War, indicates a recent colonization by both *Dolichopoda* species. Electrophoretic analysis pointed out that these 2 species are fixed for alternative alleles at the phosphohexose isomerase locus *(Phi)*, so they are clearly distinguishable. Out of an overall sample of 164 specimens we found 15 hybrids identified by their heterozygous pattern at the *Phi* locus (table 2). The relative frequency of hybrids was similar in different samples, the sex ratio was about one, and both nymph and adult hybrid specimens were scored. With respect to morphology, *D. schiavazzii* differs from *D. baccettii* in the occurrence of a series of spines on the hind femurs. Hybrids show this trait, and, on this basis, are not distinguishable from *D. schiavazzii*. Moreover, to verify the possibility of hybridization in the laboratory, we made some crosses ♀ *schiavazzii* × ♂ *baccettii*, obtaining hybrids with the same electrophoretic pattern as specimens collected in nature.

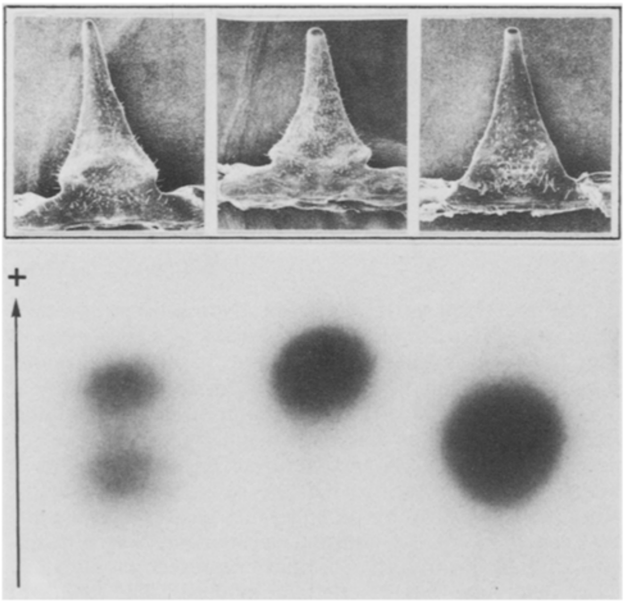

Figure 2. Epiphallus morphology and electrophoretic pattern at the *Pgm* locus of *D. laetitiae* (on the right), *D. geniculata* (in between) and their hybrid (on the left).

The occurrence of some introgression cannot be excluded even if these preliminary data cannot provide positive evidence of it in both situations examined. Our results suggest that premating isolating mechanisms against gene exchange among *Dolichopoda* species are weak. This is frequently observed among allopatric species, where reproductive isolation is not reinforced by natural selection. The observed hybridization rate between *D. baccettii* and *D. schiavazzii* was about 10%, while it was approximately 3-4% between *D. laetitiae* and *D. geniculata*. These high values are in good agreement with the small amount of genetic differentiation between these 2 pairs of species, suggesting that they have recently speciated, or are still in the process of speciation. In fact the genetic distances (D of Nei[7]) between parental species range from 0.182 to 0.192[4]; these values are lower than those frequently reported between species, and are similar to those found in semispecies comparisons[8,9].

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Effect of *Blumea eriantha* (compositae) oil on reproduction in *Earias vittella* F.

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Summary. Exposure of *Earias vittella* adults to vapors of *Blumea eriantha* oil reduced their mating ability, predominantly the males were affected.

In India, spotted the boll worm *(Earias vittella)* is one of the major insect pests of cotton and other cultivated malvaceous plants. In our earlier study on the antifeedant role of the non-host plants of this insect, it was observed that leaves of *Blumea eriantha*, a wildly growing weed, were totally rejected by the larvae as food even when no other food was available[1]. In our studies on the deterrent effects in the oil from this non-host plant on the oviposition of the boll worm, it was observed that when the moths were given a choice, there was no significant difference in the number of eggs deposited on treated and untreated parts of the oviposition substrate. However, compared to the controls, the total egg laying was reduced and the preoviposition period increased significantly. It therefore appeared that the oil vapors affected some component of reproduction. We report our findings on this aspect.

Materials and methods. Insects were reared in the laboratory and the oil was extracted as described earlier[1,2]. 20 freshly emerged male and female moths, sexed in the pupal stage, were separately exposed in a tightly stoppered 250 ml glass conical flask to oil vapors emanating from filter paper discs kept at the bottom of the flask. 20 µl of the pure oil were pipetted on the filter paper disc and care was taken to prevent contact of the moths with the treated papers. At the end of 20 min exposure, males and females were paired with untreated ones, and single pairs were caged in plastic containers covered with a black cloth. Cotton wadding soaked in 10% sucrose solution served as the food source. In another experiment, 20 males were similarly exposed to varying quantities of the oil and crossed with untreated females. Eggs laid and hatched were recorded daily. In both experiments the females were dissected after death to ascertain mating by scoring the presence of spermatophores in the bursa.

Results and discussion. 75% of the control females mated and laid, on the average, 238 eggs/female 2-7 days after pairing. Only 40% of the treated females mated and they laid, on the average, 142 eggs/female after 7.5 days. On the other hand, only 1 (5%) of the treated males mated and the female laid 81 eggs after 13.9 days. Similar results were obtained when the experiment was repeated with a larger number of insects. In the 2nd experiment, matings between treated males and untreated females increased as the amount of the oil was successively reduced (table). In all the experiments the preoviposition period increased with the increase in the quantity of oil, but average egg laying per female under control and under treated conditions did not differ significantly.

Effect of *Blumea eriantha* oil on reproduction in *Earias vittella* F. males

	Amount of oil (µl)			
	0	5	10	15
Matings (%)	90.0	70.0	15.0	10.0
Preoviposition period (days)	3.3	5.1	5.3	7.0
Eggs per mated female	314	249	217	299
Egg hatch (%)	93.9	92.9	95.3	81.2

Extension of the preoviposition period in the case of treated moths resulted not from the repellent action of the oil but was due probably to the delay in mating. This became evident when mated females were provided with treated oviposition sites; they laid the same number of eggs at the same time as those in the control situation. It therefore appears that Blumea oil through vapor action interferes predominantly with some component of the mating behavior of males. High concentration of vapors of an essential oil from *Acorus calamus* have been shown to impede copulation in *Dysdercus koenigii*[3].

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An attractant pheromone with common properties in three reptile ticks

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Summary. Female reptile ticks produce a pheromone which attracts conspecific, and less strongly, non-conspecific males over short distances.

Animal mating behaviour involves a series of signals and responses between males and females[1], which have the function of ensuring efficient fertilization[2]. In ticks pheromone signals have been widely reported[3-9]. In the reptile tick, *Aponomma hydrosauri*, male searching starts in response to a signal from females which have fed on a host for over 5 days[10,11]. Searching is not directed specifically towards the female[10]. This paper discusses how a searching male locates and recognizes a receptive female. 3 reptile tick species were used to compare responses between conspecifics and non-conspecifics.

Materials and methods. Laboratory stocks of *A. hydrosauri* originated from Tickera, *Amblyomma limbatum* from Mt. Mary, and *Amblyomma albolimbatum* from Arno Bay, all in South Australia. Newly moulted adults were kept in separate vials for 1-8 months. Males and females were attached to separate, individually isolated lizards, *Trachydosaurus rugosus*, for 14 days, and then detached to separate vials (23 °C; 80% relative humidity). Experiments were conducted in the next 36 h under dim red light in the first half of the dark phase of a 12:12 h photoperiod, when tick reproductive activity is highest[3].

The experimental technique was derived from that of Leahy et al.[12]. Plastic petri dishes (8 cm diameter) were divided into 8 equal sectors. A female, enclosed in a $1.0\ cm^2$ gauze bag to prevent male contact, was placed in 1 sector, and empty gauze bags in the other 7. The sector a male occupied at 30-sec intervals, the number of contacts, and the time it spent in contact with each bag, were recorded for 30 min following addition of a male to the dish. A new dish with a new orientation was used for each trial. Previous observations[13] had showed that males move randomly in an empty dish.

Males of each species were tested with females from 4 groups, unfed and fed conspecific females and fed females of each of the other 2 species, using a modified latin square sequence. A male was tested only once with females from each group. Each female was only used in 3 trials. In experiment 2, males were tested with conspecific and non-conspecific females in bags in opposite sectors of the dish.

Results. In experiment 1 (table 1), when bags held unfed females, males had random distributions in the dishes and the mean time in contact, and the number of contacts did not differ significantly from empty bags. With fed conspecific females males were significantly more often in the sector with the female bag. They made significantly more contacts, and spent significantly more time in contact with female bags than with empty bags. By the same criteria non-conspecific females also attracted males (table 1), although the attraction was not as strong as to conspecific females. Differential attraction was tested further in experiment 2. The results (table 2) compare male response to the 2 bags containing females. *Ap. hydrosauri* were more attracted to conspecific than non-conspecific females. *Amb. albolimbatum* preferred conspecifics to *Amb. limbatum*, but were significantly less in conspecific sectors than those containing *Ap. hydrosauri* females. *Amb. limbatum* males showed no significant discrimination.

Discussion. 2 different female signals have been described in *Ap. hydrosauri* mating behaviour[10,11]. The 1st, an exci-