

## VIRUS DISEASES OF SNAKES

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Boa constrictors and several species of pythons are most commonly affected by IBD (Infectious bursal disease), which was originally thought to be caused by a retrovirus but recently an arenavirus has been implicated. Boas are considered a more typical host because so many are infected, and they can harbor the virus for years with few to no clinical signs. Early signs, possibly precipitated by any factor causing immunosuppression, include a history of unthriftiness, anorexia, weight loss, secondary bacterial infections, poor wound healing, dermal necrosis, and regurgitation. In essence, IBD (Infectious bursal disease) should be considered in every sick boa.

IBD (Infectious bursal disease) is not curable, and many owners choose euthanasia. However, individuals may elect to isolate their snakes and treat with supportive and palliative measures. It is essential to educate owners not to sell infected specimens or their offspring, because this has caused the disease to spread worldwide.

Retroviruses have also been found in Russell vipers, corn snakes, and California kingsnakes in association with malignant tumors. A retrovirus isolated from a sarcoma in a Russell viper was designated as viper virus.

Adenoviruses have been implicated in fatal hepatic diseases in snakes (gaboon vipers, ball pythons, boa constrictors, rosy boas, and rat snakes), lizards (Jackson chameleons, savannah monitors, and bearded dragons), and crocodylians.

Methods for working with reptilian viruses

Generally, diagnosis of reptilian viruses can be approached like all other viruses. Histopathology can give the initial indication of a viral infection and most infections are described alongside the pathological changes they induce. But like all other fields of virology, reptilian virus researchers are venturing into both serological surveys and molecular tools for diagnosing viral infections

Isolation of viruses in culture has the advantage of amplifying the agent for easier identification and characterisation, but also for use in transmission studies. Specific reptilian cell lines are available that will support viral growth and for some viruses display cytopathic effect, where others do not cause CPE (carbapenemase-producing Enterobacteriaceae) or do not grow at all in known cell culture systems. For those cell lines that support propagation of a particular virus, the temperature regime for both cell lines and viral growth will be different from mammalian systems due to the poikilothermic nature of reptiles. Zoonotic viruses have been isolated from reptiles since 1939 when Rosenbusch isolated Western Equine Encephalitis from a bothrops alternata, followed by Japanese encephalitis virus from snakes, calicivirus from snakes, a flavivirus-like agent from tortoises and West Nile virus from alligators using either mammalian derived cell lines at 37°C or mosquito cell lines at 28°C. Several other reptilian viruses will grow in cell lines derived from mammals such as Vero cells or in cell lines derived from fish. Clark and Karzon isolated a herpesvirus from iguana in tissue explants from an apparently healthy iguana in 1972 and since then several reptilian cell culture systems have been established and are now available from the American Type Culture Collection. Paramyxovirus grows readily in cobra eggs, viper heart, gecko embryo and rattlesnake fibroma cell lines and ranavirus will grow in a variety of cell lines.

Boas are considered a more typical host because so many are infected, and they can harbor the virus for years with few to no clinical signs. Generally, diagnosis of reptilian viruses can be approached like all other viruses. But over all that doesn't mean that reptiles are bad pets.