Experimental Behaviour of a Tropical Invertebrate: *Epiperipatus biolleyi* (Onychophora: Peripatidae)

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ABSTRACT

Several aspects of the basic behaviour of *Epiperipatus biolleyi* Bouvier have been studied experimentally in the laboratory. The main preliminary results are presented in this short paper.

RÉSUMÉ

Comportement experimental d'un invertébré tropical : *Epiperipatus biolleyi* **(Onychophora Peripatidae).**

Divers aspects du comportement de *Epiperipatus biolleyi* Bouvier ont été étudiés expérimentalement en laboratoire. Quelques résultats préliminaires sont présentés dans cette courte note.

INTRODUCTION

The limited knowledge on the behaviour of living onychophorans is based on casual observations (RUHBERG, 1985). Quantitative experimental data are currently limited to feeding behavior in one species (READ & HUGHES, 1987) and pheromonal function of crural glands in another (ELLIOTT *et* a!., 1993). This short paper presents the results of controlled experiments on the general behaviour of *Epiperipatus biolleyi* Bouvier collected in Coronado, Costa Rica.

PRELIMINARY RESULTS

In choice tests of natural substrates in the field, for unknown reasons bryophyte vegetation and the soil associated with it were preferred to grass and its soil. In the field, *E. biolleyi* is usually found in the moss-substrate interface and in burrows in the soil. Under experimental conditions, they stayed mainly in the vegetation and rarely in the interface or within the soil. This difference between the laboratory and the field may be due to the fact that *Marchantia* and grass were used, instead of the moss which is also common in the area and provides hiding places for the animals.

In the laboratory this species was unable to form burrows (N=20) suggesting that, in the field, they need natural openings on the substrate during daytime. Their feeding and mating grounds are possibly limited by this factor. Individuals did not show any fidelity to a particular burrow when given the choice of four identical burrows and within 87 hours they switched burrows almost three times. This suggests that they show an opportunistic behaviour, entering

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any burrow found nearby when the "resting" time approaches. Most animals enter burrows by walking foward (N=31) but could also enter backwards. They show a tendency to "rest" facing the burrow's entrance, possibly to speed reaction to enemies and climatic factors, as well as to detect passing prey.

No aggressive behaviour for limited burrows was observed. Pairs of animals were seen to rest with some body contact about half of the time, possibly to reduce desiccation and thermic stress. The seven basic resting body postures identified which we called: *Line,* when the body is straight, *U* shape, *S* shape, *J* shape (head) and *J* shape *(tail), Roll* and *Ring,* were displayed with decreasing frequency by animals in burrows. The frequency of display differs between animals on the surface and those in burrows and there is a slight tendency for the S position to be more frequent for animals in the surface than in the burrows, in which there is a tendency for the U

position to occupy the second place in frequency. Onychophoran body posture has not been studied previously, with the exception of reports about coiling or shortening in response to dessication or touch (RUHBERG, 1985).

E. biolleyi hide from light of wave length between 470 and 600 nm. Perhaps onychophorans lack the ability to detect light in the infrared and ultraviolet range (MONGE-NÁJERA, 1991).

On freshwater, these animals floated and became slightly turgid after the *25* mn. that the test lasted (N=5). They remained in good health after the test, in contrast to those floated on sea water (N=4), which died after 14-18 mn. (test suspended). This suggests that onychophorans could survive contact with water while transported over freshwater (e.g. during floods), but that dry places are required in natural rafts during possible dispersal across sea (see MONGE-NÁJERA, 1995).

E. biolleyi produces an adhesive lacking smell and colour. When fresh it tastes bitter to a vertebrate predator (i.e. humans, N=9). This is in agreement with the idea that the adhesive evolved originally for defense (M0NGE-NÁJERA, 1995). The bird *Turdus grayi* and the snake *Micrurus hemprichii* feed on onychophorans in nature but this fact has hitherto remained unknown to workers in this field because the reports appeared in herpethological and ornithological publications.

In captivity and with a constant food supply, *E. biolleyi* survives for up to 150 days. A marked retraction of the antennae, which become flaccid and curved downwards (sometimes crossed in an X), and elimination of saliva, adhesive substance, faeces and sometimes immature embryos are all indications that the animal is severely stressed. Faeces have small rounded corpuscles which may contain excretory crystals or coccus type bacteria. The species avoids daylight and even weak wind currents. It moults every 15 days (N=7). The mean speed of locomotion away from a light source was 1.1-3 cm/s.

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