

Different Serotypes of *Avian Metaavulavirus* and Its Prevalence

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Commentary

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DESCRIPTION

A virus species belonging to the Paramyxoviridae family and the genus *Metaavulavirus* is known as *Avian Metaavulavirus 2* which is formerly known as *Avian Paramyxovirus 2*. The virus has a monopartite genome and is an RNA negative strand virus. One of the nine species that make the genus *Metaavulavirus* is *Avian Metaavulavirus 2*. Avulavirinae's most prevalent serotype and the serotype 1 is what cause a Newcastle Disease (ND). *Avian metaavulavirus 2* has been linked to a variety of illnesses including mild respiratory infections in domestic fowl like chickens and turkeys as well as numerous negative economic repercussions on the egg and poultry sectors. In 1956, the virus was originally discovered in a strain from Yucaipa, California. Other viral isolates have now been discovered all over the world. A negative sense RNA virus with a monopartite genome is called *Avian metaavulavirus 2*. The Baltimore classification system of viruses places it in Group V.

A core of ribonucleoprotein proteins and a bilayer of lipoprotein proteins make every Paramyxovirus virus particle. The negative-sense RNA genome is contained in a spherical viral capsid that is encased in a viral envelope by *Avian paramyxoviruses*. The "rule of six" is adhered by members of the Paramyxoviridae family such as *Avian metaavulavirus 2* whose genome length is a multiple of six. This enables the nucleocapsid to contain the genome in an appropriate manner. The Fusion protein (F) and the Hemagglutinin-neuraminidase (Hn) protein, two viral proteins, project in spike-like structures that define the envelope's shape. The nine *Avian paramyxovirus* serotypes may, however, have different protein projections. During viral entrance, the Matrix protein (M) which is thought to make the inner layer of the envelope and interacts with the F and Hn proteins on the exterior of the viral envelope. The negative-sense RNA genome of the *Avian metaavulavirus 2* must be translated into a positive-sense mRNA once it enters the cell in order to create viral proteins and reproduce the genome. By using electron microscopy, it

has been proposed that the genome adopts a left-handed helical form. An isolated Yucaipa strain's genome is 14,904 nucleotides long and has a leader sequence of 55 nucleotides at the 3' end and a trailer sequence of 154 nucleotides at the 5' end. It was isolated from chickens in Yucaipa, California. Although their genomes are varied in length which further isolated strains of *Avian metaavulavirus 2* have been discovered. One of the smallest members of the Paramyxoviridae family is *Avian metaavulavirus 2*. Six viral proteins are encoded by the genome and are separated from one another by intergenic sections that range in size from 3 to 23 nucleotides. Transcriptional stop and start signals that help with genome transcription and subgenomic RNA synthesis are located around the six virus genes. The majority of paramyxovirus serotype's viral genomes contain the genes for the proteins Hemagglutinin-neuraminidase (Hn), big polymerase protein, matrix protein, phosphoprotein and nucleocapsid Protein.

Many paramyxoviruses exhibit a cytopathic effect in cell culture by forming syncytiums which are huge multi-nucleated cells created when infected cells fuse with nearby cells. However, certain *Avian paramyxovirus* serotypes merely exhibit cell rounding and do not generate syncytia. Studies have demonstrated that after infection with *Avian metaavulavirus 2*, a group of microscopic lesions are developed in the trachea, lungs and less frequently in the stomach of animal models. Additionally, it has been demonstrated that model birds infected with isolates of *Avian metaavulavirus 2* exhibit enlarged pancreas and diarrhoea.

It is thought that *Avian metaavulavirus 2* affects the respiratory tract and in some cases especially in the lungs. Cells in the upper respiratory tract have sialic acid residues that attaches to the viral envelope protein Hn. It has been discovered that some chickens may have little respiratory symptoms or show no symptoms at all. It is thought that turkeys experience more severe symptoms such as sinusitis and a reduction in egg production. There have been reports of additional symptoms including as decreased hatchability and sterility of eggs.

Avian metaavulavirus 2 is a respiratory disease that is known to affect the egg and poultry sectors and it has reservoirs in wild *avian* species. Turkeys and passerines are the *Avian metaavulavirus 2*'s natural hosts. Other hosts include psittacines, rails and chickens. There have been reports of *Avian metaavulavirus 2* in North and South America, Asia and Europe. It has been established that the virus is more likely to affect turkeys in the US than chickens. *Avian metaavulavirus 2* isolates have been discovered in the US, Bulgaria, Costa Rica, Africa and many other locations indicating that it is a global disease.

In the United States, transmission between flocks of domesticated turkeys happens slowly and the mode of transfer is not clearly understood. It is believed that contact with infected wild birds is the source of *Avian metaavulavirus 2* infections in farmed chickens. It is possible to take precautions to stop the transmission of *Avian metaavulavirus 2* in home flocks. These preventative methods include using appropriate sanitation standards and bird proofing the places where chickens are raised and housed to reduce conflicts between flocks and wild birds. *Avian metaavulavirus 2* has not been linked to any human infections.