

A SYNOPSIS OF MARYLAND *CULICOIDES* (DIPTERA: CERATOPOGONIDAE)¹

LIONEL J. GAZEAU² AND DONALD H. MESSERSMITH³

The following is a list of *Culicoides* of Maryland as gathered from the collection of the U. S. National Museum. Distribution in the United States was compiled from available literature.

One of the earliest records was made by F. C. Pratt in 1907. Foote and H. D. Pratt described the *Culicoides* of the Eastern U. S. in 1954, and Jamnback (1965) the *Culicoides* of New York State.

Additional data were recorded from regional researches: Das Gupta (1965), Hair *et al.* (1966), Khalaf (1967), Lewis (1959), Jones (1967), Messersmith (1965, 1966), Pickard (1955), Root and Hoffman (1936), Snow (1957, 1958), Smith (1965), Williams (1955) and Wirth and Blanton (1966). New records of species: Wirth and Jones (1956) and Wirth and Blanton (1956), or breeding sites: Messersmith (1964).

Attention was also given to descriptions of new species or groups of species: Jamnback (1963), Wirth and Hubert (1962), Wirth and Jones (1957) and Wirth and Blanton (1967).

Many are new records for Maryland. We would like to express our gratitude to Dr. W. W. Wirth for permitting us to study the National Collection.

Culicoides alexanderi Wirth and Hubert. DISTRIBUTION: Mass., Conn.,

Mich., Ky., Tenn. MARYLAND RECORDS: Garrett County: Bittering 4H Camp, Grantsville (Wirth), Swallow Falls State Park (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon).

C. arboricola Root and Hoffman. DISTRIBUTION: Conn., N.J., Pa., Va., Ga., Ala., Miss., La., Texas, Okla., Neb., Kans., Minn., Wisc., Ill., Tenn. MARYLAND RECORDS: Howard County: Cooksville (Gazeau). Montgomery County: Fairland (Hubert), Forest Glen (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Worcester County: Snow Hill (Anderson).

C. baueri Hoffman. DISTRIBUTION: Conn., N.Y., Va., Ga., Fla., La., Texas, Cal., Colo., Wisc., Tenn. MARYLAND RECORDS: Frederick County: Old Mink Farm, Thurmont (Gazeau). Montgomery County: Forest Glen (Wirth). Worcester County: Snow Hill (Anderson).

C. beckae Wirth and Blanton. DISTRIBUTION: Va., Fla., Ala. MARYLAND RECORDS: Montgomery County: Forest Glen (Wirth).

C. bickleyi Wirth and Hubert. DISTRIBUTION: Mass., Conn., N.Y., Va., S.C., Fla., La., Okla., Wisc., Mich., W.Va. MARYLAND RECORDS: Garrett County: Cranesville Pine Swamp (Wirth). Montgomery County: Fairland (Hubert). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Worcester County: Snow Hill (Anderson).

C. biguttatus (Coquillett). DISTRIBUTION: Me., Vt., Mass., R.I., Conn., N.Y., N.J., Pa., D.C., Va., Ga., Fla., Ala.,

¹ Scientific Article No. A1565, Contribution No. 4274 of the Maryland Agricultural Experiment Station, College Park, Maryland 20742.

² Graduate Assistant, Department of Entomology.

³ Associate Professor, Department of Entomology, University of Maryland, College Park, Maryland 20742.

La., Texas, Colo., Ore., Mont., Kans., Wisc., Mich., Ill., Ohio, Tenn. MARYLAND RECORDS: Frederick County: Cunningham Falls State Park (Gazeau), Old Mink Farm, Thurmont (Gazeau). Garrett County: Cranesville Pine Swamp (Wirth). Howard County: Glenwood (Gazeau). Montgomery County: Fairland (Hubert), Forest Glen (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Queenstown (Scanlon), Centreville (Scanlon). Worcester County: Snow Hill (Anderson).

C. chiopterus (Meigen). DISTRIBUTION: Conn., N.Y., Va., La., Colo., Utah, Cal., Wash., Alaska, Mont., Wyo., Mich. MARYLAND RECORDS: Montgomery County: Fairland (Hubert), Forest Glen (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Worcester County: Snow Hill (Anderson).

C. crepuscularis Malloch. DISTRIBUTION: Me., Vt., Mass., R.I., Conn., N.Y., N.J., Va., N.C., Ga., Fla., Ala., Miss., La., Texas, Okla., N.M., Colo., Ariz., Utah, Cal., Wash., Mont., Wyo., S.D., Neb., Kans., Minn., Wisc., Mich., Ill., Tenn. MARYLAND RECORDS: Montgomery County: Fairland (Hubert). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Queenstown (Scanlon), Centreville (Scanlon).

C. debilipalpis Lutz. DISTRIBUTION: Va., Ga., Fla., La., Tenn. MARYLAND RECORDS: Queen Anne's County: Queenstown (Scanlon). Worcester County: Snow Hill (Anderson).

C. denticulatus Wirth and Hubert. DISTRIBUTION: Mass., Conn., N.Y., Minn., Wisc., Mich. MARYLAND RECORDS: Queen Anne's County: Queenstown (Scanlon). Worcester County: Snow Hill (Anderson).

C. footei Wirth and Jones. DISTRIBUTION: Va., Tenn. MARYLAND RECORDS: Montgomery County: Forest Glen (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon).

C. furens (Poey). DISTRIBUTION:

Mass., R.I., Conn., N.Y., N.J., Va., N.C., S.C., Ga., Fla., Miss., La., Texas. MARYLAND RECORDS: Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Kent Island (Gazeau), Queenstown (Scanlon).

C. guttipennis (Coquillett). DISTRIBUTION: Mass., Vt., Conn., N.Y., Pa., Va., Ga., Fla., Ala., Miss., La., Texas, Okla., Ariz., Kans., Minn., Iowa, Mo., Wisc., Ill., Ohio, Ky., Tenn. MARYLAND RECORDS: Baltimore County: Plummers Island (Barber). Howard County: Cooksville (Gazeau). Montgomery County: Fairland (Gazeau), Fairland (Hubert), Forest Glen (Heidemann), Forest Glen (Wirth). Prince George's County: College Park (Bishop), College Park (Gazeau). Queen Anne's County: Centreville (Scanlon).

C. haematopodus Malloch. DISTRIBUTION: Me., Mass., Conn., N.Y., Pa., D.C., Va., Ga., Fla., Ala., La., Texas, Okla., N.M., Colo., Utah, Cal., Nev., Neb., Kans., Wisc., Mich., Ill., Ohio, Tenn. MARYLAND RECORDS: Baltimore County: Plummers Island (Shannon), Green Spring Valley (Foote). Frederick County: Catoctin State Park (Gazeau), Cunningham Falls State Park (Gazeau), Old Mink Farm, Thurmont (Gazeau). Montgomery County: Fairland (Hubert), Forest Glen (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon).

C. hinmani Khalaf. DISTRIBUTION: Va., Fla., La. MARYLAND RECORDS: Montgomery County: Forest Glen (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon).

C. hollensis Melander and Brues. DISTRIBUTION: Me., Mass., R.I., Conn., N.Y., N.J., Del., Va., S.C., Ga., Fla., Miss., La. MARYLAND RECORDS: Calvert County: St. Leonard (Barber). Queen Anne's County: Centreville (Scanlon), Kent Island (Gazeau), Queenstown (Scanlon). Worcester County: Deal Beach (Trembley), Ocean City (Messersmith).

C. loisae Jamnback. DISTRIBUTION:

N.Y., Va., W.Va. MARYLAND RECORDS: Prince George's County: Patuxent Wildlife Refuge (Scanlon).

C. melleus (Coquillett). DISTRIBUTION: Me., Mass., R.I., Conn., N.Y., N.J., Del., Va., S.C., Ga., Fla., Miss., La. MARYLAND RECORDS: Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon).

C. mulrennani Beck. DISTRIBUTION: Fla. MARYLAND RECORDS: Montgomery County: Forest Glen (Wirth). Worcester County: Snow Hill (Anderson).

C. nanus Root and Hoffman. DISTRIBUTION: Conn., Va., W.Va., So. Car., Ga., Fla., Ala., La., Okla. MARYLAND RECORDS: Baltimore County: Baltimore (Root). Montgomery County: Forest Glen (Wirth).

C. niger Root and Hoffman. DISTRIBUTION: Conn., N.Y., Va., S.C., Fla., La. MARYLAND RECORDS: Baltimore County: Bay Shore (Root). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon). Worcester County: Snow Hill (Anderson).

C. obsoletus Meigen. DISTRIBUTION: Me., Vt., N.H., Mass., Conn., N.Y., N.J., Pa., D.C., Va., N.C., S.C., Ga., Fla., Ala., Miss., Okla., Colo., Cal., Ore., Wash., Alaska, Mo., Wisc., Mich., Ill., Ind., Ohio, Tenn. MARYLAND RECORDS: Baltimore County: Green Spring Valley (Foote). Garrett County: Swallow Falls State Park (Gazeau). Montgomery County: Fairland (Hubert), Forest Glen (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon).

C. ousairani Khalaf. DISTRIBUTION: Penn., Va., Fla., Ala., La., Texas, Okla., Tenn. MARYLAND RECORDS: Montgomery County: Fairland (Hubert). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon).

C. paraensis (Goeldi). DISTRIBUTION:

Va., S.C., Fla., Ala., La., Tenn. MARYLAND RECORDS: Baltimore County: Plummers Island (Zabrowsky), Plummers Island (Palmer). Montgomery County: Bethesda (Gazeau), Colesville (Hubert), Forest Glen (Wirth). Silver Spring (Hubert).

C. piliferus Root and Hoffman. DISTRIBUTION: Me., Mass., Vt., Conn., N.Y., N.J., Va., Ga., Fla., Ala., Mich., Tenn. MARYLAND RECORDS: Baltimore County: Green Spring Valley (Foote). Frederick County: Old Mink Farm, Thurmont (Gazeau). Howard County: Glenwood (Gazeau). Montgomery County: Fairland (Hubert). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Queenstown (Scanlon). Worcester County: Snow Hill (Anderson).

C. pseudopiliferus Wirth and Hubert. DISTRIBUTION: Mass., Conn., N.Y., Va., Ala., Wisc., Mich. MARYLAND RECORDS: Baltimore County: Roland Park (Root and Hoffman). Garrett County: Bittering 4H Camp, Grantsville (Wirth), Swallow Falls State Park (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon).

C. sanguisuga (Coquillett). DISTRIBUTION: Me., Vt., N.H., Mass., Conn., N.Y., N.J., Pa., D.C., Va., N.C., Ga., Wisc., Mich., Ind., Ohio, W.Va., Tenn. MARYLAND RECORDS: Baltimore County: Baltimore (Shannon), Baltimore (Wirth), Plummers Island (Barber), Plummers Island (Green), Green Spring Valley (Foote). Frederick County: Catcotin State Park (Gazeau). Montgomery County: Fairland (Hubert), Forest Glen (Wirth), Woodside (Benedict). Prince George's County: Malboro (Barber).

C. scanloni Wirth and Hubert. DISTRIBUTION: Mass., Conn., N.Y., Va., S.C., Fla., Ala. MARYLAND RECORDS: Montgomery County: Fairland (Hubert). Prince George's County: Patuxent Wildlife Refuge (Scanlon).

C. snowi Wirth and Jones. DISTRIBUTION: Va., Ga., Fla., Ala., Miss., W.Va., Tenn. MARYLAND RECORDS: Baltimore County: Plummers Is-

land (Crawford). Prince George's County: College Park (Bishop). Worcester County: Snow Hill (Anderson).

C. spinosus Root and Hoffman. DISTRIBUTION: Mass., Conn., N.Y., N.J., Pa., Del., Va., N.C., S.C., Ga., Fla., Ala., Miss., La., Texas, Okla., N.M., Colo., Ariz., Utah, Kans., Wisc., Mich., Ill., Ohio, W.Va., Tenn. MARYLAND RECORDS: Baltimore County: Plummers Island (Shannon), Roland Park (Root). Frederick County: Old Mink Farm, Thurmont (Gazeau). Montgomery County: Fairland (Hubert). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon). Worcester County: Snow Hill (Anderson).

C. stellifer (Coquillett). DISTRIBUTION: Mass., Conn., N.Y., N.J., Pa., Del., D.C., Va., N.C., S.C., Ga., Fla., Ala., Miss., La., Texas, Okla., N.M., Colo., Ariz., Utah, Cal., Neb., Kans., Wisc., Mich., Ill., Ohio, Ky., Tenn. MARYLAND RECORDS: Baltimore County: Green Spring Valley (Foote). Garrett County: Herrington Manor (Gazeau), Cranesville Pine Swamp (Gazeau). Howard County: Glenwood (Gazeau). Montgomery County: Fairland (Hubert), Forest Glen (Wirth). Prince George's County: Haydon Farm, Beltsville (Stone), Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon). Worcester County: Snow Hill (Anderson).

C. testudinalis Wirth and Hubert. DISTRIBUTION: Mass., Conn., Pa., Va., Wisc. MARYLAND RECORDS: Montgomery County: Fairland (Hubert). Prince George's County: Patuxent Wildlife Refuge (Scanlon).

C. tissoti Wirth and Blanton. DISTRIBUTION: S.C., Fla. MARYLAND RECORDS: Worcester County: Snow Hill (Anderson).

C. travisi Vargas. DISTRIBUTION: Mass., Conn., N.Y., Pa., Va., Ga., Fla., Ala., La., Okla., Colo., Ohio, Tenn. MARYLAND RECORDS: Baltimore County: Baltimore (Root), Green Spring

Valley (Foote), Roland Park (Root). Montgomery County: Forest Glen (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon).

C. variipennis (Coquillett). DISTRIBUTION: N.H., Mass., Conn., N.Y., N.J., Del., Va., Ga., Fla., Ala., Miss., La., Texas, Okla., N.M., Colo., Ariz., Utah, Cal., Nev., Ore., Wash., Mont., Wyo., Neb., Kans., Minn., Wisc., Mich., Ill., Ind., Ohio, Tenn. MARYLAND RECORDS: Montgomery County: Fairland (Hubert), Brinklow (Gould). Prince George's County: Beltsville (Alitaca), Beltsville (Scanlon), Beltsville (Wirth), Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon). Washington County: Downsville (Pope).

C. venustus Hoffman. DISTRIBUTION: Vt., Mass., Conn., N.Y., N.J., Pa., Del., N.C., Ga., Fla., Ala., Miss., La., Wisc., Mich., Ohio, Tenn. MARYLAND RECORDS: Baltimore County: Green Spring Valley (Foote). Montgomery County: Fairland (Hubert). Prince George's County: Haydon Farm, Beltsville (Dikmans), Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon). Worcester County: Snow Hill (Anderson).

C. villosipennis Root and Hoffman. DISTRIBUTION: Me., Mass., Conn., N.Y., N.J., Pa., Va., Ga., Fla., Ala., La., Texas, Okla., Kans., Iowa, Wisc., Mich., Ky., Tenn. MARYLAND RECORDS: Baltimore County: Green Spring Valley (Foote), Sparrow's Point (Root). Howard County: Cooksville (Gazeau), Glenwood (Gazeau). Montgomery County: Fairland (Gazeau), Fairland (Hubert), Forest Glen (Wirth). Prince George's County: Patuxent Wildlife Refuge (Scanlon). Queen Anne's County: Centreville (Scanlon), Queenstown (Scanlon).

References

- ATCHLEY, W. R., and WIRTH, W. W. 1967. A redescription of *C. riggsi* with notes on *C. bickleyi*

- in Oklahoma. (Diptera, Ceratopogonidae). Jour. Kansas Ent. Soc. 40:209-213.
- BECK, E. C. 1952. Notes on the distribution of *Culicoides* in Florida. (Diptera, Ceratopogonidae). Florida Entomologist 35:101-107.
- BECK, E. C. 1957. Two new species of *Culicoides* from Florida. (Diptera, Heleidae). Florida Entomologist 40:103-105.
- BECK, E. C. 1958. A population study of the *Culicoides* of Florida. (Diptera, Heleidae). Mosq. News 18:6-11.
- COHER, E. H., WIRTH, W. W., and KNUTSON, H. 1955. The *Culicoides* of New England. (Diptera, Heleidae). Mosq. News 15:153-155.
- DASGUPTA, S. K., and HANSENS, E. J. 1965. *Culicoides* (Diptera, Ceratopogonidae) from Salem County, New Jersey. Jour. New York Ent. Soc. 73:156-162.
- FOOTE, R. H., and PRATT, H. D. 1954. The *Culicoides* of the Eastern United States. Public Health Monograph No. 18:1-53.
- JAMNEACK, H. 1965. The *Culicoides* of New York State. (Diptera, Ceratopogonidae). New York State Museum and Science Service Bulletin No. 399:1-154.
- JAMNBACK, H., and WIRTH, W. W. 1963. The species of *Culicoides* related to *obsoletus* in Eastern North America. (Diptera, Ceratopogonidae). Ann. Ent. Soc. America 56:185-198.
- JONES, R. H. 1967. An overwintering population of *Culicoides* in Colorado. Jour. Med. Ent. 4:461-463.
- KHALAF, K. T. 1967. The seasonal fluctuation of the inland *Culicoides* of Southern Louisiana. (Diptera, Ceratopogonidae). The Florida Entomologist 50:151-155.
- LEWIS, F. B. 1959. Abundance and seasonal distribution of the common species of Ceratopogonidae (Diptera) occurring in the State of Connecticut. Can. Ent. 91:15-28.
- MESSERSMITH, D. H. 1964. The breeding site of *Culicoides debilipalpis* Lutz. (Diptera, Ceratopogonidae). Mosq. News 24:339.
- MESSERSMITH, D. H. 1965. *Culicoides* (Diptera, Ceratopogonidae) associated with poultry in Virginia. Mosq. News 25:321-324.
- MESSERSMITH, D. H. 1966. Reports of a collection of *Culicoides* (Diptera, Ceratopogonidae) from Western Virginia. Virginia Jour. Scien. New Series 17:83-104.
- PICKARD, E., and SNOW, W. E. 1955. Light trap collections of punkies (Family Heleidae, Genus *Culicoides*) McMinn County, Tennessee. Jour. of the Tennessee Acad. of Science 30:15-18.
- PRATT, F. C. 1907. Notes on "Punkies." U.S.D.A., B. E. Bull. 64, Part III.
- ROOT, F. M., and HOFFMAN, W. A. 1936. The North American species of *Culicoides*. Am. Jour. Hyg. 25:150-176.
- SMITH, W. W. 1965. Additional new records of tree-hole *Culicoides* (Diptera, Ceratopogonidae) in Northern Florida. Mosq. News 25:485.
- SNOW, W. E., PICKARD, E., and MOORE, J. B. 1957. The Heleidae of the Tennessee River Basin. Jour. Tennessee Acad. Scien. 32:18-36.
- SNOW, W. E., PICKARD, E., and JONES, C. M. 1958. Observations on the activities of *Culicoides* and other Diptera in Jasper County, South Carolina. Mosq. News 18:18-21.
- WILLIAMS, R. W. 1955. Studies on the *Culicoides* of Baker County, Georgia. (Diptera, Ceratopogonidae). Ann. Ent. Soc. Am. 48:30-34.
- WILLIAMS, R. H. 1955. Observations on the bionomics of some *Culicoides* of Cheboygan County, Michigan. (Diptera, Heleidae). Bull. Brooklyn Ent. Soc. 50:113-120.
- WIRTH, W. W., and JONES, R. H. 1956. Three North American species of tree-hole *Culicoides* (Diptera, Heleidae). Proc. Ent. Soc. Washington 58:161-168.
- WIRTH, W. W., and BLANTON, F. S. 1956. A new species of salt-marsh sand fly from Florida, the Bahamas, Panama and Ecuador. The Florida Entomologist 39:158-162.
- WIRTH, W. W., and JONES, R. H. 1957. The North American subspecies of *Culicoides variipennis*. (Diptera, Ceratopogonidae). U. S. Dept. Agr. Tech. Bull. 1170. pp. 1-35.
- WIRTH, W. W., and HUBERT, A. A. 1962. The species of *Culicoides* related to *piliferus* Root and Hoffman in Eastern North America. (Diptera, Ceratopogonidae). Ann. Ent. Soc. Am. 55:182-195.
- WIRTH, W. W., and BLANTON, F. S. 1966. A new day-biting sand fly from the Southeastern States. (Diptera, Ceratopogonidae). The Florida Entomologist 49:279-281.
- WIRTH, W. W., and BLANTON, F. S. 1967. The North American *Culicoides* of the *guttipennis* group (Diptera, Ceratopogonidae). The Florida Entomologist 50:207-232.