

A NEW TACHINID GENUS AND SPECIES RECORD FOR NORTH AMERICA: *ICELIOPSIS BORGMEIERI* GUIMARÃES

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INTRODUCTION

The Iceliini are a small, enigmatic New World tribe of Tachininae consisting of three genera, *Icelia* Robineau-Desvoidy, *Iceliopsis* Guimarães, and *Erviopsis* Townsend, and five recognized species (Guimarães 1976). All known species are exclusively Neotropical in distribution with the exception of *Icelia triquetra* (Olivier), which ranges from Brazil, through Central America, and as far north as New York state (O'Hara & Wood 2004). Members of the tribe are generally medium-sized (ca. 7–12 mm), elongate, yellowish or grayish in color, and resemble Dexiini or Leskiini in general appearance. Species of Iceliini are relatively rarely collected and there is but a single host record (Lepidoptera; see below). Here, we report on the discovery of a specimen of *Iceliopsis borgmeieri* Guimarães from the U.S. state of Florida, a species never before recorded outside of Brazil.

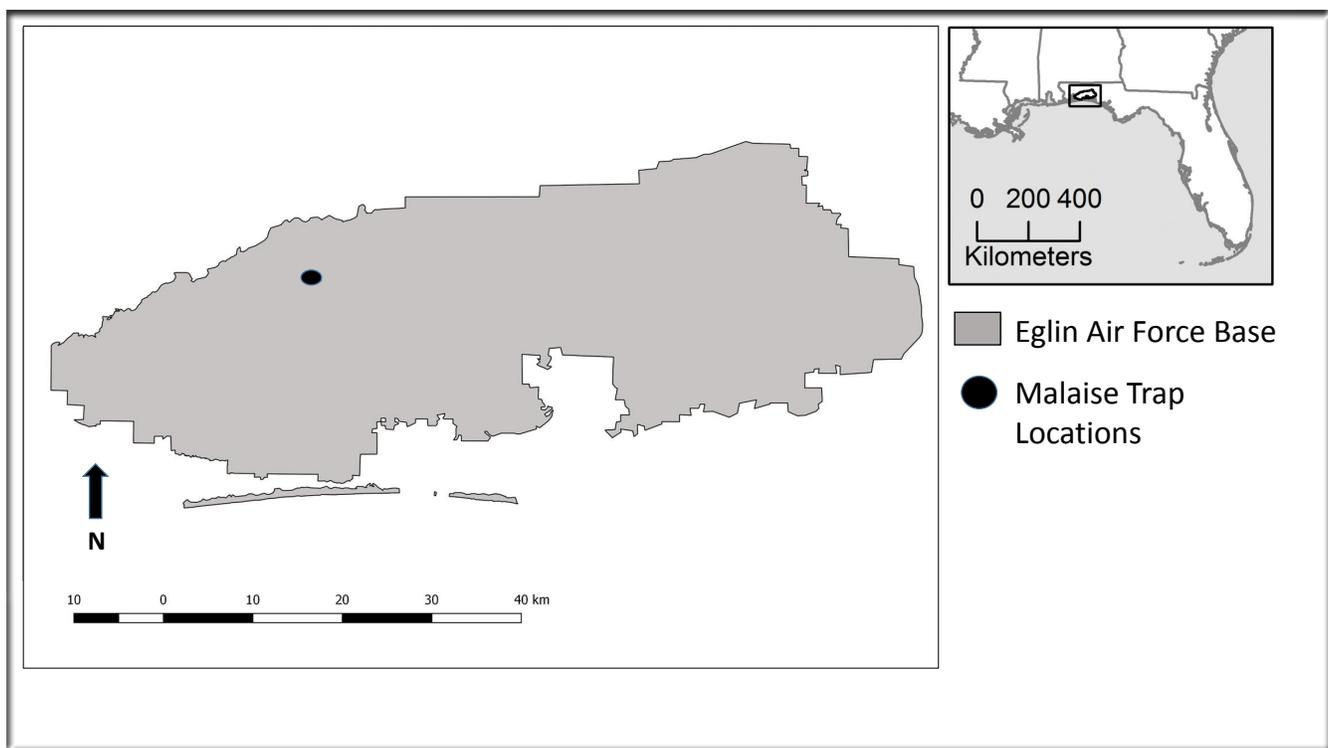


Figure 1. Map of Eglin Air Force Base (EAFB) located within the panhandle of Florida, USA. The left panel shows the location within EAFB of the burn units where specimen was captured.

COLLECTION AND IDENTIFICATION

The specimen reported here was collected during the course of a large scale ecological study examining the effects of fire on insect communities in the fire-dependent longleaf pine (*Pinus palustris*) forests at Eglin Air Force Base (EAFB) in northwest Florida (Fig. 1). EAFB is over 180,000 ha in size, is home to over half of the remaining stands of old-growth longleaf pine and is actively managed by prescribed fire on a 2–5 year return interval (Varner *et al.* 2005, Holliday 2001, Hiers *et al.* 2007). The climate is typified by hot, humid summers with frequent thunderstorms and lightning strikes, mild winters, mean annual temperature of 18.3°C, and 1580 mm of annual precipitation (Provencher *et al.* 2001). The area has little topography (0–100 m ASL) and is dominated by well-drained Lakeland series soils. Xeric sandhills and mesic flatwoods are the dominant vegetative communities found at EAFB.

Longleaf pine is a foundation species and is typically monodominant in the overstory with a relatively open canopy throughout the site and high levels of understory plant diversity. The xeric sandhills habitat is comprised of shrubby hardwood species such as turkey oak (*Quercus laevis*), blackjack oak (*Q. incana*), and persimmon (*Diospyros virginiana*). The understory vegetation is dominated by several grasses, such as wiregrass (*Aristida stricta*), little bluestem (*Schizachyrium scoparium*), broomsedge (*Andropogon virginicus*), as well as dwarf huckleberry (*Gaylussacia dumosa*), evergreen blueberry (*Vaccinium darrowii*), runner oak (*Quercus minima*), saw palmetto (*Serenoa repens*), and gallberry (*Ilex glabra*).

To address the question of the impact of fire on insect communities, a series of six, georeferenced Malaise traps (BioQuip Products Inc., model #2875AG) were erected to sample before, during, and five periods post-fire (immediately after, then at 2, 5, 10, and 12 months) (Fig. 2). Sampling was done in conjunction with three separate fires conducted as part of regular management burning in late May 2014.

One Malaise trap, sampled two months post-burn in a xeric sandhills stand, captured a male of *Iceliopsis borgmeieri*. The information from the three labels is as follows (a diagonal line [/] indicates a new line on the label:

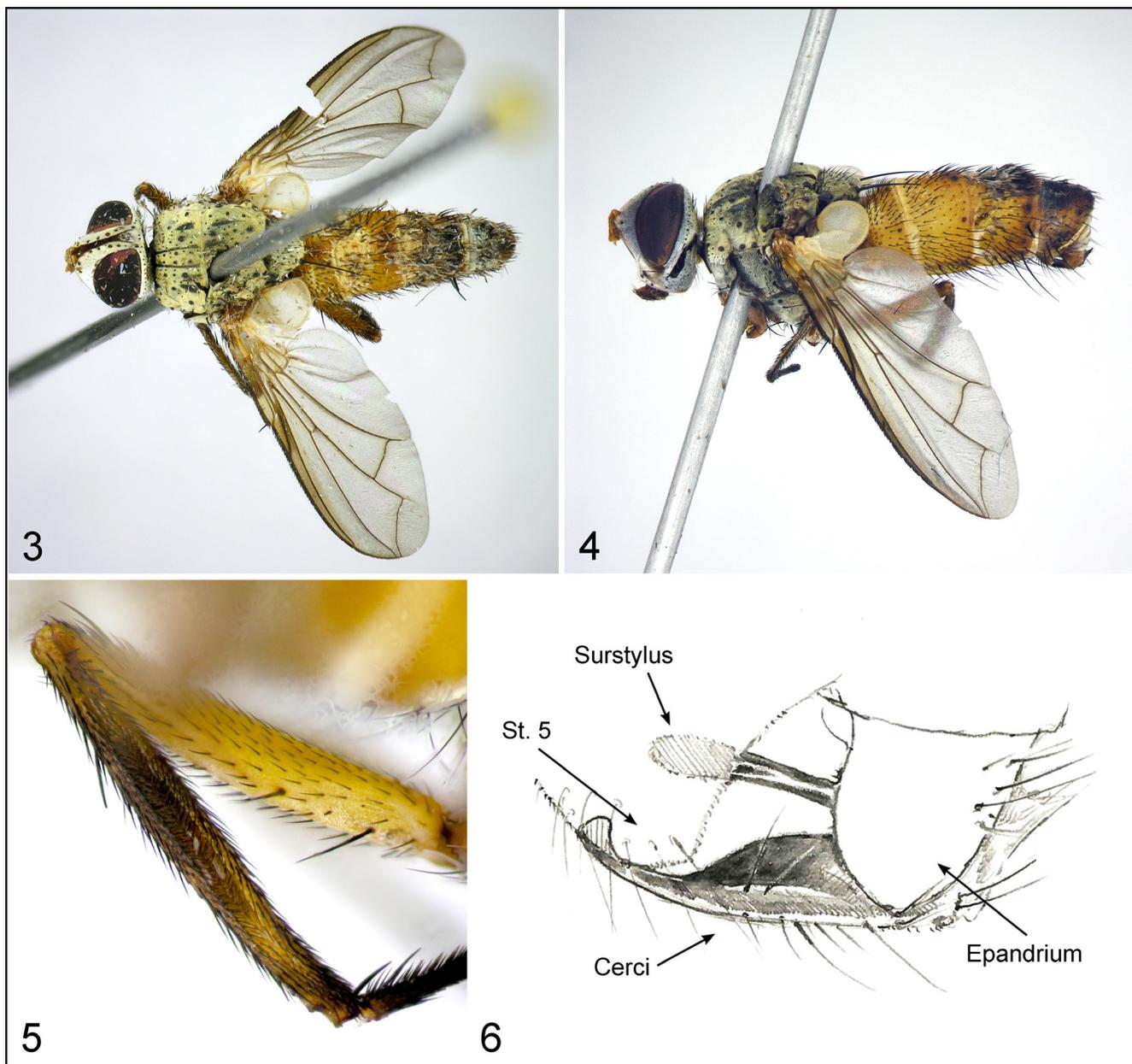
- (1) FL: Okaloosa Co./ Eglin Air Force Base/ 30.60997, -86.70266/ Malaise 8-July-2014/ J.E. Dell Earthwatch
- (2) FL: Okaloosa Co./ Burn Block 3, Trap#6/ Earthwatch/ 8 July 2014 [original locality label]
- (3) FL-S-M2708 [QR (quick response) code label with reference number for database]

Unfortunately, the specimen is in poor condition, lacking postpedicels, most legs, many bristles, and with one wing broken (Figs. 3, 4). In an attempt to remove the dusting of moth scales that covered the body, further damage was done to an already broken right wing (shown in its original condition in Fig. 3) and the distal portion was lost. Despite its poor condition, the specimen clearly matches *Iceliopsis*. Most crucially, the hind tibia is "...swollen on middle, with a longitudinal hairy groove on inner side" (Guimarães 1976: 175) (Fig. 5), an unusual trait in Tachinidae. In addition, the specimen possesses setal sockets for three strong genal bristles (*Icelia* has one or two) and abdominal syntergite 1+2 bears sockets indicating the presence of a pair of strong marginal setae (lacking in *Icelia*). In addition to these characters, the cerci and to a lesser extent the surstyli are somewhat exposed and bear a clear resemblance



Figure 2. Malaise trap erected immediately after a prescribed fire in a longleaf pine forest. Traps were set up seven times in relation to each burn (before, during, immediately after, and then 2, 5, 10, and 12 months post-burn) to track the effects fire had on insect communities.

to those of *I. borgmeieri* Guimarães (Fig. 6). In particular, in lateral view the fused (suture-less) cerci terminate in a knob-like process, and the surstyli are slender and elongate, contrasting strongly with the broad, lobate surtstyli of *Icelia triquetra* (Olivier) (the only known North American iceliine). These unique genitalic characteristics, along with features of the external morphology, indicate that the specimen is very likely *Iceliopsis borgmeieri*, or a similar species. It does deviate slightly from the original description of *I. borgmeieri* in having the surstyli slightly spatulate rather than parallel-sided subapically, the dorsum of the thorax yellowish, and the abdomen less black on sytergite 1+2 and tergite 3, but *I. borgmeieri* was described from nine specimens and this difference could be intraspecific variation. We have not yet had the opportunity to compare the specimen directly with the holotype or paratypes in the Museu de Zoologia, Universidad de São Paulo, Brazil (MZSP). The specimen currently resides in Stireman's personal collection at Wright State University (JOSC).



Figures 3–6. *Iceliopsis borgmeieri* specimen from Eglin Air Force Base, Florida. **3.** Dorsal view (note lepidopteran scales covering the specimen from the dry Malaise trap and the apparent lack of black dorsal markings on T1+2 and T3). **4.** Left lateral view. **5.** View of the posterior surface of the left hind tibia illustrating the median, longitudinal groove thickly lined with inwardly pointing setae. **6.** Left lateral sketch of the genital capsule, illustrating the distinctive knobbed cerci and narrow, elongate surstylus. The distal portions of both structures are partially concealed beneath sternite 5 (St. 5), as indicated by the diagonal fill lines.

DISCUSSION

This record of *I. borgmeieri* represents a dramatic expansion of the known range of this genus and species. Previously, the species was only known from a restricted region of the Atlantic coast of southeastern Brazil in the states of São Paulo and Rio de Janeiro (Guimarães 1976). This suggests one of two possibilities, either *I. borgmeieri* is a widespread but rarely collected species (or species complex) across the Neotropical Region and into subtropical North America, or it has recently been introduced to Florida. The first hypothesis is possible, as some other tachinid species are known to exhibit similar broad ranges spanning the Neotropical and Nearctic regions (e.g., *Cholomyia inaequipes* Bigot, de Santis & Nihei 2016). But, it seems unlikely that this species of *Iceliopsis*, with its distinctive characteristics, would have so broad a range and yet not be collected or reported anywhere outside of southeastern Brazil until now. The second possibility seems much more likely.

Both São Paulo and Rio de Janeiro are densely populated states with large ports and extensive shipping trade with North America and elsewhere. Furthermore, Florida (and to a lesser extent the Gulf Coast of the United States) is well known for the hundreds if not thousands of alien tropical species that have colonized and established populations there. It is a likely site for inadvertent tachinid introductions from tropical regions, especially via parasitized hosts that may be associated with agricultural or forestry products.

Only a single host record has been reported for any member of the tribe Iceliini. The species *Icelia guagliumii* Guimarães was reared from *Diatraea impersonates* (Walker), a crambid stem borer of sugar cane (Guimarães 1975, recorded as *D. flavipennella* Box). This is among the most important pests of sugar cane in Brazil, having garnered the common name broca pequena da cana-de açúcar or “small sugar-cane drill” (do Rosário *et al.* 2007). The planidia-form larvae of *I. guagliumii* are likely deposited in the vicinity of entrance holes and crawl through the tunnels in search of host larvae, similar to the strategy of the stem-borer parasitoid *Lixophaga diataeae* (Townsend) (Roth *et al.* 1982). We infer that *Iceliopsis* probably also attacks some sort of stem-boring lepidopteran larvae that might be easily overlooked if transported within host plant tissue from Brazil to the U.S. It may take some time before we understand the distribution of *Iceliopsis borgmeieri* in the United States, what host(s) it is using there, and how it may have been introduced (or if it has been here all along).

NOTES ON ICELIINI SYSTEMATICS

Although the Iceliini were originally placed within the Dexiinae by Townsend (1936), several authors have argued for placement in the subfamily Tachininae based on both larval (Thompson 1963) and adult characters (Guimarães 1976, O’Hara & Wood 2004). Indeed, these flies highly resemble members of the Leskiini in general appearance, although they lack the strongly protruding lower facial margin characteristic of most Leskiini and the palpi are strongly reduced or absent in iceliines. Tschorsnig (1985) suggested that the tribe is closely allied with the Tachinini (*sensu lato*), with only minor differences in the structure of the distiphallus.

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