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**THE CRANE-FLY *TIPULA (TIPULA) OLERACEA (DIPTERA: TIPULIDAE)*
REPORTED FROM MICHIGAN; A NEW PEST OF TURFGRASS IN
EASTERN NORTH AMERICA.**

Jon K. Gelhaus¹

The subgenus *Tipula (Tipula)* is an Old World group with two introduced species in North America, the European Crane Fly, *Tipula (T.) paludosa* Meigen and *T. (T.) oleracea* Linnaeus, sometimes called the Common Crane Fly (Oosterbroek, 2005). *Tipula paludosa* is better known in North America, long established in the Pacific Northwest (Jackson 1975) and Canadian Maritimes provinces (Alexander 1962), more recently in California (Umble and Rao 2004, S. Gaimari, California Dept. Food and Agriculture, pers. comm.). It is a leading insect pest of turf grass and pastures in these areas, including infesting seedling nurseries. *Tipula paludosa* has the potential to affect cereal and other crops, as it does in Europe (Anonymous 1967). More recently, *T. oleracea*, a second very similar species, has been discovered in the Pacific Northwest and California at a wide variety of localities and is considered established (Umble and Rao 2004, S. Gaimari, CDFA, pers. comm.); it may have resided in these areas undetected for years and been mistaken for *T. paludosa*. It attacks a broad range of crops and is considered a major pest in Europe (Anonymous 1967, Pesho et al. 1981). *T. oleracea* has also been recently reported as established in Ecuador damaging broccoli seedlings (Young et al. 1999).

Tipula paludosa was discovered in Ontario in the late 1990's and has now been found in a wide variety of localities in southern Ontario, including Niagara Falls (P. Charbonneau, pers. comm.; specimen confirmed by author). Turf grass damage by larvae of *T. paludosa*, known as leatherjackets, has been reported from Ontario as well (Charbonneau 2003). Gelhaus (2001) predicted that these species would spread soon into the Northeast U.S., if not already existing there undetected. This spread would probably be through movement of eggs, larvae or pupae in turf and nursery soil or through the simple dispersal of adults.

A recent light trap collection from Farmington Hills, Michigan, yielded a pair of adults of *T. oleracea in copula*. The collection data is as follows:

MICHIGAN: Oakland Co., Farmington Hills, margin of woods adjacent to Franklin Hill Country Club, 42°31'04"N, 83° 19' 54"W; 28-30 May 2005, Jason Weintraub, collector.

The flies were attracted to mercury vapor (160 w) and ultraviolet (15W "BL") lights run together at a private residence along the margin of a disturbed woods of *Quercus* (oak) and *Carya* (hickory) separating the residence from the golf course of the country club. The male identity was ultimately confirmed by examination of the male genitalia to distinguish from *T. paludosa*, and any of the other numerous Old World species in this subgenus. The specimens are vouchered in the entomology collection of The Academy of Natural Sciences.

Adults of both species will key to "*T. paludosa*?" in Alexander (1942); *T. paludosa* alone will key correctly in Alexander and Byers (1981). All species in the subgenus can be separated by using Theowald (1984). Both introduced species are very similar in the structure of male and female genitalia, characters used definitively in identifying crane flies. They do differ in other more easily observed features, such as flagellomere count, distance apart of eyes, and female wing length (Brodo 1994, LaGasse 2000). The adult stage of the two species is similar in overall appearance to at least three species of native crane flies which don't appear to cause economic damage (*T. cunctans* Say, *T. paterifera*

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Alexander, *T. sayi* Alexander). These native species can be common, even abundant, in habitats (lawns, wet pastures, wet lands) likely to be those inhabited by *T. oleracea* and *T. paludosa* in the Northeast. Adults of *T. oleracea* fly both in late spring and fall apparently with two generations per year; *T. paludosa* adults fly only in late summer to fall, apparently with only a single generation. Similar appearing native species can be found flying in similar times in the fall as well. It is suggested that adults be confirmed by an expert.

Larvae of *Tipula* (*Tipula*) are morphologically distinctive from all other known native species and can be identified using the key by Gelhaus (1986). Microscopic hair patterns have been proposed to distinguish the larvae of *T. paludosa* and *T. oleracea* from each other (Brindle 1959). It is not clear whether this is reliable in North America (LaGasse, pers. comm.) The larvae of the two species can be diagnosed using molecular markers (Rao et al. 2006).

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