Phytochemistry, 1968, Vol. 7, pp. 151 to 152. Pergamon Press. Printed in England

SHORT COMMUNICATION

ISOLATION OF THE CYANOGENETIC GLUCOSIDE PRUNASIN FROM BRACKEN FERN

W. D. BENNETT

Plant Chemistry Division, D.S.I.R., Palmerston North, New Zealand

(*Received* 21 *August* 1967)

Abstract—A cyanogenetic glucoside from bracken fern (*Pteridium aquilinum* L. var. *esculentum* (Forst. f.)) has been isolated and shown to be prunasin (β-D-glucopyranosyl-D-mandelonitrile).

INTRODUCTION

THE bracken fern (*Pteridium aquilinum* L.) is known to contain cyanoglucoside,[1,2] particularly in the young curled fronds which have been reported to contain up to an equivalent of 50 mg HCN per 100 g dry matter. In this report prunasin is shown to be the predominant cyanoglucoside in bracken tissue. No evidence for the presence of additional cyanogenetic compounds was obtained.

EXTRACTION PROCEDURE

Young curled fronds (*Pteridium aquilinum* L. var. *esculentum* Forst. f., 10 kg fresh weight) were extracted with hot 80% (v/v) aqueous ethanol; the extract was taken to dryness, with removal of a sludge of lipids and chlorophyll during concentration. The residue was extracted repeatedly with boiling ethyl acetate under reflux and the combined extracts evaporated. An aliquot of the water-soluble portion was subjected to paper chromatography using the solvent system butanol–pyridine–water (6:4:3) and only one cyanoglucoside was detected. The extract (500 ml) was shaken with a mixture of Hyflo Supercel (50 g) and charcoal (50 g). This mixture was treated batchwise with 500-ml portions of 10 per cent ethanol followed by 50 per cent ethanol. Most of the cyanoglucoside was eluted by the latter treatment and was further purified by paper chromatography in butanol–pyridine–water. The cyanoglucoside band was located and eluted; crystallization as white needles was achieved from a mixture of ethyl acetate and light petroleum.

DISCUSSION

The isolated material had an identical i.r. spectrum (KBr disc) to that obtained for authentic prunasin isolated from cherry laurel (*Prunus laurocerasus* L.).[3] A nuclear magnetic resonance spectrum of the acetylated glucoside was identical with that published for prunasin tetra-acetate.[4]

[1] A. J. THOMAS, *Biochem. J.* **88**, 56 P (1963).
[2] F. E. MOON and M. A. RAAFAT, *J. Sci. Food Agr.* **2**, 327–36 (1951).
[3] A. R. TRIM, In: *Methods of Plant Analysis* (Edited by K. PAECH and M. V. TRACEY), Vol. 2, p. 304. Springer, Berlin (1955).
[4] G. H. N. TOWERS, A. G. MCINNES and A. C. NEISH, *Tetrahedron* **20**, 717 (1964).

EXPERIMENTAL

The cyanogenic glucoside was located on paper chromatograms and in plant material by methods published elsewhere,[5] except that emulsin was used in place of linamarase. The glucoside was acetylated by treatment with acetic anhydride in pyridine at room temperature overnight.

Acknowledgements—I wish to thank B. A. Tapper and G. W. Butler for advice and D. Natusch, Chemistry Division, D.S.I.R., for the NMR spectrum.

[5] G. W. BUTLER and E. E. CONN, *J. Biol. Chem.* **239**, 1674–9 (1964).