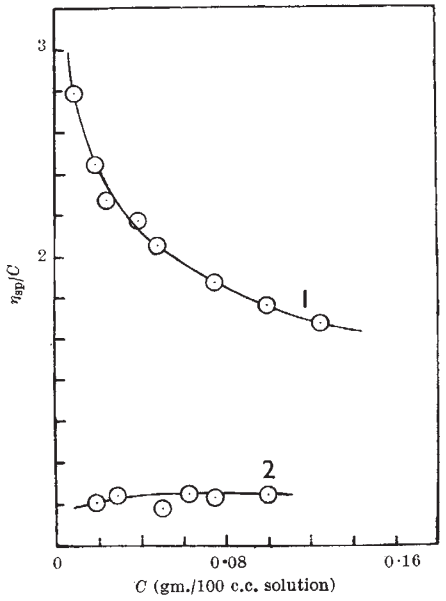
## Viscosity of Sodium Salt of Polyuronide Hemicellulose from Jute

It has been observed by Fuoss and Strauss[1] that the viscosity behaviour of a polymer such as polyvinylbutyl pyridonium bromide, containing ionizable groups, in water is not the same as that of a neutral polymer. The reduced viscosity ($\eta_{sp}/C$) of the former (a polyelectrolyte), unlike that of a neutral polymer, increases on dilution. A similar behaviour has been noted by Pals and Hermans[2] in the case of sodium pectinate. Basu[3] has studied the viscosity of sodium thymonucleate, which also behaves as a polyelectrolyte. The present communication describes the viscosity measurements of the sodium salt of methyluronic acid – xylan complex[4] (a jute hemicellulose fraction). As this uronic acid is believed to occur in a chain molecule, it was thought that the sodium salt of the complex in aqueous solution might also behave as a polyelectrolyte. This does not appear to have been studied hitherto.

The results of viscosity determinations are shown graphically; curve 1 shows that the reduced viscosity actually increases on dilution. In the presence of 0·1 *N* sodium chloride solution, the sodium salt behaves as a neutral polymer. These facts may be readily explained by the conception of polyelectrolytes put forward by Fuoss and Strauss[1]. Viscosities were measured in an Ostwald viscometer with an efflux time for water of about 165 sec. at 32° C.




Reduced viscosity of (1) sodium salt of methyluronic acid – xylan complex; (2) same in presence of sodium chloride

Defatted jute was delignified with 'Textone'[5]; the air-dry holocellulose thus obtained was treated with 9·3 per cent caustic soda solution (w/w) at room temperature for two hours and filtered through a sintered-glass filter. The filtrate was acidified with glacial acetic acid, and an equal volume of absolute ethyl alcohol was then added. The precipitate was filtered off and washed free from acetate with aqueous ethyl alcohol (1 : 1). The sodium salt of hemicellulose (acetic acid is too weak to decompose it) thus obtained was purified by dissolving in 4 per cent caustic soda solution at room temperature, filtering and washing the precipitate first with aqueous ethyl alcohol (50 per cent) and then with absolute alcohol. This was dried in a vacuum desiccator over concentrated sulphuric acid.

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[1] Fuoss and Strauss, *J. Polymer Sci.*, **3**, 602 (1948).
[2] Pals and Hermans, *J. Polymer Sci.*, **3**, 897 (1948).
[3] Basu, *Nature*, **168**, 341 (1951).
[4] Sarkar, *Nature*, **167**, 357 (1951).
[5] Chatterjee and Sarkar, *Proc. Nat. Inst. Sci. (India)*, **12**, 23 (1946

## Biological Activity of some Enteramine-related Substances

The action of enteramine on various biological test objects has been established in previous investigations[1].

The present communication represents a preliminary contribution to the comparative study of the actions developed, on some of the most important and significant biological reactives of enteramine, by a number of enteramine-related indole derivatives.

The results obtained with indol- and hydroxyindolalkylamines on the diuresis of hydrated rats (antidiuretic action), on the blood pressure of the spinal cat (hypertensive action), as well as on the isolated œstrus–uterus of the rat, and the *in situ* urinary bladder of the dog (stimulant action), are summarized in the accompanying table.

The activity of enteramine is arbitrarily taken as 100; the activity of the other substances is expressed in percentage.

| | Hydrated rats' diuresis | Rat œstrus–uterus | Dog urinary bladder | Spinal cat blood pressure |
|---|---|---|---|---|
| Enteramine | 100 | 100 | 100 | 100 |
| Bufotenine | 6–7 | 10 | 5–10 | 50 |
| Bufotenidine | <0·3 | 0 | ? | 400–600 |
| Bufothionine | 0 | 0 | 0 | 0 |
| Dehydrobufotenine | 0 | 0 | 0 | 0 |
| Tryptamine | 0·3–0·5 | 1–1·5 | 1·5 | 12–16 |
| 1-Methyltryptamine | 0·1–0·2 | 1–3 | 1–1·5 | 10–12 |
| N-Methyltryptamine | <0·3 | <0·5 | <0·5 | 10 |
| N,N-Dimethyltryptamine | <0·3 | <0·5 | <0·5 | 6–8 |
| 5-Methoxytryptamine | 25–40 | 25–30 | 30–35 | 30–50 |
| Adrenaline | diuretic action | inhibition | inhibition | 2,000–3,000 |

The following compounds have proved wholly inactive on all the above biological reactives: indole, skatole, 5-methoxyindole, β-(indole-3)-acetic acid, β-(indole-3)-propionic acid, γ-(indole-3)-*n*-butyric acid, tryptophane, tryptophanol, hypophorine.

From the data in the table and from the study of numerous records, the following conclusions may be drawn.

(*a*) Among the indolalkylamines hitherto tested, enteramine possesses the most powerful action on the diuresis and the uterus of the rat, and on the urinary bladder of the dog. Moreover, the biological reactives are in no way damaged by the substance, as shown by the easily repeatable pharmacological response, and, when working with isolated organs,