Pseudoscorpion Culture

The culture of pseudoscorpions is not easy, but once the requirements of a particular species have been ascertained (knowledge of habitat microclimate, and practice) cultures can be kept going for a long time, sufficient to be able to follow life histories. It is important to have sterile conditions, at least to start with, and simple refugia for the creatures to hide away.

Works by Legg, Wood and Gabbutt and others at the University of Manchester during the 1970s involved pseudoscorpions being kept in ground-glass stoppered 'staining jars' – jars a bit smaller than a can of baked-beans. Jam or honey jars would be suitable alternatives, but watch out for those individuals that crawl up to the top on the lid or in the crack between the lid and the jar. Within each of these about 6-12 individuals can be kept, depending on the species (aggression). Over-crowding must be avoided as cannibalism can occur. Different species have different tolerances to fellow individuals so I can not offer much advice on numbers per jar. *Cheiridium museorum, Dinocheirus panzeri* and *Neobisium carcinoides* are fairly tolerant of one another, but Chthoniids are aggressive and will fight, as will *Chelifer cancroides* if over-crowded; individuals need space to hide and be away from one another.

In the bottom of the jar a layer, 10-15mm deep substratum is placed. It is important to use clean (and preferably) laboratory grade, white sand as the basic substratum. This minimises mould growth and makes the pseudoscorpions easy to see. Don't be fooled into thinking you need some 'natural' material like dead leaves or rotting wood – they wont work and you will end in an unsuccessful culture. Fungal growth is your enemy and at the first signs of it clean out the jar; the relatively high RH that is used for many species will obviously encourage fungi to grow. Folded tissue or filter paper is used to provide niches in which the animals can secrete themselves. The amount of water used to moisten the sand and tissue will affect the relative humidity (RH). Too much water will lead to condensation on the sides of the container and this can result in drowning and mould growth; filter paper can be used to remove it. Different species have different RH preferences: *Chthonius ischnocheles* (a temperate soil/litter species) is best cultured in damp conditions where the RH is 85-90%; in contrast *Dactylochelifer latreillei* (sand dune species, dry) favours drier conditions and the RH should not exceed 70%. *Cheiridium museorum* needs even lower RH (dry barn, straw, warehouse, thatch debris). Field knowledge of the habitat should give some indication of the temperature at which the cultures should be kept. Generally, go for slightly lower mean 'summer' temperature, e.g. temperate British species are best kept at around 15°C. to achieve a controlled constant temperature we used a 'cooled incubator' (resembles a 'fridge but has higher range of temperatures that it can be accurately set). Failing that find a cool place like a cellar or back room out of direct sunlight (northern hemisphere – a north-facing room; with the domestic heating off or set low) that can provide an even temp. or suitable air-conditioned room and if necessary, use a bench lamp to provide 'controlled' warmth.

Food is not readily taken in captivity, although a peak of feeding activity can occur in some species such as *Chthonius ischnocheles* and *Neobisium carcinoides* 9-10 days after field collecting. The type of food eaten does depend upon the species of pseudoscorpion. Species with heavy short pedipalp hands generally eat slow moving prey with tough integuments. Those with long delicate fingers go for fast moving and more delicate prey. However, given the choice the following two food sources should work. Watch and see how they respond.

If a specimen or its prey dies it is important to remove the offending corpse to prevent fungal growth. Food can consist of some of the micro-arthropods found with the specimen, such as Collembola, fly and beetle larvae and mites. Care must be taken to some extent in the choice of food, otherwise the prey might become the predator! For large cultures this method of feeding is not really practicable, as you will not have time to fiddle around finding suitable wild prey. The fruit fly, *Drosophila melanogaster* can be used to feed pseudoscorpions. We found that the 'vestigial-wing' forms of this fly are best (genetic labs have plenty of these and I wont go into their culture which of course you have to do [it involves bottles of nutrient broths … leave that to you.).

Collembola, springtails, are another very good prey group. You can find these as you want them beneath stones, bricks, wood etc and catch them using a pooter or they can be cultured and provide a constant source of food if many pseudoscorpions are to be kept which is the way we did it but is a little bit more elaborate but once set up provides a steady source of pseudoscorpion food.

A wooden box about 30cm square and 10cm deep is filled with soil to a depth of 6cm. The soil is covered with a piece of glass about 25cm square and inoculated with enchytraeid worms – pot-worms (relatives of earthworms) and Collembola. Spoonfuls of soggy oatmeal are placed on the soil in the box that is covered with a light-proof lid. A community develops and the Collembola thrive.

Dr Gerald Legg 24th March 2006 revised 25 February 2020