this might be expressed as

the quantum $h\nu$ being absorbed by the erythrosin adsorbed to the silver halide, and being much smaller than that required to effect the transfer directly.

A fuller discussion of this process together with details of the experimental and analytical procedures will be published elsewhere.

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¹ Lescynski, W., *Z. wiss. Phot.*, **24**, 261 (1926-27).

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Cozymase in Invertebrate Muscle

RECENT work from the institutes of Meyerhof¹ and von Euler² has demonstrated the important part played by cozymase in muscle glycolysis. Cozymase has now been quantitatively determined in, and isolated in a pure form from, mammalian muscle³. In muscle, as in other tissues, cozymase is present partly in the reduced, dihydro form in equilibrium with the oxidized form, 35-40 per cent of the total cozymase in mammalian muscle being in the reduced form^{3,4}.

An interesting feature in the physiology of cozymase is its rapid inactivation by tissue enzymes after the death of the organism⁴. Its distribution in living tissues has been reviewed by von Euler⁵.

We have now determined the cozymase in the fresh musculature of marine invertebrates from various phyla as well as its autolytic inactivation by the minced tissue. The technique has been described elsewhere^{3,6,7}. As standard, highly purified cozymase, kindly supplied by Dr. P. Ohlmeyer, has been used. The accompanying table summarizes the results.

COZYMASE IN FRESH MUSCLE (mgm. per gm.).

Phylum	Species	Muscle	Structure	Oxidized form	Reduced form	Oxidized + reduced forms	Per cent reduced form
Coelenterata	<i>Metridium senile</i>	Dermomuscular coat	Mixed	0.022	0.008	0.030	27
Gephyrea	<i>Phascolosoma vulgare</i>	Retractors of proboscis	Smooth	—	—	0.174	—
Arthropoda	<i>Homarus vulgaris</i>	Tail	Striated	0.280	0.170	0.450	38
Mollusca	<i>Pecten maximus</i>	Adductor	Striated	0.140	0.099	0.239	41
"	<i>Ostrea edulis</i>	Adductor	Smooth	0.187	0.134	0.321	42
"	<i>Buccinum undatum</i>	Columellar	Smooth	0.132	0.069	0.201	34
"	<i>Sepia officinalis</i>	Mantle	Smooth	0.220	0.170	0.390	44
Echinodermata	<i>Echinus esculentus</i>	Jaw	Striated	0.073	0.058	0.131	45
"	<i>Holothuria nigra</i>	Longitudinal bands	Smooth	0.026	0.008	0.034	23

Although its concentration varies widely, cozymase is present in all the muscles examined. In the powerful striated tail musculature of *Homarus* and in the smooth mantle muscle of *Sepia*, its concentration is as high as in mammalian muscle³. Not much difference in concentration is found between striated and smooth muscles. This is particularly exemplified in the adductors of *Pecten* and *Ostrea*. The smallest concentrations are found in the coelenterate *Metridium* and in the two representatives of the echinoderms examined. The higher concentrations are thus shown

by those muscles capable of swift or sustained vigorous activity.

In *Metridium*, *Echinus* and *Holothuria* the pyrophosphate P is also lowest, ranging from a trace to 0.2 mgm. P_2O_5 per gm. fresh muscle as against 0.5-1.0 in the other groups.

It seems interesting that the ratio of the oxidized to the reduced form is fairly uniform and within the limits of that in mammalian musculature. The amount of enzymic inactivation during 4 hours autolysis at 18° has also been found to be fairly uniform, ranging from 30 to 50 per cent of the cozymase originally present. This is definitely lower than in mammalian musculature, where it ranges from 80 to 95 per cent^{3,4}.

This work has been done while one of us (S. O.) was holding a Ray Lankester investigatorship.

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Nov. 26.

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A New Oxidation Catalyst

COENZYMES I and II occupy pivotal positions in biological oxidations. The great majority of metabolites in animal tissues are oxidized through the intermediation of these coenzymes. But whereas the mechanism of the reduction of the coenzymes by dehydrogenase systems is well understood, the physiological mechanism of the oxidation of reduced coenzyme I or II has been obscure.

The reduced form of coenzyme I is oxidized extremely slowly by methylene blue, flavin, cytochrome c, etc. If a phosphate extract of washed and ground muscle tissue is added to a mixture of reduced coenzyme and one of these carriers, the rate of

oxidation of reduced coenzyme is increased some twenty-fold. We have fractionated this extract by centrifugation and have found that the insoluble sediment con-

tains the factor which catalyses the oxidation of reduced coenzyme I. The insoluble particles with which the factor is associated can be washed exhaustively by repeated suspension in water and centrifugation without any loss in activity. The factor is destroyed by exposure to 52° for 15 min., by precipitation with acetone or by drying.

The lactic dehydrogenase system as prepared by Green and Brosteaux¹ rapidly catalyses the oxidation of lactate by means of flavin, methylene blue and