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meanwhile presented highly resistant to beta-lactam antibiotics (>50% of isolates)

Enterobacter appeared to show susceptible almost in all isolates. Patterns of multiple drug resistance (MDR) indicated in this study, which presented in all Pasteurella and Klebsiella pneumoniae (7 isolates, 8%), Escherichia coli (15 isolates, 17%), Pseudomonas spp. (9 isolates, 10%), Klebsiella pneumoniae (7 isolates, 8%), Pasteurella spp. (6 isolates, 7%) and Enterobacter spp. (5 isolates, 6%). The staphylooccoci presented highly resistant to beta-lactam antibiotics (>50% of isolates) meanwhile Pasteurella spp. appeared to show susceptible almost of antimicrobial drugs except clindamycin. However, clindamycin seemed to resist with E. coli, Enterobacter spp, Klebsiella pneumoniae and Pasteurella in all isolates. Patterns of multiple drug resistance (MDR) indicated in this study, which presented in all Pseudomonas isolates, 93% of E. coli isolates, 80% of Enterobacter cloacae isolates, and 57% of Klebsiella isolates. Additionally, two isolates of Pseudomonas were resistant to 8 antimicrobial categories.

**Conclusion:** Bacteria isolated from upper respiratory psittacine cases presented antimicrobial resistant trend and MDR. Respiratory treating in Psittaciformes should concern with susceptibility test and prudent use of antimicrobial usage in practice for therapeutic plan. Furthermore, link between colonized bacteria in a pet bird and owner should not be overlook.

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**Livestock diseases threatening smallholder farmers in Lao people’s Democratic Republic**

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**Purpose:** In Lao People’s Democratic Republic, uncontrolled animal trade, lack of animal containment and limited access to veterinary services are a growing-ground for virus spread. Foot-and-Mouth Disease (FMD) and several avian viruses are enzootic and threaten subsistence farmers. We assessed the (sero-)prevalence of several livestock viruses, and evaluated the knowledge, attitude, and practice of smallholder farmers towards FMD.

**Methods & Materials:** In 2018, sera were collected from 394 domestic ruminants and screened using an ELISA that differentiates between infected and vaccinated animals. Questionnaires (n = 101) were statistically explored to identify knowledge gaps and risk factors related to FMD. In addition, oral and cloacal swabs, collected from 619 backyard poultry in 2011, 2014 and 2015, were tested by PCR for Newcastle disease (NDV), Influenza A, Coronavirus (CoV) and Chicken Anemia Virus (CAV). 206 poultry sera were screened by ELISA for the presence of anti-NDV and –Influenza A antibodies. Statistical and phylogenetic analyses revealed the viral infection patterns.

**Results:** Although most farmers had very limited knowledge about FMD, many could correctly enumerate the symptoms and observed outbreaks recently. This was confirmed by our laboratory analysis: overall 37.1% of the animals were seropositive and 72.3% of the farms had at least one seropositive animal. Approx. 90% of the farmers reported that FMD negatively affects livestock trade and health. Moreover, we found high positivity rates of CoV and CAV RNA in cloacal and oral swabs (CoV: 38.3% and 6.2%; CAV: 16.1% and 1.7%). Younger animals were more likely to shed both, CoV and CAV, and similar virus strains co-circulated in chickens and ducks. Despite serological evidence of NDV and influenza A circulation (86.9% and 1.9%), viral RNA was detected in none of the swabs.

**Conclusion:** A large proportion of the Lao population relies on subsistence livestock production which is, as shown here, severely compromised by the circulating viruses. To secure their livelihoods, vaccination programmes should target all susceptible hosts and achieve a high coverage throughout the country. These campaigns should be complemented by community-based sensitization to raise the awareness about prevention strategies, such as quarantine and trade restrictions.

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