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Birds caught in spider webs in Asia

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Abstract

A recent global review of birds caught in spider webs reported only three Asian cases. Given this surprisingly low number, I made a concerted effort to obtain additional Asian cases from the literature, the internet, and field workers. I present a total of 56 Asian cases which pertain to 33 bird species. As in the global dataset, mostly small bird species were caught in spider webs, with a mean body mass of 17.5 g and a mean wing chord length of 73.1 mm. Consequently, birds with a body mass >30 g were very rarely caught. This Asian review corroborates the global review that smaller birds are more likely to be caught and that *Nephila* spiders are most likely to be the predators. Continuous monitoring of spider webs is recommended to ascertain the frequency of these events.

Keywords: Spider, Predator–prey relationships, Asia

Background

Birds may be killed by environmental factors (e.g. weather; Elkins 2004), accidents or parasites (e.g. Jennings 1961), or predators. The most important predators of birds are birds, reptiles and mammals, including humans, but, more rarely, birds are also predated upon by amphibians, fish and insects (Brooks 2012). A presumably rather rare case of death occurs when a bird gets caught in a spider web; in a global review, Brooks (2012) reviewed 68 cases of birds getting trapped and often killed in the webs of large spiders. When a bird flies into a spider web, the bird may either bounce off the web or fly right through it, or it may become entangled; once entangled, the spider may or may not wrap the bird in silk. Entangled birds may then free themselves again, or they die either due to exhaustion or spider predation, while wrapped birds invariably die unless freed by humans (for details, see Brooks 2012).

Birds should therefore always attempt to avoid collision with spider webs, while the interests of spiders may differ depending on the species. Some spider species opportunistically consume trapped birds (especially large *Nephila* spiders, see below) and may therefore keep their webs inconspicuous to birds. However, other spider species apparently try to avoid collisions and the consequent damage to their webs by making them more visible to birds (Bruce et al. 2005; Walter and Elgar 2011).

As one may expect, Brooks' (2012) global review documented that it is almost exclusively smaller birds (mean body mass = 10.7 g, mean wing chord length = 61 mm) which get caught in spider webs. Consequently, 88 and 90 % of all caught birds had a body mass ≤15 g and a wing chord length <90 mm, respectively. In the 34 cases in which the spider was identified, 62 % belonged to the genus *Nephila*, and all were orb weavers except for a single *Latrodectus* species.

Most of these cases were reported from Africa, Australia, North America, and the Neotropics, but only a few from Europe and Asia (D. Brooks *in litt.* 2014). Thus, Brooks (2012) only reported three Asian cases: a Spotted Flycatcher (*Muscicapa striata*) in Iran (Doberski 1973), a juvenile Laughing Dove (*Streptopelia senegalensis*) in Oman in 2003 (Forsman 2003), and a Dusky Warbler (*Phylloscopus fuscatus*) in China some time before 2007 (D. Brooks *in litt.* 2014). Kasambe et al. (2010) presented another four cases from India not mentioned in Brooks (2012). Given that *Nephila* species are distributed across much of tropical, subtropical and even some parts of temperate Asia (Miyashita et al. 1998; Murphy and Murphy 2000; Lee et al. 2004; Harvey et al. 2007; Su et al. 2007, 2011; http://www.gbif.org/species/2149490), this relative lack of records seemed surprising. Therefore, I made a concerted effort to obtain additional cases of birds being caught in spider webs in Asia using various sources.

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Methods

In 2014 and early 2015, I used eight methods to obtain additional cases from the literature, the internet, Asian ornithologists, birdwatchers and birding tour leaders: (1) I emailed all the authors who published in *BirdingASIA* and *Forktail* and whose emails I could take from the journals' websites or the Web of Science. (2) I emailed all the authors of any article published in an ornithological journal listed on the Web of Science which were returned upon using the keywords "bird" and "Asia". (3) I posted requests on the birding fora of the Birds of Bangalore, Birds of Bombay, Bombay Natural History Society, Hong Kong Bird Watching Society, Hong Kong Wildlife Net, Kerala Birder, Malaysia Birders, Oriental Bird Club, Ornithological Society of the Middle East, and Pengamat Burung Indonesia. (4) I extensively used the web, images and video search functions of Google and Google Scholar using various combinations of the keywords "spider" "catch" "bird" "Asia" and names of Asian countries. (5) Upon any reply, I asked the person to forward my email request to other Asian ornithologists and birdwatchers. (6) I tried to obtain all references given in publications or websites which reported another case. (7) In early 2014, two native Chinese speakers (J.-L. Wu, T.-Y. Wu *in litt.* 2014) used Google Taiwan to search Taiwanese websites for cases using relevant keywords (see above), and I emailed all Taiwanese ornithologists and birders that I personally knew. (8) In late 2014, two native Japanese speakers (M. Kamioki, M. Mashiko *in litt.* 2014) used Google Japan to search Japanese websites for cases using relevant keywords (see above). I kindly request that further cases be reported to my email.

For easy comparison, I mirrored Brooks' (2012) analysis as much as possible. As described in Brooks (2012), I sought data on body mass and wing chord length for each bird species from various data sources (given in Table 1) and, if possible, determined the species of spider (given in Table 1). Unlike Brooks (2012), I added location and date for each record, if possible.

Results

In Asia, I was able to document 53 cases in addition to the three cases listed by Brooks (2012) (Table 1). The Asian cases now contain 33 bird species, and together with Brooks' (2012) global dataset, 84 bird species have been documented so far (Table 2). Three and 12 spider species were identified for Asia and the world, respectively; these are (with the number of Asian cases and cases from other continents in brackets): *Aranens trifolium* (0/1), *Argiope aurantia* (0/3), *Argiope caphinarium* (0/1), *Argiope* sp. (0/2), *Eriophora biapicata* (0/1), *Latrodectes* sp. (0/1), *Mastophora* sp. (0/1), *Neoscona hentzii* (0/1), *Nephila antipodiana* (3/3), *Nephila clavipes* (0/14), *Nephila pilipes* (31/32), *Nephila* sp. (4/8), *Nephilengys cruentata* (0/2), *Poecilotheria fasciata* (1/1), and unidentified spiders (17/49) [Brooks (2012) also mentions *Nephila inaurata* in his text, but it is not listed in his Table 1]. Thus, 38 out of 39 identified cases (97 %) in Asia were *Nephila* species.

The mean body mass and mean wing chord length are slightly larger for the Asian than for the global dataset (Table 2). This difference is certainly due to the large number of hummingbirds in Brooks' (2012) dataset which are all smaller than the smallest Asian species, the Greenish Warbler (*Phylloscopus trochiloides*; Table 1). Means are also slightly larger for the means calculated across all species than for the means calculated across all individual cases (Table 2). This difference is due to smaller-than-average species caught repeatedly; of the 14 species with more than one case, 11 species had a body mass $\leq$10 g and 9 species had a wing chord length $\leq$60 mm (Table 1; Brooks 2012). Among the 49 Asian cases identified to bird species, 71 and 88 % of all caught birds had a body mass $\leq$15 g and a wing chord length <90 mm, respectively; for the 114 global cases, the respective percentages are 82 and 89 % (Table 1; Brooks 2012). A frequency diagram of all cases shows the great propensity of small-bodied birds being caught (Fig. 1). Cases with a body mass >30 g are exceedingly rare, and the two largest species ever caught, the Laughing Dove (80.0 g) and the Brown-eared Bulbul (*Ixos amaurotis*, 70.9 g), are anomalies in the general trend.

The oldest case recorded in Asia is the Dusky Crag Martin (*Hirundo concolor*) reported in Morris (1889) that equals the previous oldest record by McCook (1889) cited in Brooks (2012). Only 11 of the Asian cases are from before 2000 (Table 1); likely reasons are that many records were reported on the internet (Table 1), and that many of the contacted ornithologists and birdwatchers were not active before 2000.

Discussion

Birds are usually predators of spiders or the contents of their webs (e.g. Waide and Hailman 1977; Gunnarsson 2007), but when small birds encounter spider webs of large spiders, the tables can be turned. Overall, this review of Asian cases corroborates the conclusions made by Brooks (2012), namely: (1) the smaller the bird species, the higher the likelihood to be caught in spider webs; and (2) *Nephila* species are by far the most common spiders to catch birds in their webs.

However, my review of Asian cases suggests that cases of birds getting caught in spider webs may be as common in Asia as in other continents wherever large orb weaver spiders are common. Therefore, the small number of Asian cases in Brooks (2012) represented a biased picture

Table 1 Birds entrapped in spider webs in Asia and their respective sizes

Common name	Scientific name	Spider sp.	Mass (g)	Wing (mm)	Location	Date	Source
Glossy Swiftlet	*Collocalia esculenta*	Np	8.0	95[0,2,3]	Great Nicobar island, Nicobar Islands, India	Before 2010	Manchi and Sankaran (2009)
Edible-nest Swiftlet	*Collocalia fuciphaga*	S	10.7	118[1,1,3]	Interview Island, Andaman Islands, India	June 2006	Manchi and Sankaran (2009)
Asian Palm Swift	*Cypsiurus balasiensis*	Na	9.2	112[1,1,0]	Doi Kham, Chiang Mai Province, Thailand	6 October 2014	W. Limparungpatthanakij *in litt.* 2014
Laughing Dove	*Streptopelia senegalensis*	Na	80.0[c]	138[c]	Oman	~ October 2003	Forsman (2003), Brooks (2012), D. Brooks *in litt.* 2014
Pied Fantail	*Rhipidura javanica*	S	12.5	82[1,1,0]	Near U Minh Thuong National Park, Kien Giang Province, Vietnam	9 August 2008	M. Le *in litt.* 2014
Black-naped Monarch	*Hypothymis azurea*	Np	11.3	69	Sanjay Gandhi National Park, Mumbai, India	October 1996	Andheria (1998, 1999)
Spotted Flycatcher	*Muscicapa striata*	S	14.0[c]	80[c]	Main Kaleh Reserve, Iran	1972	Doberski (1973)
Grey-streaked Flycatcher	*Muscicapa griseisticta*	S	15.1	83	Taiwan Area	September 2008	http://tinyurl.com/spider-tw2
Grey-streaked Flycatcher	*Muscicapa griseisticta*	Np	15.1	83[3,5,8]	Iriomote Island, Japan	5 October 2008	http://tinyurl.com/spider-jp6
Asian Brown Flycatcher	*Muscicapa dauurica*	S	9.9	66[1,1,0]	Thap Lan National Park, Nakhon Ratchhasima Province, Thailand	14 November 1999	P. Round *in litt.* 2014
Asian Brown Flycatcher	*Muscicapa dauurica*	S	9.9	66[1,1,0]	Po Toi Island, Hong Kong, China	After 2006	G. Welch *in litt.* 2014
Asian Brown Flycatcher	*Muscicapa dauurica*	Np	9.9	66[1,1,0]	Po Toi Island, Hong Kong, China	8 September 2011	M. Hale and G. Welch *in litt.* 2014
Hill Blue Flycatcher	*Cyornis banyumas*	Np	14.5	67[1,1,0]	Bukit Larut, Perak State, Malaysia	Unknown	Anonymous (1999b)
Great Tit[a]	*Parus major*	Np	15.5	59[1,0,0]	Komesu, Itoman City, Okinawa Island, Japan	10 August 2011	http://tinyurl.com/spider-jp1, http://tinyurl.com/spider-jp2
Dusky Crag Martin[b]	*Hirundo concolor*	Pf	13.0	98[1,1,0]	Shevaroys (=Servarayan) Hills near Salem, Tamil Nadu	Before 1889	Morris (1889) and Anonymous (1999a)
Light-vented Bulbul	*Pycnonotus sinensis*	Np	29.7	85	Majia, Pingtung, Taiwan Area	March 2004	http://tinyurl.com/spider-tw3
Styan's Bulbul	*Pycnonotus taivanus*	Np	26.2	84	Guangfu, Hualien, Taiwan Area	18 June 2010	http://tinyurl.com/spider-tw4
Yellow-vented Bulbul	*Pycnonotus goiavier*	Np	27.8	82[1,4,6]	Kledang-Sayong Forest Reserve, Ipoh, Perak, Malaysia	11 February 2014	Amar-Singh (2014a, b), Amar-Singh H. *in litt.* 2014
Buff-vented Bulbul	*Iole olivacea*	S	24.5	89[1,1,0]	Near Ban Bang Khram, Khlong Thom District, Krabi (area also known as Khao Nor Chuchi), Thailand	7 August 2013	P. Round *in litt.* 2014
Brown-eared Bulbul	*Ixos amaurotis*	Np	70.9	116[1,1,0]	Tokunoshima Island, Japan	1 August 2010	http://tinyurl.com/spider-jp3

Table 1 continued

Common name	Scientific name	Spider sp.	Mass (g)	Wing (mm)	Location	Date	Source
Plain Prinia	*Prinia inornata*	Np	8.2	49	Tadoba Andhari Tiger Reserve, Chandrapur district, Maharashtra, India	October 1998	Anonymous (1999a)
Plain Prinia	*Prinia inornata*	Np	8.2	49	Melghat Tiger Reserve, northern part of Amravati District of Maharashtra State, India	Before 2005	Pande et al. (2004)
Plain Prinia	*Prinia inornata*	S	8.2	49	Western Ghats, Maharashtra, India	Unknown	S. Pande *in litt.* 2015
Plain Prinia	*Prinia inornata*	S	8.2	49	Taiwan Area	September 2008	http://tinyurl.com/spider-tw2
Oriental White-eye	*Zosterops palpebrosus*	Na	8.6	51[1,1,5]	Sungei Buloh Wetland Reserve, Singapore	30 April 2012	Ong (2012a, b)
Japanese White-eye	*Zosterops japonicus*	Np	11.3	53	Mong Tseng Tsuen (near Tsim Bei Tsui), Hong Kong, China	22 August 2004	So (2005)
Japanese White-eye	*Zosterops japonicus*	Np	11.3	53	Keelung, Taiwan Area	18 August 2005	http://tinyurl.com/spider-tw5
Japanese White-eye	*Zosterops japonicus*	Np	11.3	53	Taiwan Area	Before October 2005	http://tinyurl.com/spider-tw7
Japanese White-eye	*Zosterops japonicus*	Np	11.3	53	Badouzi, Keelung, Taiwan Island	13 August 2011	http://tinyurl.com/spider-tw6
Japanese White-eye	*Zosterops japonicus*	Np	11.3	53	Okinawa Island, Japan	November 2012	http://tinyurl.com/spider-jp5
Lanceolated Warbler	*Locustella lanceolata*	S	12.9	55	E-Luan-Pi lighthouse, Kenting National Park, Pintung County, Taiwan Area	14 October 1984	TESRI[#] collection number w672, C.-t. Yao *in litt.* 2013
Grasshopper Warbler	*Locustella naevia*	N	14.8	64	Tungareshwar Wildlife Sanctuary, Maharashtra, India	18 November 2006	Kasambe et al. (2010)
Common Tailorbird	*Orthotomus sutorius*	N	7.5	43[2,2,5]	Mogarkasa Forest, Nagpur, Maharashtra, India	13 November 2008	Kasambe et al. (2010)
Dark-necked Tailorbird	*Orthotomus atrogularis*	Np	7.7	38[1,1,0]	Kaeng Krachan National Park, Petchaburi Province, Thailand	2012	W. Limparungpatthanakij *in litt.* 2014
Dusky Warbler	*Phylloscopus fuscatus*	S	11.0[c]	57[c]	Beidahe, Hebei Province, China	Before 2007	D. Zetterström *in litt.* 2007 (D. Brooks in *litt.* 2014)
Arctic Warbler	*Phylloscopus borealis*	Np	10.0	65	Yonaguni Island, Japan	10 September 2008	http://ameblo.jp/attacus/theme2-10004405518.html
Arctic Warbler	*Phylloscopus borealis*	Np	10.0	65	Bitou Cape, New Taipei City municipality, Taiwan Area	6 September 2011	Y.-P. Chiang *in litt.* 2013–2014
Arctic Warbler	*Phylloscopus borealis*	Np	10.0	65	Pak Sha O, Hong Kong, China	19 September 2015	Geoff Carey *in litt.* 2015
Greenish Warbler	*Phylloscopus trochiloides*	N	7.1	60	Bandhavgarh National Park, Madhya Pradesh, India	12 October 2007	Kasambe et al. (2010)

Table 1 continued

Common name	Scientific name	Spider sp.	Mass (g)	Wing (mm)	Location	Date	Source
Greenish Warbler	*Phylloscopus trochiloides*	N	7.1	60	Kanha National Park, Madhya Pradesh, India	22 October 2008	Kasambe et al. (2010)
Buff-breasted Babbler	*Pellorneum tickelli*	S	17.1	61[1,1,0]	Fraser's Hill, Pahang, Malaysia	5–11 June 2010	S. Pieterse *in litt.* 2014
Taiwan Yuhina	*Yuhina brunneiceps*	S	12.2	62	Taiwan Area	Unknown	H.-S. Lin *in litt.* 2013
Vinous-throated Parrotbill	*Paradoxornis webbianus*	Np	9.3	52	Mountain Pinglin, Taichung City, Taiping District, Taiwan Area	2007	http://tinyurl.com/spider-tw1
Brown-throated Sunbird	*Anthreptes malacensis*	S	11.4	66[1,1,3]	Ipoh City, Perak, Malaysia	28 December 2007	Amar-Singh (2014a, b), Amar-Singh H. *in litt.* 2014
Eurasian Tree Sparrow	*Passer montanus*	S	23.0	66	Luku, Nantao County, Taiwan Area	1990s	C.-t. Yao *in litt.* 2013
Eurasian Tree Sparrow	*Passer montanus*	Np	23.0	66	Taiwan Area	Summer 2004	http://tinyurl.com/spider-tw9
Eurasian Tree Sparrow	*Passer montanus*	S	23.0	66	Taiwan Area	Before August 2010	http://tinyurl.com/spider-tw8
Eurasian Tree Sparrow	*Passer montanus*	Np	23.0	66	Jiji, Nantou County, Taiwan Area	13 August 2013	C.-t. Yao *in litt.* 2013
White-rumped Munia	*Lonchura striata*	S	11.3	48	Taiwan Area	Unknown	Y.-C. Hsu *in litt.* 2013
Munia spec.	–	Np	–	–	Bogor Botanical garden, Bogor, Indonesia	Before 1934	Boedijn (1933)
Munia spec.	–	Np	–	–	probably near or in Bogor, Indonesia	Before 1934	Boedijn (1933)
"Small birds"	–	Np	–	–	Thailand	Before 1933	Bristowe (1932)
Unidentified	–	Np	–	–	probably near or in Bogor, Indonesia	Before 1934	Boedijn (1933)
Unidentified	–	Np	–	–	Cheung Sha, Lantau Island, Hong Kong, China	8 October 2006	Anonymous (2006)
Unidentified	–	Np	–	–	Wang Tong River, Mui Wo, Lantau Island, Hong Kong, China	12 October 2009	M. Pearse *in litt.* 2015
Unidentified	–	Np	–	–	Miyakojima Island, Japan	16 October 2011	http://tinyurl.com/spider-jp7

Common and scientific bird names and taxonomic order follow Inskipp et al. (1996)

Spider species as follows: S = bird was caught by a spider; N = bird was caught by a *Nephila* species, family Nephilidae, suborder Araneomorphae, order Araneae; Na = bird was caught by *Nephila antipodiana*; Np = bird was caught by *Nephila pilipes* (=*maculata*); Pf = bird was caught by *Poecilotheria* (=*Mygale*) *fasciata*, family Theraphosidae, suborder Mygalomorphae, order Araneae. Body masses were obtained from Glutz von Blotzheim (1966–1996), Dunning (2008), Severinghaus et al. (2010), the Encyclopedia of Life (eol.org) and Wikipedia (en.wikipedia.org). Wing chord lengths were obtained from Glutz von Blotzheim (1966–1996) and Severinghaus et al. (2010) except when a superscript indicates the number of male, female and unsexed specimens which were measured by P. Capainolo (*in litt.* 2014) at the American Museum of Natural History, New York, USA, H. van Grouw (*in litt.* 2014) at the Natural History Museum, Tring, UK, A. Gamauf (*in litt.* 2014) at the Naturhistorische Museum Wien, Austria, and T. Töpfer (*in litt.* 2014) at the Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany

[a] Also classified as Eastern Great Tit (*Parus minor*)

[b] The martin referred to in Morris (1889) must be a Dusky Crag Martin because of the record's location and the use of a house to build its nest (R. Kasambe, H. Rathore, *in litt.* 2014)

[c] I used the body masses and wing chord lengths given for the three Asian cases mentioned in Brooks (2012)

[d] TESRI refers to Taiwan Endemic Species Research Institute, Jiji, Nantou County, Taiwan Area

Table 2 Mean body masses and mean wing chord lengths of birds caught in spider webs in Asia (Table 1) and the world (Table 1; Brooks 2012); naturally, cases of unidentified bird species in Table 1 were excluded

Analysis (sample size)	Spider species	Mass (g)	Wing (mm)
Asia			
Individuals ($n = 49$)	3	15.9 ± 13.7 (7.1–80.0)	68.9 ± 20.9 (38.0–138.0)
Species ($n = 33$)	3	17.5 ± 16.2 (7.1–80.0)	73.1 ± 23.6 (38.0–138.0)
World			
Individuals ($n = 114$)	12	12.3 ± 10.8 (2.0–80.0)	63.3 ± 20.1 (37.0–138.0)
Species ($n = 84$)	12	13.5 ± 11.8 (2.0–80.0)	66.4 ± 21.8 (37.0–138.0)

The analyses were also split into individuals (i.e. all cases) and species (i.e. one case for each bird species). Each entry for body mass and wing chord length gives the mean ± standard deviation and the range in brackets

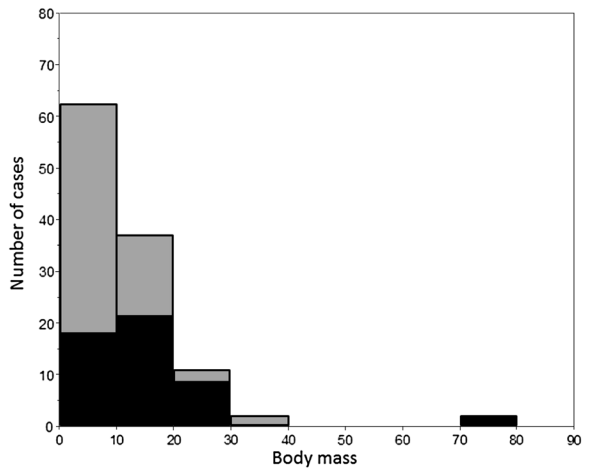

Fig. 1 Frequency diagram of body mass intervals (in steps of 10 g) of 49 cases (*black bars*) from Asia (Table 1) and the remaining 65 cases (*grey bars*) from other continents (Brooks 2012), whereby each case involves one individual bird getting caught in a spider web as described in the text

of the Asian situation. Asia covers 30 % of the world's terrestrial surface, and, due to this review, 46 % (56 out of 121) of all documented cases now come from Asia, thus giving a more representative picture.

Naturally, reporting bias is likely to be considerable for rare natural history events like these, and Brooks (2012) therefore emphasized "the importance of reporting interesting natural history notes and keeping good field records." An example of positive reporting bias is likely to be Taiwan. At 35,883 km^2, Taiwan has only 0.08 and 0.02 % of the terrestrial surface of Asia and the Earth, respectively. However, the 16 cases reported from Taiwan (Table 1) represent 29 % of all Asian and 13 % of all global cases. One reason may be that large spiders are certainly common in Taiwan Island, and especially in somewhat disturbed or semi-open habitats with many small gaps and openings suitable for building webs, such as the coastal forests at Bitou Cape (cf. Table 1) where a large spider web can be seen approximately every 10 m. Accordingly, Brooks et al. (2008) and Brooks (2012) hypothesized that disturbed habitats, e.g. forests disturbed by severe storms, may see an increase in the number of large spiders in the lower strata, as possible attachment sites for webs were destroyed in the upper strata, and Taiwan is regularly subjected to devastating typhoons. Furthermore, Taiwan has a very active bird-watching community and widespread internet use, evidenced by the fact that 10 of the 16 Taiwanese cases were reported on the internet (Table 1). The internet and citizen-science can thus play an increasing role in gathering and disseminating natural history information (e.g. Sullivan et al. 2014; Lin et al. 2014).

Certainly, a bird being caught in a spider web remains a rather rare event. I never encountered such a case in several years of birdwatching in tropical and subtropical regions, and 58 out of 68 people (85 %) who replied to my request for information also never encountered such a case. The remaining people had only encountered one case in their entire life except for Amar-Singh H., S. Pande, P. Round, G. Welch, and C.-t. Yao who each had encountered two (this does not include the multiple cases reported in the publications of Boedijn 1933; Manchi and Sankaran 2009; Kasambe et al. 2010). For any small bird, it is nevertheless a considerable risk because it carries the highest fitness cost, i.e. death. Combined with the facts that some spider species attempt to make their webs more visible to birds (Bruce et al. 2005; Walter and Elgar 2011), presumably to avoid collisions and the consequent damage to their webs, and that small bats are also at risk of spider predation (Nyffeler and Knörnschild 2013), the risks of collision, entanglement or death are probably high enough to facilitate the evolution of some avoidance behaviour in small birds. Even for larger bird species, there may be fitness costs; a 142 g Hooded Butcherbird (*Cracticus cassicus*) had to spend several minutes to preen itself after a collision with a spider web (Brooks 2012). To even begin to evaluate the magnitude of this risk, continuous video monitoring of spider webs would be required to establish collision frequencies, or captive birds could be used in experimental settings with spider webs.

Conclusions

This study adds to the previously presented evidence (Brooks 2012) that small birds face a risk of injury or death wherever large spiders build large spider webs. Although we can assume that these events are relatively rare compared to other risks of death (e.g. predation by hawks, snakes, or humans), what remains unknown is the frequency of these events, and thus the evolutionary pressure for the evolution of countermeasures in birds. Future studies should also elucidate if spiders carry a cost (damaged web) or a benefit (additional prey) from these events, and if their web building strategies have accordingly become adapted to account for these presumably rare events.

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Competing interests

The author declares that he has no competing interests.

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