

THE VISUAL PIGMENT OF AN ISOPOD CRUSTACEAN*

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Visual pigments have been isolated from only five crustacean species to date—*Euphausia pacifica* (Kampa 1955), *Homarus americanus* (Wald and Hubbard 1957), *Meganyctiphanes norvegica* (Fisher and Goldie 1959), and *Hemigrapsus edwardsii* and *Leptograpsus variegatus* (Briggs 1961). This paper reports preliminary findings on the visual pigment of *Porcellio scaber*. This appears to be the first extraction of a visual pigment from the Isopoda.

Heads were removed from between 600 and 700 specimens of *P. scaber* collected locally in the Upper Hutt Valley, N.Z., the crustaceans being first adapted to the dark overnight. All the following extraction procedures were conducted with a dim red light as the only source of illumination.

The tissues were ground with a pestle and mortar, and then with an all-glass Potter-Elvehjem homogenizer. The product was extracted repeatedly with petroleum ether to remove free carotenoids. The resulting tissues were extracted with 2% digitonin and the mixture filtered through sintered glass. The absorption spectrum of a portion of this extract was determined immediately. The solution then was exposed to sunlight for 30 min and the spectrum again determined. The spectrum of another portion of the original extract that had been stored in darkness for 30 min also was determined. No changes in the spectrum of this solution were detected, but the spectrum of the solution which had been exposed to sunlight had changed considerably. A difference spectrum was obtained by subtracting optical density readings of the bleached solution from those of the original extract. This spectrum is given in Figure 1. Maximum absorption is at *c.* 480 $m\mu$.

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Extracts of bleached and unbleached solutions were made with acetone, and also with ethyl ether. These extracts were evaporated and the residues taken up in chloroform. The absorption spectra of these solutions were determined before and after a Carr-Price reaction. Both acetone extracts contained vitamin A₁ and retinene₁ (absorption maxima at 325 and 366 m μ before the Carr-Price reaction, and at 618 and 666 m μ afterwards). Vitamin A₁ was present in the ether extracts of both bleached and unbleached solutions, but retinene₁ was detected only in the ether extract of the bleached solution.

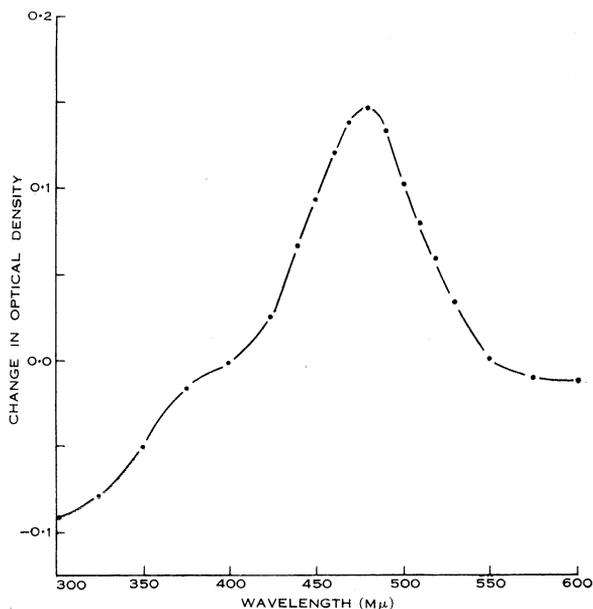


Fig. 1.—Difference spectrum of *Porcellio scaber* rhodopsin.

These results indicate that a visual pigment of *P. scaber* is a compound extractable with digitonin solution, having a λ_{max} at *c.* 480 m μ , and releasing retinene₁ on exposure to light. It is likely that the compound is a rhodopsin of the now familiar type (Wald 1960).

References

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