FIVE NEW ARIZONA SEROTYPES ISOLATED FROM REPTILES

(5 : 29 : 21 ; 13 : 22 :- ; 19 : 27 : 25 ; 19 : 27 : 40 ; and 30 : 22 : 31)

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It is known that organisms of the Arizona group occur very frequently in reptiles and many different serotypes have been found among cultures isolated from snakes (LeMinor, Fife and Edwards, 1958). The purpose of the present paper is to report the isolation of five hitherto undescribed serotypes from reptiles.

MATERIALS AND METHODS

The cultures in question were isolated from the feces of apparently normal snakes (*Agkistrodon halys blomhaffi*). They were members of a large group of *Salmonella* and Arizona cultures isolated during a study of the occurrence of such organisms in normal reptiles. The methods used in their study were those described by Edwards and Ewing (1962).

RESULTS

All of the cultures were typical members of the Arizona group of the family Enterobacteriaceae. In biochemical studies it was found that indol was not produced, the methyl red test was positive and the Voges-Proskauer test negative, growth occurred on Simmons' citrate agar, hydrogen sulfide was formed, urease and phenylalanine deaminase were not produced, no growth occurred in Moeller's KCN medium, gelatin was liquefied slowly and lysine and ornithine decarboxylases and arginine dihydrolase were produced. Glucose, arabinose, rhamnose, xylose, lactose, maltose, trehalose, mannitol, and sorbitol were fermented promptly with gas production. Cellobiose was fermented only after prolonged incubation. When tested by the method of Kauffmann and Petersen (1956), D-tartrate, citrate and mucate were not acidified within 20 hours incubation, as is usual with *Salmonella* cultures. Malonate was utilized.

The antigenic properties of the cultures were as follows :

Culture 2175-60 (CDC 3063-61) was agglutinated to the titre of O antigen group 5 serum and in absorption tests removed all agglutinins from the serum. Flagellar phase 1 was agglutinated to the titre of H 29 serum and in absorption tests reduced the titre of the serum from 20,000 to 400. Phase 2 was agglutinated to the titre of H 21 serum and in absorption tests removed all agglutinins from the serum. No fur-

ther flagellar phases could be recovered from the culture. The antigenic formula of 2175-60 was 5 : 29 : 21.

Culture 2055-60 (CDC 3064-61) was recovered from a culture which contained two serotypes. One of these (23 : 23 : 30 : 42) was described by Sakazaki, Tsujimoto, Edwards and Fife (1962). The type to be described here was agglutinated to the titre of O antigen group 13 and in absorption tests removed all agglutinins from the serum. When tested with Arizona H sera it was agglutinated only by H 22 serum, from which it effected a complete removal of agglutinins. When placed in semisolid medium which contained H 22 serum the organism was immobilized. Serial transfer in H 22 serum did not reveal the presence of a second H phase. The organism must be considered as a monophasic Arizona type which had the formula 13 : 22 :- . Serotype 24 : 24 : 31 also was found in the feces of the snake from which culture 2055-60 was isolated.

Culture 2452-60 (CDC 3065-61) was agglutinated to the titre of O antigen group 19 serum and in absorption tests reduced the titre from 800 to 50. Phase 1 of the flagellar antigens was agglutinated to the titre of test serum for H antigen 27. In absorption tests it removed all agglutinins from the serum. Phase 2 of the H antigens was agglutinated to the titre of H 25 serum and removed all agglutinins from the serum. The antigenic formula of 2452-60 was 19 : 27 : 25.

Culture 2253-60 (CDC 3061-61) was agglutinated to the titre of O antigen group 19 serum and in absorption tests reduced the titre for the homologous strain from 800 to 50. Phase 1 of the flagellar antigen was agglutinated to the titre of H 27 serum and in absorption tests removed all agglutinins from the serum. Phase 2 was agglutinated to half the titre of Arizona H 40 serum and when used to absorb the serum left a marked residue of agglutinins in the serum. A serum then was prepared from phase 2 of 2253-60. The results of cross agglutinations and reciprocal absorptions with this serum and that derived from culture 2907-58, the test strain for H antigen 40, were described by Fife, Edwards and Sakazaki (1962). From this work it was evident that H antigen 40 was divisible into two entities, 40a, 40b and 40a, 40c. Phase 2 of 2253-60 was designated 40a, 40c. The antigenic formula of the culture was 19 : 27 : 40. This type was isolated from a snake which also yielded serotype 24 : 24 : 31.

Culture 2082-60 (CDC 3071-61) was agglutinated to the titre of O antigen group 30 serum. In absorption tests the titre of the serum for the test strain was reduced from 1600 to 100. Phase 1 of the flagellar antigens was agglutinated to the titre of, and removed all agglutinins from H 22 serum. Phase 2 was agglutinated to the titre of H 31 serum and removed all agglutinins from the serum. The antigenic formula of culture 2082-60 was 30 : 22 : 31. From the snake which yielded this serotype, *Salmonella mikawashima* and Arizona serotype 16 : 27 : 25 also were recovered.

SUMMARY

The biochemical and serological properties of five new Arizona serotypes (5 : 29 : 21 ; 13 : 22 :- ; 19 : 27 : 25 ; 19 : 27 : 40 ; and 30 : 22 : 31) isolated from snakes (*Agkistrodon halys blomhaffi*) are described. All were biochemically typical members of the Arizona group of the family Enterobacteriaceae.

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