PREFACE

The present study was planned to search the lectins which agglutinate the erythrocytes of patients with type-2 diabetes mellitus in different intensities, to study the LH-specificity in patients with type-2 diabetes mellitus in the context of north India, to study the LH-specificity in patients with type-2 diabetes mellitus along with the ABO blood group system and to study the various properties of the anti-LH lectin *Erythrina lithosperma*.

A total of 263 blood samples from patients with type-2 diabetes mellitus were obtained from Guru Nanak Dev Hospital and Puneet Diabetic Centre, Amritsar, Punjab, India. The samples represented adequately the Sikh, Hindu, Muslim and other religious groups in patients with type-2 diabetes mellitus. For comparison, 251 unrelated normal healthy individuals were sampled randomly from this district place. Since sex differences were known not to exist in the LH system (Sehajpal and Shrivastava, 1980 and 1981), the samples collected from both males and females were pooled for the various analyses.

Apart from LH-specificity, various properties of the anti-LH lectin *Erythrina lithosperma* including, hemagglutination reaction, estimation of total proteins content via various methods (Biuret, Bradford, Lowry and UV method), estimation of total carbohydrates (Phenol-Sulphuric method), molecular weight of the anti-LH, biochemical characterization including sugar inhibition assay, physical stability of the anti-LH lectin including effect of pH, metal ions and temperature on the agglutinability of the anti-LH lectin were also studied.

The results of the present study indicated that the patients with type-2 diabetes mellitus were overwhelmingly LH-negative, showing statistically significant differences (p<0.001) between type-2 diabetic patients and controls, and these differences were particularly noticeable in patients with the blood group B, AB and O. In the distribution of the ABO types, no significant differences (p>0.05) were found between these two groups.

In regard to the distribution of the LH types with blood group B, AB and O, statistically significant differences were obtained (p<0.001) between the patients with type-2 diabetes mellitus and controls, but no significant differences were found statistically in regard to the distribution of the LH types with blood group A.
When the patients were compared among themselves in regard to the distribution of the LH types, no significant differences were found. In the distribution of the ABO types, differences between the groups were not statistically significant. As regard to the distribution of the LH types among patients with the blood groups A,B and AB, the differences observed were significant statistically (p<0.05).

Likewise, when we compared the distribution of the LH and ABO types and the distribution of the LH types with blood groups A, B and AB among the four religious groups which together made up the samples, statistically no significant differences (p>0.05) were found.

It was observed that the anti-LH lectin could agglutinate human erythrocytes implying that the lectin was able to bind to the erythrocytes non-specificity.

The total protein concentration of crude extracts of the anti-LH lectin was 2061.40 µg/ml, 47.56 µg/ml, 199.5 µg/ml and 5148.34 µg/ml via Biuret, Bradford, Lowry and UV-method respectively.

Phenol sulphuric acid method was used to determine the total carbohydrate content of lectin using glucose as standard. Total carbohydrate concentration was 896 µg/ml.

Haemagglutination inhibition studies showed that, of the sugars tested, N-acetyl glucosamine was the most potent inhibitory sugar followed by galactose, lactose, raffinose, mallibiose and sucrose. Other sugars tested were found to be incapable of inhibiting haemagglutination.

Molecular weight of the anti-LH lectin was 26kDa and 28kDa. It was a dimer protein. The pH of the anti-LH lectin was estimated to 5.25 to 7.0, when the pH was raised above 7.0 the lectin lost its hemagglutination activity.

The Erythrina lithosperma lectin did not require any metal ion for the hemagglutination activity.

Thermal stability data showed that the stability of the anti-LH lectin was temperature dependent.

It was also reported in the present study that the patients with type-2 diabetes mellitus having HbA1c >7.0% were predominantly LH-negative type.