The Longhorned Beetles (Coleoptera: Cerambycidae) of Tennessee: Distribution of Species, Seasonal Adult Activity, and New State Records

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The longhorned beetles (Coleoptera: Cerambycidae) of Tennessee: distribution of species, seasonal adult activity, and new state records

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Abstract

Efforts to document species of longhorned beetles (Coleoptera: Cerambycidae) occurring in Tennessee have not been updated since 1973. To address this knowledge gap, institutional, research, and private collections in Tennessee were reviewed to provide faunal distribution assessments and seasonal activity data for the cerambycid beetle species active in Tennessee. Examinations of 9,918 specimens and records yielded a list of 230 cerambycid beetle species within 5 subfamilies. Twenty-seven species are reported as new state records from Tennessee. Adult seasonal activity data that were recorded on specimen labels are presented. Where available, notes on collection method, adult resources, and larval host plants are provided for species within a supplementary table. Supplemental figures report the distribution for species collected across the state and from 85 of the 95 Tennessee counties, as well as the ecoregions from which each species is reported. The bias-corrected Chao1 species richness estimator predicts another 11 species remain to be identified across the state. Future collection efforts in the Central Appalachian, Mississippi Alluvial and Valley Loess Plains, Southeastern Plains, and western portions of the Interior Plateau ecoregions could yield additional new state records. Developmental host and adult resource plants, collection methods, as well as regional collection notes from adjacent states are discussed for several additional candidate longhorned beetle species.

Key Words: adult resource; Chao1 estimator; ecoregion; intrastate distribution; larval host plant; range map

Resumen

Los esfuerzos para documentar las especies de escarabajos de largas antenas (Coleoptera: Cerambycidae) que ocurren en Tennessee no se han actualizado desde 1973. Para examinar esta brecha de conocimiento se estudiaron las colecciones institucionales, de investigación y privadas en Tennessee para proveer la distribución faunística y datos de actividad estacional para estas especies de escarabajos cerambícidos activos en Tennessee. La examinación de 9.918 especímenes y registros resultó en una lista de 230 especies de escarabajos cerambícidos dentro de 5 subfamilias. Se reportan veintisiete especies como nuevos registros estatales de Tennessee. Se presentan los datos de actividad estacional de adultos que fueron registrados en las etiquetas de los especimenes. Cuando están disponibles, se provee notas sobre el método de recolección, recursos para adultos y plantas hospederas de las larvas para las especies dentro de una tabla suplementaria. Las cifras suplementarias informan de la distribución de las especies recolectadas en todo el estado y de 85 de los 95 condados de Tennessee, así como las regiones ecológicas de las cuales cada especie es reportada. El estimador de la riqueza de especies Chao1 corregido de sesgo predice que otras 11 especies quedan por identificar en todo el estado. Los futuros esfuerzos de recolección en las llanuras aluviales y del valle del Loess, en las llanuras del sudeste y en las porciones occidentales de las regiones ecológicas de la Meseta Interior podrían producir nuevos registros estatales adicionales. Se discuten las plantas de desarrollo y plantas de recursos para adultos, los métodos de recolección, así como las notas regionales de recolección de los estados adyacentes para varias especies adicionales de escarabajos de antena largas.

Palabras Clave: recurso adulto; estimador de Chao1; región ecológica; distribución intraestatal; planta hospedero de larvas; mapa de rango geográfico

Although the longhorned beetle fauna (Coleoptera: Cerambycidae) is relatively well known across North America, recent efforts have documented substantial increases in longhorned beetle diversity and distribution in Montana (Hart et al. 2013), Nebraska (Spomer 2014), Mississippi (Schiefer 1998, 2001), and Alabama (Holt 2013). Knowledge about the distribution of cerambycid beetles across Tennessee remains limited, and documentation of reporting has been sporadic.

Hoyt Jamerson compiled a list and maps of the longhorned beetle fauna found in Tennessee as part of his Master's thesis at Memphis State University (Jamerson 1973). His examination of published literature, plus field collection efforts and a survey of then-available institutional and some private collections, yielded some 185 species within Tennessee. Data from the thesis were not published, and although it is cited by Linsley & Chemsak (1997), the thesis was miss-catalogued following the integrations of Memphis State University holdings within

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the University of Memphis Library System (G. P. Barton, personal communication). A portion of Jamerson's specimens have been relocated and integrated into the University of Georgia Collection of Arthropods [UGCA], along with the remainder of the Memphis State University entomology collection. Other collections examined or acknowledged by Jamerson, including specimens from Vanderbilt University, are no longer available or much diminished by damage (e.g., from dermestid beetles and rough handling).

Regardless, since Jamerson's project, considerable monitoring efforts for woodboring beetles have been undertaken across portions of Tennessee. Although recent efforts have been focused on metallic woodboring beetles, bark beetles, and other species of economic interest (Oliver & Mannion 2001; Oliver et al. 2002, 2004; Hansen et al. 2012, 2015; Klingeman et al. 2015), extended-season trapping in the region has yielded many longhorned beetle specimens.

To address existing knowledge gaps, cerambycid specimens were examined at institutional research and teaching collections, museums, and personal collections to assemble available label data and to determine species occurrence and distribution across Tennessee. Label data were examined to inform about seasonal flight activity of adult longhorned beetles and to document, when recorded, the various methods used to collect specimens. When present, relevant notes about adult resources and larval hosts listed for species were compiled.

Documenting the extant cerambycid fauna in Tennessee will elucidate the range of distribution among species and is expected to highlight gaps in collection activity across Tennessee's ecoregions (Fig. 1). Collection data are important for many reasons, including documentation of species diversity, use in assessing environmental and economic impacts of habitat and host plant loss, and monitoring incursion and spread of invasive species. The current specimen summarization effort will update past work to document longhorned beetle species diversity and will help direct future field collection activities.

Supplementary material for this article in Florida Entomologist 100(2) (Jun 2017) is online at http://purl.fcla.edu/fcla/entomologist/browse. Therefore, the supplementary table is referred to in this article as Suppl. Table 3, and all distributional maps for species are displayed online in supplementary figures (Suppl. Figs. 2–231). Fig. 1 is displayed in color in the online version of the journal.

Materials and Methods

Longhorned beetle specimens were identified using descriptive keys (e.g., Yanega 1996; Lingafelter 2007), and data compiled within this report are derived from these individuals and from examinations of specimens and data from institutional and private collections. Many beetles were also collected in conjunction with a series of season-long experimental trials conducted by Tennessee State University affiliated authors and cooperators. A majority of extended seasonal collections that informed this study were made in regions of middle or eastern Tennessee at about weekly intervals from 1 Apr to 28 Aug 2001; 6 Apr to 7 Oct 2002; 5 May to 2 Sep 2003; 12 Apr to 9 Aug 2004; 2 May to 15 Aug 2005; 2 May to 15 Aug 2006; 5 Jun to 21 Jul 2009; 8 Jun to 5 Aug 2010; 17 Jun to 18 Aug 2011; 9 Apr to 10 Sep 2012; and 11 May to 10 Sep 2013.

Specimens were examined in collection depositories [brackets] (Evenhuis 2016, or as acknowledged) at the University of Tennessee Entomology and Plant Pathology Insect Museum [ECUT] and the Great Smoky Mountains National Park [GSNP]. Both collections included results of tree sampling done at multiple times across 2 or

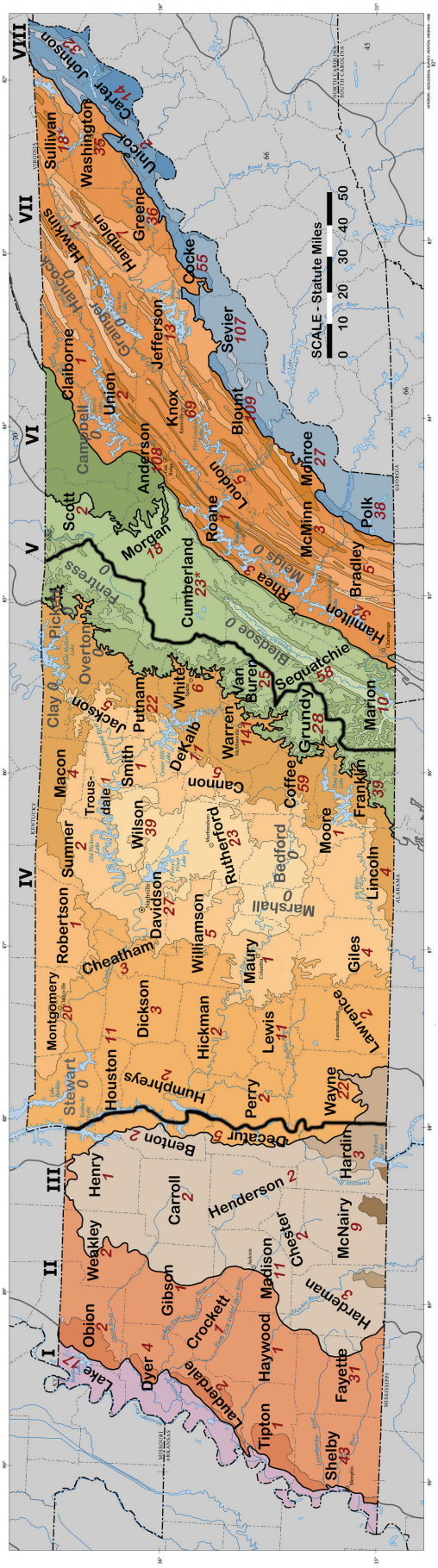

Fig. 1. Longhorned beetle species tallied within each of the 95 Tennessee counties from collection records compiled for 230 species. Collection distribution is presented across ecoregions occurring within the western, middle, and eastern Grand Divisions of Tennessee (bold black lines). Across the Grand Divisions, county names presented in pale gray text are those from which no longhorned beetle species were collected or reported. Species tallies presented do not include county records reported in Jamerson (1973) that could not be substantiated with a specimen. Roman numerals (west to east) designate the ecoregions of Tennessee, where I corresponds with the Mississippi Alluvial Plain (ecoregion 73), II are the Mississippi Valley Loess Plains (ecoregion 74), III are the Southeastern Plains (ecoregion 65), IV is the Interior Plateau (ecoregion 71), V are the Southwestern Appalachians (ecoregion 68), VI are the Central Appalachians (ecoregion 69), VII are Ridges and Valleys (ecoregion 67), and VIII are the Blue Ridge Mountains (ecoregion 66) (after Griffith et al. 1997). Full descriptions of the Tennessee ecoregions are available at: https://www.epa.gov/eco-research/ecoregion-download-files-state-region-3.

more seasons from targeted tree species, for example, tulip poplar (*Liriodendron tulipifera* L.; Magnoliales: Magnoliaceae) (LaForest et al. 2000), northern red oak (*Quercus rubra* L.; Fagales: Fagaceae) (Trieff 2002), southern magnolia (*Magnolia grandiflora* L.; Magnoliales: Magnoliaceae) (Werle 2002), and eastern hemlock (*Tsuga canadensis* [L.] Carrière; Pinales: Pinaceae) (Buck 2004).

Additional collections and published records of collections with Tennessee specimen data that were evaluated and integrated into this report include: [CMNH], [CSCA], [CUAC], [CUIC], [ECUT], [EDNC], [GSNP], [FSCA], [LSAM], [MCPM], [MEM], [PERC], [TSRS], [UGCA], [UMMZ], and [UTCI]. [UGCA] also recently had acquired and made available the arthropod collection previously maintained at the Memphis State University (now, University of Memphis). Prionini examined at [MEM] included Tennessee specimens on loan from [AMNH], [CMNH], [CNC], [CSUC], [FSCA], [MCZ], [MSUC], [NYSM], [RAAC], [SCUC], [SEMC], [TAMU], [UAAM], [UDCC], [UKIC], [USNM], and [WIRC] (Evenhuis 2016). Records of observed specimens and published accounts from additional institutional and personal collections that were incorporated included those of: CNTC = Carson–Newman Teaching Collection, DCHS = Davy Crockett High School (Jonesborough, Tennessee), ETSU = East Tennessee State University (Johnson City, Tennessee), FSGA = Forest Service (Dr. Daniel Miller, Athens, Georgia), JMBC = Jason M. Basham, JPBC = Joshua P. Basham, JHGC = Jeffrey P. Huether, NEAC= Nashville Ellington Agriculture Collection, NNYC = Nadeer N. Youssef, TTUC = Tennessee Technological University, WEKC = William E. Klingeman, and WPNC = Warner Parks Nature Center.

Other records that included seasonal activity and county occurrence data were retrieved from published reports (Meyer 1937; Dillon & Dillon 1941, 1947; Linsley 1962a,b, 1963, 1964; Dillon 1956a,b,c; Linsley & Chemsak 1972, 1976, 1984, 1995; TCEIR 1972; McCauley & Eanes 1987; MacRae 2000; Gryzmala 2006; Schiefer & Newell 2010; Tindall et al. 2010; Leavengood & Chapman 2014; Vlasak 2014; Miller et al. 2015).

With the exception of Disteniinae, which is retained within Cerambycidae as a subfamily, nomenclature follows Bezark (2016). Taxonomy is updated to reflect current status, with synonyms used in Jamerson (1973) and more recent publications included after the valid species name. In Table 1, **new state records** are listed in **bold**, with specific label and collection data provided. When provided, data were compiled from specimen labels to include collection date, county and locality information, method of collection, and information about habitat, adult resource, or larval plant host. Seasonal adult activities were recorded by range of months, with first and last followed by a numeric superscript indicating week (within month) of first and final collection. For ease of reporting, days 29 to 31 are included within the 4th week period. Observations of species occurrence within any of Tennessee's 8 ecoregions are noted.

The total dataset for species tallies that were tallied in each Tennessee county was analyzed with EstimateS software, using the bias-corrected Chao1 (Colwell 2006) that, with 95 iterations, enabled a prediction of the number of species expected within the state and consequently yielding an estimated number of species that remain to be detected.

As with our distribution report on Buprestidae occurring in Tennessee and North Carolina (Klingeman et al. 2015), this report on Tennessee Cerambycidae is presented with inherent bias. Not all portions of the state have been subjected to season-long sampling, and some regions remain largely unexamined. Regardless, this report highlights poorly studied ecoregions across Tennessee and is expected to encourage a more detailed future examination of fauna occurring in these areas.

Table 1. List of the Cerambycidae of Tennessee with notes on seasonal adult activities and ecoregional distribution(s) (west to east), as noted from collection labels.

DISTENIINAE

Elytimitatrix (*Elytrimitatrix*) *undata* (F., 1775) (=*Distenia undata* [F., 1775]), Apr[1]–Oct[2], TN ecoregion(s): 74, 65, 71, 68, 69, 67, 66 (Suppl. Fig. 2).

PARANDRINAE

Tribe Parandrini

Neandra brunnea (F., 1798) (=*Parandra brunnea* [F., 1798]), Feb[2], May[1]–Aug[4], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 3).

PRIONINAE

Tribe Macrotomini

Archodontes melanoplus melanoplus (L., 1767), Jun[1], TN ecoregion(s): 67 (Suppl. Fig. 4).

Mallodon dasystomus dasystomus (Say, 1824) (=*Stenodontes dasystomus* Lameer, 1902), May[2]–Aug[3], TN ecoregion(s): 74, 71, 67, 66 (Suppl. Fig. 5).

Tribe Merosceliscini

Tragosoma harrisii (LeConte, 1851), Sevier Co., Great Smoky Mountains NP, Porter's Creek Trail, 1 Jul 2007, M. Ferro [LSAM]. **New state record**. TN ecoregion(s): 66 (Suppl. Fig. 6).

Tribe Prionini

Derobrachus brevicollis Audinet-Serville, 1832, Coffee Co., AEDC, 18 Jun 1998 [ECUT]. **New state record**. TN ecoregion(s): 71 (Suppl. Fig. 7).

Orthosoma brunneum (Forster, 1771), Apr[1]–Aug[4], Oct[3], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 8).

Prionus (Neopolyarthron) imbricornis (L., 1767), Jun[1]–Aug[1], TN ecoregion(s): 74, 65, 71, 68, 67, 66 (Suppl. Fig. 9).

Prionus (Prionus) laticollis (Drury, 1773), Jun[1]–Oct[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 10).

Prionus (Prionus) pocularis Dalman (1817), May[1]–Aug[1], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 11).

Tribe Solenopterini

Sphenostethus taslei (Buquet, 1841) (=*Derancistrus taslei* [Champlain, Kirk & Knull, 1925]), Jun[1]–Jul[4], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 12).

NECYDALINAE

Necydalis melitta (Say, 1835), May[3]–Jun[1], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 13).

SPONDYLINAE

Tribe Asemini

Arhopalus foveicollis (Haldeman, 1847), Blount Co., Cades Cove, Jul 2004, Roger Dajoz [GSNP]. **New state record**. Since then, records from Carter Co., Jul, Oct[1], TN ecoregion(s): 66 (Suppl. Fig. 14).

Arhopalus rusticus obsoletus (Randall, 1838), Jul[3]–Oct[2], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 15).

Asemum striatum (L., 1758). Feb[3]–May[4], TN ecoregion(s): 74, 65, 71, 67, 66 (Suppl. Fig. 16).

Tetropium schwarzianum Casey, 1891, Blount Co., Cades Cove ATBI Plot, 8–21 May 2001, Robert Hightower & Jim Burbank [LSAM]. **New state record**. TN ecoregion(s): 66 (Suppl. Fig. 17).

Table 1. (Continued) List of the Cerambycidae of Tennessee with notes on seasonal adult activities and ecoregional distribution(s) (west to east), as noted from collection labels.

Tribe Atimini

Atimia confusa confusa (Say, 1826), Mar[3]–May[2], TN ecoregion(s): 71, 67 (Suppl. Fig. 18).

Tribe Saphanini

Michthisoma heterodoxum LeConte, 1850, May[4]–Jul[1], TN ecoregion(s): 66 (Suppl. Fig. 19).

LEPTURINAE

Tribe Desmocerini

Desmocerus palliatus (Forster, 1771), May[4]–Aug[4], TN ecoregion(s): 66 (Suppl. Fig. 20).

Tribe Encyclopini

Encyclops caerulea (Say, 1826), Apr[4]–Jul[3], TN ecoregion(s): 67, 66 (Suppl. Fig. 21).

Tribe Lepturini

Alosternida chalybaea (Haldeman, 1847), May[1]–Jun[2], TN ecoregion(s): 69, 66 (Suppl. Fig. 22).

Analeptura lineola (Say, 1824), May[1]–Oct[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 23).

Anoplodera (Anoploderomorpha) pubera (Say, 1826) (=*Strangalepta pubera* Say, 1826), May[1]–Jun[4], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 24).

Bellamira scalaris (Say, 1826), May[4]–Aug[3], TN ecoregion(s): 67, 66 (Suppl. Fig. 25).

Brachyleptura champlaini Casey, 1913, Jun[1]–Sep[1], TN ecoregion(s): 71, 66 (Suppl. Fig. 26).

Brachyleptura circumdata (Olivier, 1795) (=*Anoplodera circumdata* Chagnon, 1936), May[1]–Jun[3], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 27).

Brachyleptura rubrica (Say, 1824) (=*Anoplodera rubrica* Swaine & Hopping, 1928), Jun[2]–Jul[4], Sept[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 28).

Brachyleptura vagans (Olivier, 1795) (=*Anoplodera vagans* Swaine & Hopping, 1928), May[2]–Jul[3], TN ecoregion(s): 68, 67, 66 (Suppl. Fig. 29).

Charisalia americana (Haldeman, 1847), Warren Co., McMinnville, Nursery Research Center, "Summer" 2003, Joshua P. Basham [TSRS]. **New state record**. TN ecoregion(s): 71 (Suppl. Fig. 30).

Grammoptera exigua (Newman, 1841), Sevier Co., GSMNP Twin Creeks ATBI Plot, 26 Apr to 15 May 2001, Ian C. Stocks [LSAM]. **New state record**. May[3], TN ecoregion(s): 66 (Suppl. Fig. 31).

Grammoptera haematites (Newman, 1841), Apr[1]–Jun[3], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 32).

Grammoptera subargentata (Kirby, 1837), May[4]–Jun[4], TN ecoregion(s): 66 (Suppl. Fig. 33).

Idiopidonia pedalis (LeConte, 1861), May[2]–Jul[3], TN ecoregion(s): 66 (Suppl. Fig. 34).

Judolia cordifera (Olivier, 1795) (=*Anoplodera cordifera* Swaine & Hopping, 1928), May[3]–Aug[2], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 35).

Leptura (Leptura) subhamata Randall, 1838, Jun[1]–Aug[1], TN ecoregion(s): 66 (Suppl. Fig. 36).

Lepturopsis biforis (Newman, 1841) (=*Anoplodera biforis* Swaine & Hopping, 1928), Jun[4]–Jul[1], TN ecoregion(s): 71, 66 (Suppl. Fig. 37).

Neoalosterna capitata (Newman, 1841), Apr[3]–Jul[1], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 38).

Stenelytrana emarginata (F., 1797) (=*Leptura emarginata* [F., 1787]), Jun[3]–Sep[2], TN ecoregion(s): 71, 68, 66 (Suppl. Fig. 39).

Stictoleptura canadensis canadensis (Olivier, 1795), Aug[1]–Sep[1], TN ecoregion(s): 66 (Suppl. Fig. 40).

Strangalepta abbreviata (Germar, 1824), May[3]–Sep[1], TN ecoregion(s): 68, 67, 66 (Suppl. Fig. 41).

Strangalia acuminata (Olivier, 1795) (=*Strangalina acuminata* Boppe, 1921), May[4]–Jul[2], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 42).

Strangalia bicolor (Swederus, 1787) (=*Strangalina bicolor* Boppe, 1921), Jun[2]–Jul[2], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 43).

Strangalia famelica famelica (Newman, 1841) (=*Strangalina famelica* Boppe, 1921), May[2]–Jul[4], TN ecoregion(s): 71, 68, 66 (Suppl. Fig. 44).

Strangalia famelica solitaria (Haldeman, 1847) May[4]–Aug[1], Oct[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 45).

Strangalia luteicornis (F., 1775) (=*Strangalina luteicornis* Boppe, 1921), May[4]–Aug[4], Oct[1], TN ecoregion(s): 74, 65, 71, 68, 67, 66 (Suppl. Fig. 46).

Strophiona nitens (Forster, 1771) (=*Anoplodera nitens* Swaine & Hopping, 1928), May[4]–Jul[1], TN ecoregion(s): 68, 67, 66 (Suppl. Fig. 47).

Trachysida mutabilis (Newman, 1841) (=*Anoplodera mutabilis* Swaine & Hopping, 1928), May[2]–Jun[4], TN ecoregion(s): 71, 66 (Suppl. Fig. 48).

Trigonarthris minnesotana (Casey, 1913), Blount Co., Cades Cove, 10 Jul 1936, H. B. Seibert [GSNP]. **New state record**. Since then, records from Anderson and Warren Cos., May[4]–Jul[2], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 49).

Trigonarthris proxima (Say, 1824) (=*Anoplodera proxima* Swaine & Hopping, 1928), May[1]–Jul[1], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 50).

Typocerus acuticauda acuticauda Casey (1913), Jun[2]–Jul[4], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 51).

Typocerus deceptus Knull, 1929, Jun[2]–Jul[3], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 52).

Typocerus lugubris (Say, 1824), Jun[2]–Jul[3], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 53).

Typocerus lunulatus lunulatus (Swederus, 1787), Jun[3]–Jul[4], TN ecoregion(s): 74, 65, 71, 67, 66 (Suppl. Fig. 54).

Typocerus octonotatus (Haldeman, 1847), Jun[1]–Jul[3], TN ecoregion(s): 74, 71 (Suppl. Fig. 55).

Typocerus sinuatus (Newman, 1841), Jun[4]–Jul[3], TN ecoregion(s): 74 (Suppl. Fig. 56).

Typocerus velutinus velutinus (Olivier, 1765), May[2]–Sep[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 57).

Typocerus zebra (Olivier, 1795), Apr[1]–Jul[4], TN ecoregion(s): 74, 65, 71, 68, 67, 66 (Suppl. Fig. 58).

Xestoleptura octonotata (Say, 1824) (=*Anoplodera octonotata* Swaine & Hopping, 1928), Apr[3]–Jul[1], TN ecoregion(s): 67, 66 (Suppl. Fig. 59).

Tribe Rhagiini

Acmaeops discoideus (Haldeman, 1847), Apr[4], TN ecoregion(s): 71 (Suppl. Fig. 60).

Anthophylax attenuatus (Haldeman, 1847), Apr[3]–Jul[1], TN ecoregion(s): 66 (Suppl. Fig. 61).

Anthophylax cyaneus (Haldeman, 1847), May[1–3], Jul[1], TN ecoregion(s): 66 (Suppl. Fig. 62).

Anthophylax hoffmani Beutenmüller, 1903, Jul[3], TN ecoregion(s): 66 (Suppl. Fig. 63).

Anthophylax viridis LeConte, 1850, May[3]–Jun[2], TN ecoregion(s): 66 (Suppl. Fig. 64).

Brachysomida bivittata (Say, 1824) (=*Acmaeops bivittatus* Hopping, 1928; *Acmaeops nigripennis* Melsheimer, 1853), Apr[4]–May[4], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 65).

Centrodera decolorata (Harris, 1841), Jun[2]–Jul[4], TN ecoregion(s): 66 (Suppl. Fig. 66).

Centrodera sublineata LeConte, 1862, Apr[1]–May[1], TN ecoregion(s): 71, 67 (Suppl. Fig. 67).

Table 1. (Continued) List of the Cerambycidae of Tennessee with notes on seasonal adult activities and ecoregional distribution(s) (west to east), as noted from collection labels.

Evodinus monticola monticola (Randall, 1838), Apr[1]–Sep[4], TN ecoregion(s): 66 (Suppl. Fig. 68).

Gaurotes cyanipennis (Say, 1824), Apr[1]–Jul[4], Oct[1], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 69).

Gaurotes thoracica (Haldeman, 1847), Apr[3]–May[3], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 70).

Metacmaeops vittata (Swederus, 1787) (=*Acmaeops directus* Dillon & Dillon, 1961), May[4]–Aug[3], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 71).

Pidonia aurata (Horn, 1860), May[2]–Aug[2], TN ecoregion(s): 67, 66 (Suppl. Fig. 72).

Pidonia densicollis (Casey, 1914), May[3]–Jul[4], TN ecoregion(s): 66 (Suppl. Fig. 73).

Pidonia ruficollis (Say, 1824), Apr[1]–Jul[4], TN ecoregion(s): 67, 66 (Suppl. Fig. 74).

Rhagium inquisitor inquisitor (L., 1758), Feb[4]–Jun[3], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 75).

Stenocorus (Stenocorus) cylindricollis (Say, 1824) (=*Toxotus cylindricollis* LeConte, 1850), Aug[1], TN ecoregion(s): 66 (Suppl. Fig. 76).

Stenocorus (*Stenocorus*) *schaumii* (LeConte, 1850), Sevier Co., Goshen Prong ATBI Plot, 8–21 May 2001, Ian C. Stocks [LSAM]. **New state record**. A specimen from Johnson City, Washington Co. (ETSU) lacks date information, yet anecdotal accounts suggest its collection prior to 2001. May[4], Aug[1], TN ecoregion(s): 71, 66 (Suppl. Fig. 77).

Stenocorus (Stenocorus) vittiger (Randall, 1838) (=*Toxotus cinnamopterus* Cox, 1861), May[3]–Jul[1], TN ecoregion(s): 67, 66 (Suppl. Fig. 78).

Stenocorus (Toxotopsis) cinnamopterus (Randall, 1838) (=*Toxotus cinnamopterus* Haldeman, 1847), Apr[3]–Jun[3], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 79).

Tribe Xyloseini

Leptorhabdium pictum (Haldeman, 1847), May[3]–Jul[3], TN ecoregion(s): 67, 66 (Suppl. Fig. 80).

CERAMBYCINAE

Tribe Anaglyptini

Cyrtophorus verrucosus (Olivier, 1795), Mar[3]–Jul[2], TN ecoregion(s): 65, 71, 67, 66 (Suppl. Fig. 81).

Microclytus compressicollis (Laporte and Gory, 1835), Apr[3]– Jun[3], TN ecoregion(s): 66 (Suppl. Fig. 82).

Tilloclytus geminatus (Haldeman, 1847), Mar[3]–Jun[3], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 83).

Tribe Bothriospilini

Knulliana cincta cincta (Drury, 1773), Mar[2]–Aug[1], TN ecoregion(s): 73, 74, 71, 67, 66 (Suppl. Fig. 84).

Knulliana cincta spinifera (F., 1792), Mar[4]–Jul[2], TN ecoregion(s): 73, 74, 71, 67 (Suppl. Fig. 85).

Tribe Callichromatini

Plinthocoelium suaveolens suaveolens (L., 1768), Jul[3], TN ecoregion(s): 71 (Suppl. Fig. 86).

Tribe Callidiini

Callidium antennatum antennatum Newman, 1838, Apr[4], Jun[3], TN ecoregion(s): 65, 67 (Suppl. Fig. 87).

Callidium texanum Schaeffer, 1917, Warren Co., McMinnville, Nursery Research Center, 6 May 2003, Joshua P. Basham [JPBC]. **New state record**. Since then, records from Coffee, Rutherford, and Smith Cos., Apr[4]–May[3], TN ecoregion(s): 71 (Suppl. Fig. 88).

Phymatodes aereus (Newman, 1838), Apr[2,3], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 89).

Phymatodes amoenus (Say, 1824), Mar[3]–May[3], Aug[4], TN ecoregion(s): 73, 71, 67, 66 (Suppl. Fig. 90).

Phymatodes testaceus (L., 1758), Apr[2]–Jul[3], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 91).

Phymatodes varius (F., 1776), Mar[3]–May[4], TN ecoregion(s): 65, 71, 68, 67, 66 (Suppl. Fig. 92).

Physocnemum brevilineum (Say, 1824), activity data not reported. TN ecoregion(s): 67 (Suppl. Fig. 93).

Semanotus amethystinus (LeConte, 1853), Shelby Co., 4 Jun 1971, H. Jamerson [UGCA]. **New state record**. TN ecoregion(s): 74 (Suppl. Fig. 94).

Semanotus ligneus (F., 1787), Feb[1], Apr[3], TN ecoregion(s): 71 (Suppl. Fig. 95).

Tribe Clytiini

Clytoleptus albofasciatus (Laporte & Gory, 1838), Lawrence Co., 24 Mar 1988 [NEAC]. **New state record**. Since then, records from Anderson, Blount, and Warren Cos., Mar[4]–Jul[2], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 96).

Clytus marginicollis Laporte and Gory, 1838, Apr[3]–Jul[1], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 97).

Clytus ruricola (Olivier, 1795), Apr[4]–Aug[2], Oct[1], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 98).

Megacyllene caryae (Gahan, 1908), Mar[3]–Jul[1], TN ecoregion(s): 74, 71, 67 (Suppl. Fig. 99).

Megacyllene robiniae (Forster, 1771), Jul[1]–Nov[4], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 100).

Neoclytus acuminatus acuminatus (F., 1775), Mar[3]–Oct[4], TN ecoregion(s): 73, 74, 71, 68, 67, 66 (Suppl. Fig. 101).

Neoclytus caprea (Say, 1824), Mar[3]–May[4], Nov[1], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 102).

Neoclytus horridus (LeConte, 1862), Mar[4]–Apr[3], Nov[1], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 103).

Neoclytus jouteli jouteli (Davis, 1904), Jun[4]–Jul[3], TN ecoregion(s): 74, 68, 67 (Suppl. Fig. 104).

Neoclytus mucronatus mucronatus (F., 1775), Apr[4]–Nov[4], TN ecoregion(s): 74, 65, 71, 67, 66 (Suppl. Fig. 105).

Neoclytus scutellaris (Olivier, 1790), May[1]–Sep[4], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 106).

Sarosesthes fulminans (F., 1775), May[2]–Jul[4], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 107).

Xylotrechus aceris Fisher, 1917, Warren Co., McMinnville, Centertown, 9–16 Jul 2010, [TSRS]. **New state record**. Since then, records from Sequatchie Co., Jun[4]–Aug[4], TN ecoregion(s): 71, 68 (Suppl. Fig. 108).

Xylotrechus colonus (F., 1775), Apr[1]–Sep[4], TN ecoregion(s): 73, 74, 71, 68, 67, 66 (Suppl. Fig. 109).

Xylotrechus integer (Haldeman, 1847), Apr[3], TN ecoregion(s): 74, 71, 67 (Suppl. Fig. 110).

Xylotrechus nitidus (Horn, 1860), Sevier Co., GSMNP, Sugarlands [Visitor Center], 1 April to 28 June 2007, Michael Ferro [LSAM]. **New state record**. TN ecoregion(s): 66 (Suppl. Fig. 111).

Xylotrechus sagittatus sagittatus (Germar, 1821), Jun[3]–Oct[4], TN ecoregion(s): 74, 71, 67, 66 (Suppl. Fig. 112).

Tribe Curiini

Curius dentatus Newman, 1840, Warren Co., McMinnville, Nursery Research Center, 1–8 Jul 2002, Jason B. Oliver [TSRS]. **New state record**. Since then, records from Anderson, Fayette, and Franklin Cos., May[4]–Aug[1], TN ecoregion(s): 74, 71, 67 (Suppl. Fig. 113).

Table 1. (Continued) List of the Cerambycidae of Tennessee with notes on seasonal adult activities and ecoregional distribution(s) (west to east), as noted from collection labels.

Tribe Cryobiiini

Dryobius sexnotatus Linsley, 1957, Jun[2]–Jul[1], TN ecoregion(s): 74, 71, 66 (Suppl. Fig. 114).

Tribe Eburiini

Eburia (Eburia) haldemani LeConte, 1851, activity data not reported. TN ecoregion(s): 68 (Suppl. Fig. 115).

Eburia (Eburia) quadrigeminata (Say, 1826), May[2]–Aug[4], TN ecoregion(s): 74, 65, 71, 68, 67, 66 (Suppl. Fig. 116).

Tribe Elaphidiini

Aneflomorpha subpubescens (LeConte, 1862), Jun[2]–Jul[1], TN ecoregion(s): 71, 66 (Suppl. Fig. 117).

Anelaphus moestus moestus (LeConte, 1854), Hamilton Co., Chattanooga, Mountain Creek Road, 16 June 2008, S. Chatzimanolis [UTCI]. **New state record**. Since then, records from Franklin and Sequatchie Cos., Jun[2,3], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 118).

Anelaphus parallelus (Newman, 1840) (=*Elaphidionoides parallelus* Linsley, 1963), Mar[2]–Oct[3], TN ecoregion(s): 73, 74, 71, 68, 67, 66 (Suppl. Fig. 119).

Anelaphus pumilus (Newman, 1840), Mar[3]–Jun[3], TN ecoregion(s): 74, 71, 67, 66 (Suppl. Fig. 120).

Anelaphus villosus (F., 1792) (=*Elaphidionoides villosus* Linsley, 1957), Apr[2]–Aug[2], TN ecoregion(s): 73, 74, 71, 68, 67, 66 (Suppl. Fig. 121).

Elaphidion mucronatum (Say, 1824), May[1]–Sep[2], TN ecoregion(s): 73, 74, 71, 68, 67, 66 (Suppl. Fig. 122).

Enaphalodes atomarius (Drury, 1773), Jun[3]–Oct[2], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 123).

Enaphalodes cortiphagus (Craighead, 1923), Jun[4]–Oct[1], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 124).

Enaphalodes rufulus (Haldeman, 1847), Jun[1]–August[4], TN ecoregion(s): 74, 71, 68, 66 (Suppl. Fig. 125).

Micranoplium unicolor (Haldeman, 1847), Jul[1], TN ecoregion(s): 71 (Suppl. Fig. 126).

Parelaphidion aspersum (Haldeman, 1847) (=*Elaphidionoides aspersus* Linsley, 1963), May[1]–Oct[1], TN ecoregion(s): 73, 74, 71, 68, 67, 66 (Suppl. Fig. 127).

Parelaphidion incertum (Newman, 1840) (=*Elaphidionoides incertus* Linsley, 1963), May[2]–Aug[3], TN ecoregion(s): 73, 71, 68, 67 (Suppl. Fig. 128).

Psyrassa pertenuis (Casey, 1924), May[1]–Jul[2], TN ecoregion(s): 71, 68 (Suppl. Fig. 129).

Psyrassa unicolor (Randall, 1838), Jun[1]–Aug[2], TN ecoregion(s): 71, 68, 67 (Suppl. Fig. 130).

Stenosphenus notatus (Olivier, 1795), Mar[4]–Jul[3], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 131).

Tribe Hesperophanini

Tylonotus bimaculatus Haldeman, 1847, Jun[1]–Jul[4], TN ecoregion(s): 71, 67 (Suppl. Fig. 132).

Tribe Hylotrupini

Hylotrupes bajulus (L., 1758), Apr[3], TN ecoregion(s): 74, 65, 71, 67, 66 (Suppl. Fig. 133).

Tribe Ibidionini

Heterachthes ebenus Newman, 1840, May[1], TN ecoregion(s): 74 (Suppl. Fig. 134).

Heterachthes quadrimaculatus Haldeman, 1847 (=*Heterachthes pallidus* Blatchley, 1919), Jun[1]–Sep[1], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 135).

Tribe Molorchini

Molorchus bimaculatus bimaculatus Say, 1824, Feb[4]–Jun[4], TN ecoregion(s): 74, 71, 67 (Suppl. Fig. 136).

Molorchus bimaculatus corni Haldeman, 1847, Mar[1]–May[1], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 137).

Molorchus bimaculatus semiustus (Newman, 1840). Shelby Co., 8 Apr 1973, A. H. Clay [UGCA]. **New state record**. Since then, records from Anderson and Warren Cos., Mar[4]–Apr[4], TN ecoregion(s): 74, 71, 67 (Suppl. Fig. 138).

Tribe Obriini

Obrium maculatum (Olivier, 1795) (=*Obrium howdeni* Knull, 1955), Apr[4]–Aug[3], TN ecoregion(s): 73, 74, 65, 71, 68, 67 (Suppl. Fig. 139).

Obrium rufulum Gahan (1908). Wilson Co., Cedars of Lebanon State Park, 14 Jun 1997, T. L. Schiefer [MEM]. **New state record**. Since then, record from Warren Co., Jun[2], TN ecoregion(s): 71 (Suppl. Fig. 140).

Tribe Oemini

Oeme rigida rigida (Say, 1826), May[2]–Jun[2], TN ecoregion(s): 65, 71 (Suppl. Fig. 141).

Tribe Rhopalophorini

Rhopalophora longipes (Say, 1824), May[2]–Sep[3], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 142).

Tribe Smodicini

Smodicum cucujiforme (Say, 1826), Jun[2]–Aug[2], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 143).

Tribe Stenopterini

Callimoxys sanguinicollis (Olivier, 1795), Apr[2]–Jun[1], TN ecoregion(s): 67, 66 (Suppl. Fig. 144).

Tribe Tillomorphini

Euderces picipes (F., 1787), Apr[2]–Aug[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 145).

Euderces pini (Olivier, 1795), Mar[3]–Aug[4], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 146).

Euderces reichei LeConte, 1873, May[2], TN ecoregion(s): 71 (Suppl. Fig. 147).

Tribe Trachyderini

Batyle suturalis suturalis (Say, 1824), Mar[1], May[3]–Jul[4], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 148).

Elytroleptus floridanus (LeConte, 1862), Apr[3], TN ecoregion(s): 65, 71 (Suppl. Fig. 149).

Purpuricenus axillaris Haldeman, 1847, Jun[3,4], TN ecoregion(s): 68, 66 (Suppl. Fig. 150).

Purpuricenus humeralis (F., 1798), May[2]–Sep[4], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 151).

Purpuricenus paraxillaris MacRae, 2000, Jun[1], TN ecoregion(s): 66 (Suppl. Fig. 152).

Tragidion coquus (L., 1758), Jul[1]–Aug[4], TN ecoregion(s): 74, 68 (Suppl. Fig. 153).

LAMIINAE

Tribe Acanthocinini

Acanthocinus nodosus (F., 1775) (=*Tylocerinus nodosus* Dillon, 1956), Jun[1], Aug[1], TN ecoregion(s): 66 (Suppl. Fig. 154).

Table 1. (Continued) List of the Cerambycidae of Tennessee with notes on seasonal adult activities and ecoregional distribution(s) (west to east), as noted from collection labels.

Acanthocinus obsoletus (Olivier, 1795) (=*Neacanthocinus obsoletus* Dillon, 1956), May[4]–Aug[4], TN ecoregion(s): 65, 71, 68, 67, 66 (Suppl. Fig. 155).

Astyleiopus variegatus (Haldeman, 1847) (=*Sternidius variegatus* LeConte, 1873), May[1]–Aug[4], TN ecoregion(s): 74, 71, 67, 66 (Suppl. Fig. 156).

Astylidius parvus (LeConte, 1873), Jun[4]–Aug[2], TN ecoregion(s): 71, 66 (Suppl. Fig. 157).

Astylopsis arcuata (LeConte, 1878), Jun[2]-Sep[3], TN ecoregion(s): 65, 71, 68, 67, 66 (Suppl. Fig. 158).

Astylopsis collaris (Haldeman, 1847) (=*Amniscus collaris* Haldeman, 1847), Jun[2]–Sep[2], TN ecoregion(s): 71, 66 (Suppl. Fig. 159).

Astylopsis macula (Say, 1826) (=*Amniscus macula* Haldeman, 1847), Mar[2]–Aug[2], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 160).

Astylopsis sexguttata (Say, 1826) (=*Amniscus sexguttatus* Dillon, 1956), Apr[3]–Sep[1], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 161).

Dectes sayi Dillon & Dillon, 1953, Jun[4], Aug[2], TN ecoregion(s): 71, 66 (Suppl. Fig. 162).

Dectes texanus LeConte, 1862, Jul[3]–Sep[1], TN ecoregion(s): 73, 74, 65, 71, 67 (Suppl. Fig. 163).

Eutrichillus biguttatus (LeConte, 1852). May[2]–Jul[4], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 164).

Graphisurus despectus (LeConte, 1850) (=*Urographis despectus* Linsley & Chemsak, 1995), May[1]–Aug[2], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 165).

Graphisurus fasciatus (De Geer, 1775) (=*Urographis fasciatus* Lameer, 1883), Apr[3]–Oct[4], TN ecoregion(s): 73, 74, 71, 68, 67, 66 (Suppl. Fig. 166).

Graphisurus triangulifer (Haldeman, 1847) (=*Urographis triangulifer* Lameer, 1883), May[3]–Sep[3], TN ecoregion(s): 74, 71, 67 (Suppl. Fig. 167).

Hyperplatys aspersa (Say, 1824), Apr[3]–Jul[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 168).

Hyperplatys maculata Haldeman, 1847, Jun[1], Oct[1], TN ecoregion(s): 67 (Suppl. Fig. 169).

Leptostylus asperatus (Haldeman, 1847), Mar[4]–Sep[4], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 170).

Leptostylus transversus (Gyllenhal, 1817), Mar[4]–Oct[2], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 171).

Lepturges (Lepturges) angulatus LeConte, 1852, May[4]–Aug[3], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 172).

Lepturges (Lepturges) confluens (Haldeman, 1847), May[3]–Jul[4], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 173).

Lepturges (*Lepturges*) *pictus* (LeConte, 1852). Rutherford Co., Sunnybelt Glade, 12 Jun 1997, T. L. Schiefer [MEM]. **New state record**. Since then, record from Warren Co., Jun[2]–Jul[4], TN ecoregion(s): 71 (Suppl. Fig. 174).

Lepturges (Lepturges) regularis (LeConte, 1852), May[1], TN ecoregion(s): 67 (Suppl. Fig. 175).

Lepturges (Lepturges) symmetricus (Haldeman, 1847), May[4]–Jun[2], TN ecoregion(s): 71, 67 (Suppl. Fig. 176).

Sternidius alpha (Say, 1827) (=*Liopinus alpha* Linsley & Chemsak, 1995), Apr[1]–Jul[4], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 177).

Sternidius misellus (LeConte, 1852) (=*Liopinus misellus* Linsley & Chemsak, 1995), May[4]–Jul[1], TN ecoregion(s): 71, 68 (Suppl. Fig. 178).

Sternidius punctatus (Haldeman, 1847) (=*Liopinus punctatus* Linsley & Chemsak, 1995), Davidson Co., Couchville Glade Natural Area, 10 Jun 1997, T. L. Schiefer [MEM]. **New state record**. Since then, records from Anderson, Sevier, Warren, and Wilson Cos., May[2]–Jul[2], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 179).

Styloleptus biustus biustus (LeConte, 1852), Warren Co., Viola, 2006 (emerged from *Quercus* species collected in 2005), Joshua P. Basham [TSRS]. **New state record**. Since then, records from Coffee and Lake Cos., Jul[3], Sep[1], TN ecoregion(s): 73, 71 (Suppl. Fig. 180).

Urgleptes facetus (Say, 1826), Jun[4], TN ecoregion(s): 67 (Suppl. Fig. 181).

Urgleptes foveatocollis (Hamilton, 1896), Warren Co., Viola, 2006 (emerged from *Cornus* species collected in 2005), Joshua P. Basham [TSRS]. **New state record**. Since then, records from Anderson and Sevier Cos., May[4]–Jun[4], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 182).

Urgleptes querci (Fitch, 1858), May[4]–Aug[2], Oct[2], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 183).

Urgleptes signatus (LeConte, 1852). Wilson Co., Cedars of Lebanon State Park, 10 Jun 1997, J. M. Campbell [MEM]. **New state record**. Since then, records from Cocke, Sevier, and Warren Cos., May[1]–Aug[1], TN ecoregion(s): 71, 66 (Suppl. Fig. 184).

Tribe Acanthoderini

Acanthoderes (Acanthoderes) quadrigibba (Say, 1835) (=*Psapharochrus quadrigibbus* Lacordaire 1872; *Aegomorphus quadrigibbus* Linsley & Chemsak, 1984), Feb[1,3], May[1]–Sep[4], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 185).

Aegomorphus modestus (Gyllenhal, 1817) (=*Aegoschema modestum* Knull, 1946), May[1]–Aug[3], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 186).

Oplosia nubila (LeConte, 1863), Sevier Co., GSMNP, Twin Creeks ATBI Plot, 10–29 May 1999, C. R. Parker [LSAM]. **New state record**. May[3]–Jun[4] , TN ecoregion(s): 66 (Suppl. Fig. 187).

Tribe Agapanthiini

Hippopsis lemniscata (F., 1801), Apr[4]–Sep[1], TN ecoregion(s): 74, 71, 67 (Suppl. Fig. 188).

Tribe Cyrtinini

Cyrtinus pygmaeus (Haldeman, 1847), May[4]–Jun[2], TN ecoregion(s): 71, 67 (Suppl. Fig. 189).

Tribe Desmiphorini

Eupogonius pauper LeConte, 1852 (=*Eupogonius vestitus* LeConte, 1852), Jun[1]–Jul[4], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 190).

Eupogonius tomentosus (Haldeman, 1847), Jun[1]–Jul[3], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 191).

Psenocerus supernotatus (Say, 1826), Apr[1]–Jun[4], TN ecoregion(s): 74, 71, 68, 67 (Suppl. Fig. 192).

Tribe Dorcaschematini

Dorcaschema alternatum (Say, 1824), May[1]–Jul[1], TN ecoregion(s): 74, 71, 67 (Suppl. Fig. 193).

Dorcaschema cinereum (Olivier, 1795), May[1]–Aug[1], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 194).

Dorcaschema nigrum (Say, 1826), May[4], Jun[4], TN ecoregion(s): 71, 66 (Suppl. Fig. 195).

Dorcaschema wildii Uhler, 1855, Jun[4], Jul[2], TN ecoregion(s): 74 (Suppl. Fig. 196).

Tribe Monochamini

Goes debilis LeConte, 1852, activity data not reported. TN ecoregion(s): 66 (Suppl. Fig. 197).

Goes pulcher (Haldeman, 1847), activity data not reported. TN ecoregion(s): 71 (Suppl. Fig. 198).

Table 1. (Continued) List of the Cerambycidae of Tennessee with notes on seasonal adult activities and ecoregional distribution(s) (west to east), as noted from collection labels.

Goes tesselatus (Haldeman, 1847), activity data not reported. TN ecoregion(s): 68 (Suppl. Fig. 199).
Goes tigrinus (De Geer, 1775), May[1]–Jul[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 200).
Microgoes oculatus (LeConte, 1862), Apr[4]–Sep[2], TN ecoregion(s): 67, 66 (Suppl. Fig. 201).
Monochamus carolinensis (Olivier, 1792), Mar[4]–Sep[4], TN ecoregion(s): 74, 65, 71, 68, 67, 66 (Suppl. Fig. 202).
Monochamus marmorator (Kirby, 1837), Jul[2], Sep[4], TN ecoregion(s): 66 (Suppl. Fig. 203).
Monochamus notatus (Drury, 1773), May[3]–Oct[2], TN ecoregion(s): 68, 67, 66 (Suppl. Fig. 204).
Monochamus scutellatus scutellatus (Say, 1824), Mar[3]–Sep[4], TN ecoregion(s): 74, 65, 71, 68, 67, 66 (Suppl. Fig. 205).
Monochamus titillator (F., 1775), Apr[1]–Aug[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 206).
Plectrodera scalator (F., 1792), May[3]–Oct[1], TN ecoregion(s): 73, 74, 71, 67 (Suppl. Fig. 207).

Tribe Obereiini
Oberea affinis Leng & Hamilton, 1896, Cocke Co., GSMNP, Albright Grove at Old Growth Forest, 29 Jun 2001, Ian C. Stocks [LSAM]. **New state record**. Since then, records in Blount Co., Jun[4]–Jul[4], TN ecoregion(s): 66 (Suppl. Fig. 208).
Oberea myops Haldeman, 1847, Jun[3]–Jul[3], TN ecoregion(s): 66 (Suppl. Fig. 209).
Oberea ocellata Haldeman, 1847, May[3]–Jul[1], TN ecoregion(s): 74, 71 (Suppl. Fig. 210).
Oberea perspicillata Haldeman, 1847 (=*Oberea basalis* LeConte, 1852), Mar[1]–Aug[2], TN ecoregion(s): 74, 71, 67, 66 (Suppl. Fig. 211).
Oberea praelonga Casey, 1913, Anderson Co., 7 Jun 1970, W. Cloyd [CNTC]. **New state record**. Since then, records from Sevier and Warren Cos., May[4]–Jun[4], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 212).
Oberea ruficollis (F., 1792), Jun[4]–Sep[2], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 213).
Oberea tripunctata (Swederus, 1787) (=*Oberea mandarina* LeConte, 1852), May[3]–Jun[4], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 214).

Tribe Onciderini
Oncideres cingulata cingulata (Say, 1826), Apr[2], Aug[3]–Sep[4], TN ecoregion(s): 74, 71, 67, 66 (Suppl. Fig. 215).

Tribe Phytoeciini
Mecas (Mecas) cana cana (Newman, 1840), Jun[1], TN ecoregion(s): 71 (Suppl. Fig. 216).
Mecas (*Mecas*) *cineracea* Casey, 1913, Franklin Co., 3 miles NW of Huntland, 12 Aug 2003, N. N. Youssef [TSRS]. **New state record**. TN ecoregion(s): 71 (Suppl. Fig. 217).
Mecas (Mecas) pergrata (Say, 1824), May[3]–Jun[2], TN ecoregion(s): 71, 67 (Suppl. Fig. 218).

Tribe Pogonocherini
Ecyrus dasycerus dasycerus (Say, 1827), Feb[3], May[4]–Sep[2], TN ecoregion(s): 74, 71, 68, 67, 66 (Suppl. Fig. 219).
Pogonocherus (Pogonocherus) mixtus Haldeman, 1847. Emerged from larval host [controlled climate]. TN ecoregion(s): 68 (Suppl. Fig. 220).

Tribe Pteropliini
Ataxia crypta (Say, 1831), Feb[2], Jun[4], TN ecoregion(s): 74 (Suppl. Fig. 221).

Tribe Saperdini
Saperda candida F., 1787, May[3]–Aug[4], TN ecoregion(s): 67, 66 (Suppl. Fig. 222).
Saperda discoidea F., 1798, May[4]–Aug[2], TN ecoregion(s): 71, 67, 66 (Suppl. Fig. 223).
Saperda imitans Felt and Joutel, 1904, Jun[1]–Jul[1], Oct[1], TN ecoregion(s): 71, 66 (Suppl. Fig. 224).
Saperda lateralis F., 1775, May[2]–Aug[1], Oct[1], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 225).
Saperda puncticollis Say, 1824, Warren Co., Nursery Research Center, 6–11 May 2004, [TSRS]. **New state record**. TN ecoregion(s): 71 (Suppl. Fig. 226).
Saperda tridentata Olivier, 1795, May[2]–Aug[2], TN ecoregion(s): 74, 71, 66 (Suppl. Fig. 227).
Saperda vestita Say, 1824, May[3]–Aug[3], TN ecoregion(s): 71, 66 (Suppl. Fig. 228).

Tribe Tetraopini
Tetraopes femoratus LeConte, 1847, Aug[3], Oct[4], TN ecoregion(s): 71 (Suppl. Fig. 229).
Tetraopes melanurus Schoenherr, 1817, Aug[1], TN ecoregion(s): 67 (Suppl. Fig. 230).
Tetraopes tetrophthalmus (Forster, 1771), Apr[3]–Sep[4], TN ecoregion(s): 71, 68, 67, 66 (Suppl. Fig. 231).

Results

More than 9,918 Tennessee longhorned beetle specimens were assessed, and published literature was reviewed to document 230 species in Tennessee. For some species (e.g., *Neandra brunnea* [F.]), early or late "outlier" records are noted when specimens were collected across a gap in time that spanned at least 4 wk (Table 1). Total number species occurring in each of Tennessee's 8 ecoregions are reported (Table 2). For each species, available host and habitat data were also compiled from labels and are presented along with managing collection information and noted occurrence within Tennessee counties and ecoregions (Suppl. Table 3; Suppl. Figs. 2–231).

Twenty-seven species are reported as new state records for Tennessee, including *Tragosoma harrisii* (LeConte), *Derobrachus brevicollis* Audinet-Serville, *Arhopalus foveicollis* (Haldeman), *Tetropium schwarzianum* Casey, *Charisalia americana* (Haldeman), *Grammoptera exigua* (Newman), *Trigonarthris minnesotana* (Casey), *Stenocorus* (*Stenocorus*) *schaumii* (LeConte), *Callidium texanum* Schaeffer, *Semanotus amethystinus* (LeConte), *Clytoleptus albofasciatus* (Laporte & Gory), *Xylotrechus aceris* Fisher, *Xylotrechus nitidus* (Horn), *Curius dentatus* Newman, *Anelaphus moestus moestus* (LeConte), *Molorchus bimaculatus semiustus* (Newman), *Obrium rufulum* Gahan, *Lepturges* (*Lepturges*) *pictus* (LeConte), *Sternidius punctatus* (Haldeman), *Styloleptus biustus biustus* (LeConte), *Urgleptes foveatocollis* (Hamilton), *Urgleptes signatus* (LeConte), *Oplosia nubila* (LeConte), *Oberea affinis* Leng & Hamilton, *Oberea praelonga* Casey, *Mecas* (*Mecas*) *cineracea* Casey, and *Saperda puncticollis* Say. Distribution records for all 230 cerambycid species documented in Tennessee, including potential range additions taken from Jamerson (1973), are plotted by county (Suppl. Figs. 2–231).

Species counts are summed within 85 of the 95 Tennessee counties from which longhorned beetles are reported. Ten Tennessee counties, including Bedford, Bledsoe, Clay, Fentress, Hancock, Marshall, Meigs, Overton, Pickett, and Stewart counties. yielded no taxa among collec-

Table 2. Ecoregional distribution of Cerambycidae species tallied within each of the 8 ecoregions occurring across Tennessee.

Ecoregion[a]	Level III ecoregion category	Species tally	Generalized description of representative flora[b]
Ecoregion 73	Mississippi Alluvial Plain	15	Cropland, pasture, oak-tupelo-bald cypress deciduous forest
Ecoregion 74	Mississippi Valley Loess Plains	63	Cropland, pasture, woodlands (beech, sugar maple), oak–hickory forest, cypress–gum swamp habitat, oak–tupelo deciduous forest
Ecoregion 65	Southeastern Plains	20	Cropland, pasture, bottomland hardwoods (sycamore, sweetgum, tupelo, oak, cypress), oak-hickory-pine forest, blackbelt forest (sweetgum, oak, cedar), bluestem prairie
Ecoregion 71	Interior Plateau	167	Cropland, pasture, oak–hickory forest, bluestem prairie, cedar glades (red cedar, winged elm, hackberry, oak)
Ecoregion 68	Southwestern Appalachians	86	Cropland, pasture, mixed oak and shortleaf pine forests; beech–tulip poplar forests, hemlock, sugar maple-basswood-ash-buckeye forest
Ecoregion 69	Central Appalachians	2	Appalachian oak forest, northern hardwood forest (beech, sugar maple, tulip poplar)
Ecoregion 67	Ridges and Valleys	151	Cropland, pasture, white and chestnut oak forests, sycamore-ash-elm forests, cedar–pine glades, pine forest
Ecoregion 66	Blue Ridge Mountains	159	Appalachian oak forest, northern hardwoods (maple, birch, beech, hemlock), oak–pine communities, southeastern spruce–fir forest, hemlock, rhododendron, shrub, grass and heath balds

[a]Ecoregions are presented in order of occurrence, from West to East, across the state of Tennessee.
[b]Generalized descriptions of the representative flora for each ecoregion are adapted from *The Ecoregions of Tennessee* (after Griffith et al. 1997).

tions and are named in gray shade followed by a "0" designation. County names are also overlaid upon the ecoregions present among the Grand Divisions of Tennessee, as indicated by bold vertical lines (Fig. 1). Across the top of the map, Roman numeral I corresponds with the Mississippi Alluvial Plain (ecoregion 73) characterized by Northern Mississippi Alluvial Plain habitats, II = Mississippi Valley Loess Plains (ecoregion 74), which includes both Bluff Hills and Loess Plains habitats, III = Southeastern Plains (ecoregion 65), which includes Blackland Prairie, Flatwoods/Alluvial Prairie Margins, Southeastern Plains and Hills, Fall Line Hills, and Transition Hills habitats, IV = Interior Plateau (ecoregion 71), which includes Western Pennyroyal Karst, Western Highland Rim, Eastern Highland Rim, Outer Nashville Basin, and Inner Nashville Basin habitats, V = Southwestern Appalachians (ecoregion 68), which includes Cumberland Plateau, Sequatchie Valley, and Plateau Escarpment habitats, VI = Central Appalachians (ecoregion 69), characterized by Cumberland Mountain habitats, VII = Ridge and Valley (ecoregion 67), which includes Southern Limestone/Dolomite Valleys and Low Rolling Hills, Southern Shale Valleys, Southern Sandstone Ridges, and Southern Dissected Ridges and Knobs habitats, and VIII = Blue Ridge Mountains (ecoregion 66), which includes Southern Igneous Ridges and Mountains, Southern Sedimentary Ridge, Limestone Valleys and Coves, and Southern Metasedimentary Mountains habitats (after Griffith et al. 1997). Counts of species collected within each ecoregion, along with expanded descriptions of the Tennessee ecoregional typography and their associated flora are presented (Table 2) with additional details available at: https://archive.epa.gov/wed/ecoregions/web/html/tn_eco.html.

As with Buprestidae in Tennessee (Klingeman et al. 2015), the areas of most intensive collection activity were focused in eastern Tennessee around the University of Tennessee Knoxville campus and the Great Smoky Mountains National Park. In middle Tennessee, counties around the Otis L. Floyd Research Center in McMinnville were well documented. Remnants of Jamerson's thesis collection (1973) confirmed the presence of many species in the southwestern corner of Tennessee. Likewise, collections made by staff at [MEM] and in conjunction with Cooperative Agricultural Pest Surveys and Invasive Species collections, with wood-associated beetles curated by staff at [PERC], yielded numerous specimens in middle and western Tennessee, along Tennessee portions of the Natchez Trace National Scenic Trail and among cedar glades habitats within the Interior Plateau ecoregion of middle Tennessee.

The Chao1 estimator predicted that 241 (± 6.7 SD) cerambycid beetle species are expected to occur in Tennessee, with an associated confidence interval of 234 to 264 species that may be found within the state.

Discussion

Although several cerambycid species periodically can cause economic injury to forest tree species (e.g., *Enaphalodes atomarius* [Drury], *E. cortiphagus* [Craighead]*, E. rufulus* [Haldeman]), herbaceous plants, and row crops (e.g., *Dectes* sp. on soybean, *Glycine max* [L.] Merrill, Fabales: Fabaceae), none among the 230 documented longhorned beetle species in Tennessee is considered an exotic invasive species.

The limited collections of longhorned beetle species occurring across the Mississippi Alluvial and Valley Loess Plains, Southeastern Plains, western portions of the Interior Plateau ecoregions, and Central Appalachian region indicates that future collection activity across these Tennessee ecoregions would be expected to more clearly define species intrastate distributions and potential range constraints across the cerambycid fauna of Tennessee (Table 2; Suppl. Figs. 2–231).

The Chao1 estimator suggests that there are likely to be about 11 more longhorned beetle species that occur in Tennessee. Among the 185 longhorned beetle species reported in Jamerson's (1973) thesis are several for which no physical specimen could be located and no

associated collection information was provided. Among these non-validated accounts are 10 species that may yet be documented in Tennessee, including *Parandra polita* Say, *Leptura abdominalis* (Haldeman), *L. plebeja* Randall, *Lycochoriolaus lateralis* (Olivier), *Strangalia sexnotata* Haldeman, *Megacyllene decora* (Olivier), *Enaphalodes hispicornis* (L.), *Batyle ignicollis australis* Linsley, *Oberea gracilis* (F.), and *Saperda obliqua* Say.

Deciduous plants are important reproductive hosts for several species that may yet be collected in Tennessee. *Parandra polita* are attracted to lights (Holt 2013), and larvae of this species develop within decaying heartwood of, for example, *Carya* (Fagales: Juglandaceae), *Fagus* (Fagales: Fagaceae), and *Liriodendron* species (Linsley & Chemsak 1997), which occur across Tennessee. *Glycobius speciosus* (Say) larvae develop within *Acer saccharum* Marshall (Sapindales: Sapindaceae), and this beetle species may have been collected in Tennessee in McMinn County, although Holland (2009) does not list the collection that would have contained the record. In Alabama, Holt (2013) reported *G. speciosus* from Jackson County in ecoregion 68. Oak species are also larval host plants for *E. hispicornis*, which has been collected in Alabama from Lawrence and Madison counties (ecoregions 71 and 68, respectively) (Holt 2013). *Oberea gracilis* larvae also develop in seedlings of *Quercus alba* L. and *Quercus falcata* Michaux (Fagales: Fagaceae), which occur across Tennessee, yet reported *O. gracilis* collections were restricted to southern counties in Mississippi and Alabama (Schiefer 1998; Holt 2013). *Quercus*, *Amelanchier* (Rosales: Rosaceae), and *Castanea* (Fagales: Fagaceae) species are larval host plants of *Hebestola nebulosa* Haldeman. *Liriodendron* and *Nyssa* (Cornales: Cornaceae) species are developmental hosts for *Aegomorphus morrisii* (Uhler) (Linsley & Chemsak 1997), yet *A. morrisii* adults can also be attracted to a blacklight (Shieffer 1998). *Alnus serrulata* (Aiton) Willd. (Fagales: Betulaceae), *Betula* species (Fagales: Betulaceae), and *Corylopsis* species (Saxifragales: Hamamelidacea) are larval host plants used by *S. obliqua* (Lingafelter 2007). All 3 of these cerambycid species have been collected in Mississippi in ecoregion 65 (Schiefer 1998), which extends north into Tennessee. *Amorpha fruticosa* L. (Fabales: Fabaceae), which is the developmental host plant used by *M. decora* (Linsley & Chemsak 1997), can be found in ecoregions occurring across Tennessee but is less common in ecoregions 69, 66, and 65 (Ma 2016).

Coniferous plants are also used as reproductive hosts with *L. abdominalis* relying on *Taxodium distichum* (L.) Richard (Pinales: Cupressaceae) and *Juniperus* species (Pinales: Cupressaceae), whereas *L. plebeja* larvae develop within wood of *Picea* and *Pinus* species (all Pinales: Pinaceae) (Linsley & Chemsak 1997). Adults of *L. plebeja* have been collected on *Spiraea alba* var. *latifolia* (Aiton) Boivin (Rosales: Rosaceae) flowers and in blue, white, and yellow pan traps in ecoregion 66 in Polk and Henderson counties, in North Carolina (Campbell et al. 2007). *Batyle ignicollis australis* and *Scaphinus muticus* (F.), which both can develop within *Pinus* species, and within herbaceous *Bidens* species (Asterales: Asteraceae) and *Hypericum* species (Malpighiales: Hypericaceae), have been collected from southern Mississippi and Alabama (Schiefer 1998; Holt 2013).

Reproductive hosts are not documented for *L. lateralis* and *S. sexnotata*, yet adults of these species have been taken on *Callicarpa americana* L. (Lamiales: Lamiaceae), and on *Daucus carota* L. (Apiales: Apiaceae) and *Bidens aristosa* (Michaux) Britton (Asterales: Asteraceae), respectively, in Mississippi ecoregions 74 and 65 (Lago & Mann 1987; Schiefer 1998), as well as in Lauderdale county, Alabama, in ecoregion 71 (Holt 2013).

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