(m.p., mixed m.p. $[\alpha]_D$, IR, TLC, oxime). Petroleum–benzene (1:1) fraction on rechromatography yielded 16-hentriacontanol, $C_{31}H_{64}O$ (m.p., mixed m.p.) and epifriedelinol,[5] $C_{30}H_{52}O$ (m.p., mixed m.p. $[\alpha]_D$, IR, m.p. and $[\alpha]_D$ of acetate). Benzene and benzene–ether (1:1) fractions yielded β-sitosterol,[6] $C_{29}H_{50}O$ (m.p., mixed m.p. and $[\alpha]_D$; m.p., mixed m.p. and $[\alpha]_D$ of acetate) and stigmasterol,[6] $C_{29}H_{48}O$ (m.p., mixed m.p. and $[\alpha]_D$; m.p., mixed m.p. and $[\alpha]_D$ of acetate).

Ethanol extract. The ethanolic extract concentrated, pulped, dried and exhaustively extracted with Et_2O. The Et_2O extract concentrated and kept in a refrigerator when greenish precipitate accumulated in the flask. The precipitate on repeated crystallization (decolourizing carbon) afforded stigmasteryl D-glucoside,[7] m.p. 290–293 (decomp.) (Liebermann–Burchard and Molisch test positive). The glucoside on hydrolysis with 4% H_2SO_4 yielded stigmasterol (m.p. and mixed m.p.) and D-glucose (identified by paper chromatography).

[5] V. ANJANEYULU, D. N. RAO and L. R. ROW, *J. Indian Chem. Soc.* **44**, 123 (1967).
[6] L. F. FIESER and M. FIESER, *Steroids* p. 351, Reinhold, New York (1959).
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Phytochemistry, 1971, Vol. 10, pp. 2848 to 2849. Pergamon Press. Printed in England.

SCROPHULARIACEAE

AN UNUSUAL ANTHOCYANIN IN *ANTIRRHINUM MAJUS*

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(*Received* 9 *June* 1970, *in revised form* 8 *January* 1971)

Abstract—In three genetic stocks of *A. majus*, cyanidin-3-glucoside has been found to occur along with the normal pigment, cyanidin-3-rutinoside.

THE ANTHOCYANINS of the garden snapdragon hitherto investigated are of two types, either cyanidin-3-rutinoside (antirrhinin) in the normal form (magenta or crimson flowers) or pelargonidin-3-rutinoside in the recessive mutant *eosinea* (pink or bronze flowers).[1,2] Other pigments, such as aurones and flavones, also contribute to the final flower colour, so that a large range of shades is possible.

RESULTS

Flowers from three lines (viz. an inbred derivative of the commercial variety 'Eclipse'; 'Black Prince'; and an inbred derivative of 'Pan Crimson') were investigated using TLC on cellulose. All three were found to contain a second anthocyanin which was purified by

[1] R. SCOTT-MONCRIEFF, *Biochem. J.* **24**, 753 (1930).
[2] R. SCOTT-MONCRIEFF, *J. Genet.* **32**, 117 (1936).

standard methods.[3] Spectrophotometry of the purified pigment showed that it was probably a cyanidin-3-glycoside,[5] and on hydrolysis it gave glucose and cyanidin only.

Description of Plant Lines

'Eclipse': R.H.S. Colour Chart No. 60B. The plants are relatively normal in appearance apart from the heavily pigmented flowers, and there is little pigment in other parts of the plant. 'Black Prince', R.H.S. Colour Chart No. 59A, is similar to 'Eclipse', but the leaves and stem are very deeply pigmented with antirrhinin. There is no cyanidin glucoside in these parts.

Anthocyanin is absent from all parts of 'Pan Crimson' except the corolla and calyx. The flowers are large and show the mutation *sulfurea*, which extends aurones throughout the adaxial epidermis, whereas normally they are confined to a small spot on the palette. Anthocyanin is present in all cells of the palette, but shows a speckled appearance on the lobes, which varies with temperature and light, similar to a highly back-mutating line of *pallida-recurrens*.[4] Intensity is superficially 46B, owing to background aurones, but the abaxial epidermis and corolla tube are 74C.

EXPERIMENTAL

Extraction of pigments and paper chromatography were carried out using standard methods.[3] Sugars were separated in ethyl acetate–pyridine–water (12:5:4). TLC was on MN300 cellulose. Spectrophotometry was carried out using a Pye Unicam SP8000 spectrophotometer by the standard methods.[5]

Acknowledgements—I wish to thank Dr. E. C. Bate-Smith and Dr. K. J. R. Edwards for their help and encouragement throughout this work, and the Science Research Council for financial support.

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Phytochemistry, 1971, Vol. 10, pp. 2849 to 2850. Pergamon Press. Printed in England.

ALKALOIDS OF *ANTIRRHINUM ORONTIUM*

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(*Received* 10 *March* 1971)

Plant. Antirrhinum orontium L. (*Misopates orontium* Raf.)

Uses. Medicinal.[1]

[1] M. GRIEVE, *A Modern Herbal* (edited by C. F. LEYEL), p. 815, Cape, London (1931).