

Consumption of a hornet by a wasp spider, *Argiope bruennichi* (Araneae: Araneidae)

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Abstract

The wasp spider *Argiope bruennichi* is a generalist predator. However, cases that *A. bruennichi* preyed on hornets (*Vespa* spp.) have been rarely known. On the contrary, the hornet is one of the natural enemies of the wasp spider. In the present study, observation of an unusual case regarding the consumption of a yellow-vented hornet *Vespa analis insularis* by *A. bruennichi* with wrapping is reported. The finding could provide a new insight into the predator-prey relationship between orb-web spiders and hornets.

Keywords: Diet, Hymenoptera, Prey-Predation relation, Vespidae, Web-building spider.

Introduction

The wasp spider *Argiope bruennichi* (Scopoli, 1772) belonging to the family Araneidae is a generalist predator that mostly captures insects with smaller than 4 mm (55%) and more medium-sized (4-10 mm) (28.4%) (Pasquet, 1984). *Argiope bruennichi* is also known as a prey for predacious hornets, the largest eusocial wasps in genus *Vespa* (Hymenoptera: Vespidae). *Vespa* spp. have a strongly negative direct effect on the distribution and abundance of the wasp spider (Bruggisser *et al.*, 2012). From these researches, it could be assumed that the cases of the *A. bruennichi* preys on large-sized hornets, one of the natural enemies of *A. bruennichi*, are not usual. However, such an exact case that *A. bruennichi* consumed a yellow-vented hornet *Vespa analis insularis* Dalla Torre, 1894 distributing from the North area to Tanegashima & Yakushima Islands of Japan (Matsuura, 1988) was observed.

Consequent to the study that a cross spider *Argiope amoena* L. Koch, 1878 fed upon the yellow-vented hornet (Noguchi, 2020), I additionally report herein an observational case of the consumption of *V. analis* by *A. bruennichi*.

Material and Methods

The observation of the consumption was carried out in the Bunkyo Campus at Nagasaki University. The photographs were taken using a Canon digital camera IXY 630 (Tokyo, Japan).



Fig. 1. *Argiope bruennichi* consuming *Vespa analis* in the hub of its web.



Fig. 2. Captured individual item of *Vespa analis*.

Results and Discussion

I observed that an adult female of the wasp spider *A. bruennichi* was consuming a dead adult female of the yellow-vented hornet *V. analis* with wrapping in the centre of the web on azalea (*Rhododendron* sp.) plant at 9:20 am, September 16th, 2021 (Fig. 1). The hunting was not observed directly. In that day, it was windy because the typhoon “Chanthu” was approaching.

After that, I collected the prey item from the web and the body size was measured by a ruler; the length of the body of the hornet was 22.7 mm (Fig. 2; left). In order to identify the vespid, the silk was washed by water (Fig. 2; right).

The body size was rather larger than most of the prey items of *A. bruennichi* reported before (Pasquet, 1984; Szymkowiak *et al.*, 2005). The reason why such an unusual incident occurred is supposed that the wind did not help *V. analis* but *A. bruennichi* to succeed the hunting, almost the same condition as that a cross spider *A. amoena* preyed and fed upon a hornet *V. analis* (Noguchi, 2020).

It has confirmed that the predator-prey relationships between large-sized orb-web argiopids and a yellow-vented hornet could be interchangeable with each other depending on the climate condition again. However, it is not enough to say that the frequency of such inversion that *Argiope* spp. prey the predacious hornets has been revealed yet.

Further observations will contribute to the future study to focus on the factors to influence the flexibility and versatility of the roles as prey and predators of the *Argiope* spp. and the hornets.

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