

GOAT PLAGUE or PESTE DES PETITS RUMINANTS (PPR)

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
- wild and domestic small ruminants	- inhalation - contact (oral)	- fever - necrotic lesions of the mouth - diarrhoea - respiratory symptoms	Yes	None available	<i>In houses</i> <i>In zoos</i> Avoid contact with infected animals Vaccination

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Susceptible animal groups Sheep and goats are susceptible, but the latter are more susceptible than the former. Dwarf goat breeds are particularly susceptible. Cattle and pigs can be infected subclinically by experimental inoculation. Little information is available about the susceptibility of wild small ruminants. During a natural outbreak of PPR in a zoo, wild sheep (<i>Ovis orientalis laristanica</i>), gazelles (<i>Gazella dorcas</i>), gemsbok (<i>Oryx gazella</i>) and a Nubian ibex (<i>Capra inex Nubiana</i>) died, whereas Dama gazelle (<i>Gazella dama</i>), Arabian and scimitar-horned oryx (<i>Oryx leucoryx</i> and <i>O. tao</i>), red deer (<i>Cervus elaphus</i>) and blackbuck (<i>Antilopa cervicapra</i>) were not affected. However, acute fatal and subclinical forms of the disease could be induced experimentally in white-tailed deer (<i>Odocoileus virginianus</i>).	
Causative organism The PPR virus belongs to the genus Morbillivirus (family Paramyxoviridae). It is a RNA virus, which is closely related to the measles, rinderpest and distemper viruses. There is only one serotype of PPR, but there are at least 4 lineages which are distinguishable by nucleic acid sequencing. The virus is not very resistant and is rapidly inactivated at environmental temperatures by solar radiation and desiccation.	
Zoonotic potential The PPR virus is not infective to man.	
Distribution Currently, PPR is present in central, eastern and western Africa, Asia and the Near and Middle East.	
Transmission Close contact with an infected animal is necessary for virus transmission. Although oral transmission is possible (ingestion of contaminated feed and water), infection is transmitted mainly by aerosol (droplets containing virus particles in the expired air) or by contact with secretions or excretions of infected animals (saliva, faeces, urine, vaginal, nasal or ocular discharges). PPR virus is shed by infected animals during a relatively short period.	
Incubation period The incubation period is 2 to 6 days.	
Clinical symptoms The symptoms of PPR are very similar to those of rinderpest: fever, anorexia, depression, nasal and ocular discharges, difficult respiration, necrotic lesions on gum, lips and tongue resulting in salivation, erosions on the nasal mucosa and finally diarrhoea. The formation of small nodular skin lesions on the outside of the lips around the muzzle and the development of pneumonia during the later stages of the disease are frequently seen in PPR but not in rinderpest. Mild cases also occur with less marked clinical symptoms and absence of one or more of the cardinal features. Morbidity up to 100 % and mortality rates between 20 and 90 % are common, except in endemic areas or when mild disease occurs.	
Post mortem findings The carcass is usually emaciated and soiled with soft/watery faeces. Erosions are present throughout the buccal cavity and pharynx, and less frequently in the oesophagus. During the later stages of infection scabs or nodules can be seen on the lips. The abomasum and small intestine are congested and haemorrhages may be present. Zebra striping (congestion of the longitudinal folds of the mucosa) may be present in the large intestine and rectum. The lymph nodes associated with lungs and intestinal tract are soft and swollen. The lungs may be focally or diffusely congested or even more severely affected in case of concurrent	



bacterial infection. Interstitial pneumonia is common.

Diagnosis

Anamnesis, clinical and pathological signs are highly suggestive of PPR, but for a definitive diagnosis the virus or specific antigen or antibodies need to be demonstrated.

1. Direct methods

a) virus isolation: lymphoid tissues or blood leucocytes from suspected animals are inoculated into cell cultures. Cytopathogenic effects appear after 4 days. PPR is confirmed by serological tests.

b) Polymerase chain reaction (PCR): Reverse transcription (RT)- PCR can be used to identify the PPR virus.

c) Antigen detection: PPR antigen can be demonstrated using the agar-gel immunodiffusion test (AGID), the counter-immunoelectrophoresis test, sandwich ELISA or immunohistochemical staining.

2. Indirect methods: specific antibodies in serum can be detected using a monoclonal antibody based competitive ELISA or virus neutralisation test.

Material required for laboratory analysis

Whole blood (with anticoagulants), spleen, lymph node, ocular, nasal or oral swabs. Samples for virus isolation should be chilled, but not frozen. Samples should be collected from as many animals as possible, preferably in the early stages of infection (febrile or mucosal erosion phase).

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Treatment

Today an effective etiological treatment is not available. Only supportive and symptomatic treatment can be initiated.

Prevention and control in zoos

Effective homologous or heterologous (rinderpest) live attenuated vaccines are available. The rinderpest vaccine confers immunity for at least 3 years, whereas the homologous vaccine probably provides a life long immunity. New animals from endemic areas should be kept in quarantine for 3 to 4 weeks.

Suggested disinfectant for housing facilities

Lipophilic disinfectants are recommended for cleansing contaminated stables. In the presence of organic matter, the most effective disinfectants are 5% sodium hydroxide and 50% lysol.

Notification**Guarantees required under EU Legislation****Guarantees required by EAZA Zoos****Measures required under the Animal Disease Surveillance Plan****Measures required for introducing animals from non-approved sources****Measures to be taken in case of disease outbreak or positive laboratory findings****Conditions for restoring disease-free status after an outbreak****Contacts for further information****References**

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