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DOLICHOMITUS IRRITATOR (HYMENOPTERA: ICHNEUMONIDAE): A NEW PARASITE OF *DECTES TEXANUS* (COLEOPTERA: CERAMBYCIDAE) IN SOYBEANS

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The Ichneumonidae is a large insect family with over 4,900 species in the Nearctic region (Yu et al. 2005). Ichneumonids are obligate parasitoids, or hyperparasitoids, but they have not been used as successfully as classical biological control agents as hymenopteran families within Chalcidoidea and the Braconidae (Daly et al. 1998). *Dolichomitus irritator* (F.) (Ichneumonidae: Pimplinae) is common in woodland and brush habitats in eastern North America (Townes & Townes 1960) and occurs south to Costa Rica (Cancino et al. 2010). *Dolichomitus irritator* larvae are external parasites (Chittenden 1893) of larvae of wood boring insects (Townes & Townes 1960). Table 1 lists previously known insect hosts on which development of *D. irritator* has been witnessed or implied and the associated plant relationship. Unequivocal host records are very difficult to attain for parasites of wood boring insects and these records are often inferred from rearing parasite and host in the same logs.

Dectes texanus LeConte, is a native, univoltine, cerambycid beetle that, as a larva, primarily feeds within herbaceous plants in the Asteraceae over much of North America (Lingafelter 2007). Falter (1969) and Hatchett et al. (1973) first documented a host switch from plants in Asteraceae to soybeans (*Glycine max* (L.) Merr.; Fabales: Fabaceae). Since then, *D. texanus* larvae have been noted as a pest of soybeans in 14 U.S. states (Buschman & Sloderbeck 2010). Several species of braconids, ichneumonids, and pteromalids are known to parasitize *D. texanus* larvae in giant ragweed (*Ambrosia trifida* L.) (Hatchett et al. 1975); however, in soybean *D. texanus* larvae are known to be parasitized only by pteromalid wasps (Tindall, unpublished data) and a tachinid fly, *Zelia tricolor* (Coquillett) (Tindall & Fothergill 2010). Discovery of parasitoids of *D. texanus* larvae within soybeans offers opportunity for producers to manage for biological control within soybean production systems.

Soybean stems (i.e., stubble) were collected from a soybean field harvested in the fall of 2009 on 23 Mar 2010 in New Madrid County, Missouri (N 36.42482° W -89.64933°). From this set, 480 were selected based on the presence of a frass plug, an indicator of occupancy by *D. texanus* (Hatchett et al. 1975), and subsequently kept in

an insect rearing room (16:8 h L:D, 24 °C). Five *D. irritator* were recovered from these stems (Table 2). Three additional individuals were found during other stubble-based *D. texanus* survey work from soybean stems from the same field (Table 2). The *D. irritator* specimens recovered were sent to the American Entomological Institute (Gainesville, Florida) for identification by Dr. David Wahl. Six of the specimens were retained by the American Entomological Institute collection and 2 are deposited in the collection of KVT. *D. texanus* as the insect host for these *D. irritator* is confirmed by:

- 1) the timing of stem harvest (Fothergill et al. 2010),
- 2) morphology of stem tunneling (Fothergill et al. 2010),
- 3) discovery of a *D. texanus* larva carcass in a soybean stem with a *D. irritator* pupa (Table 2, specimen #6), and
- 4) emergence of only *D. texanus* and a pteromalid wasp (data not shown) from this cohort of soybeans.

This is, to our knowledge, the first documented case of *D. irritator* parasitizing *D. texanus* and using a host boring within an annual, herbaceous plant. It is likely that further research will find other insect hosts and plant associations utilized by *D. irritator*.

These records indicate that *D. irritator* can overwinter with *D. texanus* larvae in soybean stubble. The five *D. irritator* adults recovered from the above mentioned cohort of 480 soybean stubble, which contained overwintering *D. texanus* larvae, represent a field parasitism rate of 1%. Additional work is needed to determine the parasitism rate of *D. irritator* in other populations of soybean utilizing *D. texanus* and what role it may play in *D. texanus* population dynamics.

Dolichomitus irritator has been found visiting flowers of *Salix discolor* Muhl. (Graenicher 1900) (Malpighiales: Salicaceae) and the term: "Ichneumon flowers" (Knuth 1906) has been coined to describe flowers that attract Ichneumonids and other similar insects. Bianchi et al. (2006) concluded that field margins and other non-crop habitats can enhance the abundance and diversity of natural enemy species within an agricul-

TABLE 1. PREVIOUSLY KNOWN INSECT HOSTS OF *DOLICHOMITUS IRRITATOR* AND ASSOCIATED PLANTS.

Host Insect		Host Plant	
Family	Species	Family	Species
Buprestidae	<i>Chrysobothris</i> sp.	Fabaceae	<i>Cercis canadensis</i> L.
Cerambycidae	" <i>Leptura</i> "	Fagaceae	<i>Quercus</i> sp.
Cerambycidae	<i>Anelaphus parallelus</i> (Newman)		
Cerambycidae	<i>Astyleiopus variegatus</i> (Hald.)	Aceraceae	<i>Acer negundo</i> L.
Cerambycidae	<i>Elaphidion</i> sp.	Fagaceae	<i>Quercus</i> sp.
Cerambycidae	<i>Graphisurus fasciatus</i> (DeGeer)	Juglandaceae	<i>Carya</i> sp.
Cerambycidae	<i>Megacyllene caryae</i> (Drury)		
Cerambycidae	<i>Megacyllene caryae</i> (Drury)	Fabaceae	<i>Robinia pseudoacacia</i> L.
Cerambycidae	<i>Megacyllene robiniae</i> (Forster)	Oleaceae	<i>Fraxinus</i> sp.
Cerambycidae	<i>Obrium rufulum</i> Gahan		
Cerambycidae	<i>Pachyta lamed</i> (L.)	Juglandaceae	<i>Carya</i> sp.
Cerambycidae	<i>Parelaphidion incertum</i> (Newman)		
Cerambycidae	<i>Rhagium inquisitor</i> (L.)		
Cerambycidae	<i>Saperda discoidea</i> F.	Aceraceae	<i>Acer</i> sp.
Cerambycidae	<i>Trigonarthris proxima</i> (Say)	Fagaceae	Oak
Cerambycidae	Unknown		
Cerambycidae	<i>Xylotrechus annosus</i> (Say)	Fagaceae	<i>Castanea dentata</i> (Marsh.) Borkh.
Cerambycidae	<i>Anelaphus villosus</i> (F.)	Fagaceae	<i>Quercus</i> sp.
Cerambycidae	<i>Anelaphus villosus</i> (F.)		
Curculionidae	<i>Cryptorhynchus lapathi</i> (L.)	Fagaceae	<i>Fagus</i> sp.
Melandryidae	<i>Melandrya strigata</i> Say		
Synchroidae	<i>Synchroa punctata</i> Newman	Rosaceae	<i>Prunus persica</i> (L.) Batsch.
Sesiidae	<i>Synanthedon exitiosa</i> Say		
Sesiidae	<i>Synanthedon tipuliformis</i> (Clerck)	Ulmaceae	Elm
Unknown	Unknown		

¹Based on label data from collections.

TABLE 2. *DOLICHOMITUS IRRITATOR* SPECIMENS REARED FROM 2009 GROWING SEASON SOYBEAN STUBBLE INHABITED BY *DECTES TEXANUS* AND HARVESTED FROM NEW MADRID COUNTY, MISSOURI.

Specimen #	Stem harvest date	Discovery Date	Comment
1	3/23/2010	3/29/2010	adult in rearing room with stems
2	3/23/2010	3/30/2010	adult in 2 L container with stems
3	3/23/2010	3/30/2010	adult in 2 L container with stems
4	3/23/2010	4/2/2010	adult in 2 L container with stems
5	3/23/2010	4/3/2010	adult in 2 L container with stems
6	3/24/2010	3/24/2010	pupa in stem w/ <i>D. texanus</i> larva carcass -3/27/2010 adult eclosed
7	4/5/2010	4/7/2010	adult within a plastic bag of stems
8	4/5/2010	4/5/2010	pupa in <i>D. texanus</i> tunneled soybean -4/6/2010 adult eclosed

tural landscape. These findings suggest it may be possible for soybean producers to manage non-crop habitats to attract and/or produce a source of natural enemies to aid in control of *D. texanus*. Further research may elucidate these processes and discover other parasites of *D. texanus*.

SUMMARY

Dolichomitius irritator (Fabricus) was discovered utilizing *Dectes texanus* LeConte larvae as hosts within the previous year's soybean stubble in early spring in southeast Missouri. This represents the first records of *D. irritator* utilizing hosts within herbaceous plants and the first records of an Ichneumonid wasp parasitizing *D. texanus* in soybeans.

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