REPTILE BEHAVIOR BASICS FOR THE VETERINARY CLINICIAN

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Abstract: Understanding normal and abnormal behaviors of reptiles aids the practitioner in assessing the reptilian patient and in counseling owners about their pets. Many client questions can be answered with this knowledge. Common postures and behaviors and the clinical application of these behaviors in captivity are discussed in order to provide the veterinary practitioner with information that will help them to help their patients.

Key Words: reptiles, behavior, coloration, courtship, pain, aggression, feeding, thermoregulation, burrowing, behavior enrichment

Common Postures and Behaviors

Normal demeanor in reptiles is usually exhibited by a bright eyed appearance, curiosity about the environment (i.e. tongue flicking in lizards or snakes), alertness and awareness of surroundings, and the presence of a righting reflex (i.e. snakes, lizards). Abnormal demeanor is exhibited by half-closed eyes that may appear to be unfocused, inability or unwillingness to move, lack of interest in surroundings and the lack of a righting reflex.

Courtship

Courtship behaviors in lizards may include head bobbing, push-ups, tongue flicking, as well as posturing to make the interested reptile appear larger including inflation of the body, extension of the dewlap and broadside posturing (Carpenter and Ferguson, 1977). Biting in lizards may occur, often to restrain the female to facilitate alignment for proper positioning of cloacae prior to copulation.

In some species of snakes (colubrids for example) biting will also occur in order to facilitate alignment to copulate. Those snakes that possess vestigal pelvic spurs (boids for example) use these spurs to aid in alignment.

Vocalizations are common during courtship displays in tortoises, crocodilians and amphibians. In some species of semi-aquatic turtles such as the Red-eared Slider, *Trachemys scripta elegans*, the male, while in the water, will wave his claws against the head of a female to display interest. Some chelonian males will butt the shells of the females during courtship and may injure females if they are unable to escape the advances (Hernandez-Divers, 2001). Gravid females of some reptiles species will often become anorectic during later stages of gravidity and may also be more aggressive during this time.

Coloration

The coloration of reptiles and ability to readily change colors in some species provides for a form of social interaction used for courtship. It also helps to provide camouflage to aid reptiles in the avoidance of predators as well as in the acquisition of food. Changes in coloration can indicate stress and illness. It also aids in thermoregulation whereby colors are altered to increase or decrease absorption.

Social and Antisocial Behavior

It is important to know which species are naturally social or gregarious and which prefer to be solitary. It is very stressful and often dangerous to intermix species or to house conspecifics together that are solitary in nature such as the green iguana (Iguana iguana). However, there are several species including bearded dragons (*Pagona vitticeps*) and leopard geckos (*Eublepharis macularis*) that may be housed in groups of a single male with multiple females. Reptiles, however, that have been housed together for months to years may become aggressive towards each other and should be separated accordingly.

Provoked defensive aggressive behaviors include posturing that makes the aggressor appear more threatening such as inflation of the body, standing more erect on all four legs, broadside posturing, dewlap extension, open-mouthed threat and head bobbing. Biting, striking and tail whipping may also occur. Some species are able to produce a noxious substance to deter aggressors or predators including the spraying of urine, feces or musk.

Offensive aggressive behavior may be displayed toward humans and other pets as can be the case of sexually mature iguanas during the breeding season when hormone levels are fluctuating . Reptiles may also become more aggressive when exposed to natural unfiltered sunlight (Moehn, 1976; Frye, 1991) although normal behavior is usually resumed when the reptile is returned to it's enclosure. Reptiles that are approached too quickly or handled inappropriately may also show signs of aggression.

Thermoregulation

Postural changes, burrowing, coloration changes (as above) and movement between microclimates aid in thermoregulation of reptiles.

Feeding

It is important for the owner to know the normal feeding behaviors of their reptile pet including whether it is a species that sits and waits for its prey items to come close or if it is a foraging species. This will help the owner pick appropriate prey items and with some imagination help with behavioral enrichment of their pet.

Whatever the normal feeding behavior of a given species it is inappropriate to provide so many prey items that they are crawling over the reptile. Prey items should not be allowed to stay in with an uninterested reptile for lengthy periods of time allowing time for the prey species to prey on the captive predator. Healthy snakes will readily eat prey items as they are presented. If live prey is not readily consumed it should be removed to prevent injury to the captive reptile. Bite wounds inflicted by prey items can create serious medical problems.

Burrowing

Burrowing behaviors are noted in certain reptile species and are performed to aid in thermoregulation, egg laying and to avoid predation. Burrowers should be provided substrates that will allow this behavior as well as hide boxes to simulate this behavior.

Behavioral Enrichment

Unfortunately, many new and uneducated reptile owners may make inappropriate choices for enclosures and food items based on advise from pet store employees, outdated texts and from other uneducated individuals. Many reptile breeders will recommend subsistence housing in the same fashion they use for the mass production of reptiles. Decisions are also guided by the wish to make the enclosure aesthetically pleasing without knowledge of species specific needs or behaviors that should be catered to when making choices concerning substrate, prey items, as well as heat, light and humidity sources.

Encouraging natural behaviors can be accomplished by providing safe enclosures and substrates that mimic natural choices but still allow for efficient management and cleaning. Appropriate cage size should be considered in the decision about which species will be obtained as well as the ability to provide proper light, heat and humidity (or lack of humidity if appropriate for a given species) and places to hide if needed. Providing a variety of prey species can also help with creating a more balanced diet as well as aid in enhancing behavioral enrichment. Occasionally adding to or altering the cage accessories may stimulate reptile pets to explore their environment more.

Pain-Associated Behaviors

Behaviors that may be associated with pain include immobility, dull and half-closed eyes, biting at the affected area, anorexia, agitation or restlessness, hunched posture, aggression in a normally passive animal, color changes, holding body less coiled at the site of pain (i.e. snakes), rapid respiration, stinting on palpation, avoidance/withdrawal, lameness, aerophagia, scratching or flicking foot at affected area, and intermittently pulling head in and then extending head out and up (i.e. chelonians). These behaviors can be seen in reptiles with many disease processes. Pain should be considered if any of these abnormalities are present and managed accordingly.

How behavior relates to captivity

-Social or antisocial behavior of a given species must be taken into consideration when deciding on whether to cage conspecifics or members of different species together.

-Mirrors and other reflective surfaces should be avoided in enclosures as a reptile's reflection may be perceived as a dominant conspecific and create undue stress or be perceived as competition and may be attacked as such causing injury to the reptile as it strikes the surface.

-Providing a temperature gradient (horizontally as well as vertically) in an appropriately sized enclosure allows reptiles to thermoregulate as they move about the enclosure.

-Providing appropriate space and hiding places for reptiles may alleviate some of the stress associated with captivity.

-Feeding tendencies must also be considered when placing reptiles together. For instance, it would not be appropriate to put a carnivorous species in with an herbivorous species without concern for loss of one of them.

-Obesity is a common consequence of captivity for several reasons including lack of exercise due to inappropriately small cage size, inappropriate cage temperature, inappropriate diet or variety of diet items provided as well as overfeeding due to the owners fascination for seeing prey consumed.

-Anorexia may occur if species specific behaviors, tendencies and needs are not known or met. For instance, inappropriate environment (i.e. temperature, humidity), stress due to lack of space and hiding spaces and social competition, inappropriate food items provided, undetected disease processes (behavior changes unrecognized by the owner), over handling shy species, and feeding nocturnal species during the day may all contribute to anorexia.

-Arboreal and terrestrial behaviors should be taken into consideration when creating and furnishing enclosures appropriate for reptiles.

-Attempts to escape may be made and actually cause self-trauma in species maintained under certain conditions. These conditions may include housing in improper environments or where inter or intra species aggression exists, overcrowding or other social stress is present. In some cases enclosure walls that are transparent or provide a reflection of the captive reptile may increase the likelihood of attempts to escape. This social stress can be very subtle and not clinically evident to an owner or clinician. Often an owner must be convinced that such stress exists and must be eliminated in order to keep their pets healthier ("No, the iguanas laying on top of each other are not friends!").

-Castration of male iguanas prior to sexual maturity may help to decrease the chance of reproductive related aggression towards people and other pets (Funk, 2001). Clients should be counseled that castration prior to puberty will decrease the development of secondary sexual characteristics including large jowls and crests.

-It has been suggested that sexually mature male iguanas that are showing signs of aggression may have some of the behaviors curtailed by decreasing daylight hours, eliminating exposure to other male animals in the house as well as to female conspecifics, and decreasing environmental

temperatures slightly. Clients should be counseled, however, that aggression is a normal, expected behavior for iguanas, and that these efforts to control behavior can be stressful in the iguana and should not be extreme enough to cause harm to the iguana.

-Defensive aggression in reptiles can represent a safety hazard for your staff if employees are not instructed in proper restraint and handling and educated to be careful not to become complacent about the reptiles ability to inflict injury. When appropriate, nails should be trimmed prior to examination and handling to minimize trauma to staff and the clinician.

-Undertank heaters may be inappropriate for burrowing species that may expose themselves directly to the heat and be more likely to burn themselves.

-Overhandling of more shy species can lead to stress, anorexia and ill health. Species such as chameleons and ball pythons may not be the best choice for owners that wish to handle their reptile pets often.

These examples may seem rudimentary to the practitioner but many clients need to be counseled in order not to make these choices that can be harmful to their reptile pets.

Conclusion

The iguana that sits quietly on the exam table with its head extended, eyes closed and feet planted firmly (assuming it is still able to hold itself up) is usually not "content" despite the owners cooing voice and gentle strokes on the head. This is an iguana that may be zoning out due to the stress of a strange environment riddled with strange sounds, smells and potential predators. This may be an iguana that is too ill to respond with curiosity to a new environment. This may be an iguana that will readily strike if provoked - using teeth, claws and whipping tail to defend itself against predators (i.e. the clinician and staff). This may be an iguana that is closer to death than it would appear and any stressor (handling, diagnostic procedures, even treatment) may prove to be fatal.

Understanding what is normal behavior for each species and learning what is abnormal behavior for reptiles in general will allow the practitioner to better assess the reptile patient, as well as to better address owner's concerns and to educate owners to care for their reptiles in more appropriate ways.

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