

## 1. Introduction

The name corona virus is derived from Latin word “Corona”, meaning crown or wreath. The name was coined by June Almeida and David Tyrrell who first observed and studied human corona viruses. Coronaviruses (CoVs), enveloped, positive-sense RNA viruses, are characterized by club-like spikes that project from their surface, an unusually large RNA genome, and a unique replication strategy. There are four main structural proteins in coronavirus particles. These are the spike (S), membrane (M), envelope (E), and nucleocapsid (N) proteins, all of which are encoded within the 3’ end of the viral genome. Corona viruses are important pathogens for humans and vertebrates. Corona viruses are species in the genera of virus belonging to one of two subfamilies Coronavirinae. Corona viruses can cause multiple system infections in various animals and mainly respiratory tract, gastrointestinal, central nervous system infections in humans, livestock, avian, bat, mouse and many other wild animals (Khadse et al, 2020) Corona viruses were known to affect a wide range of birds and mammals. These include everyday household animals such as cat (feline) and dog (canine) to large animals such as beluga whales. The ability of CoVs to obtain mutations which facilitate the transmission between animal to humans has made it a zoonotic pathogen of concern (Seah et al, 2020) that have been proved by COVID-19 pandemic. So it is very essential to know about animal corona viruses and their reservoir host.

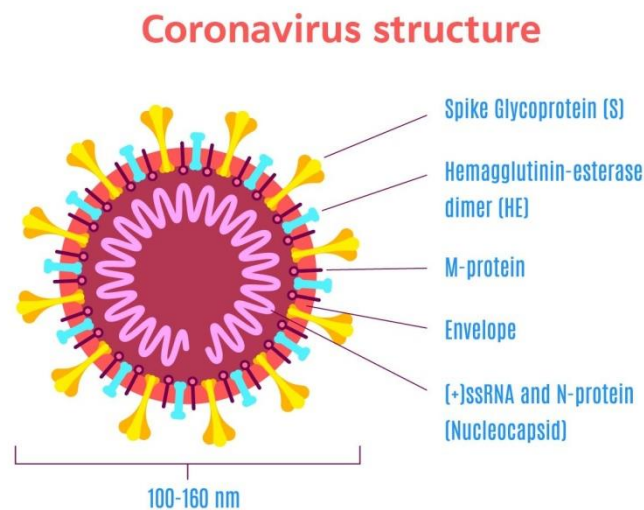


Fig: Corona virus

## **2. Materials and Methods**

The information in this report was gathered after reviewing different scientific articles published in different peer reviewed journals, magazines, proceedings; and internet resources. All the articles were collected from different data bases, such as - PubMed, Scopus, and Google Scholar.

### 3. Results and Discussion

#### 3.1. Classification of corona virus

Order: Nidovirales

Family: Coronaviridae

Subfamily: Coronavirinae

Genus: Alpha, Beta, Gamma, Delta coronavirus

Animal corona viruses cause a lot of diseases in animal with greater significance that are shown in Table 1.

**Table 1:** Animal corona viruses with their host and diseases

<b>Virus</b>	<b>Host</b>	<b>Diseases</b>
Bovine Corona Virus	Cattle, calf	Bovine corona viral diarrhoea
Canine Corona Virus	Dog	Canine corona viral enteritis
Feline Corona Virus	Tiger, lion, cat	Feline infectious peritonitis
Equine Corona Virus	Horse, donkey	Equine corona viral enteritis
Porcine Corona Virus	Pig	Porcine epidemic diarrhea, Transmissible gastroenteritis
Avian Corona Virus	Poultry	Avian infectious bronchitis
SARS Corona Virus	Bat	SARS(Severe Acute Respiratory Syndrome)
MERS Corona Virus	Camel	MERS(Middle East Respiratory Syndrome)

#### 3.2. Epidemiology of animal corona viruses

Corona virus is distributed worldwide. Corona viruses cause a variety of primarily gastrointestinal and respiratory diseases and also neurologic and generalized infections in animals and humans. Only one species of animal or at the best a small number of closely

related species were observed infected by coronaviruses at a time. But the virus that caused SARS infected both people as well as animals. Most coronaviruses infect only the cells of their natural host species with marked tissue tropism and also a few closely related species (Lei and Holmes, 2001). Corona viral infection in humans was primarily suspected to be transmitted from animal to humans, therefore has a great zoonotic significance.

### **3.2.1. Bovine corona virus (BCV)**

Bovine corona virus (BCV) was a significant pathogen of both beef and dairy cattle worldwide. The prevalence of virus antibody concentration in bulk-tank milk (BTM) was found nearly 100% (Paton *et al*, 1998).

### **3.2.2. Canine corona virus (CCV)**

Canine Corona Virus (CCV) enteritis is a highly contagious disease in dogs with worldwide distribution. The incidence of CCV disease in family-owned dogs has been reported to range from 14.8% to 26%. The incidence in kennel-raised dogs ranges upwards to 30%. The prevalence rate of CPV and CCV infections were recorded as 25.25 and 19.28 percent, respectively with a mixed infection of 4.49 percent (Deka et al, 2013).

### **3.2.3. Feline infectious peritonitis virus (FIPV)**

Feline infectious peritonitis (FIP) was a viral disease of cat that was distributed worldwide. The morbidity and mortality was found 100% and 90%. Males and sexually intact cats are also at increased risk for development of FIP (Robinson et al, 1971).

### **3.2.4. Equine corona virus (ECV)**

In horse corona virus causes corona viral enteritis. It is worldwide distributed. It was supposed that corona virus infection spreads in horse via fecal-oral transmission. Using electron microscopy, Biermann *et al*. (1991) reported 10.6% of the feces from foals contained corona virus like particles.

### **3.2.5. Transmissible gastroenteritis virus (TGEV)**

Transmissible gastroenteritis (TGE) is a corona viral enteric disease that infects swine worldwide. It was reported for the first time in 1946. TGE is transmitted in a fecal-oral pathway. It appears in an epidemic and an endemic form. In its epidemic form it is found in naïve herds, i.e. where no seropositive animals are found. Usually, animals of all ages

are affected and the disease spreads quickly. Typically, infections occur during the wintertime. The mortality rate for the youngest piglets is close to 100%. Piglets older than 3 weeks often survive, but growth will be impaired.

### ***3.2.6. Porcine epidemic diarrhea virus (PEDV)***

Another disease that is caused by a coronavirus is porcine epidemic diarrhoea (PED). The piglet mortality tends to be lower as compared to TGE, normally lying around 50%. In some cases,

Though, it may be as high as 100%. It was a devastating enteric disease that manifests as sporadic outbreaks during the winter, leading to damage on breeding farms (Song and Park, 2012).

### ***3.2.7. Infectious bronchitis virus (IBV)***

In chickens, infectious bronchitis (IB) is a major respiratory disease. The respiratory system is the primary multiplication site of IB virus (IBV), a coronavirus, after which the virus is distributed to other organs. The virus is distributed worldwide. It is spread by aerosol, ingestion of contaminated feed and water and contact with contaminated equipment and clothing. The incubation period is 24-48 hours, with the peak in excretion of virus from the respiratory tract lasting 3-5 days after infection. The IBV strains identified as nephropathogenic induced clinical nephritis, gross and histological kidney lesions, and mortality of 5–90% (Ignjatovic et al, 2002).

## **3.3. Epidemiology of human corona viruses**

### ***3.3.1. Severe acute respiratory syndrome corona virus (SARS-CoV)***

Severe acute respiratory syndrome (SARS) is a newly emerged disease that rapidly spread around the world. Severe acute respiratory syndrome (SARS) originated in Southern China in November 2002, and was brought to Hong Kong in February 2003. From Hong Kong, the disease spread rapidly worldwide but mostly to Asian countries. At the end of the epidemic in June, the global cumulative total was 8422 cases with 916 deaths (case fatality rate of 11%). People of all ages were affected, but predominantly females were the risk group. Risk factors for death included old age and comorbid illnesses, especially diabetes. The disease was caused by a novel coronavirus and was transmitted by droplets or direct inoculation from contact with infected surfaces.

Contaminated sewage was found to be responsible for the outbreak in a housing estate in Hong Kong affecting over 300 residents. The mean incubation period was 6.4 days (range 2–10). The duration between onset of symptoms and hospitalization was from 3 to 5 days.

### ***3.3.2. Severe acute respiratory syndrome corona virus-2 (SARS-CoV-2)***

In late December 2019, a cluster of patients was admitted to hospitals with an initial diagnosis of pneumonia of an unknown etiology. These patients were epidemiologically linked to a seafood and wet animal wholesale market in Wuhan, Hubei Province, China. Later it was confirmed that a novel corona virus caused the infection and the disease named COVID-19. The chronology of COVID-19 infections is as follows: The first cases were reported in December 2019. From December 18, 2019 through December 29, 2019 five patients were hospitalized with acute respiratory distress syndrome and one of these patients died. By January 2, 2020, 41 admitted hospital patients had been identified as having laboratory-confirmed COVID-19 infection. As of January 30, 2020, 7734 cases have been confirmed in China and 90 other cases have also been reported from a number of countries that include Taiwan, Thailand, Vietnam, Malaysia, Nepal, Sri Lanka, Cambodia, Japan, Singapore, Republic of Korea, United Arab Emirates, United States, The Philippines, India, Australia, Canada, Finland, France, and Germany. The case fatality rate was calculated to be 2.2%.

### ***3.2.3. Middle-East Respiratory Syndrome Corona Virus (MERS-CoV)***

Middle-East Respiratory Syndrome Corona Virus (MERS-CoV) is named by the coronavirus study group and it belongs to the C-lineage of Genus Betacoronavirus along with other bat coronavirus HKU4 and HKU5. The source and mode of transmission is not fully understood. Dromedary camels are suspected to be the primary source followed by other mammals such as bats, sheep, goats etc (Prarthana and Kalagi, 2015).

## **4. Limitations**

This report is based on mainly on published information of few journals.

## **5. Conclusion**

Coronaviruses are responsible for broad spectrum of diseases in both vertebrate animals as well as birds and humans. As the viruses of this group cause both diseases of respiratory and gastrointestinal tract, they are significant for researchers and clinicians as well as diagnosticians and epidemiologists. With the advent in the field of molecular biology and biotechnology it was easier these days to study typical structure of virion along with replicative stages the virus use to undergo in cells that it infects. Corona viruses had clinical importance, pandemic zoonotic disease caused COVID 19 caused by corona virus of animal origin. The viral infection depend on reservoir host. To control corona viral infection, should control the reservoir host and vector and create awareness against pandemic corona viruses.



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## **BIOGRAPHY**

I am Anamul Haque, son of Mr. Habibur Rahman and Mrs. Noorjahan Begum. I passed SSC from Horina Bagbati High School in 2011 and HSC from Ullapara Science College in 2013 from Rajshahi board, Bangladesh. Now I am intern student of Faculty of Veterinary Medicine,

Chittagong Veterinary and Animal Sciences University. This study was the inauguration of myself in the era of research and I have a strong intention to involve myself in this types of activities in future. I want to be a veterinarian and poultry practitioner in future.