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# Prey-capture techniques and prey preferences of *Zenodorus durvillei*, *Z. metallescens* and *Z. orbiculatus*, tropical ant-eating jumping spiders (Araneae: Salticidae) from Australia

ROBERT R. JACKSON
Department of Zoology
University of Canterbury
Christchurch, New Zealand

DAIQIN LI
Department of Biological Sciences
National University of Singapore
Singapore 119260

**Abstract** Capture techniques and preferences of *Zenodorus durvillei* (Walckenaer), *Z. metallescens* (L. Koch) and *Z. orbiculatus*, Australian salticids that feed on ants in nature, were studied in the laboratory using a wide variety of ants and other insects. Each species adopted three prey-capture modes: ambush, active pursuit in the open, and gleaning from spider webs. Large ants were sometimes stabbed several times before holding on. A variety of methods were used for testing preference. The potential of using this assortment of methods for assessing strength of preferences is discussed. Each species took dolichoderine, formicine, myrmecine, myrmicine and pseudomyrmecine ants in preference to a variety of other insects (aphids, bugs, caterpillars, crickets, flies, lacewings, mantises, mayflies, midges, mosquitoes, moths, plant and leaf hoppers, and termites). Testing with laboratory-reared spiders showed that the development of preference for ants and ant-specific prey-capture behaviour did not depend on prior experience with ants. Tests with dead, motionless lures showed that each species could distinguish between ants and other types of prey independent of the different movement patterns of the prey. Preferences were intact after 7-day and 14-day fasts, but not after 21-day fasts when prey were outside webs. When prey were in webs, preference for ants persisted even after 21-day fasts. Findings are discussed in relation to other studies on specialised salticids and in relation to the structure and function of the salticid eye.

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## INTRODUCTION

Jumping spiders (Salticidae) have large eyes, acute vision and intricate vision-based predatory strategies (Forster 1982; Land 1969a,b; Blest et al. 1990; Jackson & Pollard 1996). Although these spiders prey on a wide variety of arthropods, ants are avoided by most species despite being abundant in the habitats of most salticids. The ant's defences (e.g., powerful mandibles, poison-injecting stings and formic acid: Eisner 1970; Blum 1981; Holldobler & Wilson 1990) evidently present formidable challenges to most salticid species, but there is a sizeable minority group (the "myrmecophagic salticids") that routinely feed on ants (Li & Jackson 1996a). The most thoroughly studied myrmecophagic salticids are from nine genera, *Aelurillus*, *Chalcotropis*, *Chrysilla Anasaitis*, *Habrocestum*, *Natta* (formerly *Cyllobelus*), *Siler*, *Xenocytaea* (formerly *Euophrys*) and *Zenodorus* (formerly *Pystira*) (Edwards et al. 1974; Cutler 1980; Jackson & van Olphen 1991, 1992; Li et al. 1996; Jackson et al. 1998; Li et al. 1999). Although each of these salticids takes ants readily using ant-specific prey-capture tactics, each also uses other tactics to take other prey.

Using three types of testing, experimental studies on preferences have been carried out on each of the myrmecophagic species. Regardless of testing method, each myrmecophagic species prefers ants to other prey when well fed, but how hunger influences preference varies. After a 3-week fast, all

**Table 1** Study sites and field data for three species of myrmecophagic salticids in tropical Australia.

| Species | Locality | Description of habitat | Webs used for nesting sites | Webs in which seen taking ants |
|---|---|---|---|---|
| *Zenodorus durvillei* (Walckenaer) | Queensland: Cairns, Lake Placid, Crystal Cascades | Rainforest | *Badumna insignis* (L. Koch) (Desidae), *Inola subtilis* Davis (Pisauridae), *Psilochorus sphaeroides* (L. Koch) (Pholcidae), *Cyrtophora* sp. (Araneidae) | *Badumna insignis* (Desidae), *Inola subtilis* (Pisauridae) |
| *Zenodorus metallescens* (L. Koch) | Queensland: Dimbulah, Mareeba | Savanna woodland | Not seen | *Badumna candida* (Desidae), *Badumna insignis* (Desidae), *Cyrtophora* sp. (Araneidae) |
| | Northern Territory: Katherine | Savanna woodland | Not seen | *Badumna candida* (Desidae), *Cyrtophora* sp. (Araneidae) |
| *Zenodorus orbiculatus* (Walckenaer) | Queensland: Cairns, Lake Placid Crystal Cascades | Rainforest | *Badumna insignis* (Desidae), *Inola subtilis* (Pisauridae), *Psilochorus sphaeroides* (Pholcidae), *Cyrtophora* sp. (Araneidae) | *Badumna insignis* (Desidae), *Inola subtilis* (Pisauridae), *Cyrtophora* sp. (Araneidae) |
| | Queensland: Dimbulah, Mareeba | Savanna woodland | *Badumna candida* (L. Koch) (Desidae), *Cyrtophora* sp. (Araneidae) | *Badumna candida* (Desidae), *Cyrtophora* sp. (Araneidae) |
| | Northern Territory: Katherine | Savanna woodland | *Badumna candida* (Desidae), *Cyrtophora* sp. (Araneidae) | *Badumna candida* (Desidae), *Cyrtophora* sp. (Araneidae) |

species tested took prey indiscriminately in all three types of tests. After 2-week fasts, whether the spider continued to take ants in preference to other prey depended on which species was being tested (Jackson & van Olphen 1991, 1992; Li et al. 1991, 1996; Jackson et al. 1998).

For *A. canosa* (Walckenaer) and *Z. orbiculatus* (Keyserling), findings after 2-week fasts depended on the type of testing adopted; in alternate-day tests, prey were taken indiscriminately, but ants were taken in preference to other insects in simultaneous-presentation tests. After 2-week fasts, the other species took ants in preference to other prey in all types of tests (Jackson & van Olphen 1991).

Only one species of *Zenodorus*, *Z. orbiculatus*, has been studied before and only with a limited range of prey types (Jackson & van Olphen 1991). Here we show that another two species of *Zenodorus* are myrmecophagic salticids and that preference for ants is stable for all three species despite testing with a wide range of prey types. We also extend the earlier work by documenting an additional tactic adopted by all three of these species of *Zenodorus*, the taking of ants from spider webs. Identifying this additional tactic provided a way to investigate prey preference in greater detail than in previous studies.

## STUDY SITES AND GENERAL METHODS

The study site was rainforest for *Z. durvillei* (Walckenaer), savannah for *Z. metallescens* (L. Koch) and both for *Z. orbiculatus* (Table 1). Each species was observed capturing prey in the field. More detailed observations, using laboratory cultures started from specimens collected at each study site, were made in the laboratory both at the National University of Singapore and at the University of Canterbury. Maintenance procedures, cage design, basic testing methods and terminology, which were as in earlier salticid studies (see Jackson & Hallas 1986; Jackson & van Olphen 1991), included the convention that expressions "usually" or "often", "sometimes" or "occasionally", and "rarely" or "infrequently" indicate frequencies of occurrence of >80%, 20–80% and <20%, respectively.

## USE OF ALIEN WEBS AS NESTING AND PREDATION SITES IN THE FIELD

*Zenodorus durvillei* and *Z. orbiculatus* were frequently found inhabiting webs built by other spiders (Table 1) where they occupied silk nests built on dead leaves or inside the enclosed spaces of rolled-up dead leaves that were hanging as detritus in the webs. This was never observed for *Z. metallescens*. Females, especially those with eggs, were found nesting in webs. Each of the three species was seen taking ants from webs in nature (Table 1), but they were never seen taking any other type of prey from webs.

## USE OF ALIEN WEBS IN THE LABORATORY

In the laboratory, adult females of each species were set up in large glass tanks with occupied webs of the following spiders: *Badumna candida* (L. Koch), *Badumna longinqua* (L. Koch) and *Inola subtilis* Davies (one salticid and one web-building spider per tank) and kept together for 14 days. During this period, individuals of each salticid species were seen in webs. Individuals of *Z. durvillei* and *Z. orbiculatus*, but no individuals of *Z. metallescens*, built and used nests on dead leaves in the webs (Table 2). None of the salticids oviposited during this period. Living prey (house flies and fruit flies *Musca domestica* and *Drosophila melanogaster*) were always present during the 14-day period.

Each salticid species was seen making forays out of the web and returning, traversing the silk by leaping to and from dead leaves. Walking slowly across the silk in webs of *I. subtilis* was also common, although walking on the silk of *B. candida* or *B. longinqua* was rare. Each salticid and each web-building spider was seen feeding on a fly at least once. When seen feeding, the salticid was always outside and the web-building spider was always inside the web.

The webs of *Badumna* spp., but not the webs of *I. subtilis*, are cribellate and highly adhesive. When occasionally a salticid leapt but missed its target and landed on the silk of *Badumna*, it usually had considerable difficulty extracting itself. No salticids kept with *I. subtilis* or *B. longinqua* died during the 14-day period, but two individuals of *Z. durvillei* and one of *Z. orbiculatus* were seen being preyed on by *B. candida*. Each of these three salticids was attacked and killed by the host spider when it leapt toward a leaf, missed its target and landed on the web.

**Table 2** Data from tests in which adult females of salticid were kept for 14 days in a glass tank (600 mm × 380 mm × 290 mm high) with occupied web of web-building spider.

| Salticid | Web-building spider | No. of salticids set up with webs | No. of salticids that were at any time seen in web | No. of salticids that established nests on detritus in web | No. of salticids that died |
|---|---|---|---|---|---|
| *Zenodorus durvillei* | *Badumna candida* | 35 | 15 | 9 | 2 |
| | *Badumna longinqua* | 29 | 8 | 5 | 0 |
| | *Inola subtilis* | 30 | 8 | 3 | 0 |
| *Zenodorus metallescens* | *Badumna candida* | 31 | 3 | 0 | 0 |
| | *Badumna longinqua* | 26 | 1 | 0 | 0 |
| | *Inola subtilis* | 29 | 1 | 0 | 0 |
| *Zenodorus orbiculatus* | *Badumna candida* | 33 | 10 | 4 | 2 |
| | *Badumna longinqua* | 30 | 4 | 2 | 1 |
| | *Inola subtilis* | 32 | 12 | 7 | 0 |

## PREY-CAPTURE BEHAVIOUR

Predatory sequences were similar for the three species. As described in detail elsewhere for *Z. orbiculatus* (Jackson & van Olphen 1991), when away from webs, there were two modes of prey capture, active pursuit and ambush. Active pursuit was common against all types of prey, but ambushing was adopted almost exclusively against ants.

In active pursuit, the salticid fixated on its prey (i.e., oriented so that its large antero-medial eyes were brought to bear on the prey), approached rapidly, then leapt on to the prey from 4–10 body lengths away, with or without first pausing.

Ambushing was most often from a tree trunk, but occasionally from rocks and boulders. The spider stood facing downward and, by suddenly lunging downward or making a short leap downward (usually no more than three body lengths), took ants that walked by. The spider kept a dragline fastened to the tree during ambushing attacks and, at the end of a lunge or leap, the spider returned to the position from which it began by stepping backward. Spiders not yet prepared for ambushing sometimes reacted to ants by preparing for an ambushing attack, foregoing the opportunity for active pursuit then, upon seeing an ant, the spider moved closer, positioned itself facing down, and remained stationary until an ant came to within striking distance.

After attacking, spiders tended to hold on to smaller ants and other prey regardless of size. However, larger ants (i.e., ants comparable to the spider's size or larger) were often stabbed (i.e., the

**Table 3** Ant workers (Hymenoptera: Formicidae) used in laboratory as living prey and motionless lures when testing *Zenodorus* spp. for prey preferences.

| Subfamily | Tribe | Species | Body length (mm) | Origin |
|---|---|---|---|---|
| Dolichoderinae | Leptomyrmecini | *Leptomyrmex erythrocephalus* (Fabricius) | 9–11 | Queensland |
| | Tapinomini | *Iridomyrmex darwinanus* (Forel) | 2–3 | New Zealand |
| | | *Tapinoma* sp. | 2–5 | Queensland |
| Formicinae | Camponotini | *Camponotus gigas* (Latreille) | 6–8 | Singapore |
| | | *Camponotus* sp. | 3–6 | Queensland, Northern Territory |
| | | *Polyrachis bicolor* Smith | 5–7 | Singapore |
| | | *Polyrachis* sp. | 4–7 | Queensland |
| | Melophorini | *Notoncus ectatommoides* (Forel) | 3–4 | Queensland |
| | | *Prolasius* sp. | 5–8 | Queensland |
| | Oecophyllini | *Oecophylla smaragdina* (Fabricius) | 7–10 | Queensland, Northern Territory, Singapore |
| | Plagiolepidini | *Acropyga* sp. | 3–6 | Singapore |
| Myrmeciinae | | *Myrmecia nigriceps* Mayr | 6–8 | Queensland |
| Myrmicinae | | *Adlerzia* sp. | 4–5 | Northern Territory |
| | | *Crematogaster borneensis* André | 2–3 | Singapore |
| | | *Crematogaster* sp. | 2–4 | Queensland |
| | | *Epopostruma frosti* (Brown) | 6–8 | Queensland |
| | | *Monomorium antarcticum* (White) | 3–4 | New Zealand |
| | | *Monomorium* sp. | 3–8 | Queensland, Northern Territory |
| | | *Podomyrma* sp. | 6–7 | Northern Territory |
| | | *Tetramorium pacificum* Mayr | 4–5 | Queensland |
| Pseudomyrmecinae | | *Tetraponera puntulata* Smith | 4–6 | Northern Territory |
| | | *Tetraponera* sp. | 4–6 | Singapore |

**Table 4** Insects other than ants used as living prey and motionless lures when testing *Zenodorus* spp. for prey preferences. BL = Body length.

| Order | Family | Species | Description | BL (mm) | Origin |
|---|---|---|---|---|---|
| Blattodea | Blattellidae | *Blattella* sp. | Cockroach nymph and adult | 4–8 | Singapore |
| Diptera | Calliphoridae | *Calliphora* sp. | Blow fly | 7–8 | Singapore |
| | | *Lucillia* sp. | Blow fly | 7 | Queensland |
| | Chironomidae | Unknown | Midge | 2 | Queensland |
| | Culicidae | *Culex* sp. | Mosquito | 4–7 | Queensland, Northern Territory |
| | Dolichopodidae | Unknown | Dolichopodid fly | 4–6 | Queensland, Northern Territory, Singapore |
| | Drosophilidae | *Drosophila melanogaster* (Meigen) | Fruit fly | 2–3 | Laboratory culture, Queensland, Singapore |
| | Muscidae | *Musca domestica* (L) | House fly | 6–8 | Queensland, Laboratory culture, Singapore |
| | Sciaridae | Sciara sp. | Sciarid fly | 2–3 | Singapore |
| | Tipulidae | *Gynoplistia* sp. | Crane fly | 7–10 | Queensland |
| Ephemeroptera | Baetidae | *Baetis* sp. | Mayfly | 5–6 | Queensland, Northern Territory |
| Hemiptera | Aleyrodidae | *Aleurodicus dispersus* Russell | Whitefly nymph and adult | 2 | Singapore |
| | Aphidae | *Brevicoryne brassicae* (L.) | Aphid nymph and adult | 2 | New Zealand |
| | | Macrosyphum euphorbiae | Aphid nymph and adult | 2 | New Zealand |
| | Cicadellidae | *Nephotettix nigropictus* (Stål) | Green leaf hopper nymph and adult | 2–5 | Laboratory culture |
| | | Unknown | Leaf hopper nymph and adult | 2–5 | Queensland, Northern Territory |
| | Cixiidae | *Oliarus* sp. | Cixiid nymph and adult | 3–4 | Queensland, Northern Territory |
| | Delphacidae | *Nilaparvata lugens* (Stål) | Brown plant hopper nymph and adult | 2–3 | Laboratory culture |
| | Flatidae | *Siphanta* sp. | Flatid | 5–10 | Queensland, Northern Territory, Singapore |
| | Miridae | Unknown | Mirid bug nymph and adult | 2–3 | Queensland, New Zealand |
| | Ricaniidae | *Ricania* sp. | Ricaniid adult | 10 | Singapore |
| Isoptera | Termitidae | *Nasutitermes* sp. | Termite worker | 3–5 | Queensland, Northern Territory |
| | | Macrotermes gilvus | Termite worker | 4 | Singapore |
| Lepidoptera | Geometridae | Unknown | Caterpillar | 6–15 | Queensland |
| | Gracilariidae | *Calioptilia* sp. | Caterpillar | 6–10 | Singapore |
| | Noctuidae | *Autoba* sp. | Moth | 10–15 | Singapore, Queensland, |
| | | Unknown | Moth | 8–9 | Northern Territory |
| | Pyralidae | *Eristena* sp. | Moth | 4–7 | Singapore |
| | Tortricidae | *Capua* sp. | Caterpillar | 9–13 | Singapore |
| Mantodea | Mantidae | *Orthodera* sp. | Mantis nymph | 5–10 | Queensland, Northern Territory |
| Neuroptera | Hemrobiidae | *Micromus tasmaniae* (Walker) | Lacewing adult | 4 | New Zealand |
| Orthoptera | Gryllidae | *Metioche maoricum* (Walker) | Cricket nymph | 4–6 | New Zealand |
| | | Unknown | Cricket nymph | 5–6 | Queensland |
| Psocoptera | Ectopscocidae | *Ectopsocus californicus* | Psocid nymph and adult | 3 | New Zealand, Singapore |
| | | Species unknown | Psocid nymph and adult | 3 | Queensland |

**Table 5** Results from alternate-day tests using live prey. *Zenodorus* spp. chose ants more often than other insects.

| Salticid | Hunger state | Other insect | Ant | Chose ant only | Chose other insect only | Chose both | Chose neither | McNemar test |
|---|---|---|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Lucilia* sp. | *Polyrachis* sp. | 14 | 1 | 9 | 3 | $P < 0.001$ |
| | | Diptera: unknown dolichopodid | *Camponotus gigas* | 20 | 2 | 10 | 4 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 21 | 1 | 9 | 5 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Monomorium* sp. | 23 | 2 | 17 | 5 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Tetraponera* sp. | 21 | 2 | 14 | 4 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | Tetramorium pacificum | 15 | 3 | 3 | 2 | $P < 0.01$ |
| | | Diptera: unknown chironomid | *Crematogaster* sp. | 15 | 1 | 3 | 0 | $P < 0.001$ |
| | | Ephemeroptera: *Baetis* sp. | *Tapinoma* sp. | 12 | 2 | 5 | 4 | $P < 0.01$ |
| | | Hemiptera: *Brevicoryne brassicae* | *Iridomyrmex darwinanus* | 21 | 5 | 6 | 1 | $P < 0.001$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 14 | 0 | 8 | 4 | $P < 0.001$ |
| | | Hemiptera: unknown cicadellid | *Notoncus ectatommoides* | 9 | 0 | 6 | 3 | $P < 0.01$ |
| | | Hemiptera: *Aleurodicus dispersus* | *Camponotus gigas* | 20 | 2 | 7 | 6 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 26 | 5 | 10 | 4 | $P < 0.001$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 21 | 3 | 5 | 5 | $P < 0.001$ |
| | | Neuroptera: *Micromus tasmaniae* | *Monomorium antarcticum* | 20 | 7 | 13 | 2 | $P < 0.05$ |
| | | Orthoptera: unknown | *Polyrachis* sp. | 14 | 1 | 9 | 10 | $P < 0.001$ |
| | | Psocoptera: *Ectopsocus californicus* | *Iridomyrmex darwinanus* | 18 | 5 | 11 | 4 | $P < 0.01$ |
| | | Psocoptera: Unknown | *Crematogaster* sp. | 20 | 2 | 8 | 4 | $P < 0.001$ |
| | Well fed[1] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Iridomyrmex darwinanus* | 22 | 9 | 15 | 2 | $P < 0.05$ |
| | Starved[2] | Diptera: unknown dolichopodid | *Camponotus gigas* | 21 | 4 | 14 | 3 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 23 | 3 | 17 | 5 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Monomorium* sp. | 24 | 4 | 13 | 3 | $P < 0.001$ |
| | | Hemiptera: *Brevicoryne brassicae* | *Iridomyrmex darwinanus* | 13 | 2 | 10 | 0 | $P < 01$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 14 | 2 | 10 | 4 | $P < 0.01$ |
| | | Psocoptera, *Ectopsocus californicus* | *Iridomyrmex darwinanus* | 21 | 6 | 19 | 7 | $P < 0.01$ |
| | Starved[2] and limited diet[4] | Psocoptera, *Ectopsocus californicus* | *Iridomyrmex darwinanus* | 10 | 10 | 26 | 1 | NS |
| | Extra-starved[3] | Diptera: *Lucilia* sp. | *Polyrachis* sp. | 13 | 8 | 21 | 3 | NS |
| | | Hemiptera: *Brevicoryne brassicae* | *Iridomyrmex darwinanus* | 5 | 3 | 19 | 0 | NS |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 14 | 8 | 19 | 4 | NS |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Zenodorus metallescens* | Well fed[1] | Blattodea: *Blattella* sp. | *Polyrachis bicolor* | 14 | 0 | 8 | 5 | $P < 0.001$ |
| | | Diptera: *Calliphora* sp. | *Camponotus gigas* | 24 | 2 | 9 | 6 | $P < 0.001$ |
| | | Diptera: *Lucilia* sp. | *Myrmecia nigriceps* | 21 | 1 | 6 | 10 | $P < 0.001$ |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 23 | 4 | 6 | 9 | $P < 0.001$ |
| | | Diptera: *Gynoplistia* sp. | *Leptomyrmex erythrocephalus* | 22 | 9 | 2 | 5 | $P < 0.05$ |
| | | Diptera: *Drosophila melanogaster* | *Camponotus gigas* | 34 | 2 | 8 | 7 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 29 | 3 | 6 | 6 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Polyrachis* spp. | 27 | 2 | 16 | 9 | $P < 0.001$ |
| | | Diptera: *Sciara* sp. | *Camponotus gigas* | 16 | 1 | 6 | 6 | $P < 0.001$ |
| | | Hemiptera: *Brevicoryne brassicae* | *Iridomyrmex darwinanus* | 14 | 2 | 8 | 1 | $P < 0.01$ |
| | | Hemiptera: *Siphanta* sp. | *Adlerzia* sp. | 15 | 2 | 8 | 8 | $P < 0.01$ |
| | | Hemiptera: *Siphanta* sp. | *Tetraponera* sp. | 12 | 0 | 6 | 5 | $P < 0.001$ |
| | | Hemiptera: unknown mirid | *Tapinoma* sp. | 20 | 2 | 8 | 9 | $P < 0.001$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 21 | 3 | 9 | 9 | $P < 0.001$ |
| | | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 9 | 0 | 5 | 4 | $P < 0.01$ |
| | | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 35 | 4 | 13 | 10 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 29 | 5 | 9 | 8 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Tapinoma* sp. | 21 | 4 | 7 | 7 | $P < 0.001$ |
| | | Lepidoptera: *Calioptilia* sp. larva | *Oecophylla smaragdina* | 10 | 0 | 4 | 8 | $P < 0.01$ |
| | | Lepidoptera: *Capua* sp. larva | *Camponotus gigas* | 12 | 0 | 3 | 9 | $P < 0.001$ |
| | | Lepidoptera: unknown geometrid larva | *Prolasius* sp. | 13 | 1 | 5 | 6 | $P < 0.01$ |
| | | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 13 | 2 | 7 | 6 | $P < 0.01$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 18 | 3 | 5 | 6 | $P < 0.01$ |
| | | Mantodea: *Orthodera* sp. | *Oecophylla smaragdina* | 17 | 3 | 10 | 2 | $P < 0.01$ |
| | | Orthoptera: unknown | *Oecophylla smaragdina* | 14 | 1 | 4 | 7 | $P < 0.001$ |
| | | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 21 | 4 | 4 | 4 | $P < 0.001$ |
| | | Psocoptera: unknown | *Crematogaster* sp. | 18 | 3 | 3 | 5 | $P < 0.001$ |
| | Well fed[1] limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 15 | 3 | 6 | 4 | $P < 0.01$ |
| | Starved[2] | Diptera: *Calliphora* sp. | *Camponotus gigas* | 21 | 5 | 10 | 7 | $P < 0.01$ |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 21 | 5 | 5 | 9 | $P < 0.01$ |
| | | Diptera: *Drosophila melanogaster* | *Camponotus gigas* | 15 | 3 | 13 | 5 | $P < 0.01$ |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 21 | 7 | 8 | 4 | $P < 0.01$ |
| | | Diptera: *Culex* sp. | *Polyrachis* sp. | 19 | 4 | 12 | 6 | $P < 0.01$ |
| | | Hemiptera: *Brevicoryne brassicae* | *Iridomyrmex darwinanus* | 11 | 1 | 17 | 1 | $P < 0.01$ |
| | | Hemiptera: *Siphanta* sp. | *Tetraponera* sp. | 7 | 1 | 7 | 2 | $P < 0.05$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 12 | 2 | 8 | 4 | $P < 0.01$ |
| | | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 11 | 2 | 6 | 3 | $P < 0.05$ |
| | | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 23 | 3 | 12 | 9 | $P < 0.001$ |

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**Table 5** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose ant only | Chose other insect only | Chose both | Chose neither | McNemar test |
|---|---|---|---|---|---|---|---|---|
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 13 | 2 | 11 | 5 | $P < 0.01$ |
| | | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 18 | 3 | 9 | 6 | $P < 0.01$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 17 | 2 | 5 | 4 | $P < 0.001$ |
| | | Orthoptera: unknown | *Oecophylla smaragdina* | 15 | 3 | 9 | 6 | $P < 0.01$ |
| | | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 17 | 4 | 6 | 3 | $P < 0.01$ |
| | Starved[2] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 11 | 13 | 20 | 0 | NS |
| | Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Camponotus gigas* | 15 | 9 | 20 | 5 | NS |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 18 | 11 | 11 | 4 | NS |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 28 | 17 | 20 | 6 | NS |
| | | Hemiptera: *Brevicoryne brassicae* | *Iridomyrmex darwinanus* | 4 | 3 | 22 | 0 | NS |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 10 | 3 | 10 | 5 | NS |
| | | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 9 | 4 | 10 | 3 | NS |
| | | Isoptera: *Nasutitermes* sp. | *Tapinoma* sp. | 14 | 7 | 13 | 4 | NS |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 14 | 8 | 15 | 5 | NS |
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Lucilia* sp. | *Camponotus* sp. | 10 | 1 | 2 | 2 | $P < 0.01$ |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 15 | 4 | 3 | 5 | $P < 0.05$ |
| | | Diptera: unknown dolichopodid | *Camponotus gigas* | 21 | 4 | 9 | 5 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 23 | 4 | 4 | 7 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster* sp. | 20 | 2 | 4 | 5 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 9 | 1 | 4 | 3 | $P < 0.05$ |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 12 | 2 | 8 | 4 | $P < 0.01$ |
| | | Diptera: *Aedes* sp. | *Camponotus* sp. | 14 | 2 | 9 | 4 | $P < 0.0$ |
| | | Diptera: *Sciara* sp. | *Crematogaster borneensis* | 8 | 0 | 3 | 5 | $P < 0.01$ |
| | | Hemiptera: unknown cicadellid | *Monomorium* sp. | 12 | 1 | 6 | 1 | $P < 0.01$ |
| | | Hemiptera: *Siphanta* sp. | *Polyrachis bicolor* | 6 | 0 | 5 | 3 | $P < 0.05$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 13 | 0 | 3 | 3 | $P < 0.001$ |
| | | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 7 | 0 | 1 | 6 | $P < 0.01$ |
| | | Hemiptera: *Aleurodicus dispersus* | *Acropyga* sp. | 11 | 1 | 2 | 5 | $P < 0.01$ |
| | | Isoptera: *Macrotermes gilvus* | *Oecophylla smaragdina* | 24 | 5 | 9 | 7 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 16 | 2 | 6 | 5 | $P < 0.001$ |
| | | Lepidoptera: *Calioptilia* sp. larva | *Camponotus gigas* | 11 | 0 | 0 | 6 | $P < 0.001$ |
| | | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 8 | 0 | 1 | 6 | $P < 0.01$ |
| | | Psocoptera: *Ectopsocus californicus* | *Crematogaster borneensis* | 9 | 0 | 3 | 4 | $P < 0.01$ |
| | | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 18 | 3 | 5 | 10 | $P < 0.01$ |
| | Well fed[1] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 13 | 0 | 10 | 9 | $P < 0.001$ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Starved[2] | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 12 | 2 | 12 | 4 | $P < 0.01$ |
| | Diptera: *Musca domestica* | *Epopostruma frosti* | 13 | 2 | 10 | 5 | $P < 0.01$ |
| | Diptera: unknown dolichopodid | *Camponotus gigas* | 9 | 1 | 14 | 2 | $P < 0.05$ |
| | Hemiptera: Hemiptera: unknown mirid | *Crematogaster* sp. | 15 | 1 | 8 | 4 | $P < 0.001$ |
| | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 11 | 1 | 10 | 5 | $P < 0.01$ |
| | Hemiptera: unknown cicadellid | *Monomorium* sp. | 16 | 3 | 14 | 0 | $P < 0.01$ |
| | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 12 | 1 | 13 | 4 | $P < 0.01$ |
| Starved[2] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 13 | 11 | 27 | 0 | NS |
| Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 5 | 2 | 16 | 1 | NS |
| | Diptera: *Musca domestica* | *Epopostruma frosti* | 6 | 1 | 17 | 2 | NS |
| | Hemiptera: unknown cicadellid | *Monomorium* sp. | 6 | 4 | 20 | 0 | NS |
| Extra-starved[3] and limited diet | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 8 | 8 | 28 | 1 | NS |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing. [4] Reared on diet of only *Drosophila melanogaster* and *Musca domestica*. (All others reared on varied diet.)

spider only briefly penetrated the prey's body with its fangs and did not hold on). Ants that had been stabbed usually ran at least 10–20 mm away. The salticid sometimes followed at a distance of 10–50 mm and made successive stabbing attacks that noticeably weakened the ant. Eventually the spider attacked and held on.

Upon seeing an ant in a web, the salticid approached, usually moving more slowly than during pursuit of prey outside webs and often making frequent pauses of variable duration prior to reaching the web edge. From the edge of the web, the salticid tended to move about, repeatedly orienting toward the ant. If the ant was within a few millimetres of the web edge, the salticid usually leaned out and attacked by lunging (i.e., by rapidly moving its body forward, contacting the ant forcefully and either grabbing hold of it or else stabbing then releasing it). Although salticids did on rare occasions leap into webs and onto ants that were several body lengths away, they usually walked through the web until close enough to lean out and make a lunging attack. When there was detritus in the web, the salticid tended to step (or leap) about primarily on the detritus rather than the web silk. When stepping across on web silk, the salticid usually moved especially slowly, reaching out with forelegs to contact the silk before each step. If the silk was especially adhesive, the salticid backed away. When a detritus pathway was unavailable in a sticky web, salticids usually left the web without attacking the ant.

## METHODS USED FOR PREFERENCE TESTING

Each salticid tested was an adult female or a juvenile that was at least half adult size. Some salticids came from the field. Others came from laboratory rearing in Christchurch from eggs oviposited by spiders collected in the field. However, as there was no statistical evidence that spiders field-collected or laboratory-reared influenced outcomes of experiments, data were pooled.

A wide variety of ants and other insects were used in prey-preference testing (Tables 3 and 4). Laboratory-reared spiders were maintained on a variety of insect prey, but had no prior experience with the insects used in preference tests, or with ants of any species, prior to laboratory testing.

**Table 6** Results from simultaneous-presentation tests using live prey. *Zenodorus* spp. chose ants more often than other insects.

| Salticid | Hunger state | Other insect | Ant | Ate ant | Ate other insect | Ate neither | Test of Goodness of Fit |
|---|---|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 18 | 1 | 6 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Monomorium* sp. | 26 | 3 | 10 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Tetraponera* sp. | 20 | 4 | 8 | $P < 0.01$ |
| | | Diptera: unknown dolichopodid | *Camponotus gigas* | 18 | 1 | 7 | $P < 0.001$ |
| | | Hemiptera: *Macrosyphum euphorbiae* | *Iridomyrmex darwinanus* | 17 | 4 | 10 | $P < 0.01$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 16 | 2 | 6 | $P < 0.001$ |
| | | Hemiptera: *Aleurodicus dispersus* | *Camponotus gigas* | 15 | 2 | 8 | $P < 0.01$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 23 | 4 | 12 | $P < 0.001$ |
| | | Lepidoptera: unknown geometrid larva | *Polyrachis* sp. | 14 | 1 | 8 | $P < 0.001$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 17 | 3 | 6 | $P < 0.01$ |
| | | Orthoptera: unknown | *Polyrachis* sp. | 12 | 0 | 7 | $P < 0.001$ |
| | | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 22 | 4 | 8 | $P < 0.001$ |
| | Well fed[1] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 16 | 2 | 10 | $P < 0.01$ |
| | Starved[2] | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 18 | 3 | 3 | $P < 0.01$ |
| | | Diptera: *Musca domestica* | *Monomorium* sp. | 19 | 3 | 3 | $P < 0.001$ |
| | | Diptera: unknown dolichopodid | *Camponotus gigas* | 14 | 3 | 3 | $P < 0.01$ |
| | | Hemiptera: *Macrosyphum euphorbiae* | *Iridomyrmex darwinanus* | 19 | 7 | 12 | $P < 0.05$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 11 | 1 | 2 | $P < 0.01$ |
| | | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 22 | 5 | 3 | $P < 0.01$ |
| | Starved[2] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 15 | 2 | 1 | $P < 0.01$ |
| | Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 18 | 11 | 4 | NS |
| | | Hemiptera: *Macrosyphum euphorbiae* | *Iridomyrmex darwinanus* | 7 | 5 | 23 | NS |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 14 | 9 | 4 | NS |
| | Extra-starved[3] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 11 | 11 | 7 | NS |
| *Zenodorus metallescens* | Well fed[1] | Blattodea: *Blattella* sp. | *Polyrachis bicolor* | 11 | 0 | 5 | $P < 0.001$ |
| | | Diptera: *Calliphora* sp. | *Camponotus gigas* | 25 | 3 | 7 | $P < 0.001$ |
| | | Diptera: *Lucilia* sp. | *Myrmecia nigriceps* | 15 | 3 | 7 | $P < 0.01$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster gigas* | 31 | 3 | 8 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 24 | 4 | 7 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Polyrachis* sp. | 21 | 4 | 9 | $P < 0.001$ |
| | | Diptera: *Sciara* sp. | *Crematogaster gigas* | 11 | 0 | 9 | $P < 0.001$ |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 26 | 4 | 7 | $P < 0.001$ |
| | | Hemiptera: *Siphanta* sp. | *Adlerzia* sp. | 11 | 1 | 6 | $P < 0.01$ |
| | | Hemiptera: *Siphanta* sp. | *Podomyrma* sp. | 16 | 1 | 7 | $P < 0.001$ |
| | | Hemiptera: *Siphanta* sp. | *Tetraponera* sp. | 10 | 0 | 5 | $P < 0.001$ |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Hemiptera: unknown mirid | *Tapinoma* sp. | 23 | 3 | 10 | $P < 0.001$ |
| | Hemiptera: unknown mirid | *Crematogaster* sp. | 18 | 2 | 9 | $P < 0.001$ |
| | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 8 | 0 | 5 | $P < 0.01$ |
| | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 27 | 4 | 10 | $P < 0.01$ |
| | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 21 | 4 | 9 | $P < 0.001$ |
| | Isoptera: *Nasutitermes* sp. | *Tapinoma* sp. | 22 | 5 | 9 | $P < 0.001$ |
| | Lepidoptera: *Calioptilia* sp. larva | *Oecophylla smaragdina* | 14 | 1 | 6 | $P < 0.001$ |
| | Lepidoptera: *Capua* sp. | *Camponotus gigas* | 15 | 2 | 4 | $P < 0.01$ |
| | Lepidoptera: unknown geometrid larva | *Camponotus* sp. | 13 | 1 | 5 | $P < 0.01$ |
| | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 15 | 2 | 6 | $P < 0.01$ |
| | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 19 | 3 | 6 | $P < 0.001$ |
| | Orthoptera: unknown | *Oecophylla smaragdina* | 16 | 1 | 6 | $P < 0.001$ |
| | Psocoptera: unknown | *Crematogaster* sp. | 13 | 1 | 6 | $P < 0.01$ |
| | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 16 | 2 | 9 | $P < 0.01$ |
| Well fed[1] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 19 | 2 | 11 | $P < 0.0001$ |
| Starved[2] | Diptera: *Calliphora* sp. | *Camponotus gigas* | 12 | 2 | 3 | $P < 0.01$ |
| | Diptera: *Drosophila melanogaster* | *Crematogaster gigas* | 21 | 5 | 6 | $P < 0.01$ |
| | Diptera: *Musca domestica* | *Polyrachis* sp. | 24 | 4 | 5 | $P < 0.001$ |
| | Diptera: *Culex* sp. | *Polyrachis* sp. | 21 | 6 | 7 | $P < 0.01$ |
| | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 17 | 4 | 3 | $P < 0.01$ |
| | Hemiptera: *Macrosiphum euphorbiae* | *Iridomyrmex darwinanus* | 13 | 1 | 4 | $P < 0.01$ |
| | Hemiptera: *Siphanta* sp. | *Tetraponera* sp. | 8 | 1 | 3 | $P < 0.05$ |
| | Hemiptera: unknown mirid | *Crematogaster* sp. | 14 | 3 | 3 | $P < 0.01$ |
| | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 13 | 3 | 3 | $P < 0.05$ |
| | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 24 | 6 | 6 | $P < 0.01$ |
| | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 15 | 4 | 5 | $P < 0.05$ |
| | Lepidoptera: *Calioptilia* sp. adult | *Oecophylla smaragdina* | 10 | 2 | 4 | $P < 0.05$ |
| | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 17 | 3 | 3 | $P < 0.01$ |
| | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 16 | 2 | 4 | $P < 0.001$ |
| | Orthoptera: unknown | *Oecophylla smaragdina* | 11 | 2 | 5 | $P < 0.05$ |
| | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 20 | 2 | 6 | $P < 0.001$ |
| Starved[2] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 22 | 4 | 3 | $P < 0.001$ |
| Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Crematogaster gigas* | 19 | 13 | 5 | NS |
| | Diptera: *Musca domestica* | *Polyrachis* sp. | 20 | 15 | 7 | NS |
| | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 12 | 6 | 5 | NS |
| | Hemiptera: *Macrosiphum euphorbiae* | *Iridomyrmex darwinanus* | 8 | 5 | 26 | NS |
| | Hemiptera: unknown mirid | *Crematogaster* sp. | 9 | 4 | 4 | NS |
| | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 12 | 5 | 2 | NS |
| | Isoptera: *Nasutitermes* sp. | *Tapinoma* sp. | 14 | 8 | 5 | NS |
| | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 15 | 9 | 5 | NS |
| Extra-starved[3] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 10 | 12 | 4 | NS |

*continued over page*

**Table 6** *Continued*

| Salticid | Hunger state | Other insect | Ant | Ate ant | Ate other insect | Ate neither | Test of Goodness of Fit |
|---|---|---|---|---|---|---|---|
| *Zenodarus orbiculatus* | Well fed[1] | Diptera: unknown dolichopodid | *Camponatus gigas* | 25 | 3 | 8 | NS |
| | | Diptera: unknown dolichopodid | *Oecophylla smaragdina* | 12 | 0 | 9 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 34 | 6 | 8 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster* sp. | 24 | 4 | 5 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 11 | 0 | 5 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 24 | 3 | 6 | $P < 0.001$ |
| | | Hemiptera: *Macrosiphum euphorbiae* | *Monomorium antarcticum* | 15 | 2 | 10 | $P < 0.01$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 12 | 2 | 4 | $P < 0.01$ |
| | | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 8 | 0 | 4 | $P < 0.01$ |
| | | Hemiptera: *Aleurodicus dispersus* | *Acropyga* sp. | 13 | 0 | 4 | $P < 0.001$ |
| | | Isoptera: *Macrotermes gilvus* | *Oecophylla smaragdina* | 23 | 4 | 5 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 25 | 4 | 6 | $P < 0.001$ |
| | | Lepidoptera: *Calioptilia* sp. larva | *Camponotus gigas* | 13 | 2 | 4 | $P < 0.01$ |
| | | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 12 | 1 | 3 | $P < 0.01$ |
| | | Psocoptera: *Ectopsocus californicus* | *Crematogaster borneensis* | 11 | 0 | 4 | $P < 0.001$ |
| | Well fed[1] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 17 | 3 | 3 | $P < 0.01$ |
| | Starved[2] | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 23 | 5 | 4 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 25 | 5 | 5 | $P < 0.001$ |
| | | Diptera: unknown dolichopodid | *Camponotus gigas* | 13 | 4 | 3 | $P < 0.05$ |
| | | Hemiptera: *Macrosiphum euphorbiae* | *Monomorium antarcticum* | 11 | 2 | 12 | $P < 0.05$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 12 | 2 | 6 | $P < 0.01$ |
| | | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 15 | 3 | 5 | $P < 0.01$ |
| | Starved[2] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 9 | 0 | 31 | $P < 0.01$ |
| | Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 16 | 10 | 9 | NS |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 19 | 15 | 4 | NS |
| | | Hemiptera: *Macrosiphum euphorbiae* | *Monomorium antarcticum* | 3 | 5 | 29 | NS |
| | Extra-starved[3] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 4 | 4 | 25 | NS |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.
[4] Reared on diet of only *Drosophila melanogaster* and *Musca domestica*. (All others reared on varied diet.)

In the earlier study on the preference behaviour of *Z. orbiculatus*, maintenance prey were almost exclusively *Drosophila melanogaster* (Meigen) and *Musca domestica* L. from laboratory culture. Using a subset of each species of *Zenodorus*, we replicated this feeding regime and used spiders from this subset in selected preference tests. Findings from using the individuals subjected to this special feeding regime (called "limited diet") differed from findings on other individuals, and these data are presented separately.

Three types of tests (alternate-day, simultaneous-presentation and alternative-prey) were undertaken using living prey in the open. Alternate-day and simultaneous-presentation tests followed a paired design (each individual salticid was subjected to two trials per test). Alternate-day and simultaneous-presentation tests were also undertaken using lures in the open and lures in webs.

The goal being to determine whether a salticid took ants in preference to other prey, an ant was always paired with another insect in tests. There were three feeding regimes, "well-fed", "starved" and "extra-starved". Salticids were kept without prey for 7, 14 and 21 days, respectively, prior to testing. For all pairings, each salticid species was tested when well fed. For a portion of the pairings, each species of salticid was also tested when starved and extra-starved.

No individual salticid was used in more than one test of any one type. In each trial, the ant and the other insect were of approximately matching size, and 0.5–1.5 times the size of the salticid.

### Testing for prey preference using living prey

As described elsewhere (Jackson & van Olphen 1991; Li et al. 1996a, 1999), each test was carried out using either a petri dish or a specially made prey-preference testing box (hereafter called simply "box"). A trial began when the salticid entered the petri dish or a cell in the box. It ended when either the salticid captured a prey or 15 min had elapsed. However, if the salticid was stalking a prey when the 15-min period had elapsed, observations continued until the predatory sequence was over.

#### *Alternate-day tests*

Each salticid was used in a pair of trials (one type of prey on one day and the other type on the following day). For half of the salticids of each species, the first trial was with an ant (Group A); for the other half, the first trial was with the other type of insect (Group B). Salticids were assigned to Groups A and B at random.

#### *Simultaneous-presentation tests*

Two prey (one ant and one other insect) were put inside a petri dish or box cell. To begin testing, a salticid was allowed to enter. The trial ended when the salticid took one of the two prey (i.e., the salticid was not allowed to take them both). Occasionally, the ant killed the other insect before the salticid made a predatory attack. When this happened, testing was terminated.

#### *Alternative-prey tests*

In one trial, a salticid had access to an ant while feeding on another type of insect. In another trial, on the preceding or succeeding day, the same salticid had access to another type of insect while feeding on an ant. For each combination of prey and salticid species, half of the salticids were feeding on an ant on the first day and half on the other insect on the first day. Salticids were assigned to the two groups at random.

### Data analysis

In alternate-day testing, only those test-pairs in which the salticid took one prey type but not the other provided evidence of preference. In simultaneous-presentation tests, a series of tests in which one type of prey was consistently taken more often than the other provided evidence of preference. In alternative-prey tests, only those test-pairs in which the salticid dropped one prey to take the other, but not vice versa, provided evidence of preference.

The prey attacked was recorded as the salticid's choice, but analysing data separately for eating prey, instead of simply attacking it, did not alter the *P*-values given in Tables 4–6. This was because a salticid only rarely failed to eat a prey after attacking it and, in simultaneous-presentation tests, spiders only rarely failed to eat the prey attacked first.

### Testing for prey preference using motionless lures outside webs

Alternate-day and simultaneous-presentation testing was done with lures using apparatus and procedures detailed elsewhere (Li et al. 1996). For alternate-day testing, a single-arm ("linear") wooden platform was used as a choice ramp, whereas the choice ramp for simultaneous-presentation testing was a Y-shaped 2-arm wooden platform. The arms were 40 mm wide and angled up at 20°. The single arm

**Table 7** Results from alternative-prey tests using live prey. *Zenodorus* spp. less often released an ant to attack another insect than vice versa.

| Salticid | Hunger state | Other insect | Ant | Drops other insect to attack ant | Drops ant to attack other insect | Drops each to attack other | Drops neither | McNemar test |
|---|---|---|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 16 | 0 | 0 | 15 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Monomorium* sp. | 15 | 1 | 0 | 17 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Tetraponera* sp. | 12 | 0 | 0 | 16 | $P < 0.001$ |
| | | Diptera: unknown dolichopodid | *Camponotus gigas* | 10 | 0 | 0 | 16 | $P < 0.01$ |
| | | Hemiptera: *Macrosyphum euphorbiae* | *Iridomyrmex darwinanus* | 9 | 0 | 0 | 18 | $P < 0.01$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 7 | 0 | 0 | 16 | $P < 0.01$ |
| | | Hemiptera: *Aleurodicus dispersus* | *Camponotus gigas* | 9 | 0 | 1 | 7 | $P < 0.01$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 15 | 2 | 0 | 18 | $P < 0.01$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 8 | 0 | 0 | 16 | $P < 001$ |
| | | Orthoptera: unknown | *Polyrachis* sp. | 6 | 0 | 0 | 16 | $P < 0.01$ |
| | Well fed[1] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 10 | 0 | 0 | 19 | $P < 0.01$ |
| | Starved[2] | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 16 | 1 | 0 | 16 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Monomorium* sp. | 15 | 1 | 0 | 18 | $P < 0.001$ |
| | | Diptera: unknown dolichopodid | *Camponotus gigas* | 19 | 0 | 0 | 14 | $P < 0.001$ |
| | | Hemiptera: *Macrosyphum euphorbiae* | *Iridomyrmex darwinanus* | 9 | 1 | 0 | 20 | $P < 0.01$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 7 | 0 | 0 | 8 | $P < 0.05$ |
| | Starved[2] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 1 | 0 | 29 | | NS |
| | Extra-starved[3] | Diptera: *Lucilia* sp. | *Polyrachis* sp. | 3 | 2 | 0 | 13 | NS |
| | | Hemiptera: *Macrosyphum euphorbiae* | *Iridomyrmex darwinanus* | 2 | 0 | 0 | 24 | NS |
| | | Lepidoptera: *Eristena* sp. | *Tetraponera* sp. | 3 | 1 | 1 | 12 | NS |
| | Extra-starved[3] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 0 | 0 | 0 | 30 | NS |
| *Zonodorus metallescens* | Well fed[1] | Blattodea: *Blattella* sp. | *Polyrachis bicolor* | 9 | 0 | 0 | 8 | $P < 0.01$ |
| | | Diptera: *Calliphora* sp. | *Camponotus gigas* | 13 | 0 | 0 | 8 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Camponotus gigas* | 17 | 2 | 0 | 18 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 15 | 2 | 1 | 13 | $P < 0.01$ |
| | | Diptera: *Culex* sp. | *Polyrachis* sp. | 21 | 1 | 1 | 13 | $P < 0.001$ |
| | | Diptera: *Sciara* sp. | *Camponotus* gigas | 7 | 0 | 0 | 5 | $P < 0.01$ |
| | | Hemiptera: *Macrosyphum euphorbiae* | *Iridomyrmex darwinanus* | 8 | 1 | 0 | 17 | $P < 0.05$ |
| | | Hemiptera: unknown mirid | *Tapinoma* sp. | 17 | 0 | 0 | 7 | $P < 0.001$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 12 | 0 | 0 | 5 | $P < 0.001$ |
| | | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 7 | 0 | 0 | 4 | $P < 0.01$ |
| | | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 13 | 1 | 1 | 10 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 18 | 1 | 0 | 11 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Tapinoma* sp. | 12 | 0 | 0 | 8 | $P < 0.001$ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Lepidoptera: *Calioptilia* sp. larva | *Oecophylla smaragdina* | 8 | 0 | 0 | 4 | $P < 0.01$ |
| | | Lepidoptera: *Capua* sp. larva | *Camponotus gigas* | 10 | 0 | 0 | 5 | $P < 0.01$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 7 | 0 | 0 | 5 | $P < 0.01$ |
| | Well fed[1] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 9 | 0 | 0 | 22 | $P < 0.01$ |
| | Starved[2] | Diptera: *Calliphora* sp. | *Camponotus gigas* | 14 | 2 | 0 | 12 | $P < 0.01$ |
| | | Diptera: *Drosophila melanogaster* | *Camponotus gigas* | 11 | 0 | 0 | 19 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 16 | 1 | 0 | 22 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Polyrachis* sp. | 16 | 1 | 0 | 24 | $P < 0.001$ |
| | | Hemiptera: *Macrosyphum euphorbiae* | *Iridomyrmex darwinanus* | 7 | 0 | 0 | 22 | $P < 0.01$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 6 | 0 | 0 | 13 | $P < 0.05$ |
| | | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 7 | 0 | 0 | 13 | $P < 0.01$ |
| | | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 15 | 2 | 1 | 19 | $P < 0.01$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 14 | 2 | 0 | 12 | $P < 0.01$ |
| | | Lepidoptera: *Calioptilia* sp. larva | *Oecophylla smaragdina* | 7 | 0 | 0 | 10 | $P < 0.01$ |
| | | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 10 | 0 | 0 | 14 | $P < 0.01$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 11 | 1 | 1 | 9 | $P < 0.01$ |
| | Starved[2] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 10 | 0 | 0 | 30 | $P < 0.01$ |
| | Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Camponotus gigas* | 3 | 1 | 0 | 23 | NS |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 5 | 2 | 0 | 24 | NS |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 3 | 1 | 1 | 16 | NS |
| | | Hemiptera: *Macrosyphum euphorbiae* | *Iridomyrmex darwinanus* | 1 | 1 | 0 | 25 | NS |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 2 | 1 | 0 | 45 | NS |
| | | Hemiptera: *Ricania* sp. | *Oecophylla smaragdina* | 2 | 0 | 0 | 17 | NS |
| | | Isoptera: *Nasutitermes* sp. | *Tapinoma* sp. | 5 | 1 | 0 | 28 | NS |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 4 | 2 | 0 | 16 | NS |
| | Extra-starved[3] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 1 | 0 | 0 | 22 | NS |
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 7 | 0 | 0 | 9 | $P < 0.01$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 13 | 2 | 0 | 10 | $P < 0.01$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster* sp. | 13 | 0 | 0 | 18 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 13 | 1 | 0 | 14 | $P < 0.01$ |
| | | Diptera: unknown dolichopodid | *Camponotus gigas* | 8 | 0 | 0 | 9 | $P < 0.01$ |
| | | Hemiptera: unknown cicadellid | *Camponotus* sp. | 10 | 2 | 0 | 22 | $P < 0.05$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 6 | 0 | 0 | 12 | $P < 0.05$ |
| | | Hemiptera: *Aleurodicus dispersus* | *Acropyga* sp. | 7 | 0 | 0 | 11 | $P < 0.01$ |
| | | Isoptera: *Macrotermes gilvus* | *Oecophylla smaragdina* | 12 | 2 | 1 | 12 | $P < 0.01$ |
| | | Lepidoptera: *Calioptilia* sp. larva | *Camponotus gigas* | 6 | 0 | 0 | 16 | $P < 0.05$ |
| | | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 8 | 0 | 0 | 15 | $P < 0.01$ |
| | Well fed[1] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 10 | 1 | 0 | 20 | $P < 0..01$ |

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Table 7 Continued

| Salticid | Hunger state | Other insect | Ant | Drops other insect to attack ant | Drops ant to attack other insect | Drops each to attack other | Drops neither | McNemar test |
|---|---|---|---|---|---|---|---|---|
| | Starved[2] | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 7 | 0 | 0 | 11 | $P < 0.01$ |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 10 | 1 | 0 | 16 | $P < 0.01$ |
| | | Diptera: unknown dolichopodid | *Camponotus gigas* | 7 | 0 | 0 | 10 | $P < 0.01$ |
| | | Hemiptera: unknown cicadellid | *Camponotus* sp. | 6 | 0 | 0 | 19 | $P < 0.05$ |
| | | Hemiptera: unknown mirid | *Crematogaster* sp. | 9 | 1 | 0 | 10 | $P < 0.05$ |
| | | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 8 | 1 | 0 | 12 | $P < 0.05$ |
| | Starved[2] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 0 | 0 | 0 | 34 | NS |
| | Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 2 | 2 | 0 | 25 | NS |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 2 | 2 | 1 | 27 | NS |
| | | Hemiptera: unknown cicadellid | *Camponotus* sp. | 2 | 1 | 0 | 24 | NS |
| | Extra-starved[1] and limited diet[4] | Psocoptera: *Ectopsocus californicus* | *Monomorium antarcticum* | 0 | 0 | 0 | 34 | NS |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.
[4] Reared on diet of only *Drosophila melanogaster* and *Musca domestica*. (All others reared on varied diet.)

used for alternate-day testing was 100 mm long, whereas each of the two arms (ends of the Y) used for simultaneous-presentation testing was 50 mm long (stem of the Y also 50 mm long). On both types of choice ramps, arms always ended at a "wall" (a 55 mm high, 40 mm wide and 15 mm thick piece of brown wood glued perpendicular to the top end of the arm). The salticid walked up the arm and viewed a lure centred 10 mm in front of the wall.

Lures were made by killing an insect by asphyxiation with $CO_2$, placing it in alcohol for 1 h, then mounting it in a lifelike posture on the centre of one side of a disc-shaped piece of cork. The cork was in diameter 1–2 times the body length of the insect. The insect and cork were sprayed with an aerosol plastic adhesive (for preservation and to eliminate the potential of olfactory cues being present on the dead insect) and left to air out for at least 24 h before being used. During testing, salticids were not allowed to contact lures.

Before testing began, the salticid was kept until quiescent in a covered pit near the lower end of the ramp. Tests were allowed to start by removing the cover. Successful tests ended when the spider moved past the threshold on an arm. The threshold was a line 10 mm below where the two arms of the Y-shaped ramp joined (40 mm from the centre of the pit) or a line at the same distance from the pit on the linear ramp. After uncovering the pit, tests were aborted if the salticid failed to come out within 30 min or came out, but then moved off the ramp before reaching the threshold. When tests were aborted, the salticid was tested repeatedly up to four times a day, then on subsequent days, until a successful test was completed or four days of unsuccessful testing elapsed.

### Testing for prey preference using motionless lures in webs

Modified ramps were used. Instead of being rectangular, the wall was round (diameter 172 mm). A cavity (diameter

**Table 8** Results from alternate-day tests using lures. Lures not in web. *Zenodorus* spp. chose ants more often than other insects.

| Salticid | Hunger state | Other insect | Ant | Chose ant only | Chose other insect only | Chose both | Chose neither | McNemar test |
|---|---|---|---|---|---|---|---|---|
| *Zenodorus durvellei* | Well fed[1] | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 25 | 2 | 3 | 10 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Prolasius* sp. | 26 | 3 | 5 | 11 | $P < 0.001$ |
| | | Diptera: *dolichopodid* | *Camponotus gigas* | 19 | 1 | 5 | 8 | $P < 0.001$ |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 18 | 2 | 3 | 7 | $P < 0.001$ |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 13 | 2 | 5 | 1 | $P < 0.01$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 13 | 1 | 8 | 6 | $P < 0.01$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 28 | 5 | 10 | 8 | $P < 0.001$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 16 | 2 | 6 | 9 | $P < 0.001$ |
| | Starved[2] | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 22 | 5 | 12 | 4 | $P < 0.01$ |
| | | Diptera: *Musca domestica* | *Prolasius* sp. | 25 | 5 | 12 | 3 | $P < 0.01$ |
| | | Diptera: *dolichopodid* | *Camponotus gigas* | 24 | 6 | 12 | 5 | $P < 0.01$ |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 15 | 3 | 8 | 2 | $P < 0.01$ |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 10 | 1 | 8 | 0 | $P < 0.01$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 15 | 3 | 9 | 3 | $P < 0.01$ |
| | Extra-starved[3] | Diptera: *Lucilia* sp. | *Polyrachis* sp. | 9 | 4 | 18 | 0 | NS |
| | | Diptera: *Musca domestica* | *Prolasius* sp. | 5 | 5 | 20 | 0 | NS |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 4 | 3 | 20 | 1 | NS |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 3 | 4 | 18 | 0 | NS |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 8 | 3 | 17 | 2 | NS |
| *Zonodorus metallescens* | Well fed[1] | Blattodea: *Blattella* sp. | *Polyrachis bicolor* | 21 | 3 | 3 | 10 | $P < 0.001$ |
| | | Diptera: *Calliphora* sp. | *Camponotus gigas* | 27 | 5 | 3 | 11 | $P < 0.001$ |
| | | Diptera: *Lucilia* sp. | *Myrmecia nigriceps* | 24 | 4 | 3 | 8 | $P < 0.001$ |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 19 | 2 | 9 | 2 | $P < 0.001$ |
| | | Hemiptera: *Siphanta* sp. | *Polyrachis* sp. | 16 | 3 | 9 | 6 | $P < 0.01$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster* sp. | 20 | 2 | 4 | 11 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 37 | 6 | 11 | 18 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Polyrachis* sp. | 27 | 5 | 16 | 9 | $P < 0.001$ |
| | | Diptera: *Sciara* sp. | *Crematogaster gigas* | 14 | 1 | 3 | 9 | $P < 0.001$ |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 24 | 3 | 2 | 9 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 16 | 2 | 2 | 7 | $P < 0.001$ |
| | | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 23 | 2 | 6 | 12 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 27 | 3 | 4 | 11 | $P < 0.001$ |
| | | Lepidoptera: *Calioptilia* sp. larva | *Oecophylla smaragdina* | 14 | 0 | 2 | 14 | $P < 0.001$ |
| | | Lepidoptera: *Capua* sp. | *Camponotus gigas* | 12 | 1 | 1 | 8 | $P < 0.01$ |
| | | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 16 | 1 | 2 | 8 | $P < 0.001$ |

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**Table 8** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose ant only | Chose other insect only | Chose both | Chose neither | McNemar test |
|---|---|---|---|---|---|---|---|---|
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 19 | 2 | 1 | 8 | $P < 0.001$ |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 16 | 0 | 5 | 5 | $P < 0.001$ |
| | | Orthoptera: unknown | *Oecophylla smaragdina* | 11 | 0 | 6 | 4 | $P < 0.001$ |
| | Starved[2] | Diptera: *Calliphora* sp. | *Camponotus gigas* | 25 | 5 | 8 | 5 | $P < 0.001$ |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 13 | 2 | 17 | 0 | $P < 0.01$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster* sp. | 23 | 3 | 10 | 4 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 37 | 8 | 18 | 13 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Polyrachis* sp. | 15 | 2 | 8 | 2 | $P < 0.01$ |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 19 | 3 | 6 | 3 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 16 | 3 | 4 | 3 | $P < 0.01$ |
| | | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 27 | 4 | 11 | 6 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 22 | 2 | 9 | 7 | $P < 0.001$ |
| | | Lepidoptera: *Calioptilia* sp. adult | *Oecophylla smaragdina* | 13 | 2 | 2 | 3 | $P < 0.01$ |
| | | Lepidoptera: *Autoba* sp. | *Oecophylla smaragdina* | 11 | 1 | 4 | 2 | $P < 0.01$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 14 | 1 | 5 | 3 | $P < 0.001$ |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 14 | 2 | 10 | 5 | $P < 0.01$ |
| | | Orthoptera: unknown | *Oecophylla smaragdina* | 9 | 1 | 2 | 4 | $P < 0.05$ |
| | Extra-starved[3] | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 4 | 5 | 21 | 1 | NS |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster* sp. | 5 | 2 | 28 | 5 | NS |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 8 | 4 | 34 | 12 | NS |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 7 | 2 | 19 | 2 | NS |
| | | Hemiptera: mirid | *Crematogaster* sp. | 5 | 1 | 12 | 3 | NS |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 6 | 4 | 21 | 5 | NS |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 7 | 4 | 11 | 2 | NS |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 3 | 2 | 21 | 5 | NS |
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 20 | 2 | 5 | 6 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 25 | 5 | 8 | 11 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 26 | 5 | 9 | 10 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 29 | 6 | 5 | 10 | $P < 0.001$ |
| | | Diptera: dolichopodid | *Camponotus gigas* | 26 | 6 | 9 | 10 | $P < 0.001$ |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 15 | 2 | 15 | 1 | $P < 0.01$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 15 | 1 | 3 | 6 | $P < 0.001$ |
| | | Hemiptera: *Aleurodicus dispersus* | *Acropyga* sp. | 18 | 1 | 2 | 9 | $P < 0.001$ |
| | | Isoptera: *Macrotermes gilvus* | *Oecophylla smaragdina* | 28 | 6 | 10 | 12 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 23 | 3 | 15 | 5 | $P < 0.001$ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Starved[2] | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 15 | 2 | 3 | 8 | $P < 0.01$ |
| | Neuroptera: *Micromus tasmaniae* | *Camponotus* sp. | 11 | 2 | 13 | 0 | $P < 0.05$ |
| | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 21 | 6 | 11 | 5 | $P < 0.01$ |
| | Diptera: *Musca domestica* | *Epopostruma frosti* | 23 | 6 | 10 | 6 | $P < 0.01$ |
| | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 25 | 5 | 9 | 9 | $P < 0.001$ |
| | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 7 | 0 | 18 | 5 | $P < 0.01$ |
| | Hemiptera: mirid | *Crematogaster* sp. | 12 | 2 | 10 | 3 | $P < 0.01$ |
| | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 20 | 3 | 18 | 5 | $P < 0.001$ |
| Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 10 | 4 | 25 | 2 | NS |
| | Diptera: *Musca domestica* | *Epopostruma frosti* | 13 | 5 | 20 | 5 | NS |
| | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 9 | 4 | 23 | 6 | NS |
| | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 4 | 4 | 20 | 1 | NS |
| | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 3 | 4 | 24 | 3 | NS |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.

170 mm, depth 10 mm) in the wall held an open plastic petri dish with matching diameter and depth. The petri dish contained a vacant web spun by an adult female of *Badumna longinqua*. This Australian species has long been established in New Zealand where its cribellate sheet webs are now commonly found in and around houses. Webs were obtained by maintaining *B. longinqua* females (one per dish for 14 days) without prey, then removing the spiders (without noticeably damaging the webs) and keeping the dishes open for another 7 days. No eggs were present in any of the webs used.

During testing, a lure was positioned in the centre of the web (facing down) in the open petri dish. Lures could readily be kept in place because of the adhesive properties of the cribellate silk spun by *B. longinqua*. Positioned in the web were two blank cork disks (same diameter as lure), each half way between the lure and the side of the petri dish (one on the left, one on the right), and equidistant from the bottom and top ends of the dish.

During tests where there were no webs, spiders were not permitted to reach the end of the ramp. However, reaching the end of the ramp was permitted in tests with webs. Two criteria were used for "choice" in tests with webs; approach web and enter web. In these tests, the definition of approaching a web was, as during tests in which there were lures but no webs present, crossing the threshold 40 mm from the pit. Entering a web was defined as leaping from the side of the petri dish toward one of the corks between the side of the dish and the lure.

The *Zenodorus* species could not move unimpaired across the sticky cribellate silk of *B. longinqua*. Sometimes they placed their legs momentarily on the silk, but approaching lures was always by leaping to a cork rather than by attempting to walk across the web. If the spider left the ramp, went under the ramp or moved below the demarcation line without first leaping toward a cork, only the first criterion for recording a choice was used and the test ended. Otherwise the test ended when the second criterion for choice was met.

## RESULTS

Well-fed and starved spiders that had been reared on a varied diet showed significant preference for ants in alternate-day (Table 5), simultaneous-presentation (Table 6) and alternative-prey tests

**Table 9** Results from simultaneous-presentation tests using lures. Lure not in web. *Zenodorus* spp. chose ants more often than other insects.

| Salticid | Hunger state | Other insect | Ant | Chose ant | Chose other insect | Chose neither | Test of Goodness of Fit |
|---|---|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: Fruit fly, *Drosophila melanogaster* | *Tapinoma* sp. | 22 | 2 | 13 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Prolasius* sp. | 23 | 2 | 10 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 26 | 5 | 12 | $P < 0.001$ |
| | | Diptera: dolichopodid | *Camponotus gigas* | 23 | 2 | 5 | $P < 0.001$ |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 12 | 0 | 7 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 15 | 1 | 9 | $P < 0.010$ |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 17 | 1 | 8 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 22 | 3 | 12 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Tetraponera puntulata* | 16 | 2 | 4 | $P < 0.01$ |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 19 | 2 | 7 | $P < 0.001$ |
| | | Neuroptera: *Micromus tasmaniae* | *Monomorium antarcticum* | 14 | 1 | 10 | $P < 0.001$ |
| | Starved[2] | Diptera: *Drosophila melanogaster* | *Tapinoma* sp. | 24 | 4 | 10 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 22 | 5 | 6 | $P < 0.01$ |
| | | Diptera: *Musca domestica* | *Prolasius* sp. | 28 | 6 | 9 | $P < 0.001$ |
| | | Diptera: dolichopodid | *Camponotus gigas* | 21 | 3 | 8 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 13 | 2 | 3 | $P < 0.01$ |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 22 | 5 | 7 | $P < 0.01$ |
| | | Neuroptera: *Micromus tasmaniae* | *Monomorium antarcticum* | 13 | 2 | 8 | $P < 0.01$ |
| | Extra-starved[3] | Diptera: *Lucilia* sp. | *Polyrachis* sp. | 13 | 7 | 6 | NS |
| | | Diptera: *Musca domestica* | *Prolasius* sp. | 15 | 11 | 8 | NS |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 10 | 9 | 9 | NS |
| | | Hemiptera: mirid | *Crematogaster* sp. | 9 | 12 | 7 | NS |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 12 | 11 | 11 | NS |
| | | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 14 | 7 | 4 | NS |
| | | Neuroptera: *Micromus tasmaniae* | *Monomorium antarcticum* | 17 | 15 | 9 | NS |
| *Zenodorus metallescens* | Well fed[1] | Blattodea: *Blattella* sp. | *Polyrachis bicolor* | 13 | 1 | 9 | $P < 0.01$ |
| | | Diptera: *Lucilia* sp. | *Oecophylla smaragdina* | 15 | 1 | 12 | $P < 0.001$ |
| | | Diptera: *Calliphora* sp. | *Camponotus gigas* | 21 | 2 | 8 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster gigas* | 25 | 2 | 9 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Polyrachis* sp. | 28 | 3 | 8 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Polyrachis* spp. | 25 | 2 | 7 | $P < 0.001$ |
| | | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 20 | 2 | 7 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 13 | 0 | 8 | $P < 0.001$ |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Hemiptera: *Siphanta* sp. | *Adlerzia* sp. | 19 | 5 | 13 | $P < 0.01$ |
| | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 12 | 2 | 4 | $P < 0.01$ |
| | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 28 | 4 | 10 | $P < 0.001$ |
| | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 29 | 4 | 9 | $P < 0.001$ |
| | Lepidoptera: *Calioptilia* sp. larva | *Oecophylla smaragdina* | 16 | 1 | 12 | $P < 0.001$ |
| | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 19 | 2 | 9 | $P < 0.011$ |
| | Lepidoptera: unknown noctuid adult | *Oecophylla smaragdina* | 14 | 1 | 10 | $P < 0.001$ |
| | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 14 | 0 | 7 | $P < 0.001$ |
| | Mantodes: *Orthodera* sp. | *Monomorium antarcticum* | 20 | 2 | 17 | $P < 0.001$ |
| | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 24 | 3 | 15 | $P < 0.001$ |
| | Orthoptera: *Metioche maoricum* | *Polyrachis* sp. | 11 | 0 | 12 | $P < 0.001$ |
| | Orthoptera: unknown | *Oecophylla smaragdina* | 9 | 0 | 6 | $P < 0.01$ |
| Starved[2] | Diptera: *Calliphora* sp. | *Camponotus gigas* | 20 | 3 | 6 | $P < 0.001$ |
| | Diptera: *Lucilia* sp. | *Oecophylla smaragdina* | 22 | 5 | 16 | $P < 0.01$ |
| | Diptera: *Drosophila melanogaster* | *Crematogaster* sp. | 27 | 4 | 5 | $P < 0.001$ |
| | Diptera: *Musca domestica* | *Polyrachis* sp. | 37 | 8 | 12 | $P < 0.001$ |
| | Diptera: *Culex* sp. | *Polyrachis* sp. | 20 | 4 | 4 | $P < 0.001$ |
| | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 15 | 2 | 4 | $P < 0.01$ |
| | Hemiptera: mirid | *Crematogaster* sp. | 13 | 2 | 4 | $P < 0.01$ |
| | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 18 | 4 | 4 | $P < 0.01$ |
| | Isoptera: *Macrotermes gilvus* | *Acropyga* sp. | 23 | 6 | 5 | $P < 0.01$ |
| | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 26 | 6 | 5 | $P < 0.001$ |
| | Lepidoptera: *Calioptilia* sp. larva | *Oecophylla smaragdina* | 9 | 1 | 5 | $P < 0.05$ |
| | Lepidoptera: *Autoba* sp. adult | *Oecophylla smaragdina* | 16 | 2 | 4 | $P < 0.001$ |
| | Lepidoptera: unknown noctuid adult | *Camponotus* sp. | 18 | 2 | 6 | $P < 0.001$ |
| | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 14 | 1 | 4 | $P < 0.001$ |
| | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 16 | 3 | 10 | $P < 0.01$ |
| | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 20 | 5 | 8 | $P < 0.01$ |
| | Orthoptera: *Metioche maoricum* | *Polyrachis* sp. | 22 | 3 | 8 | $P < 0.001$ |
| | Orthoptera: unknown | *Oecophylla smaragdina* | 10 | 1 | 5 | $P < 0.01$ |
| Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Crematogaster gigas* | 22 | 10 | 3 | NS |
| | Diptera: *Lucilia* sp. | *Oecophylla smaragdina* | 14 | 12 | 6 | NS |
| | Diptera: *Musca domestica* | *Polyrachis* sp. | 20 | 11 | 4 | NS |
| | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 17 | 9 | 3 | NS |
| | Hemiptera: mirid | *Crematogaster* sp. | 11 | 5 | 4 | NS |
| | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 15 | 11 | 2 | NS |
| | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 17 | 9 | 5 | NS |
| | Lepidoptera: unknown noctuid | *Camponotus* sp. | 3 | 4 | 22 | NS |
| | Lepidoptera: *Eristena* sp. adult | *Tetraponera* sp. | 12 | 5 | 3 | NS |

*continued over page*

**Table 9** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose ant | Chose other insect | Chose neither | Test of Goodness of Fit |
|---|---|---|---|---|---|---|---|
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 15 | 10 | 7 | NS |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 20 | 15 | 2 | NS |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | 13 | 13 | 3 | NS |
| *Zenodorus* | Well fed[1] | Diptera: *Gynoplistia* sp. | *Oecophylla smaragdina* | 17 | 1 | 9 | $P < 0.001$ |
| *orbiculatus* | | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 22 | 4 | 14 | $P < 0.001$ |
| | | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 22 | 1 | 12 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 29 | 3 | 10 | $P < 0.001$ |
| | | Diptera: dolichopodid | *Camponotus gigas* | 23 | 2 | 12 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 20 | 2 | 15 | $P < 0.001$ |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 25 | 3 | 8 | $P < 0.010$ |
| | | Isoptera: *Macrotermes gilvus* | *Oecophylla smaragdina* | 22 | 2 | 13 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 27 | 7 | 18 | $P < 0.001$ |
| | | Mantodea: *Orthodera* sp. | *Oecophylla smaragdina* | 11 | 2 | 5 | $P < 0.05$ |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 13 | 1 | 6 | $P < 0.01$ |
| | Starved[2] | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 16 | 3 | 6 | $P < 0.01$ |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 26 | 3 | 7 | $P < 0.001$ |
| | | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 23 | 4 | 9 | $P < 0.001$ |
| | | Hemiptera: Mirid | *Crematogaster* sp. | 25 | 6 | 10 | $P < 0.001$ |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 21 | 2 | 7 | $P < 0.010$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 24 | 4 | 6 | $P < 0.001$ |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 10 | 1 | 2 | $P < 0.01$ |
| | Extra-starved[3] | Diptera: *Drosophila melanogaster* | *Crematogaster borneensis* | 17 | 10 | 5 | NS |
| | | Diptera: *Musca domestica* | *Epopostruma frosti* | 19 | 9 | 4 | NS |
| | | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 22 | 17 | 5 | NS |
| | | Hemiptera: Mirid | *Crematogaster* sp. | 17 | 13 | 4 | NS |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 14 | 14 | 6 | NS |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 20 | 19 | 5 | NS |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 12 | 10 | 3 | NS |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.

(Table 7) with living prey despite the diverse array of ant species and other prey species we used. However, when extra-starved spiders were tested, findings were not significant in any of the types of tests (Tables 5–7), providing no evidence of preference.

In alternate-day and simultaneous-presentation tests, well-fed and starved salticids reared on a varied diet chose lures made from dead, motionless ants more often than they chose lures made from other kinds of insects, but showed no preference when extra-starved (Tables 8 and 9). Although salticids tended to ignore motionless lures longer than living prey, the behaviour the salticid directed toward lures made from ants and lures made from other insects were otherwise comparable to the salticid's respective prey-capture behaviour against the corresponding living prey.

Findings from testing spiders reared on the limited diet were different (Tables 5–7). When salticids were well fed, there was a pronounced preference for ants in alternate-day, simultaneous-presentation and alternative-prey tests (Tables 5–7). There was also a pronounced preference for ants in simultaneous-presentation tests when salticids were starved (Table 6). However, no preference was evident in alternate-day or alternative-prey tests of starved salticids (Tables 5 and 7).

By both criteria for choice (approached web and entered web), findings from alternate-day testing using lures in webs (Table 10) matched the findings from using lures outside webs (Table 8). That is, well-fed and starved spiders in alternate-day tests chose lures made from ants, whether in or out of webs, more often than they chose lures made from other kinds of insects, but showed no preference when extra-starved.

By both criteria, well-fed and starved spiders in simultaneous-presentation tests chose lures in webs made from ants more often than they chose lures made from other kinds of insects, but showed no preference when extra-starved (Table 11). These findings matched the findings from tests using lures outside webs (Table 9). However, for extra-starved spiders, findings when lures were in webs depended on the criterion used for inferring that the spider made a choice. When the criterion was approaching the web, extra-starved spiders showed no evidence of preference. However, when the criterion was entering the web, extra-starved spiders chose ants more often than other insects (Table 11).

Additional data analysis was carried out to look specifically at the relationship between strength of the preference for ants (i.e., strength of the bias toward choosing lures made from ants), the type of test and the criterion for choice. For this, we compared data from tests in which the same pairs of lures (i.e., same two insect species) were used in tests with and without webs present (Tables 12–19). All comparisons were made using chi-square tests of independence with Bonferroni adjustments (Rice 1989; Sokal & Rohlf 1995).

The salticid's tendency to make a choice at all, regardless of which lure was chosen, is considered first. When the criterion for having made a choice was only that the salticid approached the lure, there was no statistical evidence that whether the lure was in or out of a web influenced the salticid's tendency to choose during either alternate-day (Table 12) or simultaneous-presentation testing (Table 13). When the choice-making criterion met by the salticid was to enter the web during tests with lures in webs, and simply approach the lure during tests with lures outside webs, choices were made significantly more often in tests with lures away from webs (Tables 14 and 15). These trends held for each species of *Zenodorus*, for each pairing of lures and for each of the three hunger states of the spiders.

The influence of whether lures were in or away from webs on the strength of the preference for ant lures is considered next. When the criterion for having made a choice was simply approaching the lure, there was no statistical evidence in alternate-day or simultaneous-presentation tests that the strength of the preference for ants, regardless of the salticid's hunger level, depended on whether the ant was in or out of a web (Tables 16 and 17). When the criterion for having made a choice during tests with lures in webs was that the spider entered the web, there was no statistical evidence that the strength of the preference for ants, regardless of the salticid's hunger level, depended on whether the ant was in or out of a web during alternate-day tests (Table 18), but findings from simultaneous-presentation tests depended on hunger level. There was no statistical evidence that the strength of the preference for ants depended on whether the ant was in or away from webs in simultaneous-presentation tests when the salticid was well-fed or starved, but there was a significantly stronger preference for ants when salticids were extra-starved. These conclusions held for each species of *Zenodorus* and each pairing of two types of lures (Table 19).

**Table 10** Alternate-day tests using lures. Lures in web of *Badumna longinqua*. Web in petri dish at end of ramp. *Zenodorus* spp. chose ants more often than other insects.

| Salticid | Hunger state | Other insect | Ant | Choice criterion | Chose ant only | Chose other insect only | Chose both | Chose neither | McNemar test |
|---|---|---|---|---|---|---|---|---|---|
| *Zenodorus* | Well fed[1] | Diptera: *Musca domestica* | *Prolasius* sp. | Approached web | 27 | 4 | 11 | 21 | $P<0.001$ |
| *durvillei* | | | | Entered web | 8 | 0 | 2 | 53 | $P<0.01$ |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | Approached web | 28 | 2 | 16 | 17 | $P<0.001$ |
| | | | | Entered web | 11 | 0 | 1 | 51 | $P<0.001$ |
| | | Hemiptera: *Nephotettix* | *Monomorium* | Approached web | 26 | 4 | 20 | 18 | $P<0.001$ |
| | | *nigropictus* | *antarcticum* | Entered web | 6 | 0 | 2 | 60 | $P<0.05$ |
| | Starved[2] | Diptera: *Musca domestica* | *Prolasius* sp. | Approached web | 29 | 6 | 19 | 14 | $P<0.001$ |
| | | | | Entered web | 8 | 0 | 0 | 60 | $P<0.01$ |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | Approached web | 26 | 5 | 20 | 13 | $P<0.001$ |
| | | | | Entered web | 10 | 0 | 2 | 52 | $P<0.001$ |
| | | Hemiptera: *Nephotettix* | *Monomorium* | Approached web | 35 | 8 | 19 | 14 | $P<0.001$ |
| | | *nigropictus* | *antarcticum* | Entered web | 10 | 0 | 1 | 65 | $P<0.001$ |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Prolasius* sp. | Approached web | 4 | 5 | 33 | 12 | NS |
| | | | | Entered web | 1 | 0 | 9 | 44 | NS |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | Approached web | 6 | 5 | 31 | 15 | NS |
| | | | | Entered web | 1 | 0 | 5 | 51 | NS |
| | | Hemiptera: *Nephotettix* | *Monomorium* | Approached web | 6 | 4 | 27 | 13 | NS |
| | | *nigropictus* | *antarcticum* | Entered web | 1 | 0 | 6 | 43 | NS |
| *Zenodorus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla* | Approached web | 28 | 7 | 18 | 22 | $P<0.001$ |
| *orbiculatus* | | | *smaragdina* | Entered web | 8 | 0 | 2 | 65 | $P<0.01$ |
| | | Hemiptera: *Nephotettix* | *Camponotus* sp. | Approached web | 29 | 5 | 22 | 24 | $P<0.001$ |
| | | *nigropictus* | | Entered web | 10 | 0 | 2 | 68 | $P<0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 32 | 9 | 19 | 21 | $P<0.001$ |
| | | | | Entered web | 11 | 1 | 2 | 67 | $P<0.01$ |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla* | Approached web | 23 | 3 | 29 | 14 | $P<0.001$ |
| | | | *smaragdina* | Entered web | 9 | 0 | 4 | 56 | $P<0.01$ |
| | | Hemiptera: *Nephotettix* | *Camponotus* sp. | Approached web | 27 | 7 | 25 | 14 | $P<0.001$ |
| | | *nigropictus* | | Entered web | 8 | 0 | 3 | 62 | $P<0.01$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 30 | 9 | 27 | 13 | $P<0.001$ |
| | | | | Entered web | 11 | 1 | 8 | 59 | $P<0.01$ |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla* | Approached web | 9 | 7 | 33 | 14 | NS |
| | | | *smaragdina* | Entered web | 2 | 0 | 13 | 48 | NS |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | Approached web | 4 | 6 | 29 | 15 | NS |
| | | | | Entered web | 0 | 0 | 13 | 41 | NS |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 5 | 5 | 31 | 14 | NS |
| | | | | Entered web | 1 | 0 | 15 | 39 | NS |
| *Zenodorus metallescens* | Well fed[1] | Diptera: *Musca domestica* | *Polyrachis* sp. | Approached web | 32 | 10 | 7 | 25 | $P < 0.001$ |
| | | | | Entered web | 11 | 0 | 0 | 53 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | Approached web | 33 | 14 | 8 | 24 | $P < 0.01$ |
| | | | | Entered web | 8 | 0 | 0 | 71 | $P < 0.01$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 39 | 17 | 12 | 17 | $P < 0.01$ |
| | | | | Entered web | 19 | 3 | 0 | 63 | $P < 0.001$ |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | Approached web | 33 | 9 | 7 | 22 | $P < 0.001$ |
| | | | | Entered web | 11 | 0 | 0 | 60 | $P < 0.001$ |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | Approached web | 35 | 11 | 13 | 20 | $P < 0.001$ |
| | | | | Entered web | 16 | 2 | 0 | 61 | $P < 0.01$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | Approached web | 37 | 13 | 15 | 17 | $P < 0.001$ |
| | | | | Entered web | 20 | 2 | 0 | 60 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 33 | 10 | 18 | 22 | $P < 0.001$ |
| | | | | Entered web | 15 | 3 | 1 | 64 | $P < 0.01$ |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | Approached web | 35 | 10 | 17 | 20 | $P < 0.001$ |
| | | | | Entered web | 16 | 1 | 1 | 64 | $P < 0.001$ |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | Approached web | 3 | 5 | 37 | 15 | NS |
| | | | | Entered web | 1 | 0 | 15 | 44 | NS |
| | | Hemiptera: mirid | *Crematogaster* sp. | Approached web | 8 | 7 | 35 | 17 | NS |
| | | | | Entered web | 1 | 0 | 15 | 51 | NS |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 4 | 6 | 35 | 15 | NS |
| | | | | Entered web | 0 | 0 | 20 | 40 | NS |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | Approached web | 4 | 4 | 36 | 19 | NS |
| | | | | Entered web | 0 | 0 | 16 | 47 | NS |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.
Approached web: came close to the lure while still on ramp.
Entered web: leapt from side of petri dish to cork between side of dish and lure (see text).

**Table 11** Simultaneous-presentation tests using lures. Lure in web of *Badumna longinqua*. Web in petri dish at end of ramp. *Zenodorus* spp. chose ants more often than other insects. Tests from using lures. All salticids well fed.

| Salticid | Hunger state | Other insect | Ant | Choice criterion | Chose ant | Chose other insect | Chose neither | Test of Goodness of Fit |
|---|---|---|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Musca domestica* | *Prolasius* sp. | Approached web | 34 | 10 | 30 | $P < 0.001$ |
| | | | | Entered web | 13 | 0 | 61 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | Approached web | 38 | 12 | 28 | $P < 0.001$ |
| | | | | Entered web | 10 | 0 | 68 | $P < 0.01$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | Approached web | 35 | 11 | 25 | $P < 0.001$ |
| | | | | Entered web | 15 | 0 | 56 | $P < 0.001$ |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | Approached web | 31 | 9 | 20 | $P < 0.001$ |
| | | | | Entered web | 8 | 0 | 52 | $P < 0.01$ |
| | Starved[2] | Diptera: *Musca domestica* | *Prolasius* sp. | Approached web | 39 | 15 | 23 | $P < 0.01$ |
| | | | | Entered web | 11 | 1 | 65 | $P < 0.01$ |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | Approached web | 36 | 13 | 23 | $P < 0.01$ |
| | | | | Entered web | 17 | 0 | 55 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | Approached web | 38 | 12 | 21 | $P < 0.001$ |
| | | | | Entered web | 12 | 0 | 59 | $P < 0.001$ |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | Approached web | 35 | 10 | 25 | $P < 0.001$ |
| | | | | Entered web | 11 | 0 | 59 | $P < 0.001$ |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Prolasius* sp. | Approached web | 30 | 23 | 15 | NS |
| | | | | Entered web | 21 | 1 | 46 | $P < 0.001$ |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | Approached web | 32 | 24 | 15 | NS |
| | | | | Entered web | 9 | 0 | 62 | $P < 0.01$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | Approached web | 33 | 24 | 18 | NS |
| | | | | Entered web | 20 | 0 | 55 | $P < 0.001$ |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | Approached web | 29 | 20 | 19 | NS |
| | | | | Entered web | 11 | 0 | 57 | $P < 0.001$ |
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | Approached web | 36 | 12 | 22 | $P < 0.001$ |
| | | | | Entered web | 14 | 2 | 54 | $P < 0.01$ |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | Approached web | 36 | 10 | 25 | $P < 0.001$ |
| | | | | Entered web | 10 | 0 | 61 | $P < 0.01$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | Approached web | 32 | 12 | 29 | $P < 0.01$ |
| | | | | Entered web | 12 | 0 | 61 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 43 | 20 | 19 | $P < 0.01$ |
| | | | | Entered web | 22 | 5 | 55 | $P < 0.01$ |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | Approached web | 35 | 10 | 29 | $P < 0.001$ |
| | | | | Entered web | 15 | 1 | 58 | $P < 0.001$ |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | Approached web | 42 | 16 | 25 | $P < 0.001$ |
| | | | | Entered web | 21 | 2 | 60 | $P < 0.001$ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | Approached web | 39 | 11 | 22 | $P < 0.001$ |
| | | | | Entered web | 12 | 0 | 60 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | Approached web | 37 | 5 | 28 | $P < 0.001$ |
| | | | | Entered web | 16 | 0 | 54 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 38 | 15 | 21 | $P < 0.01$ |
| | | | | Entered web | 20 | 2 | 52 | $P < 0.001$ |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | Approached web | 37 | 13 | 20 | $P < 0.001$ |
| | | | | Entered web | 9 | 0 | 61 | $P < 0.01$ |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | Approached web | 29 | 24 | 15 | NS |
| | | | | Entered web | 14 | 0 | 51 | $P < 0.001$ |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | Approached web | 30 | 21 | 14 | NS |
| | | | | Entered web | 19 | 2 | 44 | $P < 0.001$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | Approached web | 25 | 21 | 12 | NS |
| | | | | Entered web | 10 | 0 | 48 | $P < 0.01$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 27 | 25 | 12 | NS |
| | | | | Entered web | 15 | 3 | 46 | $P < 0.01$ |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | Approached web | 30 | 23 | 15 | NS |
| | | | | Entered web | 11 | 0 | 57 | $P < 0.001$ |
| *Zenodorus metallescens* | Well fed[1] | Diptera: *Musca domestica* | *Polyrachis* sp. | Approached web | 32 | 12 | 27 | $P < 0.01$ |
| | | | | Entered web | 11 | 0 | 60 | $P < 0.001$ |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | Approached web | 35 | 14 | 30 | $P < 0.01$ |
| | | | | Entered web | 13 | 0 | 66 | $P < 0.001$ |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | Approached web | 30 | 10 | 26 | $P < 0.01$ |
| | | | | Entered web | 10 | 0 | 56 | $P < 0.001$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 34 | 13 | 29 | $P < 0.01$ |
| | | | | Entered web | 13 | 2 | 61 | $P < 0.01$ |
| | | Mantodes: *Orthodera* sp. | *Monomorium antarcticum* | Approached web | 37 | 11 | 27 | $P < 0.001$ |
| | | | | Entered web | 12 | 0 | 63 | $P < 0.001$ |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | Approached web | 36 | 12 | 23 | $P < 0.001$ |
| | | | | Entered web | 10 | 0 | 63 | $P < 0.01$ |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | Approached web | 35 | 15 | 28 | $P < 0.01$ |
| | | | | Entered web | 11 | 0 | 71 | $P < 0.001$ |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | Approached web | 36 | 12 | 24 | $P < 0001$ |
| | | | | Entered web | 13 | 1 | 67 | $P < 0.01$ |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | Approached web | 38 | 13 | 25 | $P < 0.001$ |
| | | | | Entered web | 16 | 2 | 58 | $P < 0.001$ |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | Approached web | 31 | 11 | 24 | $P < 0.01$ |
| | | | | Entered web | 10 | 0 | 58 | $P < 0.01$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 38 | 17 | 21 | $P < 0.01$ |
| | | | | Entered web | 19 | 3 | 56 | $P < 0.001$ |
| | | Mantodes: *Orthodera* sp. | *Monomorium antarcticum* | Approached web | 35 | 10 | 21 | $P < 0.001$ |
| | | | | Entered web | 10 | 0 | 54 | $P < 0.01$ |

*continued over page*

**Table 11** *Continued*

| Salticid | Hunger state | Other insect | Ant | Choice criterion | Chose ant | Chose other insect | Chose neither | Test of Goodness of Fit |
|---|---|---|---|---|---|---|---|---|
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | Approached web | 29 | 10 | 20 | $P < 0.01$ |
| | | | | Entered web | 9 | 0 | 50 | $P < 0.01$ |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla* | Approached web | 31 | 10 | 20 | $P < 0.01$ |
| | | | *smaragdina* | Entered web | 8 | 0 | 53 | $P < 0.01$ |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | Approached web | 36 | 22 | 17 | NS |
| | | | | Entered web | 21 | 1 | 53 | $P < 0.001$ |
| | | Diptera: *Lucillia* sp. | *Oecophylla* | Approached web | 22 | 16 | 21 | NS |
| | | | *smaragdina* | Entered web | 9 | 0 | 50 | $P < 0.01$ |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | Approached web | 26 | 18 | 18 | NS |
| | | | | Entered web | 13 | 1 | 48 | $P < 0.01$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | Approached web | 24 | 24 | 23 | NS |
| | | | | Entered web | 13 | 0 | 58 | $P < 0.001$ |
| | | Mantodes: *Orthodera* sp. | *Monomorium* | Approached web | 26 | 20 | 21 | NS |
| | | | *antarcticum* | Entered web | 9 | 0 | 58 | $P < 0.01$ |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | Approached web | 23 | 20 | 15 | NS |
| | | | | Entered web | 9 | 0 | 49 | $P < 0.01$ |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla* | Approached web | 21 | 16 | 10 | NS |
| | | | *smaragdina* | Entered web | 8 | 0 | 39 | $P < 0.01$ |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.

**Table 12** Additional analysis of data from alternate-day tests. Choosing in tests with lures in web defined as moving toward web (not necessarily entering web). All comparisons (tests of independence for each row) NS. For data and sample sizes, see Tables 7 and 9

| Salticid | Hunger state | Other insect | Ant | Chose[4] a prey in tests using lures away from webs | Chose[4] a prey in tests using lures in webs |
|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Musca domestica* | *Prolasius* sp. | 76% | 67% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 77% | 73% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 71% | 72% |
| | Starved[2] | Diptera: *Musca domestica* | *Prolasius* sp. | 86% | 79% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 93% | 80% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 86% | 82% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Prolasius* sp. | 88% | 78% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 84% | 74% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 81% | 74% |
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 80% | 71% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 78% | 70% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 85% | 74% |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 81% | 80% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 83% | 81% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 89% | 84% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 86% | 78% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 82% | 72% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 91% | 75% |
| *Zenodorus metallescens* | Well fed[1] | Diptera: *Musca domestica* | *Polyrachis* sp. | 75% | 66% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 80% | 70% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 76% | 80% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 81% | 69% |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | 83% | 75% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 88% | 79% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 83% | 73% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 96% | 76% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | 79% | 75% |
| | | Hemiptera: *Siphanta* sp. | *Crematogaster* sp. | 86% | 75% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 86% | 75% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 84% | 70% |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing. [4] Chose: met criterion for choice in at least one trial in the pair of trials carried out on each individual salticid.

**Table 13** Additional analysis of data from simultaneous-presentation tests. Choosing in tests with lures in web defined as moving toward web (not necessarily entering web). All comparisons (tests of independence for each row) NS. For data and sample sizes, see Tables 8 and 10.

| Salticid | Hunger state | Other insect | Ant | Chose a prey in tests using lures away from webs | Chose a prey in tests using lures in webs |
|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Musca domestica* | *Prolasius* sp. | 71% | 59% |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 72% | 64% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 64% | 65% |
| | | Hemiptera: Delphacidae, *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 69% | 63% |
| | Starved[2] | Diptera: *Musca domestica* | *Prolasius* sp. | 79% | 70% |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 82% | 68% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 83% | 70% |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 79% | 64% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Prolasius* sp. | 76% | 78% |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 68% | 79% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 75% | 76% |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 68% | 72% |
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 65% | 69% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 78% | 65% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 59% | 60% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 65% | 77% |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 70% | 61% |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 64% | 70% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 77% | 69% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 76% | 60% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 82% | 72% |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 85% | 71% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 87% | 78% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 82% | 78% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 88% | 79% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 89% | 81% |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 88% | 78% |
| *Zenodorus metallescens* | Well fed[1] | Diptera: *Musca domestica* | *Polyrachis* sp. | 79% | 62% |
| | | Diptera: fly, *Lucillia* sp. | *Oecophylla smaragdina* | 57% | 62% |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 78% | 61% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 67% | 62% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 56% | 64% |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 64% | 68% |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | 85% | 64% |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | 79% | 67% |

*continued*

**Table 13** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose a prey in tests using lures away from webs | Chose a prey in tests using lures in webs |
|---|---|---|---|---|---|
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 63% | 67% |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 85% | 64% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 86% | 72% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 66% | 68% |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 76% | 66% |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | 76% | 67% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | 89% | 77% |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 81% | 64% |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 93% | 71% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 79% | 68% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 78% | 70% |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 95% | 74% |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | 90% | 79% |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.

**Table 14** Additional analysis of data from alternate-day tests using lures. Choosing lures in web defined by entering web. All comparisons (tests of independence for each row) $P < 0.001$. For data and sample sizes, see Tables 7 and 9.

| Salticid | Hunger state | Other insect | Ant | Chose[4] a prey in tests using lures away from webs | Chose[4] a prey in tests using lures in webs |
|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Musca domestica* | *Prolasius* sp. | 76% | 16% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 77% | 19% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 71% | 12% |
| | Starved[2] | Diptera: *Musca domestica* | *Prolasius* sp. | 93% | 12% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 93% | 19% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 86% | 16% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Prolasius* sp. | 88% | 19% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 96% | 11% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 81% | 14% |
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 80% | 13% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 97% | 15% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 89% | 17% |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 81% | 19% |

*continued over page*

**Table 14** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose[4] a prey in tests using lures away from webs | Chose[4] a prey in tests using lures in webs |
|---|---|---|---|---|---|
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 83% | 15% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 89% | 25% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 86% | 24% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 97% | 24% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 91% | 29% |
| *Zenodorus metallescens* | Well fed[1] | Diptera: *Musca domestica* | *Polyrachis* sp. | 75% | 14% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 80% | 10% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 76% | 26% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 81% | 15% |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | 83% | 23% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 88% | 27% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 83% | 23% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 96% | 22% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | 79% | 27% |
| | | Hemiptera: *Siphanta* sp. | *Crematogaster* sp. | 86% | 24% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 86% | 33% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 84% | 25% |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing. [4] Chose: met criterion for choice in at least one test in the pair of tests carried out on each individual salticid.

**Table 15** Additional analysis of data from simultaneous-presentation tests using lures. Choosing in tests with lures in web defined as entering web. All comparisons (tests of independence for each row) $P < 0.001$. For data and sample sizes, see Tables 8 and 10.

| Salticid | Hunger state | Other insect | Ant | Chose a prey in tests using lures away from webs | Chose a prey in tests using lures in webs |
|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Musca domestica* | *Prolasius* sp. | 71% | 18% |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 72% | 13% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 64% | 21% |
| | | Hemiptera: Delphacidae, *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 69% | 13% |
| | Starved[2] | Diptera: *Musca domestica* | *Prolasius* sp. | 79% | 16% |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 82% | 24% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 83% | 28% |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 79% | 16% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Prolasius* sp. | 76% | 32% |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 68% | 13% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 75% | 27% |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 68% | 16% |

*continued*

**Table 15** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose a prey in tests using lures away from webs | Chose a prey in tests using lures in webs |
|---|---|---|---|---|---|
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 65% | 23% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 78% | 14% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 59% | 16% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 65% | 33% |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 70% | 22% |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 64% | 28% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 77% | 17% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 76% | 23% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 83% | 30% |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 85% | 13% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 87% | 21% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 82% | 32% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 88% | 17% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 89% | 28% |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 88% | 16% |
| *Zenodorus metallescens* | Well fed[1] | Diptera: *Musca domestica* | *Polyrachis* sp. | 79% | 15% |
| | | Diptera: fly, *Lucillia* sp. | *Oecophylla smaragdina* | 57% | 16% |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 78% | 15% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 67% | 20% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 56% | 16% |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 64% | 14% |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | 85% | 13% |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | 79% | 17% |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 63% | 24% |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 85% | 15% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 86% | 37% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 66% | 16% |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 76% | 15% |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | 76% | 13% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | 89% | 29% |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 81% | 15% |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 93% | 23% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 79% | 18% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 78% | 13% |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 87% | 16% |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | 90% | 17% |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.

**Table 16** Additional analysis of data from alternate-day tests using lures. No evidence that strength of preference for ants depends on whether lure is in a web or away from webs (tests of independence NS for all rows). Data in this table are from only those test pairs in which salticid chose prey in a single test (see Tables 7 and 9). Choosing in tests with lures in web defined as moving toward web (not necessarily entering web).

| Salticid | Hunger state | Other insect | Ant | Chose ant in tests using lures away from webs | Chose ant in tests using lures in webs |
|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Musca domestica* | *Prolasius* sp. | 90% | 87% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 90% | 93% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 87% | 87% |
| | Starved[2] | Diptera: *Musca domestica* | *Prolasius* sp. | 83% | 83% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 83% | 84% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 91% | 81% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Prolasius* sp. | 50% | 44% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 57% | 55% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 43% | 60% |
| *Zendorus orbiculatus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 83% | 80% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 88% | 85% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 88% | 78% |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 83% | 88% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 100% | 79% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 87% | 77% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 69% | 56% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 50% | 40% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 43% | 50% |
| *Zenodorus metallescens* | Well fed[1] | Diptera: *Musca domestica* | *Polyrachis* sp. | 86% | 76% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 84% | 70% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 90% | 70% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 100% | 79% |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | 82% | 76% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 84% | 74% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 92% | 77% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 87% | 78% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | 67% | 37% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 83% | 53% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 60% | 40% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 60% | 50% |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.

**Table 17** Additional analysis of data from simultaneous-presentation tests using lures. No evidence that strength of preference for ants depends on whether lure is in a web or away from webs (tests of independence NS for all rows). Data in table are from only those tests in which salticid chose prey (see Tables 8 and 10). Choosing in tests with lures in web defined as moving toward web (not necessarily entering web).

| Salticid | Hunger state | Other insect | Ant | Chose ant in tests using lures away from webs | Chose ant in tests using lures in webs |
|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Musca domestica* | *Prolasius* sp. | 92% | 77% |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 84% | 76% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 94% | 76% |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 94% | 77% |
| | Starved[2] | Diptera: *Musca domestica* | *Prolasius* sp. | 82% | 72% |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 81% | 78% |
| | | Hemiptera: bug | *Crematogaster* sp. | 87% | 76% |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 81% | 78% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Prolasius* sp. | 58% | 57% |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 53% | 57% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 43% | 58% |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 52% | 59% |
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 85% | 75% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 89% | 78% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 91% | 73% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 79% | 68% |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 93% | 78% |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 85% | 73% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 91% | 78% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 81% | 88% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 86% | 72% |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 91% | 74% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 56% | 55% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 50% | 59% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 57% | 54% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 51% | 52% |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 55% | 58% |
| *Zenodorus metallescens* | Well fed[1] | Diptera: *Musca domestica* | *Polyrachis* sp. | 90% | 73% |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 94% | 71% |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 86% | 75% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 88% | 72% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 91% | 77% |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 89% | 75% |
| | | Orthoptera: *Metioche maoricum* | *Polyrachis* sp. | 100% | 70% |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | 82% | 75% |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 81% | 75% |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 81% | 74% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 81% | 69% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 84% | 78% |

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**Table 17** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose ant in tests using lures away from webs | Chose ant in tests using lures in webs |
|---|---|---|---|---|---|
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 80% | 74% |
| | | Orthoptera: *Metioche maoricum* | *Polyrachis* sp. | 91% | 76% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | 65% | 62% |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 54% | 58% |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 58% | 59% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 65% | 50% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 60% | 57% |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 57% | 50% |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | 50% | 57% |

[1] Kept without prey for 5 days prior to testing. [2] Kept without prey for 15 days prior to testing. [3] Kept without prey for 21 days prior to testing.

**Table 18** Additional analysis of data from alternate-day tests using lures. No evidence that strength of preference for ants depends on whether lure is in a web or away from webs (tests of independence NS for all rows). Data in this table are from only those test pairs in which salticid chose prey in a single test (see Tables 7 and 9). Choosing in tests with lures in web defined as entering web.

| Salticid | Hunger state | Other insect | Ant | Chose ant in tests using lures away from webs | Chose ant in tests using lures in webs |
|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Musca domestica* | *Prolasius* sp. | 90% | 100% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 90% | 100% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 87% | 100% |
| | Starved[2] | Diptera: *Musca domestica* | *Prolasius* sp. | 83% | 100% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 83% | 100% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 91% | 100% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Prolasius* sp. | 50% | 100% |
| | | Ephemeroptera: *Baetis* sp. | *Camponotus* sp. | 57% | 100% |
| | | Hemiptera: *Nephotettix nigropictus* | *Monomorium antarcticum* | 43% | 100% |
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 83% | 100% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 88% | 100% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 88% | 92% |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 83% | 100% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 100% | 100% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 87% | 92% |

*continued*

**Table 18** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose ant in tests using lures away from webs | Chose ant in tests using lures in webs |
|---|---|---|---|---|---|
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 69% | 100% |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 50% | 100% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 43% | 100% |
| *Zenodorus metallescens* | Well fed[1] | Diptera: *Musca domestica* | *Polyrachis* sp. | 86% | 100% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 89% | 100% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 90% | 86% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 100% | 100% |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | 82% | 89% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 84% | 91% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 92% | 83% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 87% | 94% |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | 67% | 100% |
| | | Hemiptera: mirid | *Crematogaster* sp. | 83% | 100% |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 60% | 100% |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 60% | 100% |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.

**Table 19** Additional analysis of data from simultaneous-presentation tests using lures. No evidence that strength of preference for ants depends on whether lure is in a web or away from webs when salticid is well fed or starved. For extra-starved salticids, preference for ants stronger when lure is in a web. Data in this table are from only tests in which spider chose prey (see Tables 8 and 10). Choosing in tests with lures in web defined as entering web.

| Salticid | Hunger state | Other insect | Ant | Chose ant in tests using lures: away from webs | in webs | Test of independence |
|---|---|---|---|---|---|---|
| *Zenodorus durvillei* | Well fed[1] | Diptera: *Musca domestica* | *Monomorium* sp. | 92% | 100% | NS |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 84% | 100% | NS |
| | | Hemiptera: mirid | *Crematogaster* sp. | 94% | 100% | NS |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 94% | 100% | NS |
| | Starved[2] | Diptera: *Musca domestica* | *Monomorium* sp. | 82% | 92% | NS |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 81% | 100% | NS |
| | | Hemiptera: mirid | *Crematogaster* sp. | 87% | 100% | NS |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 81% | 100% | NS |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Monomorium* sp. | 58% | 86% | $P < 0.01$ |
| | | Diptera: *Culex* sp. | *Monomorium antarcticum* | 53% | 100% | $P < 0.05$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 43% | 100% | $P < 0.001$ |
| | | Hemiptera: *Nilaparvata lugens* | *Iridomyrmex darwinanus* | 52% | 100% | $P < 0.01$ |

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**Table 19** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose ant in tests using lures: away from webs | Chose ant in tests using lures: in webs | Test of independence |
|---|---|---|---|---|---|---|
| *Zenodorus orbiculatus* | Well fed[1] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 85% | 87% | NS |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 89% | 100% | NS |
| | | Hemiptera: mirid | *Crematogaster* sp. | 91% | 100% | NS |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 79% | 81% | NS |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 93% | 94% | NS |
| | Starved[2] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 85% | 91% | NS |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 91% | 100% | NS |
| | | Hemiptera: mirid | *Crematogaster* sp. | 81% | 100% | NS |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 86% | 91% | NS |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 91% | 100% | NS |
| | Extra-starved[3] | Diptera: *Musca domestica* | *Oecophylla smaragdina* | 56% | 100% | $P < 0.01$ |
| | | Hemiptera: *Nephotettix nigropictus* | *Camponotus* sp. | 50% | 81% | $P < 0.01$ |
| | | Hemiptera: mirid | *Crematogaster* sp. | 57% | 100% | $P < 0.05$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 51% | 83% | $P < 0.05$ |
| | | Neuroptera: *Micromus tasmaniae* | *Polyrachis* sp. | 55% | 100% | $P < 0.05$ |
| *Zenodorus metallescens* | Well fed[1] | Diptera: | *Polyrachis* sp. *Musca domestica* | 90% | 100% | NS |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 94% | 100% | NS |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 86% | 100% | NS |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 88% | 87% | NS |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 91% | 100% | NS |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 89% | 100% | NS |
| | | Orthoptera: *Metioche maoricum* | *Polyrachis* sp. | 100% | 100% | $P < 0.05$ |
| | Starved[2] | Diptera: *Musca domestica* | *Polyrachis* sp. | 82% | 93% | NS |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 81% | 89% | NS |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 81% | 100% | NS |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 81% | 86% | NS |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 84% | 100% | NS |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 80% | 100% | NS |
| | | Orthoptera: *Metioche maoricum* | *Polyrachis* sp. | 91% | 100% | NS |

*continued*

**Table 19** *Continued*

| Salticid | Hunger state | Other insect | Ant | Chose ant in tests using lures: away from webs | Chose ant in tests using lures: in webs | Test of independence |
|---|---|---|---|---|---|---|
| | Extra-starved[3] | Diptera: *Musca domestica* | *Polyrachis* sp. | 65% | 95% | $P < 0.05$ |
| | | Diptera: *Lucillia* sp. | *Oecophylla smaragdina* | 54% | 100% | $P < 0.05$ |
| | | Hemiptera: *Siphanta* sp. | *Camponotus* sp. | 58% | 93% | $P < 0.05$ |
| | | Isoptera: *Nasutitermes* sp. | *Camponotus* sp. | 65% | 100% | $P < 0.05$ |
| | | Mantodea: *Orthodera* sp. | *Monomorium antarcticum* | 60% | 100% | $P < 0.001$ |
| | | Neuroptera: *Micromus tasmaniae* | *Tapinoma* sp. | 57% | 100% | $P < 0.05$ |
| | | Orthoptera: *Metioche maoricum* | *Oecophylla smaragdina* | 50% | 100% | $P < 0.05$ |

[1] Kept without prey for 7 days prior to testing. [2] Kept without prey for 14 days prior to testing. [3] Kept without prey for 21 days prior to testing.

## DISCUSSION

### Specialisation in myrmecophagic salticids

All ants belong to a single family, Formicidae, in the order Hymenoptera. About 9000 species in 297 genera have been described. Twelve subfamilies are recognised, for most of which there is further division into tribes (Holldobler & Wilson 1990). In the present study, we used 17 genera from five subfamilies (Table 2), with representatives from two and four tribes of Dolichoderinae and Formicinae, respectively. Six of the genera were formicines, another six were myrmicines, three were dolichoderines, one was a myrmecine and one was a pseudomyrmecine.

The other insects came from ten orders (Table 2). We used an especially wide variety of Diptera (8 families represented), Hemiptera (8 families) and Lepidoptera (5 families). Hemiptera is divided into three suborders, and we used representatives of each: Stenorrhyncha (Aleyrodidae, Aphidae), Auchenorrhyncha (Cicadellidae, Cixiidae, Delphacidae, Flatidae, Ricaniidae) and Heteroptera (Miridae). Lepidoptera included both larvae (i.e., caterpillars) and adults. Otherwise, all holometabolous insects used were adults. The hemimetabolous insects we used included both adults and nymphs. Despite the wide range of ant species and other insects used, the three species of *Zenodorus* consistently chose ants more often than other prey.

*Zenodorus durvillei*, *Z. metallescens* and *Z. orbiculatus*, along with 21 species previously studied (Edwards et al., 1974; Cutler 1980; Jackson & van Olphen 1991, 1992; Jackson et al. 1998; Li et al. 1996, 1999), appear to be exceptions to the rule that salticids are averse to ants as prey (Bristowe 1941). "Myrmecophagic" is an appropriate term for these 24 species. It might also be appropriate to call these species "ant-specialists", but the term "specialist" can be applied to a variety of adaptations in a predator. Clarifying precisely how myrmecophagic salticids have become specialised on ants is one of our long-term goals.

One way in which myrmecophagic salticids are "specialists" is by having diets that are special: unlike the majority of salticids, they readily feed on ants. However, no myrmecophagic species are known to feed exclusively on ants. Instead, each of the 24 species studied also feeds on a wide range of other prey both in the laboratory and in nature (Jackson & van Olphen 1991, 1992; Jackson et al. 1998; Li et al. 1996, 1999).

Another way in which myrmecophagic species are specialised is by adopting special prey-capture tactics against ants. These tactics are pre-programmed (i.e., not dependent on prior experience with ants), consistent with these species having become adapted over evolutionary time to their unusual prey. However, details of prey-capture behaviour vary among the species. The higher order systematics of salticids is poorly understood, but the 24 myrmecophagic species can be assigned at least tentatively to three subfamilies, Aelurillinae (*Aelurillus*), Euophrynae (*Chalcotropis*, *Anasaitis*, *Habrocestum*, *Xenocytaea*, and *Zenodorus*) and Heliophanae (*Chrysilla*, *Natta*, and *Siler*). The myrmecophagic heliophanines routinely attack ants from directly behind in stab-and-release sequences. Greater variation is evident in the myrmecophagic euophryines and aelurillines. *Aelurillus* spp., *Anasaitis canosa*, *Habrocestum pulex*, and *Xenocytaea* spp. (formerly *Euophrys* spp.) manoeuvre to attack ants head-on. In *Chalcotropis*, small ants are attacked from more or less any orientation, but attacks on large ants are consistently oriented head-on. When in active pursuit, the capture behaviour of *Zenodorus durvillei*, *Z. metallescens* and *Z. orbiculatus* against ants and other insects is more or less the same. However, active pursuit is but one of three prey-capture tactics used by these three species, with the other two (ambushing and taking prey from the webs of other spiders) being deployed primarily against ants.

Use of different prey-capture tactics for different kinds of prey is a conditional predatory strategy, an example of predatory versatility (Curio 1976). Pronounced predatory versatility is also found in araneophagic (spider-eating) spartaeine salticids (Jackson, 1992a). In common with ants, spiders tend to be especially dangerous prey for a salticid, and it appears that inclusion of unusual and dangerous prey in a salticid's diet has favoured the evolution of especially pronounced predatory versatility (Jackson 1992a,b; Li & Jackson 1996a). This is consistent with general theory that predicts prey-specific adaptations will be found primarily when predators take exceptionally dangerous prey (Brodie & Brodie 1999).

### Influence of hunger on strength of preference

When well-fed (i.e., after a fast of only 1 week), the three species of *Zenodorus*, along with the other 21 myrmecophagic species that have been studied (Jackson & van Olphen 1991, 1992; Jackson et al. 1998; Li et al. 1996, 1999), showed consistent preference for ants over other insects in three types of tests. Like prey-specific capture behaviour, the preferences of these species appear to be pre-programmed (i.e., preference did not depend on prior experience with ants). However, there appears to be considerable interspecific variation in how longer fasting periods affect preference. In earlier studies *Chrysilla lauta*, *Corythalia canosa*, *Natta* spp., *Siler* spp., and *Zenodorus orbiculatus* (Li et al. 1996) took ants and other insects indiscriminately after a 2-week fast. In *Aelurillus* spp., *Chalcotropis* spp., *Habrocestum pulex*, and *Xenocytaeae* spp., preference for ants was still pronounced after a 2-week fast. However, after a 3-week fast, all species tested took ants and other insects indiscriminately. Why the effects of fasting on preference vary interspecifically is poorly understood. However, maintenance diet appears to be an important variable.

In the earlier study of *Z. orbiculatus* (Jackson & van Olphen 1991), the diet used for maintenance feeding was primarily *Drosophila melanogaster* and *Musca domestica*. Most individuals in the present study were reared on a wider array of insects. However, when we replicated the diet used in the previous study, the outcome in preference tests was consistent with the earlier findings.

Regardless of diet, *Zenodorus orbiculatus* that had fasted for 2 weeks took ants in preference to other prey in simultaneous-presentation tests, but diet influenced findings in alternate-day tests. Salticids maintained on a varied diet took ants in preference to other insects in alternate-day tests after 2-week fasts, but salticids maintained on a limited diet took ants and other prey indiscriminately after a 2-week fast. These comparisons suggest that, as assays of preference, simultaneous-presentation tests are more sensitive than alternate-day tests. More specifically, they suggest that the preferences of salticids break down under the stress of hunger and that diet affects how severely fasting will stress a spider.

Except when nutritionally stressed, predators are expected to select more profitable prey (Stephens & Krebs 1986), and preference for ants suggests that ants are for myrmecophagic salticids nutritionally more profitable than other potential prey. More specifically, models based on optimal foraging and risk-sensitivity theory (Pyke et al. 1977; Caraco et al. 1980; McNamara & Houston 1990) suggest that selective foraging becomes disadvantageous when prey become scarce and predators become nutritionally stressed. A common prediction is that, when nutritionally-stressed, predators will switch from highly selective to more or less indiscriminate foraging. Findings here and from earlier experiments on myrmecophagic and araneophagic salticids (Li & Jackson 1996a) are consistent with this prediction, showing that pronounced preference for ants and spiders, respectively, changes to indiscriminate feeding after lengthy pre-test fasts. Findings from rearing *Zenodorus* spp. on a limited diet suggest that a diet of *D. melanogaster* and *M. domestica* alone is nutritionally deficient. This diet evidently impairs the ability of individuals to withstand the stress of a 2-week fast, with these individuals after 2 weeks becoming more or less equivalent to individuals on a better diet after a 3-week fast.

The behaviour of choosing one prey over another is a behavioural adaptation and distinctly different from the question of what prey are taken by a predator in nature (its diet) and also distinctly different from the question of what behaviour a predator uses to capture prey. Although not a logical necessity, in *Zenodorus* spp. and all other myrmecophagic salticids that have been studied, diet, capture behaviour and preference have converged. Diet, capture behaviour and preference have also been studied, and shown to have converged, in four genera of araneophagic salticids.

Using a variety of testing methods provides the potential for assessing the strength of preferences. Simultaneous-presentation testing might be envisaged as the most straight-forward assay for preference and the type of testing most likely to reveal any preference that might be present. This is because, in these tests, the salticid has access to two potential prey at the same time and can make a choice during a single test interval to take one while the other is present.

Alternate-day testing might be envisaged as more demanding because in these tests a spider's inclination to take each type of prey is assessed in isolation from the other prey. Spiders that are especially inclined to take one type of prey (when only this one type of prey is available) and relatively disinclined to take the other type (when only this other type of prey is available) provide evidence of preference. The rationale for viewing this as more demanding is the idea that a spider might prefer one type of prey over another but not be willing to pass up an opportunity to take the less preferred prey when only the less preferred prey is available at the time.

Alternative-prey tests might be envisaged as even more demanding because spiders are offered a second prey after they have already captured and begun feeding on the first. Showing preference in these tests requires that the spider release an already secured prey to capture an alternative.

Each of these three testing methods has been used in studies on all 24 species of myrmecophagic salticids. Regardless of testing method, whenever a preference has been shown, it has been a preference for ants. Findings from araneophagic salticids are more variable. The same three methods (alternate-day, simultaneous-presentation and alternative-prey testing) have been used in studies on *Brettus*, *Cocalus*, *Cyrba* and *Portia* (Jackson et al. 1998; Li & Jackson 1996b; Li et al. 1996, 1999), four genera of araneophagic salticids. By two criteria, alternate-day testing and simultaneous-presentation testing, all araneophagic salticids studied have been shown to have a significant preference for spiders over other prey. Findings from alternative-prey testing have revealed a significant preference for spiders in *Portia*, but no significant preference in the other three genera. This has been interpreted as showing that *Portia* more strongly than *Brettus*, *Cocalus* and *Cyrba* prefers spiders, with alternative-prey testing being the type of testing that resolves this difference among the genera.

Findings from testing *Zenodorus* spp. kept on a limited maintenance diet support the hypothesis that alternate-day testing is a more demanding assay of preference than simultaneous-presentation testing. When well-fed, all three types of testing revealed significant preference for ants regardless of maintenance diet. When the spiders had been maintained on the standard diet (i.e., a variety of insects), but starved *Zenodorus* that had been maintained on the limited diet (i.e., only *D. melanogaster* and *M. domestica*) took ants in preference to other prey in only the simultaneous-presentation tests. Starved *Zenodorus* that had been maintained on a limited diet resembled extra-starved *Zenodorus* when alternate-day and alternative prey tests were used: they appeared to take prey indiscriminately.

Starved spiders that had been maintained on the limited diet appeared to have been stressed nutritionally to a level sufficient to mitigate against expressing preference in alternate-day and alternative-prey tests, but insufficiently to override preference in simultaneous-presentation tests. Extra-starved spiders, even when they had been maintained on the standard diet, may have been stressed nutritionally to a level where discriminating between preferred and non-preferred prey is no longer optimal in the situations simulated in any of these three types of tests.

## Taking prey from webs

*Zenodorus* adopted a prey-capture tactic not known for other myrmecophagic salticids: it attacked ants by entering spider webs. *Zenodorus durvillei* and *Z. orbiculata* not only prey on ants they find in alien webs but also use webs as nesting sites. Ants are extraordinarily abundant in the tropics (Holldobler & Wilson 1990) and they are routinely found in the webs of a wide variety of spiders. Most salticids probably stay out of other spiders' webs, but there are numerous exceptions (Jackson 1986). The most extensively studied exceptions are the web-invading araneophagic spartaeines.

Among salticids, only spartaeines are known to make aggressive-mimicry signals, and these signals are reserved primarily for spider prey. However, despite their preferred prey being spiders, web-invading spartaeines opportunistically take the insects from the alien webs they invade (Jackson 1992b). Only rarely, and briefly, do spartaeines make aggressive-mimicry signals when pursuing insects in webs (Jackson & Hallas 1986). There are, however, salticids other than spartaeines, that take spiders and insects from alien webs (Jackson & Pollard 1996). Few details are available for most of these, but prey-capture usually appears to be achieved by leaping into the web.

*Zenodorus durvillei*, *Z. metallescens* and *Z. orbiculatus* appear to be the first salticids for which predation on ants in webs has been documented. The webs *Zenodorus* spp. invaded included the very sticky cribellate webs of *Badumna* spp. Web-invading spartaeines can move freely through cribellate webs because the cribellate glue in these webs does not adhere to the spartaeine's cuticle (Jackson & Pollard 1996), but close contact with cribellate silk is detrimental to *Zenodorus* spp. They get stuck. Movement through cribellate webs by *Zenodorus* spp. appears to depend largely on skill at using detritus in the web as a path.

## Web invasion and preference strength

Web invasion gave us an additional assay for assessing preference strength. When the criterion for having chosen a prey was web entry in tests with webs present, but only approaching prey in the absence of webs, our test spiders often failed to choose at all when the prey was in a web, although choosing a prey was common whenever prey was outside webs. Compared with stalking and leaping on prey found outside webs, entering a web to capture prey would appear to demand a higher level of commitment by the salticid. Entering a web, for instance, is likely to be especially risky and especially likely to take much time.

When the criterion for "preference" was entering a web, even extra-starved *Zenodorus* spp. showed preference for ants in simultaneous-presentation testing. This is the only assay that was effective at showing a preference when salticids were extra-starved, consistent with web invasion being an especially demanding assay of preference.

## Visual acuity

*Zenodorus* spp. stalked and attacked motionless lures using the same prey-specific capture behaviour observed in tests with live, motile prey and also consistently chose ants in preference to other prey regardless of whether tests were with live, motile prey or dead, motionless lures. This held despite the wide array of ants and other insects used.

These and earlier findings illustrate the remarkable acuity of the salticid eye (see Harland & Jackson 2000). Even in the absence of prey movement, optical cues alone permit these myrmecophagic salticids to distinguish ants from bugs, cockroaches, crickets, flies, lacewings, mantises, plant and leaf hoppers, psocids and mayflies. Even termites, which humans often mistake for ants, were distinguished by the *Zenodorus* spp. from ants in the absence of cues from different movement patterns.

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