

New Information About the Cypress Weevil, *Eudocimus mannerheimii* (Boheman, 1836) (Coleoptera: Curculionidae: Molytinae): Redescription, Range Expansion, New Host Records, and Report as a Possible Causative Agent of Tree Mortality

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NEW INFORMATION ABOUT THE CYPRESS WEEVIL, *EUDOCIMINUS MANNERHEIMII*
(BOHEMAN, 1836) (COLEOPTERA: CURCULIONIDAE: MOLYTINAE):
REDESCRIPTION, RANGE EXPANSION, NEW HOST RECORDS, AND REPORT
AS A POSSIBLE CAUSATIVE AGENT OF TREE MORTALITY

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ABSTRACT

The cypress weevil, *Eudocimus mannerheimii* (Boheman, 1836), is reported from northwestern Arkansas (**new state record**). The suspected host in this area is eastern red cedar (*Juniperus virginiana* L.), which represents a new host record. Additional new host records from arborvitae (*Thuja* L.) in North Carolina are reported. A brief redescription of the adult that expands upon the original description and photographs are included. Although cypress weevils are not generally considered pestiferous, a case of landscape trees likely killed by this species is included.

Key Words: distribution, range expansion, Interior Highlands, Ozark Mountains, Hylobiini

Eudocimus mannerheimii (Boheman, 1836) (Figs. 1–8, 12), commonly called the cypress weevil, is a large, native hylobiine weevil (Curculionidae: Molytinae) that breeds in stressed bald cypress and related trees (Cupressaceae). Although not generally considered a pest, damage to small-diameter nursery stock and girdling of sprouts and seedlings has been occasionally reported (Mayfield 2004; Randall *et al.* 2005). Aside from checklist and catalogue entries (*e.g.*, Hopkins 1904; Blatchley and Leng 1916; Alonso-Zarazaga and Lyal 1999), information about *E. mannerheimii* is limited (Mayfield 2004).

The cypress weevil ranges from New York south to Florida and west to Louisiana (O'Brien and Wibmer 1982; Peck and Thomas 1998). Recently, it has also been reported from Querétaro and Jalisco, Mexico (Jones *et al.* 2003; Sánchez-Martínez *et al.* 2010). Recorded hosts include bald cypress (*Taxodium distichum* (L.) Rich.) (Hopkins 1904; Anderson 2002; Bambara 2004), pond cypress (*Taxodium ascendens* Brongn.), Montezuma cypress (*Taxodium mucronatum* Ten.) (Jones *et al.* 2003; Sánchez-Martínez *et al.* 2010), Japanese cedar (*Cryptomeria japonica* (L.f.) D. Don), and Leyland cypress (*Cupressocyparis leylandii* A. B. Jacks.

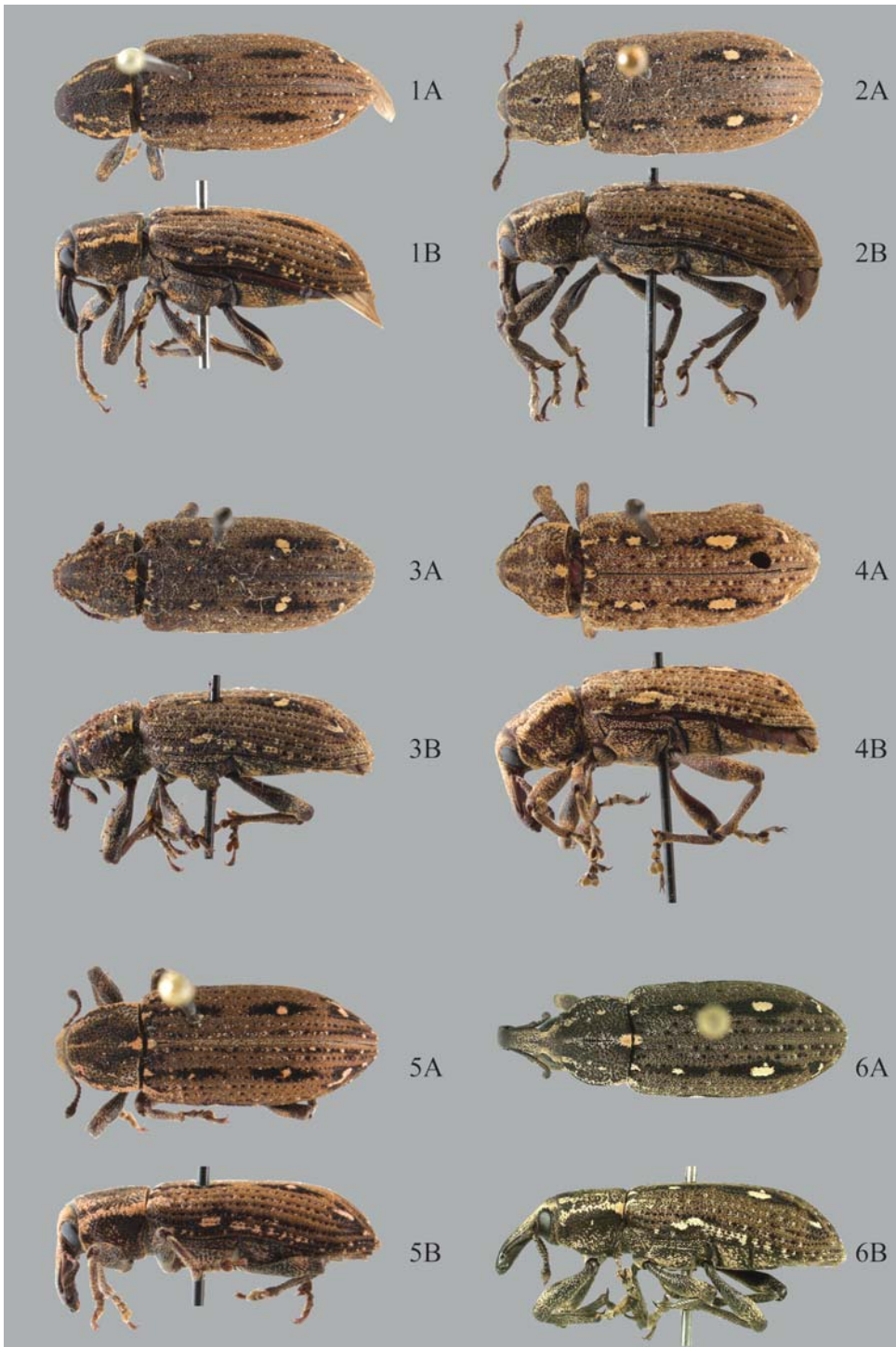
and Dallim.) (Bambara 2004). Additionally, Baker and Bambara (1999) suggested *E. mannerheimii* may feed on Atlantic white cedar (*Chamaecyparis thyoides* (L.) Britton, Sterns and Poggenb.) in New York, as bald cypress is not native so far north.

Herein, we discuss the collection of *E. mannerheimii* outside its known range and present a situation in which the beetle was involved in the death of landscape trees. Furthermore, as the original description of this species is in Latin, and therefore inaccessible to most modern readers, and subsequent redescriptions (*e.g.*, Blatchley and Leng 1916) do not encompass the variation, especially in color, seen in the species, we provide a brief updated description of the adults.

MATERIAL AND METHODS

In Arkansas, adult weevils (Figs. 1–2) were collected at Steel Creek along the Buffalo National River (Newton County) by Malaise traps in an eastern red cedar (*Juniperus virginiana* L.) glade and in a purple Lindgren funnel trap in a mixed forest containing eastern red cedar.

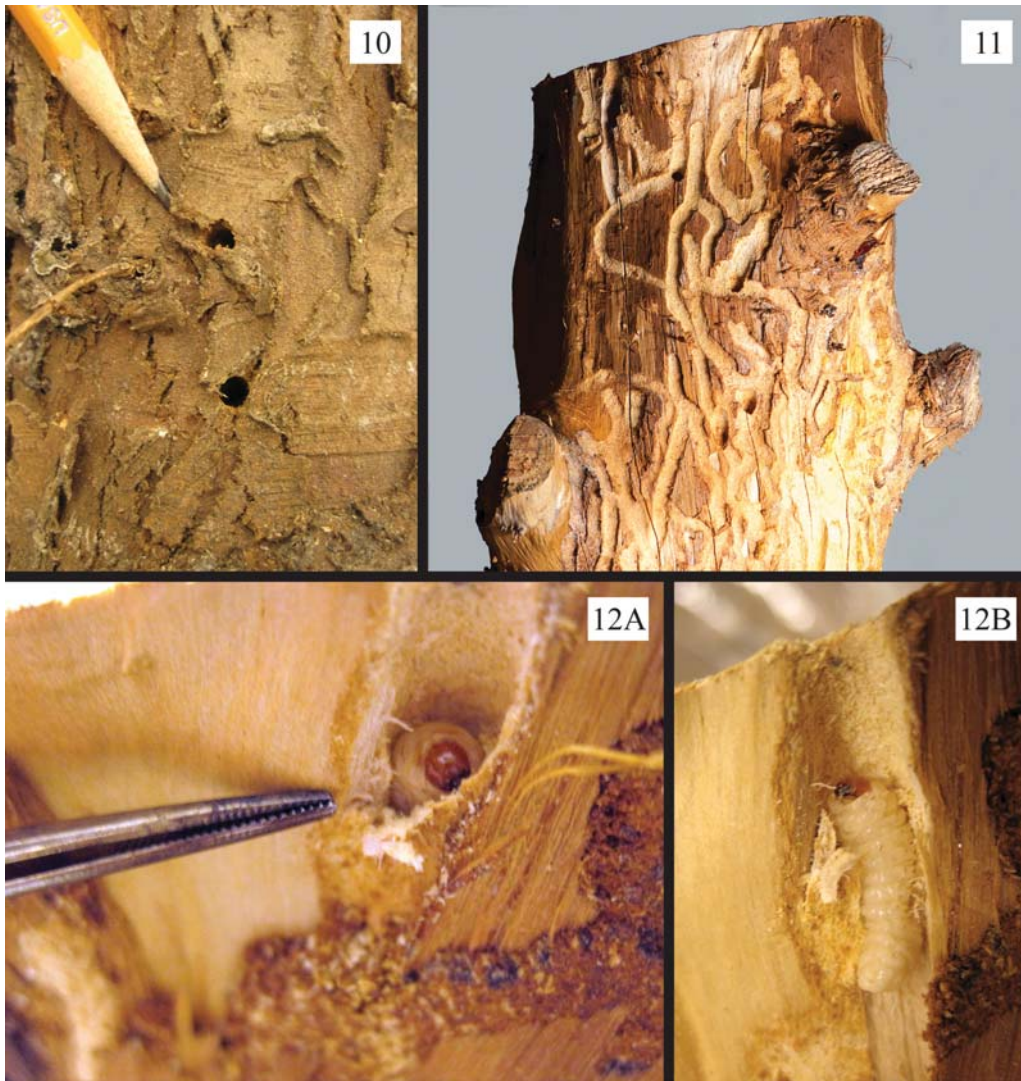
Specimens from North Carolina (locality data below) were collected in 2013 as larvae (Fig. 7) and



Figs. 1–6. *Eudociminus mannerheimii*, adults, dorsal (A) and lateral (B) habitus. **1)** Steel Creek, Newton Co., Arkansas; **2)** “Univ. of Ark. Student Coll.”; **3–4)** Phelps Lake, North Carolina; **5)** Holly Springs, Wake Co., North Carolina; **6)** Gainesville, Alachua Co., Florida. Photograph by Michael C. Thomas. Used with permission. Not to scale.



Figs. 7–9. *Eudocimus mannerheimii*, immature stages and landscape damage. **7)** Larva; **8)** Pupa; **9)** Landscape damage. “X” indicates the same tree in both photographs; **A)** View left showing one undamaged tree and three minimally damaged trees, **B)** View right showing three minimally damaged trees and two dead trees.



Figs. 10–12. Tree damage by *Eudocimus mannerheimii*. **10)** Exit holes; **11)** Larval galleries after bark was removed; **12A–B)** Larva *in situ*.

pupae (Fig. 8) or reared to adulthood (Figs. 3–5) from a *ca.* 30 cm × 12 cm trunk section of ‘Green Giant’ arborvitae (*Thuja plicata* Donn ex D. Don × *T. standishii* (Gordon) Carrière). The section was received at the Plant Disease and Insect Clinic at North Carolina State University on 30 January 2013 and isolated in a covered 18.9-L (5-gallon) bucket at room temperature. Late instars were observed under the bark, and the sample was maintained until adults emerged around 18 April 2013.

Specimens collected in Arkansas have been deposited in the University of Arkansas Arthropod

Museum (UAAM). Specimens collected in North Carolina have been deposited in the North Carolina State University Insect Museum (NCSU). Institutional abbreviations follow Evenhuis (2014).

TAXONOMY

Eudocimus Leng, 1918

Eudocinus Dejean 1835: 276 [*nomen nudum*]

Eudocimus Boheman 1836: 240 [preoccupied by

Eudocimus Wagler, 1832 (Aves)]

Eudocinus Laporte 1840: 335 [*lapsus*]
Eudociminus Leng 1918: 210

LSID: urn:lsid:zoobank.org:act:8652B3EE-8CC9-49F0-8930-6D3EF060A0F3

Type species: *Eudociminus mannerheimii* Boheman, 1836

***Eudociminus mannerheimii* (Boheman, 1836)**

Eudocinus mannerheimii Dejean 1835: 276 [*nomen nudum*]

Eudocinus mannerheimii Boheman 1836: 241

Eudociminus mannerheimii Leng 1918: 210

LSID: urn:lsid:zoobank.org:act:51E0D421-BFBC-4BDE-8AE4-C987AD13038F

Description. Body 10–17 mm long, 3.5–5.5 mm wide ($n = 14$). Cuticle dark red to black, generally clothed in colored scale-like setae. **Dorsum:** Dark gray to brown, with scale-like setae densely packed. **Head:** Punctate with smooth median line; light tan, orange, or white scales dorsolaterally and immediately posterior and ventral to eye, otherwise without setae; rostrum 2/3 length of pronotum; eyes elongate, reniform. **Pronotum:** Slightly longer than wide and sides moderately rounded; disc coarsely punctate with smooth median line; with 5 lines of variable color (light tan, orange, pink, or white): 2 complete lines dorsolaterally that connect anteriorly midway between eyes and posteriorly to spots on 6th elytral intervals; 2 incomplete lines that connect anteriorly to the dorsal apex of eye and terminate in anterior third of pronotum; and median line, which may be indistinct in the middle. **Scutellum:** Triangular and light tan to white. **Elytra:** Slightly wider than pronotum and parallel-sided, with humeral angle distinct; preapical elytral hump present in some specimens (*e.g.*, Fig. 4b); striae deeply impressed, intervals flat. With 4 dark brown to black spots on 4th intervals, sometimes coalescent into stripes, with or without 4 light tan to white spots; elytral bases usually with 2–4 light tan to white spots on intervals 4 and 6; intervals 9 and 10 with tan to white spots, sometimes coalescent into longer lines. **Venter (including legs):** Generally appearing dark, with sparse, scale-like, light tan, orange, pink, or white setae; legs with additional simple setae. Tibiae with strong, hook-like unci. Tarsal claws simple, without teeth.

Specimens Examined. 14 pinned specimens. 2 males, **USA:** North Carolina, Phelps Lake, ex. cypress bark, 25 October 1928, coll. B. B. Fulton (NCSU) ● 1 female, **USA:** North Carolina, Bladen Co, White Lake, cypress, 14 March 1953, coll. D. M. Weisman (NCSU) ● 4 females, 1 male, **USA:** North Carolina, Wake Co, Holly Springs, reared from *Thuja* sp., 30 January 2013, coll. M. A. Bertone

(NCSU) ● 1 female, **USA:** Arkansas, Newton Co., Steel Creek, ex Malaise trap set in eastern red cedar glade, 10 July 2010, coll. J. R. Fisher and D. Keeler (UAAM) ● 1 female (APGD 10-0618-003, #135701), **USA:** Arkansas, Newton Co, Steel Creek (36°01'56" N, 93°20'02" W), ex Malaise trap set in eastern red cedar glade, 18 June 2010, col. J. R. Fisher and M. J. Skvarla (UAAM) ● 2 males (APGD 10-0618-003, #135702), **USA:** Arkansas, Newton Co, Steel Creek (36°01'56" N, 93°20'02" W), ex Malaise trap set in eastern red cedar glade, 18 June 2010, col. J. R. Fisher and M. J. Skvarla (UAAM) ● 1 female (MS 13-1023-017, #133546), **USA:** Arkansas, Newton Co, Steel Creek (36°02'19" N, 93°20'27" W), ex. purple Lindgren funnel trap, 23 October 2013, col. M. J. Skvarla (UAAM) ● 1 male, "Univ. of Ark. Student Coll.," no other data (UAAM). The Arkansas specimens represent **new state records.**

DISCUSSION

Specimens collected from Steel Creek along the Buffalo River in the Boston Mountains represent the first report of the species from the Interior Highlands of Arkansas and significantly expand the range of the species north from previous records in Louisiana. While we did not observe oviposition, larval feeding, or adult emergence, we suggest the beetles were breeding in eastern red cedar as they were collected in a cedar glade and no other Cupressaceae were present at or near the site. All specimens collected were brown with orange, scale-like setae, with dark brown spots on the fourth elytral interval, and lacking light elytral spots (Figs. 1–2).

The sole specimen located in the Arthropod Museum at the University of Arkansas lacks collection data beyond "Univ. of Ark. Student Coll." (Fig. 2). While it was most likely collected in Arkansas, it cannot be assigned to the state conclusively and therefore does not represent an earlier record for the species in the state. It is similar in coloration to the Steel Creek specimens except that light elytral spots are present.

North Carolina specimens (Figs. 3–5) reared from arborvitae were similar in coloration to the Arkansas specimens. They also exhibited variation in the extent of light-colored elytral spots and presence/absence of a preapical elytral hump, which suggests these characters do not represent geographic variation. No dark grey specimens with black elytral stripes and white spots (*e.g.*, Fig. 6) were examined. Further investigation is needed to determine if this variation in color has any correlation with geography or phylogenetic history.

The cypress weevil appears to be an occasional primary pest and, more frequently, a secondary invader

of trees (Baker and Bambara 1999; Bambara 2004). Adult feeding damage to young shoots and green twigs (Baker and Bambara 1999; Bambara 2004; Randall *et al.* 2005) may cause aesthetic damage to trees. Tunneling by the larvae in small saplings is known (Mayfield 2004) and likely causes mortality in some plants. Most infestations of this beetle, however, occur in stressed, dying, or dead trees. In the case of the first record of this beetle in *Thuja* L., a row of mature trees (Fig. 9) planted outside a school began to decline rapidly due to unknown factors. Landscape contractors stated that only some of the plants were affected, and adjacent Japanese cedars were unaffected. A trunk section from one of the dead trees revealed approximately 12 large larvae residing in tunnels (Figs. 10–12). The large number of specimens found in such a small portion of the plant, and located largely in the vascular tissue just below the bark, suggests the weevil likely overwhelmed some of the plants, resulting in rapid death. At this time, we do not know why some plants were so heavily infested, while others were not.

Specimen records indicate two to three generations of this weevil per year in North Carolina. Final instars were abundant in the arborvitae collected in January, signifying initial colonization during the previous fall. Adults emerged under laboratory conditions in March, similar to the suggested early spring timing of adults as mentioned in the literature (Bambara 2004; Mayfield 2004). Mid- to late instars were also found in a small arborvitae branch in North Carolina during May and probably represented the second generation. Based on the specimens described here, adult beetles can be found in the summer (July specimens) and fall (October specimens).

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REFERENCES CITED

- Alonso-Zarazaga, M. A., and C. H. C. Lyal. 1999. A World Catalogue of Families and Genera of Curculionoidea (Insecta: Coleoptera) (excepting Scolytidae and Platypodidae). Entomopraxis, Barcelona, Spain.
- Anderson, R. S. 2002. Family 131. Curculionidae Latreille 1802 [pp. 722–816]. *In*: American Beetles Polyphaga: Scarabaeoidea through Curculionoidea, Volume 2 (R. H. Arnett, Jr., M. C. Thomas, P. E. Skelley, and J. H. Frank, editors). CRC Press, Boca Raton, FL.
- Baker, J. R., and S. B. Bambara. 1999. Cypress weevils emerge. North Carolina Pest News 14(6). North Carolina Cooperative Extension Service, North Carolina State University.
- Bambara, S. 2004. Cypress weevil. www.ces.ncsu.edu/depts/ent/notes/O&T/trees/note132/note132.html (accessed 18 September 2014).
- Blatchley, W. S., and C. W. Leng. 1916. Rhynchophora or Weevils of North Eastern America. The Nature Publishing Company, Indianapolis, IN.
- Boheman, C. H. 1836. *Eudocimimus* [pp. 240–242]. *In*: *Genera et species curculionidum, cum synonymia hujus familiae. Species novae aut hactenus minus cognitae, descriptionibus a Dom. Leonardo Gyllenhal, C. H. Boheman, et entomologicis aliis illustratae, Tomus septimus, Pars prima* (C. J. Schönherr, editor). Roret, Paris, France.
- Dejean, P. F. M. A. 1835. Catalogue des Coléoptères de la collection de M. le comte Dejean. [Livraison 4]. Méquignon-Marvis, Paris, France.
- Evenhuis, N. L. 2014. Abbreviations for insect and spider collections of the World. hbs.bishopmuseum.org/codens/codens-inst.html (accessed 29 July 2015).
- Hopkins, A. D. 1904. Catalogue of exhibits of insect enemies of forests and forest products at the Louisiana Purchase Exposition, St. Louis, MO. USDA Division of Entomology Bulletin No. 48.
- Jones, R. W., C. W. O'Brien, and J. L. Cozar. 2003. Nuevos registros de Curculionidae y Apionidae (Coleoptera: Curculionoidea) para México. *Folia Entomológica Mexicana* 42: 293–294.
- Laporte, F. L. N. 1840. Histoire naturelle des insectes Coléoptères; avec une introduction renfermant l'anatomie et la physiologie des animaux articulés, par M. Brullé. Tome deuxième. P. Duménil, Paris, France.
- Leng, C. W. 1918. Notes on some changes in the list of Coleoptera. *Journal of the New York Entomological Society* 26(3/4): 201–211.
- Mayfield, A. E., III. 2004. The cypress weevil, *Eudocimimus mannerheimii* (Boheman) (Coleoptera: Curculionidae). *Entomology Circular* No. 415. Florida Department of Agriculture & Consumer Services, Division of Plant Industry, Gainesville, FL.
- O'Brien, C. W., and G. J. Wibmer. 1982. Annotated checklist of the weevils (Curculionidae *sensu lato*) of North America, Central America, and the West Indies (Coleoptera: Curculionoidea). *Memoirs of the American Entomological Institute* Number 34. The American Entomological Institute, Gainesville, FL.
- Peck, S. B., and M. C. Thomas. 1998. A distributional checklist of the beetles (Coleoptera) of Florida. *Arthropods of Florida and Neighboring Land Areas, Volume 16*. Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, FL.
- Randall, C. K., M. L. Duryea, S. W. Vince, and R. J. English. 2005. Factors influencing stump

sprouting by pond cypress (*Taxodium distichum* var. *nutans* (Ait.) Sweet). *New Forests* 29(3): 245–260.

Sánchez-Martínez, G., A. Equihua-Martínez, E. González-Gaona, and R. W. Jones. 2010. First record of *Eudocimus mannerheimii* (Boheman)

(Coleoptera: Curculionidae) attacking *Taxodium mucronatum* Ten. (Cupressaceae) in Jalisco, Mexico. *The Coleopterists Bulletin* 64(1): 96–97.

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