

RESEARCH NOTE

Distribution of Phagetype Patterns of *Mycobacterium tuberculosis* Isolated in Cuba (1987-1991)

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The provincial distribution of different *Mycobacterium tuberculosis* phage types in Cuba is reported through the identification of 918 strains from Cuban tuberculosis patients. The isolation of strains was performed between 1987 and 1991 when diagnosed and before the beginning of the treatment. The analysis carried out showed a relatively homogenous distribution of A, Ax and I types in all the provinces of the country, predominating phagetype A (56.97%) followed by the phagetypes I (35.06%), Ax (4.24%), C (1.09%), and B (1.01%), in that order.

Many reports of mycobacterial characterization using bacteriophages for typing have followed the studies of GM Garder and RS Weiser (1947 *Proc Soc Exp Biol Med* 66: 205-206) and S Froman et al. (1954 *Am J Pub Health* 44: 1326-1333) who isolated for the first time, active phages capable of lysing *M. smegmatis* and *M. tuberculosis*, respectively.

Studies carried out on the division of *M. tuberculosis* into types and sub-types through specific bacteriophages have gained importance in the epidemiological and clinical control of tuberculosis (WD Jones et al. 1982 *Am Rev Respir Dis* 125: 640-643, S Clavel-Seres et al. 1988 *Rev Mal Resp* 5: 577-581).

Through studies made in several countries, the distribution of phagetypes of *M. tuberculosis*

in different regions of the world has been reported allowing the differentiation of strains introduced by immigrants, particularly in those countries that are controlling and reducing their tuberculosis rate (S Clavel-Seres & F Clément 1984 *Ann Microbiol (Inst Pasteur)* 135B: 35-44, WD Jones 1990 *Am Rev Respir Dis* 142: 1000-1003).

As part of the standardization of this technique in 1989, CA Jiménez-Misas et al. (1989 *Mem Inst Oswaldo Cruz* 84: 271) reported a preliminary study of the distribution of *M. tuberculosis* phagetypes in Cuba. The absence of phagetype B was described in 227 strains studied.

The purpose of the present report was to determine the phagetype distribution by province of *M. tuberculosis* covering a considerable portion of the total *M. tuberculosis* isolates between 1987 and 1991. This study represents a more complete *M. tuberculosis* phagetypes distribution in a country of the Latin American region. Phage typing was applied to a total of 918 strains of *M. tuberculosis* by the techniques initially described by W Redmond and D Ward (1966 *Bull WHO* 35: 563-568) with the modifications introduced by TA Rado et al. (1977 *Am Rev Respir Dis* 115 (Suppl): 268) as well as those described by JM Grange et al. (1977 *Tubercle* 58: 207-215).

The Table summarizes the results and percentages of *M. tuberculosis* phagetype distribution for all provinces. This enables a comparison between the individual results of each province and the rest of the provinces. These results demonstrate a higher proportion of phagetype A (56.97%) and I (35.06%), followed by types Ax (4.24%), C (1.09%), B (1.01%). Except for the provinces of Matanzas, Ciego de Avila, Holguin and Guantánamo, a certain homogeneity in the Cuban population was observed in relation to the distribution of phagetypes A, Ax and I. As for the capital of the country (Ciudad de La Habana), La Habana, Pinar del Rio, Villa Clara and Santiago de Cuba, the patterns reported represent all *M. tuberculosis* types. It must be noted, however, that in spite of the large number of strains studied, not all of the provinces are equally represented according to their actual tuberculosis incident rates.

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TABLE
Mycobacterium tuberculosis phagetype provincial distribution in Cuba (1987-1991)

Province	Phagetypes										
	Total	A	%	Ax	%	I	%	B	%	C	%
Pinar del Rio	62	36	58.0	5	8.0	17	27.4	2	3.2	2	3.2
Ciudad de La Habana	259	180	69.4	3	1.1	69	26.6	3	1.1	4	1.5
La Habana	30	12	40.0	1	3.3	15	50.0	1	3.3	1	3.3
Isla de la Juventud	20	12	60.0	1	5.0	6	30.0	-	-	1	5.0
Matanzas	54	34	62.9	-	-	19	35.1	1	1.8	-	-
Villa Clara	103	60	58.2	2	1.9	36	34.9	2	1.9	3	2.9
Cienfuegos	40	29	72.5	2	5.0	8	20.0	-	-	1	2.5
Sancti Spiritus	25	7	28.0	4	16.0	14	56.0	-	-	-	-
Ciego de Avila	19	14	73.6	5	26.3	-	-	-	-	-	-
Camaguey	87	34	39.0	3	3.4	46	52.8	-	-	4	4.5
Las Tunas	38	6	15.7	3	7.8	29	76.3	-	-	-	-
Granma	46	18	39.1	6	13.0	22	52.1	-	-	-	-
Holguin	30	23	76.6	-	-	7	23.3	-	-	-	-
Santiago de Cuba	80	38	47.5	4	5.0	34	42.5	2	2.5	2	2.5
Guantánamo	25	20	80.0	-	-	5	20.0	-	-	-	-
Total	918	523		39		327		11		18	
		(56.97)		(4.24)		(35.06)		(1.01)		(1.09)	