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Molecular epidemiology, vaccine matching, and assessment of risk factors of foot-and mouth disease virus circulating in Ethiopia

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The study was conducted in three regional states of Ethiopia; Amhara, Oromia, and Addis Ababa from August 2008 to April 2009 with the aims of identifying the molecular epidemiology of FMD virus circulating in Ethiopia, to determine the appropriate vaccinal strains, and to assess seropositivity, attack rate and associated risk factors of FMD. From a total of 7,781 animals observed and recorded on a designed format in six districts, 1,409 (19.6%) were found infected, and 15 (0.12%) died during outbreaks of FMD. Epidemiological investigations revealed that the morbidity rate of the disease was 21.1% in Akaki-kality sub-city, but the mortality rate was <2% in all districts. Furthermore, the mortality and case fatality rates were relatively higher, 1.6% and 8.9% in calves than the other age groups, respectively. From the total of 33 bovine epithelial tissue cultured samples, 19 (57.57%) samples were showed cytopatic effect for FMD in which 3 samples were serotype A and Africa topotype and 16 samples were serotype O and East Africa-3 topotype. Certain FMD isolates were characterized by two dimensional virus neutralization test and/or LPBE in order to choose an appropriate vaccine strain found at World Reference Laboratory for FMD. The result indicated that most vaccine strains found at World Reference Laboratory for FMD for FMD can protect against serotype O of Ethiopian isolates, while serotype A has highest antigenic variation and only few vaccine strains found at World Reference Laboratory for FMD can provide protection. Various strains of FMD virus were isolated in Ethiopia and therefore, continuous monitoring of newly emerging strains is necessary to perform vaccine matching studies to support the efficacy of actual vaccine formulations.