NOTES

FURTHER STUDIES ON THE EIJKMAN REACTIONS OF SHIGELLA CULTURES

C. A. STUART AND ROBERT RUSTIGIAN

Biological Laboratory, Brown University, Providence, Rhode Island

Stuart *et al.* (1942) found that 15 cultures of *Shigella paradysenteriae*, with one exception, failed to grow while 17 *S. sonnei*, 4 *S. alkalescens* and one *S. dispar* (madampensis) cultures grew readily and fermented glucose at 45.5°C. Wood *et al.* (1943) found that the ability of *Shigella* species to reduce trimethylamine oxide corresponded to their Eijkman reactions. In view of this correlation it seemed advisable to extend the work on the Eijkman reactions of *Shigella*.

In the present work on 276 cultures a temperature of 45°C., ± 0.1°C., was found more satisfactory than 45.5°C. Inoculations were made from 24-hour broth cultures. Two loopfuls of group I and one loopful of group II species

TABLE 1

GROUP	SHIGELLA SPECIES	CULTURES TESTED	EIJKMAN REACTIONS			
			No growth	Growth	Slight acid	Strong acid
I	*Sh. dysenteriae*	6	6			
	Sh. paradysenteriae	61	61			
	Sh. ambigua	3	3			
	Sh. sp. (Newcastle type)	15	15			
	Sh. equirulis	1	1			
Totals		86	86	0	0	0
II	*Sh. sonnei*	17		1	2	14
	Sh. alkalescens	142		2		140
	Sh. dispar (madampensis)	22				22
	Sh. ceylonensis	9				9
Totals		190	0	3	2	185

(table 1) were inoculated into Difco Eijkman medium base with glucose. All cultures were incubated for 24 hours. Table 1 shows that none of 86 group I cultures grew at 45°C. After 24 hours at 45°C. the cultures were placed at 37°C. Seventy-nine group I cultures, after showing no visible growth for from 12 to 36 hours at 37°C., produced acid while 7 cultures failed to grow. In the previous work one carefully checked *S. paradysenteriae* gave a strong acid reaction at 45.5°C. Unfortunately this culture was not available for the trimethylamine test. All 190 group II cultures tested in the present work grew and 185 or 97.4 per cent produced strong acid from glucose at 45°C.

As pointed out by Neter (1942) *S. alkalescens* is not infrequently mistaken for *S. paradysenteriae*. To a lesser extent a similar condition holds true for *S. sonnei* cultures fermenting lactose much more slowly than the average strain. Diagnostic laboratories without adequate antiserums could use either the Eijkman or the trimethylamine test or both to good advantage with *Shigella* cultures. Considering the large number of cultures tested the single group I, Eijkman positive exception and the single group I, trimethylamine positive exception (Wood *et al.* 1943) detract but little from the practicability of these two tests.

REFERENCES

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A PRIMARY DIVISION OF THE GENUS SHIGELLA BASED ON THE TRIMETHYLAMINE TEST

A. J. WOOD, ELIZABETH A. BAIRD AND FRANCES E. KEEPING

Atlantic Fisheries Experimental Station, Halifax, Canada

A recent survey (Wood and Baird 1943) of the Enterobacteriaceae has revealed that most of the species of this family are able to reduce trimethylamine oxide to trimethylamine. The only exceptions were noted in *Shigella* and *Erwinia*.

TABLE 1

GROUP	SHIGELLA SPECIES	NUMBER OF CULTURES	TRIMETHYLAMINE PRODUCTION	
			Neg.	Pos.
I	*S. dysenteriae*	16	16	
	S. paradysenteriae	87	86	1
	S. ambigua	7	7	
	S. schmitzii	1	1	
	S. sp. (Newcastle type)	5	5	
	S. equirulis	1	1	
Totals		117	116	1
II	*S. sonnei*	22		22
	S. alkalescens	98		98
	S. madampensis (dispar)	19		19
	S. ceylonensis	2		2
Totals		141	0	141