

## RESULTS OF PRESERVING SPIDERS BY THE

### PULVERTAFT KAISERLING TECHNIQUE.

by F.R.WANLESS.

Only time will determine if a new method for preserving spiders is satisfactory, but having used the Pulvertaft Kaiserling technique for over three years, the results I have obtained may be of interest.

Two solutions are involved, one acting as a fixative, the other as a preservative; they are normally employed to preserve the colour of pathological specimens, for example, whole livers or kidneys. I used this method for preserving spiders in perspex boxes for display, and it was not intended to replace the use of 70% alcohol as a means of storing collections. This technique has been described in B.S.S.G. Bulletins No.19 and 20 (July and October 1963).

When preserving biological material for display it is important that the solutions used do not cause excessive shrinkage or distortion of the specimen, although normally some shrinkage does occur during the first few weeks of preservation. It is also desirable that colour patterns are not lost, especially due to any clearing or bleaching action of the preservative. Colour pigments and the nature of colour patterns have an important bearing on their preservation. Generally, colour patterns of spiders are made up in two ways, firstly, colour pigments are present in the cuticle and epidermal tissues, or secondly, the patterns are formed by hairs covering the general surface of the body; often there is a combination of both types.

Those patterns formed by hairs are not always retained by the Pulvertaft Kaiserling technique; the reason became obvious when working with Salticus scenicus (Clk.), for the white abdominal bands, quite distinct after fixation, disappeared when placed in the preserving solution, thus giving the spider an overall black appearance. When the spider was replaced in fixative the bands reappeared. This effect will have been caused by the refractive index of the preservative. Closer examination using a microscope with direct overhead illumination showed that the white hairs were almost transparent, allowing the dark cuticle below to dominate the hairs. On using oblique light however, the white hairs stood out in relief against the cuticle. Generally, all patterns formed by hairs lose their richness, the degree of loss depending to some extent on the density of colours involved. The predominant hair colours are black, white, yellow and brown, and they are not seriously affected by any chemical action of the preservative. Red hairs occur less frequently and are often rather sparse in distribution; they usually change to a dull brown after preservation.

Patterns formed by hairs predominate in the Salticidae, Lycosidae and Agelenidae. The remaining families have patterns formed by cuticular pigments which are not obviously affected by the refractive index, but they are more prone to any chemical action of the preservative. The bright emerald green of Diaea dorsata (Fabr.) is retained for about six months after which it fades to a pale green, yet the bright green of Araneus cucurbitinus Clk. has remained in good condition after two years preservation. Red colours are just as variable and in most cases change to a dull rust colour, but the reds of Dysdera crocata C.L.K. and the

hour-glass pattern of the American Black Widow are well preserved. The pink colour of Thomisus onustus Walck. turned yellow within a week of being placed in the preservative. Black, white, brown and yellow colours keep well, and patterns such as the folium, lanceolate stripes and chevrons are always retained.

With the Pulvertaft Kaiserling solution, shrinkage and hardening start in the fixative and are completed in the preservative. The size of the spider is not altered to any noticeable extent, but distortion of the abdomen does occasionally take place with the larger Argiopids. If distortion is going to occur it will do so within forty-eight hours of the spider being placed in the preservative. Fortunately it can be cured quite easily; the distorted specimen should be left for about four days and then, by means of a fine hypodermic needle, fresh preservative should be injected into the abdomen, which will blow up to its original shape and not contract again. If preservative is injected in too early, the abdomen will collapse as soon as the needle is withdrawn, in which case one should repeat the process in a few days. If injected too late, when the abdomen has fully hardened, it will not inflate.

An unexpected fault which has occurred in a few spiders is the appearance of fat-like droplets on the abdomen. These droplets are only visible when viewed under the microscope; they do not spoil the general appearance of the specimens and can be removed with a soft paint brush. It should be noted that there has been no occurrence of contamination by fungi or bacteria. Specimens preserved in this way may be neglected for long periods, for if leaks occur the glycerol in the preservative will prevent the spiders from drying out.

Such mounted and preserved spiders can be shown at exhibitions and handled without any fear of damage. More important, the genitalia may be critically examined under the microscope. It is useful if both sexes are arranged in the same box, with one of the male palps removed and set in such a position that structure is easily seen. This method of preservation has proved most successful for the majority of spiders and should also prove suitable for related orders.

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CANNIBALISM IN PIRATA PIRATICUS (Clerck)

by C.FELTON.

During August 1968, several instances of cannibalism in Pirata piraticus were observed among a population of this species in a Juncus swamp at Kirkby, Lancashire.

Adults were taken with small juveniles dead in their fangs, which they released only when placed inside a glass tube. Although the actual number of cases of cannibalism witnessed on this occasion were few, it would seem reasonable that this behaviour is widespread, at least at this time of the year when large numbers of immatures are about.

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