

Rapid communication

Report of the turnip aphid, *Lipaphis erysimi* (Kaltenbach, 1843) from Missouri, USA*Mustafa A. Adhab*^{1,2*}, *James E. Schoelz*¹¹ Division of Plant Sciences, University of Missouri, Columbia, Missouri 65211, USA² Plant Protection Department, University of Baghdad, Abu Ghraib, Baghdad 31020, Iraq

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Abstract: The turnip aphid, *Lipaphis erysimi* (Kaltenbach, 1843), is one of the most destructive pests in the United States. It has been reported in 33 states, but had not been reported in the state of Missouri. In this study we report this species for the first time in Missouri.

Key words: *Cauliflower mosaic virus* (CaMV), *Lipaphis erysimi*, turnip aphid, virus vector

Introduction

The turnip aphid, *Lipaphis erysimi* (Kaltenbach 1843) is one of the most destructive pests of the mustard family (Brassicaceae). This aphid typically infests mustard, radish, shepherd's purse, turnip, watercress, and other crops in the United States of America (USA) (Allen and Harrison 1941; Buntin and Raymer 1994; Jessie 2013), Canada (Caesar 1927), India (Verma and Singh 1987), and other parts of the world (Prasad 1988; Bath *et al.* 1989; Begum 1995; Liu *et al.* 1997; Yue and Liu 2000). It regularly causes heavy direct and indirect losses to growers of mustard crops in the southern USA (Allen and Harrison 1941). Outside of the South, significant damage has also been reported in the states of Maine, Connecticut, New York, New Jersey, Maryland, Pennsylvania, Delaware, Indiana, Ohio, Michigan, Wisconsin, Illinois, Nebraska, Kansas, New Mexico, Colorado, Wyoming, Arizona, Utah, Idaho, California, and Washington (Distribution Maps... 1965). Furthermore, the turnip aphid has been shown to transmit about 13 different viruses, including important viruses of the Brassicaceae, such as *Beet mosaic virus*, *Cabbage black ring spot virus*, *Cauliflower mosaic virus*, and *Radish mosaic virus* (Kennedy *et al.* 1962). Several management approaches have been applied to lessen damage from turnip aphids in the states where aphids exist. Some aphid-resistant turnip cultivars have been bred and grown in several places (Kennedy 1978). Until this study, the turnip aphid has not been formally reported in the state of Missouri (Leonard 1959, 1963). In this study, we identified the turnip aphid, *L. erysimi*, on turnips *Brassica rapa* L. var. *rapa* 'Just Right' and 'Kale Redbor' *Brassica oleracea*, for the first time in Missouri.

Materials and Methods

An aphid infestation of turnips (*B. rapa* L. var. *rapa* 'Just Right') was noticed inside the greenhouse of the University of Missouri – Columbia, in July 2014. Samples of winged and wingless adults were collected and stored in 95% ethanol at 4°C until identification. In October 2014, other samples of the same type of aphids were also collected from *B. oleracea* 'Kale Redbor' plants located in a garden of the University of Missouri – Columbia campus, in October 2014. The aphids were immediately identified. In the greenhouse, the aphids were reared on turnip plants (25±2°C and 16 : 8 of light : dark cycle). A stereomicroscope with 40× magnification was used to identify the specimens following the key of Blackman and Eastop (1994).

Results

Lipaphis erysimi has so far been reported on the mustard family from 33 USA states, but not Missouri. The important identification characters are discussed here. Turnip aphids were found as large colonies on the lower leaf surface (Fig. 1). Cornicles are not dark and elongate (longer than the cauda) (Fig. 2). The cauda is distinct and tongue-shaped. The antennae are long with six segments. The frontal tubercles are distinct at the vertex inside the base of the antennae and do not converge. The abdominal dorsum of winged aphids is without an abdominal patch. Aphids were found to be clustering and feeding on the lower leaf surface. The colonies have a thin layer of white waxy secretion. The front M wing vein of the winged adults has three branches. The frontal tubercles diverge, but do not distinctly exceed the vertex. In one transmission test in the greenhouse, the aphids transmit-

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Fig. 1. Turnip aphids *Lipaphis erysimi* (Kaltenbach, 1843) on the lower leaf surface of turnip plants found in Columbia, Missouri, USA



Fig. 2. Turnip aphid *Lipaphis erysimi* (Kaltenbach, 1843) under a microscope; 40× magnification was used

ted *Cauliflower mosaic virus* to five turnip plants. *Lipaphis erysimi* is widely distributed in the USA, Canada, China, India, and many other countries (Caesar 1927; Allen and Harrison 1941; Verma and Singh 1987; Prasad 1988; Bath *et al.* 1989; Buntin and Raymer 1994; Begum 1995; Liu *et al.* 1997; Yue and Liu 2000; Jessie 2013). This species attacks plants from the mustard family and some other members from different crops. This is the first formal identification report of the turnip aphid from Missouri, USA.

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