ABSTRACTS FROM THE ORIGINAL PAPERS.

*On the Differences between the Oryzenin
of Common and Glutinous Rice.*

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It is widely known that the difference between common and glutinous rice is caused by the different physico-chemical properties of the starches found in the two varieties while the quantitative differences of fat and protein contents have also been reported. Many authors investigated on rice proteins and distinguished four different kinds i. e. albumin, globulin, prolamin and glutenin which last is called oryzenin in the case of rice. Also many kinds of amino-acids in their decomposition products have been described. But until recently, there has been no report stating the difference between these two varieties of rice in respect to physico-chemical properties of oryzenin. Recently Kondo investigated only on the optical properties of rice protein which was extracted by alkalins and reported that the protein of common rice is more compact optically than that of glutinous.

The authors undertook the following experiments on many samples of both kinds of rice which were produced in different parts of Japan. (A) The distribution of these four kinds of protein, albumin, prolamin, globulin and oryzenin was determined quantitatively. (B) Physico-chemical investigations were undertaken on pure oryzenin which had been freed from albumin, globulin and prolamin. From these experiments, the authors found out many characteristic differences between common and glutinous rice oryzenin and here those results will be stated briefly.

(A) The chemical characteristics of oryzenin.

(1) On the distribution of four kinds of protein in both kinds of rice, the oryzenin contents predominate in glutinous rice.

(B) The physicochemical characteristic properties of oryzenin.

(1) The pure oryzenin contains from 0.291 to 0.599% of ash but in common rice oryzenin the ash content is always greater.

(2) The iso-electric point of glutinous rice oryzenin is more acidic than that of common, i. e. that of the former is in pH 4.8-5.2 and that of the latter is in pH 5.2-5.8.

(3) The solubility of glutinous rice oryzenin in alkali solution is greater than that of common rice oryzenin and the alkali solution of the latter is more turbid than that of the former.

(4) The viscosity of glutinous rice oryzenin in alkali solution is a little less than that of common rice oryzenin solution and the decrease of viscosity of the former by time is more pronounced than that of the latter.

(5) The rotatory power of glutinous rice oryzenin solution is lower than that of common rice. When this alkali solution was illuminated by ultraviolet rays its rotatory power decreases more rapidly in the case of the former.

(6) On the elemental composition of oryzenin, the nitrogen contents of common rice is higher than that of glutinous rice. The difference is not only in the nitrogen contents but also in the sulphur and phosphorous contents which are reversed in the two kinds of oryzenins, i. e. the S-content of common rice oryzenin predominates and the P-content of glutinous rice oryzenin predominates.

Further difference was observed in their elemental composition. If the ratio of carbon for oxygen was taken, that of glutinous rice oryzenin is lower than that of common rice.

(7) In the partition of amino-acids in hydrolytic products of oryzenin, ammonia-, arginin- and lysin-form nitrogen are predominant in common rice oryzenin while monoamino-, histidin- and cystin-form nitrogen predominate in glutinous rice oryzenin.

(8) There is no remarkable difference in tyrosin and tryptophan contents between the hydrolytic products of common and glutinous rice oryzenin.

(9) The iodine contents of oryzenin-iodide is superior in glutinous rice oryzenin in comparison with that of common.

(10) The free amino nitrogen content of common rice oryzenin is greater than that of glutinous and when the oryzenin alkali solution was illuminated by ultraviolet ray, the free amino nitrogen contents of glutinous rice oryzenin increased

more easily than that of common.

(11) In the pancreatin digestion of oryzenin, the glutinous rice oryzenin is digested more easily than that of common.

(12) The silver salt of glutinous rice oryzenin contains more silver than that of common but the nitrogen content is the reverse.

(13) The combined HCl-quantity of common rice oryzenin is greater than that of glutinous, because the former contains more amino groups in its molecule than the latter.

(14) The refractive index of common rice oryzenin is higher than that of glutinous.

(15) The contents of acetyl-group and of nitrogen in acetyl oryzenin are quite different between common and glutinous rice oryzenin, the former being superior in nitrogen contents and inferior in acetyl-group while the latter is the reverse.

(16) In the decomposition products of acetyl oryzenin, the common rice oryzenin produces great quantities of base, pyrrol, pyrrolic acid, $\text{H}_2\text{OK}_2\text{CO}_3$ soluble substances while the glutinous produces large quantities of pyrrolidin, glyoxalin and proteol.

Studies on Proteins. (The preliminary report)

(Contribution No. I from the Laboratory of Nutritional Chemistry, Department of Agriculture, Kyoto Imp. University)

By Kinsuke KONDO.

A. In the writer's opinion, it is not right in the views of endeavouring to elucidate the essential or all nature and behavior of the colloidal solutions as those of proteins by the capillary chemistry, and also not by the physical chemistry nor pure chemistry only, rejecting the capillary chemical consideration. Of course we can find many phenomena, which should be elucidated from the physico-chemical views, in the case of emulsoids such as protein solutions, whose nature is near to the real solutions.

We must, therefore, deal with protein solutions, on the one hand, by stoichiometrical and physico-chemical measurements and particularly by the development of more exact analytical procedures, and on the other hand, endeavour to elucidate