

CLASS INSECTA

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This list is a compilation of the species of insects that may be expected to occur in maritime environments of South Carolina. Very few records of insect collections from the seacoast of South Carolina are available, but a considerable number of published studies have been made in North Carolina and Georgia. Therefore, this list is based mainly upon records from the two states whose coastlines adjoin the South Carolina coastline, the assumption being made that insect species that occur in North Carolina and/or Georgia will also be present in South Carolina. My own informal observations indicate that the coastal insect fauna of South Carolina is indeed very similar to that of North Carolina.

This list includes insects collected from the following environments:

1. Sea water, estuaries, tidal pools, and brackish streams and ponds.
2. Salt marshes of all types including particularly: (a) the intertidal Spartina alterniflora marsh, which is inundated at every high tide; (b) Salicornia-Spartina alterniflora marsh, which frequently appears as a zone in the vicinity of the high tide mark, where daily inundation is of brief duration; (c) Juncus roemerianus and Distichlis spicata marshes which are reached only by spring tides and storm tides; (d) Spartina patens, which is flooded only rarely (during storms or extraordinarily high tides); and (e) Panicum virgatum, which often appears in dense stands on the landward side of Juncus marsh, where freshwater drainage produces soil water of reduced salinity. Some other types of plants occupy special habitats, or are sometimes scattered among the dominant species of the salt marshes; for instance: Borrchia frutescens often grows plentifully along the high tide mark; Scirpus americanus and Mariscus jamaicense may form stands on the landward side of Juncus marsh; Iva frutescens may grow among S. patens and Juncus marshes; and Baccharis halimifolia often appears at the edge of the S. patens and Juncus marshes. For additional information on these and other species of salt marsh-inhabiting plants of the Carolinas, see Radford, Ahles, and Bell (1968).
3. Tidal flats, mud beaches, and intertidal rocks.
4. Sea beaches and coastal dunes, including the sometimes moist depressions between dunes.
5. The driftline, or band of jetsam, that may be more or less continuous along the high tide mark. The principal constituent of the driftline is usually straw (the dead stems of Spartina alterniflora and other species of salt marsh plants), but there are always many large solid objects, especially sticks, timbers, dead animals, and various plastic and metal objects that have washed ashore. Stranded seaweeds are sometimes plentiful after storms.
6. Maritime forest. (Little information is available on insects from this environment.)

The insects of typical non-maritime coastal plains environments, such as swamps, pine forests, rivers, and cultivated fields, are not included here. Virtually all of the usual kinds of coastal plains habitats may occur near the ocean, within the coastal zone of the state. However, a list that included all the insect species that have been collected in non-maritime coastal environments would reach formidable length, and its compilation would be a major undertaking.

Notations and Abbreviations

To conserve space, the several major types of salt marshes are indicated by the initials of the dominant species of plants, thus:

- SA = Spartina alterniflora
- SP = Spartina patens
- SAL-SA = Salicornia-Spartina alterniflora
- JR = Juncus roemerianus
- DS = Distichlis spicata
- PV = Panicum virgatum

When available, data on the seasonal presence of each species are given by inclusion of the months or range of months during which it has been collected. The months are designated by Roman numerals. Unless otherwise stated, the Roman numerals refer to months in which the imago stage of the species has been collected.

Specimens of many of the species in this list have been identified by specialists. Whenever this is the case, and the name of the authority is known, it is given, and follows the abbreviation "Det." which means "determined by".

Many of the species included here are hitherto unpublished records from my own research. Whenever this is the case, the reference will be (Davis Unp.).

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Subclass Apterygota

Order Collembola

Family Poduridae

Anurida maritima Guerin. Det. J. W. Folsom. Shackleford Banks, Carteret County, N. C., V (Pearse, 1936).

Family Isotomidae

Isotoma viridis Bourlet. Det. D. L. Wray. Abundant; collected on sticky plates, ground surface of salt marshes (SA, SP, JR, DS), Bogue Banks and Core Creek, Carteret County, N. C., VI to VIII (Davis, Unp.).

Isotomurus palustris Muller. Det. J. W. Folsom. Collected from surface of brackish stream above Morton's Mill Pond, Carteret County, N. C., V (Pearse, 1936).

Family Entomobryidae

Tomocerus flavescens Tullberg. Det. D. L. Wray. Collected on sticky plates, ground surface of revegetated spoilbank, Bogue Banks, Carteret County, N. C., VI to VIII (Davis, Unp.).

Orchesella ainsliei Folsom. Det. D. L. Wray. Collected on sticky plates, ground surface of salt marshes (SA, SP, DS), Bogue Banks and Core Creek, Carteret County, N. C., VI to VIII (Davis, Unp.).

Family Sminthuridae

Sminthurides aquatica var. levanderi (Reuter). Det. D. L. Wray. Abundant; vacuumed from surface of salt marshes (SA), Calico Creek and Dill Creek, Carteret County, N. C. VI through VIII (McMahan, 1972).

Bourletiella spinata MacGillivray. Det. J. W. Folsom. Collected from surface of brackish stream above Morton's Mill Pond, Carteret County, N. C. V (Pearse, 1936).

Sminthurus sp. Det. D. L. Wray. Abundant; collected on sticky plates, ground surface of salt marshes (SA, SP, JR, DS), Bogue Banks and Core Creek, Carteret County, N. C., VI to VIII (Davis, Unp.).

Subclass Exopterygota

Order Ephemera

Family Baetidae

Callibaetis sp. Det. J. R. Traver. Collected at Carteret Lodge Pond, Carteret County, N. C., VI (Pearse, 1936).

Caenis diminuta Walker. Det. J. R. Traver. Collected at ditch, Open Grounds, Carteret County, N.C., VI (Pearse, 1936).

Order Odonata

Suborder Anisoptera

Family Aeschnidae

Gomphaeschna furcillata Say. Det. P. P. Calvert. Collected at stream above Morton's Mill Pond, and at Open Grounds, Carteret County, N. C., VI and VII (Pearse, 1936).

Coryphaeschna ingens (Rambur). Det. P. P. Calvert. Carteret County, N. C. (Pearse, 1936).

Anax junius Drury. Det. P. P. Calvert. Collected at Mullet Pond, Shackleford Banks, Carteret County, N. C., VII. (Pearse, 1936). Imagoes occasionally observed over or near salt marshes in summer months, Carteret County, N. C. (Davis, Unp.).

Family Libellulidae

Somatochlora linearis Hagen. Det. P. P. Calvert. Collected at Eastman's Creek, Carteret County, N. C., VII (Pearse, 1936).

Celithemis eponina Drury. Det. P. P. Calvert. Collected at Carteret Lodge Pond, Carteret County, N. C., VI (Pearse, 1936).

Libellula auripennis Burmeister. Det. P. P. Calvert. Collected at Morton's Mill Pond and Calico Creek, Carteret County, N. C., VI and VII (Pearse, 1936).

Libellula incesta Hagen. Det. P. P. Calvert. Collected at Carteret Lodge Pond, Carteret County, N. C., VI (Pearse, 1936).

Libellula semifasciata Burmeister. Det. P. P. Calvert. Collected at Open Grounds and Carteret Lodge Pond, Carteret County, N. C., VI (Pearse, 1936).

Libellula vibrans Fabricius Det. P. P. Calvert. Collected at stream, Open Grounds, Carteret County, N. C., VII (Pearse, 1936).

Plathemis lydia Drury. Det. P. P. Calvert. Collected at Calico Creek, Carteret County, N. C., VI (Pearse, 1936).

Erythrodiplax berenice Drury. Det. P. P. Calvert. Collected at Mullet Pond, Morton's Mill Pond, and other brackish water habitats, Carteret County, N. C., VI and VII (Pearse, 1936). Imagoes are very common in salt marshes, especially JR, during summer months, Carteret County, N. C. (Davis and Gray, 1966). This species is restricted to coastal habitats, and has been collected in every Atlantic and Gulf coast state (Needham and Westfall, 1955).

Erythemis simplicicollis Say. Det. P. P. Calvert. Collected at Mullet Pond and Carteret Lodge Pond, Carteret County, N. C., IV and VI (Pearse, 1936). Imagoes are fairly common in salt marshes, especially JR, during summer months, Carteret County, N. C. (Davis, Unp.).

Pachydiplax longipennis Burmeister. Det. P. P. Calvert. Collected at Core Creek Canal, Mullet Pond, and other brackish to mesohaline habitats, Carteret County, N. C., IV through VII (Pearse, 1936). Imagoes are of common occurrence in salt marshes, especially JR, during summer months, Carteret County, N. C. (Davis, Unp.).

Tramea carolina Linnaeus. Imagoes occur occasionally in or near JR salt marshes, summer months, Carteret County, N. C. (Davis, Unp.).

Suborder Zygoptera

Family Calopterygidae

Calopteryx maculata (Beauvois). Det. P. P. Calvert. Collected at stream, Open Grounds, Carteret County, N. C., VII (Pearse, 1936).

Family Agrionidae (Coenagrionidae)

Argia fumipennis (Burmeister). Det. P. P. Calvert. Collected at ditch, Open Grounds, Carteret County, N. C., VI and VII (Pearse, 1936).

Enallagma durum Hagen. Imagoes occasionally collected by sweep-net from salt marsh vegetation (SA, SP), summer months, Carteret County, N. C. (Davis, Unp.).

Enallagma sp. collected at Mullet Pond and Carteret Lodge Pond, VI and VII; det. P. P. Calvert (Pearse, 1936).

Ischnura posita (Hagen). Det. P. P. Calvert. Collected at brackish stream and ditch, Carteret County, N. C., VII (Pearse, 1936).

Ischnura ramburi Selys. Det. P. P. Calvert. Collected at brackish streams, ponds, and ditch, Carteret County, N. C., IV, VI, and VII (Pearse, 1936).

Ischnura verticalis (Hagen). Det. P. P. Calvert. Collected at Open Grounds, brackish ditch, Carteret County, N. C., VI (Pearse, 1936).

Anomalagrion hastatum Say. Det. P. P. Calvert. Collected at brackish stream, ditch, and pond, Carteret County, N. C., VI, VII (Pearse, 1936). Imagoes occasionally collected by sweep-net from salt marsh grasses (SA, SP), summer months, Carteret County, N. C. (Davis, Unp.).

Order Dermaptera

Family Forficulidae

Anisolabis maritima (Géné). "Occurring...along the coast from Maine to Texas, and is seldom found far from salt water" (Blatchley, 1920). Found along the Atlantic coast under seashore debris (Helfer, 1963).

Euborellia annulipes (Lucas) (= Anisolabis annulipes). Commonly occurs in coastal areas, N. C. to Fl.; mostly found under litter and debris (Helfer, 1963).

Labidura riparia (Pallas). "Found under litter along sea beaches," N. C. and southwards (Helfer, 1963).

Order Orthoptera

Family Mantidae

Stagmomantis carolina (Johannson). Specimens collected by sweep-net from salt marsh vegetation, Carteret County, N. C., as follows: North River, JR, VIII; Core Creek, JR, VII; Harlowe Creek, DS, VIII; Lennoxville Point, SP, VII and VIII; and Bogue Banks, PV, VII (Davis, Unp.).

Brunneria borealis Scudder. Single specimens (adults and nymphs) frequently present in sweep-net collections from salt marsh vegetation, especially SA and SP but also DS and JR, VII to X, Carteret County, N. C. (Davis, Unp.).

Family Blattidae

Ischnoptera johnsoni Rehn. Collected by Rehn and Hebard (1916) from among dead leaves under live oak trees, St. Simon's Island, Ga.; also reported from Va.

Ischnoptera uhleriana fulvescens Saussure and Zehntner. Collected from under beach refuse. Fl., and from among dead leaves in liveoak forest, St. Simon's Island, Ga., by Rehn and Hebard (1916); this species was also collected by them in S. C.

Family Phasmidae

Manomera tenuescens (Scudder). Piver's Island, Carteret County, N. C. (Pearse, 1936).

Family Gryllidae

Cycloptilum antillarum (Redtenbacher). Det. A. B. Gurney. Fairly common in sweep-net collections from salt marsh vegetation, especially SP and JR, VI to X, Carteret County, N. C. (Davis and Gray, 1966). "In the main, a subarctic species;" occurs along the Atlantic coast from N. C. southwards (Blatchley, 1920).

Cycloptilum squamosum Scudder. Found along the Atlantic coast from Long Island southwards; often found under driftline material (jetsam, especially boards and straw) (Blatchley, 1920). Occurs in salt marsh grasses (Helfer, 1963). Collected from salt marsh, Carolina Beach, N. C. by B. B. Fulton (Brimley, 1938).

Anaxipha litarena Fulton. Det. A. B. Gurney. Collected occasionally by sweep-net from vegetation, JR and DS salt marshes, summer months, Carteret County, N. C. (Davis, Unp.).

Anaxipha scia Hebard. Det. A. B. Gurney. Collected frequently and often in substantial numbers by sweep-net from vegetation, JR salt marsh, VI to XI, Carteret County, N. C. Both nymphs and adults are common (Davis and Gray, 1966). Adults and nymphs frequently caught on sticky plates, ground surface, JR and DS salt marsh, Core Creek, Carteret County (Davis, Unp.).

Anaxipha exigua (Say). Occurs from New England to northern Fl. Found to be common on Iva frutescens on Staten Island, and collected from among Scirpus americanus in tidal marsh, Va.; lives in or near salt marshes, New England (Blatchley, 1920). Although not yet reported from Carolina salt marshes, it may be expected to occur in them.

Anaxipha pulicaria (Burmeister). Range is from N. C. southwards. Occurs "on the edges of the salt marshes" (Blatchley, 1920).

Oecanthus quadripunctatus Beutenmuller. Det. A. B. Gurney. Frequently obtained in sweep-net collections from vegetation, JR and SP salt marshes, V to X, Carteret County, N. C. (Davis and Gray, 1966).

Gryllus firmus Scudder. Det. A. B. Gurney. Rare; collected by sweep-net from salt marsh vegetation, Carteret County, N. C. (Davis, Unp.).

Nemobius sparsus Fulton. Det. A. B. Gurney. Collected frequently from vegetation, DS salt marshes, VI to X, Carteret County, N. C. This is the most conspicuous insect inhabitant of DS; individuals often hop along on the surface of the short dense grass. In its distribution, it seems almost limited to stands of DS (Davis and Gray, 1966).

Nemobius cubensis Saussure. Range is from N. Y. to Fl. "The general distribution is southern and subarctic...The natural home of this species is probably in or among the tall grasses of marshes and tidal flats" (Blatchley, 1920). Collected at Carolina Beach, N. C. by B. B. Fulton (Brimley, 1938).

Family Tettigidae

Neotettix femoratus (Scudder). Det. A. B. Gurney. Collected occasionally by sweep-net from vegetation, SP salt marshes, Carteret County, N. C. Collected fairly often on sticky plates, ground surface, SP marsh on Bogue Banks, Carteret County, summer months (Davis, Unp.).

Neotettix bolteri Hancock. Collected by Rehn and Hebard (1916) from "undergrowth on dunes and in bare spots on barrier beaches", Sullivan's Island, S. C.

Family Acrididae

Mermiria intertexta Scudder. Det. A. B. Gurney. Fairly common in SP, and occasionally observed among other types of high marsh vegetation, Carteret County, N. C., V to X (Davis and Gray, 1966). Collected on Isle of Palms, S. C. (Rehn and Hebard, 1916).

Mermiria bivittata (Serville). Det. A. B. Gurney. Occasionally collected in SP, PV, and other types of high marsh vegetation, summer and early fall, Carteret County, N. C. Less common than M. intertexta (Davis, Unp.).

Orphulella olivacea (Morse). Det. A. B. Gurney. Quite common in SAL-SA and DS salt marshes, Carteret County, N. C., V to IX. This is one of the most characteristic insect species of these two types of salt marsh. Nymphs are not readily distinguishable from nymphs of Clinoccephalus elegans (entry below), in the early instars (Davis and Gray, 1966). "A subarctic species...ranging along the ocean border of the coastwise states from Mass. to Corpus Christi, Tx." (Blatchley, 1920). Marples (1964) reports "Orphulella sp." to be a "rare visitor" to SA salt marsh, Sapelo Island, Ga. Collected from Isle of Palms, S. C. (Rehn and Hebard, 1916).

Orphulella pelidna (Burmeister). Found on Isle of Palms, S. C. "in the dry hollows of dunes among vegetation composed of bayberry, Myrica cerifera, scrubby oak, briars and cabbage palmetto..." (Rehn and Hebard, 1916).

- Clinocephalus elegans Morse. Det. A. B. Gurney. Quite common in DS, V to VIII; present, but less common in SP; Carteret County, N. C. This is one of the most characteristic insect species occurring in DS salt marsh (Davis and Gray, 1966). "A sub-maritime species...ranging from Long Island, N. Y. to Dickinson, Tx." (Blatchley, 1920). Blatchley quotes Henry Fox as stating that C. elegans prefers DS as a habitat, but also occurs in "extensive areas of Scirpus americanus and Spartina patens and much less frequently in the tall reed, Spartina cynosuroides." Collected by Rehn and Hebard (1916) in S. C. and Ga.
- Scirtetica marmorata (Harris). According to Blatchley (1920), this species occurs on sandy stretches just behind sea beaches, Atlantic and Gulf coast states. It has been reported from Southport and Wrightsville Beach, N. C. (Brimley, 1938).
- Fainidia fenestralis (Serville). Collected by Rehn and Hebard (1916) on Isle of Palms and Sullivan's Island, S. C., in "sandy situations".
- Trimerotropis maritima (Harris). Inhabits the beaches and higher sand dunes of the North Carolina seacoast (Metcalf, 1920). According to Rehn and Hebard (1916), this species occurs on the beaches and sand dunes of coastwise states from Va. to Fl. Blatchley (1920) says that it is a characteristic inhabitant of the seabeaches and dunes of the South Atlantic coast.
- Leptysma marginicollis (Serville). Det. A. N. Caudell. Collected in the vicinity of Mullet Pond, Shackleford Banks, Carteret County, N. C. (Pearse, 1936). Mullet Pond is a brackish body of water surrounded by sand dunes; it has a small marginal area of marsh (cattails, Scirpus, etc.).
- Schistocerca obscura (Fabricius). Det. A. B. Gurney. Occasionally collected or seen in PV and SP salt marshes, Carteret County, N. C., summer months (Davis, Unp.). Blatchley (1920) quotes Henry Fox as having found it in "the reedy areas of tidal marshes in Virginia." It occurs in all of the coastwise states from Delaware southwards.
- Schistocerca alutacea (Harris). Collected by Rehn and Hebard (1916) from "dune vegetation, i.e. bayberry, oak, briars and palmetto," Isle of Palms, S. C.
- Paroxya clavuliger (Serville). Det. A. B. Gurney. Occurs commonly in JR salt marshes, Carteret County, N. C., VI to X. This is probably the largest and most conspicuous insect inhabitant of JR marshes, and one of the most characteristic species of that habitat (Davis and Gray, 1966). According to Blatchley (1920), Henry Fox found P. clavuliger in Va. tidal marshes, often inhabiting dense growths of Scirpus americanus and Spartina cynosuroides. Occurs along Atlantic coast from New England to Fl.
- Melanoplus femur-rubrum (DeGeer). Det. A. B. Gurney. Collected and observed in SP and neighboring habitats of mixed shrubs and herbaceous plants, where adults are sometimes fairly common in late fall and winter (during mild spells of weather). It is sometimes seen in salt marshes in summer (Davis, Unp.).
- Family Tettigoniidae
- Scudderella texensis Saussure-Pictet. Occasionally collected by sweep-net from higher salt marsh habitats (PV, SP), Carteret County, N. C., summer months (Davis, Unp.). According to Blatchley (1920), it occurs in a wide range of habitats throughout the eastern United States, and has been reported from "the taller vegetation near the border of the salt marshes" in N. J.
- Beleocephalus subapterus Scudder. Nymphs collected by sweep-net from higher salt marsh habitats (PV, SP) on a few occasions (Davis, Unp.). According to Blatchley (1920), it is commonest in Ga., and has been collected at Yemassee, S. C.
- Homorocoryphus malivolans (Scudder). Collected on Piver's Island, Carteret County, N. C. Det. A. N. Caudell (Pearse, 1936). Blatchley (1920) quotes Henry Fox as saying that H. malivolans at Tappahanock, Virginia was found mostly in dense stands of the tall marshgrass, Spartina cynosuroides (L.), in tidal marshes...Observed ovipositing in the Spartina. Its coastwise range is from Va. to Fl.
- Neoconocephalus exiliscanorus (Davis). Collected by sweep-net, PV, Jarrett Bay, Carteret County, IV (Davis, Unp.). According to Blatchley (1920), Fox found it "in tidal marshes occurring most commonly in tall reeds, Spartina cynosuroides (L.)," at Tappahanock, Va.
- Orchelimum agile (DeGeer). Det. A. B. Gurney. Collected by sweep-net, SA, Bogue Banks, and DS, Harlowe Creek, VIII, Carteret County, N. C. Evidently it occurs only occasionally in North Carolina salt marshes (Davis, Unp.). Fox found it in Scirpus americanus tidal marsh in Va.; coastwise range is from N. J. to Fl. (Blatchley, 1920).
- Orchelimum concinnum Scudder. Det. A. B. Gurney. Collected rather frequently by sweep-net from vegetation of JR marshes, less frequently from SP, DS and PV, Carteret County, N. C., VII to IX (Davis, Unp.). Common in tidal marshes in Va.; ranges along the Atlantic coast from Cape Cod to Fl. (Blatchley, 1920).

Orchelimum fidicinium Rehn and Hebard. Det. A. B. Gurney. Extremely common in sweep-net collections from SA, IV to IX, Carteret County, N. C. This is the most conspicuous insect species in SA salt marsh; O. fidicinium is highly characteristic of SA, and is only occasionally collected in other types of salt marsh, and then usually in stands bordering SA (Davis and Gray, 1966). Occurs abundantly in SA salt marshes, Sapelo Island, Ga. (Smalley, 1960). An important herbivore in SA salt marshes, Sapelo Island, V to IX (Marples, 1964). Fed by the long-billed marsh wren to nestlings, Sapelo Island, Ga. (Kale, 1964). Has been found at numerous places along the Atlantic coast from L. I. to south Ga. (Blatchley, 1920).

Orchelimum superbum Rehn and Hebard. Det. A. Gurney. Collected by sweep-net from PV, Bogue Banks, Carteret County, N. C., VI and VII. Evidently restricted to the most highly elevated salt marsh habitats (Davis, Unp.). Found in tidal marshes dominated by Scirpus americanus, Tappahannock, Va. (Blatchley, 1920).

Conocephalus stictomerus Rehn and Hebard. Det. A. B. Gurney. Collected by sweep-net from PV, Jarrett Bay, Carteret County, N. C., VII and VIII (Davis, Unp.). It was originally collected by Rehn and Hebard from PV in New Jersey, and has been collected by Fox in Va. from Spartina cynosuroides. It may be nocturnal (Blatchley, 1920).

Conocephalus nigropleuroides (Fox). Det. A. B. Gurney. Often quite abundant in sweep-net collections from SA vegetation, Carteret County, N. C., VII and VIII. It is only occasionally collected in other types of salt marsh, and seems to be a characteristic species of the SA habitat (Davis, Unp.). Fox found it to be "almost entirely restricted to the tidal Spartina grasses" of salt marsh tidal flats; ranges from N. J. to southern Ga. (Blatchley, 1920).

Conocephalus spartinae (Fox). Det. A. B. Gurney. Very common in sweep-net collections from JR and DS, less common in SA and SP but sometimes quite abundant in the former, and also occasionally collected in SAL-SA; VII to IX, Carteret County, N. C. This is one of the most widely distributed species of insects in salt marsh vegetation (Davis, Unp.). "Occurs mostly among the salt marsh grasses of the genus Spartina...a coast-wise species ranging from Maine...to Cape Sable, Florida" (Blatchley, 1920).

Conocephalus aigialus Rehn and Hebard. Det. A. B. Gurney. Collected rather frequently by sweep-net from SA, SP, DS, and JR, Carteret County, N. C., VII to IX. Like C. spartinae (entry above), shows little preference for any particular type of marsh vegetation as a habitat. It is generally less abundant than C. spartinae (Davis, Unp.). Inhabits salt marshes from Cape Henry, Va. to Pablo Beach, Fl. (Blatchley, 1920).

Order Hemiptera

Family Scutellaridae

Amaurochrous dubius (Palisot de Beauvois). Det. D. M. Weisman. Collected by sweep-net from salt marsh vegetation, Carteret County, N. C., twice: SP, Nelson Bay, IV; Core Creek, JR, V (Davis, Unp.).

Family Corimelaenidae

Corimelaena pulicaria (Germar). Det. D. M. Weisman. Two specimens collected by sweep-net from SP, Beaufort Channel, Carteret County, N. C., VI (Davis, Unp.).

Family Cydnidae

Geotomus subpunctatus Blatchley. Found under "vegetable debris" (drift) on sea beaches; reported from Md., Wilmington, N. C., and Fl. (Blatchley, 1926).

Family Pentatomidae

Rhytidolomia saucia (Say). Det. D. M. Weisman. Frequently collected by sweep-net from DS, IV to IX, Carteret County, N. C. (Davis and Gray, 1966). This insect is a very characteristic inhabitant of DS, and has seldom been collected in any other habitat. Blatchley (1926) referred to it as "a submarine species," and gives its range as extending from New England to Fl.

Rhytidolomia senilis Say. Det. D. M. Weisman. Six collections, all by sweep-net, from salt marsh vegetation, Carteret County, N. C. (DS, JR, and SA; V, VIII, and IX) (Davis, Unp.). Occurs in salt marshes, Sapelo Island, Ga. (Kale, 1964).

Mormidea lugens (Fabricius). Det. D. M. Weisman. A single collection by sweep-net from PV, Nelson Bay, Carteret County, N. C., IV (Davis, Unp.).

Solubea pugnax (Fabricius). Det. D. M. Weisman. Sometimes abundant in sweep-net collections from PV, and occasionally found in JR and SP, Carteret County, N. C., V to XI (Davis, Unp.).

Euschistus servus (Say). Det. D. M. Weisman. Two collections by sweep-net from salt marsh vegetation, Carteret County, N. C. (JR, Goose Bay, XI; DS, Lennoxville Point, VIII) (Davis, Unp.).

Murgantia histrionica (Hahn). Det. D. M. Weisman. A single collection by sweep-net from SA, Piver's Island, Carteret County, N. C., IV (Davis, Unp.).

Podisus fretus Olsen. "Originally described from specimens taken along the Atlantic coast from Massachusetts to Wilmington, N. C. The types in part were beaten from oak and pine and others were taken from washup along the ocean beaches" (Blatchley, 1926).

Family Coreidae

Leptoglossus phyllopus (Linnaeus). Det. D. M. Weisman. Collected twice from SP, Bogue Banks and Beaufort Channel, Carteret County, N. C., XI, sweep-net. Often noted in flight in salt marshes, fall months (Davis, Unp.).

Alydus eurinus (Say). Det. D. M. Weisman. A single collection by sweep-net from SA, Goose Bay, Carteret County, N. C., VII (Davis, Unp.).

Alydus pilosulus Herrich-Schaeffer. Det. D. M. Weisman. Three collections by sweep-net from SP, Carteret County, N. C. (Beaufort Channel, VII; Piver's Island, VI and VIII) (Davis, Unp.).

Family Aradidae

Aradus uniformis Heidemann. "Occurs especially along the ocean in beach drift." Coastwise range is from Mass. to Fl. (Blatchley, 1926).

Family Neididae

Jalysus spinosus (Say). A single collection by sweep-net from DS, Harlowe Creek, Carteret County, N. C., VIII (Davis, Unp.).

Family Lygaeidae

Ortholomus scolopax (Say). Det. D. M. Weisman. A single collection by sweep-net from salt marsh vegetation, date and place not recorded, Carteret County, N. C. (Davis, Unp.).

Nysius californicus Stal. Det. D. M. Weisman. Four collections, all by sweep-net, from SP, Carteret County, N. C. (North River, VIII; Lenoxxville Point, VI, VII, VIII) (Davis, Unp.).

Nysius ericae Schilling. A single collection by sweep-net from SP, Beaufort Channel, VII, Carteret County, N. C. (Davis, Unp.).

Cymus breviceps Stal. Det. D. M. Weisman. Frequently collected by sweep-net, often in abundance, from all types of salt marsh vegetation, spring months, Carteret County, N. C. In summer, populations evidently decline rapidly, although a few may be collected as late as VIII (Davis and Gray, 1966).

Ischnodemus badius Van Duzee. Det. D. M. Weisman. Very common in sweep-net collections from SA, reaching peak abundance in VIII and IX, but present the year around, Carteret County, N. C. (Davis and Gray, 1966). Abundant in vacuum collections from SA, Morehead City, Carteret County, N. C. (McMahan, Knight, and Camp, 1972). An important "grazer" in SA salt marsh, Sapelo Island, Ga. (Marples, 1966). Adults and nymphs of all sizes are "seen throughout the spring and summer, while only adults and penultimate nymphs are noticed in winter." Eaten by the long-billed marsh wren (Kale, 1964).

Blissus leucopterus insularis Barber. Det. D. M. Weisman. A subspecies found in coastal habitats (Blatchley, 1926). Six collections by sweep-net from salt marsh vegetation, Carteret County, N. C. (PV, Nelson Bay, V; DS, North River and Nelson Bay, VII and VIII; SP, North River twice and Piver's Island, VIII and VII (Davis, Unp.).

Oedancala crassimana (Fabricius). Det. D. M. Weisman. Numerous collections by sweep-net from DS, VIII through X, when it is sometimes quite abundant. Also, a few specimens collected from PV, V and VII. Carteret County, N. C. (Davis, Unp.).

Heraeus plebejus Stal. Det. D. M. Weisman. A single collection by sweep-net, from SA, V, Bogue Banks, Carteret County, N. C. (Davis, Unp.).

Pachybrachius bilobatus (Say). Det. D. M. Weisman. A single collection by sweep-net from SAL-SA, Bogue Banks, Carteret County, N. C., X (Davis, Unp.).

Peritrechus palundemanis Barber. "A subarctic species, usually inhabiting the edges of the salt marshes from Massachusetts...to Florida" (Blatchley, 1926).

Cryphula parallelogramma Stal. Det. D. M. Weisman. Two collections by sweep-net from salt marsh vegetation, Carteret County, N. C. (Core Creek, DS, IX; Core Creek, JR, X) (Davis, Unp.).

Family Reduviidae

Pygolampis pectoralis (Say). Det. D. M. Weisman. A single collection by sweep-net, from PV, Nelson Bay, IV, Carteret County, N. C. (Davis, Unp.).

Zelus cervicalis Stal. Det. D. M. Weisman. Collected fairly often by sweep-net from SP salt marsh, and once from PV, IV to XI, Carteret County, N. C. (Davis, Unp.).

Doldina interjungens Bergroth. Det. D. M. Weisman. Collected occasionally by sweep-net from all types of salt marsh vegetation (except PV), VII to I, Carteret County, N. C. (Davis, Unp.).

Sinea diadema (Fabricius). A single collection by sweep-net, VIII, from DS, Harlowe Creek, Carteret County, N. C. (Davis, Unp.).

Family Nabidae

Nabis capsiformis Germar. Det. D. M. Weisman. Collected occasionally by sweep-net from salt marsh vegetation (SP, DS, SA), Carteret County, N. C., VI to I. Common in one stand of SA, North River (Davis, Unp.).

Family Miridae

Trigonotylus americanus Carvalho. Det. R. C. Froeschner. Present in sweep-net collections from DS, Carteret County, N. C., IV to X; extremely abundant from V to VIII. This mirid is a highly characteristic inhabitant of DS salt marsh, in which it was always present in spring and summer collections, and is rarely found in other habitats (Davis and Gray, 1966).

Trigonotylus uhleri (Reuter). Det. R. C. Froeschner. Extremely common in sweep-net collections from SA and DS, IV to XI, Carteret County, N. C. This species is much less common in DS than T. americanus, and is often very abundant in SA (Davis and Gray, 1966). Abundant in vacuum collections from SA, Morehead City, Carteret County, N. C. (McMahan, Knight, and Camp, 1972). Trigonotylus sp. (presumably uhleri) is an important herbivorous species in SA marshes, Sapelo Island, Ga. (Marples, 1966).

Teratocoris discolor Uhler. Two collections by sweep-net from salt marsh vegetation, Carteret County, N. C. (Core Creek, DS, VIII; Lennoxville Point, SP, VIII) (Davis, Unp.).

Lygus apicalis Fieber. Det. R. C. Froeschner. Collected occasionally by sweep-net from various types of salt marsh vegetation, especially SA and SP, Carteret County, N. C., VIII to XII. (Davis, Unp.). "Relatively uncommon in (SA) marsh," Sapelo Island, Ga. (Kale, 1964).

Porpomiris curtulus (Reuter). Det. R. C. Froeschner. Collected four times by sweep-net from salt marsh vegetation, Carteret County, N. C. (Jarrett Bay, PV, VII; Lennoxville Point, SP, VII) (Davis, Unp.).

Lopidea sp. Det. R. C. Froeschner. Collected once by sweep-net (from JR, Bogue Banks, VI), Carteret County, N. C. (Davis, Unp.).

Melaneathus uhleri (Signoret). Det. R. C. Froeschner. A single collection by sweep-net from salt marsh vegetation (SP, Lennoxville Point, V), Carteret County, N. C. (Davis, Unp.).

Parthenicus vaccini Van Duzee. Det. R. C. Froeschner. Collected once by sweep-net, SAL-SA, Bogue Banks, Carteret County, N. C., XI (Davis, Unp.).

Tytthus parviceps (Reuter). Det. R. C. Froeschner. Collected occasionally by sweep-net from SA salt marsh, Carteret County, N. C., VIII to XII (Davis, Unp.).

Tytthus vagus (Knight). Det. R. C. Froeschner. Common, sometimes abundant, in SA salt marsh, Carteret County, N. C., sweep-net collections, VI to I. Occasionally collected by sweep-net from DS (Davis and Gray, 1966).

Family Hydrometridae

Hydrometra martini Kirkaldy. Det. H. B. Hungerford. Collected from brackish water (Open Grounds and Carteret Lodge Pond), VI (Pearse, 1936).

Family Mesoveliidae

Mesovelia mulsanti White. Det. H. B. Hungerford. Collected from brackish water (Mullet Pond, Carteret Lodge Pond). Carteret County, N. C., VI and VIII (Pearse, 1936).

Family Gerridae

Gerris nebularis Drake and Hottes. Det. C. S. Brimley. Collected from surface of brackish water (Open Grounds), VI, Carteret County, N. C. (Pearse, 1936).

Rheumatobates tenuipes Meinert. Det. H. B. Hungerford. Collected from surface of brackish water (stream above Morton's Mill Pond), Carteret County, N. C., VII (Pearse, 1936).

Family Saldidae

Pentacora signoreti (Guerin). "It lives on the pale sands not remote from the (sea) beach...often swarming on the moist places." Distributed along the Atlantic coast from Mass. to Fl. (Blatchley, 1926).

Pentacora sphacelata (Uhler). "A subarctic species occurring along the beaches of the Atlantic and Gulf coasts from Massachusetts to Texas." Often extremely abundant on banks of mixed sand and mud (Blatchley, 1926).

Pentacora hirta (Say). Det. R. C. Froeschner. Collected occasionally by sweep-net from DS; obtained more frequently on sticky plates, ground surface of DS and SA salt marshes (Davis, Unp.). Reported to occur on muddy tidal flats and beaches, Atlantic coast from Conn. to Fl. (Blatchley, 1926).

Saldula interstitialis (Say). "Almost any collection of Saldidae made in the eastern states...among the edges of the salt marshes will number hosts of this common little species." Bueno, as quoted by Blatchley (1926).

Saldula reperta (Uhler). Det. H. B. Hungerford. Collected in vicinity of Mullet Pond (brackish water), Carteret County, N. C., VII (Pearse, 1936).

Micracantha pumpila Blatchley. Det. R. C. Froeschner. Collected twice by sweep-net from salt marsh vegetation (SA, Beaufort Channel, I and DS, Nelson Bay, VII), and once on a sticky plate, SA marsh, Bogue Banks, all in Carteret County, N. C. (Davis, Unp.).

Family Belostomatidae

Benacus griseus (Say). Det. C. S. Brimley. Collected from brackish water (Open Grounds, Carteret Lodge Pond), Carteret County, N. C., VI (Pearse, 1936).

Family Notonectidae

Notonecta irrorata Uhler. Det. H. B. Hungerford and C. S. Brimley. Collected from brackish water (Open Grounds, Harlowe Creek), Carteret County, N. C., VI (Pearse, 1936).

Family Corixidae

Trichocorixa verticalis (Fieber). Very common in brackish pools, and even in pools in which the salinity is very high (70 ppt or more) due to evaporation, Carteret County, N. C. (Davis, Unp.). Collected from brackish water (Morton's Mill Pond, Mullet Pond, Open Grounds), VI and VII, Carteret County, N. C. Det. H. B. Hungerford (Pearse, 1936).

Order Homoptera

Family Cicadidae

Tibicen chloromera Walker. Collected near Harlowe Creek and Eastman's Creek, Carteret County, N. C., VI and VII (Pearse, 1936).

Tibicen viridifasciata Walker. Adults are reported to occur among the grasses of tidal flats at Wrightsville Beach, N. C. The exuviae of nymphs were found clinging to marsh grass-stems (Metcalf and Osborn, 1920). Nymphal exuviae and adults were collected from sea oats, Uniola paniculata, on dunes at Wrightsville Beach (Osborn and Metcalf, 1920).

Family Membracidae

Spissistilus festinus (Say). Det. L. M. Russell. A few specimens collected by sweep-net in SP salt marsh, VII to XI, Carteret County, N. C. (Davis, Unp.).

Family Cercopidae

Clastophora xanthocephala Germar. Det. L. M. Russell. A few specimens collected by sweep-net in Carteret County, N. C. salt marshes: DS, Core Creek, VI and Harlowe Creek, VI; SP, Piver's Island, VIII and North River, IV (Davis, Unp.).

Prosapia bicincta (Say). Det. L. M. Russell. A few specimens collected by sweep-net in Carteret County, N. C. salt marshes: SP, North River, IX; DS, Core Creek, VIII; DS, North River, X (Davis, Unp.).

Family Cicadellidae

Agallia constricta Van Duzee. Det. J. P. Kramer. A single collection of a few specimens in SA salt marsh. North River, Carteret County, N. C., VIII (Davis, Unp.).

Draeculacephala portola Ball. Det. J. P. Kramer. Fairly common in sweep-net collections from SA salt marshes, Carteret County, N. C., V to XI (Davis and Gray, 1966).

Spangbergiella vulnerata (Uhler). Det. J. P. Kramer. Fairly common in sweep-net collections from DS salt marshes, V to X, Carteret County, N. C. (Davis and Gray, 1966).

Deltocephalus flavocostatus Van Duzee. Det. J. P. Kramer. A few specimens collected by sweep-net from SP and DS salt marsh, North River, IX, and JR salt marsh, Goose Bay, X, Carteret County, N. C. (Davis, Unp.).

Deltocephalus marinus Metcalf and Osborn. Found on a "fine leaved grass" in intertidal zone, Wrightville Beach, N. C. (Metcalf and Osborn, 1920).

Amphicephalus littoralis (Ball) (= Deltocephalus littoralis). Det. J. P. Kramer. Extremely abundant in sweep-net collections from DS salt marshes, Carteret County, N. C., IV to XI. This species is evidently restricted to DS, and is one of the most characteristic inhabitants of this type of salt marsh (Davis and Gray, 1966). Collected on intertidal grasses at Wrightsville, Beach, N. C. (Metcalf and Osborn, 1920).

Graminella nigrifrons (Forbes). Det. J. P. Kramer. Fairly common in sweep-net collections from both SA and DS salt marshes, Carteret County, N. C., V to VII (Davis and Gray, 1966).

Chlorotettix sp. Det. J. P. Kramer. A few specimens collected by sweep-net from DS salt marsh, Core Creek, VIII, and from SP salt marsh, North River, VIII, and Beaufort Channel, IX, Carteret County, N. C. (Davis, Unp.).

Sanctanus sanctus (Say). Det. J. P. Kramer. Fairly common in sweep-net collections from SAL-SA salt marsh, V to XI, Carteret County, N. C. The absence of this species from SA salt marsh indicates that it probably utilizes Salicornia spp. as its food source (Davis and Gray, 1966).

Sanctanus aestuarium (DeLong and Slosson). Det. J. P. Kramer. Fairly common in sweep collections from SA salt marshes, V to X, Carteret County, N. C. (Davis and Gray, 1966). One of the most important herbivorous insect species in SA marshes at Morehead City, N. C. (McMahan, Knight, and Camp, 1972).

Tinobregmus vittatus Van Duzee. Det. J. P. Kramer. This species is distributed along South Atlantic and Gulf coasts; utilizes Iva frutescens as its food source (Lawson, 1932). Frequently obtained in swmp-net collected from salt marshes in which Iva frutescens is interspersed among dominant plant species; observed to occur on Iva frutescens plants, Carteret County, N. C. (Davis, Unp.).

Balclutha hebe (Kirkaldy). Det. J. P. Kramer. A few specimens collected by sweep-net from SAL-SA salt marsh, Bogue Banks, XI, Beaufort Channel, XII, Carteret County, N. C. (Davis, Unp.).

Fieberiella florii (Stal). Det. J. P. Kramer. A few specimens collected by sweep-net from DS salt marsh, Core Creek, Carteret County, N. C., IX and X (Davis, Unp.).

Polyamia caperata (Ball). Det. J. P. Kramer. Occasional specimens collected on sticky plates, ground surface of DS salt marsh, Core Creek, VI, and SP salt marsh, Bogue Banks, VI and VII, and by sweep-net from SP, North River, IX, all in Carteret County, N. C. (Davis, Unp.).

Family Cixiidae

Bothriocera sp. Det. J. P. Kramer. Collected occasionally in small numbers by sweep-net from DS, SP, and PV marshes, Carteret County, N. C., VI to IX. A few specimens caught on sticky plates, ground surface, DS and SP, VI through VIII (Davis, Unp.).

Haplaxius enotatus (Van Duzee) (= Myndus enotatus). Det. J. P. Kramer. Commonly collected by sweep-net from SP, VI to XI, Carteret County, N. C. (Davis and Gray, 1966).

Family Derbidae

Cedusa fedusa McAtee. Det. J. P. Kramer. Collected by sweep-net in small numbers from JR, VIII and IX, Carteret County, N. C. (Davis, Unp.).

Family Acanaloniidae

Acanalonia pumila (Van Duzee). Det. J. P. Kramer. Frequently obtained in sweep-net collections from salt marshes in which Borrighia frutescens is interspersed among dominant plant species; observed to occur on Borrighia frutescens plants, VII to IX, Carteret County, N. C. (Davis, Unp.). Collected from intertidal plants, Wrightsville Beach, N. C. (Metcalf and Osborn, 1920).

Family Dictyopharidae

Rhynchomitra microrrhina (Walker) (= Dictyophara microrrhina). Det. J. P. Kramer. Frequently collected by sweep-net from JR, IV to IX, Carteret County, N. C. One of the commonest and most conspicuous insect species in JR marshes (Davis and Gray, 1966). Collected on "rank lowland grasses" and "beach grasses", Wrightsville Beach, N. C. (Metcalf and Osborn, 1920).

Family Issidae

Aphelonema simplex Uhler. Det. J. P. Kramer. Collected by sweep-net from SP the year around (in all but the coldest weather); often collected by sweep-net from DS; trapped on sticky plates, ground surface of SP and DS marshes; Carteret County, N. C. (Davis and Gray, 1966; Davis, Unp.).

Family Delphacidae

Pentagramma vittatifrons (Uhler). Det. J. P. Kramer. Collected by sweep-net from SP, Bogue Banks, Carteret County, N. C. Infrequently found in summer and early fall collections, 1959, becoming common in December and January, 1960, and disappearing in late winter and spring (Davis and Gray, 1966).

Liburniella ornata (Stal). Det. J. P. Kramer. A single specimen collected by sweep-net, SP, Beaufort Channel, Carteret County, N. C. VIII (Davis, Unp.).

Tumidagena terminalis (Metcalf). Det. J. P. Kramer. Common in sweep-net collections from DS, V to X, but not obtained in other months; fairly common in sweep-net collections from SP throughout the year; occasionally caught on sticky plates, ground surface, SP and DS marshes, summer months; Carteret County, N. C. (Davis and Gray, 1966; Davis, Unp.).

Neomegamelanus dorsalis (Metcalf). Det. J. P. Kramer. Common in sweep-net collections from DS, IV to IX, but not obtained in other months; present and sometimes fairly abundant in sweep-net collections from SP throughout the year (except in coldest weather); occasionally caught on sticky plates, ground surface, SP and DS marshes, summer months; Carteret County, N. C. (Davis and Gray, 1966; Davis, Unp.).

Delphacodes detecta (Van Duzee) (= Liburnia detecta). Det. J. P. Kramer. Occurring in sweep-net collections from SA, SAL-SA, and SP, except in early spring, becoming extremely abundant in late fall and early winter; found in sweep-net collections from DS in all months except II, very abundant VI to IX; fairly commonly caught on sticky plates, ground surface of SP, SA, and DS, summer months; Carteret County, N. C. (Davis and Gray, 1966; Davis, Unp.). Found to occur in "great abundance on a grass that grew luxuriantly near the level of low tide," Wrightsville Beach, N. C. (Metcalf and Osborn, 1920). Occurs in SA salt marsh, Sapelo Island, Ga. (Teal, 1962; Marples, 1966). Specimens found in the digestive tract of the long-billed marsh wren, Telmatodytes palustris griseus, Sapelo Island, Ga. (Kale, 1964).

Delphacodes puella (Van Duzee) Det. J. P. Kramer. Collected frequently, but in small numbers, by sweep-net from SA, SP, DS, and PV; Carteret County, N. C. All specimens obtained in V, VIII, and IX (Davis, Unp.).

Prokelisia marginata (Van Duzee) (= Megamelanus marginatus). Det. J. P. Kramer. Common in sweep-net collections from SA and SAL-SA, all months, reaching extremely high population levels VII to XI; caught in small numbers on sticky plates, ground surface of SA marsh; occasionally present in DS, SP, and other salt marsh vegetation; Carteret County, N.C. (Davis and Gray, 1966; Davis, Unp.). Abundant in collections made by vacuum from SA vegetation, Morehead City, N. C. (McMahan, Knight, and Camp, 1972). Found to occur on intertidal plants, Wrightsville Beach, N. C. (Metcalf and Osborn, 1920). Abundant in SA salt marshes, Sapelo Island, Ga. (Smalley, 1959; Marples, 1966). "Common for most of the year except in the late summer, and is extremely abundant in the later winter-early spring period" (Marples, 1964). Specimens found in the digestive tract of the long-billed marsh wren (Kale, 1964).

Sogata furcifera (Horvath). Det. J. P. Kramer. Collected in small numbers by sweep-net from SA, SP, and DS, VIII to XI, Carteret County, N. C. (Davis, Unp.).

Megamelus spartini Osborn. Beaten from Uniola paniculata, Wrightsville Beach, N. C. (Metcalf and Osborn, 1920).

Megamelus lobatus Beamer. Det. J. P. Kramer. Collected by sweep-net from DS, IV to XII, usually in small numbers but becoming abundant in the fall; Carteret County, N. C. Caught in large numbers by sticky plates, ground surface, DS, summer months, Core Creek, Carteret County (Davis and Gray, 1966; Davis, Unp.).

Bakerella bullata Beamer. Det. J. P. Kramer. Collected in small numbers by sweep-net, and by sticky plates on ground surface, from DS and SP salt marshes, VI to X, Carteret County, N. C. (Davis, Unp.).

Pissonotus albovenosus Osborn. Det. J. P. Kramer. Fairly common in sweep-net collections from DS, V to X, and from JR, year around except in coldest weather; fairly common, sometimes abundant, on sticky plates, ground surface of DS and JR salt marshes, summer months; Carteret County, N. C. (Davis and Gray, 1966; Davis, Unp.).

Keyflana hasta Beamer. Det. J. P. Kramer. Often abundant in sweep-net collections from JR, V to I, reaching highest population level as nymphal stages, VI and VII; frequently collected in small numbers on sticky plates, ground surface, JR marshes, summer months, Carteret County, N. C. (Davis and Gray, 1966).

Family Aphidae

Eulachnus rileyi (Williamson). Det. L. M. Russell. A few specimens collected by sweep-net from SP and SAL-SA, Bogue Banks, and from SP and DS, North River, winter months (I and II), Carteret County, N. C. (Davis, Unp.).

Family Psyllidae

Trioza tripunctata (Fitch). Det. L. M. Russell. A few specimens collected by sweep-net, DS and JR marshes, X and XII, Core Creek, Carteret County, N. C. (Davis, Unp.).

Aphalara furcata Caldwell. Det. L. M. Russell. A few specimens collected by sweep-net from SP and JR, North River, VIII to X, Carteret County, N. C. (Davis, Unp.).

Family Pseudococcidae

Symnocroccus spirapuncta (Lobdell). Collected from Juncus spp., Cumberland Island, Ga., V; also collected on sedges, Cumberland Island, VIII and XI (Tippins and Beshear, 1972).

Family Diaspididae

Aspidiotus marisci Tippins and Beshear. Occurs on saw grass, Mariscus jamaicense, Cumberland Island, Ga. (Tippins and Beshear, 1971a).

Circulaspis fistulella Ferris. Reported to occur on Spartina sp. Cumberland Island, Ga., III and IX (Tippins and Beshear, 1968).

Haliaspas spartinae (Comstock). Occurs on SA, intertidal zone, Cumberland Island, Ga., I, III, IX (Tippins and Beshear, 1972). "Colonies of reproducing H. spartinae from Cumberland Island, Ga., USA, were found on SA at (same height on plants) as reproducing barnacles...H. spartinae survives in the intertidal zone with submersion for one hour every high tide. This species over-winters in the egg on dead host material" (Tippins and Beshear, 1971b).

Haliaspas uniola Takagi. Described by Takagi from material collected on Cumberland Island. Occurs on SA, SP, and Uniola paniculata (Tippins and Beshear, 1972). Collections made in III and IV (Tippins and Beshear, 1970).

Odonaspis sp. close to litrosa Ferris. Collected from Panicum, Cumberland Island, Ga., IX (Tippins and Beshear, 1970).

Odonaspis sp. close to saccharicaulis Zehnt. Collected from Spartina sp., Cumberland Island, Ga., IX (Tippins and Beshear, 1972).

Order Thysanoptera

All of the species included in this section were collected by beating SP and SA on Cumberland Island, Ga. (Beshear, 1971). Identifications were made by T. H. Wilson, T. C. Vance, and C. J. Stannard.

Suborder Terebrantia

Family Thripidae

Chirothrips praeocularis Andre. Collected from both SP and SA, III and IX. Abundant in one collection from each.

Frankliniella tritica (Fitch). One specimen collected from SA, IX; five specimens collected from SP, III, IV, and IX.

Pseudothrips inequalis (Beach). One specimen collected from SP, IV.

Sericothrips desmodianus Stannard. One specimen collected from SP, IX.

Suborder Tubulifera

Family Phloeothripidae

Adraneothrips bellus (Hood and Williams). Abundant on SP in all collections (III, IV, VI, IX). None were collected on SA.

Adraneothrips exiguus Hood. One specimen collected from SP, IV.

Adraneothrips fasciapennis (Franklin). One specimen collected from SP, VI.

Amphibolothrips watsoni Hood. Four specimens collected from SP, IX.

Diceratothrips harti Hood. One specimen collected from SP, III.

Haplothrips graminis Hood. One specimen collected from SA, IX; seven specimens collected from SP, III, IV, and IX.

Haplothrips harti Hood. One specimen collected from SP, IV.

Haplothrips mali (Fitch). Two specimens collected from SP, III and IX.

Haplothrips melaleucus (Bagnall). Fairly common in SP collections, III and IX.

Nesothrips near bicolor (Haegen). Abundant in SP, IX, and also collected III, IV, and VI.

Oedaleothrips hookeri Hood. One specimen collected from SP, IX.

Order Mallophaga

Brimley (1938, 1942) and Wray (1950) provide a list of Mallophaga collected in N. C., together with their bird hosts.

Subclass Endopterygota

Order Neuroptera

Family Mantispidae

Mantispa brunnea Say. Frequently observed in salt marshes (especially SP) and neighboring habitats, Bogue Banks, Carteret County, N. C., summer months (Davis, Unp.). According to Brimley (1938), Z. P. Metcalf and T. B. Mitchell have reported it to be common at Carolina Beach, N. C. in the summer months.

Family Myrmeleonidae

Myrmeleon crudelis Walker. Imagoes occasionally collected in PV and JR marshes, Bogue Banks, Carteret County, N. C., VIII (Davis, Unp.).

Order Coleoptera

The following list does not include records of beetles from maritime habitats of South Carolina given in Kirk (1969, 1970).

Family Cicindellidae

Cicindela dorsalis media Lee. "Very common along the (coastal) strand, and wanders up into the higher dunes...Frequently taken in the tidal zone," Wrightsville Beach, N. C. (Metcalf, 1920). "A common hunter on all sandy beaches," Beaufort, N. C. area (Pearse, Humm, and Wharton, 1942).

Cicindela marginata Fabricius. According to Dillon and Dillon (1961), this is a common species on muddy beaches along the Atlantic seacoast of the United States. Brimley (1938) states that it occurs along the N.C. seacoast from Beaufort southwards.

Cicindela hirtocollis Say. Found on "tidal flats that do not border the ocean near Fort Macon," Carteret County, N. C. (Pearse, Humm, and Wharton, 1942). Pearse (1936) collected it on Shackleford Banks near Mullet Pond, VI. According to Brimley (1938), it occurs along the entire coast of North Carolina.

Cicindela hamata lacerata Chaudoir. Collected near Mullet Pond, Shackleford Banks, Carteret County, N. C., VI (Pearse, 1936).

Cicindela tortuosa ascendens LeConte. Collected in the Mullet Pond area of Shackleford Banks, Carteret County, N. C., VII (Pearse, 1936).

Family Dytiscidae

Hydaticus bmarginatus Say. Obtained by Pearse (1936) twice from brackish water habitats in Carteret County, N. C. (Mullet Pond Swamp, IV; Eastman's Creek, VII).

Rhantus calidus Fabricius. Collected at Open Grounds, Carteret County, N. C., VI (Pearse, 1936).

Hydroporus carolinus Fall. Collected by Pearse (1936) from a ditch at Open Grounds, Carteret County, N. C., VI.

Hydroporus clypeatus Sharp. Collected from two brackish habitats, a ditch at Open Grounds, and Harlowe Creek, Carteret County, N. C., VI (Pearse, 1936).

Copelatus glypticus Say. Collected from ditch. Open Grounds, Carteret County, N. C., VI (Pearse, 1936).

Family Noteridae

Hydrocanthus bicolor (Say). Collected by Pearse from Carteret Lodge Pond, Carteret County, N. C., VI (Pearse, 1936).

Family Gyrinidae

Dineutes carolinus LeConte. Collected by Pearse (1936) from Morton's Mill Pond and Carteret Lodge Pond, Carteret County, N. C., VI and VII.

Dineutes emarginatus Say. Two collections by Pearse (1936) from brackish habitats (Carteret Lodge Pond, VI; stream above Morton's Mill Pond, VII).

Dineutes serrulatus LeConte. Collected by Pearse (1936) at Open Grounds, Carteret County, N. C., VI.

Gyrinus analis Say. Obtained from brackish ditch, Open Grounds, Carteret County, N. C., VI and VII (Pearse, 1936).

Family Hydrophilidae

Berosus infuscatus LeConte. Collected by Pearse (1936) from Mullet Pond, Shackleford Banks, Carteret County, N. C., VII.

Berosus peregrinus (Herbst). Collected from Carteret Lodge Pond, Carteret County, N. C., VI (Pearse, 1936).

Tropisternus glaber (Herbst). Larva collected from Mullet Pond, Shackleford Banks, Carteret County, N. C., VII; imago collected at Open Grounds, VI (Pearse, 1936).

Tropisternus quadristriatus (Horn). Collected by Pearse (1936) from brackish water of Mullet Pond, Shackleford Banks, Carteret County, N. C., III, IV, and VII, and from a pond at Open Grounds, III.

Enochrus sublongus Fall. Collected from Mullet Pond, IV, and Open Grounds, III and VI, both in Carteret County, N. C. (Pearse, 1936).

Enochrus perplexus (LeConte). Collected by Pearse (1936) from Mullet Pond, Shackleford Banks, Carteret County, N. C., IV, VI, and VII.

Family Staphylinidae

Stenus punctatus Erickson. Det. D. H. Kistner. Collected twice by sweep-net in Carteret County, N. C. salt marshes: PV, Nelson Bay, IV; JR, Core Creek, IV (Davis, Unp.).

Family Scarabaeidae

Popillia japonica Newman. Sometimes very abundant on foliage of Baccharis halimifolia bushes at periphery of salt marshes, summer months, Carteret County, N. C. (Davis, Unp.).

Cotinis nitida (Linnaeus). Collected occasionally by Wagner (1964) on sea oats, Uniola paniculata, where it probably feeds on pollen, Carteret County, N. C., summer months.

Family Eucinetidae

Eucinetus strigosus LeConte. Det. J. M. Kingsolver. Collected in abundance on a sticky plate, ground surface, below a Baccharis halimifolia bush, Bogue Banks, Carteret County, N. C., VI to VIII (Davis, Unp.).

Family Buprestidae

Taphrocerus agriloides Crotch. Det. D. M. Weisman. Collected three times by sweep-net from vegetation, DS salt marshes, Carteret County, N. C., Core Creek, VII and VIII; Nelson Bay, V (Davis, Unp.).

Family Elateridae

Conoderus vespertinus (Fabricius). Det. T. J. Spilman. Collected twice by sweep-net from SP, VI and VII, Beaufort Channel, Carteret County, N. C. (Davis, Unp.).

Glyphonyx sp. Det. T. J. Spilman. Common, sometimes fairly abundant, in sweep-net collections from SP, Carteret County, N. C., VI to VIII. This species is one of the most characteristic insects of the SP salt marshes (Davis and Gray, 1966).

Family Cantharidae

Chauliognathus marginatus (Fabricius). Collected by Pearse (1936) at Morton's Mill Pond, Carteret County, N. C., VI.

Podabrus sp. Det. T. J. Spilman. Several specimens collected by sweep-net from salt marsh vegetation on three occasions, Carteret County, N. C. at Nelson Bay (PV two collections, IV), and North River (SP, V), (Davis, Unp.).

Family Lampyridae

Photurus frontalis LeConte. Det. T. J. Spilman. Collected twice by sweep-net from PV, Bogue Banks, Carteret County, N. C., V (Davis, Unp.).

Family Cleridae

Isohydnocera aegra (Newman). Det. D. M. Weisman. Collected frequently, in moderate numbers, by sweep-net from SP salt marshes, Carteret County, N. C., IV to VII. Although not abundant, this species is fairly characteristic of SP; it was also collected twice each from DS and PV (Davis and Gray, 1966).

Isohydnocera tabida (LeConte). Det. D. M. Weisman. A common and fairly abundant species in sweep-net collections from SA, Carteret County, N. C., V to X. This species was not collected in any other type of salt marsh (Davis and Gray, 1966). In SA, Sapelo Island, Ga. (Marples, 1964).

Family Melyridae

Collops nigriceps Say. Det. D. M. Weisman. Sporadic in occurrence, but sometimes fairly common in sweep-net collections from SA vegetation, Carteret County, N. C., V to VII (Davis and Gray, 1966). According to Wagner (1964), C. nigriceps is often very common (50 or more individuals per panicle) on sea oats, Uniola paniculata, where it appears to feed on pollen and flower parts.

Collops balteatus LeConte. Det. D. M. Weisman. Two specimens collected by sweep-net from SA, North River, Carteret County, N. C., IX (Davis, Unp.).

Collops subtropicus Fall. Collected occasionally in SA salt marshes Sapelo Island, Ga. (Marples, 1964).

Attalus sp. Det. D. M. Weisman. Five specimens collected on each of two occasions by sweep-net from PV, Bogue Banks, Carteret County, N. C., V (Davis, Unp.).

Family Mordellidae

Mordellistena nigricans (Melsheimer). Commonly collected in SA, Sapelo Island, Ga. (Marples, 1964). At least two species of Mordellistena, possibly M. nigricans and M. splendens (see entry below), are sporadic in occurrence, but sometimes abundant, in

sweep-net collections from SA, Carteret County, N. C., IV to IX (Davis and Gray, 1966).

Mordellistena splendens Smith. Commonly collected in SA, Sapelo Island, Ga. (Marples, 1964). For possible occurrence in SA, Carteret County, N. C., see the previous entry.

Family Oedmeridae

Oxycoptis suturalis (Horn). Det. R. H. Arnett. Collected three times by sweep-net from salt marsh vegetation, Carteret County, N. C. (Harlowe DS, VI; Bogue Banks, PV, VI and VIII) (Davis, Unp.).

Family Anthicidae

Isomira sp. Found by Wagner (1964) to be common (often 50 or more per panicle) on Uniola paniculata, sand dunes of Bogue Banks, Carteret County, N. C. Isomira appears to feed mainly on pollen and tissues of flower parts of Uniola.

Family Languridae

Languria spp. Two large species of beetles that inhabit the SA salt marsh at Sapelo Island, Ga.; found in the stomachs of long-billed marsh wrens (Kale, 1964).

Family Coccinellidae

Cycloneda sanguinea (Linnaeus). Det. E. A. Chapin. Collected twice by sweep-net from salt marshes at Lennoxville Point, Carteret County, N. C. (SA, VIII and SP, VII) (Davis, Unp.).

Coccinella novemnotata Herbst. Det. E. A. Chapin. Collected twice by sweep-net from salt marsh vegetation, Carteret County, N. C. (Nelson Bay, PV, V, and Beaufort Channel, SP, VI) (Davis, Unp.).

Epilachna varivestis Mulsant. Det. E. A. Chapin. Collected once by sweep-net from SA, Beaufort Channel, Carteret County, N. C., XI (Davis, Unp.).

Hippodamia convergens Guérin. Collected by Wagner (1964) from panicles of sea oats, sand dunes along outer beaches, Carteret County, N. C.

Naemia serriata (Melsheimer). Det. E. A. Chapin. Sporadic in occurrence, but often very abundant in DS and less frequently in SA, sweep-net collections, salt marshes of Carteret County, N. C. N. serriata was also occasionally collected from SP and PV; imagoes collected from DS, IV to XII and larvae collected from V to XI. This is the commonest and most widely spread species of beetle in the salt marshes (Davis and Gray, 1966). Wagner (1964) collected it from panicles of sea oats, Uniola paniculata, in Carteret County.

Family Orthoperidae

Orthoperis spp. According to Kale (1964), these "very small (up to 1 mm) round, brown or black beetles...live in the leaf crevices of Spartina," Sapelo Island, Ga.

Family Chrysomelidae

Bassareus clathratus (Melsheimer). Det. D. M. Weisman. Collected once, by sweep-net, from SP, Bogue Banks, Carteret County, N. C., VI (Davis, Unp.).

Bassareus lituratus (Fabricius). Det. D. M. Weisman. Collected once by sweep-net, from DS, Harlowe Creek, Carteret County, N. C. (Davis, Unp.).

Exema sp. Det. D. M. Weisman. Collected three times by sweep-net from SP (Beaufort Channel, VI, Bogue Banks, VII, Harlowe Creek, IX), Carteret County, N. C. (Davis, Unp.).

Chalcoides nana (Say). Det. D. M. Weisman. Collected three times by sweep-net (JR, Core Creek, IV and North River, IX; SA, Beaufort Channel, V), Carteret County, N. C. (Davis, Unp.).

Chaetocnema sp. Det. D. M. Weisman. Sporadic, but occasionally common in sweep-net collections from SP, VI to XI; also collected twice from SA and once each from DS and JR, Carteret County, N. C. (Davis and Gray, 1966).

Colaspis favosa Say. Det. D. M. Weisman. Collected once by sweep-net from SP, Bogue Banks, Carteret County, N. C., VI (Davis, Unp.).

Cryptocephalus venustus Fabricius. Det. D. M. Weisman. Occasionally collected by sweep-net from SP, Carteret County, N. C., VI to VIII (Davis and Gray, 1966).

Deloyala guttata (Olivier). Det. D. M. Weisman. Collected once by sweep-net from PV, Bogue Banks, Carteret County, N. C., IV (Davis, Unp.).

Diabrotica undecimpunctata howardi Barber. Det. D. M. Weisman. Collected eleven times by sweep-net (SA 7 times; JR once; DS twice, SP once), salt marshes, Carteret County, N. C. (Davis, Unp.).

Erynephala maritima (LeConte). Det. D. M. Weisman. Collected 8 times by sweep-net (SAL-SA three times; SA three times; DS twice), salt marshes, Carteret County, N. C. (Davis, Unp.).

Galerucella notulata (Fabricius). Det. D. M. Weisman. Collected once by sweep-net from SP vegetation, Bogue Banks, Carteret County, N. C., VIII (Davis, Unp.).

Galerucella sexvittata (LeConte). Det. D. M. Weisman. Collected six times by sweep-net from salt marsh vegetation, Carteret County, N. C. (Bogue Banks, twice from JR and once each from SA and SP, all in VI; Bell Creek, JR, VII; Lennoxville Point, SA, V) (Davis, Unp.).

Longitarsus testaceus (Melsheimer). Det. D. M. Weisman. Collected five times by sweep-net from salt marsh vegetation, Carteret County, N. C. (Goose Bay, JR, IV and SA, X; Core Creek, DS, VII; North River, SP, IX; Beaufort Channel, SA, XI) (Davis, Unp.).

Metriona bisignata (Boheman). Det. D. M. Weisman. Collected once by sweep-net, from PV, Nelson Bay, Carteret County, N. C., V (Davis, Unp.).

Pachybrachys atomarius (Melsheimer). Det. D. M. Weisman. Sporadic; occasionally fairly common in sweep-net collections from SP, Carteret County, N. C., VI to VIII (Davis and Gray, 1966).

Paria virginiae Wilcox. Det. D. M. Weisman. Collected three times by sweep-net, Carteret County, N. C. salt marshes (Nelson Bay, PV and DS, both IV; Beaufort Channel, SA, XI) (Davis, Unp.).

Paria aterrima (Oliver). Det. D. M. Weisman. Collected once by sweep-net, from SP, Piver's Island, Carteret County, N. C., VI (Davis, Unp.).

Altica litigata Fall. Det. D. M. Weisman. Collected once by sweep-net from SP, Lennoxville Point, Carteret County, N. C., VI (Davis, Unp.).

Family Phalacridae

Stilbus sp. Det. J. M. Kingsolver. Collected once by sweep-net (SA, North River, XI), Carteret County, N. C. (Davis, Unp.).

Olibrus sp. Det. J. M. Kingsolver. Collected once by sweep-net (SP, Beaufort Channel, IX), Carteret County, N. C. (Davis, Unp.).

Family Anthribidae

Trigonorhinus sp. Det. R. E. Warner. Several specimens collected by sweep-net, DS, Core Creek, Carteret County, N. C., IX (Davis, Unp.).

Family Curculionidae

Agraphus bellicus (Say). Det. R. E. Warner. Collected once by sweep-net, from SP, Piver's Island, Carteret County, N. C., VI (Davis, Unp.).

Anthonomus sp. Det. R. E. Warner. Five specimens collected by sweep-net, SP, Carteret County, N. C., X; one specimen collected from DS, same location, XI (Davis, Unp.).

Apion sp. Det. R. E. Warner. Collected twice by sweep-net from salt marsh vegetation (North River, SP, VIII; Goose Bay, SA, IV), Carteret County, N. C. (Davis, Unp.).

Hypera postica (Gyllenhal). Det. R. E. Warner. Collected once by sweep-net (SA, Beaufort Channel, XII), Carteret County, N. C. (Davis, Unp.).

Lissorhoptrus sp. Det. R. E. Warner. Nine specimens obtained in a single sweep-net collection from SA, Piver's Island, Carteret County, N. C., IV (Davis, Unp.).

Lixus marginatus Say. Collected by Pearse (1936) from a ditch, Open Grounds, Carteret County, N. C., VI.

Nicentrus grossulus Casey. Det. R. E. Warner. Fairly common in one stand of DS, Core Creek, Carteret County, N. C., VII to IX; also, collected twice from SP, Bogue Banks, VI and VII (Davis, Unp.).

Sitophilus sp. Det. R. E. Warner. Collected once by sweep-net (Core Creek, DS, V), Carteret County, N. C. (Davis, Unp.).

Sphenophorus sp. Det. R. E. Warner. Collected once by sweep-net (Core Creek, DS, III), Carteret County, N. C. (Davis, Unp.).

Order Diptera

Family Tipulidae

Limonia brevivena (Osten Sacken). Det. A. Stone. Occasionally collected in small numbers by sweep-net from various types of salt marsh vegetation, Carteret County, N. C. (Davis, Unp.).

Limonia domestica (Osten Sacken). Det. A. Stone. Occasionally collected in small numbers by sweep-net from various types of salt marsh vegetation, Carteret County, N. C. (Davis, Unp.).

Limonia floridana (Osten Sacken). "Marine, or virtually so." Reported from S. C., Fl., Va., Md (Alexander, 1965).

Family Culicidae

Anopheles atropos Dyar and Knab. "Breeds in the salt water of coastal marshes from New Jersey and southward to Texas" (King, et. al., 1960). Reported from many coastal localities, N. C. (Wray, 1950).

Anopheles bradleyi King (= Anopheles crucians bradleyi). "Occurs along the Atlantic and Gulf Coasts from Massachusetts south to Texas and Mexico. A. bradleyi larvae have been found principally in brackish water near the coast, and water with a low concentration of salt (about 1.5% or less) appears to be preferred" (King, et. al., 1960).

Toxorhynchites rutilus rutilus (Coquillett). Reported from Myrtle Beach, S. C. "The larvae are found in tree holes and artificial water containers" (King, et. al., 1960). Presumably, this species would breed in tree holes in maritime forest.

Aedes sollicitans (Walker). Det. A. Stone. Extremely common in poorly drained salt marshes, and in salt marshes disturbed by the activities of cattle and horses, Carteret County, N. C. The larvae were often observed in water-filled hoof tracks, as well as in shallow pools. Seldom collected by sweep-net in SA or JR, but may be very common in DS and SP, especially in the fall. Collected from IV through XII (Davis and Gray, 1966). "It occurs in all types of salt marshes along the Atlantic and Gulf Coasts and...is usually by far the most important of the salt marsh species. The larvae are found on the parts of the marsh not reached by high tides, usually in potholes or depressions of various sizes, but often over extensive areas of nearly level marsh. The eggs are laid on almost any moist place in such marshes and also in low grassy lands immediately adjacent. Hatching occurs when the land is covered with rainfall or with monthly or seasonal high tides (spring tides), and enormous numbers may be produced in a single brood" (King, et. al., 1960).

Aedes taeniorhynchus (Wiedemann). Seldom obtained in sweep-net collections from salt marsh vegetation, Carteret County, N. C. Occasionally observed in damp sandy areas above the high tide level (Davis, Unp.). "While (A.) taeniorhynchus usually is not the predominant (salt marsh) species north of Florida, there are a few records of collections in which they outnumber (A.) sollicitans." Reports from Charleston and Parris Island, S. C. are cited in which A. taeniorhynchus was the most abundant mosquito species (King, et. al., 1960).

Aedes canadensis (Theobald). Det. A. Stone. Collected in area of Core Creek Canal, Carteret County, N. C., VII (Pearse, 1936).

Psorophora ciliata (Fabricius). Det. A. Stone. Collected in area of Core Creek Canal, Carteret County, N. C., VII (Pearse, 1936).

Culex salinarius Coquillett. "No information is available as to its salt tolerance, but (the larva) is known to occur at least in brackish water in salt marshes...C. salinarius occurs in all the southeastern states. It is common along the Gulf and Atlantic Coasts and less abundant inland" (King, et. al., 1960).

Family Ceratopogonidae

Leptoconops bequaerti (Kieffer). Collected frequently, but in small numbers, on sticky traps, ground surface of DS marsh, Core Creek, Carteret County, N. C., VI through VIII. Occasionally abundant in sweep-net collections from DS (Davis, Unp.). A species that occurs only along the Atlantic coast of the United States, and coastlines of islands and mainland of Caribbean area (Wirth, 1965a).

Atrichopogon sp. Det. W. W. Wirth. Collected occasionally on sticky plates, ground surface of SP and other salt marsh types, VI and VII, Carteret County, N. C. Sometimes collected in fairly large numbers in sweep-net samples from salt marsh vegetation (Davis, Unp.).

Dasyhelea luteogrisea Wirth and Williams. Often trapped in large numbers on sticky plates, ground surface, SP marsh, Bogue Banks, Carteret County, N. C., VI through VIII. Occasionally caught in smaller numbers on sticky plates, ground surface of DS and JR. Collected frequently, but mostly in small numbers, in sweep-net collections, salt marsh vegetation (Davis, Unp.). Distributed along the Atlantic and Gulf Coasts of the United States, Md. to Tx. (Wirth, 1965a).

Culicoides furens (Poey) (= Culicoides dovei). Larvae occur in salt marshes, ditches, and other bodies of water, Charleston, S. C. (Hull, Dove, and Prince, 1934). Adults collected at Charleston by placing a cage over the ground in salt marshes, to trap them as they emerge from pupae in soil. Larvae were collected from salt marsh mud, and from water in fiddler crab holes. However, larvae were never collected from the mud of marshes that are flooded daily. Larvae are particularly abundant in the soil of marshes where shade is provided by overhanging tree limbs (Dove, Hall and Hull, 1932). This biting midge is a common pest of the salt marshes of Atlantic coastal states (Wirth, 1965a).

Culicoides melleus Coquillett. A biting midge pest ("noseeum") that is common on sandy beaches, Maine to Fl. (Wirth, 1965a).

Culicoides niger Root and Hoffman. A biting midge pest of coastal areas, Mass. to Fl. (Wirth, 1965a).

Culicoides hollensis (Melander and Brues). Det. W. W. Wirth. Occasionally collected in small numbers on sticky plates, ground surface of salt marshes (SP, DS), Bogue Banks and Core Creek, Carteret County, N. C., VI and VII (Davis, Unp.). A biting midge pest of salt marshes, Nova Scotia to Fl. (Wirth, 1965a).

Ceratopogon sp. Det. W. W. Wirth. Occasionally collected in small numbers, sticky plates, ground surface of SP and DS salt marshes, Bogue Banks and Core Creek, Carteret County, N. C., VI and VII (Davis, Unp.).

Mallacohalea atripes Wirth. Distributed along the east coast of the United States from N. J. to Fl. (Wirth, 1965a).

Bezzia setulosa (Loew). Det. W. W. Wirth. Three collections by sweep-net from salt marsh vegetation, Carteret County, N. C.: Core Creek, DS, IV, 23 specimens; Goose Bay, JR, IV, 5 specimens; North River, JR, V, 1 specimen (Davis, Unp.).

Family Chironomidae

Anatopynia decolorata (Malloch) (= Tanypus decoloratus). Collected from three localities (Open Grounds, Carteret Lodge Pond, Mullet Pond on Shackleford Banks), Carteret County, N. C., VI and VII (Pearse, 1936).

Orthocladius sp. (= Hydrobaenus sp.). Det. W. W. Wirth. Present in nearly all sweep-net collections from salt marsh vegetation, Carteret County, N. C., II and III, and often extremely abundant; collected by sweep-net from salt marshes, I through V (Davis and Gray, 1966). Collected in large numbers by vacuum, SA, Morehead City, Carteret County, N. C., spring months (McMahan, Knight, and Camp, 1972).

Chironomus sp. Det. W. W. Wirth. Occasionally collected in small numbers on sticky plates, ground surface of SP marsh, VI and VII, Bogue Banks, Carteret County, N. C. (Davis, Unp.).

Glyptotendipes lobiferus (Say). (= Chironomus lobiferus). Collected from three localities (Morton's Mill Pond, Calico Creek, Open Grounds), Carteret County, N. C., V through VII (Pearse, 1936).

Microtendipes anticus (Walker). A species whose distribution is coastal, from Va. to Tx. (Sublette and Sublette, 1965).

Polypedilum convictum (Walker) (= Chironomus flavus). Collected at Carteret Lodge Pond, Carteret County, N. C., VI (Pearse, 1936).

Family Sciaridae

Bradysia coprophila (Lintner). Det. R. J. Gagne. Collected in fair abundance on a single sticky plate, spoilbank area beneath a bush of Baccharis halimifolia, Bogue Banks, Carteret County, N. C., VI and VII (Davis, Unp.).

Epidapus sp. Det. R. J. Gagne. Collected fairly often in small numbers, sticky plates, ground surface of DS salt marsh, Core Creek, Carteret County, N. C., VI and VII (Davis, Unp.).

Family Stratiomyidae

Ptecticus sackenii Williston. Collected at Open Grounds, Carteret County, N. C., VI (Pearse, 1936).

Family Tabanidae

Chrysops atlanticus Pechuman. Collected by Ezell, et. al. (1974) at several localities along the coast of S. C., IV to X, using plastic canopy traps. According to Ezell (personal communication), it is common in all types of salt marshes, on dunes and sea-beaches, and in maritime forest. Davis (Unp.) found it to be a severe pest at the upland borders of salt marshes and in maritime forests, Carteret County, N. C., summer months. Dukes, Edwards, and Axtell (1974) collected some C. atlanticus larvae from soil, "mostly in open marsh slightly below mean high tide and dominated by dense growth of short SA," Carteret County, N. C. In N. J., Rockal and Hansens (1970b) found the larvae to occur mainly in the soil of SA below mean high water level. The same authors (1970a) report that C. atlanticus adults leave the marsh for higher grounds, to feed, soon after emergence, which occurred in N. J. from June 26 to July 12.

Chrysops brimleyi Hine. Collected in coastal localities of S. C., IV to VI (Ezell, et. al., 1974). It is commonly collected in maritime forest (Ezell, personal communication).

Chrysops callidus Osten Sacken. Collected by Ezell, et. al. (1974) at Charleston and Georgetown, S. C., IV to IX. It is commonly collected in maritime forest (Ezell, personal communication).

Chrysops fuliginosus Wiedemann. Collected by Ezell, et. al. (1974) at Charleston, S. C. from III to VI; also obtained at other coastal localities in S. C. It is common in maritime forest, in salt marshes, and in dune and beach areas; the larvae occur in the soil of Spartina marshes (Ezell, personal communication). In Carteret County, N. C., "larvae were recovered from all dominant (salt marsh) vegetative types, but greater densities were found in areas flooded twice daily by high tides and dominated by SA" (Dukes, Edwards, and Axtell, 1974). According to Rockal and Hansens (1970a), the adults leave the salt marsh for higher ground soon after emergence.

Chrysops obsoletus Wiedemann. Collected by Ezell, et. al. (1974) at Charleston and Georgetown, S. C., V to VIII. It occurs commonly in maritime forest and in areas of seabeach and dune (Ezell, personal communication).

Microtabanus pygmaeus (Williston). A single specimen collected near Beaufort, S. C., VI (Ezell, et. al., 1974).

Leucotabanus annulatus (Say). Collected by Ezell, et. al. (1974) at Charleston, S. C., VI to VIII. It occurs commonly in maritime forest (Ezell, personal communication).

Tabanus atratus var. fulvopilosus Johnson. Collected by Ezell, et. al. (1974) at Charleston, S. C., V to X. Ezell (personal communication) states that it is common in all types of salt marsh, in maritime forest, and in dune and beach areas, and that another variety of T. atratus occurs rarely in maritime forest and dune-beach areas. According to Freeman and Hansens (1972), the larvae occur in the soil of N. J. salt marshes.

Tabanus lineola Fabricius. Found by Ezell, et. al. (1974) to occur at Charleston and Georgetown, S. C., summer months to X. It is common in all types of salt marshes, in maritime forest, and in dune and seabeach areas; the larvae occur in the soil of Spartina marshes (Ezell, personal communication). Dukes, Edwards, and Axtell (1974) obtained the larvae from salt marsh soil, Carteret County, N. C., mainly in areas dominated by short SA. Rockal and Hansens (1970b) state that "unlike T. nigrovittatus (entry below), T. lineola breeds primarily near the upland," in N. J.

Family Mydidae

Mydas clavatus (Drury). Collected at Harlowe Creek, Carteret County, N. C., VI (Pearse, 1936).

Family Asilidae

Laphystia litoralis Curran. Det. C. T. Greene. Abundant on sand beaches, Carteret County, N. C., summer months, and present until XII (Pearse, Humm, and Wharton, 1942). Range is from N. Y. to Fl. (Martin and Wilcox, 1965).

Family Bombyliidae

Villa sinuosa (Wiedemann) (= Anthrax sinuosa). Collected in vicinity of Morton's Mill Pond, Carteret County, N. C., VI (Pearse, 1936).

Family Empididae

Hybos sp. Det. R. H. Foote. Collected frequently, sometimes in abundance, in stand of SP, Bogue Banks, Carteret County, N. C., V through XI (Davis, Unp.).

Chersodromia inusitata (Melander). "Chersodromia adults occur on the wet or dry beaches of both fresh and salt water. Range is from Massachusetts to Florida." (Melander, 1965).

Family Dolichopodidae

Condylostylus caudatus (Wiedemann). Det. H. Robinson. Occasionally collected by sweep-net, PV and SP, Bogue Banks, Carteret County, N. C., summer months (Davis, Unp.).

Dolichopus marginatus Aldrich. Det. H. Robinson. Specimens occasionally collected by sweep-net and sticky plate, salt marshes, Carteret County, N. C. (Davis, Unp.).

Gymnopternus annulatus Van Duzee. Det. G. C. Steyskal. Very common in sticky plate collections, ground surface, DS salt marsh at Core Creek, Carteret County, N. C. Collected in smaller numbers by sweep-net at North River, various types of vegetation, and by sticky plate at JR, Core Creek (Davis, Unp.).

Paracleius alternans (Loew) (= Paraclytus vicinus). Det. H. Robinson. Fairly common in sweep-net collections from SP, V through VIII, Carteret County, N. C. (Davis and Gray, 1966).

Paracleius claviculatus Loew. Det. G. C. Steyskal & H. Robinson. Present occasionally in sweep-net collections from salt marsh vegetation, especially SA, summer and fall (Davis and Gray, 1966). Fairly common in sticky plate collections, ground surface of SA, Bogue Banks, Carteret County, N. C., VI through VIII.

Paracleius filifer Aldrich. Det. G. C. Steyskal. Common, sometimes abundant, in sticky plate collections, ground surface of SA; sometimes collected on sticky plates from other types of salt marshes; VI through VIII, Carteret County, N. C. (Davis, Unp.).

Paracleius hybridus Melander. Det. H. Robinson. Occasionally collected by sweep-net, SA salt marsh, Carteret County, N. C. (Davis, Unp.).

Pelastoneurus lamellatus Loew. Det. G. C. Steyskal and H. Robinson. Very common in sweep-net collections from SA and SAL-SA salt marsh vegetation, less common in DS, IV through XI, Carteret County, N. C. (Davis and Gray, 1966).

Pelastoneurus abbreviatus Loew. Det. G. C. Steyskal. Caught in abundance on sticky traps, ground surface, SA and DS salt marshes; less commonly caught on traps in other kinds of salt marsh; VI through VIII, Carteret County, N. C. (Davis, Unp.).

Thinophilus bimaculatus Johnson. Det. H. Robinson. A single collection of nine specimens from mixed marshy vegetation (SP, Fimbristylis castanea), Beaufort-Morehead City causeway, Carteret County, N. C., V (Davis, Unp.).

Thinophilus frontalis Van Duzee. Det. G. C. Steyskal. Occasionally collected on sticky plates, SA and DS salt marsh, Carteret County, N. C., VII and VIII (Davis, Unp.).

Thinophilus ochrifacies Van Duzee. Det. G. C. Steyskal and H. Robinson. Present in sweep-net collections, IV through XII, from both DS and SP salt marsh vegetation, but more abundant in DS; very common on sticky plates, ground surface of SA marsh, less common in DS, VI through VIII; Carteret County, N. C. (Davis, Unp.).

Thinophilus vespertinus Robinson. Det. G. C. Steyskal. Often abundant in sticky plate collections, ground surface, SA salt marsh, Bogue Banks, Carteret County, N. C., VI and VII (Davis, Unp.).

Hypacharassus gladiator Mik. "Hypacharassus larvae are intertidal and form cocoons of sand in which the insect pupates. Adults are occasionally found in immense numbers on floating seaweed" (Foote, Coulson, and Robinson, 1965). Pearse, Humm, and Wharton (1942) report collections of larvae of either H. gladiator or H. pruinus (entry below) from Bird Shoal, Carteret County, N. C., VI.

Hypacharassus pruinus (Wheeler). Det. H. Robinson. Range is coastwise, from New England to Fl. (Foote, Coulson, and Robinson, 1965). Adults collected in intertidal zone, protected areas (sounds, estuaries), Carteret County, N. C., summer months. (Davis, Unp.).

Medetera aberrans Wheeler (= Medetera lobatus). Det. H. Robinson. Collected occasionally by sweep-net, spring months, SA, Carteret County, N. C. (Davis, Unp.).

Keirosoma slossonae Van Duzee. Det. G. C. Steyskal. Single specimens collected on sticky plates, ground surface, DS salt marsh, Core Creek, Carteret County, N. C., VII and VIII (Davis, Unp.). Previously reported from Fl. (Foote, Coulson, and Robinson, 1965).

Syntormon cinereiventre (Loew). Det. G. C. Steyskal. One specimen collected on a sticky plate, ground surface of DS marsh, Core Creek, Carteret County, N. C., VII (Davis, Unp.).

Diaphorus contiguus Aldrich. Det. G. C. Steyskal. Collected occasionally on sticky plates, ground surface, SP marsh, Bogue Banks, Carteret County, N. C., VI through VIII (Davis, Unp.).

Diaphorus leucostoma Loew. Det. H. Robinson. Twenty-one specimens obtained in two sweep-net collections, mixed marshy vegetation (SP, Fimbristylis castanea), Beaufort-Morehead City causeway, Carteret County, N. C., V and VI (Davis, Unp.).

Chrysotus discolor Loew. Det. H. Robinson. Collected both by sweep-net and sticky plate, SP and DS salt marshes, Carteret County, N. C. The species of Chrysotus are quite difficult to distinguish apart, but all three species listed (C. discolor, C. picticornis, C. simulans) appear to be fairly abundant in SP and DS in the summer months (Davis, Unp.).

Chrysotus picticornis Loew. Det. H. Robinson. See entry for C. discolor above.

Chrysotus simulans Van Duzee. Det. G. C. Steyskal. See entry for C. discolor above.

Asyndetus syntormoides Wheeler. Det. H. Robinson. Occasionally present in sweep-net samples from salt marsh vegetation, Carteret County, N. C., summer months (Davis, Unp.).

Family Phoridae

Megaselia spp. Det. W. W. Wirth. Three species were frequently obtained by sticky plates, ground surface of SA, DS and JR salt marshes, especially SA, summer months, Carteret County, N. C. These species were never found in sweep-net samples (Davis, Unp.).

Family Pipunculidae

Pipunculus (Eudorylas) sp. (probably P. cinctus cinctus Banks). Collected occasionally by sweep-net from salt marsh vegetation, Carteret County, N. C. (Davis, Unp.). Range is coastwise, from Va. to Fl. (Hardy, 1965).

Pipunculus biscaynei Cresson (= Dorilas biscaynei). Collected occasionally by sweep-net from DS salt marsh, Carteret County, N. C. (Davis, Unp.).

Tomösvaryella appendipes (Cresson). Collected occasionally by sweep-net from salt marsh vegetation, Carteret County, N. C. (Davis, Unp.).

Tomösvaryella coquilletti (Kertész). Fairly common in sweep-net collections from DS, Carteret County, N. C. (Davis and Gray, 1966).

Family Conopidae

Stylogaster biannulata (Say). Collected a few times by sweep-net from salt marsh vegetation, Carteret County, N. C. (Davis, Unp.).

Family Syrphidae

Mesograpta polita (Say) (= Mesogramma polita). Collected at Calico Creek, Carteret County, N. C., VI (Pearse, 1936).

Family Otitidae

Chaetopsis apicalis Johnson. Det. R. H. Foote. Collected by sweep-net from vegetation, SA marshes, year around except in coldest weather, Carteret County, N. C. This species is a highly characteristic inhabitant of SA salt marsh (Davis and Gray, 1966). Abundant in vacuum collections from SA marsh, Morehead City, Carteret County, N. C. (McMahan, Knight, and Camp, 1972). A common species in SA marshes, Sapelo Island, Ga. (Marples, 1966). Much more abundant at Sapelo Island than C. aenea, entry below (Kale, 1964).

Chaetopsis fulvifrons (Macquart). Det. R. H. Foote. Collected by sweep-net from SA, less frequently from other kinds of salt marsh vegetation, IV through XII, Carteret County, N. C. C. fulvifrons is even more abundant in the Carteret County marshes than C. apicalis (entry above), and was present in 100% of the sweep-net samples taken from SA (Davis and Gray, 1966). This species is also reported by Pearse (1936), presumably occurring on the vegetation adjacent to the brackish bodies of water that he names as collection sites.

Chaetopsis aenea (Wiedemann). Reported by Pearse (1936) from Calico Creek and Eastman's Creek (presumably collected from the adjacent vegetation), Carteret County, N. C., VI and VII. Davis and Gray (1966) did not find it in their extensive collections of salt marsh insects. According to Marples (1966) it is a common insect in SA marshes at Sapelo Island, Ga. Kale (1964) states that it is less abundant at Sapelo Island than C. apicalis (entry above). Neither Marples nor Kale indicate if their identification was verified by an expert. Steyskal (1965a) has stated that "most of the published locality records of aenea (and) fulvifrons...are unreliable."

Euxesta notata (Wiedemann). Det. R. H. Foote. Collected occasionally by sweep-net, salt marsh vegetation (SP, JR, DS, SA), Carteret County, N. C., IV through VIII (Davis, Unp.).

Family Platystomatidae

Rivellia quadrifasciata (Macquart). Det. R. H. Foote. Collected occasionally by sweep-net from salt marsh vegetation (usually SP), Carteret County, N. C., V through VIII (Davis, Unp.).

Rivellia succinata (Wiedemann). Det. R. H. Foote. Collected three times by sweep-net from salt marsh vegetation (SA, VI and VIII; JR, VI), Goose Bay, Carteret County, N. C. (Davis, Unp.).

Family Tephritidae

Tephritis stigmatica (Coquillett). Det. R. H. Foote. Collected three times by sweep-net from SP, XI through III, and occasionally from other types of salt marsh vegetation, XI through VI, Carteret County, N. C. This species was found to be much more abundant in winter than at other seasons (Davis, Unp.).

Family Sciomyzidae

Dictya oxybeles Steyskal. Det. G. C. Steyskal. Fairly common in sweep-net collections from SA, all months of the year; collected occasionally from other types of salt marsh vegetation; Carteret County, N. C. The larvae are probably parasites of a marine snail, such as the salt marsh periwinkle (Littorina irrorata) or the mud snail (Nassarius obsoletus) (Davis and Gray, 1966).

Hoplodictya setosa (Coquillett). Present in SA salt marshes, Sapelo Island, Ga. (Marples, 1964). A coastal species whose range is from Mass. to Ga. (Steyskal, 1965b).

Hoplodictya spinicornis (Loew). Det. G. C. Steyskal. Not common; collected occasionally by sweep-net from SA and SAL-SA, Carteret County, N. C., V through IX (Davis, Unp.).

Family Canaceidae

Canace snodgrassii Coquillett. "Canaceids are almost all intertidal. The larvae feed on algae on wave-splashed rocks or sandy beaches..." This species occurs from Prince Edward Island to Fl., along the Atlantic coast of North America (Wirth, 1965b).

Family Ephydriidae

Polytrichophora agens Cresson. Apparently limited to marine and/or estuarine habitats; coastwise range extends from Ma. to Tx. (Wirth, 1965c).

Polytrichophora conciliata Cresson. Det. W. W. Wirth. Sporadically abundant in sweep-net collections from DS and SA salt marsh vegetation; sometimes collected in small numbers from SP and SAL-SA; IV through XI, Carteret County, N. C. (Davis, Unp.).

Clanoneurum americanum Cresson. Range includes "Atlantic and Gulf States in saline habitats" (Wirth, 1965c).

Psilopa compta (Meigen). Present in SA, Sapelo Island, Ga. (Marples, 1964). According to Kale (1964), it is probably eaten by the long-billed marsh wren at Sapelo Island.

Psilopa flavida Coquillett. Det. W. W. Wirth. Collected fairly often by sweep-net from SA and DS vegetation, IV through II, Carteret County, N. C. This species is occasionally abundant in SA marsh (Davis and Gray, 1966). Wirth (1965c) gives its range as "coastal, Maine to Texas."

Ceropsilopa costalis Wirth. Det. W. W. Wirth. Frequently collected by sweep-net from vegetation, DS salt marshes, and occasionally from SA, IV through IX, Carteret County, N. C. In DS, this species is sometimes abundant (Davis and Gray, 1966).

Ceropsilopa coquilletti Cresson. Det. W. W. Wirth. Occasionally collected by sweep-net, SA and DS salt marshes, IV through X, Carteret County, N. C. (Davis, Unp.).

Ceropsilopa mellipes (Coquillett). Det. W. W. Wirth. Collected occasionally on sticky plates, ground surface, JR salt marsh, Bogue Banks, Carteret County, N. C., VI through VIII (Davis, Unp.).

Cressonomyia aeneonigra (Loew) (= Cressonomyia fulvipennis and Plagiopsis aeneonigra). Det. W. W. Wirth. Collected occasionally by sweep-net from vegetation, SA salt marsh, Carteret County, N. C., VIII through II (Davis, Unp.). Present in SA salt marshes, Sapelo Island, Ga. (Marples, 1964; Kale, 1964).

Cressonomyia hinei (Cresson). Wirth (1965c) calls this a "coastal" species, and gives its range as being from N. Y. to Tx.

Nostima quinquenotata Cresson. Det. W. W. Wirth. Three collections by sweep-net from salt marsh vegetation (North River, SP IX; Beaufort Channel, SA, XII; Nelson Bay, DS, VIII); Carteret County, N. C. (Davis, Unp.).

Notiphila bispinosa Cresson. Det. W. W. Wirth. Frequently collected by sweep-net from SA vegetation, less frequently from DS, Carteret County, N. C., IV through XI. This species is often abundant in SA marshes near their upper elevations (Davis and Gray, 1966). Kale (1964) notes that it is "fairly abundant" in SA marsh at Sapelo Island, Ga.

Parydra imitans Loew. Present in SA salt marshes, especially from I through III, Sapelo Island, Ga. (Marples, 1964). Kale (1964) notes that this species is "relatively common" at Sapelo Island and is occasionally eaten by the long-billed marsh wren. It is referred to as a "coastal" species by Wirth (1965c), and its range along the Atlantic coast is from Nova Scotia to Ga.

Parydra unituberculata Loew. Det. W. W. Wirth. Four collections by sweep-net from salt marsh vegetation, Carteret County, N. C. (Goose Bay, JR, III; Beaufort Channel, SA, II and X; Lennoxville Point, SA, V) (Davis, Unp.).

Lipochaeta slossonae Coquillett. Wirth (1965c) gives the habitat of this species as "coasts and saline habitats," and indicates that it has been reported from Mass., Md., and Fl.

Dimecoenia austrina (Coquillett). Det. W. W. Wirth. Collected by sweep-net from SAL-SA, year around, Carteret County, N. C. This species is quite common, and was collected occasionally in SA and DS as well; it seems to frequent the area around the high tide mark (Davis and Gray, 1966; Davis, Unp.). Wirth (1965c) gives its coastwise distribution as including the area from Tx. to Va.

Dimecoenia spinosa (Loew). Wirth (1965c) calls this a coastal species and gives its coastwise range as being from New Brunswick to Fl.

Neoscatella obscuriceps (Cresson). Det. W. W. Wirth. Extremely common in sweep-net collections from various types of salt marsh vegetation grazed by cattle, North River, Carteret County, N. C. Only occasionally collected elsewhere. Period of peak abundance is late winter and spring (Davis, Unp.).

Scatella picea (Walker). Det. W. W. Wirth. Collected occasionally by sweep-net from various types of salt marsh vegetation, Carteret County, N. C., VII through XII (Davis, Unp.).

Family Chamaemyiidae

Leucopsis sp. Reported from the stomach of the long-billed marsh wren by Kale (1964).

Family Lauxaniidae

Lauxaniella trivittata (Loew) (= Lauxania facialis). Collected at Mullet Pond, Carteret County, N. C., IV (Pearse, 1936).

Family Chloropidae

Hippelates bicolor Coquillett. Four collections by sweep-net from salt marsh vegetation, Carteret County, N. C. (Lennoxville Point, DS, VIII and SP, VI; Harlowe Creek, DS, VI and VIII) (Davis, Unp.). Restricted to coastal habitats from N. Y. to Tx. (Sabrosky, 1965).

Hippelates bishoppi Sabrosky. One specimen collected by sweep-net, Beaufort-Morehead City Causeway, Carteret County, N. C., SP, V (Davis, Unp.).

Hippelates dissidens Loew. Det. C. W. Sabrosky. Fairly common in sweep-net collections DS, present but less common in SA and SP, V to XI, Carteret County, N. C. (Davis and Gray, 1966).

Hippelates nobilis Loew. Collected twice by sweep-net from salt marsh vegetation, Carteret County, N. C. (Nelson Bay, PV, V, and DS, VIII) (Davis, Unp.).

Hippelates particeps Becker. Det. C. W. Sabrosky. Abundant in sweep-net collections from SP vegetation, occasional in DS, V to IX, Carteret County, N. C. (Davis and Gray, 1966).

Hippelates plebejus Loew. Collected twice by sweep-net from salt marsh vegetation, Carteret County, N. C. (Nelson Bay, DS, and Piver's Island, SP, Both VIII) (Davis, Unp.).

Hippelates pusio Loew. Three collections by sweep-net from salt marsh vegetation, Carteret County, N. C. (Bogue Banks, SAL-SA, VIII; Beaufort Channel, SA, VII; Piver's Island, SP, VII) (Davis, Unp.).

Ceratobarys eulophus (Loew). Det. C. W. Sabrosky. Five collections by sweep-net from salt marsh vegetation, Carteret County, N. C. North River, DS, V, and JR, I; Harlowe Creek, SA, VIII and DS, VII; Lennoxville Point, DS, VIII) (Davis, Unp.).

Elachiptera angustifrons Sabrosky. Det. C. W. Sabrosky. Collected three times by sweep-net from salt marsh vegetation, Carteret County, N. C. (Beaufort Channel, SA, XI; Lennoxville Point, SA, VIII; North River, SA, VIII) (Davis, Unp.). A coastal species (Sabrosky, 1965).

Elachiptera sp. near penita (Adams). Det. C. W. Sabrosky. Nineteen collections by sweep-net from SA vegetation, Carteret County, N. C., VI to II (Davis, Unp.). According to Kale (1964) and Marples (1964), a species of Elachiptera is found rather commonly in sweep-net samples from SA at Sapelo Island, Ga.

Eribolus longulus (Loew). A single sweep-net collection from salt marsh vegetation, Carteret County, N. C. (Lennoxville Point, SA, VII) (Davis, Unp.).

Monochaetoscinella nigricornis (Loew). Det. C. W. Sabrosky. Collected occasionally by sweep-net from salt marsh vegetation (SA, DS, SP, JR), Carteret County, N. C., V to XII. This species was never present in large numbers (Davis, Unp.).

Oscinella carbonaria (Loew). Det. C. W. Sabrosky. Distribution sporadic, but sometimes quite abundant in sweep-net collections, SA salt marshes, Carteret County, IV to IX (Davis and Gray, 1966). Also occasionally collected by sweep-net from PV, DS, and SP, and on sticky plates, ground surface of salt marshes (Davis, Unp.).

Oscinella coxendix (Fitch). Collected five times by sweep-net from salt marsh vegetation, Carteret County, N. C. (Lennoxville Point, SA and DS, both VIII; Nelson Bay, DS, VIII; North River, DS, V; Goose Bay, SA, VI) (Davis, Unp.).

Oscinella infesta Becker (= Conioscinella infesta). Det. C. W. Sabrosky. Authoritative determinations of this species and Oscinella insularis (entry below) seem inconsistent; either they are conspecific or quite difficult to distinguish apart. O. infesta has been reported by Davis and Gray (1966) to be extremely abundant in sweep-net collections from SA vegetation, and much less abundant but common in other types of salt marshes, III to XII, Carteret County, N. C. If only one species is represented in the count, O. infesta is by far the commonest species in the salt marshes of Carteret County at most times of the year. According to Sabrosky (1965), O. infesta is strictly coastal in distribution, and occurs from Ma. to Tx.

Oscinella insularis Malloch. Det. C. W. Sabrosky. Common on sticky plates, ground surface of salt marshes (SA, DS, SP, JR, Core Creek and Bogue Banks), VI to VIII. Carteret County, N. C. C. W. Sabrosky identifies these as O. insularis although they appear to me to be identical to specimens swept from vegetation that were determined by him to be O. infesta (see entry for O. infesta, above) (Davis, Unp.). According to Marples (1964), O. insularis is very abundant at Sapelo Island, Ga. in SA marshes; he also mentions this species in his paper of 1966. According to Sabrosky (1965), O. insularis has been reported from Mass., Va., and Ga.

Oscinella neocoxendix Sabrosky. Det. C. W. Sabrosky. Seven collections by sweep-net from salt marsh vegetation, Carteret County, N. C. (Bell Creek, JR, VIII; Lennoxville Point, DS, VII; Nelson Bay, DS, VI; Piver's Island, SP, VII; Beaufort Channel, SP, IX; North River, SAL-SA, IX; Lennoxville Point, DS, VII; Bogue Banks, SA, VII) (Davis, Unp.).

Oscinella ovalis (Adams). Det. C. W. Sabrosky. Abundant in sweep-net collections, DS, and common in PV and SP, Carteret County, N. C., V to X (Davis and Gray, 1966).

Conioscinella nuda (Adams) (= Oscinella nuda). Det. C. W. Sabrosky. Sporadic, but sometimes abundant in sweep-net collections from SA salt marshes; more common, but never as abundant, SP and DS vegetation; Carteret County, N. C., V to X (Davis and Gray, 1966).

Ectecephala albistylum Macquart. Det. C. W. Sabrosky. One collection by sweep-net, from DS vegetation, Core Creek, Carteret County, N. C., IX (Davis, Unp.).

Olcella trigramma (Loew) (= Madiza trigramma). Common in sweep-net collections from SA salt marshes, occasional in PV, SP, and DS, Carteret County, N. C., V to XI (Davis and Gray, 1966).

Family Anthomyiidae

Hylemya sp. Det. R. H. Foote. Five collections by sweep-net from SA (North River and Goose Bay) and single collections from JR, SP, and SAL-SA, Carteret County, N. C., IX to III. This species seems to occur only in fall and winter months. (Davis, Unp.). Found in digestive tract of long-billed marsh wren at Sapelo Island, Ga. (Kale, 1964).

Family Muscidae

Coenosia spp. Det. R. H. Foote. Occasional specimens in sweep-net collections from JR, SA, SP, and DS vegetation, Carteret County, N. C., all months of the year. At least two, and probably more, species of Coenosia occur in the N. C. salt marshes (Davis, Unp.).

Family Callophoridae

Cochliomyia macellaria (Fabricius) (= Callitroga macellaria). Det. C. W. Sabrosky. Collected twice by sweep-net from SA (North River and Bogue Banks), Carteret County, N. C., IX and XI. Actually this large callophorid is rather common in salt marshes, and can often be seen on the tips of SA leaves, but it is a strong flyer and usually eludes the net (Davis, Unp.).

Family Sarcophagidae

Sarcophaga johnsoni Aldrich. Range is from Mass. to Tx.; found only along the seacoast (Downes, 1965).

Sarcophaga sarracenoides Aldrich. Collected at Open Grounds, Carteret County, N. C., VI (Pearse, 1936).

Sarcophaga sp. Occasional collections by sweep-net and sticky plate, salt marshes, Carteret County, N. C. (Davis, Unp.). Present in SA marshes, Sapelo Island, Ga. (Kale, 1964).

Tricharaea simplex (Aldrich). Restricted to littoral habitats; occurs coastwise from S. C. to Tx.; has been reared from dead snails (Downes, 1965).

Order Hymenoptera

Family Braconidae

Apanteles marginiventris Ashmead. Det. C. F. W. Muesebeck. Collected four times (Bogue Banks, SAL-SA, VIII and IX; North River, JR, V; Beaufort Channel, SP, IV) by sweep-net from salt marsh vegetation, Carteret County, N. C. (Davis, Unp.).

Bracon gelechia Ashmead. Det. C. F. W. Muesebeck. Collected twice (Bogue Banks, V, and North River IX) by sweep-net from SP salt marsh, Carteret County, N. C. (Davis, Unp.).

Bracon nuperus Cresson. Det. C. F. W. Muesebeck. Collected once by sweep-net from vegetation, SAL-SA, Bogue Banks, VIII, Carteret County, N. C.

Orgilus gelachivorus Cushman. Det. C. F. W. Muesebeck. Collected once by sweep-net, from SP, Beaufort Channel, V; Carteret County, N. C. (Davis, Unp.).

Family Ichneumonidae

Clistopyga alutaria Townes. Det. L. M. Walkley. One female collected by sweep-net from SA, Bogue Banks, Carteret County, N. C., VIII (Davis, Unp.).

Gelis sp. nr. perniciosus (Viereck). Det. L. M. Walkley. Two specimens, both females, collected by sweep-net from SP, Bogue Banks, Carteret County, N. C., XII (Davis, Unp.).

Neliopisthus sp. Det. L. M. Walkley. Several specimens, all males, collected by sweep-net from SP, Beaufort Channel, Carteret County, N. C., IV and IX (Davis, Unp.).

Pseuderipterus radiolatus (Provancher). Det. L. M. Walkley. Two collections by sweep-net from SA, Beaufort Channel, Carteret County, N. C., X and XI (Davis, Unp.).

Hyposoter sp. Det. L. M. Walkley. Two specimens collected by sweep-net from SA, Beaufort Channel and Bogue Banks, Carteret County, N. C., VIII and IX (Davis, Unp.).

Temelucha sp. nr. brevipetiolatus. Det. L. M. Walkley. Eight specimens collected from mixture of SP and Fimbristylis castanea, Morehead City-Beaufort Causeway, Carteret County, N. C., VI (Davis, Unp.).

Tricholabus sp. Det. L. M. Walkley. Collected three times by sweep-net from salt marsh vegetation, Bogue Banks (SA, VII and VIII and SP, VII), Carteret County, N. C. (Davis, Unp.).

Tromatobia zonata (Davis). Det. L. M. Walkley. A single specimen collected by sweep-net (SAL-SA, Bogue Banks, IX), Carteret County, N. C. (Davis, Unp.).

Schizopyga pulchra Walley. Det. L. M. Walkley. Several specimens collected by sweep-net from SA, North River and Beaufort Channel, Carteret County, N. C., X and XI (Davis, Unp.). Present in SA salt marshes, Sapelo Island, Ga. (Kale, 1964).

Family Eulophidae

Horismenus texanus (Girault). Det. B. D. Burks. One specimen collected by sweep-net, SP, North River, Carteret County, N. C., VIII (Davis, Unp.).

Tetrastichus oecanthivorus compar Gahan. Det. B. D. Burks. Collected twice by sweep-net from SP, North River, Carteret County, N. C., VIII (Davis, Unp.).

Tetrastichus polynemae Ashmead. Det. B. D. Burks. Collected four times by sweep-net from SA, North River, Carteret County, N. C., IX to XII (Davis, Unp.).

Family Encyrtidae

Meromyzobia sp. Det. B. D. Burks. Collected by sweep-net from SA, Carteret County, N. C. This species appears to be fairly common in SA during the winter months, being collected only from XI through IV (Davis, Unp.).

Family Pteromalidae

- Callitula illinoensis. (Ashmead). Det. B. D. Burks. Collected four times by sweep-net from salt marsh vegetation (Core Creek, DS, III; North River, SA, XII; Beaufort Channel, SA, III and IX), Carteret County, N. C. (Davis, Unp.).
- Eupteromalus americanus Gahan. Det. B. D. Burks. Collected twice by sweep-net from SA, Bogue Banks, Carteret County, N. C., VIII (Davis, Unp.).
- Eupteromalus subapterus (Riley). Det. B. D. Burks. A single collection by sweep-net from SA, North River, Carteret County, N. C., IX (Davis, Unp.).
- Norbanus perplexus (Ashmead). Det. B. D. Burks. Collected twice by sweep-net from SP (Piver's Island and Beaufort Channel), Carteret County, N. C., IV and VII (Davis, Unp.).

Family Eurytomidae

- Eurytoma sp. Det. B. D. Burks. Collected twice by sweep-net from salt marshes, Beaufort Channel, Carteret County, N. C., VI and IX (Davis, Unp.). Reported to occur in SA salt marshes, Sapelo Island, Ga. by Kale (1964) and Marples (1964).
- Rileya cecidomyiae Ashmead. Det. B. D. Burks. Collected twice by sweep-net (North River, DS, XI; Beaufort Channel, SP, IX), salt marshes, Carteret, N. C. (Davis, Unp.).
- Tenuipetiolus sp. Collected five times by sweep-net from SA (Bogue Banks, VIII, and Beaufort Channel, VIII and IX), Carteret County, N. C. (Davis, Unp.). According to Kale (1964), it occurs in SA salt marsh at Sapelo Island, Ga.

Family Chalcididae

- Haltichella xanticles (Walker). Det. B. D. Burks. Collected once by sweep-net from DS, Core Creek, Carteret County, N. C., VIII (Davis, Unp.).

Family Elasmidae

- Elasmus marylandicus Girault. Det. B. D. Burks. Collected twice by sweep-net from SP (Bogue Banks and North River), Carteret County, N. C., VIII (Davis, Unp.).

Family Cynipidae

- Disholcaspis virens (Ashmead). Det. L. H. Weld. Collected once by sweep-net from SP, Bogue Banks, Carteret County, N. C., XII (Davis, Unp.).

Family Scelionidae

- Ceratoteleia marlattii Ashmead. Det. C. F. W. Muesebeck. Collected once by sweep-net from SP, Bogue Banks, Carteret County, N. C., VIII (Davis, Unp.).
- Stictoteleia sp. Det. C. F. W. Muesebeck. Collected frequently, usually in small numbers, by sweep-net from DS, SP, and SA salt marshes, Carteret County, N. C., VI to XI (Davis, Unp.).
- Stictoteleia virginianensis (Ashmead). Det. C. F. W. Muesebeck. Collected three times by sweep-net from salt marshes (Core Creek, DS; Goose Bay, JR), Carteret County, N. C., VIII and X (Davis, Unp.).
- Telonomus podisi Ashmead. Det. C. F. W. Muesebeck. Collected three times by sweep-net from salt marshes (Bogue Banks, SAL-SA; North River, DS and SP), Carteret County, N. C., IV, X and XI (Davis, Unp.). Very common in SA salt marsh, Sapelo Island, Ga., and often found in stomach of long-billed marsh wren (Kale, 1964).

Family Formicidae

- Pseudomyrmex pallida F. Smith. Found in grassy salt marshes, Carteret County, N. C. "Nests were located in grass stems" (Carter, 1962). Fairly common in sweep-net collections, SP salt marsh, V through XII, Carteret County, N. C. Det. M. R. Smith (Davis and Gray, 1966).
- Pogonomyrmex badius (Latreille). Collected from grassy depressions between sand dunes, Bogue Banks, Carteret County, N. C. "All colonies observed were located in dry sand at unshaded sites. The nest entrance was marked by characteristic large domed mounds...Activity was observed from V to IX" (Carter, 1962).
- Aphaenogaster flemingi M. R. Smith. Collected from two grassy depressions between dunes, Bogue Banks, Carteret County, N. C...."A distinct preference for open, grassy sites of dry, sandy soil was indicated...Activity was noted from V to IX" (Carter, 1962). A few specimens were collected by sweep-net from SP salt marshes, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.).
- Aphaenogaster floridana M. R. Smith. "Occurs in depressions between sand dunes on Bogue Banks (Carteret County, N. C.). All nests were found in sandy, dry soil. Activity was noted from V to IX" (Carter, 1962).
- Pheidole dentata Mayr. Collected from grassy areas of sand dunes and open maritime forests, Bogue Banks, Carteret County, N. C. "Soil nests were located in well-drained areas, often under stones or other cover. Colonies also occur in decayed stumps and logs." Collected from IV through XII (Carter, 1962).

- Pheidole morrisi Forel. Collected in maritime forests, Bogue Banks, Carteret County, N. C. "Nests may be constructed in unprotected areas or at the base of grass clumps ... (or) under stones." Collected from IV through XII (Carter, 1962). A few individuals collected by sweep-net from salt marsh vegetation, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.).
- Crematogaster atkinsoni W. M. Wheeler. This species occurs in SP marsh, Carteret County, N. C. "The hanging nests of plant detritus (are) either attached to, and supported by, a number of grass stalks, or built up into the grass from the dense base of the clumps" (Carter, 1962). A few specimens were collected by sweep-net from SA and SP marsh vegetation, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.).
- Crematogaster clara Mayr. Collected from among stands of Uniola paniculata (sea oats), SP, grassy areas on or between dunes, and maritime forest, Carteret County, N. C., IV through XII (Carter, 1962). Collected frequently, but in fairly small numbers, from all types of salt marsh vegetation, Carteret County, IV through I. Colonies nest in the hollow stems of dead SA. Det. M. R. Smith (Davis and Gray, 1966; Davis, Unp.). Found in SA marsh, Sapelo Island, Ga. (Marples, 1964). Colonies found nesting in standing stalks of dead SA, Sapelo Island, Ga. This species is an important food item of the long-billed marsh wren (Kale, 1964).
- Crematogaster lineolata (Say). Collected in maritime forest, Bogue Banks, Carteret County, N. C. "Nests are found in stumps, logs, and standing dead trees and in the soil under stones or other cover. Collections were made from IV to XI" (Carter, 1962).
- Monomorium minimum (Buckley). Collected in live-oak stands on Bogue Banks, Carteret County, N. C. "Nests are constructed in the soil, and may be observed under stones, logs, litter, or other cover" (Carter, 1962). Fairly common in sweep-net collections from SP marshes, Carteret County, N. C., V through X. Det. M. R. Smith (Davis and Gray, 1966).
- Myrmecina americana (Emery). Collected in live oak forest, coastal counties of N. C. "Nests are found in the soil under stones or other cover... Collections were recorded for the months of IV to XI" (Carter, 1962).
- Leptothorax pergandei Emery. Collected from live-oak forest, coastal counties of N. C., III to XI. Nests in the soil or in rotten wood (Carter, 1962). Occasionally collected by sweep-net from SP, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.).
- Leptothorax curvispinosus Mayr. Collected from live-oak forest, coastal counties of N. C. Nests occur in twigs and branches of woody plants, stems of herbaceous plants, and acorns (Carter, 1962).
- Dolichoderus mariae Forel. Collected in moist grassy areas in depressions between dunes, Bogue Banks, Carteret County, N. C. Prefers to nest in sandy soil. Active above ground, VI through IX (Carter, 1962).
- Dolichoderus pustulatus Mayr. Collected from "dense grassy salt marshes periodically flooded by high tides," Carteret County, N. C. (Carter, 1962). Occasionally collected by sweep-net from salt marsh vegetation, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.).
- Iridomyrmex pruinosus (Roger). "Colonies were... discovered on the sand dunes of Bogue Banks (Carteret County, N. C.) in grassy areas of sea oats, broomsedge, and SP, and in grassy dune depressions... Nests are constructed in the soil, and the entrance often marked by craters... Collections were recorded for the months of III to XII" (Carter, 1962). Frequently collected in small numbers by sweep-net from SP, and occasionally from DS, IV through IX, Carteret County, N. C. Det. M. R. Smith (Davis, Unp., Davis and Gray, 1966).
- Dorymyrmex pyramicus (Roger). "It is an abundant and characteristic ant of the sand dunes of Bogue Banks (Carteret County, N. C.)... Nests are constructed in the soil with entrances marked by craters. Activity was noted from V to IX" (Carter, 1962). Frequently collected in small numbers by sweep-net from SP, Carteret County, N. C., VI through IX. Det. M. R. Smith (Davis, Unp.; Davis and Gray, 1966).
- Tapinoma sessile (Say). Collected from coastal counties of N. C. "Nests occur in the soil under stones and logs and in rotten stumps and logs" (Carter, 1962). Collected by sweep-net rather frequently, but in small numbers, from SP, and less frequently from DS, V through IX, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.; Davis and Gray, 1966).
- Camponotus pennsylvanicus (DeGeer). Collected in maritime forest, Bogue Banks, Carteret County, N. C. "Colonies were found in decayed stumps and logs, especially hardwood. Nests are also established in standing dead trees or in living trees with hollow portions and extensively decayed areas. Collections were recorded for the months of IV to XI" (Carter, 1962).

- Camponotus castaneus (Latreille). Collected from live-oak forests, coastal counties of N. C. "Colonies are found in decayed stumps and logs...Stump nests may extend into the roots below the soil surface. Collections were made from V to IX" (Carter, 1962).
- Camponotus pylartes fraxinicola M. R. Smith. "These ants live in hollow dead stems of Spartina," Sapelo Island (Marples, 1964). Specimens found in the digestive tract of the long-billed marsh wren at Sapelo Island (Kale, 1964).
- Paratrechina (Nylanderia) spp. Occasionally obtained in sweep-net collections from all types of salt marsh vegetation, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.).
- Prenolepis imparis (Say). Collected from live-oak forests, coastal counties, N. C. "All nests were located in the soil." Most common V through IX (Carter, 1962). A few specimens obtained by sweep-net from various kinds of salt marsh vegetation, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.).
- Lasius alienus (Foerster). Collected in live-oak forests, coastal counties, N. C. "Colonies are found in the soil under stones and in stumps and logs. Collections were taken from IV to X" (Carter, 1962).
- Lasius neoniger Emery. Collected in coastal counties, N. C., mainly from abandoned fields. "Nests were subterranean, with entrances marked by craters. Some colonies were found under stones. Activity was noted from IV to XI" (Carter, 1962). Occasionally collected by sweep-net from SP salt marshes, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.).
- Formica (Neofornica) spp. Occasionally collected by sweep-net from SP and other salt marsh vegetation, Carteret County, N. C. Det. M. R. Smith (Davis, Unp.).

Unless otherwise noted, the species for the following families were collected at Kill Devil Hills, N. C.

Family Chrysididae

- Hedychrum violaceum Brulle. Occurs on sand barrens and in maritime forests, V to VII (Krombein, 1958).
- Chrysis equidens Viereck. Collected on sand barrens, V to VII (Krombein, 1958).
- Chrysis conica Brulle. A single specimen collected on sand barrens, VIII (Krombein, 1958).
- Chrysis stenodyneri Krombein. Collected on sand barrens, V to VII (Krombein, 1958).
- Chrysis derivata Buysson. Two collections from sand barrens, VI and VII (Krombein, 1958).
- Chrysis fabricii Mocsary. Collected on sand barrens and in maritime forest, VI to IX (Krombein, 1958).
- Chrysis smaragdula Fabricius. A single specimen collected on sand barrens, VIII (Krombein, 1958).
- Chrysis verticalis Patten. Det. K. V. Krombein. A single collection by sweep-net from SA, Beaufort Channel, Carteret County, N. C., IX (Davis, Unp.).
- Panorpis westcottii atlanticus Krombein. Occurs on sand barrens, VI to IX (Krombein, 1958). It has also been collected at Southport and Wrightsville Beach, N. C. Its host is probably Microbembex.

Family Tiphidae

- Tiphia convexa Allen. Maritime forest, V and VI (Krombein, 1949; Krombein, 1953).
- Tiphia conformis Malloch. Sandy barrens and maritime forest, mainly the former, VII and VIII (Krombein, 1953).
- Tiphia dryophila Krombein. Sandy barrens, V to VIII (Krombein, 1953).
- Tiphia egregia Viereck. Sandy barrens, V, and maritime forest, VIII (Krombein, 1952; Krombein, 1953).
- Tiphia floridana Robertson. Sandy barrens and maritime forest, mainly the former, VI to VIII (Krombein, 1952; Krombein, 1953).
- Tiphia hollowayi Allen. Sandy barrens, VI (Krombein, 1949).
- Tiphia infossata Allen. One specimen, maritime forest, VII (Krombein, 1952).
- Tiphia intermedia Malloch. Det. K. V. Krombein. A single collection from SP, Lennoxville Point, Carteret County, N. C. (Davis, Unp.). Collected by Krombein (1953) on sandy barrens at Kill Devil Hills, VIII.
- Tiphia micropunctata Allen. On specimen, maritime forest, VII (Krombein, 1959).
- Tiphia subcarinata Malloch. Maritime forest, VI and VII (Krombein, 1952).
- Tiphia transversa Say. Sandy barrens, VI to VIII (Krombein, 1952; Krombein, 1953).
- Tiphia waldenii Viereck. One specimen, VII, maritime forest (Krombein, 1952).
- Paratiphia algonquiana Viereck. Sandy barrens and maritime forest, VI and VII (Krombein, 1952).

Myzinum carolinianum carolinianum (Panzer). Sandy barrens, VI and VII (Krombein, 1952).
Myzinum dubiosum Cresson. Sandy barrens, VI to VIII (Krombein, 1952; Krombein, 1953).
Myzinum maculatum (Fabricius) (= Myzinum interrupta). Det. K. V. Krombein. Four specimens collected by sweep-net from SP, Piver's Island, Carteret County, N. C. VI and VII (Davis, Unp.). Maritime forest and sandy barrens, Kill Devil Hills, VII and VIII (Krombein, 1952; Krombein, 1953).

Methocha stygia Say. Maritime forest and sandy barrens, VI and VIII (Krombein, 1952).

Myrmosa unicolor Say. Maritime forest, VI and VII (Krombein, 1952).

Family Mutillidae

Pseudomethoca frigida (Smith) (= Pseudomethoca canadensis). Maritime forest, V and VII (Krombein, 1952; Krombein, 1953).

Pseudomethoca sanbornii aetis (Fox). Sandy barrens and maritime forest, V to VIII (Krombein, 1952; Krombein, 1953).

Pseudomethoca similina (Smith). Sandy barrens and maritime forest, V to VII (Krombein, 1949; Krombein, 1952).

Pseudomethoca vanduzeei Bradley. Maritime forest, VI and VII (Krombein, 1952).

Dasymutilla asopus bexar (Blake). Sandy barrens and maritime forest, VI and VII (Krombein, 1952).

Dasymutilla interrupta Banks. Sandy barrens and maritime forest, VI to VIII (Krombein, 1952; Krombein, 1953).

Dasymutilla lepeletierii (Fox). Sandy barrens and maritime forest, VI to VIII (Krombein, 1952; Krombein, 1953).

Dasymutilla mutata (Blake) (= Dasymutilla allardi). Maritime forest, VI to VIII (Krombein, 1952; Krombein, 1953).

Dasymutilla nigripes (Fabricius) (= Dasymutilla sparsa). Maritime forest, VI to VIII (Krombein, 1952; Krombein, 1953).

Dasymutilla occidentalis (Linnaeus). Sandy barrens and maritime forest, VI and VII (Krombein, 1952).

Dasymutilla vesta (Cresson). Maritime forest and sandy barrens, VI to VIII (Krombein, 1952; Krombein, 1953).

Timulla dubitata (Smith). Sandy barrens and maritime forest, V to VIII (Krombein, 1953).

Timulla euterpe (Blake). One specimen, maritime forest, VII (Krombein, 1952).

Timulla ornatipennis (Bradley). Sandy barrens and maritime forest, V to VII (Krombein, 1949; Krombein, 1952).

Timulla rufosignata (Bradley) (= Timulla dubitatiformis). Sandy barrens, V to VIII (Krombein, 1952; Krombein, 1953).

Ephuta scrupea (Say). Maritime forest, VI and VII (Krombein, 1952).

Ephuta battlei Bradley. Sandy barrens, VIII (Krombein, 1953).

Ephuta spinifera Schuster. Sandy barrens and maritime forest, V and VII (Krombein, 1952).

Family Rhopalosomatidae

Olixon banksii (Brues). Numerous males collected on sandy barrens, V and VI (Krombein, 1952).

Family Scoliididae

Campsomeris plumipes fossulana (Fabricius). Common on sandy barrens, less common in maritime forest, V to VII (Krombein, 1952; Krombein, 1953).

Campsomeris quadrinotata (Fabricius). One specimen collected at edge of maritime forest, V (Krombein, 1953).

Scolia bicincta Fabricius. One specimen collected on sandy barrens, VII (Krombein, 1953).

Scolia nobilitata Fabricius. One specimen collected at the edge of maritime forest, VII (Krombein, 1952).

Family Vespidae

Zethus spinipes variegatus Saussure. Sandy barrens and maritime forest, V to VIII (Krombein, 1952; Krombein, 1953).

Pseudodynerus quadrisectus Say. One specimen collected in maritime forest, VII (Krombein, 1952).

Monobia quadridens (Linnaeus). Collected in maritime forest and on sandy barrens, V to VIII (Krombein, 1952; Krombein, 1953).

Rhygchium foraminatum (Saussure). Two specimens collected on edge of maritime forest, V (Krombein, 1952).

Rhygchium hidalgo boreoorientalis (Becquaert). Sandy barrens, VIII (Krombein, 1959).

- Rhygchium megaera (Lepeletier). Sandy barrens and maritime forest, V to VIII (Krombein, 1953).
- Rhygchium molestum (Saussure) (= Rhygchium manifestum). Sandy barrens and maritime forest, V to VIII (Krombein, 1953).
- Ancistrocerus campestris (Saussure). Three specimens collected on sandy barrens and in maritime forest, V to VII (Krombein, 1952; Krombein, 1953).
- Ancistrocerus spinolae (Saussure). Maritime forest, V and VII (Krombein, 1959).
- Stenodynerus ammonia (Saussure). Sandy barrens, V to VIII (Krombein, 1952; Krombein, 1953).
- Stenodynerus fulvipes (Saussure). Collected on sandy barrens and in maritime forest, V to VII (Krombein, 1953).
- Stenodynerus histrio (Lepeletier). Collected on sandy barrens and in maritime forest, V to VIII (Krombein, 1953).
- Stenodynerus lineatifrons Bohart. Sandy barrens, V to VIII (Krombein, 1952).
- Stenodynerus oculus illinoiensis (Robertson) (= Odyneus oculus). Sandy barrens, VIII (Krombein, 1959).
- Stenodynerus pedestris (Saussure). Common in maritime forest, occasional on sandy barrens, VI to VIII (Krombein, 1952; Krombein, 1953).
- Stenodynerus perennis (Saussure). Maritime forest, V and VIII (Krombein, 1953).
- Stenodynerus pulvinatus Bohart. One specimen collected on sandy barrens, VIII (Krombein, 1959).
- Stenodynerus saecularis (Saussure). Occasionally collected on sandy barrens and in maritime forest, VII (Krombein, 1952).
- Leptochilus tylocephalus monotylus (Bohart). Usually collected in maritime forest, occasionally on sandy barrens, VI and VII (Krombein, 1952).
- Vespula maculata (Linnaeus). One specimen collected in maritime forest, VII (Krombein, 1953).
- Vespula maculifrons (Buysson). Maritime forest, V (Krombein, 1953).
- Vespula squamosa (Drury). Three specimens collected at edge of maritime forest and on sandy barrens, V to VII (Krombein, 1952; Krombein, 1953).
- Polistes bellicosus Cresson. Det. K. V. Krombein. Collected five times by sweep-net from salt marsh vegetation (Harlowe Creek, SA; Bogue Banks, PV and SP), Carteret County, N. C., IV to VII (Davis, Unp.).
- Polistes exclamans Viereck. One specimen collected on sandy barrens, V (Krombein, 1953).
- Polistes fuscatus (Fabricius). Det. K. V. Krombein. Collected three times by sweep-net from salt marsh vegetation (Bogue Banks, SA twice and SP once), Carteret County, N. C., VII and VIII (Davis, Unp.). Common on sandy barrens at Kill Devil Hills (Krombein, 1949).
- Polistes hunteri Bequaert. Det. K. V. Krombein. Collected four times by sweep-net from salt marsh vegetation (Core Creek, DS; Lennoxville Point, SP; Goose Bay, JR; Harlowe Creek, SP), Carteret County, N. C., VII and VIII (Davis, Unp.). Common on sandy barrens and at edge of maritime forest, Kill Devil Hills (Krombein, 1949).
- Polistes metricus Say. Common on sandy barrens and at edge of maritime forest (Krombein, 1949).
- Eumenes fraternus Say. Five specimens collected in maritime forest, VI (Krombein, 1955).
- Symmorphus walshianus (Saussure). One specimen collected in maritime forest, VI (Krombein, 1955).

Family Pompilidae

- Ageniella faceta (Cresson). Mostly in maritime forest, occasionally on sandy barrens, VI and VII (Krombein, 1952).
- Ageniella partita Banks. One specimen collected in maritime forest, V (Krombein, 1953).
- Agenioideus birkmanni (Banks). Two specimens collected in maritime forest, VI (Krombein, 1955).
- Anoplius americanus trifasciatus (Beauvois). Sandy beaches, V and VIII (Krombein, 1952; Krombein, 1953).
- Anoplius amethystinus atramentarius (Dahlbom). Sandy barrens, V to VIII (Krombein, 1952; Krombein, 1953).
- Anoplius apiculatus pretiosus (Banks). Common on sandy barrens, V to VII (Krombein, 1952).
- Anoplius atrox (Dahlbom). Occasionally collected on sandy barrens and in maritime forest, VI to VIII (Krombein, 1952; Krombein, 1953).

- Anoplius bellicosus (Banks). Sandy barrens and maritime forest, V to VII (Krombein, 1949; Krombein, 1952).
- Anoplius bengtssoni (Regan). Sandy barrens and maritime forest, V to VII (Krombein, 1949; Krombein, 1952).
- Anoplius cleora (Banks). Occasionally collected on sandy barrens, VI and VII (Krombein, 1952).
- Anoplius cylindricus (Cresson). Sandy barrens, V to VII (Krombein, 1952).
- Anoplius krombeini Evans. Rather common on sandy barrens, V to VII (Krombein, 1952).
- Anoplius marginalis (Banks). Occasionally collected on sandy barrens, VI and VII (Krombein, 1952).
- Anoplius marginatus (Say). Fairly common in maritime forest, VI and VII (Krombein, 1952).
- Anoplius pretiosus (Banks). Sandy barrens, V and VI (Krombein, 1949).
- Anoplius rectangularis gillaspyi Evans. Fairly common in maritime forest, V to VII (Krombein, 1952).
- Anoplius relativus (Fox). Fairly common on sandy barrens, V and VI (Krombein, 1952).
- Anoplius semirufus (Cresson). Fairly common in maritime forest, VI and VII (Krombein, 1952).
- Anoplius splendens (Driesbach). Fairly common in maritime forest, uncommon on sandy barrens, VI and VII (Krombein, 1952).
- Anoplius subcylindricus (Banks). Collected on sandy barrens, V to VII, but not common (Krombein, 1952).
- Anoplius ventralis (Banks). Not common; collected in maritime forest and on sandy barrens, VI and VII (Krombein, 1949).
- Aporinellus apicatus Banks. One specimen collected on sandy barrens, VII (Krombein, 1959).
- Aporinellus fasciatus (Smith). Rather common on sandy barrens, V to VII (Krombein, 1952).
- Aporinellus taeniatus (Kohl). A few specimens collected on sandy barrens, V (Krombein, 1949).
- Auplopus mellipes (Say). One specimen collected in maritime forest, VII (Krombein, 1952).
- Ceropales bipunctata Say. A few specimens collected on sandy barrens, V and VI (Krombein, 1952).
- Dipogon pulchripennis (Cresson). One specimen collected on sandy barrens, V (Krombein, 1952).
- Episyron biguttatus (Fabricius). Occasionally collected on sandy barrens and in maritime forest, VI and VII (Krombein, 1952).
- Episyron posterus (Fox). Quite common on sandy barrens and in maritime forest, VI and VII (Krombein, 1952).
- Episyron snowi (Viereck). Fairly common on sandy barrens, less common in maritime forest, V to VII (Krombein, 1952).
- Evagetes mohave (Banks). Fairly common on sandy barrens and at edge of maritime forest, V to VII (Krombein, 1952).
- Evagetes padrinus minusculus (Banks). Fairly common on sandy barrens, V to VII (Krombein, 1952).
- Evagetes parvus (Cresson). One specimen collected in maritime forest, VI (Krombein, 1955).
- Paracyphononyx funereus (Lepeletier). Fairly common in maritime forest, VI, VII (Krombein, 1952).
- Pepsis elegans Lepeletier. Occasionally collected on sand barrens, VII (Krombein, 1955).
- Phanagenia bombycina (Cresson). One specimen collected in maritime forest, VII (Krombein, 1952).
- Poecilopompilus algidus (Smith). Occasionally collected on sandy barrens, VI and VII (Krombein, 1952).
- Poecilopompilus interrupta (Say). Fairly common in maritime forest and on sandy barrens, VI and VII (Krombein, 1952).
- Pompilus similis (Banks). Two specimens collected in maritime forest, VI (Krombein, 1955).
- Priocnemis cornica Say. Common on sandy barrens, V to VII (Krombein, 1952).
- Psorthaspis legata (Cresson). A few specimens collected in maritime forest, VI and VII (Krombein, 1952).

- Psorthaspis mariae (Cresson). Two specimens collected in maritime forest, VI and VII (Krombein, 1955).
- Psorthaspis sanguinea (Smith). Two specimens collected in maritime forest, VII (Krombein, 1952).
- Sericopompilus apicalis (Say). Very common on sandy barrens and in maritime forest, VI and VII (Krombein, 1952).
- Sericopompilus neotropicalis (Cameron). Two specimens collected on sandy barrens, VII and VIII (Krombein, 1953).
- Sophropompilus hyacinthinus (Cresson). Fairly common on sandy barrens, V and VI (Krombein, 1949).
- Sophropompilus minusculus (Banks). Fairly common on sandy barrens, V (Krombein, 1949).
- Tachypompilus ferrugineus (Say). One specimen collected in maritime forest, VII (Krombein, 1952).
- Family Sphecidae
- Alysson melleus Say. Det. K. V. Krombein. One specimen collected by sweep-net from SA, Lennoxville Point, Carteret County, N. C., VI (Davis, Unp.). Three specimens collected on sandy barrens, V (Krombein, 1952).
- Ammatomus moneduloides (Packard). One specimen collected at edge of maritime forest, VII (Krombein, 1952).
- Bembex carolina (Fabricius). Common on sandy barrens, VI and VII (Krombein, 1952).
- Bicyrtes quadrifasciata (Say). Fairly common on sandy barrens and in maritime forest, VI and VII (Krombein, 1952).
- Cerceris bicornuta Guerin. Six specimens collected on sandy barrens, VI and VII (Krombein, 1952).
- Cerceris blakei Cresson. Fairly common on sandy barrens, VI and VII (Krombein, 1952).
- Cerceris compacta Cresson. Four specimens collected in maritime forest and on sandy barrens, VI and VIII (Krombein, 1959).
- Cerceris flavofasciata H. S. Smith. Occasionally collected in maritime forest, VII and VIII (Krombein, 1953).
- Cerceris robertsoni Fox. Fairly common in maritime forest, VI and VII (Krombein, 1952).
- Chalybion californicum (Saussure). One specimen collected on sandy barrens, VII (Krombein, 1952).
- Chlorion aerarium Patton. Nine specimens collected on sandy barrens and in maritime forest, VI and VII (Krombein, 1952).
- Chlorion auripes Fernald. One specimen collected at edge of maritime forest, VI (Krombein, 1952).
- Chlorion aztecum (Saussure). One specimen collected in maritime forest, VI (Krombein, 1952).
- Chlorion cinereum (Fernald). Three specimens collected in maritime forest, VI and VII (Krombein, 1952).
- Chlorion daggyi (Murray). Collected occasionally in maritime forest and on sandy barrens, VI and VII (Krombein, 1952).
- Chlorion pennsylvanicum (Linnaeus). Three specimens collected on sandy barrens, VII (Krombein, 1952).
- Chlorion pubidorsum (Costa). "Very common" on sandy barrens in 1948, "rare" in 1950, VI and VII (Krombein, 1952).
- Crabro aequalis Fox. Two specimens collected in maritime forest, VII (Krombein, 1952).
- Crabro argus Packard. Fairly common on sandy barrens, VI and VII (Krombein, 1952).
- Crossocerus nitidiventris (Fox). One specimen collected at edge of maritime forest, VI (Krombein, 1952).
- Crossocerus similis (Fox). Nine specimens collected in maritime forest VII (Krombein, 1952).
- Ectemnius decemmaculatus (Say). Fairly common on sandy barrens, V to VII (Krombein, 1952).
- Ectemnius scaber (Lepelletier and Brullé). Three specimens collected on sandy barrens and in maritime forest, V and VI (Krombein, 1952).
- Epibembex pruinosa (Fox). Fairly common on sandy barrens, VII (Krombein, 1952).
- Epibembex spinolae (Lepelletier). One specimen collected on sandy barrens, VII (Krombein, 1952).
- Epibembex texana (Cresson). Two specimens collected in maritime forest, VII (Krombein, 1952).
- Eupilis rufigaster (Packard). Seven specimens collected in maritime forest, VII (Krombein, 1952).

- Gorytes asperatus Fox. One specimen collected at edge of maritime forest, VII (Krombein, 1952).
- Gorytes dorothyae Krombein. Fairly common in maritime forest, V to VII (Krombein, 1952).
- Gorytes phaleratus Say. One specimen collected in maritime forest, VI (Krombein, 1955).
- Lestica producticollis (Packard). One specimen collected in maritime forest, VII (Krombein, 1952).
- Lyroda subita Say. Two specimens collected, one each in maritime forest and on sandy barrens, VI (Krombein, 1952).
- Microbembex monodonta (Say). "An extremely abundant species, both on (sandy) barrens and in (maritime forest), though more common in the former habitat," V to VII (Krombein, 1952).
- Mimesa longicornis Fox. Det. K. V. Krombein. Collected twice by sweep-net from PV, Bogue Banks, Carteret County, N. C., VI (Davis, Unp.).
- Miscophus americanus Fox. Eight specimens collected in maritime forest and on sandy barrens, VII (Krombein, 1952).
- Motes aequalis Fox. Three specimens collected in maritime forest, VII (Krombein, 1952).
- Motes argentata Beauvais. Collected occasionally in maritime forest and on sandy barrens, V to VII (Krombein, 1952).
- Nyssus aequalis Patton. Collected occasionally in maritime forest and on sandy barrens, VI and VII (Krombein, 1952).
- Nyssus mellipes Cresson. Collected fairly often in maritime forest, VI and VII (Krombein, 1952).
- Nyssus opulentus Gerstaecker. Fairly common both on sandy barrens and in maritime forest, VI and VII (Krombein, 1952).
- Oxybelus emarginatus Say. Occasionally collected in maritime forest and on sandy barrens, VI and VII (Krombein, 1952).
- Philanthus gibbosus (Fabricius). One specimen collected on sandy barrens, VIII (Krombein, 1953).
- Philanthus ventilabris (Fabricius). Seven specimens collected on sandy barrens, VIII (Krombein, 1953).
- Plenoculus davisi atlanticus Viereck. Five specimens collected on very barren sand, VI and VII; "this subspecies has been taken in coastal areas from Connecticut to North Carolina and in Texas." (Krombein, 1955).
- Pluto arenivagus Krombein. Seven specimens collected on sandy barrens, V to VII (Krombein, 1952).
- Pluto littoralis (Malloch). Det. K. V. Krombein. Collected by sweep-net five times from SP and once each from DS and SAL-SA, VI to IX, Carteret County, N. C. (Davis, Unp.).
- Podalonia violaceipennis (Lepelletier). Seven specimens collected on more sparsely vegetated portion of sandy barrens, VI (Krombein, 1955).
- Podium carolina Rohwer. One specimen collected in maritime forest, VII (Krombein, 1952).
- Psammaecius costalis Cresson. One specimen collected in maritime forest, VII (Krombein, 1952).
- Psammaecius denticulatus (Packard). Four specimens collected on sandy barrens, VI and VII (Krombein, 1952).
- Psammaecius nebulosus (Packard). Fairly common in maritime forest, V to VII (Krombein, 1952).
- Psammaletes pechumani Pate. One specimen collected in maritime forest, VII (Krombein, 1952).
- Sceliphron caementarium (Drury). One specimen collected on sandy barrens, V (Krombein, 1952).
- Solierella inermis (Cresson). One specimen collected on sandy barrens, VII (Krombein, 1959).
- Sphecius speciosus (Drury). "Quite common on (sandy) barrens," VI and VII (Krombein, 1952).
- Spheg aureonotatus (Cameron). Four specimens collected in maritime forest and on sandy barrens, VII (Krombein, 1952).
- Spheg procerus (Dahlbom). Occasionally collected on sandy barrens and in maritime forest, V to VII (Krombein, 1952).
- Tachysphex sepulcralis Williams. Four specimens collected on sandy barrens, VI and VII (Krombein, 1952).

- Tachysphex similis Rohwer. Occasionally collected on sandy barrens and in maritime forest, V to VII (Krombein, 1952).
- Tachysphex tarsatus (Say). Fairly common on sandy barrens, V and VI (Krombein, 1952).
- Tachysphex terminatus (Smith). Quite common on sandy barrens and in maritime forest, V to VII (Krombein, 1952).
- Tachytes aurulentes (Fabricius). Nine specimens collected on sandy barrens, late VII and VIII (Krombein, 1953).
- Tachytes distinctus Smith. Seven specimens collected on sandy barrens and in maritime forest, VI and VII (Krombein, 1952).
- Tachytes elongatus Cresson. Fairly common on sandy barrens, VI and VII (Krombein, 1952).
- Tachytes harpax Patton. Nine specimens collected on sandy barrens VI and VII (Krombein, 1952).
- Tachytes mandibularis Patton. Four specimens collected on sandy barrens VI and VII (Krombein, 1952).
- Tachytes mergus Fox. Common on sandy barrens, VI and VII (Krombein, 1952).
- Tachytes obductus Fox. Six specimens collected on sandy barrens, VI and VII (Krombein, 1952).
- Tachytes parvus Fox. One specimen collected on sandy barrens, VI (Krombein, 1952).
- Tachytes pattoni Banks. Five specimens collected on sandy barrens, VI (Krombein, 1952).
- Tachytes pepticus (Say). Fairly common on sandy barrens, VI and VII (Krombein, 1952).
- Tropoxylon clavatum Say. One specimen collected at edge of maritime forest, VII (Krombein, 1952).
- Tropoxylon johnsoni Fox. One specimen collected in maritime forest, VIII (Krombein, 1959).
- Tropoxylon rubrocinctum Packard. Eleven specimens collected in maritime forest, VI and VII (Krombein, 1952).
- Zanysson fuscipes (Cresson). Four specimens collected on sandy barrens, VI and VII (Krombein, 1952).
- Family Halictidae
- Lasioglossum halophitum (Graenicher). Det. K. V. Krombein. Collected by sweep-net on sixteen occasions from salt marsh vegetation (SA five times, DS three times, SP nine times). Carteret County, N. C. (Davis, Unp.). Collections were made from V to IX.
- Family Apidae
- Apis mellifera Linnaeus. Det. K. V. Krombein. Collected three times by sweep-net from salt marsh vegetation, Carteret County, N. C. (Davis, Unp.).
- Order Lepidoptera
- See contribution by Dr. R. Dominick.

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