A NOTE ON THE EYES OF HARVESTMEN (ARACHNIDA, PHALANGIDA) AND CORRELATION WITH THEIR ENVIRONMENT

by DAVID J.CURTIS.

Whilst carrying out an electron microscopical investigation into the eyes of several species of harvestmen at the Department of Zoology, University of Liverpool, I had the opportunity of observing the habits and habitats of these animals in the field. The structure of these eyes was studied in the last century principally by Purcell (1894). More recently, however, Juberthie (1964a,b) has studied phalangid eyes, among other aspects of the animal's biology. He showed the occurrence of regression of the visual system in different groups of phalangids, depending on their habitats.

Curtis (1968,1969) describes the fine structural features of the eyes of seven species and shows how beautifully adapted they are to their function. The lens is a bi-convex cuticular thickening on top of a glassy body of columnar lentigen cells. These cells are longest in Mitopus morio (Fabr.) and Opilio parietinus (Deg.) which live mainly in the upper reaches of the field layer (Todd,1949; D.J.Curtis, personal observations) and on branches etc. and only slightly shorter in Oligolophus agrestis (Meade) which also lives in the upper regions of the field layer. In Oligolophus tridens (C.L.K.) which lives in the middle of the field layer amidst grass stems etc. the lentigen cells are of medium length, approximately one-third that of the former species. Nemastoma lugubre (Müll.) lives on the ground layer, in or just on the top layer of soil and shows the shortest lentigen cells, barely larger than their nuclei.

The depth of the retina and the length of the rhabdoms, which are the primary photoreceptors at the centre of each of the hexagonally packed retinulae, also show variations in length which may possibly be correlated with environment. In Nemastoma lugubre the retina is very shallow and backed by a cellular sheath, and the rhabdoms are disorganised and contorted. These features, most noticeable in the electron microscope, probable indicate that the eyes of Nemastoma lugubre have undergone a certain degree of regression. This is correlated with the habitat in which the animal lives. Juberthie (1964a,b) states that cavernicolous species show the greatest degree of regression, while epigeal species have the most well-developed eyes. Intermediate degrees of regression occur in species living below stones, amidst mosses etc. Thus Nemastoma lugubre shows the degree of regression in keeping with its habitat, and the differences between the other species may possibly be explained in similar terms. Other interspecific differences, however, are more likely to have a purely physiological basis or merely to represent anatomical differences.

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A NOTE ON THE MATING OF NEON VALENTULUS Falconer

by A.M.WILD.

A pair of Neon valentulus Falconer were taken at Wicken Fen on 15th June 1960 and the spiders placed alive in separate corked tubes. The same day the female, who must have mated 2 to 3 weeks earlier, laid three eggs. The following day, the female was transferred to the tube containing the male. In this instance there was no courtship. The male, as soon as he sighted the female, watched her movements closely and then moved towards her. The female slowly waved her forelegs up and down in a graceful manner but as the male drew near she started to run away. However, she was prevented by the cotton wool plug of the tube in which they were enclosed. The male then leapt upon her from a distance of about $\frac{1}{4}$", as if attacking a fly. For a few minutes he did not attempt to insert his palps but drummed with them on the female's head and then gradually he turned around on her cephalothorax to face in the opposite direction to hers. After about five to ten minutes he appeared to have inserted one palp. The pair remained together for over two hours before the male broke away.

The suggestion of encouraging signals by the female was interesting in that it seemed to lead to a bold approach by the male without signals from him. The same thing was observed in the case of Sitticus floricola (C.L.K.), whereas in an earlier mating, when the same female had been more challenging, the male gave characteristic signals.

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