

Phosphorus
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'SOIL ORGANIC PHOSPHORUS'

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TABLE OF CONTENTS

	<u>Page</u>
Summary	xi
Declaration	xiii
Acknowledgements	xiv
<u>INTRODUCTION</u>	1
<u>REVIEW OF THE LITERATURE</u>	
I. General	3
II. Measurement of organic phosphorus	4
1. Ignition	4
2. Extraction	6
3. Amounts	9
III. Inositol polyphosphates	15
1. Introduction	15
2. Presence in the soil	15
3. Extraction and purification	20
4. Amounts	23
IV. Unidentified organic phosphates	25
<u>AIMS OF THE EXPERIMENTAL WORK</u>	
I. The extraction of organic phosphorus	27
II. Fractionation of organic phosphates	28
III. The unidentified compounds	29

THE EXTRACTION OF ORGANIC PHOSPHORUS FROM SOIL

I.	Materials	30
II.	Methods	31
	1. General	31
	2. Comparison of extraction by ultrasonic vibration with extraction by shaking	32
	3. Development of the extraction procedure using ultrasonic vibration	33
III.	Results and Discussion	35
	1. Effectiveness of extraction by ultrasonic vibration	35
	2. Variation of the solution to soil ratio	36
	3. Effect of high temperature on extraction	37
	4. Use of a sequestering agent with the extractant	39
	5. Incorporation of an acid pretreatment	41
	6. Comparison of the results with other extraction procedures	42
IV.	Recommended extraction procedure	45
	1. The basis of the recommendation	45
	2. The steps in the proposed procedure	45
	3. Adaptations of the method	46
V.	The significance of the Results	48
	1. Eastern Australia soils	48
	2. Urrbrae series	49
	3. Urrbrae soils sampled by other workers	50
	4. Total phosphorus determinations	52
	5. The conversion of phosphorus from fertilizer into organic forms	54

GEL CHROMATOGRAPHY OF ORGANIC PHOSPHATES

I.	Materials	57
II.	Methods	58
	1. General	58
	2. Standard phosphates	58
	3. pH of elution	58
	4. Analyses	59
III.	Results and Discussion	60
	1. Anion exclusion effect	60
	2. Behaviour of standard phosphate compounds	60
	3. Fractionation of crude extracts of soil	62
	4. Development of a routine chromatographic procedure	66
IV.	Other applications of gel chromatography	69
	1. The unidentified soil organic phosphorus	69
	2. Materials containing haemoglobin	69
	3. Extracts of microorganisms	71

THE UNIDENTIFIED FRACTION OF SOIL ORGANIC PHOSPHORUS

I.	Introduction	73
II.	Electrophoresis of material excluded from Sephadex G-50	74
	1. Preliminary	74
	2. Material as such	75
	3. After fractionation on Sephadex G-100	75

	<u>Page</u>
III. Dialysis of a crude NaOH extract of soil	77
1. Introduction	77
2. Experimental details	77
3. Results and Discussion	78
IV. Removal of coloured materials	80
1. General	80
2. Precipitation at low pH	80
3. Removal of colour from the fulvic fraction	82
V. Fractionation by anion-exchange chromatography and examination of the products	83
1. Preparation of the sample	83
2. Electrophoresis of standard phosphates	87
3. Anion-exchange chromatography	89
4. Examination of the major organic phosphorus component	91

APPENDICES

1. Extraction of phosphorus from soils by three different methods	96
2. Gel chromatography of inositol polyphosphates and the avian haemoglobin-inositol pentaphosphate complex	99
3. Gas-liquid chromatography of inositol acetates	100

BIBLIOGRAPHY

SUMMARY

This thesis deals with the extraction, fractionation and characterization of organic phosphorus from soil.

An effective and rapid method to extract organic phosphorus from soils has been developed using an acid pretreatment followed by ultrasonic vibration in the presence of sodium hydroxide. The results obtained by this method compared favourably with those by other published extraction procedures. The method is suitable for both analytical and preparative extractions.

A simple gel chromatographic procedure which fractionated the phosphorus in the crude extracts was then developed. This resulted in a fraction containing the inositol polyphosphates in a form suitable for further separation by electrophoresis or anion-exchange chromatography.

The gel chromatographic results also revealed that the major portion of the organic phosphorus extracted from all the soils behaved as a macromolecule. This fraction in the Urrbrae soil had the nature of a polysaccharide and was partially degraded with acid to yield three main organic phosphates which did not contain

inositol. Two of these compounds were reducing sugar phosphates which gave a characteristic colour reaction with the carbazole method for uronic acids. The third component was a non-reducing compound.

These results have opened the way for a detailed characterization of the various components of a major and, as yet, unidentified portion of organic phosphorus in the Urrbrae red-brown earth.