Contribution to the Question of Antigenic Interrelationships between Crimean Hemorrhagic Fever Virus Strains Isolated in Rostov and Astrakhan Oblasts of the USSR, and in Bulgaria

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Several 1968 publications by Chumakov and coworkers showed that CHF virus strains isolated in 1967 and 1968 in Astrakhan, Rostov, and Samarkand Oblasts of the USSR, and in Bulgaria, were antigenically similar or identical. The authors used CF, DPRA, and NT for testing hyperimmune sera from laboratory animals, sera from persons who had recovered from CHF in different regions, and sera of naturally infected farm animals from Bulgaria.

In our work, sera from cattle and sheep from Krasnyy Sulin region (Rostov Oblast), which is unfavorable for CHF, were used to clarify DPRA and CF antigenic interrelationships of CHF virus strains isolated in Rostov and Astrakhan oblasts and in Bulgaria. These sera were collected in July 1968 and May 1969.

Seventy-eight cattle and sheep serum samples were investigated in parallel with 4 CHF virus strains: Sudarkina and Nr-14 (from Rostov), Drozdov (from Astrakhan), and 269 (from Bulgaria).

The Nr-14 strain was isolated from *Hyalomma plumbeum* and other strains from patient blood.

Of 78 cattle sera examined, 73 proved negative; the 5 positive showed antigens to all strains. Antibody titers in the 5 positive sera were identical with all antigens used (sucrose-acetone antigens of the same activity).

Thus, serum from cow 12 tested with antigen of Sudarkina, Nr-14, Drozdov, and 269 strains had titers 1:2, 1:2, 1:4, 1:2, respectively. Sera from cow 69 reached a titer of 1:2 with all antigens. Undiluted sera from cows 95 and 127 gave positive reactions with all antigens (Table 24).

The 46 sheep sera investigated with antigens of 4 strains gave negative results.

Sera (kindly presented by V. N. Milyutin, M.D., Director, Rostov Institute of Epidemiology, Microbiology and Hygiene) from 2 horses experimentally infected with CHF virus strain Sudarkina were tested by DPRA with antigens of Sudarkina, Nr-14, Drozdov, and 269 strains. These sera were taken from animals on day 5, 6, 7, 9, 11, 13, 15, 20, 27, 34, and 40 following infection.

Antibodies were found by DPRA in horse 1 on day 7–20 and in horse 2 on day 6–34 following infection. Antibody titers in positive sera were identical in reactions with all antigens used (maximum level of antibodies in horse 1 was 1:2 on day 11–13 and in horse 2 was 1:4 on day 9 after infection (Tables 25, 26).

Table 24.—Results of DPRA tests with bovine sera.

Cow no.	Antigens (strain)			
	Sudarkina	Nr-14	Drozdov	No. 269
12	½	½	¼	½
38	½	½	½	½
69	½	½	½	½
95	u/s	u/s	u/s	u/s
127	u/s	u/s	u/s	u/s

These sera were kindly presented by Director of RIEMH, Doctor of Medical Sciences V. N. Milyutin. Designations same as in Table 21.

Table 25.—DPRA results with serum from horse no. 1.

Antigen (strain)	Blood sample taken on day:										
	5	6	7	9	11	13	15	20	27	34	40
Sudarkina	–	–	u/s	u/s	½	½	u/s	u/s	–	–	–
Nr-14	–	–	u/s	u/s	u/s	½	u/s	u/s	–	–	–
Drozdov	–	–	u/s	u/s	u/s	½	u/s	u/s	–	–	–
No. 269	–	–	u/s	u/s	½	½	u/s	u/s	–	–	–

Designations same as in Table 21.

Table 26.—DPRA results with serum from horse no. 2.

Antigen (strain)	Blood sample taken on day:										
	5	6	7	9	11	13	15	20	27	34	40
Sudarkina	–	u/s	½	¼	½	½	½	u/s	u/s	u/s	–
Nr-14	–	½	¼	¼	½	½	½	u/s	u/s	u/s	–
Drozdov	–	½	½	¼	½	½	½	u/s	u/s	u/s	–
No. 269	–	½	½	¼	½	½	½	u/s	u/s	u/s	–

Designations same as in Table 21.

Table 27.—DPRA results with sera from horses 1 and 2 after repeated inoculation.

Blood sample taken on day	Horse 1				Horse 2			
	Sudarkina	Nr-14	Razdol'g	No. 269	Sudarkina	Nr-14	Razdol'g	No. 269
4	–	–	–	–	u/s	–	–	u/s
7	u/s	½	u/s	u/s	½	u/s	½	½
14	u/s	u/s	½	½	u/s	u/s	u/s	u/s
10	u/s	½	u/s	u/s	u/s	u/s	u/s	u/s
17	u/s	u/s	u/s	u/s	½	u/s	½	u/s
21	u/s	u/s	u/s	–	–	–	–	–

Designations same as in Table 21.