

# The Study Importance of Crimean-Congo Hemorrhagic Fever Virus in Kosovo

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## Abstract

Viral Zoonosis is distributed in Africa, Asia, and Mediterranean Europe. The major vectors of most of these zoonoses are ticks belonging to the genus *Hyalomma*, *Rhipicephalus* and *Ixodes*. Since Kosovo is a suitable place for the development and growth of these vectors, we thought to draw the attention of the authorities with this review article. The most important fact is that this disease has never been studied in Kosovo. The Crimean Congo Hemorrhagic Fever is a zoonotic disease transmitted through vectors. CCHF is an acute, tick borne disease often associated with hemorrhagic presentations. The virus belongs to the genus *Orthonairovirus*, family Nairoviridae with RNA. It causes mild fever and viremia in cattle, sheep and small mammals such as hares. Human become infected by contact with infected blood or other tissues of livestock or human patients or from tick bite. The disease presents not only economic but also social significance. Damage caused by the disease in the areas where it appears is very considerable.

**Keywords:** Zoonosis, Virus, CCHF, Ticks, Kosovo.

## Literature Review

Crimean-Congo hemorrhagic fever virus (CCHFV) is the most widespread tick-borne virus in the world. Crimean-Congo hemorrhagic fever is an emerging tick-borne zoonotic disease often associated with hemorrhagic presentations and a case fatality rate of 10–50%. Causative agent is the CCHF that have been reported in Africa, south-eastern Europe, Middle East, and Asia, with significant increase in disease incidence in the last decade, especially in the south-eastern Europe. The CCHF virus belong to genus *Orthonairovirus*, family Nairoviridae with RNA. This virus is a tick-born virus that include 34 viruses, which are grouped in seven serogroups (14,17,19,27,30,31). The geographic distribution of the virus closely linked to the distribution of tick and limited up to 43 grade N (latitude North) (2,3,6,7,10,11). CCHF virus circulate in nature in an enzootic tick-vertebrates-tick cycle. Tick genus *Orthonairovirus* are the main vector and reservoir of the virus. In humans, cases have been reported from more than 30 countries of Asia, Africa, south-Eastern Europe. In Europe human cases occur regularly in Albania, Bulgaria, Macedonia, Kosovo and Serbia (1,2,6, 18, 26, 35). The first cases of CCHF in Kosovo were registered in 1954 in Nishor village, of Suhareke, tree of which were fatal (11). CCHFV usually circulates between asymptomatic animals and tick in an enzootic cycle. This virus has been found in at least species of tick, including seven genera of the family Ixodidae (hard tick) (12,13,16,17,20,31). Members of the genus *Hyalomma* seem to be the principal vectors. Ticks are not only relevant as vector but also play a role as natural reservoir, since the virus can be transmitted transtadially and trasovarially or by venereal route within the tick population. Another possible rout immature tick, of transmission from one tick to another is by co-feeding (23, 27, 29, 30, 32). The status, of CCHFV-specific antibody in the animal population of a region is a good indicator for the presence or absence of CCHFV in the respective area (4).

Many species of mammals can transmit CCHFV to ticks when they are viremic. Small vertebrate such is hares and hedgehogs, which are infested by immature tick, may be particularly important as amplifying hosts (14, 18, 24, 26, 34). With a few exceptions, birds seem to be refractory to infection; however, they may act as mechanical vector by transporting infected tick (13, 22, 25, 34, 35). Migratory birds might spread the virus between distant geographic areas (6,7,8,9,10). Kosovo, a south-eastern European country, is an endemic area for CCHF. It covers an area of approximately 11,000 km<sup>2</sup> with a population of 1.9 million. The endemic zone, which represents half of the Kosovo territory, is characterized by a hot and dry climate, low bushes and high density of agriculture and farming. Climate is influenced by continental air masses resulting in relatively cold winters and hot and dry summer and autumn. These conditions provide an ideal ecosystem for *Hyalomma* ticks which are the main vector of CCHF. CCHF has been present in Kosovo for at least a half of century. The first documented cases date back to 1957, when seven fatal cases were reported. Since then, CCHF cases emerged sporadically until 1995 when 46 confirmed cases were reported, with 7 fatal cases (4, 7, 8, 19). Crimean-Congo hemorrhagic fever (CCHF) virus is transmitted to humans by *Hyalomma* ticks or by direct contact with the blood of infected humans or domestic animals. CCHF virus has been reported from the Near, Middle, and Far East (countries such as Iraq, Pakistan, United Arab Emirates, Kuwait, Oman, and China [1,26,28,35) and from several African countries (4,9, 12, 17). Besides, there are several reports on CCHF virus in the former Yugoslavia (5,10, 16, 23, 31), but CCHF virus strains from this area have not been characterized up to now. We describe here a case of CCHF in the year 2000 in Kosovo that preceeded an outbreak in the same region in 2001 (2, 5, 6, 8, 19, 26, 29). Kosovo represents a hot spot for deadly CCHF infections and can serve as a model region for studies of disease prevalence and spread. This importance is heightened because of its vicinity to other European countries where no cases have yet been reported but do have competent tick vectors.

### **Conclusions and Recommendations**

The Crimean-Congo hemorrhagic fever Orthonairovirus (CCHFV) is a tick borne virus belonging to the genus *Orthonairovirus*, family *Nairoviridae* of RNA virus. Viral zoonosis are distributed in Africa, Asia and Mediterranean Europe. Since the disease is zoonotic, it causes major damages in the economy and the social sector. Kosovo's climatic conditions constitute an ideal ground for the growth and development of vectors thus made, the study of this disease in this area is of great importance. Obtaining accurate data, helps us take the necessary measures to prevent this dangerous disease. We draw our attention to the relevant authorities for real investment for the study of the disease situation in Kosovo.

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