

Multiple Detections of Two Exotic Auger Beetles of the Genus Sinoxylon (Coleoptera: Bostrichidae) in Georgia, USA

Authors: Price, Terry, Brownell, Kayla A., Raines, Mark, Smith, Cecil L., and Gandhi, Kamal J. K.

Source: Florida Entomologist, 94(2): 354-355

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/024.094.0235

The BioOne Digital Library (<u>https://bioone.org/</u>) provides worldwide distribution for more than 580 journals and eBooks from BioOne's community of over 150 nonprofit societies, research institutions, and university presses in the biological, ecological, and environmental sciences. The BioOne Digital Library encompasses the flagship aggregation BioOne Complete (<u>https://bioone.org/subscribe</u>), the BioOne Complete Archive (<u>https://bioone.org/archive</u>), and the BioOne eBooks program offerings ESA eBook Collection (<u>https://bioone.org/esa-ebooks</u>) and CSIRO Publishing BioSelect Collection (<u>https://bioone.org/csiro-ebooks</u>).

Your use of this PDF, the BioOne Digital Library, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at <u>www.bioone.org/terms-of-use</u>.

Usage of BioOne Digital Library content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne is an innovative nonprofit that sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

MULTIPLE DETECTIONS OF TWO EXOTIC AUGER BEETLES OF THE GENUS *SINOXYLON* (COLEOPTERA: BOSTRICHIDAE) IN GEORGIA, USA

TERRY PRICE¹, KAYLA A. BROWNELL², MARK RAINES¹, CECIL L. SMITH³ AND KAMAL J. K. GANDHI² ¹Georgia Forestry Commission, 1508 Hwy. 25 South, Waynesboro, GA 30830, U.S.A. E-mail: tprice@gfc.state.ga.us; mraines@gfc.state.ga.us

²Daniel B. Warnell School of Forestry and Natural Resources, The University of Georgia, Athens, GA 30602, U.S.A. E-mail: brownellk@warnell.uga.edu; kgandhi@warnell.uga.edu

³Georgia Museum of Natural History, The University of Georgia, Athens, GA 30602, U.S.A. E-mail: clsmith@uga.edu

False powderpost or auger beetles (Coleoptera: Bostrichidae) are important pests of agricultural and forestry products colonizing living plants, lumber, and finished wood products. Seventy three species of bostrichid beetles are present in North America, with an additional 34 exotic species intercepted at ports-of-entry with varying degrees of frequency (Ivie 2002; Haack 2006). Bostrichid beetles have frequently been found on crates, dunnage, and pallets (collectively termed "solid wood packing material") (SWPM) arriving from other countries (Haack 2006). In particular, members of the genus Sinoxylon Duftschmid, commonly known as auger beetles, have been transported on SWPM from the Old World tropics to other parts of the world. Between 1985 and 2000, Sinoxylon species accounted for 32% of total interceptions of bostrichid beetles, and half of the total number of bostrichid beetle species intercepted in 16 U.S. states (Haack 2006). Of the 50 or so described species of Sinoxylon, at least 2 species, S. unidentatum (F.) (synonym: conigerum Gerstaecker) (Borowski 2007) and S. ceratoniae (Linnaeus), are thought to be established in Florida and California, respectively (Peck & Thomas 1998; Ivie 2002).

We report multiple collections of Sinoxylon, including S. anale Lesne and S. unidentatum from various storage facilities and ports-of-entry in Georgia, USA (Fig. 1 A, B). Twenty one adults of S. anale (Fig. 1 A) were collected on 15 May 2004 emerging from wooden pallets holding peanuts from India in a storage facility in Albany, Dougherty County, Georgia. In addition, 12 adults of S. anale were collected on 22 Jul 2010 from SWPM originating from India and intercepted at a portof-entry in Fulton County, Georgia. Two adults of S. unidentatum (Fig. 1 B) were collected on 3 Oct 1996 emerging from SWPM originating from India in Laurens County, Georgia. All specimens are deposited in the Georgia Museum of Natural History, University of Georgia in Athens.

Sinoxylon anale, endemic to the Oriental Region, is one of the most commonly found bostrichid species in imported material around the world. This species has been reportedly introduced to Venezuela (Joly et al. 1994), Brazil (Teixeira et al. 2002), Israel (Argaman 1987), Australia



 (\mathbf{A})



Fig. 1. Lateral views of the adults of *Sinoxylon anale* Lesne (A) and *Sinoxylon unidentatum* (F.) (B). Note the differences in elytral declivity between these 2 species.

(Stanaway et al. 2001), Poland (Sliwa 1971, Skalski 1971), and Ukraine (Gumovsky 2010). In North America, *S. anale* has been intercepted in New York, Detroit, Philadelphia, San Francisco, Miami, Florida, and Columbus (Fisher 1950; Teixeira et al. 2002). *Sinoxylon anale* is one of the most destructive woodboring beetles in India (Fisher 1950), and is quarantined in Hawaii, Brazil, Argentina, Uruguay, and Paraguay. It is

polyphagous, colonizing >70 deciduous woody plant species and a wide variety of products such as lumber, logs, stored wood, and plant seeds (Lesne 1906; Beeson & Bhatia 1937, Sittichaya et al. 2009). In Israel, an infestation by S. anale resulted in mortality of the ornamental tree species, Delonix regia (Bojer ex Hook.) Raf., which were subsequently burned, but S. anale still became established (Argaman 1987). Sinoxylon uniden*tatum* is also of oriental origin, polyphagous, and has been introduced to all major continents including North America (Fisher 1950, Filho et al. 2006). Recently, S. unidentatum was found infesting wood pallets used to import tea to Italy from Sri Lanka (Savoldelli & Regalin 2009), and it was found for the first time in Colombia in imported furniture from India (cited as S. conigerum) (Quiroz-Gamboa & Sepúlveda-Cano 2008).

Our records for *S. anale* and *S. unidentatum* in Georgia indicate that SWPMs are the most common source of these exotic beetles. Similarly, *S. anale* was intercepted in wooden crates of manhole covers from India in Escambia County in Florida (Halbert 1996). We, therefore recommend a greater emphasis be placed on inspecting and treating SWPM originating from the Old World to reduce the introductions of exotic bostrichid beetles. It is unclear whether either of these bostrichid beetle species has become currently established in Georgia. However, our results indicate multiple introductions spanning >14 years and hence, a high potential for establishment of these 2 bostrichid beetle species over time.

We are grateful to Michael Ivie (Montana State University) for assistance with species verifications, and James Hanula (USDA Forest Service) for taking photographs of the beetles. We thank Lee Ogden (University of Georgia), Daniel Miller (USDA Forest Service), and anonymous reviewers for providing useful comments on this paper. This research was supported by funds from the Georgia Forestry Commission and the Daniel B. Warnell School of Forestry and Natural Resources, University of Georgia, Athens.

SUMMARY

Two exotic bostrichid beetle species, *Sinoxylon anale* and *S. unidentatum*, were collected on multiple occasions over 14 years from solid wood packing materials (SWPM) originating from India that were either stored in warehouses or intercepted at ports-of-entry in Georgia, USA.

References Cited

- ARGAMAN, Q. 1987. Sinoxylon anale a new destructive wood borer in Israel. Phytoparasitica 15: 257.
- BEESON, C. F. C., AND BHATIA, B. M. 1937. On the biology of the Bostrychidae (Coleoptera). Indian Forest Records, Entomology 2: 223-323.

- BOROWSKI, J. 2007. Family Bostrichidae Latreille, 1802, pp. 320-328 In I. Löbl, and A. Smetana [eds.], Catalogue of Palaearctic Coleoptera, Elateroidea—Derodontoidea—Bostrichoidea—Lymexyloidea—Cleroidea—Cucujoidea, Volume 4. Apollo Books, Stenstrup. 935 pp.
- FILHO, O. P., TEIXEIRA, E. P., BEZERRA, M. L. M., DOR-VAL, A., AND FILHO, E. B. 2006. First record of Sinoxylon conigerum Gerstäcker (Coleoptera: Bostrichidae) in Brazil. Neotropical Entomol. 35: 712-713.
- FISHER, W. S. 1950. A Revision of the North American Species of Beetles Belonging to the Family Bostrichidae. Misc. Publ. U.S. Department of Agric., No. 698, 157 pp.
- GUMOVSKY, A. V. 2010. A record of Sinoxylon anale Lesne in Ukraine with notes on false powder-post beetles (Coleoptera: Bostrichidae) and their chalcidoid parasitoids (Hymenoptera). Ukrainska Entomofaunistyka 1: 1-8.
- HAACK, R. A. 2006. Exotic bark- and wood-boring Coleoptera in the United States: recent establishments and interceptions. Can. J. Forest Res. 36: 269-288.
- HALBERT, S. E. 1996. Entomology section. In Tri-ology 35, No. 1. URL: http://www.doacs.state.fl.us/pi/enpp/ triology/archive/96-1&2all.htm.
- IVIE, M. A. 2002. Bostrichidae Latreille 1802, pp. 233-244 In R. H. Arnett, Jr., M. C. Thomas, P. E. Skelley, and J. H. Frank [eds.], American Beetles: Polyphaga: Scarabaeoidea through Curculionoidea, Volume 2. CRC Press, Boca Raton Florida. 861 pp.
- JOLY, L. J., DEDORDY, J., AND MOREIRA, M. 1994. Sinoxylon anale Lesne, 1897 (Coleoptera, Bostrichidae) neuvo restro para la fauna Venezolana. Nol. Entomol. Venez. N.S. 9: 21-24.
- LESNE, P. 1906. Révision des coléopteres de la famille des bostrychides. 5^{eme} Mémoires Annales de la Société Entomologique de France 75: 444-561.
- PECK, S. B., AND THOMAS, M. C. 1998. A distributional checklist of the beetles (Coleoptera) of Florida. Arthropods of Florida and neighboring land areas. URL: http://www.fsca-dpi.org/coleoptera/mike/bostrich.htm.
- QUIROZ-GAMBOA, J. A., AND SEPÚLVEDA-CANO, P. A. 2008. Sinoxylon conigerum Gerstäcker, 1855 (Coleoptera: Bostrichidae), Nuevo registro para Colombia. Boletin Científico Museo de Historia Natural 12: 167-170.
- SAVOLDELLI, S., AND REGALIN, R. 2009. Infestation of wood pallets by *Sinoxylon unidentatum* (Fabricius) (Coleoptera: Bostrichidae) in Italy. Bollettino di Zoologia Agraria e di Bachicoltura 41: 235-238.
- SITTICHAYA, W., BEAVER, R. A., LIU, L.-Y., AND NGAM-PONGSAI, A. 2009. An illustrated key to powder post beetles (Coleoptera, Bostrichidae) associated with rubberwood in Thailand, with new records and a checklist of species found in southern Thailand. Zookeys 26: 33-51.
- SKALSKI, J. 1971. Sinoxylon anale Lesne-przybysz z Pakistanu. Przem-Drzewny 22: 34-35.
- SLIWA, E. 1971. Sinoxylon anale Lesne-szkodnik zawleczony z Pakistanu do Plski. Sylwan 115: 51-54.
- STANAWAY, M. A., ZALUCKI, M. P., GILLESPIE, P. S., RO-DRIGUEZ, C. M., AND MAYNARD, G. V. 2001. Pest risk assessment of insects in sea cargo containers. Australian J. Entomol. 40: 180-192.
- TEIXEIRA, É. P., NOVO, J. P. S., AND FILHO, E. B. 2002. First record of *Sinoxylon anale* Lesne and *Sinoxylon senegalensis* (Karsch) (Coleoptera: Bostrichidae) in Brazil. Neotropical Entomol. 31: 651-652.