77. The Colouring Matter of "Awobana."

Part III.

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As shown in the earlier paper¹⁾ from the pigment of Awobana (the flowers of *Commelina communis*) paper, delphinidin monoglucoside had been isolated. After more exact investigation of the pigment from Awobana paper, and also of the pigment directly obtained from raw Awobana flowers, another crystalline pigment which was considered to be 3-5-diglucoside of delphinidin chloride [I] was isolated. To separate the colouring matter from the flowers, the fresh flowers were immersed in CH_3OH , HCl

and the resulting red solution was treated with lead acetate, then from the precipitate of the lead compound of the pigment, chloride of pigment was obtained by aid of CH_3OH , HCl , and ether, as in the case of Awobana paper.²⁾ This chloride resembled the similar chloride from Awobana paper, however, the colour of the former was brighter than the latter.

The above chloride was dissolved in water and equal vol. of conc. HCl aq. was added and kept at ordinary temperature for some days (7–30 days). Then reddish brown crystalline precipitate was separated. When this precipitate was washed with CH_3OH , crystals with metallic lustre were isolated. This substance was washed again with 5% HCl aq. to remove monoglucoside, and was recrystallized several times with $\text{CH}_3\text{OH} + \text{HCl}$ or dil HCl aq. Thus purified, the crystalline substance in thin plates, (D.P. 207°) (Fig. I) with copper like lustre was obtained. The substance was difficultly soluble in CH_3OH or dil. HCl aq. The analytical results agreed with the diglucoside of delphinidin chloride, $\text{C}_{27}\text{H}_{31}\text{O}_{17}\text{Cl}$, $3\text{H}_2\text{O}$: found C, 45.43; H, 5.11; Cl, 4.45%; calc. C, 45.25; H, 5.17; Cl, 4.60%.

When the glucoside was decomposed with boiling hydrochloric acid, 1 mol. of delphinidin (Fig. II) and 2 mols of glucose which gave glucosazone (m.p. 212°) were yielded. The quantity of glucose was determined by Pavy's method the result was fairly in agreement with theoretical (Found 47.81%, cal. 50.28%). The position of the glucose was confirmed to be "3" and "5" by Karrer's perhydrol method.³⁾

1) Kuroda: Proc. **9** (1933), 94.

2) Kuroda: Proc. **9** (1933), 95.

3) Helv., 1212, 15, 1932.

Furthermore colour reactions with Na_2CO_3 and with Buffered solution were exactly in agreement with "delphin chloride," 3-5-diglucoside of delphinidin chloride in literature.¹⁾ Absorption spectrum was observed to be similar to the diglucoside of delphinidin chloride.

The yield of the diglucoside was considerable.

In concluding, the pigment in Awobana is considered to be the anthocyanins combined (or mixed) with P-coumaric acid²⁾ and co-pigment [A]³⁾ of which was previously mentioned.

Fig. I. Diglucoside of Delphinidin chloride from Awobana.

Fig. II. Delphinidin chloride from Awobana.

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1) Reynolds, Robinson and Scott-Moncrieff: J. C. S., 1235, 1934.

2) Kuroda: Proc. 9 (1933), 95.

3) Kuroda: Proc. 9 (1933), 94.