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MIGRATION OF WATERFOWL IN THE EAST ASIAN FLYWAY AND SPATIAL RELATIONSHIP TO HPAI H5N1 OUTBREAKS

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Important Findings

During 2007–08, researchers marked wild ducks at Poyang Lake with satellite transmitters to examine the location and timing of spring migration and identify any spatiotemporal relationship with highly pathogenic avian influenza (HPAI) H5N1 outbreaks. These wild ducks (excluding the resident mallard and Chinese spotbill ducks) followed the East Asian Flyway along the coast to breeding areas in northern China, eastern Mongolia, and eastern Russia. None migrated west toward Qinghai Lake (site of the largest wild bird epizootic), thus failing to demonstrate any migratory connection to the Central Asian Flyway. A newly developed Brownian bridge spatial analysis indicated that HPAI H5N1 outbreaks reported in the flyway were related to latitude and poultry density but not to the core migration corridor or to wetland habitats. Researchers also found a temporal mismatch between timing of outbreaks and wild duck movements.

Significance of Findings

Poyang Lake is situated within the East Asian Flyway, a migratory corridor for waterfowl that also encompasses Guangdong Province, China, the epicenter of HPAI H5N1. The lake is the largest freshwater body in China and a significant congregation site for waterfowl; however, surrounding rice fields and poultry grazing have created an overlap with wild waterbirds, a situation conducive to avian influenza transmission. Reports of HPAI H5N1 in healthy wild ducks at Poyang Lake have raised concerns about the potential of resilient free-ranging birds to disseminate the virus. Yet the role wild ducks play in connecting regions of HPAI H5N1 outbreak in Asia is hindered by a lack of information about their migratory ecology. By documenting movements of wild waterfowl, this study presents ecological knowledge that better informs epidemiological investigations seeking to explain and predict the spread of avian influenza viruses.

Additional Information

Over 520,000 birds are found at Poyang Lake during the nonbreeding period, many of which are long-distance migrants including over 2700 Siberian cranes, representing 95% of the global population. Among the 300 bird species recorded, a significant proportion are migratory Anatidae, including the whooper swan, greater white-fronted goose, greylag goose, Chinese spotbill, Eurasian wigeon, and mallard. Poultry grazing in surrounding croplands maximizes overlap between wild bird and domestic poultry, thereby increasing chances of transmission of avian influenza viruses (AIVs). In addition, a relatively recent farming practice at the Poyang Lake region involves rearing wild waterfowl in captivity, which is preferred by some Chinese consumers over domestic fowl. Migratory swan geese as well as nonmigratory Chinese spotbills are now raised in captivity for sale in markets. Many of these farm-raised waterfowl are allowed to feed or swim in the wetlands, facilitating direct interaction of farmed and free-ranging wild birds.

Areas such as Poyang Lake in which large numbers of domestic ducks and geese are raised in areas with little or no biosafety measures are conducive to the emergence of novel HPAI subtypes. Subsequent introductions of new AIVs from domestic to wild birds are also probable, especially because domestic and wild ducks are intermixed and poultry outnumber wild waterfowl by more than 25 to 1. Evidence for introduction of novel AIVs into wild bird populations exists in the detection of two HPAI H5N1 genotypes ('*Z*' and '*V*') from Poyang Lake between October 2004 and March 2005. Two studies have implicated wild waterfowl at Poyang Lake in HPAI H5N1 transmission, and both proposed a possible link to Qinghai Lake, where the largest recorded wild bird epizootic occurred in 2005. However, little empirical information was available at that time on the migratory movements of wild ducks from the Poyang and Qinghai regions to ecologically establish an association with HPAI H5N1 outbreaks.

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MIGRACIÓN DE LAS AVES ACUÁTICAS EN LA RUTA DE VUELO DEL ESTE DE ASIA Y LA RELACIÓN ESPACIAL PARA LOS BROTES DE HPAI H5N1

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Hallazgos Importantes

Durante el 2007–08, unos investigadores marcaron a patos silvestres en el Lago Poyang con transmisores satelitales para examinar su localización y tiempos en la migración de primavera e identificar cualquier relación espacio-temporal con brotes por el virus de influenza aviar altamente patogénico (HPAI, por sus siglas en inglés) H5N1. Estos patos silvestres (excluyendo al pato real y a los patos de pico manchado chinos) siguen la ruta de vuelo del este de Asia a lo largo de la costa a áreas reproductivas en el norte de China,

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