



STANDARD OPERATING PROCEDURE No. 10

HOUSING AND CAPTIVE MAINTENANCE OF BALL PYTHONS (*PYTHON REGIUS*)

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I. Overview

Herein I outline the proper procedures for the housing and captive maintenance of ball pythons (*Python regius*). These procedures adhere strictly to the animal care and use policies of the American Society of Ichthyologists and Herpetologists. However, as these policies are designed to apply to all herptiles, and are thus not species specific, I justify the specific housing needs of *P. regius* by referencing recent representative technical papers; both the animal care and use policies of the American Society of Ichthyologists and Herpetologists and several of the referenced technical papers are included as appendices.

II. Housing

A. Location

Snakes will be housed in a separate, specialized facility outside the Washington College vivarium. The snake colony will be located in room SG13B in the Toll Science Center, a room built specifically for the housing of these animals, and will only be used to house snakes. The specifications of the rooms (size, materials, insulation, etc) allow for easy, accurate, and precise regulation of temperature, the most pivotal parameter in the captive care of reptiles (ASIH animal care guidelines; see below).

B. Caging System

Snakes will be housed in a custom-built rack system (Freedom Breeder, Turlock, CA) especially designed for housing snakes. The rack holds 21 separate tubs in which snakes will be housed (see below). The rack system comes pre-wired with a thermostat-driven heating system which provides temperature control over each tub (see below).

Each snake will be housed individually in a 17" x 33" x 8" nalgene tub suspended within the rack system. The front of each tub is fitted with a 15" x 4" lexan polycarbonate window affording a clear view into each enclosure. The top of each tub has a tight-fitting lid built of ballistic plastic in a metal frame. The front portion of the lid (17" x 6") is

hinged and can be opened and closed to gain access to the tub. The placement and position of each tub within the rack system prevents the lid from being removed unless the tub is removed from the rack, and the hinged section of the lid can only be opened if the tub is pulled out of the rack system.

Unlike the case with rodents, there are no requirements for ventilation rates of airflow or air turnover when housing reptiles (ASIH animal care guidelines; Rossi 1992). Snakes are dry-skinned (secreting no sebaceous secretions and producing no dander) and, on account of their very low metabolic rates, produce small amounts of nitrogenous wastes very infrequently (see below). Thus, there is no pressing need for high airflow and air turnover rates.

C. Additional Housing Consideration

1. Bedding Material

Cages will be lined with newspaper, a commonly-used bedding material when housing snakes (e.g. Rossi 1992; Krochmal and Bakken 2003; Krochmal et. al 2004). Using natural material (e.g. soils, sand, peat moss, etc) is more costly, is more apt to breed and harbor bacterial and fungal pathogens, and can be associated with impaction of the gastrointestinal tract (Rossi 1992; Krochmal, personal observation).

2. Cleaning schedule

Bedding will be changed and cages cleaned once weekly. The low metabolic rate of snakes (approximately 10% of that of a mammal of equal mass) and their captive feeding schedule (see below) will dictate that snakes will only excrete approximately one or twice monthly. Further, snake skin is dry (lacking sebaceous secretions) and does not slough continuously, secretions and dander cannot accumulate in an animal's home cage. When combined, the low frequency of excretion and the lack of sebaceous secretions and dander dictate that daily changing of bedding unnecessary. Bedding will instead be changed weekly or sooner if needed (e.g. soiled by wastes or soaked by spilled water).

III. Captive Maintenance

A. Temperature

As ectothermic organisms, snakes are incapable of generating metabolic heat internally and they therefore must rely on the external environment for body heat. Accordingly, maintaining an appropriate thermal environment in captivity, and providing captive animals with thermoregulatory opportunity are the most important elements in the captive care of snakes (ASIH animal care guidelines).

An appropriate thermal environment will be provided for all captive *P. regius* using two separate methods. First, ambient temperature will be held at 25°C, the lower boundary of the range of operative temperatures, and therefore, body temperatures, experienced by wild *P. regius* (e.g. Aubret et al. 2003). The ambient temperature will be maintained using both the wall-mounted thermostat in SG013A (the outer room that encompasses SG013B) that will be set at 20°C and an industrial, thermostat-enabled, forced-air heater mounted in SG013B set at 25°C. The ambient temperature set by wall

thermostat, the high simulation of the walls in SG013B, the small size of SG013B and the power of the external heat will assure the heater is rarely on. Secondly, each cage will be fitted with a substrate heater attached to a thermostat set to 30°C, the upper end of the range of operative temperatures, and therefore, body temperatures experienced by wild *P. regius* (e.g. Aubret et. al 2003). By doing so, I will establish a gradient from 25°C-30°C in each cage. This temperature regime reflects the natural range of body temperatures selected by wild *P. regius*, but also allows each individual snake the opportunity to regulate its body temperature relative to its specific needs.

This temperature regime is standard for the housing and captive maintenance of *P. regius* (Ebert et. al. 2007; Ott and Secor. 2007; Skovgaard et. al 2007; Starck and Wimmer 2005).

B. Food

Snakes will be maintained on a diet of pre-killed, frozen-thawed mice purchased from a commercial supplier (Rodent Pro, Inglefield, IN). All species of snakes readily take pre-killed mice in captivity (e.g. ASIH animal care guidelines; Rossi 1992; DeVault and Krochmal 2002) and captive colonies are typically maintained on such mice for monetary and logistical purposes.

Feedings will take place every 10-14 days as is typical for housing *P. regius* under the aforementioned ambient conditions (Ebert et. al. 2007; Ott and Secor. 2007; Skovgaard et. al 2007; Starck and Wimmer 2005). The amount of food provided (i.e. number of mice / feeding and/or mass of mice provided) will vary based on size of snake.

C. Water

Snakes will be provided with *ad libitum* water, as is common in the maintenance of ball pythons (Ebert et. al. 2007; Ott and Secor. 2007; Skovgaard et. al 2007; Starck and Wimmer 2005). Many snake species will drink from a drip dispenser, but *P. regius* does not; it will take water from a bowl. Water will be refilled as needed, and water bowls will be cleaned weekly.

D. Shelter

Each snake will be provided with a shelter box which will serve as a refuge. Like most snakes, *P. regius* spends the majority of its time hidden under the shelter of a bush, log or rock crevice, and in captivity they both need and use artificial shelter boxes. These boxes can be made out of plastic or cardboard boxes of sufficient size so as to allow the snake to enter comfortably and to remain coiled inside.

P. regius have fossorial tendencies, and therefore likes to burrow under the loose newspaper bedding for shelter (G.S. Bakken, personal communication) and often times does not make use of shelter boxes; I will nevertheless provide such boxes to all captive snakes.

E. Light Cycle.

Snakes will be housed on a 12:12 light:dark cycle throughout the year. Such a diel cycle is typical in and appropriate for the housing of *P. regius* (Ebert et. al. 2007; Ott and Secor. 2007; Skovgaard et. al 2007; Starck and Wimmer 2005).

IV. Additional Considerations**A. Access**

To reduce both disturbance to the animals and the likelihood of unauthorized visitors to the colony, access thereto will be decidedly limited. In addition to the principle investigator, only the chair of the Department of Biology, the chair of the Washington College Institutional Animal Care and Use Committee and the Washington College Director of Living Resources will have keys to the facility. The chair of the Department of Biology, the chair of the Washington College Institutional Animal Care and Use Committee and the Washington College Director of Living Resources will be granted continuous access to the facility so as to monitor the status of the colony and to perform their monitoring duties; they need not contact the principle investigator for permission. Any special circumstances that might prevent or restrict their access (e.g. experiment in progress, particular treatment, etc) will be posted on the entry door to the colony.

B. Maintenance Responsibility

The full and complete responsibility for maintaining all snakes housed at Washington College falls solely on the principle investigator or his direct designee. Anyone other than the principle investigator who might conceivably offer care and maintenance to captive snakes will be trained directly by the principle investigator, be included on any specific IACUC protocols submitted, and have their contact information posted prominently and given to the Director of Living Resources (see below)

C. Emergency Contacts

A list of all emergency contacts and the order in which contacts should be made will be prominently posted in two places – inside SG13A and directly on the door to snake colony, SG13B. A copy of this list will also be submitted to the Director of Living Resources.

Literature Cited

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