SUMMARY AND CONCLUSIONS
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1. Survey carried out for the prevalence of thermophilic actinomycetes depicted that *T.vulgaris* was most commonly found organism and *T.sacchari* the least. In India, the prevalence was found to be 39% which was followed by *T.candidus* (29%), *S.viridis* (12.9%), *F.rectivirgula* (11.7%) and *T.sacchari* (7.8%).

2. *T.vulgaris* was found in all the sources studied but maximum percentage was found in humidifiers.

3. *T.candidus* was also present in all the sources studied but maximum percentage was found in rice husk.

4. *F.rectivirgula* was not found in garbages, cow sheds, humidifiers and rice husk, but maximum percentage of this species was found in mouldy hay.

5. *T.sacchari* was absent from all the sources except in baggase.

6. *S.viridis* was commonly found in garbages and absent from cowsheds and wheat straw.

7. Baggage was the only source which gave the presence of all the 5 species of thermophilic actinomycetes and hence the best source for isolation of
thermophilic actinomycetes.

8. Of all the media tested 3% casein hydrolysate broth was found to be the best medium which gave reproducible growth of all the four thermophilic actinomycetes studied and gave antigens of thermophilic actinomycetes which were free from any media components and hence used in our studies.

9. Growth characteristics studies revealed that maximum amount of protein as well as maximum amount of dry weight of mycelium produced by *T. vulgaris*, *T. candidus*, *F. rectivirgula* and *S. viridis* was on the 7th, 5th and 10th day respectively.

10. With all the four species studied, decrease in protein content coincided with increase in proteinase activity during growth.

11. pH for growth medium was found to be almost neutral for all the four species at the time of maximum production of protein.

12. Antigens obtained at different time intervals during growth studies of all the four species, when analysed by Crossed immuno electrophoresis, Poly acrylamide gel electrophoresis and IEF gave maximum number of bands with the culture filtrate giving maximum amount of protein.
13. 90% ammonium sulfate precipitate of mass cultured culture filtrate antigens of all the four species i.e. \textit{T. vulgaris}, \textit{T. candidus}, \textit{F. rectivirgula} and \textit{S. viridis} displayed 15-22 precipitin arc on Crossed immuno electrophoresis.

14. The Thin layer isoelectric focussing pattern of all the four species showed more than 20 silver stained bands in PI range of 4-6.5.


16. 22 sera samples out of 36 samples of interstitial lung disease patients collected gave positive precipitine line on Immunodiffusion with \textit{T. vulgaris} antigens only.

17. Immunoblot studies of \textit{T. vulgaris} antigen with sera of Interstitial lung disease patients having high ELISA titre, depicted, major bands of molecular weight 95 KD and 63 KD and were of diagnostic significance.

18. Protein fractions of molecular weight 5 and 27 KD showed antibodies in 8% and 15% of patients sera respectively and were considered as minor antigens of \textit{T. vulgaris}. 

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19. With *F. rectivirgula* antigens, proteins of molecular weight 85KD and 100KD were present in most of the patient’s sera having ELISA O.D. more than 0.2 and could be of diagnostic use.

20. With *S. viridis* antigenic extract, patient’s sera having high ELISA titre exhibited only 2 bands and protein fraction of molecular weight 80 KD was common to all of them.

21. One band of molecular weight 95 KD was present in all the sera having high ELISA titres, i.e. O.D. more than 0.5 but pooled sera with low ELISA titre did not exhibit any band.

22. No correlation was observed between total IgE and specific IgG levels in interstitial lung disease patient’s sera.

23. High titres of specific IgG were not obtained against *T. vulgaris* antigens extracts in the sera of patient’s having respiratory disease other than interstitial lung disease.

24. Little shared antigenicity existed between *S. viridis* and two species of *Thermoactinomyces* whereas *S. viridis* and *F. rectivirgula* were more closely related. However, *Faeni* species did not show any
cross reactivity with two species of the genera *Thermoactinomyces*.

25. FPLC profile of *T. vulgaris* antigenic extract gave five peaks out of which fraction no. IV and V were found to be most reactive as they required 80ng and 130ng of proteins respectively for 50% inhibition with pooled patient's sera of high ELISA titre as compared to 360ng of crude antigen required for the same inhibition.

26. We can conclude from our studies that higher prevalence of *T. vulgaris* raised the possibility of having IgG antibodies in more number of interstitial lung disease patients.