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Painted Bunting (*Passerina ciris*) Caught in the Web of a Giant Lichen Orb-Weaver Spider (*Araneus bicentenarius*)

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Painted Bunting (*Passerina ciris*) caught in the web of a giant lichen orb-weaver spider (*Araneus bicentenarius*)

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ABSTRACT—Orb-weaver spiders weave large webs that are capable of entrapping various species of birds. We report a case of a male Painted Bunting (*Passerina ciris*) caught in the web of a giant lichen orb-weaver (*Araneus bicentenarius*). Most cases of bird entrapment in spider webs involve spiders with larger webs (often *Nephila* sp.) and very small birds, usually hummingbirds. Our case is noteworthy because we report a relatively large bird caught in a relatively small web. Furthermore, the geographic distribution of *A. bicentenarius* extends beyond the tropics and subtropics, which is where most reported cases of bird entrapment occur. This observation suggests that even small orb-weaver webs may pose a threat to relatively large

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birds, and that this risk may extend well beyond the regions most commonly associated with entrapment. *Received 17 July 2017. Accepted 30 September 2018.*

Key words: *Araneus bicentenarius*, bird caught in spider web, giant lichen orb-weaver spider, Painted Bunting, *Passerina ciris*.

Un azulejo *Passerina ciris* atrapado en la tela de la araña *Araneus bicentenarius*

RESUMEN (Spanish)—Las arañas tejedoras elaboran grandes telarañas capaces de atrapar varias especies de aves. Reportamos el caso de un macho del azulejo *Passerina ciris* atrapado en la telaraña de *Araneus bicentenarius*. La mayoría de los casos de aves atrapadas involucra a arañas con telarañas muy grandes (con frecuencia *Nephila* sp.) y aves muy pequeñas, usualmente colibríes. Nuestro caso es notable porque reportamos un ave relativamente grande atrapada en una telaraña relativamente pequeña. Además, la distribución geográfica de *A. bicentenarius* se extiende más allá de los trópicos y subtrópicos, que es de donde se originan la mayoría de los casos reportados de aves atrapadas. Esta observación sugiere que aún las telarañas pequeñas podrían significar una amenaza para aves relativamente grandes y que este riesgo podría extenderse más allá de las regiones más comúnmente asociadas con esos incidentes.

Palabras clave: *Araneus bicentenarius*, ave atrapada en telaraña, *Passerina ciris*.

Orb-weaving spiders build large webs that are designed to capture a variety of invertebrate prey (Brown 1981, Rypstra 1985, Higgins 1987) and their webs are made from the toughest known biological material (Gosline et al. 1986, Agnarsson et al. 2010). While these spiders do not specialize on birds (Nentwig 1987), numerous accounts exist of birds entrapped in orb-weaver spider webs, making this phenomenon an ecological hazard to both birds and spiders (Brooks 2012). The likelihood of a bird becoming entrapped in spider webs is most dependent on the bird's size, because larger birds are more able to use their wings to free themselves from the web. If a bird is unable to free itself it will probably die by dehydration or be consumed by the spider (Brooks 2012). Larger birds are less likely to be prepared for consumption because spiders are less likely to immobilize prey that is too large to consume (Nentwig 1987). As such, spider webs generally pose greatest risk to smaller birds. Brooks (2012) reported that the mean mass of birds caught in spider webs is 11 g and that 87% of entrapped birds weighed less than 15 g. It is not surprising then that a review study found that, among all birds, hummingbirds (<5 g, see Brooks 2012) are the birds most frequently found trapped in spider webs.

The size of the spider web also seems to be correlated with the likelihood of a bird becoming tangled in its web. Of the 46 reports analyzed by Brooks (2012) in which the species of spider was reported, half were of birds entrapped in webs of *Nephila* spiders, which is the largest genus of orb-weavers and makes the biggest webs. *Nephila* female body size ranges from 17.9 mm (*N. fenestrate*) to 36.3 mm (*N. komaci*), and *Nephila* females commonly make webs 1 m or more in diameter (Kuntner and Coddington 2009). *Nephila* have captured birds as large as an 80 g Laughing Dove (*Streptopelia senegalensis*; see table 1 in Brooks 2012) and a 34 g Lewin's Honeyeater (*Meliphaga lewinii*; Robinson 1941). Reports of smaller orb-weavers capturing birds in their webs are also widespread, but seem to decrease in frequency with decreasing spider size (Brooks 2012). Incidents of smaller orb-weavers capturing birds may be underreported because small orb-weavers may be less conspicuous and recognizable than the charismatic *Nephila* spiders. In fact, 23 out of 69 reports analyzed by Brooks (2012) did not specify the type of spider beyond "orb-weaver." Here we report a case of a male Painted Bunting (*Passerina ciris*) found tangled in the web of a giant lichen orb-weaver spider (*Araneus bicentenarius*) in the Texas Hill Country, near Kendalia, Texas.

Methods and results

In June 2012 we found a male *P. ciris* suspended in the remains of a web that was constructed ~1.5 m off the ground in a clearing between 2 Ashe juniper (*Juniperus ashei*) trees (Fig. 1). The bird was alive but unmoving, and the spider was on the underside of a nearby branch (Fig. 2). The bird was not wrapped in silk and it did not appear as though the spider was treating it as a prey item. The bird had completely destroyed the web. We freed the bird from the web and it flew away seemingly unharmed. We therefore cannot be sure if the spider would have consumed the bird had we not interfered.

Discussion

The foraging behavior of *P. ciris* may increase its risk of entrapment in spider webs. During the breeding season, *P. ciris* switches from a primarily granivorous diet to one rich in arthropods in order

Figure 1. A male Painted Bunting (*Passerina ciris*) caught in the web of a giant lichen orb-weaver spider (*Araneus bicentenarius*).

to feed its young (Shulenberg 2009). Rather than avoiding spider webs, *P. ciris* will sometimes approach webs in order to consume both spiders and their prey items. One researcher even observed a female that flew above a web, folded in her wings, and fell through the web to the ground and ate the arthropods from the web (Shulenberg 2009). Many other bird species forage from spider webs, either to prey upon the spider or the insects trapped in the web (Waide and Hailman 1977, Gunnarsson 2007). This behavior may increase the chances of *P. ciris* and other species becoming entrapped in orb-weaver webs. The incident we report suggests that there may be a high cost to this foraging tactic, because even if rare, a single instance of entrapment in an individual's lifetime could have significant effects on fitness because the chance of death is high (Brooks 2012). While *P. ciris* uses spider webs as a component of its nest, it typically uses cobwebs (Shulenberg 2009) and is therefore unlikely to gather nesting material from active orb-weaver webs.

Figure 2. The Painted Bunting (*Passerina ciris*) once we freed it from the web. The giant lichen orb-weaver spider (*Araneus bicentenarius*) is photographed here as we found it.

Although orb-weavers specialize in capturing insects (Nentwig 1987) they are known to capture and consume both birds and bats (Brooks 2012, Nyffeler and Knörnschild 2013), although predation of birds is considered incidental (Vernon 1976, Levy 1987, Peloso and De Sousa 2007; see Brooks 2012 for review). Furthermore, entrapment of birds in spider webs often results in complete destruction of the web, as in the case we report here, which is costly for the spider in both time and energy if it is unable to consume the bird. In fact, many species of orb-weaving spiders weave stabilimenta into their webs, which are bright strands of white, non-capture silk that are thought to serve as a visual deterrent to birds that reduces the likelihood that birds will fly into and damage the web (Bruce et al. 2005). Stabilimenta may decrease prey-capture success (Blacklege and Wenzel 1999), so the presence of such conspicuous adornments despite a foraging cost suggests that birds destroying spider webs may pose a significant cost to orb-weaver spiders.

Our observation of a *P. ciris* trapped in the web of an *A. bicentenarius* is noteworthy because we report a relatively large bird entrapped in a relatively small web at a latitude where this is not commonly reported. *P. ciris* mass averages 13–19 g (Shulenberg 2009), heavier than the average mass of birds (11 g) reported in a review on bird entrapment in spider webs (Brooks 2012). Female *A. bicentenarius* make relatively small webs, with an average width of 29 cm in the lab, although they may make webs even smaller in nature (Sensenig et al. 2012). In contrast, *Nephila* orb-

weavers make large webs, over 100 cm across (Kuntner and Coddington 2009), and are most commonly found in the tropics. This and other observations (McKenzie 1991, Cox and Nesmith 2007, Brooks et al. 2008, Martin and Platt 2011) report bird entrapment as far north as Florida, Texas, and Louisiana, although we find it curious so few reports exist in temperate zones. *Nephila* and *Agirope* orb-weavers—the genera most strongly associated with bird entrapment—occur as far north as Canada, as do many orb-weaver species, including *A. bicentenarius*. The dearth of cases of bird entrapment in spider webs in temperate zones is puzzling given the prevalence of spiders with webs that are apparently capable of entrapment in these regions.

Here we show that orb-weaver webs may pose a greater threat to birds than is appreciated, especially for species that are known to forage within spider webs, such as *P. ciris*. We show that even relatively small orb-weavers make webs that can entrap relatively large birds, which suggests orb-weaver webs may pose a threat to birds well beyond the tropics. Authors should report the species of both the spider and the bird when reporting a case of bird entrapment, as this information allows a more robust understanding of how factors such as habitat, spider size, and web size affect the likelihood of entrapment.

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