

Table 5: Non-infectious, environmental health problems in Loridae

Environmental condition	Resulting problem, symptom in Loridae	Measures for improvement of environment
Temperature		
Normal temperature	Temperatures naturally found in the wild depend on the region and altitude above sea level. For distribution areas of <i>Loris</i> forms in Sri Lanka, for instance, the following temperature data were found ^{72, 73, 74} : for <i>L. t. tardigradus</i> and <i>L. t. nordicus</i> (lowland forms) average temperatures about 20-27 °C, minimum > 15.5 °C; for <i>L. t. grandis</i> (highland form): average 18-20.5 °C, minimum 11 °C (estimated at 900 m above sea level), for the extreme mountain form <i>L. t. lydekkerianus</i> : average 15.4 °C, minimum -4 °C.	In general, a temperature gradient within the cage is recommended for the taxa whose thermoregulatory capacities are primitive ⁷⁵ .
Too low temperature. "Cold is one of the worst, if not the worst, enemy of the captive loris" ¹⁷	Hypothermia In <i>N. pygmaeus</i> , in five cases animals kept in a cool room showed locomotor and equilibrium problems after sleeping period, were found on the ground or minimally responsive and cold to the touch ^{32, 61} . In one captive <i>N. pygmaeus</i> severe hypothermia with minimal responsiveness occurred after sleeping on cold concrete floor in an otherwise warm cage; lack of cover in other parts of the cage might have been a cause for this choice of sleeping place. The animals recovered when brought to a warmer place ³² . Two <i>N. pygmaeus</i> kept in a cold room showed no problems, but used heated place in the cage at short intervals ³² . In <i>Loris</i> , tolerance to cold is relatively low, possibly because of the large body surface. Optimal temperature is 25-32,5 °C; at 10-12 °C a decrease of rectal temperature of more than 5 °C was measured in spite of an increase of basal metabolic rate and food consumption. ²⁶ . The peculiar blood vessel system (retia mirabilia) in the limbs of lorises and changes of blood circulation during sleeping period might play a role in development of hypothermic problems. In <i>Loris tardigradus nordicus</i> ¹⁵ , healthy adults showed no problems with room temperatures of 16-17°C for some time whereas in two sick, weak animals hypothermic problems after sleeping period were observed at about 19-20°C. Problems in captive lorises because of low temperature were also reported from Sri Lanka ¹⁷ . Slender loris babies cool down rather quickly when separated from their mother, probably because of their scarce fur ¹⁵ .	Adequate room temperature. In general, a temperature gradient within the cage is recommended for the taxa whose thermoregulatory capacities are primitive ⁶¹ . Consideration of adaptations of local populations may be necessary: the slender loris subspecies <i>L. t. nycticeboides</i> for instance is adapted to cool montane mist forest climate with temperatures sometimes below 0°C whereas lowland forms need a much warmer climate. In cool rooms which cannot be heated satisfactorily, in sick or very old animals, an additional heated sleeping place is helpful and is readily used.
High ambient temperatures	In <i>Loris</i> ¹⁵ : energy-saving behaviour, very relaxed sleeping postures with limbs not held close to the body. Evaporation by faster breathing, enlarged veins in the auricles and in males enlarged, scrotal testes apparently help to emit heat.	In general, a temperature gradient within the cage is recommended for the taxa whose thermoregulatory capacities are primitive ⁷⁵ .
Humidity		
Low air humidity	In <i>Loris</i> , air humidity of less than about 70% may lead to repeated sneezing. Diseases due to longer-lasting stay in rooms are not known	Air humidifiers from Turmix, Switzerland, were used for the colony at Ruhr-University because they hardly produce any noise ¹⁵ .
Unusually high air humidity leading to bacterial development of acid on urine-marked branches	In very humid air development of acid in the urine markings on branches by bacteria. In <i>Loris</i> , irritation of the dorsal / pelvic skin in contact with branches during sleeping and resting may occur. Hairless spots and in severe cases inflamed and sore skin may be the result ¹⁵ .	More frequent cleaning or replacing of the branches by fresh ones ¹⁵ . New branches have in one case, for unknown reasons, caused similar problems ¹⁵
Wet fur, by rain or an other cause: in <i>Loris</i> danger of hypothermia "Once the animal gets its woolly coat thoroughly wettened it takes a considerable time to dry" ¹⁷	Risk of development of pneumonia in <i>Loris</i> "very great"; death in a number of captive animals ¹⁷	
Noise, disturbance		
Stress	Environmental stress may lead to behavioural changes (see see figures 2.1 and 2.3) and reduced food consumption (see table 1, behavioural signs of problems); stress caused by transfer to unfamiliar environments led to deaths due to gastric ulcera, fatty liver and inanition in 27 % of 48 slender lorises from Ruhr-University (days or weeks after transport) and nine of 12 examined Angwantibos (death within two months after arrival) ¹⁰ . The danger of stress-related health problems can be reduced by environmental enrichment and adequate housing in a reasonably quiet environments.	