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Authors: Tindall, Kelly V., and Fothergill, Kent

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ZELIA TRICOLOR (DIPTERA: TACHINIDAE): FIRST HOST RECORD FROM DECTES TEXANUS (COLEOPTERA: CERAMBYCIDAE)

KELLY V. TINDALL¹ AND KENT FOTHERGILL^{1,2}

¹University of Missouri, Division of Plant Sciences, Delta Research Center, PO Box 160, Portageville, MO 63873 USA

²Conservation Seeding and Restoration, Inc. 506 Center Street West, Kimberly, ID 83341 USA

Insect parasitoids, such as tachinid flies (Tachinidae), affect the population dynamics of their hosts in both managed and natural systems, and are a major component of global biodiversity (Smith et al. 2006; Stireman et al. 2006). There are about 10,000 described species of tachinids and probably some thousands more undescribed species (O'Hara 2008). Tachinid species have been used in applied biological control, sometimes with great success (Grenier 1988). All tachinid species are koinobiont endoparasitoids of arthropods (almost exclusively insects) that typically kill their host before pupating within the remains of the host or leaving the host to pupate elsewhere (Stireman et al. 2006). Most tachinids parasitize the larval stage of their hosts; however, 5-10% of species parasitize adults, and none are known to attack eggs or pupae (Stireman et al. 2006). Host records are the beginning of understanding tachinid biology and are lacking for many species. Here we present a host record for *Zelia tricolor* (Coquillett).

The tachinid, *Z. tricolor*, belongs to the Dexiini (Dexiinae), a tribe that almost exclusively parasitizes beetles. It is widely distributed in North America from Nevada to Pennsylvania, and south to Mexico and Florida (O'Hara & Wood 2004). Arnaud (1978) listed only *Rhabdoscelus obscurus* (Boisduval) (Curculionidae) as a host of this species, citing Wray (1950). Wray (1950) cited a record by C. S. Brimley from Wilson, North Carolina, in which *Z. tricolor* was reared from a larval *Rhodobaenus* in a *Dahlia* stem on Aug 30, 1939. *Rhabdoscelus obscurus* does host tachinids (Waggey & Beardsley 1974), but is known to occur only in the Australasian and Oceanian regions (Halfpapp & Storey 1991). Wray (1950) did not identify the host to species and Arnaud (1978) assumed it to be *R. obscurus*, but it is more likely that the "*Rhodobaenus*" of Wray is *Rhodobaenus* (Curculionidae), of which 2 species occur in North Carolina: *R. tredecimpunctatus* (Illiger) and *R. quinquepunctatus* (Say) according to the insect collection at North Carolina State University (NCSU 2010). Both of these *Rhodobaenus* species feed on Asteraceae (Blatchley & Leng 1916) and are likely to be found in *Dahlia*. Therefore, the previously known host for *Z. tricolor* should be correctly stated as *Rhodobaenus* sp.

Dectes texanus LeConte, is a wide-ranging North American cerambycid that primarily feeds on herbaceous plants in the family Asteraceae (Lingafelter 2007) and can be a pest of sunflower (*Helianthus annuus* L.) (Rogers 1977). It was first reported as a pest of soybeans (*Glycine max* (L.) Merr.) in 1968 in Beaufort County, North Carolina (Falter 1969) and in New Madrid and Dunklin Counties, Missouri (Hatchett et al. 1973). *Dectes texanus* has 1 generation per year (Falter 1969; Hatchett et al. 1975), and partially grown larvae overwinter inside the stem of the host plant (Hatchett et al. 1975). Several species of Hymenoptera in the Braconidae, Ichneumonidae, and Pteromalidae are known to parasitize *D. texanus* in Ambrosia (Hatchett et al. 1975); however, there are no published records of parasitoids of *D. texanus* from soybeans (Niide 2009).

On 7 May 2008, a puparium of a larva was found that had emerged from a *D. texanus* larva. The *D. texanus* larva was part of a cohort of cerambycid larvae from the 2007-growing season taken from soybean stems in Southeast Missouri during late-winter 2008 and reared on artificial diet (Hatchett et al. 1973, Product #F9703B, Bio-Serv, Frenchtown, NJ) in an insect rearing room (16:8, 24°C). The adult fly eclosed from the puparium on 12 May 2008 and was identified as *Z. tricolor* by Norman E. Woodley of the Systematic Entomology Laboratory, Agricultural Research Service, U.S. Department of Agriculture (Lot# 0806898). The specimen currently resides in the University of Missouri Enns Museum collection (Columbia, Missouri). The remaining individuals of the aforementioned cohort of cerambycid larvae ($n = 479$) were identified as *D. texanus* by Ted C. MacRae (Chesterfield, Missouri) based on Linsley & Chemsak (1995).

This rearing record demonstrates that in nature *Z. tricolor* overwintered as a larva within an overwintering *D. texanus* larva. Our specimens had a 5-day pupal time period under lab conditions. We reared only 1 *Z. tricolor* from 480 overwintering *D. texanus* larvae, representing a parasitism rate of 0.2%. Additional work is needed to determine the parasitism rate of *Z. tricolor* in other populations of *D. texanus* and what role it may play in *D. texanus* population dynamics or if this report was a case of an incidental parasitism.

SUMMARY

A single specimen of *Zelia tricolor* (Diptera: Tachinidae) fly, was reared from a larval *Dectes texanus* (Coleoptera: Cerambycidae) overwintering in soybean in southeastern Missouri. This represents the first record of *Z. tricolor* from *D. texanus* and the second host record for *Z. tricolor*. Our specimen of *Z. tricolor* overwintered as a larva, had a 5-day pupal period, and represented a parasitism rate of 0.2%.

REFERENCES CITED

- ARNAUD, JR., P. H. 1978. A Host-parasite Catalog of North American Tachinidae (Diptera). United States Department of Agriculture. Miscellaneous Publication 1319: 1-860.
- BLATCHLEY, W. S., AND LENG, C. W. 1916. Rhynchophora or Weevils of Northeastern America. The Nature Publishing Company: Indianapolis, IN, 682 pp.
- FALTER, J. M. 1969. *Dectes* sp. (Coleoptera: Cerambycidae): A unique and potential important pest of soybeans. J. Elisha Mitch. Sci. Soc. 85: 123.
- GRENIER, S. 1988. Biological control with tachinid flies (Diptera, Tachinidae): a review. Anz. Schadlingskd. Pfl. 61: 49-56.
- HALFPAPP, K. H., AND STOREY, R. I. 1991. Cane weevil borer, *Rhabdoscelus obscurus* (Coleoptera: Curculionidae), a pest of palms in northern Queensland, Australia. Princeps. 35: 199-207.
- HATCHETT, J. H., JACKSON, R. D., BARRY, R. M., AND HOUSER, E. C. 1973. Rearing a weed cerambycid, *Dectes texanus*, on an artificial medium, with notes on biology. Ann. Entomol. Soc. America 66: 519-522.
- HATCHETT, J. H., DAUGHERTY, D. M., ROBBINS, J. C., BARRY, R. M., AND HOUSER, E. C. 1975. Biology in Missouri of *Dectes texanus*, a new pest of soybean. Ann. Entomol. Soc. America 68: 209-213.
- LINGAFELTER, S. W. 2007. Illustrated Key to the Long-horned Woodboring Beetles of the Eastern United States. The Coleopterists Society, North Potomac, MD, 206 pp.
- LINSLEY, E. G., AND CHEMSAK, J. A. 1995. The Cerambycidae of North America, Part VII, No. 2. Taxonomy and Classification of the Subfamily Lamiinae, Tribes Acanthocinini through Hemilophini. Univ. Calif. Publ. Entomol. Berkely, 114: 292 pp.
- NCSU. 2010. Insect collection at NC State University. Web Application. <http://inventory.ent.ncsu.edu/index.cfm>. Last Accessed: 12 July 2010.
- NIIDE, T. 2009. Development of Soybean Host Plant Resistance and other Management Options for the Stem Borer, *Dectes texanus* LeConte. Ph.D. Dissertation, Kansas State Univ., Manhattan, KS.
- O'HARA, J. E. 2008. Tachinid flies (Diptera: Tachinidae), pp. 3675-3686 In J. L. Capinera [ed.], Encyclopedia of Entomology, 2nd Edition. Springer, Netherlands, Dordrecht, 4346 pp.
- O'HARA, J. E., AND WOOD, D. M. 2004. Catalogue of the Tachinidae (Diptera) of America North of Mexico. Mem. Entomol. Int. 18: iv + 410 pp.
- ROGERS, C. E. 1977. Cerambycid pests of sunflower: distribution and behavior in the Southern Plains. Environ. Entomol. 6: 833-838.
- SMITH, M. A., WOODLEY, N. E., JANZEN, D. H., HALLWACHS W., AND HERBERT, P. D. N. 2006. DNA barcodes reveal cryptic host-specificity within the presumed polyphagous members of a genus of parasitoid flies (Diptera: Tachinidae). Proc. Natl. Acad. Sci. USA. 103.10: 3657-3662.
- STIREMAN, III, J. O., O'HARA, J. E., AND WOOD, D. M. 2006. Tachinidae: evolution, behavior, and ecology. Annu. Rev. Entomol. Vol. 51: 525-555.
- WAGGY, S. L., AND BEARDSLEY, JR., J. W. 1974. Biological studies on two sibling species of *Lixophaga* (Diptera: Tachinidae), parasites of the New Guinea sugarcane weevil, *Rhabdoscelus obscurus* (Boisduval). Proc. Hawaii Entomol. Soc. 21.3: 485-494.
- WRAY, D. L. 1950. Insects of North Carolina. Second Supplement. North Carolina Department of Agriculture: Raleigh, NC. 59 pp.