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Jason A. Hansen
Michigan State University

Toby R. Petrice
USDA Forest Service

Robert A. Haack
USDA Forest Service

74 THE GREAT LAKES ENTOMOLOGIST Vol. 44, Nos. 1 - 2

New State Distribution and Host Records of North American Buprestidae (Coleoptera)

Jason A. Hansen[1], Toby R. Petrice[2] and Robert A. Haack[2]

Abstract

The following new state records are reported for buprestid species in the eastern United States: *Agrilus egeniformis* Champlain and Knull and *Polyceta elata* LeConte from Georgia, *Agrilus defectus* LeConte and *Agrilus vittaticollis* (Randall) from Minnesota and *Agrilus paramasculinus* Champlain and Knull from Michigan and Indiana. *Chrysobothris shawnee* Wellso and Manley and *Chrysobothris rugosiceps* Melsheimer are reported from red oak (*Quercus rubra* L.) and English oak (*Q*uercus *robur* L.) for the first time, after being reared from naturally infested host material collected in Michigan, USA.

Larvae of metallic woodboring beetles (Coleoptera: Buprestidae) are often restricted to a narrow range of host plants, i.e., a single genus or family of plants (Nelson et al. 2008). Understanding the host range and geographic distribution of buprestids can aid in preliminary identification of potential pest species when specimens are collected as larvae and when planning pest management activities. In some cases precise knowledge of host plants and geographic range can aid in selecting buprestids as biological control agents (Campbell and McCaffrey 1991). Herein we report six new state records from four U.S. states and new host records for two members of the *Chrysobothris femorata* species group. The geographic range of *Agrilus paramasculinus* Champlain and Knull is significantly expanded northwards into the Great Lakes region. New state records were confirmed using Nelson et al. (2008) and performing a search of relevant literature on buprestid distribution in the United States. Codens for collection repositories follow the Insect and Spider Collections of the World website (Evenhuis 2009).

***Agrilus egeniformis* Champlain and Knull. NEW STATE RECORD**. This species is widely distributed in the eastern U.S., but has also been recorded from New Mexico (Nelson and Westcott 1981). The two known larval host plants are *Gleditsia triacanthos* L. and *Sapindus saponaria* L. var. *drummondii* (H. & A.) L. Benson (Nelson et al. 2008). Georgia: Carlton Co., Okeefenokee Nat. Wildlife Refuge, Camp Cornelia, 17–19-VI-1988, three specimens, C.L. Smith; Emanuel Co., 9-V-1973, one specimen, R.T. Franklin. [UGCA]

***Agrilus defectus* LeConte. NEW STATE RECORD**. The larvae of this eastern species feed in several *Quercus* species (Nelson et al. 2008). It has been found as far north as Quebec in Canada and as far south as Texas in the U.S. (Nelson et al. 2008). It is also known from North Dakota and Iowa and in the province of Ontario, Canada (Fisher 1928, Nelson and Westcott 1976, Bright 1987). Minnesota: Clearwater Co., 18-VI-1978, 1♂, R.T. Franklin [UGCA].

***Agrilus paramasculinus* Champlain and Knull. NEW STATE RECORDS**. This species has been recorded from three midwestern U.S. states

[1]Department of Entomology, Michigan State University, 243 Natural Sciences Building, East Lansing, MI 48824.
[2]USDA Forest Service, Northern Research Station, 1407 S. Harrison Rd, East Lansing, MI 48823.

with Polk Co., Iowa, being the northernmost record reported by Nelson (1987) and Nelson and Westcott (1976). Bright (1987) includes Michigan and possibly Ontario as part of its geographic range, citing personal communication with G.H. Nelson, "… ex MI (Wellso, in litt.)". No other reference was given by Bright (1987) to support a record of *A. paramasculinus* from Michigan. Neither Wellso et al. (1976) nor Nelson et al. (2008) included *A. paramasculinus* as part of the buprestid fauna of Michigan. Specimens reported here significantly expand the range of *A. paramasculinus* northeastward into northern Indiana and southeastern Michigan. Michigan: Ingham Co., East Lansing, Tree Research Center, Lat 42.6752 N, Long 84.467053W, captured on yellow sticky card suspended from live branch of *Quercus robur* L., 21–28-V-2010, 1♂, T.R. Petrice [MSUC]; Ingham Co. East Lansing, Michigan State University (MSU) tree recycling center, 26-VI-1980, 1♂, 1-VII-1980, 1♂, 2-VII-1980, 1♂, 2-VI-1982, 1♂, S.G. Wellso [SGWC]. Indiana: Tippecanoe Co., West Lafayette, 13–23-V-1990, eight adults emerged from *Gymnocladus dioica* (L.) K. Koch. wood collected 2-VI-1989, S.G. Wellso [SGWC].

***Agrilus vittaticollis* (Randall). NEW STATE RECORD**. Larval hosts of this species include: *Amelanchier canadensis* (L.) Medik., *Crataegus* sp., *Malus* spp. and *Pyrus* spp. (Nelson et al. 2008). Its geographic range includes the provinces of British Columbia, Ontario,9 and Quebec, Canada (Bright 1987, Nelson et al. 2008). In the U.S., *A. vittaticollis* has been recorded in states from Florida in the southeast to Washington in the northwest (Fisher 1928, Nelson et al. 2008). Minnesota: Clearwater Co., 12-VI-1978, one specimen, R.T. Franklin [UGCA].

***Polycesta elata* LeConte. NEW STATE RECORD**. Georgia: Athens, 15-X-1953, one specimen, W. Garrett [UGCA]. This species has been collected in several southeastern and midwestern states where at least one of its three known host plants occurs, i.e. *Fraxinus greggii* Gray, *Platanus occidentalis* L. and *Quercus texana* Buckl. (Nelson et al. 2008).

***Chrysobothris shawnee* Wellso and Manley.** This common eastern species has been reared from *Castanea dentata* (Marshall) Borkhausen, *Q. stellata* Wangenh, *Q. phellos* L. and *Q. palustris* Muenchh (Wellso and Manley 2007). Wellso and Manley (2007) also report collecting *C. shawnee* adults on *Q. rubra* L. and numerous other *Quercus* spp. In our lab on the MSU campus, larvae of this species were found in naturally infested logs of red oak (*Q. rubra*) and English oak (*Q. robur*), **NEW HOST RECORDS.** Trees that were apparently uninfested with buprestids were cut into 1-m-long logs and stood vertically in a *Q. robur* and *Q. alba* L. provenance planting at the MSU Kellogg Forest, Kalamazoo County, Michigan, in May 2010. Logs remained in the field until brought into the laboratory in March 2011. For each log, one half was debarked and larvae removed, while the other half of each log was placed indoors (~22ºC) in rearing tubes to allow for adult emergence. Adults were collected from both rearing tubes and reared from the dissected late-instar larvae that were placed on artificial diet modified from Gindin et al. (2009). Larvae on artificial diet pupated within two weeks of being placed on diet. Michigan: Ingham Co., East Lansing, MSU Tree Research Center, *Quercus robur* girdled 21-V-2010, adult emerged 25-III-2011 in rearing tube held indoors, 1♀, S. Shooltz [MSUC]; Ingham Co., East Lansing, MSU Tree Research Center, *Quercus robur* girdled spring 2010, tree section cut 13 m above ground, 7 cm in diameter, adult emerged 18-IV-2011 in rearing tube held indoors, 1♀, S. Shooltz [MSUC]; Kalamazoo Co., Kellogg Forest, larvae extracted from *Quercus rubra* log 1 m long and 18 cm in diameter, finished pupating 18-IV-2011 indoors, 1♂1♀, J.A. Hansen [MSUC]; Kalamazoo Co., MSU Kellogg Forest, larva extracted from *Quercus rubra* log, 1 m long and 18 cm in diameter, finished pupating 11-IV-2011 indoors, 1♂, J.A. Hansen [MSUC].

***Chrysobothris rugosiceps* Melsheimer.** Wellso and Manley (2007) reported larvae of this species in C*astanea dentata*, *Quercus alba*, *Q. macrocarpa* Michaux and *Q. velutina* Lam. *Chrysobothris* larvae were recovered from English oak (*Q. robur*) and red oak (*Q. rubra*) that were later reared to adult *C. rugosiceps*, **NEW HOST RECORDS**. All adults collected as described in the preceding paragraph. Michigan: Kalamazoo Co., MSU Kellogg Forest, adult emerged 3-V-2011 in rearing tube held indoors from *Quercus rubra* log, 1 m long, 13 cm in diameter, 1♀, S Shooltz [MSUC]; Kalamazoo Co., MSU Kellogg Forest, larva extracted from *Quercus robur* log 1-IV-2011, log 1 m long and 18 cm in diameter, finished pupating 5-V-2011 when held indoors, 1♀, J.A.Hansen [MSUC]; Kalamazoo Co., MSU Kellogg Forest, larva extracted from *Quercus robur* log 1-IV-2011, log was 1 m long and 18 cm in diameter, finished pupating 18-IV-2011 when held indoors, 1♀, J.A. Hansen [MSUC].

Chrysobothris rugosiceps and *C. shawnee* are two of 12 species in the *Chrysobothris femorata* species group in North America (Wellso and Manley 2007). Half the species in this complex utilize *Quercus* species as host plants and some utilize the same *Quercus* species (Wellso and Manley 2007). The occurrence of multiple species of the *Chrysobothris femorata* species group in the same host plant makes initial identification of these borer species difficult. For example, *Q. rubra* is a known host plant of *C. quadriimpressa* as well as *C. shawnee* and *C. rugosiceps*, as reported here. This overlap in plant host utilization may lead to misidentification if larvae are not reared to adults. Many of the eastern *Chrysobothris* species in this species group have subtle male genitalic differences between them, suggesting that interbreeding may occur. Taxa within the *Chrysobothris femorata* species group are so closely related that recent molecular investigations using nuclear and mitochondrial gene sequences were largely unable to resolve their phylogenetic relationships (Hansen 2010). Future studies focusing on interbreeding between species within the *Chrysobothris femorata* species group will help clarify these taxa as currently delimited. Until such studies are complete, careful attention to reliable morphological characters in this species group, especially male genitalia, can facilitate species separation (Wellso and Manley 2007).

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