38. Studies on Biocatalyses. (XIII).

Boron in Sea Weeds.

Kinsuke Kondo, Shigeki Mori and *Fumio Kawai.*

As McHargue et al.[1] has pointed out, sea weed contains extraordinarily large quantity of boron. The amount of boron, calcium and the mucilageous component, alginic acid were determined on seven varieties of sea weeds[2] and it was found that there was no close relation to each other. The boron content of the sea weeds are as follows; each numeral represents mg B per Kg dry matter, Green sea weeds, (1) Hitoegusa, Monostroma nitidum Wittrock 138, (2) Aomogusa. Boodlea coacta (Dickie) Murray et de Toni 519, Brown sea weeds, (3) Mamedawara, Sargassum piluliferum A. Agardh 233, (4) Umiuchiwa, padina argorescens Holmes 262, Red sea weeds, (5) Kamogashira-nori, Nemalion palvinatum grun 408, (6) Hanafunori, Gloiopeltis Complanata (Harv.) Yamada 127, (7) Fukurofunori. Gloiopeltis furcata postels et Ruprecht 105.

The amount of boron extracted with hot water (at 85 °C) from the weeds, and the ratio of dialysability, calculated from the amount of boron dialysed from the aqueous extract were also determined.

1) J. Am. Soc. Agr., 32 622 (1940).

2) Collected at Seto Marine Biological Laboratory, Kyoto Univ., Shirahama, Wakayama Pref.

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39. Studies on Biocatalyses. (XIV)

Boron in some Animal Products.

Kinsuke Kondo, Shigeki Mori and *Morikazu Kajima.*

The boron content of some animal products were determined. The results are as follows; the numerals were represented in mg B per Kg dry matter; hens egg, yolk 5.2, egg white 28.8 shell 22.6; blood (ox) 16.8, corpuscle 10., serum 43.7; cow's milk 19.2, purified casein, trace; rabbit, muscle 2.6, kindney 36.4, heart 39.4, stomach 23.0, eyeball 97.9. As seen in the above results, large amount of boron was found in egg white, whey, blood serum and various visceras.

We also determined the boron content in the different part of body of oyster, in the whole body 36.3, (a) mascular scar 98.1, (b) Mantle 52.8, (c) branchia 21.5 and the remainder part after removing (a), (b) and (c) 30.0.

To the mushed paste of Oyster was added 0.5 n salt solution. After standing for 3 hrs. at 0 °C, it was pressed and the extracted liquor was filtered. To the clear filtrate ammon. sulfate were added and globulin and albumin precipitated and then were filtered. The boron content in the proteins and the filtrate were determined respectively. From the result of analysis, it was found that the boron content in proteins was very small or as little as trace and the greater part was found in the filtrate, the mucoidal part.

40. Studies on Biocatalyses. (XV)

On the Distribution and Chemical Form of Boron in Plant.

Kinsuke Kondo and *Shigeki Mori.*

Of various plant products boron is rich in the vegetables which contains abundant pectinous matter and mudh richer in various pulpy fruits. For example, as seen in our results, potato 27.7, sweet potato 50.3, radish 70.7, turnip 161.2, carrot 165.0, persimmon (Jiro) 91.8, mandarin 185.4 and apple 200.4, where each numeral represents mg B per Kg dry matter.

In the next experiment, we have analysed the amount of boron in orange peel. After extracting orange peel with hot water, the pressed cake was again extracted with 0.5 % ammon. oxalate to press out the fibrous residue 58 % of total B were found in the aqueous extract (1), 15 % in the extract of ammon. oxalate (2) and 27 % in the pressed cake (3). Tee boron content in the dry matter of (1) was 188 mg, in (2) 104 mg and in (3) 173 mg, each per kg dry matter respectively.

In the aqueous extract it seems boron occurs as boric acid or its ester in soluble state, while in ammon. pectate and in the cake it combines tightly in insoluble form.