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PREDATION & PREY IN HENIA (CHAETECHELYNE) VESUVIANA (NEWPORT) (CHILOPODA, GEOPHILOMORPHA)

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There have been few field observations of predation and feeding by the chilopod, Henia vesuviana (Newport), principally for two reasons;

- a) the relative rarity of this species in Britain
- b) its nocturnal habits.

During September 1984, observations were made on this species both in the field and in the laboratory in an attempt to establish (a) the prey taken by this species and (b) the method(s) of predation.

The field observations were made at a site at Newport, Isle of Wight, grid ref. 40/498894, where H. vesuviana is known to be abundant. The site is situated in a suburban area and consists of a small area of waste ground bordered to the North by a disused railway viaduct, to the South by a stream, to the East by a wall and to the West by a car park.

To assist in these observations and to encourage the specimens of H. vesuviana to remain on the ground surface a number of boards were placed on the ground surface during the spring of 1984 and left "in situ" until these observations commenced. The boards consisted of "chip-board" which is capable of retaining a high percentage of moisture, thus providing an ideal micro-site for ground-living species requiring a high relative humidity. This method of observing H. vesuviana in the field proved to be satisfactory and consequently a small number of field observations were made.

Eight specimens of H. vesuviana were collected from other sites in the Isle of Wight and were kept separately in petri dishes in leaf litter over a base of damp plaster of Paris. Various organisms were introduced to the petri dishes in an attempt to see which would be taken by H. vesuviana as prey.

### FIELD OBSERVATIONS

Generally, observations were made at the Newport site during the first hour after sunset on alternate days over a period of 18 days during September 1984. Areas of open ground were searched but there was no evidence of H. vesuviana attacking or eating prey in such areas. The underside of each board was examined resulting in six observations of H. vesuviana eating prey. There were no observations of H. vesuviana attacking prey in such sites.

The following observations of prey type were made:

- Earthworm, sp. unknown on three occasions
- Fly larva, sp. unknown on one occasion
- Fly larva, Tipulidae sp. on one occasion
- Isopoda, Porcellio scaber on one occasion.

### LABORATORY OBSERVATIONS

The eight specimens of H. vesuviana kept under laboratory conditions were given organisms at infrequent but regular periods, dependent on the size of the organism offered as prey and whether such organisms were accepted as prey, or rejected. In the case where an organism was rejected as prey by one specimen of H. vesuviana it was introduced to a second specimen to test whether the rejection was valid or otherwise. In any case, organisms offered as prospective prey were left 'in situ' for a period of 48 hours before being removed and a different organism introduced.

#### Organisms introduced and attacked or eaten

- Enchytraeid worms (species unknown)
- Isopoda (Porcellio scaber, Armadillidium vulgare, Philoscia muscorum, Trichoniscus pusillus)
- Tipulidae larva (species unknown)
- Whitefly (Aleyrodidae sp.)
- Greenfly (Aphidoidea sp.)
- Arachnida (Dysdera sp. - small, 4mm)
- Bristle tails (Thysanura sp. and Diplura sp.)
- Mollusca (Cepaea sp., Arion sp., Deroceras sp.)
- Earthworms (sp. unknown)

Organisms introduced but rejected as prey

Arachnida (Dysdera sp. - 7mm long)

Dermaptera (Forficula auricularia, Forficula lesnei)

Diplopoda (Brachydesmus superus, Cylindroiulus punctatus, Ommatoiulus sabulosus,  
Polydesmus angustus, Polymicrodon polydesmoides, Tachypodoiulus niger,  
Chordeuma sp.)

Ants (sp. unknown)

Opilione (Nemastoma bimaculatum, Platybunus triangularis)

Beetle larvae (sp. unknown)

Observations on the method of predation

In most cases it was possible to observe the specimens of H. vesuviana attack and eat the prey offered. Generally the prey was examined by the specimens of H. vesuviana by tapping it with the distal article of the antennae. Occasionally the H. vesuviana would draw its antennae through its forcipules after having tapped the prey, either to 'taste' the prey or to cleanse the antennal articles. H. vesuviana is known to have a small depression on the distal antennal article which contains a number of 'thin walled' basiconic sensilla, which are probably the organs of 'taste' or 'smell'. Having identified the organism as prey, the H. vesuviana moves forward and bites into the organism with its forcipules. In the case of small organisms i.e. enchytraeid worms, whitefly, greenfly and bristletails they are immediately transferred to the oral field where feeding commences immediately. The enchytraeid worms and the greenfly were devoured almost entirely, with only small sections of the exoskeleton being discarded. The whitefly and the bristle-tails were only partially devoured, leaving the greater part of the exoskeleton.

No observations were made of the method of attack employed by H. vesuviana against the Isopoda. However, feeding on Isopoda was observed, and took place through the ventral surface of the Isopod just anterior to the pleon. The exoskeleton of the Isopoda was discarded entirely, the body contents appearing to be devoured by pre-oral digestion.

The small arachnid (Dysdera sp.) was attacked from beneath as it passed over the litter in which the H. vesuviana was concealed. It was bitten on the ventral surface of the thorax and was obviously injected with venom from the poison claws. The Dysdera was immediately incapable of escape

and thrashed about for some 27 seconds until it was overcome by paralysis or death. During this time the centipede had withdrawn into the leaf litter and only emerged when movement of the prey had ceased, moving forward to examine the prey with the distal articles of the antennae. After a short examination of the prey during which the antennae were drawn through the oral field, the centipede moved forward on to the now exposed ventral surface of the spider and commenced feeding through a slit in the thorax. The centipede made no attempt to force its head into the wound but was observed to be feeding on the body fluids leaking from the wound. The period of feeding lasted for about 9 minutes. The Tipulid larva was approached by the centipede and a short examination was made of the prey with the antennae. The larva was then bitten with the poison claws, causing it to thrash about and to expand and contract its body. The centipede again withdrew from the prey whilst it was thrashing about, but remained in close proximity until the larva was subdued. The centipede then moved forward and appeared to search for the site where it had first bitten the larva, consequently finding the wound and then enlarging it. The centipede then forced its head capsule inside the wound in the larva, having first folded the antennae back over the head, thus keeping the distal articles of the antennae away from the feeding site. Feeding commenced and continued for 23 minutes, followed by a period of cleaning of the antennae and the oral area.

When earthworms are introduced as prey, H. vesuviana examines them with the distal articles of the antennae and then bites into the mid-trunk section of the worms causing the worm to thrash about. In all but one case the H. vesuviana remained attached to the worms until they were subdued. Small species of earthworm (about 25mm) are subdued quite rapidly whilst large specimens (about 100mm) do not fully succumb to the centipede's venom but seem incapable of escape. Feeding often commences before the prey is totally incapacitated. The centipede's head capsule is again forced inside of the trunk, with the antennae being held back over the head capsule.

The mollusca were attacked and eaten by the same method employed as in the case of the earthworms. Surprisingly the H. vesuviana were not deterred by mucus secretions of the mollusca.

When the diplopoda were introduced to H. vesuviana they were examined with the distal articles of the antennae after which the centipede withdrew

under the leaf litter and showed no further interest. Diplopoda would not be expected to be prey for H. vesuviana because of their heavy exoskeleton which could not be pierced by the centipede's forcipules.

The large arachnid (Dysdera sp.) was introduced to a H. vesuviana and immediately attacked the centipede by grasping it in the mid-trunk region. The H. vesuviana squirmed about until after some 20 seconds the spider dropped it and withdrew, apparently cleaning its chelicerae. It is probable that the spider's chelicerae had become coated with a secretion from the sternal pore areas on the centipede's trunk. The animal withdrew under the leaf litter and adopted a 'defensive' posture i.e. curled, with the sternites displayed outwards.

The two species of earwig (Forficula auricularia and Forficula lesnei) were "tasted" with the centipede's antennal tips, followed by the centipede withdrawing under the leaf litter.

Ant species caused centipedes to adopt the defensive pose described above when they walked over it. There were no attempts made by the centipedes to attack the ants. On several occasions, ants which came into contact with a H. vesuviana withdrew and spent time cleaning their legs and antennae.

In the cases of the opilione spiders and the beetle larva the centipedes involved had no contact but immediately withdrew into the leaf litter and remained concealed. No attempt was made to attack any of these relatively large predaceous animals.

#### Summary

Henia vesuviana specimens were given various organisms which it was thought would be present in the same microsites as the centipedes. Notes were then made of the reaction of H. vesuviana to this prospective prey and, where possible, on the method of predation used by H. vesuviana. The method of predation on various organisms is described as is the defensive posture adopted by H. vesuviana when threatened or attacked.