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TERRY L. ERWIN

A new Bombardier Beetle in Canada
(Col. Carabidae)

Preliminary diagnoses of five new North
American *Brachinus* (Col. Carabidae)

OPUSCULA ENTOMOLOGICA 34 1969

LUND, SWEDEN

REPRINT

A new Bombardier Beetle in Canada (Col. Carabidae)

By TERRY L. ERWIN

Department of Entomology, University of Alberta, Edmonton, Alberta

The purpose of this single species description, in advance of a forthcoming revision of the North and Middle American species, is to provide a name to be included in Lindroth's Part VI of "The Ground Beetles of Canada and Alaska." Of the ten species of *Brachinus* known to inhabit parts of Canada, the following is described as new:

Brachinus cyanochroaticus new species

Type locality. - Eleven miles west of York, Benson County, North Dakota.

Type specimens. - The holotype male and allotype female are in the Museum of Comparative Zoology, Cambridge, Massachusetts. Both were collected at the type locality by G. E. Ball on May 30, 1956. Five paratypes collected at various localities and on various dates are in each of the following museums: American Museum of Natural History, New York; California Academy of Natural Sciences, San Francisco; Museum of Comparative Zoology, Cambridge; Strickland Museum, University of Alberta, Edmonton, Canada; and my own collection.

Diagnostic combination. - Medium-sized beetles, 7.0 to 11.3 mm.

Color. Antennal articles 3 and 4 apically, metepisterna, metasternum at sides, and abdominal sterna and terga infuscated, otherwise ferrugineous. Dorsal surface and epipleura of elytra blue, usually with metallic luster.

Microsculpture. Isodiametric throughout.

Macrosculpture. Frontal furrows rugose and punctate. Disc of pronotum punctate, punctures barely impressed.

Head. Frontal furrows moderately impressed. Antennal scape robust, widest at middle. Ligula with center area ellipsoid-convex with two lateral rows of three setae per row. Mentum and submentum without accessory setae.

Prothorax. Pronotum (fig. 1) slightly convex, flattened along center line, sides moderately reflexed. Proepisterna pubescent throughout, proepipleura glabrous. Anterior tibia with anterior surface strigose.

Pterothorax. Elytra elongate, narrow, costae weakly elevated. Humeral angle square. Costae and depressions pubescent. Wings fully developed.

Abdomen. Ambulatory setae present on sterna two to six.

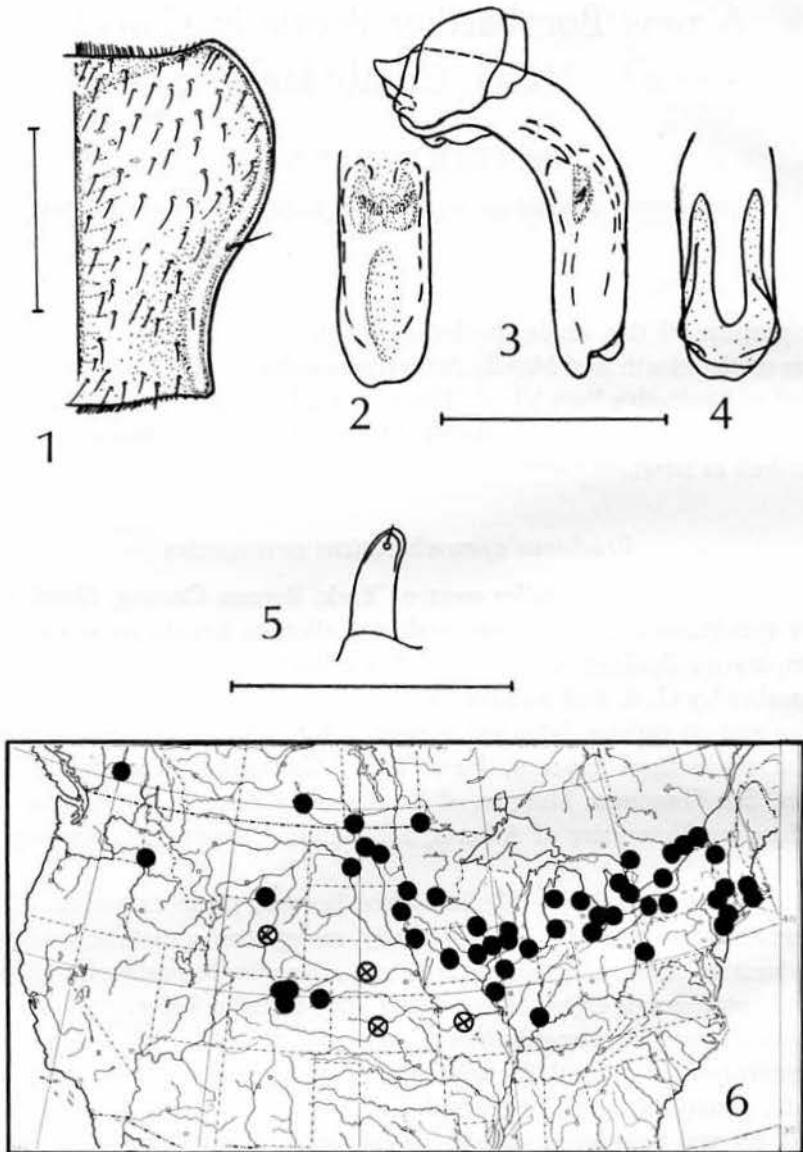


Fig. 1-6. *Brachinus cyanochroaticus* n.sp. - Fig. 1. Pronotum, right half, dorsal aspect. - Fig. 2. Male genitalia, ventral aspect. - Fig. 3. Male genitalia, left lateral aspect. - Fig. 4. Male genitalia, dorsal aspect. - Fig. 5. Right stylus of female ovipositor, ventral aspect. - Fig. 6. Geographical distribution map. Open circles with X's indicate state locality only.

Genitalia. Male (figs. 2, 3, 4). Median lobe with plane of shaft rotated from plane of basal bend. Basal bend long. Apex of shaft broad and blunt, with slight notch at middle. Venter of shaft with elongate longitudinal depression. Entire median lobe more robust than in *Brachinus cordicollis*. Ligule elongate, narrow, rounded apically. Virga (figs. 2, 3). Stylus of female (fig. 5) narrow, parallel-sided, rounded apically.

Variation. - The members of this species vary considerably in the shape of the pronotum and in the color of the elytra. These are both local variations, but generally the color has a metallic luster in the north and western portions of the range, while in the south and eastern parts of the range, the color is dull blue.

Flight. - The flight of these beetles has not been recorded.

Etymology. - Greek, *kyanos* = blue; *chroaticus* = color of the skin; referring to the blue color of the elytra of these beetles.

Collecting notes. - H. Goulet collected these beetles near old beaver houses in the company of *Platypatrobis lacustris* Darlington, and G. E. Ball and R. T. Bell collected them at the edges of ponds.

Life history. - Members of this species have been collected from April to October. Teneral adults were collected in May in Quebec. At least some adults overwinter.

Distribution. - (Fig. 6). The range of this species extends from British Columbia and Idaho, east to Massachusetts, and south to Kansas. I have seen 342 specimens from the following localities:

CANADA

BRITISH COLUMBIA: (Salmon Arm) CAS. MANITOBA: (Boissevain, south of Brandon) ZMLS; (Whitewater Lake) UASM, ZMLS. ONTARIO: (Belleville) CUNY; (Britannia) CAS; (Craighleith, West Collingwood, Georgian Bay) ZMLS; (De Cew Falls) CNC; (Grand Bend, Lake Huron) ZMLS; (Gravenhurst) AMNH; (Hyde Park Corner) RTBe; (Lake of the Woods, Clearwater Bay) CNC; (Point Pelee) ZMLS; (Port Credit) ZMLS; (Prince Edward County) CUNY; (Toronto) CAS; (Turkey Point, Lake Erie) ZMLS. SASKATCHEWAN: (Regina) ZMLS. QUEBEC: (Dorval) CAS; (Gatineau, 1.0 miles southwest of Meach Lake) CNC; (Lachine) CAS; (Lac Saint Jean) CAS; (La Trappe) ZMLS; (Montreal) CAS; (Outrem't) CAS; (Rigaud) CAS, HGou; (Saint Eustache) CAS; (Saint Rose) CAS; (Venise) CCha.

UNITED STATES

COLORADO: Boulder County (Bellmire Reservoir, Longmont) CArm, (McCall Lake, Lyons) CArm; Larimer County (Fort Collins) CAS; Weld County (Greeley) USNM; Yuma County (Wray) KSU. CONNECTICUT: New Haven County (New Haven) CAS. IDAHO: Nez Perce County (Lewiston) UIMI. ILLINOIS: Cook County (Chicago) WSUP; Putnam County (No locality given) ISNH. INDIANA: Posey County (Hovey Lake) PUM. IOWA: Clayton County (Guttenberg) ISUA; Dickinson County (Lake Okoboji) USNM; Johnson County (Iowa City) ANSP; Palo Alto County (Ruthven) UMAH; Story County (Ames)

ISUA. KANSAS: (No locality given) USNM. MASSACHUSETTS: Bristol County (Dartmouth) ISUA; Hampshire County (Mount Tom) CMPP; Middlesex County (Waltham) MCZ, (Wayland) MCZ. MICHIGAN: Calamazoo County (Gull Lake Biology Station) JSch; Eaton County (Grand Ledge) USNM; Huron County (Charity Island) UMAH; Kent County (Grand Rapids) CNHM, UNLN; Missaukee County (No locality given) UMAH; Oceania County (Crystal Valley) CNHM (Silver Lake State Park) UMAH; Tuscola County (Fostoria) RCGr; Washtenaw County (Ann Arbor) ISUA, UMAH, (Whitmore Lake) JSch, UMAH; Wayne County (Detroit) CAS. MINNESOTA: Clearwater County (De Soto Lake, Itasca State Park) UMSP, (Itasca State Park) UMSP; Houston County UMSP, (Brownsville) USNM; Stearns County (Rice Lake, Paynesville) USNM; Traverse County (No locality given) UMSP. MISSOURI: Counties unknown (Cliff Caves) USNM, (Luxemburg) USNM. MONTANA: Big Horn County (Lodge Grass) MSUM. NEBRASKA: (No locality given) ISNH. NEW HAMPSHIRE: Cheshire County (Swanzy Pond) MCZ. NEW JERSEY: Essex County (Orange Mountains) USNM; Hudson County (Secaucus) CAS; Morris County (Towaco) USNM; Passaic County (Paterson) AMNH; Warren County (Phillipsburg) CAS; County unknown (Snake Hill) AMNH, CAS. NEW YORK: Cayuga County (Montezuma Marsh) UASM; Chautauqua County (Mayville) UASM; Cortland County (McLean Bogs) CUNY; Erie County (Buffalo) CAS, ISNH, (East Aurora) CUNY, (Lancaster) CAS; Genesee County UMAH, (Batavia) CUNY; Herkimer County (Warren) MCZ; Monroe County (Rochester) LACM; New York County (New York City) MCZ, (Staten Island) CNHM, USNM, (Yonkers) CAS; Niagara County (Olcott) CUNY; Orange County (West Point) USNM; Rockland County (Piermont) CAS, SDNHM, USNM; Tompkins County (Ithaca) CAS, CUNY, UASM; Wyoming County (Pike) AMNH, MCZ; County unknown (West Hebron) USNM. NORTH DAKOTA: Benson County (11.9 miles west of York) UASM; McLean County (Turtle Mountain) UMAH; Ramsey County (Devils Lake) USNM. OHIO: Ashtabula County (Ashtabula, Chestnut Grove) PUM. PENNSYLVANIA: Allegheny County CMPP, USNM, (Pittsburgh) CMPP. SOUTH DAKOTA: Brookings County (Brookings) VMKI, (Volga) CAS. VERMONT: Chittenden County (Burlington) RTBe, (Gillette Pond, Richmond) RTBe, (Home Creek Delta, Charlotte) RTBe, (Shelburne) CAS, (Shelburne Pond, Shelburne) RTBe; Franklin County (La Moille River, East Georgia) RTBe. WISCONSIN: Dane County (Madison) UWMW; Dodge County (Beaver Dam) ROM, UMAH. WYOMING: Laramie County (Pine Bluffs) AMNH.

Note: Museum codes given in the above distribution list will be fully explained in the aforementioned revision of the North and Middle American species.

Preliminary diagnoses of five new North American *Brachinus* (Col. Carabidae)

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Department of Entomology, University of Alberta, Edmonton, Alberta

Carl H. Lindroth has informed me that he would like to include the following five species in his key to *Brachinus* in part of the "Ground-Beetles of Canada and Alaska", since these species are found in the northern United States. Along with all the remaining North and Middle American members of the genus they will be described in full in the published form of my doctoral thesis (Quaest. ent., *in press*). The following names are hereby validated:

Brachinus microamericanus new species — (type loc. Dundee, Mississippi; holotype male and allotype female in Univ. of Michigan, Ann Arbor Museum).

Metepisterna and sides of abdomen infuscated, elytra and epipleura blue, otherwise ferruginous. Mentum and submentum with many setae. Proepipleura and proepisterna with a few setae anteriorly and posteriorly, glabrous medially. Anterior tibia with anterior surface strigose. Hind wings reduced to elongate pads. L. 6.0–8.7 mm. These beetles occur in Mississippi, Missouri, and Michigan.

Brachinus adustipennis new species — (type loc. Myakka River, Myakka River State Park, Sarasota County, Florida; holotype male and allotype female in Museum of Comparative Zoology, Harvard).

Antennal articles 3 and 4, metepisterna, femoral apices, and sides of abdominal sterna infuscated, elytra brown, epipleura testaceous. Proepipleura glabrous. Proepisterna setiferous anteriorly. Anterior tibia with anterior surface strigose. L. 6–10.2 mm. Eastern U. S. to Mexico and Cuba, south to Panama, not west of Rockies.

Brachinus kavanaughi new species — (type loc. Superior, Boulder County, Colorado, along Coal Creek; holotype male and allotype female in Museum of Comparative Zoology, Harvard).

Antennal articles 3 and 4, metepisterna, metasternum at sides, abdominal sterna and terga infuscated, elytra and epipleura blue. Proepipleura glabrous. Proepisterna setiferous anteriorly and posteriorly, glabrous medially. Anterior tibiae with anterior surface strigose. L. 7.2–10.6 mm. The ranges of this species is discontinuous. Indiana, New York and Massachusetts to Maryland, North Carolina.

Brachinus vulcanoides new species — (type loc. Baychester, New York; holotype male and allotype female in Museum of Comparative Zoology, Harvard).

Antennal articles 3 and 4, metepisterna, metasternum at sides, abdominal sterna and terga infuscated, elytra and epipleura blue. Proepipleura glabrous. Proepisterna setiferous anteriorly and posteriorly, glabrous medially. Anterior tibia with anterior surface punctate, punctures small. L. 8.6-10.2 mm. These beetles occur along the east coast from Massachusetts to New Jersey.

Brachinus fulminatus new species — (type loc. Wayland, Middlesex County, Massachusetts; holotype male and allotype female in Museum of Comparative Zoology, Harvard).

Antennal articles 3 and 4, metepisterna, metasternum at sides, and abdominal sterna and terga infuscated to black, elytra and epipleura blue. Proepipleura glabrous. Proepisterna setiferous anteriorly and posteriorly, glabrous medially. Anterior tibia with anterior surface strigose. L. 7.2-10.6 mm. These beetles occur in a discontinuous pattern. Indiana, North Carolina, northeast (from New York to Massachusetts to Maryland).