CCCLXV.—*The Yellow Colouring Matter of Khapli Wheat,* Triticum Dicoccum.

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As part of a series of investigations on the nature of rust in wheat, which are being carried out under the direction of the National Council of Canada, the organic constituents of a resistant variety, "Khapli," are being examined in the hope that amongst them a substance toxic to the fungus will be detected. For reasons which have been given by Newton and Anderson (*Canad. J. Res.*, 1929, **1**, 86), attention is being directed, in the first place, to the presence in this plant of compounds possessing a phenolic character. From admixture with these a flavone-like colouring matter, present in trifling amount, has been isolated, a description of which forms the subject of this paper.

When an alcoholic solution of the leaves is evaporated, the residue exhaustively extracted with ether, and the extract concentrated, a trace of yellow dye can be isolated with difficulty by means of benzene. The yield from 68 lb. of dried leaf was 1·3 g., and the total amount available for investigation about 3 g. *Tricin* (the name suggested for this new colouring matter) has the formula $C_{15}H_8O_5(O{\cdot}CH_3)_2$ (Found : C, 61·7; H, 4·4; CH_3, 9·3. $C_{17}H_{14}O_7$

requires C, 61·8; H, 4·3; CH_3, 9·1%). It separates from dilute alcohol in pale yellow needles, m. p. 288°, soluble in dilute alkali solution with a yellow tint. In alcoholic solution it gives a red-brown colour with ferric chloride and a yellow precipitate with lead acetate; an oxonium sulphate separates as bright orange needles when tricin in hot acetic acid is treated with sulphuric acid. Tricin dyes a pale yellow colour on aluminium-, pale brown on iron-, and a deep green-yellow on chromium-mordanted wool. Gentle acetylation gives *diacetyl tricin*, pale yellow needles, m. p. 211—213° (Found: C, 60·7; H, 4·4; CH_3, 7·4. $C_{21}H_{18}O_9$ requires C, 60·9; H, 4·4; CH_3, 7·3%), which, by further treatment, yields *triacetyl tricin*, colourless needles, m. p. 251—254° (Found: C, 60·5; H, 4·5; CH_3, 6·8. $C_{23}H_{20}O_{10}$ requires C, 60·5; H, 4·4; CH_3, 6·6%).

Demethylation of tricin with hydriodic acid gives *tricetin* (Found: C, 59·2; H, 3·4. $C_{15}H_{10}O_7$ requires C, 59·6; H, 3·3%), which crystallises from alcohol in pale yellow needles, and decomposes slowly when heated above 330°. Its colour reactions are of a similar character to those of tricin, though it dyes much more strongly than the latter, the shades obtained resembling those given by kaempferol. *Tetra-acetyl tricetin* (Found: C, 59·5; H, 4·0. $C_{23}H_{18}O_{11}$ requires C, 58·7; H, 3·8%), colourless needles, m. p. 260—261°, passes by further acetylation into *penta-acetyl tricetin*, colourless needles, m. p. 244° (Found: C, 58·6; H, 4·1. $C_{25}H_{20}O_{12}$ requires C, 58·6; H, 3·9%). Hydrolysis with boiling hydriodic acid gave 60·1% of tricetin (calc., 59%).

Fusion of tricetin, of which but a trace was available, with potassium hydroxide at 200° gave two products; one was, without doubt, phloroglucinol, and the other was an acid resembling gallic acid in its general properties. Such a result indicated that tricetin was 5 : 7 : 3′ : 4′ : 5′-pentahydroxyflavone, though its colour reactions, notably those with alkali (compare myricetin, 3 : 5 : 7 : 3′ : 4′ : 5′-hexahydroxyflavonol), hardly harmonised with this view. A synthesis of this 5 : 7 : 3′ : 4′ : 5′-pentahydroxy-compound, a detailed account of which will be given in a later communication, has afforded proof that this is not tricetin. The possibility that tricetin is a pentahydroxy*iso*flavone is under consideration, and further experiments are in progress in the hope of synthesising this compound.

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