Attempts to find suitable chemotherapeutical agents for tuberculosis date almost from the time Koch (1882) announced the discovery of etiological agent of this disease. Many bacterial infections can be completely controlled and eliminated, but there are still some against which no really successful drug has been designed. Tuberculosis and staphylococcal infections are most outstanding examples of these.

The present study can be divided into three parts – Synthesis of compounds, their antitubercular studies, and pharmacological screening of the compounds synthesised.

Four types of compounds defined by the following general structure were prepared and studied:

\[ \text{I} \]
\[ \text{II} \]
\[ \text{III} \]

\[ \text{R} = \text{Nicotinic acid} / \text{Isonicotinic acid} \]

\[ \text{Sugar derivatives of 4-aminosalicylic acid, isonicotinic acid and nicotinamide.} \]

\[ \text{R} = \text{Phenyl} / \text{substituted phenyl} \]
Sugar derivatives of isonicotinyl hydrazides have already been reported. Hence sugar derivatives of 4-aminosalicylic acid, isonicotinic acid and nicotinamide were prepared by the standard established methods with slight modifications wherever necessary. Nicotinyl 4-aminosalicylic acid is reported but method of preparation is not described hence an attempt was made to synthesise and establish the method of their preparation. The same procedure was followed for the preparation of isonicotinyl 4-aminosalicylic acid. This compound is not reported so far.

The two series of compounds (class III and IV) being new, their method of preparation has been standardised. These compounds being polyfunctional in nature, posed a challenge in their synthesis, isolation and purification.
Their methods of preparation have been established by modulating various factors, i.e. reaction temperature, the reaction medium and instability of acid chloride which is prone to diverse ways of degradation such as dimerisation and polymerisation.

Synthesis of twenty compounds was attempted and nineteen compounds out of these belonging to different classes were successfully prepared. Infra-red, Nuclear Magnetic resonance and mass spectroscopy have been used to confirm the structure of the compounds synthesised in the present study. These were used not only to follow the progress of the reaction but also to isolate, purify and characterise the various reaction products.

The compounds synthesised were screened for anti-tubercular activity. Phenyl and phenyl substituted derivative of isonicotinic acid showed a fairly good activity. However, only isonicotinyl amilide a representative of this class was tested. The activity of compound was not comparable to standard compound. This may be ascribed to a difference in the transfer of the organic molecule into the semipermeable membrane of the cells. Difference in penetration may be due to the hydrophillic and hydrophobic nature of the substituent. This class of compounds require further study as they may reveal a compound which could possibly be of medicinal use.
Other classes of compounds (class I and II) as mentioned earlier were also screened for antitubercular activity. All compounds showed activity against *M. tuberculosis*. These compounds were screened for minimum inhibitory concentration value (MIC value). It was found to be more than 50 mcg/ml. The MIC value is much higher as compared to standard compound. The decrease in activity was found to decrease with higher alkyl substituents possibly due to some relationship between molecular size and penetration into cellular membrane of *M. tuberculosis*. However in view of the limited number of compounds screened, the evidence is not sufficient to justify definite conclusions.

The synthesised compounds were subjected to pharmacological screening. The compounds have not shown significant depressant action on CNS in mice. Compounds were also tested for their effect on cardiovascular system; they showed no effect on blood pressure and respiration of pentobarbitone sodium anaesthetized mongrel dogs.