The separation of a fraction corresponding to prostaglandin A₁ from yellow onion \textit{(Allium cepa)} and subsequent purification of that fraction as prostaglandin A₁ has led to the identification of prostaglandins in a plant material for the first time. Kilogram quantities of onions were processed and purified by extraction procedures, column chromatography and thin layer chromatography (TLC). Prostaglandin A₁ was characterized and identified by a combination of comparative TLC, gas chromatography-mass spectrographic analysis and blood pressure lowering properties. The results of these experiments are consistent with standard prostaglandin A₁. It is concluded that prostaglandin A₁ is present in onion.
environment for 15-20 hr. After this period, the solution was filtered and the ethanol removed with a rotary vacuum evaporator at 35 C. The pH of the remaining mixture was adjusted to 8 with 5 N sodium hydroxide and partitioned against equal volumes of petroleum ether 3 times; the ether layer was then discarded. The pH of the solution was adjusted to 3 with 2 N citric acid, partitioned against equal volumes of petroleum ether 3 times and the ether layer was discarded. The solution was then extracted with equal volumes of chloroform 3 times, and the chloroform layers were pooled. The chloroform solution was then evaporated at 35 C. The residue was removed from the vessel by washing with 3 ml of ethanol/chloroform (1:1) 3 times. The solution was then evaporated in a water bath by passing a stream of N2 over the sample. This fraction was designated as the crude onion extract.

**Purification of the Crude Onion Extract by Column Chromatography**

Sil-A-200 silicic acid prepared for resolution of acidic mixtures with a mesh size 60-200 was obtained from Sigma Chemical Company (St. Louis, MO). Spectrograde methanol, benzene and ethyl acetate were used without further purification. The silicic acid column chromatographic separation procedure is similar to that previously reported (8,9).

Silicic acid (7.89 g) was combined with 25 ml of the eluting solvent benzene/ethyl acetate (9:1, v/v). This slurry was poured into a column 1 cm in diameter and 50 cm length. The final silicic acid column height was 21.5 cm. A crude onion extract sample weighing ca. 70-100 mg was dissolved in the benzene/ethyl acetate (9:1) and introduced on the column head. The elution rate was adjusted to ca. 1 ml/min, and a 500 ml fraction of the benzene/ethyl acetate (9:1, v/v) was collected. The eluting solvent was changed to benzene/ethyl acetate (8:2, v/v), and a 500 ml fraction was collected. This fraction, which corresponds to PGA1, was taken to dryness with a rotary vacuum evaporator at 35 C. The residue in the flask was then evaporated to dryness with a rotary vacuum evaporator at 35 C and the residue was then evaporated to dryness with a rotary vacuum evaporator at 35 C. The residue was then extracted from the vessel by washing with 3 ml of ethanol/chloroform (1:1, v/v) 3 times. The solution was then evaporated in a water bath by passing a stream of N2 over the sample. This fraction was designated as the crude onion extract.

Further purification of the PGA1 fraction collected from the column chromatography was performed by TLC using chloroform/THF/acetic acid (10:2:1) as the solvent. The spot corresponding to PGA1 was removed from the sorbent by adding chloroform/methanol (1:1) to the sorbent and filtering. The solution was then evaporated to dryness with a rotary vacuum evaporator at 35 C and the residue taken up in 0.5 ml of methanol. To this solution, 5 ml of water was added and the pH was adjusted to 3 with 2 N citric acid. This was extracted with equal volumes of chloroform 4 times. The chloroform extracts were pooled and washed with water until the pH of the water was ca. pH 7. The chloroform solution was then evaporated to dryness with a rotary vacuum evaporator at 35 C. The residue was removed from the vessel by washing with 3 ml of chloroform/ethanol (1:1) 3 times. This solution was then evaporated in a water bath by passing a stream of N2 over the sample. This fraction was submitted to further TLC studies which included 10 different solvent systems. The procedure just described was also used to prepare samples for the gas chromatography-mass spectrometry (GC-MS) studies and the biological studies.

In the TLC study, ca. 50-100 µg of the onion component and 50 µg PGA1 were spotted on the activated plates. The solvent front was allowed to migrate up to the plate for a distance of 10 cm. The plates were air dried and were visualized by short and long ultraviolet (UV) light. Permanent thin layer chromatograms were developed by spraying with a 10% phosphomolybdic acid in ethanol and heating at 100 C until visible.

**GC-MS Analysis of Onion Extract**

A portion of the previously described onion extract was further purified by TLC on Silica Gel G(F) sorbent using chloroform/methanol/water (15:1:0.03). This TLC study was done independently from the previous TLC studies. The compounds were chromatographed on 2.5 cm x 7.5 cm plates and visualized with UV light or by spraying with sulfuric acid/ethanol (1:1) followed by heating to 100 C. For preparative procedures for GC-MS analyses, compounds were chromatographed on 20 cm x 20 cm TLC plates, visualized with UV light and recovered by treating the plate with “Strip-Mix” (Applied Science). Areas containing prostaglandin A1 were removed and eluted with chloroform-ethanol (1:1).

Prostaglandin methyl esters (MEs) were prepared by reaction with excess diazomethane

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