Survey of Tick-borne-disease from *Ornithodoros* spp. in Uninhabited Islands of Korea.

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Objective

The aim of this study is to survey data of ticks distribution of Korean islands and to investigate pathogens in Argasid ticks.

Introduction

Ticks and tick-borne diseases have been thought global important issues, because it's affect to animal and human health and are the cause of significant economic losses. The genus *Ornithodoros* spp., which is included in Family Argasidae, is usually associated with wild animals including seabirds and it was difficult to investigate because seabirds' nests are found in inaccessible uninhabited islands. However, *Ornithodoros* spp. has been known for the vector of many diseases including African swine fever.

Method

In this study, nest with soil and litter of seabirds were collected, to investigate *Ornithodoros* species from 9 uninhabited islands, Nan-do, Chilsan-do, Chilbal-do, Sogukhol-do, Googul-do, Gaerin-do, Sasu-do, Hong-do (Hallyeohaesang) and Dok-do located western and southern part of the Korea from July, 2017 to September in 2018. The islands are known for breeding places of migratory and resident birds. Maximum ten nests with soil and litter of seabirds were collected from one uninhabited island for the conservation of the islands environment. Ticks were collected from nest with soil and litter of seabirds using Tullgren funnel and were assayed for tick identification by PCR using 16S rRNA gene and tick-borne pathogens including *Rickettia* spp., *Borrelia* spp., *Bartonella* spp., *Ehrlichia chaffensis*, *Ehrlichia canis*, *Anaplasma phagocytophilum* and *Anaplasma bovis* by nested PCR.

Results

Total 65 *Ornithodoros* species ticks from 338 seabird's (black-tailed gull, *Larus crassirotris*; streaked shearwater, *Calonectris leucomelas* and Swinhoe's storm petrel, *Oceanodroma monorhis*) nesting soil with litter in 9 uninhabited islands. In the sequence identification of 16S rRNA gene fragment of *Ornithodoros* species, *O. capensis* and *O. sawaii* were 37 and 28, respectively. In the analyses of tick-borne pathogens, *Borrelia* spp. (n=5) was detected in *O. sawaii* from Gaerin-do and Googul-do. The total detection rate of *Borrelia* sp. from *Ornithodoros* spp. was 7.69% (5/65).

Conclusions

In this research, we discovered that *O. sawaii* are habitat in west and southern part of uninhabited islands to breeding place of black-tailed gulls and streaked shearwater and *O. capensis* are habitat in uninhabited islands related to breeding place of streaked shearwater. This is first report of the *Borrelia* spp. from *Ornithodoros sawaii* in Korea.

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