Agar colony.	surface & bottom small.	ditto.	ditto (starch agar)
Potato.	yellow, moist, potato browned.	gray, white, moist, potato no change.	yellow, potato no change.
Milk.	acid, coagulation, in 5 days, no digestion, reduce litmus.	acid-coagulation in 3 days, wheyed, gas, reduce litmus.	slight acid coagulation in 3 days, wheyed, gas.
Indol.	—	positive.	negative.
Catalase.	—	positive.	negative.
Methyl acetyl carbinol.	—	negative.	negative.
Best N source.	—	albumin.*	peptone.
Fermentation of Carbohydrates.	starch, hemicellulose, glucose, xylose.	starch, hemicellulose, raffinose, glucose, lactose, maltose, mannose, galactose, fructose, sucrose, xylose, arabinose, salicine.	ditto.

* The action on the albumin will be reported in the next paper.

The photographs, in original paper, showing the vegetative cells, sporangia, flagella and fermentation of the filter paper in the test-tubes are accompanied.

STUDIES ON OYSTERS (I).

CONSTITUENTS OF OYSTERS.

By

Wataru. SHIMIDZU.

(Received July, 28th., 1929.)

These chemical studies on the two kinds of Japanese oysters, *Ostrea gigas* Thumb. & *Ostrea densamellosa* Lisch. were inaugurated in May 1926, extending over two years. The results thus produced are as follows:

1. As for the ratio of the amount of flesh to shell, the *Ostrea gigas* has a higher value, though relatively, than the *Ostrea densamellosa*. The flesh of the latter is wasted especially in summer.

2. The analytic results of the flesh show that the *O. densamellosa* contains much more nitrogen than *O. gigas*, but on the contrary, with regard to the quantities of the other elements—ash, soluble matters in ether and alcohol, glycogen—, the former is inferior to the latter.

The *O. gigas*, which lives in less salty water, contains very large quantity of ash; this fact seems to indicate that it has large amount of mineral substances with the rapid growth of the shell.

These oysters contain much more glycogen than the other marine shells; but this glycogen, of course, is not always constant in the different seasons when they are collected, and also it will be properly supposed that it is changeable every moment when they are being stored, because it is a storing substance like fat or oil.

3. The ash of oysters was analysed and the following results have been obtained.

	In 100 g. of ash.	
	<i>Ostrea gigas</i> .	<i>Ostrea denselamellosa</i> .
Carbon	0.593	0.0
Sand & SiO_2	5.897	4.530
SO_3	3.827	7.042
K_2O	23.148	16.281
Na_2O	16.799	18.914
Fe_2O_3	3.320	2.043
CaO	4.495	5.783
P_2O_5	30.502	21.564
MgO	4.945	4.534
Mn_2O_3	0.134	0.190
Cl	1.769	15.248

These results prove that the chlorine-content in the ash of the *O. gigas* is very deficient, but the phosphoric acid content is remarkably rich. From the above, most of the phosphoric acid in the *O. gigas* may be said to have taken the chlorine's place for an anion. The potash is one of the predominant constituents in the ash, and exists, it seems, mostly in the form of the phosphate in the oysters.

4. The nitrogen of the extract of the flesh with ether and alcohol was respectively measured and the various forms of nitrogen in the residue were also determined:—

	In 100 g. of the anhydrous oysters.	
	<i>Ostrea gigas</i> .	<i>Ostrea denselamellosa</i>
Total nitrogen.	7.135	9.600
Nitrogen soluble in ether.	0.127	0.445
Nitrogen soluble in alcohol.	1.601	1.692
Nitrogen not dissolved in conc. HCl.	0.257	0.217
Nitrogen dissolved in conc. HCl.	5.220	7.350
Amide nitrogen.	0.409	0.677
Humin nitrogen.	0.148	0.150
Mono-amino nitrogen.	3.481	4.977
Di-amino nitrogen.	1.427	2.060
Arginin nitrogen.	0.567	0.825

Cystin nitrogen.	0.339	0.460
Histidin nitrogen.	0.440	0.619
Lysin nitrogen.	0.081	0.158

From these results, it will be concluded that the flesh of the oysters has a high nutritive value, as it contains Histidin, Cystin, Lysin in abundance.

STUDIES ON OYSTERS (II).

THE OPTIMUM HYDROGEN ION CONCENTRATION AND THE OPTIMUM TEMPERATURE OF THE GLYCOGENASE OF THE OYSTER.

By

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(Received Sept, 6th , 1929.)

The powerful, yet unstable, glycogenase were isolated from the flesh of *Ostrea gigas*, and the various characters on its activity were investigated:

1). The optimum hydrogen ion concentration for the glycogenase action of the oyster in acetic-soda buffer was found to be at or near pH 5.0, and in citrate buffer it was at pH 5.5. These experiments were carried out under the identical conditions, viz. the enzyme was allowed to act upon glycogen solutions at 30°C for 48 hours, and at the end of the time their reducing powers were determined. So the above results prove that the optimum hydrogen ion concentration is varied with the buffer solution used.

But, on the other hand, when phosphate buffer was used, the optimum hydrogen ion concentration was shown to be at least as high as that indicated by pH 6.5~6.8 at the first hour; but its maximum point being moved little by little with time, it was shown to be at pH 5.5 after 24 hours, and lower than it after 48 hours.

2). And its reaction velocity was turned down with time. From these results, we can suggest these two facts.

The first—, if we grant that the enzyme is active but easily destroyed at or near pH 6.8; and at or near pH 5.0, it is less active and it is durable; thus, as a necessary consequence, we can understand that the diastatic products are greater at the higher hydrogen ion concentration in the long run. The second—, it is quite possible that there are really two or more amylases