbean area. 9. Typhloroncus, a new genus from the Virgin Islands (Ideoroncidae). Florida Entomol., 62:317-320.
- Muchmore, W.B. 1981. Pseudoscorpions from Florida and the Caribbean area. 11. A new Parachelifer from the Virgin Islands (Cheliferidae). Florida Entomol., 64:189-191.
- Muma, M.H. and M.L. Nazario. 1971. New solpugids (Arachnida: Solpugida) from Puerto Rico. J. Agri. Univ. Puerto Rico, 55:506-512.
- Ogren, R.E. 1981. Land planarians in Pennsylvania. Proc. Pennsylvania Acad. Sci., 55:52-56.
- Peck, S.B. 1975. A review of the New World Onychophora with the description of a new cavernicolous genus and species from Jamaica. Psyche, 82:341-358.
- Philibosian, R. and J.A. Yntema. Annotated checklist of the birds, mammals, reptiles, and amphibians of the Virgin Islands and Puerto Rico. Information Services, St. Croix, VI. 48 pp.
- Pressick, M.L. and E. Herbst. 1973. Distribution of ants on St. John, Virgin Islands. Carib. J. Sci., 13:187-197.
- Quintero, D. 1981. The amblypygid genus Phrynus in the Americas (Amblypygi, Phrynidae). J. Arachnol., 9:117-166.
- Raffaele, H.A. 1983. A guide to the birds of Puerto Rico and the Virgin Islands. Fondo Educative Interamericano, San Juan, PR. 255 pp.
- Reid, C.F. 1941. Bibliography of the Virgin Islands of the United States. H.W. Wilson C., New York. 225 pp. (Zoology, p. 181-194).
- Riley, N.D. 1975. A field guide to the butterflies of the West Indies. Collins, London. 224 pp.
- Rowland, J.M. and J.R. Reddell. 1980. The order Schizomida (Arachnida) in the New World. III. mexicanus and pecki groups (Schizomidae: Schizomus). J. Arachnol., 8:1-34.
- Savory, T.H. 1968. Hidden lives. Sci. Amer., 219(1):108-114.
- Silhavy, V. 1973. Two new systematic groups of gonyleptomorphid phalangids from the Antillean-Caribbean region, Agoristenidae fam. n. and Caribbiantinae subfam. n. (Arachn.: Opilionidea). Vest. Ceskoslov. Spol. Zool, 37:110-143.
- Stahnke, H.L. 1970. Centruroides dammanni, sp.n., a new Virgin Island buthid scorpion. J. Arizona Acad. Sci., 6:51-55.
- Terry-Purdy, M. 1984. Island Insects, Handbook for Insect Study. Cooperative Extension Service, C.V.I., St. Croix, VI. 49 pp.

APPENDIX I. GLOSSARY

Some technical terms and words with special biological meanings are included here. Certain words have different meanings in different contexts; in those cases the definition here is limited to use of the word in this work.

Abdomen - the posterior, often elongated, region of the body behind the thorax in arthropods; also called "opisthosoma" in arachnids.

Adult - a fully mature animal.

Antenna - one of the paired, movable, sensory appendages at the front of the head of certain arthropods. Also called "feeler."

Appendage - a limb; may be used for support and locomotion (as a leg), or may be modified for other purposes such as receiving sensations (antennae), food gathering and processing (jaws, chelicera), respiration (gills), etc.

Aquatic - living wholly or chiefly in water.

Cephalothorax - the united head and thorax of arachnids and many crustaceans; also called "prosoma" in arachnids.

Cercus - a simple or jointed appendage at the posterior end of many insects.

Chela - a pincerlike organ or claw born by certain of the appendages of arthropods.

Chelate - provided with a chela or claw.

Chelicera - one of the anterior pair of appendages of an arachnid, generally used in food gathering and feeding.

Circa (ca.) - about, around, approximately.

Dorsal - of or relating to the back of an animal; opposed to ventral.

Dorsum - the dorsal surface of an animal.

Habitat - the place where a plant or animal naturally lives.

Head - the anterior division of the body of an animal, bearing the major sense organs and the mouth and mouthparts.

Indigenous - native; originating or occurring naturally in a particular geographic region.

Larva - an early stage of an animal that at hatching or birth is fundamentally unlike the parent and must undergo more or less of a metamorphosis before acquiring the features of the adult.

Nocturnal - active at night.

Nymph - an early stage of insects which generally resembles the adult except in size and the development of wings and reproductive organs.

Opisthosoma - the posterior division of the body of arachnids; also call "abdomen."

Pedipalp (palp) - one of the second pair of appendages of arachnids; variously developed for different functions in the several orders.

Prosoma - the anterior region of the body of arachnids; also called "cephalothorax."

Segmentation - the division of the body of an animal into more or less similar parts (segments) arranged in a linear series along the anteroposterior axis.

Synonymy - a list of all the names (synonyms) which have been applied to a species, together with bibliographic references to those names.

Telson - the terminal (posterior) segment of the body of an arthropod.

Teneral - referring to the state of an arthropod immediately after molting, when it is soft and pale in color.

Tentacle - an elongate, flexible process, sometimes bearing eyes, on the head of a mollusk (e.g. snail).

Terrestrial - living on the land.

Thorax - the middle one of the three main divisions of the body of an insect, commonly bearing three pairs of legs and two pairs of wings; the corresponding part of the body of a crustacean or arachnid, usually fused with the head to form a cephalothorax.

Type locality (TL) - the geographical place of capture or collection of the first identified individual of a species of plant or animal.

Ventral - of or relating to the belly of an animal; opposed to dorsal.

APPENDIX II. SPECIALISTS FOR IDENTIFICATION

- | | |
|---|----------------------------------|
| E.L. Bousfield
National Museum of Natural Science
Ottawa, CANADA | - amphipods |
| W.J. Clench
Dorchester, MA | - snails |
| B. Condé
University of Nancy, FRANCE | - palpigradid and
millipedes |
| J.E. Deisler
Corpus Christi Museum
Corpus Christi, TX | - snails |
| G.B. Edwards
Florida State Collection of Arthropods
Gainesville, FL | - spiders |
| O.F. Francke
Texas Tech University
Lubbock, TX | - scorpions |
| C.J. & M.L. Goodnight
Western Michigan University
Kalamazoo, MI | - harvestmen |
| H.H. Hobbs, Jr.
National Museum of Natural History
Washington, DC | - decapod crustaceans |
| R.L. Hoffman
Radford University
Radford, VA | - millipedes |
| M.A. Ivie
Montana State University
Bozeman, MT | - insects |
| J.G.E. Lewis
Taunton School, ENGLAND | - scolopendromorph
centipedes |
| E.A. Malek
Tulane University Medical Center
New Orleans, LA | - freshwater snails |
| A. Minelli
University of Padova, ITALY | - geophilomorph
centipedes |
| M.H. Muma
Portal, AZ | - solpugids |
| R.E. Ogren
Wilkes College
Wilkes-Barre, PA | - land planarian |

- D. Quintero
University of Panama, PANAMA - amblypygids
- J.R. Reddell
Texas Memorial Museum
Austin, TX - schizomids
- H. Ruhberg
University of Hamburg, W. GERMANY - onychophora
- U. Scheller
Lundsberg, SWEDEN - symphyla and
pauropods
- G.A. Schultz
Hampton, NJ - woodlice
- S.L. Sissom
Southwest Texas State University
San Marcos, TX - clam shrimp
- F.G. Thompson
Florida State Museum
Gainesville, FL - snails
- C.M. Tibbetts
University of California
Berkeley, CA - amblypygids
- M. Würmli
Tutzing, W. GERMANY - scutigeromorph
centipedes

APPENDIX III. FRESHWATER INVERTEBRATES ON ST. JOHN

Incidental to the study of the terrestrial invertebrates, a few freshwater invertebrates were collected in some of the streams and pools on St. John. Those identified are listed here to serve as a base for future studies of this little known fauna.

PHYLUM MOLLUSCA
CLASS GASTROPODA

Subclass Prosobranchia

Family Thiariidae

Thiara tuberculata (Muller 1774)

pools in Fish Bay Gut (lower)

Family Hydrobiidae

Pyrgophorus parvulus (Guilding 1828)

pools in Fish Bay Gut (upper) and Great Lameshur Bay Gut

Subclass Pulmonata

Family Physidae

Physa marmorata (Guilding 1828)

Petroglyph pools in Living Gut

Family Planorbidae

Drepanotrema lucidum (Pfeiffer 1839)

pools in Great Lameshur Bay Gut

Family Ancyliidae

Ferrissia irrorata (Guilding 1828)

pools in Fish Bay Gut (upper)

PHYLUM ARTHROPODA
CLASS CRUSTACEA

Subclass Branchiopoda

Order Conchostraca

Family Limnadiidae

Eulimnadia diversa (Mattox 1937)

temporary pond at Great Lameshur Bay

Subclass Malacostraca

Order Decapoda

Suborder Natantia

Family Palaemonidae

Macrobrachium carcinus (Linnaeus 1758)Macrobrachium heterochirus (Wiegmann 1836)

Petroglyph pools in Living Gut and pools in Fish Bay Gut.

CLASS INSECTA

Subclass Pterygota

Order Odonata

Family Libellulidae

naiads of dragonflies

pools in various guts

Order Hemiptera

Family Gerridae

water striders

pools in various guts

Family Corixidae

water boatmen

pools in various guts

Order Coleoptera

4-5 species of water beetles

pools in various guts

APPENDIX IV. SPECIES DESCRIBED FROM ST. JOHN
(i.e. type locality is St. John)

Arthropoda

Crustacea

Isopoda

Rhyscotus turgifrons Budde-Lund 1885

Arachnida

Scorpionida

Centruroides dammanni Stahnke 1970

Heteronebo yntemai Franke and Sissom 1980

Pseudoscorpionida

Caribchthonius butleri Muchmore 1976

Bituberochernes jonensis Muchmore 1979

Typhloroncus coralensis Muchmore 1979

Parachelifer parvus Muchmore 1981

Opilionida

Martibianta virginsulana Silhavy 1973

Araneida

Argyroides quasiobtusus Exline and Levi 1962

Otiiothops pentucus Chickering 1967

Miagrammopes pinopus Chickering 1968

Scaphiella kalunda Chickering 1968

Zimiromus muchmorei Platnick and Shadab 1976

Microsa chickeringi Platnick and Shadab 1977

Monoblemma muchmorei Shear 1978

Anapisona bordeaux Platnick and Shadab 1979

Palpigradida

Eukoeningenia berlesei virginea Condé 1984

Diplopoda

Siphonophora albiceps Loomis 1970

Poratioides virginalis Loomis 1970

Insecta

Coleoptera

Decuanellus buclavatus Howden 1983

Diptera

Tephritis floccosa Curran 1928

Clunio virginianus Paggi 1985

APPENDIX V. REFERENCES TO TERRESTRIAL INVERTEBRATES ON ST. JOHN.

These references specifically mention the occurrence of certain terrestrial invertebrates on the island of St. John.

- Archer, A.F. 1963. Aranas tejedoras de las Islas Virgenes. Carib. J. Sci., 3:207-208.
- Barber, H.G. 1939. Insects of Porto Rico and the Virgin Islands. Hemiptera - Heteroptera (excepting the Miridae and Corixidae). New York Acad. Sci. Scientific Survey of Porto Rico and the Virgin Islands, 14(3):263-441.
- Beal, R.S. 1985. Two new species of Cryptorhopalum (Coleoptera: Dermestidae) from the Virgin Islands. Entomol. News, 96:19-23.
- Blackwelder, R. 1944-1957. A checklist of the coleopterous insects of Mexico, the West Indies, and South America. Parts 1-6. Bull. U.S. Nat. Mus. 185(1-6):1-1492.
- Bland, T. 1854. Note on the geographical distribution of the terrestrial molluscs which inhabit the island of St. Thomas, W.I. Ann. Lyceum Nat. Hist. N.Y., 6:74-75.
- Budde-Lund, G. 1885. Crustacea Isopoda Terrestria per familias et genera et species descripta. Haunia. 319 pp.
- Chace, F.A., Jr. and H.H. Hobbs, Jr. 1969. The freshwater and terrestrial decapod crustaceans of the West Indies with special reference to Dominica. Bull. U.S. Nat. Mus., 292:1-243.
- Chickering, A.M. 1967. The genus Nops (Araneae, Caponiidae) in Panama and the West Indies. Breviora, 274:1-19.
- Chickering, A.M. 1967. Two new species of the genus Otiothops (Araneae, Palpimanidae) from the Virgin Islands. Psyche, 74:203-207.
- Chickering, A.M. 1968. The genus Miagrammopes (Araneae, Uloboridae) in Panama and the West Indies. Breviora, 289:1-28.
- Chickering, A.M. 1968. The genus Ischnothyreus (Araneae, Oonopidae) in Central America and the West Indies. Psyche, 75:77-86.
- Chickering, A.M. 1968. The genus Scaphiella (Araneae, Oonopidae) in Central America and the West Indies. Psyche, 75:135-156.
- Chickering, A.M. 1969. The genus Stenoonops (Araneae, Oonopidae) in Panama and the West Indies. Breviora, 339:1-35.
- Chickering, A.M. 1971. The genus Oonops (Araneae, Oonopidae) in Panama and the West Indies. Part 2. Psyche, 78:203-214.

- Chickering, A.M. 1973. Notes on Heteroonops and Triaeris (Araneae, Oonopidae). *Psyche*, 80:227-229.
- Comstock, W.P. 1944. Insects of Porto Rico and the Virgin Islands. Rhopalocera or butterflies. *New York Acad. Sci. Scientific Survey of Porto Rico and the Virgin Islands*, 12(4):421-622.
- Condé, B. 1984. Palpigrades (Arachnida) d'Europe, des Antilles, du Paraguay et de Thaïlande. *Rev. Suisse Zool.*, 91:369-391.
- Curran, C.H. 1928. Insects of Porto Rico and the Virgin Islands. Diptera or two-winged flies. *New York Acad. Sci. Scientific Survey of Porto Rico and the Virgin Islands*, 11(1):1-118.
- Curry, L.L. 1974. The midge fauna (Diptera: Chironomidae) of the U.S. and British Virgin Islands; the genera Goeldichironomus and Siolimya. *Entomol. Tidsk. Suppl.* 95:58-65.
- Curry, L.L. and M.C. Curry. 1971. The Chironomidae (Diptera) found in the U.S. Virgin Islands and Anegada, British Virgin Islands. *Canadian Entomol.*, 103:310-314.
- Curry, M.C. 1970. Entomological check list for Virgin Island Ecological Research Station and Virgin Island National Park Museum, St. John, U.S. Virgin Islands (mimeographed, 25 pp., VINP library).
- Exline, H. and H.W. Levi. 1962. American spiders of the genus Argyrodes (Araneae, Theridiidae). *Bull. Mus. Comp. Zool., Harvard*, 127:75-204.
- Forbes, W.J.M. 1930. Insects of Porto Rico and the Virgin Islands. Heterocera or moths (excepting the Noctuidae, Geometridae and Pyralididae). *New York Acad. Sci. Scientific Survey of Porto Rico and the Virgin Islands*, 12(1):1-171.
- Fox, I. 1946. A review of the species of biting midges or Culicoides from the Caribbean region (Diptera: Ceratopogonidae). *Ann. Entomol. Soc. Amer.*, 39:248-258.
- Francke, O.F. and W.D. Sissom. 1980. Scorpions from the Virgin Islands. *Occ. Pap. Mus. Texas Tech Univ.*, 65:1-19.
- Howden, A.T. 1983. Two new species of Decuanellus Osella from the Virgin Islands (Coleoptera: Curculionidae: Cossoninae). *Coleopt. Bull.*, 37:81-89.
- Ivie, M.A. 1983. The Cicendelidae (Coleoptera) of the Virgin Islands. *Florida Entomol.*, 66:191-199.
- Ivie, M.A. 1985. Nomenclatorial notes on West Indian Elaphidiini (Coleoptera: Cerambycidae). *Pan-Pacific Entomol.*, 61:303-314.
- Ivie, M.A. and R.S. Miller. 1984. Buprestidae (Coleoptera) of the Virgin Islands. *Florida Entomol.*, 67:288-300.

- Ivie, M.A. and D.A. Nickle. 1986. Virgin Islands records of the change, Scapteriscus didactylus (Orthoptera: Gryllotalpidae). Florida Entomol., 69:760-761.
- Jadan, D. 1978. A child's eye view of the Virgin Islands. St. Thomas Graphics, St. Thomas, VI. 30 pp.
- Jadan, D. 1985. A guide to the natural history of St. John. E.S.P. Inc., Cruz Bay, St. John, VI. 71 pp.
- Jadan, I. and D. Jadan. 1974. The adventures of Ivan Environman. E.S.P. Inc., Cruz Bay, St. John, VI. 109 pp.
- Klots, E.B. 1932. Insects of Porto Rico and the Virgin Islands. Odonata or dragon flies. New York Acad. Sci. Scientific Survey of Porto Rico and the Virgin Islands, 14(1):1-107.
- Lehtinen, P.T. 1981. Spiders of the Oriental-Australian region. III. Tetrablemmidae, with a world revision. Acta Zool. Fennica, 162:1-151.
- Levi, H.W. and L.R. Levi. 1970. Spiders collected in the Virgin Islands, March 1970 (mimeographed, 2 pp., VINP library).
- Levins, R., M.L. Pressick and H. Heatwole. 1973. Coexistence patterns in insular ants. Amer. Sci., 61:463-474.
- Loomis, H.F. 1970. Millipeds of St. John, U.S. Virgin Islands, and a new species from Puerto Rico. Florida Entomol, 53:129-134.
- Miller, A.C. 1971. Observations on the Chironomidae (Diptera) inhabiting the leaf axils of two species of Bromeliaceae on St. John, U.S. Virgin Islands. Canadian Entomol., 103:391-396.
- Muchmore, W.B. 1976. Pseudoscorpions from Florida and the Caribbean area. 6. Caribchthonius, a new genus with species from St. John and Belize (Chthoniidae). Florida Entomol., 59:361-367.
- Muchmore, W.B. 1979a. Pseudoscorpions from Florida and the Caribbean area. 8. A new species of Bituberochernes from the Virgin Islands (Chernetidae). Florida Entomol, 62:313-316.
- Muchmore, W.B. 1979b. Pseudoscorpions from Florida and the Caribbean area. 9. Typhloroncus, a new genus from the Virgin Islands (Ideoroncidae). Florida Entomol., 62:317-320.
- Muchmore, W.B. 1981. Pseudoscorpions from Florida and the Caribbean area. 11. A new Parachelifer from the Virgin Islands (Cheliferidae). Florida Entomol., 64:189-191.
- Opell, B.D. 1987. Changes in web-monitoring forces associated with web reduction in the spider family Uloboridae. Canad. J. Zool., 65:1028-1034.

- Osborn, H. 1935. Insects of Porto Rico and the Virgin Islands. Homoptera (exclusive of Sternorhynchi). New York Acad. Sci. Scientific Survey of Porto Rico and the Virgin Islands, 14(2):111-260.
- Paggi, A.C. 1985. Two new species of the genus Clunio (Diptera: Chironomidae). Proc. Entomol. Soc. Washington, 87:460-466.
- Paulian, R. and H.F. Howden. 1982. Un nouveau genre de Ceratocanthides des Antilles [Col. Scarabaeoidea]. Bull. Soc. Entomol. France, 87:78-85.
- Peck, S.B. 1975. A review of the New World Onychophora with the description of a new cavernicolous genus and species from Jamaica. Psyche, 82:341-358.
- Petrunkévitch, A. 1926. Spiders from the Virgin Islands. Trans. Conn. Acad. Arts Sci., 28:21-78.
- Platnick, N.I. 1975. A revision of the palpimanid spiders of the new subfamily Otiiothopinae (Araneae, Palpimanidae). Amer. Mus. Novitates, 2562:1-32.
- Platnick, N.I. 1978. A new Microsa from the Bahama Islands (Araneae, Gnaphosidae). J. Arachnol., 5:182-183.
- Platnick, N.I. and M.V. Shadab. 1976. A revision of the neotropical spider genus Zimiromus, with notes on Echemus (Araneae, Gnaphosidae). Amer. Mus. Novitates, 2609:1-24.
- Platnick, N.I. and M.V. Shadab. 1977. A new genus of the spider subfamily Gnaphosinae from the Virgin Islands (Araneae, Gnaphosidae). J. Arachnol., 3:191-194.
- Platnick, N.I. and M.V. Shadab. 1979. A review of the spider genera Anapisona and Pseudanapis (Araneae, Anapidae). Amer. Mus. Novitates, 2672:1-20.
- Platnick, N.I. and M.V. Shadab. 1980. A revision of the spider genus Cesonia (Araneae, Gnaphosidae). Bull. Amer. Mus. Nat. Hist., 165:335-386.
- Platnick, N.I. and M.V. Shadab. 1982. A revision of the American spiders of the genus Camillina (Araneae, Gnaphosidae). Amer. Mus. Novitates, 2748:1-38.
- Pressick, M.L. and E. Herbst. 1973. distribution of ants on St. John, Virgin Islands. Carib. J. Sci., 13:187-197.
- Quintero, D. 1981. The amblypygid genus Phrynus in the Americas (Amblypygi, Phrynidae). J. Arachnol., 9:117-166.
- Reddell, J.R. and J.C. Cokendolpher. 1986. New species and records of Schizomus (Arachnida: Schizomida) from Mexico. Texas Mem. Mus. Speolol. Monogr., 1:31-38.

- Schaus, W. 1940. Insects of Porto Rico and the Virgin Islands. Moths of the family Noctuidae. New York Acad. Sci. Scientific Survey of Porto Rico and the Virgin Islands, 12(2):177-290.
- Schaus, W. 1940. Insects of Porto Rico and the Virgin Islands. Moths of the families Geometridae and Pyralididae. New York Acad. Sci. Scientific Survey of Porto Rico and the Virgin Islands, 12(3):291-417.
- Shear, W.A. 1978. Taxonomic notes on the armored spiders of the families Tetrablemmidae and Pacullidae. Amer. Mus. Novitates, 2650:1-46.
- Shuttleworth, R.J. 1858. Catalogue of the terrestrial and fluviatile shells of St. Thomas, West Indies. Ann. Lyceum Nat. Hist. N.Y., 6:68-73.
- Silhavy, V. 1973. Two new systematic groups of gonyleptomorphid phalangids from the Antillean-Caribbean region, Agoristenidae fam. n. and Caribbiantinae subfam. n. (Arachn.: Opilionidea). Vest. Ceskoslov. Spol. Zool, 37:110-143.
- Stahnke, H.L. 1970. Centruroides dammanni, sp. n. a new Virgin Island buthid scorpion. J. Arizona Acad. Sci., 6:51-55.
- Stahnke, H.L. and M. Calos. 1977. A key to the species of the genus Centruroides Marx (Scorpionida, Buthidae). Entomol. News, 88:111-120.
- Van Duzee, M.C. 1927. New Dolichopodidae from the West Indies. Amer. Mus. Novitates, 262:1-10.
- Van Name, W.G. 1936. The American land and fresh-water isopod Crustacea. Bull. Amer. Mus. Nat. Hist., 71:1-535.
- Walker, T.J. and M.D. Greenfield. 1983. Songs and systematics of Caribbean Neoconocephalus (Orthoptera: Tettigonidae). Trans. Amer. Entomol. Soc., 109:357-389.
- Walsingham, Lord. 1897. Revision of the West Indian Micro-Lepidoptera, with descriptions of new species. Proc. Zool. Soc. London 1897:54-182.
- Williams, N.S. 1982. Mallophaga from bananaquits, Coereba flaveola sanctithomae from the Virgin Islands. Carib. J. Sci., 18:27-28.

