populations simplify their behavior in courtship as a result of founder effects. Thus, females in the ancestral population discriminated against males from the derived population, while females from the derived population not only accepted courtship with males from the ancestral population, but sometimes even preferred them over males from their own population. Similar results for *D. mercatorum* subspecies were observed by Koeper and Fensten (1991), who found asymmetric mating between different geographic strains of *D. mercatorum*. However, their results did not allow to accurately infer direction of evolution between *D. mercatorum* subspecies.

The asymmetries observed in the intrasubspecific crosses show that males from lines with extreme IPI and FF values are accepted preferentially by females from lines with medium values for these parameters. This suggests a stabilizing selection on sound A. This fact agrees with the prediction made by Ewing and Myian (1986) after analyzing the sound of the species from the *repleta* group. According to these authors, sound A may be considered an isolating or identifying signal in the species that takes place at the beginning of courtship. It is unambiguous and subject to stabilizing selection.

Our results show that there is variation in the sexual behavior of *D. mercatorum* and it could not be explained by an exclusive hypothesis, instead it should be a byproduct of the modifications of the evolutionary process involving this species.

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The attractiveness of *Drosophila* bait to arachnid predators and hymenopteran parasitoids.

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Introduction

When trapping drosophilids in the field it is not unusual to collect a number of hymenopteran parasitoids in the same traps. The parasitoids are attracted to olfactory cues from their host's resource in order to locate hosts for their larvae (*e.g.*, Carton *et al.*, 1986; Vet *et al.*, 1984; van Alphen *et al.*, 1991).

During a survey of drosophilids in New Zealand orchards, it was noticed that spiders and harvestmen were often found in the fruit-baited traps. *Drosophila* are often used as food for spiders maintained in laboratory cultures and appear suitable prey for a wide variety of spider families (*e.g.*, Linyphiidae - Turnbull, 1962; Lycosidae - Hardman and Turnbull, 1974; Salticidae - Edwards and Jackson, 1994; Theridiidae - Rypstra, 1993; Thomisidae - Pollard, 1989). Some spiders make foraging decisions based on previous success, suggesting they use 'learnt' information to influence subsequent foraging effort (*e.g.*, Pasquet *et al.*, 1999) and some species locate webs in sites containing insect attractants (Janetos, 1986). Spiders are known to have olfactory capabilities (Foelix, 1996) and we hypothesized that the spiders found in our *Drosophila* traps may be using cues from the fermenting fruit bait in order to locate a site that is rich in dipteran prey.

The aim of this investigation was to systematically assess whether spiders were attracted to *Drosophila* bait or were simply using the traps as suitable shelters or web sites. In carrying out the investigation, we also gained information on the attractiveness of the *Drosophila* bait to hymenopteran parasitoids in New Zealand.

Methods

The investigation was carried out in six sites in the Christchurch region of Canterbury, New Zealand, between November 1998 and June 1999. The sites were chosen so as to represent a variety of different habitat types utilized by *Drosophila*. The sites were an organic orchard (Lincoln University, Canterbury), a sub-urban garden (Riccarton, Christchurch), a native forest remnant (Riccarton Bush, Christchurch), a recently planted forest restoration site (King George V Reserve, Christchurch), a conifer plantation (near Lincoln, Canterbury) and farm out-buildings (Prebbleton, Canterbury).

Plastic containers (60 mm high; 40 mm diameter) with yellow plastic lids were used as the trapping vessels. Nine holes (4mm diameter) were drilled into the lids to allow entry of animals. The traps were either baited with pieces of ripe banana ($\approx$ 20 g) or left unbaited. Thirty replicates of baited and unbaited traps were placed on the ground at each field site. The traps were placed on their sides, so that the lids were perpendicular to the ground. The traps were left in the field for 10 days and then collected and returned to the laboratory. The presence or absence of drosophilids, hymenopteran parasitoids and spiders in each trap was recorded. The distribution of each major taxa between baited and unbaited traps at each site was assessed using χ^2 tests. The heterogeneity of the distributions between sites was also assessed and, if viable, a χ^2 test using Cochrane's method was then performed on the pooled data (Zar, 1984).

Results

Four species of *Drosophila* were collected; *D. melanogaster*, *D. pseudoobscura*, *D. immigrans* and *D. neozealandica*. As expected, *Drosophila* showed a highly significant association with the banana bait (pooled data $\chi^2 = 198.4$ for 1 df; $P < 0.001$) and - with one exception - were found only in baited traps (Tables 1 and 2).

Eight different families of hymenopteran were collected (Table 1). In the first three trials, Hymenoptera were significantly more likely to be found in baited traps than in unbaited traps (Table 2). However, the Hymenoptera collected from the pine plantation showed no significant bias to either baited or unbaited traps and, due primarily to the late season, only a single specimen was collected at both the remnant forest and around the farm buildings. The distribution of Hymenoptera was, therefore, significantly heterogeneous between sites ($\chi^2 = 19.2$ for 5 df; $P < 0.01$) and the data could not legitimately be pooled for an overall analysis.

At least five families of spider (Anapidae, Linyphiidae, Lycosidae, Salticidae and Theridiidae) were found inside the traps, along with a number of unidentifiable juveniles (Table 1). Spiders were relatively rare, being present in only 30 of the 360 traps (Table 2). Although there was an overall trend towards spiders being found in baited traps this was not statistically significant within any one site or for the overall collection (Table 2; pooled data $\chi^2 = 1.8$ for 1 df; $P > 0.10$).

Discussion

The results tend to confirm the attractiveness of *Drosophila* baits to parasitoid wasps, which showed a clear preference in three of the six sites. On the last two sampling occasions too few Hymenoptera were captured to make any sound judgments. The Hymenoptera collected in the pine forest showed a spurious distribution, in that they were equally occurrent in baited traps as in unbaited. We have no immediate explanation for this result.

Table 1. Species of *Drosophila*, families of parasitoid Hymenoptera and species of spiders found in *Drosophila* traps at each of the field sites. (B - baited traps; U - unbaited traps).

	Family	Orchard		Garden		Restoration		Pines		Remanant		Farm	
		B	U	B	U	B	U	B	U	B	U	B	U
Drosophila	*D. immigrans*	✓	-	✓	-	✓	-	✓	-	✓	-	✓	✓
	D. melanogaster	✓	-	-	-	-	-	-	-	-	-	✓	-
	D. neozealandica	-	-	-	-	✓	-	-	-	✓	-	-	-
	D. pseudoobscura	✓	-	✓	-	✓	-	✓	-	✓	-	✓	-
Hymenoptera	Bethylidae	-	-	✓	-	-	-	-	-	-	-	-	-
	Braconidae	✓	-	✓	-	✓	✓	-	-	-	-	-	-
	Diapriidae	-	-	-	-	-	-	✓	✓	-	-	-	-
	Encyrtidae	✓	-	-	-	-	-	-	-	-	-	-	-
	Eulophidae	-	-	-	-	-	-	-	-	-	✓	-	-
	Figitidae	-	-	-	-	-	-	✓	-	-	-	-	-
	Ichneumonidae	-	-	-	-	-	-	✓	✓	-	-	-	-
	Pteromalidae	-	-	-	-	-	-	-	-	-	-	✓	-
Spiders													
Anapidae	*Zealanapis armata*	-	-	-	-	-	-	-	-	✓	-	-	-
Linyphiidae	*Araeoncus humilis*	-	-	-	-	-	-	-	-	✓	-	-	✓
	Diplocephalus cristatus	-	-	-	-	-	-	-	-	✓	✓	-	✓
	juveniles	✓	-	-	-	✓	-	✓	-	-	-	-	-
Lycosidae	*'Lycosa' hilaris*	✓	-	✓	-	-	-	-	-	-	-	-	-
Salticidae	juveniles	-	-	-	-	-	✓	-	-	-	-	-	-
Theridiidae	undescribed sp1	-	-	-	-	-	-	✓	✓	-	-	-	-
	undescribed sp2	✓	✓	-	-	-	-	-	-	-	-	-	-
	juveniles	✓	✓	-	-	-	✓	-	✓	-	-	✓	-
unknown	juveniles	✓	-	✓	-	✓	✓	-	-	-	-	-	-

Table 2. Number of baited and unbaited traps containing *Drosophila*, hymenopteran parasitoids and spiders at each of six sites near Christchurch, New Zealand (N = 30).

Site	Date	*Drosophila*		Parasitoids		Spiders	
		baited	unbaited	baited	unbaited	baited	unbaited
Organic orchard	30/11/98	29	0*	10	0*	5	3
Sub-urban garden	22/12/98	19	0*	11	0*	4	0
Restoration site	29/3/99	25	0*	10	2*	2	3
Pine plantation	21/4/99	10	0*	7	10	2	2
Remnant forest	20/5/99	19	0*	0	1	5	1
Farm out-buildings	1/6/99	20	1*	1	0	1	2
Total (N = 180)		122	1*	39	13	19	11

* - significant preference for baited traps identified using χ^2 test; P<0.05

Our casual observation that spiders were frequent visitors to *Drosophila* traps did not withstand systematic examination. We found fewer spiders than expected, and those that were collected showed no significant preference towards baited traps. However, as almost two thirds of spiders collected were caught in the baited traps, this issue may warrant further investigation. Separating spiders into different families or species may reveal more detailed patterns in preference of foraging site. Also, the use of olfactometer experiments in the laboratory may clarify whether certain species of spider are attracted to *Drosophila* resources.

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Factors of spontaneous mutations, mutability in large chromosomes and mortality from dominant lethals in *Drosophila melanogaster*.

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The ideas are widespread that changes of the natural radiation background increase the rate of mutability and are responsible for such prominent events in life on the Earth as extinction of fossil faunas (dinosaurs are mentioned most frequently), outbreaks of pest reproduction, epizooites and other phenomena believed to be associated with emergence of mutations causing resistance to pesticides and of more virulent or antibiotic-resistant microbial strains. However, 1) mutations are destructive and have nothing to do with biogenesis (Ivanov and Ivannikov, 1997), that is why the above ideas about the emergence of new forms with a heightened fitness are extremely doubtful. It is not new mutant forms that arise, it is that tolerable hereditary types preadapted to new conditions which are inherent in the given species from its very origin, but rare under the usual conditions, begin to reproduce more intensely. The species becomes adapted to various possible