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Introduction: Foot and mouth disease (FMD) is the most contagious disease ofcloven-hoofed animals, and has a great potential for causing severe economicloss. Detection of antibodies to non-structural protein (NSP) has been used toidentify past or ongoing infections with any of the existing serotypes of FMDV.Surveillance activity consists of passive epidemiological surveillance systemof investigating reported disease activity and active epidemiologicalsurveillance system of examining statistically selected and targeted sampleswithin host populations. In this study, we have summarized serologicalsurveillance results for the detection of NSP antibody across the country in2014.

Materials and Methods: A totalof 37,336 sera from 6,965 farms were tested for statistical surveillance. Atotal of 93,893 sera from 4,613 farms were tested for targeted surveillance. Thosesera were tested by NSP ELISA (Median Diagnostics or Bionote) accordingto the manufacturer's instructions.

Results: Results: A total of 33 samplesfrom 20 farms were NSP antibody positive with 28 cattle, 1 pig and 4 goats instatistical serological surveillance. Targeted serological surveillance foundout 127 samples NSP antibody from 18 farms. When we traced back those NSPantibody positive farms, any evidence of virus circulation was not found. Inaddition, all the samples from 617 wild animals such as wild boars and so onwere negative by the NSP ELISA.

Conclusions: Theanimals with NSP antibody positives did not show any clinical sign and all negativeby PCR for antigenic samples.

References

[1] Oem JK, Chang BS, Joo HD, Yang MY, Kim GJ, Park JY, Ko YJ, Kim YJ, Park JH, Joo YS. Developmentof an epitope-blocking-enzyme-linked immunosorbent assay to differentiatebetween animals infected with and vaccinated against foot-and-mouth disease virus. J. Virol. Methods, 2007. 142(1-2), 174-181.

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Characterization of MonoclonalAntibodies Against VP2 and VP4 of Foot-and-Mouth Disease Virus

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Introduction: Foot-and-mouth disease (FMD) is one of the most highly contagiousdiseases of cloven-hoofed animals including cattle, swine, sheep and goats. Thecausative agent is a FMD virus (FMDV), which is classified into sevenserotypes; O, A, Asia1, C, South African Territory1 (SAT1), SAT2 and SAT3. FMDVis surrounded by an icosahedral capsid that comprises 60 copies of fourstructural proteins: VP1, VP2, VP3 and VP4. As a serological method, virusneutralization test (VNT) is a standard test. It, however, takes several daysto complete and requires a containment facility. These aspects make the VNTinappropriate for mass serological surveillance. The other prescribed test atOIE manual is the liquid-phase blocking (LPB) ELISA which requires training andexperience to yield reproducible results and use an inactivated FMDV as adiagnostic antigen. To address these limitations, recombinant proteins derivedfrom FMDV P1 precursor and 3C protease genes of FMDV type O was developed inour previous study. In this study, monoclonal antibody was developed againstVP2 and VP4 of FMDV. We suppose that these mAbs can be applied tocharacterization of FMD recombinant antigens.

Materials and Methods: VP2,VP4 genes were cloned into Rhamnose SUMO vector separately and expressedrecombinant proteins using Rhamnose SUMO Cloning Expression System in BL21 DE3 *E.coli*strain. Soluble VP2 and VP4 proteins were purified using Ni-NTA affinitychromatography and the purified proteins were confirmed by sodium dodecylsulfate polyacrylamide gel electrophoresis (SDS-PAGE). MAbs against VP2and VP4 were produced by immunizing mouse (Balb/c) with each recombinant VP2and VP4 proteins.

Results: VP2 and VP4proteins were purified using Ni-NTA affinity chromatography and the purifiedproteins were confirmed by sodium dodecyl sulfate polyacrylamide gelelectrophoresis (SDS-PAGE). To obtain mAbs, the purified proteins VP2 and VP4were immunized to mouse followed by cell fusion, and selection according to thegeneral mAb production protocol. As a result, we screened 6 of VP2 and 1 of VP4monoclonal antibodies using ELISA and fluorescence analysis (FA) and alsocharacterized using isotyping kit respectively.

Conclusions: Therecombinant VP2 and VP4 proteins were expressed using Rhamnose SUMO CloningExpression System and monoclonal antibodies against VP2 and VP4 were alsoproduced with the recombinant proteins. We suppose that these mAbs can beapplied to characterization of FMD recombinant antigens.

References

[1] Hamblin, C., Barnett, I.T.,Hedger, R.S., A new enzyme-linked immunosorbent assay (ELISA) for the detection ofantibodies against foot-and-mouth disease virus. I. Development and method ofELISA. J. Immunol. Methods 1986, 93: 115-121.

[2] Ko, Y.J., Jeoung, H.Y., Lee, H.S., Chang, B.S., Hong, S.M., Heo, E.J., Lee, KN,Joo, H.D., Kim, S.M., Park, J.H., Kweon, C.H. A recombinant protein-basedELISA for detecting antibodies to foot-and-mouth disease virus serotype Asia 1.J. Virol. Mehtods 2009, 159: 112-118.