Captive snow leopardsin the Chongqing Zoo

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Most of the captive breeding and viewing of snow leopard in zoos of China has been provided by Xining Zoo. Xining has a temperate continental climate at 2275 m elevation and the average annual air temperature is 5.5°C. The highest temperature is in July with a monthly average of 17.2°C. Summer is cool and comfortable. In the long winter the lowest temperature has reached 26.6°C. Average annual precipitation (19541970) is 371.7 mm, and the annual amount of sunshine is 26002800 hrs. This is 700 hrs more than other cities at the same latitude. With strong radiation and ultraviolet rays and variation in temperature between day and night (1220°C), the annual quantity of radiation totals 139177 kcal/cm^2. Such an alpine climate condition is quite similar to that of the snow leopard's natural habitat.

Chongqing is located in a subtropical zone with an average annual temperature of 18.9°C, extreme low temperatures of 2.8°C to 1°C and extreme high temperatures of 40.5°C to 44°C. The annual temperature totals 5931.1°C and annual precipitation is 10002000 mm. The frostfree period is 330337 days. Average annual sunshine is 1140 hrs. Chongqing Zoo is less than 300 m above sea-level. These conditions are quite different from that of snow leopard habitat. Can a typical alpine animal such as the snow leopard survive in Chongqing?

Chongqing Zoo has twice introduced snow leopards from Xining Zoo. With great effort the feeders and managers of the zoo made a suitable artificial environment for snow leopard, protecting it from heat, lowering its body temperature in summer and increasing artificial light in winter. They tamed the snow leopards to help in exercising them and fed them with high quality food. Thus, one snow leopard survived hot summers and cold winters safely in Chongqing and was viewed for 8 years. The following is a brief introduction to snow leopard rearing and management in Chongqing Zoo.

MATERIALS AND METHODS

Animals -- Chongqing Zoo introduced a female oneyearold snow leopard from Xining Zoo in 1975. This animal was captured by Xining Zoo from Yushu, Qinghai Province in November 1974 at about 5 months of age. In 1984 a oneyearold male snow leopard from Xining Zoo was transferred to Chongqing, this one captured by Xining Zoo in Lan County, Qinghai Province in 1983 when it was about 50 days old.

Cage -- The cage was divided into an inside house and an outside sports-ground, with an iron fence connecting the two parts. The house was built of brick, was 3.6 m in breadth by 2.8 m in height, with a cement floor. A ground window and an observation window was set in the inside wall for shade and ventilation. A wooden board 180 cm long and 70 cm wide was propped up inside the house 50 cm above the ground as a sleeping place for the snow leopard.

The sports-ground, 4.72 m by 3.65 m, was surrounded by an iron fence 2.8 m in height, and was paved with slabstone. A wooden stick and a pair of swinging boards were hung in the sports-ground for snow leopard grinding and play. The swinging board was 150 cm in length, 50 cm in breadth and 1.5 m above the ground.

Feeding -- Selected lean meat (pork and beef) was dipped into 1% potassium permanganate for 1015 minutes, washed and cooled, then mixed with codliver oil, vitamins and trace elements. This was provided to the snow leopard at 1.52.0 kg per day in the seasons of spring, fall and winter, with live chicken and rabbit twice a week and no food every Sunday.

Management -- The house was kept clean, irradiated with ultraviolet rays for 15 minutes a day and disinfected with 12% hot liquid sodium hydroxide once a week. During summer, a shed was set up to prevent solar radiation. If the air temperature outside reached more than 35°C, water was sprinkled three times a day (0800, 1200, 1600 hrs) to lower the temperature in the house, and a fan was used for air convection to maintain the house temperature under 32°C. In winter the shed was taken away to allow more natural sunshine. At the same time irradiation was provided with ultraviolet and infrared rays to make up for the insufficiency in sunshine.

In early spring, late fall and winter the snow leopard moved freely outside the house and was kept inside at night. If the weather became cold, the door and windows were closed to prevent cold winds. During summer and early fall the snow leopard could go in and out any time so as to prevent sunstroke and

to let it avoid heat in its limited cage. The snow leopard was tamed and actively exercised to increase its movement capacity.

RESULTS

During the hot summer and early autumn the snow leopard's activity was noticeably reduced. It always lay in a place with good ventilation from 1000 to 1700 hrs. If the outside temperature reached 25°C the snow leopard's breathing was faster. Once the temperature reached 30°C the snow leopard lay completely prostrate on the ground with its body sticking to the loose hot slabstones. The snow leopard was very active at night. It often jumped up and down to the swinging board, making it sway freely, and lay on the board at dawn. After the male snow leopard was 3 years old its mating behavior appeared. Excited by a female leopard's sex hormones and sound signals in the next cage, the male snow leopard raised its tail along the iron fence, urinating on the fence. A keeper teased the snow leopard with broom and the snow leopard rode astride the broom for a mating action. This male snow leopard was transferred from Xining Zoo in 1984 and viewed in Chongqing Zoo for 8 years.

DISCUSSION

The snow leopard, a typical alpine animal, could survive in a low altitude area with normal growth, development and reproductive behavior. It survived in a crude and simple cage in Chongqing Zoo for over 8 years under the conditions of very high temperature and moisture! This shows that snow leopard possesses a strong adaptive capability.

It is necessary to keep snow leopards tame in captivity. Taming can make snow leopard easier to exercise and keep fit. At the same time taming is good for rearing and for viewing.

Maintaining artificial light for snow leopard is a key to its proper care and breeding. A certain amount of light may increase the stimulation to the animal's hypothalamus and therefore affect its pituitary, impelling the increase of sex hormones for estrus and mating behavior. Because the wild snow leopard can get more sunshine in the field than can the captive snow leopard, insufficient sunshine might be a important factor causing poor reproductive behavior in captive snow leopards.

Postscript

A female snow leopard was transported from Xining Zoo in 1975 and died from respiratory system disease. A male snow leopard was sent from Xining Zoo to Chongqing Zoo in 1984 and died of a disease of the respiratory system. Although both snow leopards died from respiratory disease in Chongqing Zoo, whether this was inevitable due to the conditions in Chongqing will continue to be studied in the future.

REFERENCES

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