



# BUG BIZ

Pest Management and Insect Identification Series



## *Tarophagus colocasiae*, Taro planthopper (Hemiptera: Delphacidae)

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### Description

The taro planthopper (*Tarophagus colocasiae* Matsumura) is a phytophagous, sap-feeding insect that feeds on plants in the genus *Colocasia*, which includes taro and elephant ears (Halbert and Bartlett, 2015). It is a member of the family Delphacidae, which is characterized by short antennae, a movable spur on the hind tibia, and “hopping” movements when walking (O’Brien, 2002). Adults are small,  $\frac{1}{12}$  to  $\frac{1}{15}$  of an inch (2 to 4 mm) in length and brown to black in color with longitudinal white to pale yellow markings located on the front of the head and dorsal plates of the thorax (Asche and Wilson, 1989) (Figure 1). The taro planthopper can be differentiated from other *Tarophagus* species by unique genital features of the adults. Two morphological forms of the adult stage exist within populations: a long-winged form capable of flying, and an incomplete wing form (brachypterous) (Vargo, 2000). The long-winged forms are more abundant during cooler periods or when plants are

beginning to mature and die (Vargo, 2000). Early instars are creamy white in color initially, but markings become darker as they mature.

### Biology and Distribution

The life history of a taro planthopper occurs entirely on taro leaves. Eggs are laid in the bases of petioles and midribs of leaves. Nymphs are commonly found aggregated on young, coiled leaves, and adults are often found at the base of petioles and along leaf veins (González-Vázquez, 2016; Diaz et al., 2020). Oviposition sites can be recognized by dark brown secretions on the surface of the stem. Nymphs hatch two weeks after oviposition and undergo five instars. Duration of development from egg to adult is approximately four weeks (Matthews, 2003). Nymphs and adults feed by inserting piercing-sucking mouthparts into plant tissue and ingesting the sugar-rich sap (Tasi and Dale, 2020).

Members of the genus *Tarophagus* are found in tropical and subtropical regions, including Southeast Asia, the



Figure 1. Taro plant hopper colony (left) and taro plant with wilted leaves (right). Note the short wing pads in the adult insects, this condition is described as brachypterous (LSU AgCenter photos).

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Pacific and the Caribbean (Bartlett, 2018). In northern latitudes, winter temperatures cause loss of host plant leaves, limiting *Tarophagus* overwintering and survival (Matthews, 2003). Of the three *Tarophagus* species, *T. colocasiae* has the widest distribution, including the Asian mainland through Southeast Asia and the Pacific Islands (Matthews, 2003). In the Americas, the taro planthopper was first reported in Jamaica during 2011, in Cuba during 2014 and in the continental United States in Florida during 2015 (Halbert and Bartlett, 2015; Bartlett, 2018). More recently, this species has been reported in Louisiana (Diaz et al., 2020). As of January 2021, iNaturalist users have reported 41 observations of *T. colocasiae* as far north as West Feliciana Parish, south to Plaquemines Parish and as far west as Lafayette Parish (Figure 2).

## Ecological Significance

The taro planthopper, *T. colocasiae*, causes direct injury to taro plants by piercing and sucking sap from xylem and phloem and creating puncture wounds in leaves and petioles during oviposition (Tasi and Dale, 2020). After damage, the taro plant exudes sap at injection sites that later harden and form distinctive round scars (González-Vázquez et al., 2016). Insect damage causes plant leaves to wilt and petioles to curl downwards, causing premature aging and, eventually, death of the taro plant (Figure 1) (González-Vázquez et al., 2016; Diaz et al., 2020). Planthoppers in the genus *Tarophagus* have been reported as vectors of diseases (Gollifer et al., 1978; González-Vázquez et al., 2016). But whether *T. colocasiae* can transmit plant diseases is unknown.

*Tarophagus colocasiae* is a major pest of cultivated taro in the native range (Halbert and Bartlett, 2015). In the U.S., this insect has been reported mostly feeding on elephant ear or wild taro (*Colocasia esculenta*) in Florida and Louisiana (Tasi and Dale, 2020, Diaz et al., 2020). In wetlands in the southeastern U.S., wild taro is considered invasive, displacing native species and reducing biodiversity (Moran and Yang 2013, Diaz et al. 2020). Thus, *T. colocasiae* may act as a fortuitous biological control agent reducing taro populations in the introduced range (Cozad et al. 2018, Diaz. et al. 2020). Recently, field biologists reported wild taro plants dying at the Bluebonnet Swamp Nature Center in Baton Rouge, Louisiana (Diaz et al., 2020). High densities of *T. colocasiae* and several plant diseases were associated with this die-back at the park.

Despite its potential as a biological control agent, *T. colocasiae* may pose risks to closely related genera used as ornamental plants in the U.S. (Tasi and Dale, 2020). Taro planthopper may attack landscape plants in the genera *Colocasia*, *Alocasia* and *Xanthosoma*, resulting in economic losses to the nursery industry (Tasi and Dale, 2020). In Florida, a closely related planthopper, *Tarophagos proserpina*, is known to feed on ornamental angel wings (*Caladium bicolor*),

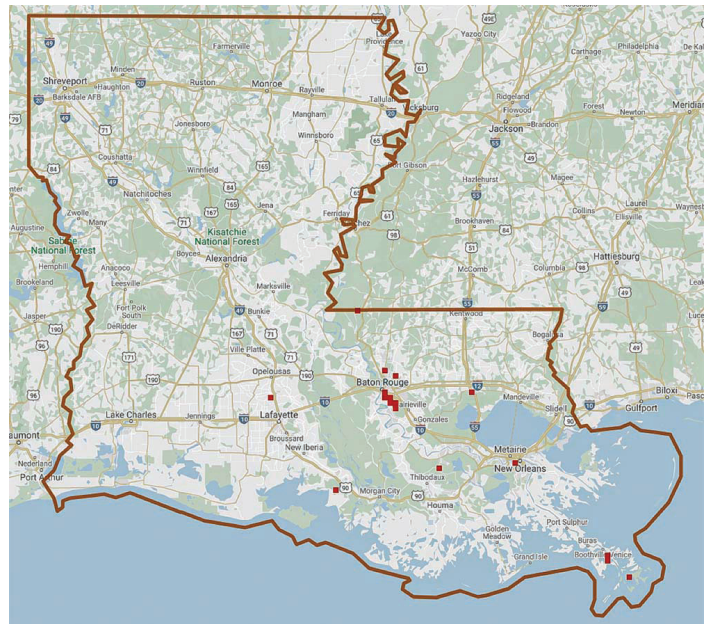


Figure 2. Distribution of *Tarophagus colocasiae* in Louisiana (iNaturalist).

elephant ears (*Xanthosoma* spp.), sweet potatoes (*Ipomea batatas*), cassava (*Manihot esculenta*), milkweed (*Euphorbia hirta*), water morning glory (*Ipomoea aquatica*), oval-leaved pondweed (*Monochoria vaginalis*) and tropical spiderwort (*Commelina benghalensis*) (Dautin et al, 1986). Thus, studies are needed to determine whether the taro planthopper will attack ornamental taro as well as its potential economic impact to the nursery industry in the United States.

## Management

Because of the potential risk of the taro planthopper to ornamental *Colocasia*, *Alocasia* and *Xanthosoma*, effective pest management tactics may be needed. Insecticide applications should be integrated with other practices to achieve greater control (Tasi and Dale, 2020). Caution should be used when applying synthetic insecticides because this could exacerbate taro planthopper outbreaks by killing their natural enemies. Common predators of delphacid planthoppers include wolf spiders (Lycosidae) and predatory mirid bugs (Miridae), while parasitoids are considered less effective (Denno and Peterson, 2000). Increasing populations of natural enemies may be achieved by providing additional food resources or by releasing commercially available predators in nurseries (Tasi and Dale, 2020). For example, the egg predator, *Cyrtorhinus fultus* Knight, has been introduced to most islands in the South Pacific where the taro planthopper occurs; however, *C. fultus* predation alone was not sufficient and other management tactics were necessary (Carmichael et al., 2008). Field samples from Baton Rouge suggest that nymphs of *T. colocasiae* are attacked by an external parasitoid in the genus *Gonatopus* (Dryinidae); however, its impacts on populations are unknown.

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