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Mycobacteriocin typing of *Mycobacterium tuberculosis* isolated from patients in south India, Hong Kong & Britain

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A total of 148 strains of *M. tuberculosis* (south India, 118; Hong Kong, 24; Britain, 6) were screened for mycobacteriocin production by cross-streak method using 9 rapid growers (group IV mycobacteria) as indicator strains adapting the scheme suggested by Takeya and Tokiwa. Eighty six per cent (127 of 148) of the cultures were found typable into two types–type 11 (84%); and type 9 (2%). The remaining 14 per cent (21) cultures were untypable and exhibited different inhibition patterns not reported earlier. Since 98 per cent (125 of 127) of the typable cultures belonged to type 11, the limitation of the present indicator system for typing *M. tuberculosis* from south India is discussed-

Bacteriocinogeny is known to be a stable genetic character. Intra-species differentiation using bacteriocin production as a marker has been successfully applied to some bacterial[1-3]. However, only one report is available on mycobacteriocin production as a marker for typing *Mycobacterium tuberculosis* [4]. We report here the results of our investigation on mycobacteriocin typing of *M. tuberculosis* isolated from south India, Hong Kong and Britain, using the same set of indicator strains as employed earlier[4].

Material & Methods

Cultures : In all, 148 cultures of *M. tuberculosis* were screened for the production of mycobacteriocin-118 from south India, 24 from Hong Kong and 6 from Britain.

Method : The 'streak-plate' method using 9 indicator strains as described by Takeya and Tokiwa[4] was followed. The indicator strains were *M. diernhoferi* ATCC 19340; *M. thermoresistible* ATCC 25814; *M. thermoresistible* ATCC 25815 *; M. chitae* ATCC 25805 ; *M. aurum* 15009; *M. aurum* 15011; *M. aurum* 15002; *M. diernhoferi* ATCC 19341; and *M. chitae* ATCC 19627. All the test cultures were coded and plates were set up in duplicate for each isolate.

Results & Discussion

The mycobacteriocin types of *M. tuberculosis* obtained from the 3 geographical regions are shown in the Table. All the strains of *M. tuberculosis* isolated from Hong Kong, Britain and about 81

Table. Mycobacteriocin types of *M. tuberculosis*

Source	No. tested	Inhibition pattern of indicator strains									Type No.	
		1	2	3	4	5	6	7	8	9		
Hong Kong	24	–	–	–	–	–	–	–	–	–	11	24
Britain	6	–	–	–	–	–	–	–	–	–	11	6
South India	118	+	+	+	+	+	+	+	+	+	9	2
		–	–	–	–	–	–	–	–	–	11	95
		–	–	–	–	+	–	–	–	–	New	20
		–	+	+	–	–	–	–	–	–	New	1

per cent of the typical strains from south India were classified as type 11. Of the remaining 23 strains from south. India, 2 strains were classified as type 9 and the other 21 strains showed 2 new patterns not reported by earlier workers[4].

In the present study 86 per cent of *M. tuberculosis* cultures were typable as compared to 92 per cent typability observed by Takeya and Tokiwa[4]. Clustering of a great majority of the strains into a single type defeats the very purpose of the intra-species differentiation of *M. tuberculosis* strains. However, the earlier workers from Japan[4] grouped their cultures into 11 types among which type 11 constituted only 12 per cent and type 9, 1.7 per cent. They observed that all the 14 isolates obtained from Africa belonged to a single type *viz.*, type 11 as has also been observed in the present study.

This study and also the experience by previous workers[4] indicate the limitations of the present typing scheme. The results of our investigation suggest the need for further work to look for suitable indicator strains among local isolates of mycobacteria with the object of evolving a good and reproducible typing scheme for typing *M. tuberculosis* and other non-tuberculous mycobacteria obtained in this region and other parts of the world.

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