

## National Surveillance for Five Arthropod-borne Viruses in *Culicoides* biting midges, 2016

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**Introduction:** Arthropod-borne viruses (arboviruses) are transmitted by several vectors, such as mosquitoes, *Culicoides* biting midges, and ticks. *Culicoides* biting midges are among the smallest and most abundant hematophagous vectors. Aino virus and Akabane virus, in the family *Bunyaviridae*, are among the arboviruses that cause disease outbreaks in cattle. Bovine ephemeral fever virus is classified into the family *Rhabdoviridae* and is known to cause an acute febrile disease. Chuzan virus and Ibaraki virus belong to the family *Reoviridae* and cause reproductive disorders, fever, and anorexia. This study described that the result of the arboviruses surveillance conducted by collecting *Culicoides* biting midges in 2016.

**Materials and Methods:** *Culicoides* biting midges were collected once a week using a light trap (SNC, Korea) on five sites, Yongin, Goseong, Jeonju, Goryeong and Jeju from May to September in 2016. *Culicoides* species (~60) were pooled in one sample and were subjected to RT-PCR for detecting five arboviruses. The PCR was performed on by RT-PCR kit (Median, Korea).

**Results:** A total of 35,698 *Culicoides* biting midges comprising of 8 species were collected. The most commonly collected species was *Culicoides punctatus* (51.96%, n=18,547), followed by *C. arakawae* (37.67%, n=13,447) and *C. maculatus* (8.24%, n=2,940), while the remaining 5 species accounted for 2.15% of all *Culicoides* spp. *C. punctatus* was the most abundantly identified species at Yongin and accounted for 56.01% of all *C. punctatus* collected. *C. arakawae* was the most abundantly identified species at Jeonju and accounted for 78.72% of all *C. arakawae* collected. *C. arakawae* was low profile in early summer, whereas was most abundant in autumn.

**Conclusions:** *Culicoides punctatus* and *C. arakawae* were the primary species collected during this study. Although all samples were negative against five arboviruses, the detection rate of the *Culicoides* biting midges might be one of the important factors to predict the possibility of outbreak of arbovirus diseases. By analyzing the surveillance data, the livestock producer can be provided with vital information on when and where arboviruses are active, which may be helpful to prevent potential outbreaks.

### References:

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## An Outbreak of Type C Botulinum in Wildfowls : Incheon, Korea

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**Introduction:** Avian botulinum is a fatal paralytic disease of wildfowls worldwide. The disease is most frequently caused by the toxin of *Clostridium botulinum*. Type C botulinum has been reported that the one of typically causes disease and mortality in wildfowls. The avian botulism was reoccurred on July 2016 in Incheon after outbreak of type C botulism in 2008. Avian type C botulism affected approximately 700 wild waterfowl, including spot-billed duck, herons, seagull in the Namdong reservoir, 11 Gong-gu and Gozan foreshore. In this study, we describe an outbreak of type C botulinum in wildfowls in Incheon, Korea.

**Materials and Methods:** We collected sera, intestinal tissue, and maggots from carcass, sediments, water samples, crabs and freshwater snail from the Namdong reservoir. To diagnose botulinum, sera from ten spot-bill ducks were conducted the mouse neutralization test. Environment samples cultured in cooked meat medium were applied to the mouse bioassay for detection of botulinum toxin. Botulinum toxin gene was identified by real-time PCR using botulinum toxin gene specific primers and probes. To change the environmental conditions, the Namdong reservoir was flooded by seawater for five days.

**Results:** Sera, tissue extract and maggots from the carcasses were shown positive results about type C botulinum neurotoxin, respectively. Moreover, the type C botulinum toxins were detected in sediments samples, water samples, crabs, freshwater snail from the Namdong reservoir, Seunggi-cheon, and Song-do Bio-bridge. Likewise, a similar result was diagnosed in real-time qPCR test. After draining or flooding the Namdong reservoir, the number of carcasses was dramatically decreases.

**Conclusions:** The factors contributing to type C botulinum emergence and outbreak remain undetermined, but increased temperature and drought may have increased the replication of *C. botulinum*. The water management through draining or flooding the Namdong reservoir may become a new strategy for overcoming outbreak of *C. botulinum*.

## US-Originated Strain of Porcine Deltacoronavirus Outbreaks in South Korea, 2014~2016

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