Bacteria one culled due to lethargy and swollen eyes. Flock of ~40 turkeys lives on property and comingles with landowner’s domestic pigeons.

- Generally wild turkey populations are abundant and healthy in Colorado, although sinusitis could be a population limiting disease (mycoplasmosis, fowl cholera).
- Management of wild turkeys in Colorado includes translocations to address issues of overabundance and create new hunting opportunities. Testing prior to movement includes serology or PCR for Mycoplasma spp., avian influenza, and Salmonella spp.

Disease testing is driven by concern for domestic poultry and wild population health, although reports of disease are limited in wild populations.

- This case resembles diseases of concern (mycoplasmosis, fowl cholera).

**Hypothesis**

*Avibacterium sp.* is causing clinical disease and mortality in a flock of wild turkeys.

**Materials and Methods**

1. One sick turkey culled from the flock for evaluation.
2. Gross necropsy, histopathology, aerobic culture, and Mycoplasma PCR performed.
3. Eight additional birds (~25% of the flock) were culled for disease surveillance.
4. Intraorbital swab for aerobic culture (mass spectrometry, 16S rRNA and full genomic sequencing), and Mycoplasma PCR.
5. Similar testing performed in connected flock with a domestic turkey, distant flock, and domestic pigeons.

**Introduction**

- January 2020: Landowner in Pueblo County, Colorado reported sick and dying wild turkeys – one culled due to lethargy and swollen eyes. Flock of ~40 turkeys lives on property and comingles with landowner’s domestic pigeons.

**Results**

**Gross Postmortem Examination**

- Both eyes swollen shut with ulceration and crusting of the palpebral skin.

**Histopathology**

- Nasal conchae: Irregularly shaped scrolls and dilated nasal cavity with marked expansion of the nasal mucosa by goblet cell hyperplasia.
- Naleral epithelium: Marked hyperkeratosis with abundant bacterial cocci embedded within the sloughed keratin layer.

**Mass Spectrometry**

- MALDI-TOF main spectra dendrogram demonstrates isolates from the symptomatic wild turkey (20-126, 20-129, 20-132) and those from a connected flock (21-595, 21-599) have greater similarity to each other than defined Pasteurellaceae species. Isolates from a domestic turkey (21-594) and pigeon (21-586) cluster together as an independent clade.

**Phylogenetics**

- Phylogenetic analysis of full genomic sequencing demonstrates *Avibacterium* isolates from the symptomatic wild turkey (20-126, 20-129, 20-132) and a connected flock (21-595, 21-599) form a monophyletic clade with whole genome ANI values greater than 95% like-species threshold when compared to each other, and below like-species threshold for established *Avibacterium* species. Bootstrap support values are displayed at the nodes of the tree.

**Conclusions**

- Clinical signs, gross lesions, and histologic findings of sinusitis and conjunctivitis in the symptomatic wild turkey are associated with infection by a novel species of *Avibacterium*.
- Bacterial isolates from the symptomatic turkey and turkeys in the affected and connected flocks cluster together, yielding a novel species of *Avibacterium* (recently submitted to GenBank as *Avibacterium gallopavo*).
- Histologic changes in asymptomatic turkeys were consistent with chronic mild sinusitis.
- The presence of bacteria within the flock in absence of clinically significant widespread disease suggests involvement of other factors in the development of severe sinusitis and conjunctivitis.
- Failure to culture *Avibacterium spp.* in a distant flock suggests this bacteria is not widespread in Colorado.
- Given the potential role of *Avibacterium* spp. in upper respiratory disease in wild turkeys, continued monitoring in wild and domestic gallinaceous birds is warranted.
- Development of additional diagnostics including immunohistochemistry and PCR may help better understand the extent of this bacteria and advise translocation decisions.

**Figure 1** - Both eyes swollen shut with ulceration and crusting of the palpebral skin.

**Figure 2** - Ulcerated skin removed, revealing extensive matts of fibrin covering the eye and filling the infraorbital sinus.

**Figure 3** - Nasal conchae: Irregularly shaped scrolls and dilated nasal cavity with marked expansion of the nasal mucosa by goblet cell hyperplasia.

**Figure 4** - Nasal epithelium: Marked hyperkeratosis with abundant bacterial cocci embedded within the sloughed keratin layer.

**Figure 5** - Conjunctiva: Diffuse crust of fibrin necrotic debris covering the palpebral skin, with congestion and lymphoplasmacytic inflammation of the underlying dermis.

**Figure 6** - MALDI-TOF main spectra dendrogram demonstrates isolates from the symptomatic wild turkey (20-126, 20-129, 20-132) and those from a connected flock (21-595, 21-599) have greater similarity to each other than defined Pasteurellaceae species. Isolates from a domestic turkey (21-594) and pigeon (21-586) cluster together as an independent clade.

**Figure 7** - Phylogenetic analysis of full genomic sequencing demonstrates *Avibacterium* isolates from the symptomatic wild turkey (20-126, 20-129, 20-132) and a connected flock (21-595, 21-599) form a monophyletic clade with whole genome ANI values greater than 95% like-species threshold when compared to each other, and below like-species threshold for established *Avibacterium* species. Bootstrap support values are displayed at the nodes of the tree.