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Distemper in captive Red pandas

Ailurus fulgens

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The Lesser or Red panda *Ailurus fulgens* has been a popular animal in zoological collections since its adaptability to captivity was first reported in the mid-1800's (Hodgson, 1847). For the ensuing hundred years zoological gardens from India to America obtained and exhibited this species which became renowned for its pleasant disposition and charming nature. By the 1950's and 1960's the Red panda had become so much in demand that one animal dealer alone reported handling more than 350 specimens in a 17-year period (Munro, 1969). By the mid-1970's, collection for zoological exhibition, hunting for furs and range decimation had affected populations in the wild to the point that the Red panda had become rare or had disappeared over large parts of its original range of Nepal, Szechuan and Yunnan, and is now common in only the remoter sections of Bhutan and Sikkim.

Despite this long history in captivity, the Red panda has fared rather poorly in terms of captive longevity and reproduction. For example, the National Zoological Park has exhibited over 40 specimens during the last 50 years with a mean longevity of 446 days (range=9–2132 days) with 11 litters totalling 28 offspring being born. Paradoxically, the National Zoo seems to have fared somewhat better than most as we have successfully reared litters to breeding age and have had second generation births (Roberts, 1975). In the five-year period, 1969–73, the *Yearbook* breeding census reported a minimum of 20 litters consisting of 35 individuals, with a survival rate of only 37%.

The reasons for the poor success in maintaining Red pandas in captivity fall into several broad management categories: first the species does not thrive when placed in traditional, confining small mammal enclosures and is intolerant of extreme heat and humidity; secondly, the species, being herbivorous (primarily folivorous) (Hodgson, 1847; Bartlett, 1900; Sowerby, 1932; Mottershead, 1961), requires a diet high in fibre and bulk and does not tolerate diets low in bulk such as the traditional 'gruels' on which it is fed. In this respect, it is much like the Colobine primates in that it responds with severe gastro-intestinal distress unless *c.*80% of the intake consists of bulk (bamboo, grasses, foliage, etc.). Thirdly, the species appears especially susceptible to certain diseases, particularly canine distemper.

SUSCEPTIBILITY TO DISTEMPER

Although the taxonomic position of *Ailurus* has not been finally resolved for either the family Ailuropodidae, which includes the Giant panda *Ailuropoda melanoleuca*, or the Procyonidae, containing the raccoons and their allies, both of these families of the order Carnivora are susceptible to canine distemper virus and possibly feline panleukopaenia virus. Deaths of Red pandas directly attributable to the canine distemper virus have been described on several occasions (Anon., 1961; Fiennes, 1961; Erken & Jacobi, 1972). Discussions with zoo officials both in the United States and Europe during the last three years indicate that other unpublished cases of Red panda deaths due to canine distemper virus are probable.

In at least two accounts, involving the deaths of five animals, the origin of the virus was attributed to the live or modified live virus vaccines (Erken & Jacobi, 1972; Bush *et al.*, 1976). The animals became depressed approximately two weeks post-vaccination and developed purulent naso-ocular discharges and concurrent anorexia and diarrhoea. In some cases these symptoms were followed within two to four days by epileptic seizures, coma and death, but in others death followed within two to three days of the onset of the naso-ocular discharge without additional symptoms.

The pathological findings in the other published records were similar, all demonstrating varying degrees of bronchopneumonia, conjunctivitis and rhinitis and histological findings of typical canine distemper-type intracytoplasmic inclusion bodies in the tissues of the bronchi, trachea and lungs. In a more recent investigation, the classical pathological findings and appropriate viral isolation of the vaccine virus verified that the disease was vaccine induced (Bush *et al.*, 1976).

On this evidence, it becomes clear that an effective means of protection needs to be found. Attempts at passive immunity by the administration of serum (usually canine) with antibodies for canine distemper generally have not met with success as the immunity is only short lived (two to three weeks) and is not always complete. An additional problem is that repeated injections of serum are necessary and these can potentially cause the animal to experience an antigen-antibody reaction to the foreign protein of the canine serum.

The use of modified live virus vaccine preparations for exotic species has become a widespread practice but there are problems encountered with this method. These vaccines are modified so that they have lost virulence for one specific species only (usually the domestic dog or cat) but may retain their virulence towards other species. The modified live canine distemper virus vaccine, for example, will induce canine distemper in ferrets, other mustelids and raccoons. As cited above, modified live canine distemper virus vaccines have proven fatal when used in an attempt to immunise Red pandas. For these reasons we do not recommend, nor, at the National Zoological Park, do we use modified live virus vaccines in any exotic animals.

The use of killed virus canine distemper vaccine, Trioid Plus, has proved effective. Our vaccination programme begins when the animal is 6–8 weeks of age, followed by vaccinations every three weeks until the animal is three and a half months old. Subsequently, yearly boosters have provided complete protection. No cases of canine distemper have occurred in the collection since the programme's inception. In addition to the Red panda, the Giant panda and species belonging to the families Procyonidae, Viverridae, Mustelidae and Felidae are routinely vaccinated against panleukopaenia (feline distemper) with Felocine, a killed feline distemper virus vaccine, according to the same schedule and with similar success.

PRODUCTS MENTIONED IN THE TEXT

Trioid Plus: killed canine distemper/hepatitis vaccine, manufactured by Fromm Laboratories, Inc., Grafton, Wisconsin 53024, USA.

Felocine: killed feline distemper vaccine, manufactured by Norden Laboratories, Lincoln, Nebraska 68501, USA.

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