leucinanaloge Aminoketon E 9 nicht beeinflusst, obwohl nach 5 Tagen *invivo*-Behandlung der Larven mit $3 \cdot 10^{-3} M$ E 9 ein starker Anstieg der spezifischen Kathepsinaktivität im Schwanzgewebe zu beobachten ist. Das leucinanaloge γ-Bromallylglycin (BAG) hemmt die Regeneration wenig, erhöht jedoch die *Km* deutlich. Es wird postuliert, dass E 9 eine Zunahme der Kathepsine im Schwanzgewebe bewirkt, ohne die kinetischen Eigenschaften dieser Enzyme zu beeinflussen, während BAG an den aktiven Zentren der Kathepsine wirkt und die Affinität zum Substrat herabsetzt.

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Electroretinographic Responses to Polarized Light in the Wolf-Spider *Arctosa variana* C. L. Kock[1]

The ability to make correct astronomical orientation, even in the shade, displayed by the wolf-spider *Arctosa variana* C.L.K. (Lycosidae), and the possibility of modifying consistently the escape direction by interposing and rotating a polaroid sheet between the spider and the sky, led PAPI[2] to conclude that this spider uses the plane of vibration of polarized light for orientation. A similar conclusion was reached by GOERNER[3] on the basis of oriented reactions of *Agelena labyrinthica* (Clerck) (Agelenidae).

The aim of the present experiments was to determine whether the electroretinogram (ERG) of *Arctosa variana* would show a differential response to light polarized in different planes.

This spider, like most others, has four pairs of simple eyes. The anterior median eyes (AM) differ from the other three pairs (indicated as anterior lateral, Al; posterior median, PM; posterior lateral, PL), both in their embryological origin and structure. Adult and subadult males and females were used. Under light chloroform anaesthesia, the animals were secured by means of adhesive tape to a small board, and all the eyes but the one under investigation were covered with a lightproof mixture of shellac and lamp black. A silver–silver chloride electrode (diameter approx. 100 μ) was inserted through a small hole in the cephalothorax near the eye under investigation; an 'indifferent' electrode was placed in contact with the abdomen. Conventional DC and AC amplifying and recording systems were used. A uniform source of non-polarized light, obtained by passing the light of a projector lamp down a bundle of glass fibres (American Optical Co.), was focused on the eye by means of a microscope objective. The axis of the light beam coincided as nearly as possible with the optical axis of the eye. A polaroid filter could be inserted between the microscope lens and the eye. Neutral filters could also be inserted in the path of the rays to control the intensity of stimulation. Flashes of light of durations from 10 msec up to several seconds could be delivered to the preparation by means of an electromagnetically operated camera shutter. Routinely, flashes of 100 msec were used at a repetition rate of 0.1/sec. In each experiment only one eye was investigated. At the end of each experiment the completeness of the covering of the other eyes was checked.

The following results were obtained: The EEG consists of a negative wave which has a latency of about 15 msec, rises to a maximum in about 120 msec, and then slowly declines in amplitude. At the end of stimulations lasting up to 250 msec, the potential falls to the baseline. For stimuli of longer durations, a positive overshoot appears at the end and becomes more prominent as the duration is increased. The amplitude of the response is linearly proportional to the logarithm of the stimulus intensity for any given duration. It seems likely that the response represents the sum of the generator potentials produced by the retinal receptor cells. This hypothesis is supported by the investigations performed by AUTRUM[4] on the electrical responses to light of several invertebrate species.

When *AM or PM eyes* are stimulated by a beam of *linearly polarized light*, the EEG shows a consistent and at times conspicuous difference in amplitude depending on the plane of polarized light. When the $\vec{e}$ vector of the beam lies in a plane normal to the ventral plane of the animal, the EEG is at a minimum. When the polaroid filter is rotated clockwise from this position, the response reaches a maximum at 90° and has intermediate amplitudes at 45° and 135°. The increase above the minimum may be as much as 100%. So far it has not been possible to find evidence of a similar phenomenon in the *AL and PL eyes*, although some minor and inconsistent differences in response have been observed.

These results are in agreement with the conclusion of PAPI that this animal uses polarized light for orientation and supports the hypothesis that the mechanism of analysis lies within the eye.

It remains to be determined whether these results can be explained by some physical characteristic of the cornea or optical apparatus of the eye, or by some property inherent in the retinal cells themselves.

Zusammenfassung. Registrierung der Elektroretinogramme jedes Auges der Wolfspinne *Arctosa variana* C.L.K. nach Reizung mit polarisiertem Licht. Bei Reizung der vorderen und hinteren Mittelaugen erhält man während der Polarizatordrehung Minima und Maxima. Der Effekt unterbleibt an den vorderen und hinteren Seitenaugen.

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