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INSECTS IN FOUR MARYLAND MARSHES

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Miscellaneous Publication 870

April, 1975

ACKNOWLEDGMENTS

Acknowledgment is made of major financial support for this research under the National Science Foundation RANN Grant GI 29906 through the Chesapeake Research Consortium, Inc. Additional support was furnished by the Maryland Agricultural Experiment Station, Department of Entomology Project H-104.

We are indebted to W. Jay Nixon for collecting and preparing a large portion of the total number of insect specimens. George Foster and J. L. Hellman also assisted with collecting, preparing and identifying many specimens.

The cooperation of specialists at the U. S. National Museum of Natural History and the Beltsville Agricultural Research Center, West was indispensable. Dr. R. H. Foote and Miss Edna M. Hoover, U.S.D.A., are thanked for their help in arranging for and reporting determinations.

Most of the specialists are on the staff of the Systematic Entomology Laboratory, IIBIII, ARS, U. S. Department of Agriculture. A few are on the staff of the Department of Entomology, Smithsonian Institution, and in the list which follows, such affiliation is shown as (SI), along with other exceptions.

The authors are especially grateful for assistance in the identification of Orthoptera by A. B. Gurney; Thysanoptera by K. O'Neill; Hemiptera by R. C. Froeschner (SI), and J. L. Herring; Homoptera by J. P. Kramer and L. M. Russell; Trichoptera by O. S. Flint, Jr. (SI); Lepidoptera by D. R. Davis, D. C. Ferguson, R. W. Hodges, and E. L. Todd; Coleoptera by D. M. Anderson, O. L. Cartwright (SI), J. G. Connell (Univ. of Md.), W. A. Connell (Univ. of Del.), T. L. Erwin (SI), R. D. Gordon, J. M. Kingsolver, L. L. Pechuman (Cornell Univ.), P. J. Spangler (SI), T. J. Spilman, R. E. Warner, and R. E. White; Diptera by R. J. Gagne, L. V. Knutson, C. W. Sabrosky, G. C. Steyskal, and W. W. Wirth; and Hymenoptera by B. D. Burks, P. M. Marsh, A. S. Menke, and D. R. Smith.

INTRODUCTION

Relatively little information about insect populations in Chesapeake Bay marshes has been assembled. Mosquito breeding is fairly well understood, and some knowledge of horse flies and deer flies has been obtained; but qualitative and quantitative studies are needed. The principal objective of the work reported here was to collect and identify insects at selected stations to form the nucleus of an inventory of Chesapeake Bay insects. It is desirable to have an understanding of the normal or average insect fauna in and adjacent to Chesapeake Bay wetlands.

This report is qualitative. Thousands of insects were collected and identified in 1971, 1972 and 1973. A few records from previous years are included in the lists which follow. It is planned to supplement this report with information as follows: 1) Ecological conditions in the four areas. 2) Geographic and seasonal distribution patterns of insects. 3) Analysis and interpretation of relationships among insects and other organisms leading to an assessment of the economic importance of insects in marsh environments. 4) Comparison of results with reports of other workers such as Davis and Gray (1966) and Wall (1973).

Contribution No. 5032 of the Maryland Agricultural Experiment Station,
Department of Entomology Project H-104.
The University of Maryland is an equal opportunity institution.

MATERIALS AND METHODS

Collections of insects were made principally with aerial nets. Records of the duration of sweeping and beating were kept. Dippers and aquatic nets were occasionally used. Traps for collecting tabanids were also used. They were simple plywood box traps about 2 feet⁵, total height 4 feet, with the inverted "V" screen on the inside of the box. These traps are comparable to those used in the Massachusetts Greenhead Fly Control Program (L. A. Uhrich, Personal Communication) and to those described by Hansens (1971).

The marsh stations, described below, were Deal Island, Gunpowder State Park, Kent Island and Magruder's Landing. Visits to each of the stations were made almost every month, from September 1971 to June 1973. No collections were made in February, and only two stations were visited in January. In the warm months, four visits per month were usually made to each station.

The Deal Island station, Somerset County, is part of the Deal Island Wildlife Management Area of the U. S. Department of the Interior. The site is on the north side of State Route 363, two miles west of St. Stephens extending about 1.5 miles west to Messick Road and about 600 feet north of Rt. 363. This station consists of about 200 acres of low marsh and high marsh. There are many acres of *Scirpus robustus* Pursh and *Distichlis spicata* (Linnaeus) with some *Spartina alternifolia* Loisel, *Salsola kali* Linnaeus, *Aster tenuifolium* Linnaeus and *Juncus Roemerianus* Scheele. There is a hammock in the high marsh with a salt hay (*Spartina patens* Muhl.) meadow. Other common plants are *Spartina cynosuroides* Roth, *Baccharis halimifolia* Linnaeus, *Pluchea purpurascens* Cass, *Iva frutescens* Linnaeus, *Echinochloa Walteri* Nash, *Rosa palustris* Marsh, *Myrica cerifera* Linnaeus, *Solidago graminifolia* Salisb., *Sabatia stellaris* Pursh, *Setaria glauca* Beauv., *Limonium carolinianum* Britt. and *Prunus serotina* Ehrh. In some drainage ditches the water depth was about 30 inches. Daily tidal action occurs in most ditches. There are some permanent pools. This area is a rather typical salt marsh, an estuarine community where many diverse organisms thrive.

The study area on Kent Island, Queen Annes County, is about 9 miles south of Routes 50/301 near the southwest point of the island. It is a marsh of about 10 acres on both sides of a tidal inlet (gut) about 1/4 mile west of Tanners Creek. A shallow pond is at the head of the gut. The water is distinctly brackish, but somewhat fresher than at Deal Island. The most numerous plants are *Spartina patens* Muhl., *Iva frutescens* Linnaeus, and *Phragmites communis* Trin. Also present are *Andropogon* sp., *Plantago lanceolata* Linnaeus, *Solidago graminifolia* Salisb. and *Spartina cynosuroides* Roth. A narrow strip of high ground separates the marsh from cultivated fields. This is a sort of buffer zone. Many insects congregate here, especially in winter. A number of woody plants characterize this strip.

Gunpowder State Park, Baltimore County, is located at the confluence of the Gunpowder River and Chesapeake Bay. The marsh studied here consists of about 50 acres edging Saltpeter Creek. The water is only slightly brackish. Large amounts of organic sediment from decaying marsh vegetation are present. The dominant plant is *Typha angustifolia* Linnaeus. Other plants are *Apocynum androsaemifolium* Linnaeus, *Hibiscus moscheutos* Linnaeus and *Pontederia cordata* Linnaeus. Surrounding the marsh, the high ground supports a complex hardwood community. Muskrats thrive in this marsh.

Magruder's Landing, Prince George's County, is on the left bank of the Patuxent River about 1/2 mile downstream and across from Lower Marlboro. State Route 382 leads to the site. The marsh comprises about 5 acres, is slightly brackish, and varies in depth. *Phragmites communis* ^{T. L.}Linnaeus and *Pontederia communis* Linnaeus are the dominant plants. Other plants are *Althaea officinalis* Linnaeus, *Peltandra virginica* (Linnaeus) and *Scirpus americanus* Pers. Adjacent to the marsh on three sides are cultivated fields.

Insects collected at the four stations were appropriately preserved, mounted and labeled preparatory to identification. The majority of the specimens were identified by specialists of the U. S. Department of Agriculture, Agricultural Research Service, Systematic Entomology Laboratory at the U. S. National Museum of Natural History. Specialists employed by the Smithsonian Institution and other specialists also helped. Some of the specimens were identified by the authors, but the assistance of the U.S.D.A. and Smithsonian specialists was indispensable. These individuals are named in the section entitled, "Acknowledgments".

RESULTS

Lists are presented phylogenetically by order, alphabetically by family and alphabetically by genus within each family.

Letters following each species represent location(s) where it was collected: D = Deal Island, G = Gunpowder, K = Kent Island, and M = Magruder's Landing.

Roman numerals represent first and last months of the year during which collections were made.

Deal Island 1778-1844

TRINIVS

COLLEMBOLA

Poduridae

Podura aquatica Linn. G; IV

ODONATA

Coenagrionidae

Anomalagrion hastatum D G K M; IV-X
Argia moesta (Hagen) D G K; VI
Enallagma ebrium (Hagen) K; VI-VIII
Ishnura posita (Hagen) G M; VI-VIII
I. verticalis (Say) D G K M; IV-X

Libellulidae

Erythemis simplicicollis Say M; VIII
Erythrodiplax berenice (Drury) D K; V-X
Libellula flavida Rambur M; VI
L. needhami (Westfall) D G; VII-IX
Sympetrum rubieundulum Say G; XI

ORTHOPTERA

Acrididae

Clinocephalus elegans Morse D; VIII-X
Leptysma marginicollis (Serville) M; VII
Melanoplus differentialis (Thomas) D G K M; VII-IX
M. punctulatus (Scudder) D; VIII
Metaleptea brevicornis (Linn.) M; VIII-IX
Orphulella spp. D; VII-IX
Paroxya spp. G K M; VI-VIII
Pseudopomala brachyptera (Scudder) D; VI

Gryllidae

Anaxripha exigua (Say) G M; VIII-IX
Cycloptilum spp. D; IX-X
Gryllotalpa hexadactyla (Perty) K; XII
Gryllus pennsylvanicus Burmeister K; I
Hapithus agitator Uhler D M; IX-X
Oecanthus quadripunctatus Beutenmuller D K M; VI-IX
O. sp. M; VII
Phyllopalpus pulchellus Uhler D M; VIII-IX

Mantidae

Stagmomantis carolina Linn. D; IX

Tetrigidae

Tettigidea armata Morse G; V

Tettigioniidae

Conocephalus spartinae (Fox) D G K; VII-X
C. spp. D G K M; VI-IX
Microcentrum rhombifolium (Saussure) D K; VIII-IX
Neoconocephalus retusus (Scudder) K; X
N. robustus crepitans (Scudder) G; VIII-IX
N. spp. D M; VI-VII
Orchelimum concinnum Scudder D; IX
O. pulchellum Davis D G M; VIII-X
O. sp. G; VIII
Scudderia furcata Brunner D; X
S. spp. G M; V-VIII

ISOPTERA

Rhinotermitidae

Reticulitermes flavipes (Kollar) M; VI

DERMAPTERA

Labiduridae

Anisolabis maritima Gene K; IV-X

Forficulidae

Doru aculeatum Scudder M; XI

PSOCOPTERA

Pseudocaeciliidae

Unidentified species

THYSANOPTERA

Phloeothripidae

Haplothrips graminis Hood D; VII

HEMIPTERA

Anthocoridae

Orius insidiosus (Say) D; VI-X

Belastomatidae

Belastoma testaceum (Leidy) D G M; V-VII

Berytidae

Jalysus spinosus (Say) M; VI-VIII

Corixidae

Trichocorixa verticalis Fieber D; VI-IX

Coreidae

Archimenus alternatus (Say) M; VII
Leptoglossus oppositus (Say) M; VIII

Cydnidae

Galgupha sp. K M; VI-IX

Gelastocoridae

Gelastocoris oculatus (Fabr.) D; IX-X

Gerridae

Gerris marginatus Say G K; IV-VII

Hydrometridae

Hydrometra martini Kirkaldy G; IV-VII

Largidae

Largus succintus (Linn.) M; V

Lygaeidae

Cymus angustatus Stal. D G K M; IV-VII
Ischnodemus falicus (Say) D K M; IV-X
Kleidocerys resedae (Panzer) D K; V-XII
Pachybrachius basalis (Dallas) M; XI
Phlegyas abbreviatus (Uhler) K; VI
Peritrechus paludemaris Barber D; X

Mesoveliidae

Mesovelia mulsanti White D; VI-IX

Miridae

Halticus sp. D; VI

Hyaliodes vitripennis (Say) M; VII

Leptoterna dolobratus (Linn.) D K M; VI-IX

Lygus lineolaris (Palisot de Beauvois) D G K M; IV-XII

Lygus sp. D; IX

Neurocolpus nubilis (Say) G M; VII

Pycnoderes quadrimaculatus Guerin G; VI-VII

Stenodema trispinosum Reuter D K M IV-XII

S. vicinum (Prov.) D K M; VII-IX

Stenotus binotatus (Fabr.) K; VI

Teratocoris discolor Uhler G K; VI, IX

Trigonotylus sp. D K M; VI-VIII

Nabidae

Nabis propinque Reuter D; VI

N. spp. D G; VI-VIII

Nepidae

Ranatra sp. M; VIII

Notonectidae

Notonecta indica Linn. K; IV

Pentatomidae

Brochymena quadripustulata (Fabr.) K M; V-IX

Chlorochroa uhleri Stal. G; VI-VII

Euschistus variolarius (Palisot de Beauvois) D G M; VI-X

Mormidea lugens (Fabr.) G; VI

Nezara viridula (Linn.) M; VIII

Solubea pugnax (Fabr.) D K; V-X

Phymatidae

Phymata fasciata (Gray) M; VII

Reduviidae

Ariulus cristatus (Linn.) D; VIII-X

Doldina interjungens Bergroth D; IX

Sinea diadema (Fab.) D G M; VI-X

Rhopalidae

- Arhyssus lateralis* (Say) K; IX
Harmostes reflexus (Say) D; IX

Saldidae

- Pentacora sphacelata* Uhler
Saldula interstitialis Say D; VI-VIII
Saldula spp. G; VI-VII

Scutelleridae

- Diolcus* sp. K; V

Tingidae

- Corythucha marmorata* (Uhler) K; VII-VIII
Gargaphia solani Heidemann M; XI

Veliidae

- Velia watsoni* Drake G; VII

HOMOPTERA

Aphididae

- Dactynotus* sp. D K; V-X
Hyalopteroides humilis (Walker) K; IV

Cercopidae

- Aphrophora quadrinotata* (Say) K; VIII
Clastoptera saintcyri Provancher G; VI-VII
C. xanthocephala Germar D G K M; IV-XI
Prosapia bicincta (Say) D K M; VII-IX

Cicadellidae

- Agallia constricta* Van Duzee K M; V
Amplicephalus littorallis Ball D; VII-VIII
A. simplex (Van Duzee) D K; VI-IX
Balclutha impicta (Van Duzee) G M; V-VII
Chlorotettix spatulatus Osborn and Ball D; VIII
C. viridius Van Duzee K M; VIII-X
Coelidia olitoria (Say) G; VII
Draeculacephala antica (Walker) K M; VIII
D. portola Ball D G K M; IV-XII
D. sp. G; VIII
Exitianus exitiosus (Uhler) K M; VIII-XII

Cicadellidae (contd.)

- Flexamia atlantica* (DeLong) D; VI-IX
F. spp. D; VIII-X
Graminella nigrifrons (Forbes) D G K M; VI-XII
Graphocephala coccinea (Forster) G K M; V-X
Gyponana octolineata (Say) D M; VI-IX
Idiocerus nervatus Van Duzee M; V
Limotettix truncatus (Sleesman) M; VIII
Macrosteles bifurcatus Beirne D; VII-VIII
M. fascifrons (Stal.) K M; V-VII
M. spp. D G K; VI-IX
Oncometopia orbona (Fabr.) M; VIII
Paraulacizes irrorata (Fabr.) D K; X
Planicephalus flavocostatus (Van Duzee) K M; IX
Polygamia weedi (Van Duzee) M; VIII
Scaphoideus sp. M; VII
Scaphytopius acutus (Say) M; VIII
Stirellus obtutus (Van Duzee) K M; IV
Stragania alabamensis (Baker) K M; VI-X

Cicadidae

- Tibicen chloromerus* (Walker) D M; VII-IX

Cixiidae

- Haplaxius sp.* D K; VI
Oliarus montanus Metcalf G; VI
O. placitus Van Duzee M; VII

Delphacidae

- Delphacodes detecta* (Van Duzee) D K; VI-VIII
D. puella (Van Duzee) D; X
Liburmiella ornata (Stal.) K; VI
Neomegamelanus dorsalis (Metcalf) D; VIII
N. elongatus (Ball) K; V
Pentagramma vittatifrons (Uhler) D; IX
Pissonotus piceus (Van Duzee) M; VI
P. spp. D K; VIII-X
Prokelisia marginata Van Duzee D; VII-VIII
Stenocranus sp. K; X
Stobaera pallida Osborn D; IX
S. tricarinata (Say) K; XII

Derbidae

- Cedusa sp.* G; VII

Flatidae

- Anormensis septentrionalis* (Spinola) G K M; VIII

Issidae

Aphelonema simplex Uhler D; VI-IX
Bruchomorpha dorsata Fitch D; VI

Membracidae

Campylenchia sp. D; VI
Micrutalis calva (Say) D K M; VI-IX
Stictolobus subulatus (Say) D; X
Strictocephala bubalis (Fabr.) D M; VIII
S. sp. M; V

Psyllidae

Psylla annulata Fitch M; VI
Trioza diospyri Ashmead D G K M; VI-VII

NEUROPTERA

Hemerobiidae

Hemerobius humulinus Linn. D G; VIII-IX
Micromus posticus Walsh M; VIII
M. subanticus (Walker) K; XII

Chrysopidae

Chrysopa carnea Stephens K; XII
C. oculata Say D G K M; VI-IX
C. sp. D; IX

TRICHOPTERA

Leptoceridae

Oecetis inconspicua (Walker) G; VII

LEPIDOPTERA

Arctiidae

Diacrisia virginica (Fabr.) M; VII

Ctenuchidae

Ctenucha virginica (Fabr.) M; VII

Danaidae

Danaus plexippus (Linn.) D K G; VII-VIII

Hesperiidae

- Ancyloxypha numitor* (Fabr.) G; VIII-X
Atrytone delaware delaware (Edwards) M; VII
Paones aaroni aaroni (Skinner) D; VI
P. viator (Edwards) G; VI

Lycaenidae

- Lycaena thoe* Guenee G, IX
Lycaenopsis argiolus (Linn.) K; V

Noctuidae

- Amphipyra pyramidoides* Guenee D; VII
Anticarsia gemmatalis Huebner D K; IV-X
Peridroma saucia (Huebner) D; VII-XI
Plathypena scabra (Fabr.) K; VIII
Zale spp. D; VII-XI

Nymphalidae

- Phyciodes tharos* Drury G K; V-X
Polygonia comma Harris G M; VII-VIII
Precis lavinia coenia (Cramer) D K; VII-X

Papilionidae

- Papilio glaucus* Linn. G M; IV-VIII
P. polyxenes asterius Stoll G; VIII
P. troilus Linn. G; VIII

Pieridae

- Colias eurytheme* Boisduval K M; IV-VII
Pieris rapae Linn. D G K M; VI-X

Satyridae

- Ceryconis pegala* Fabr. D; VII

COLEOPTERA

Alleculidae

- Isomira sericea* (Say) G; VI

Anthicidae

- Tomoderus constrictus* Say K M; V-XII
Notoxus monodon (Fabr.) G M; V

Bruchidae

Althaeus hibisci (Olivier) G M; V-XI

Buprestidae

Brachys aerosus (Melsheimer) G M; VI

Paragrilus tenuis Le Conte M; VI

Taphrocerus gracilis Say D G; V-XII

Cantharidae

Cantharis bilineatus (Say) G M; IV-V

C. spp. D G K M; VI-VIII

Chauliognathus marginatus (Fabr.) D; VI

C. pennsylvanicus Degeer D; VII

Malthodes occipitalis (Le Conte) G; VI

Silis latiloba Blatchley D K; V

S. spathulata Le Conte G; V

Carabidae

Galerita janus Fabr. K; V

Agonoderus pallipes Fabr. G; IV

Cerambycidae

Prionus pocularis Dalman D; VII

Strangalina famelica (Newman) G; VI

Chrysomelidae

Altica spp. D G K; V-VII

Anisostena ariadne Newman D; V

Anomoea laticlavata (Forster) K; VI

Baliosus ruber (Weber) M; V

Cerotoma trifurcata (Forster) M; VI

Chaetocnema denticulata (Illiger) K; X

C. sp. G K M; V-XII

Chrysochus auratus (Fabr.) D; VII

Colaspis brunnea (Fabr.) D; VII

C. favosa (Say) D; VI

Crepidodera nana (Say) M; V

Cryptocephalus venustus Fabr. D; VI

Disonycha glabrata (Fabr.) M; VIII

Donacia sp. nr. metallica Ahrens M; VI

Epitrix hirtipennis (Melsheimer) K M; V-VIII

Labidomera clivicollis (Kirby) M; VI

Lema sexpunctata Olivier M; VI

L. trilineata (Olivier) D; VII-VIII

Nodonota sp. K; VII

Oedionychus thoracicus (Fabr.) M; IV

Ophraella sp. K; VI

Chrysomelidae (contd.)

Pachybrachis relictus Fall M; VI-IX
Paria spp. D M; V-VIII
Phyllotreta striolata (Fabr.) K; III
Plagiodera versicolora (Laicharting M; VIII
Systema blanda Melsheimer M; VII
Trirhabda bacharidis (Weber) D; VII
Xenochalepus dorsalis (Thunberg) G; V

Cicindelidae

Cicindela cuprascens Le Conte K M; IV-VI

Cleridae

Enoclerus rosmarus (Say) M; VI
Isohydnocera tabida (Le Conte) M; VI
Phyllobaenus sp. G; VII

Coccinellidae

Anatis ocellata mali (Say) K; IV
A. quinquedecimpunctata (Olivier) K; IV
Ceratomegilla maculata (Degeer) K M; V
Diomus amabilis Le Conte K; V
Hippodamia parenthesis (Say) D; VII-VIII
H. quinquefasciata Kirby D; VI
Hyperaspis proba proba (Say) G M; IV-VII
Naemia seriata (Melsheimer) D; V-VIII
Psyllobora vigintimaculata (Say) K; XI
Scymnillus aterrimus Horn M; V
Scymus (Pullus) socer Le Conte M; VI

Cryptophagidae

Atomaria sp. K; XII

Curculionidae

Anthonomus molochinus Dietz D; IX-XI
A. virgo Dietz M; IX
A. sp. M; IX
Apion spp. G M; V-VI
Barilepton filiforme Le Conte M; V-VI
Centrinaspis picumnus (Herbst) K M; VIII-IX
Curculio strictus (Casey) G; V
Cyrtepistomus castaneous Roelofs G; VII
Endalus longirostris Board D; V-VII
E. sp. D; VI
Gymnetron pascuorum Gyllenhal K; VI
Hylobius pales Herbst K; V
Lissorhoptrus chapini chapini Kuschel D; V; new state record

Curculionidae (contd.)

- Lixus punctinasus* Le Conte G; VII
Miccotrogus picirostris (Fabr.) M; V
Odontocorynus salebrosus Casey M; VI-VII
Onychylis longulus Le Conte M; V
O. nigrirostris Boheman G; VI
Rhinoncus longulus Le Conte M; V
Sibariops confusus (Boheman) K; VI
Smicronyx apionides Casey K; VI
S. interruptus Blatchley K; VI
Sphenophorus costipennis Horn G; V
S. venatus vestitus Chittenden D K; VI-X
Trichobaris bridwelli Barber D; X
Tychius stephensi Schoen M; V

Dermestidae

- Dermestes caninus* Germar K; V

Dytiscidae

- Hydroporus clypealis* Sharp G; IV
Laccophilus fasciatus rufus Melsheimer K; V-VI
Liodes affinis (Say) D; VI-IX

Elateridae

- Athous rufifrons* Randall G; VII
Ctenicera inflata (Say) M; V
Conoderus vespertinus (Fabr.) M; VII
Horistonotus curiatus (Say) G; V
Limonium basillaris (Say) G; V-VI
L. griseus (Palisot) K; VI

Gyrinidae

- Dineutus assimilis* Kirby K; IV
D. emarginatus Say K; IV-VI

Helodidae

- Cyphon* spp. G M; VI-VIII

Hydrophilidae

- Enochrus hamiltoni* (Horn) D K; IV-X
Paracymus confluens Wooldridge D VI-VII
Phaenonotum estriatum (Say) D; X
Tropisternus lateralis (Fabr.) D; VI-VIII
T. quadristriatus Horn D; VI-IX

Lampyridae

Photinus scintillans Say G; VII
Photinus pyralis (Linn.) K; VII
Pyropyga decipiens (Harris) G; V

Languriidae

Languria angustata (Beauvois) G; V

Melyridae

Attalus scincetus Say D K; V-VI
A. spp. K M; VI-VII

Mordellidae

Mordella octopunctata Fabr. K; VII
Mordellistena sexnotata Drury G; VII
M. spp. D K M; VIII
Tomoxia sp. K; VI

Nitidulidae

Carpophilus antiquus Melsheimer M; V
Meligethes nigrescens Stephens M; IV-VI

Phalacridae

Phalacrus prob. *politus* Melsheimer D K M; V-VIII
Stilbus apicalis Melsheimer D K; IX-XII
S. sp. M; V

Rhipiphoridae

Rhipiphorus fasciatus (Say) M; VI

Scarabaeidae

Ataenius wenzelii Horn D; VII; Rare
Onthophagus hecate Panzer M; IV
Strigoderma arboricola (Fabr.) D; VI

Scolytidae

Cnesinus strigicollis Le Conte K; VI

Silphidae

Silpha americana Linn. D; VIII

Staphylinidae

10 species unidentified

Tenebrionidae

Uloma punctulata Le Conte D; IV

DIPTERA

Agromyzidae

Agromyza sp. D; X
Cerodontha dorsalis (Loew) D K; IV-VI
C. longipennis (Loew) K; VI
Liriomyza sp. K; V
Melanogromyza sp. D; VI
Ophiomyia labiatarum Hering K; VI
O. sp. D; VI
Phytobia spp. K M; IV-V

Anthomyiidae

Fucellia tergina (Zetterstedt) D K; III-IV
Hydrophoria ambigua (Fallen) K; VI
Hylemyz cinerella (Fallen) G K M; IV-VII
H. platura (Meigen) D K M; IV-X
H. variabilis Stein M; IV
Scatophaga furcata (Say) D K M; IV-X
S. stercoraria (Linn.) D G K; III-XII

Anthomyzidae

Mumetopia occipitalis Melander K; VI

Bibionidae

Unidentified species - numerous, Kent Island

Asilidae

Unidentified species, Deal Island

Bombyliidae

Anthrax tigrinus (Degeer) G M; VIII

Calliphoridae

Cochliomyia macellaria (Fabr.) B; IX
Phaenicia sericata (Meigen) G K M; VI-VII
Phormia regina (Meigen) G; XI
Pollenia rudis (Fabr.) K; VII

Ceratopogonidae

Atrichopogon fuscus (Coquillett) D; VI
Bezzia setulosa Loew M; V
Bezzia sp. D; V
Dasyhelea sp. D; VI

Ceratopogonidae (contd.)

- Heteromyia fasciata* Say D M; V-VI
Palpomyia subasper (Coquillett) M; VI-VII
Palpomyia sp. M; VI

Chamaemyiidae

- Leucopis* sp. K; V-VIII

Chironomidae

- Coelotanypus* sp. M; VI
Unidentified species D; VII

Chloropidae

- Chlorops melanocerus* Loew K; V-VI
Conioscinella infesta (Becker) D K; VI
C. nuda (Adams) K; VI-XI
C. sp. near insularis Malloch K; VI
Diptotoxa versicolor (Loew) M; V
D. spp. K M; V-VIII
Elachiptera erythropleura Sabrosky K; V
E. formosa (Loew) G; VI
E. nigriceps (Loew) G M; V-VII
Eribolus longulus (Loew) D K M; IV-VI
Hippelates dissidens (Tucker) D K; VI-IX
H. nobilis Loew D; VI
H. particeps Becker K M; VI-VIII
H. plebejus Loew K; VII-VIII
Lasiopleura hirtoides Sabrosky G M; IV-XI
Lasiosina approximatonevis (Zetterstedt) D M; V
Olcella cinerea (Loew) K; VI
Oscinella carbonaria (Loew) D K; IV-VIII
O. coxendix (Fitch) K; IV
O. frit (Linn.) K; VIII-IX
O. incerta Becker D; VI
O. neocoxendix Sabrosky K; VI-IX
O. soror (Macquart) K; VI
O. sp. near fuscipalpis Becker M; VI
Siphonella nigripalpis (Malloch) D; VI
Thaumatomyia glabra (Meigen) G K M; V-XI
T. pulla var. *punctum* (Becker) G K; VI

Conopidae

- Physoconops brachyrhynchus* (Macquart) M; IX
Zodion americanum Wiedemann M; VI

Culicidae

- Aedes canadensis* (Theobald) D G; IV-VI
A. cantator (Coquillett) D K; V-VI

Culicidae (contd.)

- A. cinereus* Meigen D K; V-VII
A. sollicitans (Walker) D K; III-IX
A. vexans (Meigen) D G; IV-VI
Anopheles atropos Dyar and Knab D K; IV-V
A. bradleyi King D; IV-X
Culex salinarius Coquillett D; VI-IX

Dolichopodidae

- Chrysotus aldrichi* Van Duzee M; VIII
C. barbatus (Loew) K; V
C. discolor Loew M; VII
C. dorsalis Van Duzee M; VII
C. spp. D K M; V-VII
Condyllostylus caudatus (Wiedemann) M; VII
C. debilis Becker M; VII
C. radians (Macquart) M; VII
C. spp. D G K M; VI-IX
Diaphorus spectabilis Loew M; V
Dolichopus comatus Loew K G; V
D. longipennis Loew M; VI
D. marginatus Aldrich D; VI
D. variabilis Loew G; VII
Gymnopternus albiceps Loew D; VI
G. annulatus Van Duzee D; VI
G. debilis Loew M; VI
G. difficilis Loew M; VI
G. exilis Loew G; VI
G. lamellatus Loew D; VIII
G. lugubris Loew M; VIII
G. maculiventris (Van Duzee) M; VI
G. vetitis Melander G; V
Gymnopternus sp. G; V
Keirosoma sp. D; VI - Undescribed sp.
Medetera univittata Van Duzee M; VII
Micromorphus spp. D; VI-VIII
Pelastoneurus abbreviatus Loew D G K M; V-IX - numerous
P. lamellatus Loew D; VI
P. lugubris Loew M; VII
P. vagans Loew G K M; V-VII
Pelastoneurus sp. D; VI
Sympycnus lineatus Loew D G; VI
Thinophilus ochrifacies Van Duzee D; VI

Drosophilidae

- Drosophila* sp. G; X
Leucophenga sp. G; VII
Scaptomyza adjusta (Loew) K; XII
S. pallida (Zetterstedt) K; VI-XII

Empididae

- Hilara* sp. D; VI
Hilara sp. G; V
Platypalpus aequalis Loew K; V
Rhampomyia sp. D G M; IV-V
R. sp. M; IV
Syneches sp. G; VII

Ephydriidae

- Dimecoenia spinosa* (Loew) D K; VI
Hydrellia griseola (Fallen) K; VI
H. tibialis Cresson M; V
H. sp. K; VI
Iytogaster excavata (Sturtevant and Wheeler) K M; VI
Notiphila bispinosa Cresson D K; V-VIII
N. carinata Loew D; VI
N. erythrocerata Loew G K M; VI-VII
N. scalaris Loew K M; VI
Ochthera mantis (Degeer) M; VII
Paralimna punctipennis (Wiedemann) M; VII
Parydra imitans Loew M; VI
P. pinguis (Walker) K; VI
P. quadrituberculata Loew D; VI
Polytrichopora conciliata Cresson M; V
Rhysophora robusta Cresson M; VII
Scatella picea (Walker) K; IV-V
S. stagnalis (Fallen) K; VI
Typopsilopa atra (Loew) K; VI

Lauxaniidae

- Homoneura disjuncta* (Johnson) D; VI
H. houghi (Coquillett) M; VI-VII
Lyciella pictiventris (Malloch) M; VII
Poecilominettia valida (Walker) K; V-VI, VIII

Lonchaeidae

- Lonchaea* sp. D; IX

Loncopteridae

- Lonchoptera furcata* (Fallen) G K; V-VI

Milichiidae

- Pholeomyia indecora* (Loew) K; VI

Micropezidae

- Taeniaptera trivittata* Macquart K; IX

Mycetophilidae

- Keroplatus* sp. G; VI
Mycetophila thioptera Shaw K; X

Muscidae

- Coenosia atrata* Walker D K M; IV-X
Coenosia spp. D G K M; I-XI
Graphomya maculata (Scopoli) K; VI
Lispe albitarsis Stein D K; VI-VIII
L. spp. D K; VI
Muscina assimilis (Fallen) G K; VI-XI
M. stabulans (Fallen) K; VI
Myospila mediatunda (Fabr.) D; VI
Ophyra leucostoma (Wiedemann) M; V
Phaonia spp. D K; VII
Schoenomyza dorsalis Loew K; IV-VI
Stomoxys calcitrans (Linn.) D K; VI-VIII

Otitidae

- Chaetopsis aenea* (Wiedemann) G K; VI-VIII
C. apicalis Johnson D M; V-VIII
C. fulvifrons (Macquart) D G K M; IV-X
Tritoxa flexa (Wiedemann) K; VI
T. incurva Loew K; VI-VII

Pipunculidae

- Pipunculus* spp. D K; V-IX

Platystomatidae

- Rivellia colei* Namba M; V
R. quadrifasciata (Macquart) M; VI-VIII
R. steyskali Namba M; V
R. variabilis Loew M; V
R. winifredae Namba G M; V-VIII

Rhagionidae

- Rhagio punctipennis* (Say) G; V-VI

Sarcophagidae

- Helicobia rapax* (Walker) G K; V-VIII
Metopa sarcophaga importuna (Walker) M; VIII
Microcerella hypopygialis (Townsend) D; VII-X
Oxysarcodexia ventricosa (Wulp) G; X
Ravinia sp. D; IX
Sarcophaga sarracenioides Aldrich D; IX
S. spp. D G K M; VI-X

Sarcophagidae (contd.)

Senotainia trilineata (Wulp) M; IX

Sciaridae

Bradysia sp. K; V-VI
Sciara sp. M K; VI-VII

Sciomyzidae

Atrichomelina pubera (Loew) G; XI
Dictya expansa Steyskal G; IX-XII
D. lobifera Curran D K; V-VI
D. stricta Steyskal D; VI
D. spp. D G K M; V-XI
Hoplodictya setosa (Coquillett) K; VII
Pherbellia nana (Fallen) K; X
Sepedon armipes Loew M; V
Tetanocera vicina Macquart M; V
T. sp. M; V

Sepsidae

Sepsis neocynipsea (Melander and Spuler) D M; VIII-IX
S. punctatum (Fabr.) G K; IV-X

Sphaeroceridae

Leptocera spp. D G K M; V-XII

Stratiomyidae

Odontomyia sp. D G; VI-VIII
Sargus decorus Say M; VI

Syrphidae

Chrysogaster sp. D; X
Eristalis transversus Wiedemann G; VI
Helophis distinctus Williston G M; V-IX
Mesograpta floralis (Fabr.) K; VII-X
M. marginata (Say) D G K M; VI-X
Metasyrphus sp. K; X
Microdon sp. K; X
Paragus tibialis (Fallen) K; VI
Platycheirus angustatus (Zetterstedt) D; VI
P. quadratus (Say) D G K M; IV-IX
P. sp. M; V
Sphaerophoria cylindrica (Say) D G K; VI
Toxomerus geminatus (Say) D G M; VI-X
Xylota metallica Wiedemann G; VII

Tabanidae

- Chrysops atlanticus* Pechuman D G K; VI-VIII
C. callidus Osten Sacken G M; VI-VII
C. niger Macquart G M; VI
C. nigribimbo Whitney K; VI
C. obsoletus Wiedemann G M; VI-VIII
Hybomitra daeckei (Hine) D K; VI
H. lasiophthalma (Macquart) G; VI
Tabanus atratus Fabr. D; VIII
T. lineola Fabr. D M; VIII-IX
T. marginalis Fabr. G; VI
T. nigrescens Palisot de Beauvois M; VI
T. nigrovittatus Macquart D G K M; VI-IX
T. sackeni Fairchild M; VIII
T. sparus milleri Whitney G; VI
T. sulcifrons Macquart D M; VIII-IX
T. trimaculatus Palisot de Beauvois G M; VI-VIII

Tachinidae

- Bonnetia comta* (Fallen) G M; VIII
Helioplagia slossonae (Coquillett) M; VIII
Melanophora roralis (Linn.) D; VI
Myiophasia spp. D K; VI-X
Peleteria anaxias (Walker) M; VI
Spathidexia clemonsi Townsend G; VI
Trichopoda pennipes (Fabr.) D: X
Winthemia sinuata Reinhard K; VI

Tephritidae

- Neaspilota albidipennis* (Loew) M; VIII
Tephritis subpura (Johnson) D G M; I, IV-VI, VIII-XII

Tethinidae

- Tethina albula* (Loew) K; VI

Threvidae

- Furcifera pictipennis* (Wiedemann) M; VI

Tipulidae

- Cladura flavoferruginea* Osten Sacken G M; VII-VIII
Erioptera chlorophylla Osten Sacken G; V
E. hybrida (Meigen) DGG K M; III-VIII
E. needhami Alexander K; V
E. vespertina Osten Sacken GK; V-VII
Helius flavipes (Macquart) M; VII-VIII
Limnophila mundoides Alexander G IV-X

Tipulidae (contd.)

- Limona liberta* Osten Sacken K; V-VI
Nephrotoma ferruginea (Fabr.) D K M; V-VIII
Pilaria recondita Osten Sacken G; VII-VIII
Tipula eluta Loew G K M; IV-IX
T. tribittatus Say D; V
T. umbrosa Loew K; V
T. spp. D G M; VI-X

HYMENOPTERA

Apidae

- Apis mellifera* Linn. G; VIII

Braconidae

- Agathis* spp. D M; VI-VIII
A. panteles spp. D K M; V-X
Ascogaster sp. D; VI
Bracon spp. D M; V-VIII
Chelonus sp. D; VI
Coelinidea sp. G; V
Meteorus spp. G M; V-XI
Microplitis sp. D; VIII
Orgilus sp. D; VI
Orthostigma sp. G; V
Phanerotoma sp. M; V
Polystenidea sp. G; V
Rogas sp. G; X

Chalcididae

- Brachymeria ovata* (Say) G; VIII

Chrysididae

- Chrysis* spp. G K M; VIII-IX
Elampus marginatus (Patton) M; VIII

Cynipidae

- Euceroptres* sp. M; V
2 genera and spp. in subfamily Encoilinae DM; V-VI

Diapriidae

- Cinetus* sp. G; V

Eulophidae

- Aprostocetus* sp. M; V
Cirrospilus coptodiscae Girault D; VI

Eulophidae (contd.)

- Euderus subopacus* (Gahan) D; VI
Notanisomorpha sp. D; VI
Pediobius rugosithorax (Crawford) M; V

Eumenidae

- Monobia quadridens* G; IX
Stenodynerus spp. D G K; IX-XI

Eupelmidae

- 1 sp. unidentified M; V

Eurytomidae

- Eurytoma bicolor* Walsh M; V
Eurytoma spp. G K M; VI-VIII

Formicidae

- Camponotus ferrugineus* (Fabr.) G K; VI-XI
C. subbarbatus Emery D G K M; V-VII
C. (Colobopsis) sp. K; V
Crematogaster pilosa Emery D; X
C. sp. G; VIII
Dolichoderus pustulatus Mayr D G K M; V-IX
D. sp. D; X
Formica fusca Linn. G M; IV-IX
F. pallide-fulva nitidiventris Emery G M; VI-IX
F. spp. D; VI-VIII, X
Leptothorax sp. M; V
Monomorium pharaonis (Linn.) G; VI-VII
Myrmica americana Weber D; V-X
M. emeryana Forel D K M; VIII-IX
M. sp. D; IX
Prenolepis imparis (Say) G; IV
Tapinoma sessile (Say) D; VI-VII

Ichneumonidae

- Pseuderipternus radiolatus* (Provancher) D; VI

Mutillidae

- Sphaerophthalma pennsylvanica* (Lepeletier) D; VII
Timulla euterpe (Blake) G; VII

Perilampidae

- Perilampus muesebecki* Smulyan M; IX

Platygasteridae

Trichacis sp. M; V

Pompilidae

Anoplius sp. K; IX

Tachypompilus ferrugineus (Say) M; VIII

Pteromalidae

Dinarmus sp. M; IX

Gastrancistrus sp. K; VI

Halticoptera circulus (Walker) K; VI

Heteroschema sp. M; V

Tenthridinidae

Strongylogaster tacitus (Norton) G; V

Tiphiidae

Myzinum maculatum (Fabr.) M; VIII-IX

M. quinquecinctum (Fabr.) K; VIII

Vespidae

Polistes exclamans Viereck M; VIII

P. fuscatus (Fabr.) D K M; IV-X - common

Vespula maculifrons (Buysson) G; VIII-X

V. squamosa (Drury) G; VIII

V. vidua (Saussure) G; VIII-X

SUMMARY AND CONCLUSIONS

Insect populations at marsh stations at Deal Island, Gunpowder State Park, Kent Island and Magruder's Landing were sampled almost every month from September 1971 to June 1973. In warmer months weekly visits were usually made. Most collections were made with aerial nets. It is estimated that 9,700 specimens were taken.

The total number of species identified was 491. The number of genera identified was 448; these were placed in 153 families and 15 orders.

A large number of specimens were identified to the genus level only. At least one of these a small Dolichopodid fly in the genus *Keirosoma* is believed to be undescribed. (G. C. Steyskal, personal communication). Some rare specimens have not been thoroughly studied by specialists. In some instances specialists are not available to make determinations. One new state record is noted.

In general, a fairly large proportion of the species identified were found at more than one station. Spectacularly large swarms of insects were not encountered; a few species were very common; and these are noted.

This list proves that the insect fauna of estuarine marshes in Maryland is rich and diverse. The list also provides qualitative data which can be used in interpreting the role of insects in marsh ecology, and the records serve as a base-line for future research.

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