Dottorato di ricerca in Scienze Veterinarie XXXVI CICLO - Anno di corso: 3°
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INSIGHTS INTO AVIAN INFLUENZA EPIDEMIOLOGY AT THE WILD BIRDS/POULTRY INTERFACE

Objectives

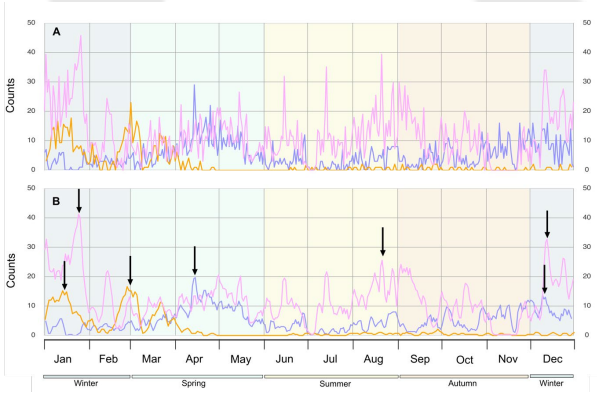
- To characterize the poultry-wild birds interface through **camera traps** in a **high-risk area for primary avian influenza virus (AIV) introduction**;
- To **expand the AIV surveillance** in wild birds by sampling game ducks and monitoring migratory stopover sites;
- To understand **mechanisms** governing **AIV host switch** and transmission between wild birds and poultry **(University of Georgia - USA).**

Materials and Methods

- Infrared and motion-sensing **camera traps** were deployed in 3 laying-hen farms in Bologna province and footages were analyzed through time-series analysis;
- **534 cloacal swabs** and **fecal droppings** were collected during 2021 and analyzed through real-time RT-PCR; AIV positive samples were further characterized through whole genome sequencing and viral isolation was attempted on SPF embryonated-chicken eggs;
- **Potentially relevant mutations** for host-switch were introduced into H9N2 AIV through **PCR mutagenesis** and **reverse genetics (University of Georgia - USA).**

Results and Conclusions

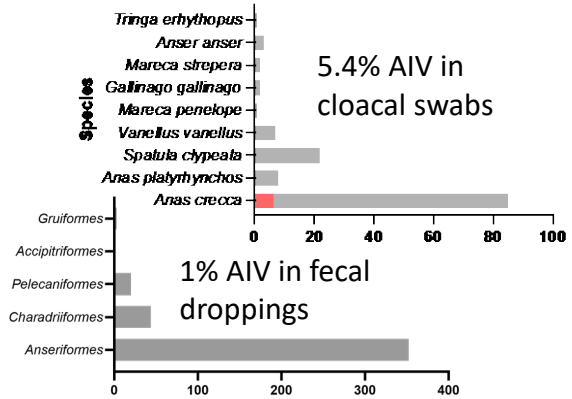
CAMERA TRAP SURVEY



Spring and winter seasons - peaks of wild bird visits

Species more frequently approaching poultry farm should be targeted for AIV surveillance

AIV SURVEILLANCE



5.4% AIV in cloacal swabs

1% AIV in fecal droppings

H9N2, H1N1, and H5N3 LPAIV isolated from cloacal swabs

Combining cloacal swabs and fecal droppings helps the detection of AIV circulation in wild birds

H9N2 REVERSE GENETICS

Aminoacid **substitutions at 127, 146 and 216 positions** in the hemagglutinine gene (H9 numbering) have been identified as potentially relevant for **transmissions** of H9N2 LPAIV at the **wild birds/poultry interface.**

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