

Oil-Soluble Vitamin A in Some Pulses and Fishes of Bengal.

THE importance of accessory food factors—enzymes and vitamins—is well recognised. Cod liver oil, owing to its A vitamin content, commands a world-wide reputation. However, other fish oils, such as Halibut, are being discovered with nearly sixty times the potency of cod liver oil. Amongst the Bengal fishes Hilsha (*Clupea ilisha*), Rohit (*Labeo rohita*) and Catla (*Catla catla*) are in daily use. Body, roe and liver fats of these fishes had been studied at the Bose Research Institute Laboratories and referred to in the abstracts published in the *Proceedings of the Indian Science Congress*.¹

Vegetable oils are generally classed as "bad fats"² and classed with lard, which last is used in physiological control experiments. At the Bose Research Institute, Bengal, pulses have been the subject of investigation from various points of view; certain special qualities of *Cicer arietinum* have been reported in the *Transactions of the Bose Institute*.³ Particular attention was drawn to the presence of carotene and its significance to vitamin A. Lovibond Tintometric measurements showed *Cicer arietinum* oil to approach cod liver oil of approved quality. Spectroscopic examination of the $SbCl_3$ blue compound also confirmed this significance¹. Photographs taken of the spectra show absorption bands at about 610—625 μ , 570—580 μ and 540—550 μ , corresponding to those obtained with cod liver oil.⁴ The specificity of the band at or about 620 μ is now well recognised. Hilsha fish liver oil gives a band at 500 μ , which is very pronounced; the other bands are rather broad and often merge one into the others.

The subject is being further studied in its various aspects as regards keeping quality and potency. Hilsha fish oil shows variation with season, and whether the fish is

¹ Banerjee and Nag, *Proc. Ind. Sci. Congress*, XX, Chem., No. 192.

² Plimmer and Plimmer, *Food, Health, Vitamins*, p. 60, Longmans, Green & Co., 1932.

³ Banerjee, "Chemical Examination of Oils from Leguminous Pulses," *Trans. Bose. Inst.*, VII, 1931-32.

Nag and Banerjee, *Proc. Ind. Sci. Congress*, XIX, 1932, Chem., No. 211, p. 244.

⁴ "Communications from the Universities of Zurich and Utrecht," *Nature*, July 1st and July 29th, 1933.

roe-bearing or not. In some Tintometric measurements, the figures were as high as those of halibut oil or even higher.

Physiological observations with rats have given very promising results with *Cicer arietinum* oil. Its importance will be easily appreciated when it is remembered that Lovibond Tintometric figures for this vegetable oil approach closely those of cod liver oil.

Fuller details with spectrographs will be published in due course in the *Transactions of the Bose Research Institute*.

N. C. NAG.

H. N. BANERJEE.

Bose Research Institute,
Calcutta,
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A Note on the "New Type of Fertilization" in Plants.

VARIATION from the generally accepted view that during double fertilization in plants the primary endosperm-nucleus becomes triploid and contains 3x number of chromosomes was first reported by Ferguson.¹ She found that due to the premature division of the primary endosperm-nucleus before the discharge of the sperms from the pollen tube, one-fourth of the endosperm tissue (which is derived from the fertilized micropylar endosperm-nucleus) becomes triploid whereas the remaining three-fourths (which is derived from the unfertilized chalazal endosperm-nucleus) remains diploid. During my investigation on the embryology of some members of Solanaceae, I have also observed this new type of double fertilization in one of the strains of 'Tomato' grown in the college experimental grounds. Here also the two polar nuclei fuse before the opening of the flower and divide as a rule before the discharge of the sperms from the pollen tube forming a small micropylar and a big chalazal endosperm cell. Fig. 1 will show that the primary endosperm nucleus has divided while the two sperms are still seen inside the pollen tube.

After the discharge of the sperms into the embryo-sac, one sperm fuses with the egg and the other with the micropylar endosperm-nucleus. The chalazal nucleus, however, divides and forms part of the

¹ Ferguson, M. C., *Bull. Torr. Bot. Club*, 64, 657-664, 1927.