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A new method of DNA isolation from sputum samples for diagnosis of tuberculosis without any laboratory instruments

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DNA isolation from difficult specimens is an important point in the detection of many pathogens and bacteria. Today, many DNA isolation methods have complex processing steps and require laboratory devices. Therefore, a simply DNA isolation method that can be used not only in laboratory but also in the field is required. The aim of this study is development of a simple and effective method for homogenization of sputum samples and isolation of DNA without any laboratory instruments. Before DNA isolation and homogenization, samples were contaminated with 10^1 to 10^5 CFU/mL *M. tuberculosis*. Homogenization was carried out in 7% trypsin solution at room temperature for 30 min. After homogenization, samples were passed through the silica solid phase column. Before using, columns were conditioned with chemical treatment in order to better retention of DNA. After passing sample through the column, column was washed with 80% isopropyl alcohol. In order to remove alcohol, column was dried. Finally, DNA in the column was eluted with 10 mM TE solution. Trypsin homogenization method is found more successful and simpler than methods in the previous studies. Studying in room temperature is the additional advantage of this method. Five different DNA isolation methods have been compared and it has been reported that Qiagen Qiamp is the most successful method. In the developed new method, 10^2 CFU/mL concentrations can be detected, so the method is as successful as the Qiagen Qiamp Kit. The most important point of this method is isolation of DNA without using any complex devices.

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