

THE EPIDEMIOLOGY AND BIOLOGY EVOLUTION OF RABIES EBL VIRUSES. REVIEW

Dainius Zienius

*Department of Virology, Veterinary Institute of Lithuanian Veterinary Academy, Instituto 2,
LT-56115 Kaišiadorys, Tel. +370 346 60691, +370 687 50931, fax. +370 346 60697,
e-mails: direktorius@lvavi.lt; dainzien@yahoo.com;*

Summary. The aim of this study was to review the EBLV epidemiology in Europe and provide the evolutionary history of these viruses. Rabies is still present in Europe and three *Lyssavirus* genotypes are endemic: genotype 1 or rabies virus (RABV), which infects terrestrial animals, and genotypes 5 and 6 or European bat lyssavirus type 1 (EBLV-1) and type 2 (EBLV-2). Each of the EBLV types, according to the nucleoprotein (N) and glycoprotein (G) genes nucleotide and amino acid sequence phylogenetic analysis, has been subdivided into two variants – EBLV-1a/1b and EBLV-2a/2b. During the last 20 years more than 600 cases of EBLV infection have been reported throughout Europe, most recently in Scotland, Netherlands, Spain and Denmark. More than 95% of EBLV-1 were isolated from *Eptesicus serotinus* bats, whereas EBLV-2 appears to be associated with *Myotis dasycname* and *Myotis daubentonii* bats. EBLV-1 infection has also been reported in small number of terrestrial mammals, including five sheep in Denmark and a stone marten in Germany. Four cases of bat-associated rabies in humans have been reported and confirmed: two cases were infected with EBLV-1 and two – with EBLV-2. By combining a variety of data (taxonomic relationships, virus population dynamics, phylogeography) it's able to reveal some aspects of the evolutionary history of EBLV in Europe: chiropteran lyssaviruses existed long before carnivoran RABV with the host switching from chiropters to carnivores to 888 -1459 years ago; the current lineages of EBLV-1 arose some 500 to 750 years ago and possible have different patterns of geographical spread from North Africa with different points of introduction into Europe. So rabies in bats will never be eradicated because of the nature of the infection, unlike classical rabies (RABV, serotype 1) in other terrestrial mammals, which can be eradicated using oral rabies vaccination programme in many “rabies free” countries. It is therefore something people must learn to live with.

Key words: EBLV, rabies, bat, epidemiology, Europe, review.