Salmonella roggeveld 51 : - : 1,7

A New Serotype*

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SUMMARY

A new Salmonella, S. roggeveld **51 : — : 1,7 is described. So far this Salmonella seems to be geographically restricted to the western Cape Province. A total of 18 different isolations, all performed at the Department of Medical Microbiology, University of Stellenbosch, between 1962 and 1969 gives some insight into the ecology of this type. It seems that** S. roggeveld **is fairly widely distributed among indigenous tortoises, lizards and snakes. Ticks can act as vectors. The isolation of** S. roggeveld **from mesenterial lymph nodes of a pig, show that mammals can also be infected. The lack of isolations from human beings so far, may be attributed to the easy escape of this type from routine laboratory investigations.**

S. roggeveld **is ideally suited for the preparations of anti-0-51- diagnostic sera.**

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This monophasic Salmonella was first isolated from a rectal swab from an apparently healthy wild tortoise (*Psammobates tentorius trimenis*) during October 1962. The animal was caught in the environment of a farm, named Roggeveld, in Southern Namaqualand. The culture was sent to Dr Joan Taylor, Salmonella Reference Laboratory, Colindale, London, for further investigation. Kauffmann reported the serological formula without a name in his sixth supplement to the Kauffmann-White-scheme[1] in 1963 and with a name in the seventh supplement in 1964.[2] The new serotype is also mentioned by Lapage *et al.* in 1966.[3] Our own group refrained from early publication to gain more information about the distribution, ecology and significance of the new type.

FURTHER ISOLATIONS

During the following 7 years we obtained 17 further isolations, bringing the total to 18. Of these, 15 were isolated from different tortoises belonging to the two species *Psammobates tentorius trimenis* (1 isolation from a rectal swab) and *Chersina angulata* (14 isolations from 9 animals: 8 from rectal swabs, one from eggs *in situ*, and 5 from bile). The tortoises were caught in the following areas: Namaqualand, Calvinia, Heidelberg/Cape, and in the Worcester district. As we collected specimens from 200 tortoises from the Kalahari Desert, Transvaal and the whole area of the Cape Province, it seems that *S. roggeveld* is restricted to an area south of the Orange River comprising Namaqualand and the south-western Cape Province. *S. roggeveld* occurs in about 5% of South African tortoises.

Three other isolations came from ticks (*Rhipicephalus appendiculatus*), from a lizard and from a pig. The ticks were collected from the anal region of a *S. roggeveld*-positive tortoise. The ticks were rinsed and cleaned in sterile water, disinfected by alcohol and ether, dried and afterwards crushed. Enrichment cultures of the pulp showed *S. roggeveld*. Therefore it seems that ticks are able to harbour *S. roggeveld* in their intestinal tracts.

The lizard, a *Cordylobus cataphractus*, was caught in the southern part of the Cape Peninsula. The rectal swab of this lizard was positive, the gall bladder and the mouth cavity did not contain *S. roggeveld*.

Mesenterial glands from 6 pigs were collected at the abattoirs of Cape Town in October 1965. The pigs appeared healthy. They originated from the Western Cape. Glands of 5 pigs were Salmonella-negative, but the sixth carried *S. roggeveld* in its mesenterial glands.

Salmonella enrichment cultures from different organs of 400 sea birds, mainly seagulls, collected at random, have never shown *S. roggeveld*. Feeding experiments on 6 seagulls and 6 doves were unsuccessful.

So far *S. roggeveld* seems to be restricted to tortoises, ticks, and lizards of the western Cape Province, but the isolation of this serotype from the mesenterial glands of a pig makes it likely that *S. roggeveld* may also be carried and spread by mammalians.

CHARACTERISTICS

Biochemical

The biochemical characteristics of *S. roggeveld* were uniform and are shown in Table I.

Tartrate reactions were read after 3 days; mucate was positive after 24 hours. Because of the positive malonate reactions, the liquefaction of gelatin, and the behaviour with organic acids, *S. roggeveld* belongs to subgenus II (Kauffmann).[4]

*Date received: 31 March 1971.

TABLE I. BIOCHEMICAL CHARACTERISTICS OF SALMONELLA ROGGEVELD

Chemical	Reactions
Lactose 5%	Negative
Sucrose	Negative
Glucose	Acid and gas
Mannitol	Acid
Arabinose	Acid
Dulcitol	Acid and gas
Inositol	Negative
Rhamnose	Acid
Trehalose	Acid
Xylose	Acid
Salicin	Negative
Urea	Negative
H_2S	Positive
KCN	Negative
Indole	Negative
Malonate	Positive
Stern's glycerol	Lilac after 2 days
Simmons citrate	Positive after 2 days
Sodium citrate	Positive
d-Tartrate	Negative
l-Tartrate	Negative
m-Tartrate	Negative
Mucate	Positive after 1 day
Gelatin	Liquefied in 9 days

Serology

On serological examination, *S. roggeveld* was agglutinated by the 0 antiserum 51. The mobile monophasic organism was further agglutinable by the H antisera 1 and 7. Due to its simple antigenic structure, *S. roggeveld* is an ideal type for the preparation of agglutinating anti-O: 51-sera in rabbits.

The 0 - 1 phage disintegrates *S. roggeveld* colonies.

SALMONELLA GROUP 51

Our observations with *S. roggeveld* justify some reflections on the Salmonella group 51. Of the 8 types belonging to this group not one was primarily isolated from a human being. All are restricted to areas in the Gondwana district (India, Madagascar, Central and South Africa) (see Table II). So far most of the 51-group Salmonellae have been isolated from reptiles and some from the intestinal tract and from the bone marrow of mammals. Ticks act as vectors. The question about the pathogenicity in human beings has not been answered, perhaps because group 51 agglutinating sera are not generally used in diagnostic laboratories and the normal Widal's reaction misses antibodies against the Salmonella 0 antigen 51.

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TABLE II. SALMONELLA GROUP 51: TYPES, ANTIGENS, ECOLOGY*

Type	Antigens	Habitat	Origin
S. gokul	1,51: d: —	pig (gut)	India
S. meskin	51: e,h: 1,2	goat (lymph node)	Tschad
S. dan	51: k: e,n,z: 1,5	snake (Vipera xanthina)	Israel
S. overschie	51: 1,v: 1,5	tortoise	?
S. antsalova	51: z: 1,5	chameleon	Madagascar
S. treforest	1,51: z: 1,6	crushed bone	India
S. harmelen	51: z_4, z_{23} —	snake (Boa constrictor)	?
S. roggeveld	51: — : 1,7	tortoise, ticks, lizard, pig	South Africa

* References collected from Kelterborn(5)