豬瘟研究組

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摘要

2014年1月至7月,全國各地方防治單位共送檢54場119個下 痢病例至本所,其中20場的哺乳仔豬有嚴重的下痢與嘔吐等臨床症 狀且伴隨著高死亡率。這些檢體分別進行 TGEV、PEDV 與 Rotavirus 的 RT-PCR 檢測,結果有 39 場共 86 個檢體呈現 PEDV 陽性,而 TGEV 與 Rotavirus 則均呈現陰性。進一步進行 PEDV 病毒分離,則有7個 檢體於 Vero 細胞內出現融合等 CPE, 並經 RT-PCR 與電顯確認為 PEDV,之後進一步使用 MEGA 5.2 進行基因序列之分析,發現此病毒 株序列與 PEDV/USA/2013、 PEDV/China/2011-2013 以及 PEDV/Korea/2014 最為相近, 而與傳統的 CV777 病毒株及早期台灣之 PEDV 不同,顯示此病毒株為新型 PEDV。此外,於動物試驗中發現, 此新型 PEDV 具有高度致病性,其可引發7日齡哺乳仔豬產生嚴重的 下痢症狀與高達 50%的死亡率,綜合以上之結果顯示,此新型 PEDV 是造成此次下痢疫情之元兇且對仔豬具有高度致病性。

The epidemiology and pathogenesis of novel porcine

epidemic diarrhea virus in Taiwan

Chia-Yi Chang

Abstract

Between January 20 and July 30 of 2014, a total of 119 samples from 54 herds in 13 counties were submitted to the Animal Health Research Institute. In 20 of the 25 herds with detail histories, including severe diarrhea and vomiting occurred in pigs of all ages, with mortality approximately 100% in suckling pigs. The differential etiologies, including transmissible gastroenteritis virus (TGEV), porcine epidemic diarrhea virus (PEDV), and porcine group A rotavirus (GARV), were tested by reverse transcription polymerase chain reaction (RT-PCR). The RT-PCR of PEDV was positive in 86 cases of 39 herds. Attempts to isolate PEDV in Vero cells revealed that only 7 specimens from 7 herds showed the cytopathic effects (CPEs) of fusion and syncytia. These CPEs were indeed caused by PEDV, as confirmed by RT-PCR, sequencing, and electron microscopy. Sequence comparisons of diarrhea samples and isolated PEDV were assayed by MEGA 5.2 software. The newly isolated PEDV/Taiwan/2014 strains were clustered in group 2 as novel PEDV, together with strains PEDV/USA/2013, PEDV/ China/2011-2013, and PEDV/Korea/2014, whereas the classical CV777 strain and historic Taiwan strains were placed in a separate group 1. Further, the virulence of novel PEDV was examined in the suckling pigs with 7 days old. The diarrhea and vomiting were shown in all pigs inoculated with 10^7 $TCID_{50}$ PEDV. The mortality reached to 50%. These results indicated that a novel PEDV was the cause of the recent new outbreak of diarrhea in Taiwan and was high virulence in pigs.