American Zoo and Aquarium Association

Minimum Husbandry Guidelines for Mammals: Viverrids and Mongooses
AZA Mammal Standards Task Force, 1997

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INTRODUCTION

Minimum husbandry standards for these two families are variable because of differences in size, morphology, and behavior. The Viverridae (civets and genets) and Herpestidae (mongooses) consist of thirty-five genera and over seventy species (Corbett and Hill, 1980). Most species may best be described as small to medium sized carnivores, ranging from 16 - 91 in. (170 - 975 mm.) in length (HBL), and 1.1 - 28.7 lb. (.5 - 13 kg) in weight (Walker, 1968).

Both families dwell primarily in tropical forests but some species also live in dense brush and thick grass (Walker, 1968). They may be diurnal or nocturnal, solitary or social, and terrestrial or arboreal. All live in holes in trees, tangles of vines, caves, crevices, or burrows, and in captivity require nest boxes. Civets and mongooses feed on small vertebrates, invertebrates, fruits, bulbs, or nuts. Their sight, hearing and smell are acute, and they actively use their scent glands for marking and defense.

NOMENCLATURE
The following description is taken from the IUCN Action Plan for Mustelids and Viverrids (Schreiber et al, 1989).

VIVERRIDAE - CIVETS AND GENETS

1. Viverrinae - This subfamily includes the medium-sized ground dwelling civets, Viverra;
arboreal species such as linsangs, *Prionodon* and *Polana*; and the monotypic aquatic genus *Osbornictis*.
Common Name Latin Name
Genets (11 species) *Genetta sp.*
Civets (4 species) *Viverra sp.*
African linsang *Poiana richardonii*
Small Indian civet *Viverricula indica*
Water civet *Osbornictis piscivora*
Linsangs (2 species) *Prionodon sp.*

2. Paradoxurinae - This subfamily consists primarily of palm civets and their allies. All species inhabit Asian rain forests; most species are arboreal and frugivorous.
Three-striped palm civet *Arctogalidea trivirgata*
Palm civets (3 species) *Paradoxurus sp.*
Masked palm civet *Paguma larvata*
Brown palm civet *Macrogalidea muschenbroekii*
Binturong *Arctictis binturong*

3. Hemigalinae - This subfamily is found only in Southeast Asian rain forests. Ottercivets are largely aquatic.
Palm civets (2 species) *Hemigalus sp.*
Owston's palm civet *Chrotogale owstoni*
Otter-civet *Cynogale bennetti*

4. Fossinae - This subfamily is confined to Madagascar and represented only by the Malagasy civet, *Fossa fossana*.

5. Euplerinae - This subfamily contains only two species, the fanalouc, *Eupleres goudotii*, a highly specialized species that feeds predominately on earthworms, and the cat-like fossa, *Cryptoprocta fossa*, Madagascar's largest predator.

6. Nandiniinae - A subfamily with only one species, the African palm civet, *Nanginia binotata*.

HERPESTIDAE – MONGOOSE

This family is represented by the distinctive mongooses. All species are small or medium-sized diurnal, terrestrial carnivores. Their social structures can be quite
complex, some species forming temporary aggregations while others live in complex colonies.

   Ring-tailed mongoose *Galidea elegans*
   Broad-striped mongoose *Galidictis sp.*
   Narrow-striped mongoose *Mungoticis decemlineata*
   Salano *Salanoia concolor*

2. Herpestinae - True mongooses.
   Meerkat or Suricate *Suricata suricatta*
   Common mongoose *Herpestes sp.*
   Dwarf mongoose *Helogale sp.*
   Pousargues’ mongoose *Dologale dybowskii*
   African mongoose *Galerella sp.*
   Water mongoose *Atilax paludinosus*
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   Banded mongoose *Mungos sp.*
   Cusimanse *Crossarchus sp.*
   Liberian mongoose *Liberictis kuhni*
   White-tailed mongoose *Ichneumia albicauda*
   Mongooses *Bdeogale sp.*
   Meller’s mongoose *Rhyncholgale melleri*
   Yellow mongoose *Cynictis pencillata*
   Gray meerkat *Parcynictis selousi*

HUSBANDRY

Many aspects of captive husbandry for both groups are similar and discussed below. Requirements unique to certain groups are listed separately.

Temperature: Viverrids and mongooses originate in warm climates and prefer temperatures between 68 - 78 degrees F (20 - 25 C). When kept outdoors during warm summer months, shade and shelter should be provided. When indoors, temperatures should remain between 71 - 78 degrees F (22 - 25 C). In localities where indoor ambient temperatures fall below these temper-atures, an artificial heat source should be provided.
Lighting: Indoor facilities may use natural or artificial light. The light should be evenly distributed and/or of sufficient intensity to permit routine inspection and cleaning. For indoor enclosures, any cycle providing 8 - 12 hours of illumination will suffice. Fluorescent lighting is an efficient light source that provides full spectrum illumination. Red or blue reverse lighting can also be used.

Ventilation: Indoor facilities should have 5 - 8 air changes of non-recirculated air per hour. Humidity requirements depend on the species. Desert species do well with 30% humidity while aquatic ones require 60%.

Water: Clean drinking water should be available at all times. Water containers should be cleaned and disinfected daily. For aquatic species, a small pool with clean water should be provided.

Food: Viverrid diets should consist of ground meat supplemented with vitamins and minerals, fruits and vegetables, and occasional whole animals, eggs, and insects. Commercially available feline diets may also be used, and dog food may be used in place of cat food for genets, civets and binturongs (Rettig and Divers, 1978). Many species require specific diets that should be researched prior to acquisition.

Caging: Enclosures should be escape-proof and have walls, ceilings and floors that can be easily disinfected. Walls may be solid or mesh and constructed of wood, fiberglass, mesh, concrete or block, the last two surfaces painted with an epoxy paint for easy cleaning. If no top is provided, walls need to be non-climbable and escape-proof. Concrete flooring 4 inches (10 cm) thick is recommended as it is easily cleaned and not damaged if other substrates cover it. Fiberglass flooring may also be used, as can weld mesh (9 gauge with 3/4 inch holes).
Housing should include tree limbs for climbing and a nest box or elevated platform for
retreat. Compatible animals may be housed together but should not be housed near
animals that may cause them stress. Common walls between incompatible animals
should be constructed so that animals cannot reach or see each other. Enclosure size depends upon species and number of individuals. If a pool is present, the floor space occupied by the pool should be in addition to the minimum floor space.
All enclosures require sufficient drainage to prevent standing water. See Table 2. for
further details.

Sanitation: Enclosures should be spot cleaned daily. Large enclosures with dirt
substrates should be raked and spot cleaned daily, and soil completely removed once a
year or as needed. In very large outdoor enclosures, substrate removal may not be
necessary.

Because these animals scent mark their area, total daily cleaning may cause stress.
This problem can be reduced by cleaning the substrate but not the "furniture" (rocks,
trees etc.). The furniture can be replaced when soiled.

Veterinary care: Services of an experienced veterinarian should be available. Periodic
(once a year) fecal examinations should be made. Parasite control is similar to those of
canids and felids, as are most other medical problems (Rettig and Divers, 1978). When
circumstances permit, an overall examination should be performed.

Viverrids and mongooses are subject to canine distemper and feline
panleukopenia (Rettig and Divers, 1978) and annual vaccinations are recommended;
vaccines should be derived from avian cell live modified live vaccines. In areas where
rabies, canine leptospirosis and canine hepatitis are a problem, vaccination should also
be considered.
SPECIAL REQUIREMENTS

For purposes of the following discussion, viverrids and mongooses are divided into three groups: solitary/terrestrial species, solitary/arboreal species and social/terrestrial species. Table 1 lists known genera and their categories. All solitary species, whether terrestrial or arboreal, should be maintained as heterosexual pairs, provided there is adequate space available.

Table 1. suggests minimum floor space and height for various species. Wherever possible, minimum sizes should be exceeded.

Solitary/terrestrial: Many viverrids and mongooses are solitary; all viverrids and many mongooses are nocturnal. For this group, it is essential that sufficient floor space be available for normal movement. Most species dig and natural substrates are best. Mongoose have non-retractable front claws and digging is essential to prevent them from becoming too long. Substrates should be placed on concrete floors to allow for periodic cleaning. If substrates are not used, hollow objects will suffice for the animals' retreat.

Each adult should have a nest box large enough for two adults to enter. Stones, concrete blocks, logs, branches, balls, etc. are useful artifacts for the animals to use and scent mark. All should be changed periodically.

Solitary/arboreal: Most viverrids fit into this category; all are nocturnal. Animals in this group require branches, and elevated platforms or nest boxes, pipes or hollow logs placed at least 4 ft. (1.2 m.) off the ground. There should be at least one nest box per adult that is large enough for two animals to enter. An enclosure for one medium-sized member of this group (genets and civets) requires at least 40 sq. ft. (3.7 sq. m.) of floor space, and 64 sq. ft. (6 sq. m.) for two. Another 20
sq. ft. (1.9 sq. m.) is recommended for additional animals. Enclosures should be at least 7 ft. (2.1 m.) high.

A single binturong should have at least 80 sq. ft. (7.4 sq. m.) of floor space, and twice that much for two. Each additional animal requires another 40 sq. ft. (3.7 sq. m.). Enclosures should be at least 8 ft. (2.4 m.) high.

Social/terrestrial: Only mongooses fit into this category. All species are diurnal and prefer brightly lit enclosures with opportunities to bask in the sun or near heat sources. All species require natural substrates for digging. Substrates should be placed on concrete floors to permit periodic cleaning. Masonry sand works well because it can be quickly cleaned with a screen sifter (Wemmer and Fleming, 1975). All substrate should be removed at least once a year for cleaning and disinfecting. Where it is not possible to provide sufficient natural substrate, long drainage pipes connected to a communal box are recommended. Hollow logs are another alternative.

Mongooses should have communal sleeping areas with internal nesting boxes. Mongooses are extremely fastidious animals. Many species only defecate in one area and daily cleaning of this area is sufficient to maintain good hygiene. Other species (meerkats) defecate in nest boxes and they will require cleaning as well. Colonies with young should not be cleaned or disturbed.

Marking is a very important social behavior and "furniture" is necessary to accommodate this need. Thick branches or stones will facilitate this behavior. Because they are active and inquisitive, mongooses should be provided with objects that are changed regularly. Mongooses suffer from stress leading to apathy and emaciation if isolated for prolonged periods. Also, established groups of many species, particularly meerkats, do not tolerate
new individuals and their introduction to an established group often results in the stranger being injured. Temporary removal of individuals from established groups may also result in permanent rejection so whenever possible, medical procedures should be administered without animal removal.

Since most mongooses are extremely active, cages should be as large as possible. Rassa (1975) found that dwarf mongoose, *Helagale hirtula*, required at least 10.7 - 21.4 sq. ft. (1 - 2 sq. m.) of floor space for each individual. Below this level, lethargy interspersed with bouts of fighting and a breakdown of social structure occurs; mortality is common. Minimum cage sizes may be found in Table 2.

Two of the most commonly displayed mongooses are the dwarf mongoose and meerkat (*Suricata suricatta*). Dwarf mongoose live in a strict family groups. They are diurnal, extremely social and live in nomadic groups of 12 or more. If hand raised, they seldom breed. In nature, meerkats live in colonies of over 24 animals which consist of several adult breeding pairs and off-spring. Young, sexually mature females are expelled from the colony but young, sexually mature males may co-exist peaceably. These behaviors should be considered when developing groups of either species (Wemmer & Flemming, 1975).

In establishing a colony of social mongooses, it is best to start with a compatible pair and let the young stay with the parents until the desirable group size has been established. Thereafter, breeding can be controlled by contraception.

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