Observations of the behavior of Tayras and Grisons

By John H. Kaufmann and Arleen Kaufmann

Eingang des Ms. 15. 2. 1964

The tayra (Eira barbara) and the grison (Galictes canaster) are tropical mustelids found in Central America from Mexico to Panama. Almost nothing is known of their behavior. In 1959 and 1960, we kept two tayras and three grisons in captivity at the Smithsonian Institution's field station on Barro Colorado Island in the Panama Canal Zone. These animals were studied as part of a survey of behavior patterns in certain tropical mustelids and procyonids.

All five animals were obtained from native dealers in the market in Panama City, so that we do not know their exact age nor the precise location where they were caught. Tayras are found in forests throughout the region, and are commonly seen on Barro Colorado itself. Grisons have been seen in several grassland areas near water within the Canal Zone, but are apparently absent on Barro Colorado, which is almost completely forested.

The two tayras, a male and a female, were obtained in January, 1960, when they were not over two months old. Both were hand raised together and remained relatively tame. They were confined in a cage 4 feet by 6 feet by 4 feet until May, when they were transferred to a pen 15 feet by 15 feet by 6 feet, which contained slanting tree trunks for climbing and a shelter box in which both slept. Both tayras were allowed to run loose in the laboratory clearing and nearby forest almost daily for four to five hours, but were confined in their cage each night.

Wild tayras were frequently observed throughout the study.

The first grison, a male approximately one to two months old, was obtained in July, 1959. He was hand raised, very tame, and was allowed free run of our house and the laboratory clearing. This animal contracted an undetermined disease in December, 1959, and died in January, 1960. The other two grisons, both males, were obtained in February, 1960, when they were several months old. These two did not tame, and were confined at first in a cage 4 feet by 6 feet by 4 feet. In May they were transferred to a pen identical to that occupied by the tayras.
In addition to making direct observations, we took black and white, still and motion picture photographs, and recorded vocal patterns on tape. Observations on the two remaining grisons were continued through June, 1960, and on the tayras through January, 1961.

Results

Morphology

Tayras are about the same size as fishers (*Martes pennanti*), which they resemble superficially with their relatively long legs and long tail, the diameter of which is doubled when the hairs are erected. Although both of our tayras were slender, the female was noticeably more so; as they got older the difference became more marked. The male's testes descended when he was approximately six months old. At this time he weighed 10.5 lbs., and the female 9.5 lbs. The male subsequently gained two to three more pounds and became very heavily muscled around the neck and shoulders, while the female remained about the same weight.
Both of our tayras were completely black when we acquired them, except for a white spot on the throat of the female. By June their heads and necks had begun to turn brown. Wild adults observed on Barro Colorado were all black with brown heads, and some had white throat spots. The tayra's black eyes shone blue-green in a light at night, and their feet were one-third webbed.

Grisons are more the size and shape of mink (*Mustela vison*), but they have a striking black and white color pattern. Their legs and tail are short, and the hairs on the tail arranged in two lateral ranks. These hairs usually lay along the vertebrae of our grisons, pointing posteriorly, but could be erected to point straight out to the sides. Our tame grison weighed a maximum of six pounds when in good health. The other two reached nine pounds, but both were overweight. The testes of all three were descended by approximately their fourth month. Dalquest & Roberts (1951) reported that the male and female grison they kept were full grown at four months, when they weighed 3300 g. and 1830 g. respectively (about 7 and 4 pounds). The grisons' feet were three-quarter webbed, and their black eyes shone bright blue.

**Locomotion**

Tayras are agile climbers, equally adept at traveling in trees and on the ground, and wild tayras were frequently seen moving and feeding in the tops of the tallest forest trees. On the ground they walked and trotted with the transverse pattern of foot placement used by most carnivores, but changed to a bouncing gallop at high speeds, in which both forefeet and then both hindfeet were moved together. In grass they occasionally moved with the belly flat on the ground, pushing with their hind legs which extended out behind. On horizontal limbs they ran as on the ground, using the tail as a balancing rod, and ascended and descended vertical trunks head first with the gallop pattern, grasping the trunks alternately with the fore and hind legs. While descending, the hindfeet were turned up and back and the tail was out free behind.

Our grisons were strictly terrestrial. They climbed on furniture and fallen logs, and about three feet up the side of their small cage; but they never climbed trees, or even slanting logs. During the first week after we acquired him, our tame grison repeatedly walked off the tops of tables without hesitation. The grisons walked and ran with the transverse pattern of steps, and never galloped, even during the short bursts of their top speed. When running, their backs were arched; the tayras backs were arched only when they galloped. In grass the grisons occasionally moved in the same manner already described for the tayras. At such times, with their long necks extended and their short legs, the grisons looked almost snake-like. Both grisons and tayras displayed this form of locomotion occasionally on bare cement floors.

**Activity of free-ranging animals**

Certain activities were characteristic of the two tayras and the tame grison when they roamed at will in and around the laboratory clearing, and these may give some hints to the natural activities of these species in the wild.

The tayras roamed freely, exploring the clearing and nearby forest up to 200 yards from their cage. They stayed predominantly in the forest, chasing each other on the ground and on fallen logs, and occasionally climbing trees. Rarely did they stay in the grassy clearing more than a few minutes after they were released. Usually once or twice a day they took short naps in elevated locations, as on the top of a large
aviary, on logs, or in tree crotches. Gaumer (1917) and Cabrera & Yepes (1940) both reported tayras to be chiefly nocturnal and crepuscular, but coatis (Nasua narica), which are strongly diurnal on Barro Colorado, are also reported to be nocturnal in other areas. The tayras drank from the banks of streams, but were always careful never to enter the water. However, Villa (1948) reported seeing a tayra swimming across a pond in pursuit of a brocket (Mazama).

The grison, although having unlimited freedom, ranged far less widely than did the tayras and was less active. He was capable, however, of keeping up with us on walks through the forest of one to two miles. He explored the bare ground and high grass in the clearing, but never went more than 50 yards from our house, and only that far to visit two burrows which he had discovered. One of the burrows was under a pile of old lumber at the edge of the clearing, and the other was under the roots of a tree ten feet inside the edge of the forest. These burrows were apparently unoccupied, and may have been old agouti (Dasyprocta) burrows. Usually when the grison left the house he went straight to one of the burrows, entered, and apparently slept for four or five hours during the middle of the day. On days when he did not go out he also slept during the middle of the day, in dark corners behind and under bookcases and file cabinets, but was very active in the early morning and late afternoon. The two caged grisons also tended to sleep during the hot midday hours. Dalquest & Roberts' grisons habitually followed walls rather than cross open floors, and examined any narrow passage that resembled a burrow.

The grison waded frequently in the streams, but avoided deep water and never swam voluntarily or got his back wet. While wading he often picked up in his mouth leaves and twigs from the stream bottom, carried them to the bank, and deposited them there apparently at random. He paid no further attention to them, and was never seen to pick up similar objects on land. The grisons kept by Dalquest both swam skillfully and voluntarily in a large tank, remaining submerged up to 30 seconds.

Both of the tayras and all three grisons habitually splashed all of the water out of the large pans in their cages and in the house, by standing or lying in front of the pan and splashing toward themselves with their forepaws until the pan was empty. None of our procyonids ever displayed this habit.

Exploratory behavior

Our tayras and grisons shared several exploratory patterns. When traveling flat in the tall grass they raised their heads up high, stretching out their necks (in the grison, to a surprising length), but not lifting their bodies clear of the ground. At such times, and also during frequent pauses while walking or running, they bobbed their heads up and down and from side to side, sniffing and peering about. When investigating an unfamiliar object lying near them, they stretched out their bodies low to the ground, taut and straight, with the hind legs extended posteriorly, ready to pull back quickly at the slightest disturbance.

One pattern was displayed only by the tayras: they frequently investigated by standing upright on their hind legs, with their fore legs hanging limply at their sides. This pattern is shared with other mustelids, the procyonids, and many other mammals.

Feeding behavior

The captive tayras were fed raw eggs and milk for the first few weeks. Then they received canned dog and cat food, and hamburger, as did the three grisons from the
start. The tayras also ate bananas. Wild tayras were frequently seen eating the fruits from Cecropia trees (Cecropia mexicana), and were also seen eating mamey fruits (Calocarpum mammosum). Although no predation by wild tayras was observed, the captives readily killed and ate small vertebrates which we presented to them. An encounter with a three foot colubrid was particularly interesting, since it is unlikely that these tayras had had previous experience with snakes. On seeing the snake the female Snorted, then approached, stretched tautly toward it, and jumped back when it struck. She approached it repeatedly, jumping back without being touched at each strike. After ten minutes of this she darted in, grabbed the snake’s head in her teeth and killed it by biting the head. During the whole performance she kept the male away with rumbling Snarls, but he succeeded in stealing part of the dead snake from her, and between them they ate all of it.

Cabrera & Yepes reported that tayras kill mammals and birds with a single bite in the head, and that they also like honey. Fruit eating by tayras has been reported by Enders (1935), Villa, and Alvarez del Toro (1952), while Gaumer and Alvarez del Toro also reported predation by tayras on birds and mammals.

The tame grison attacked several animals which he located himself: several cockroaches (1½ to 2 inches), a 2 inch grasshopper, a tarantula (Eurypelma), a 6 inch Bufo marinus (taken from him by force), and a spiny rat (Proechimys semispinosus). All but the Bufo were killed, but only the spiny rat was eaten. The Bufo’s head was bitten, and the spiny rat was killed by a bite at the base of the neck. This grison also sniffed excitedly and dug briefly at a burrow in a stream bank from which a spiny rat ran when the grison left. He frequently carried his food to one of his burrows or indoor retreats before eating it.

Dalquest’s grisons killed mice with one bite at the back of the neck or shoulder, and this technique improved with practice. They also killed and ate English sparrows and a nearly grown pigeon, and one of them killed and ate specimens of Rana catesbiana and Rana pipiens. Although all parts of the prey were eaten, no teeth or bones were found in the scats; this was also true of our grisons. Both our grisons and those kept by Dalquest ate bananas.

The tayras and grisons all used their forepaws to hold their food, but not to manipulate it in the manner of the procyonids.

Defecation and urination

Both species squatted, raised their tails (arched by the tayras, straight up or curled sideways by the grisons), and bobbed them up and down while defecating and urinating. Afterwards, the base of the tail was sometimes brushed lightly over the feces, and the anus was dragged briefly over the ground.

The male tayra backed up about two feet before defecating during the first few weeks after arrival, but did not go into a corner, and neither tayra showed this behavior later. They squatted anywhere they happened to be when running free, but showed a slight tendency to defecate along walls in the house and cages.

The tame grison invariably backed into a corner — the tighter and darker the better — when defecating and urinating indoors; one corner was selected in each room and no other spots were ever used despite our efforts to train him to use a different place. He was never seen to defecate in the open out of doors, but could have done so in his burrows. The other two grisons always defecated in the same corner of their cage or pen. Dalquest’s grisons also backed into one corner of their cage to defecate, holding their tails horizontal, up 30°, or curled sideways, with the posterior third of the body arched.
Scent marking

The tame grison raised his tail and brushed it against familiar objects (walls, furniture, our legs, etc.) as he passed, and his tail was stained in the midline with a greenish-yellow secretion. Grisons have anal musk glands, as do tayras, and the secretion on the tail was probably from this source. As the tayras got older, they occasionally marked objects by rubbing over them briefly with the anus.

Grooming

Our tayras nibbled and licked themselves and used their forepaws (simultaneously where possible) and hindpaws to scratch. They also rubbed their heads, chins, and backs on logs as they rolled on them. Low intensity clicking vocalizations often accompanied the grooming. On two occasions the captives lay head to head, and the female licked the male's ears and scratched and nibbled at his head, using her forepaws to manipulate it. The male was passive and did not return the grooming. We have also observed head to head social grooming between two captive otters (*Lutra canadensis*), and between various pairs of kinkajous (*Potos flavus*). Coatis (*Nasua narica*) and raccoons (*Procyon lotor, P. cancrivorus*) begin mutual grooming in a head to tail position, but sometimes work forward to a head to head position, especially in excited grooming between adult male and female coatis. Neither our grisons nor our tayras solicited grooming from their conspecifics, or from us. Coatis, however, which do solicit grooming from each other in the wild (KAUFMANN, 1962), commonly show this behavior in captivity and even showed it toward us in appropriate situations.

Our grisons occasionally scratched themselves with their hind feet, but did no social grooming, and DALQUEST & ROBERTS apparently observed no social grooming by their grisons.

Sexual behavior

At 8 p.m. on January 3, 1959, in the forest on Barro Colorado, MARTIN MOYNIHAN and the senior author were attracted by a loud commotion consisting of five distinct vocalizations: Snorts, high and low pitched Clicking, Snarls (see Hostile behavior), and a high-pitched Yowling similar to that of a male cat. When we arrived on the scene we found three wild tayras, two males and a female. The female was inside of a large hollow tree and the males were running around outside. They continued to do so, despite our presence, until the female came out of the tree and ran off. This may have been a sexual encounter; the first four vocalizations belong in the hostile series, but the Yowling was not heard in any other context. Apparently tayras do at least some of their mating at night, but so do coatis, which are strongly diurnal otherwise (KAUFMANN, 1962).

GAUMER reported that female tayras make nests in tree forks for their two young, which accompany their mother on foraging trips when they are two months old. CABRERA & YEPES reported a litter size of three to four tayras, and two to four for another species of grison.

Hostile behavior

We are using „Hostile behavior“ here as an arbitrary term to include all of the socially negative behavior that is usually called „distress“, „frustration“, „alarm“, „aggressive-
ness“, „agonistic behavior“, etc. Most of the hostile behavior of our animals was expressed through vocal signals; signal postures, so commonly used by some other mammals in similar situations, were almost completely lacking.

**Juvenile distress:** Many of the mammals whose vocalizations have been studied have vocal signals which indicate a generalized state of „juvenile distress“. A single call, or variations of a basic call, is used in a wide variety of situations in response to many different stimuli — whenever the young animal is „uncomfortable“, „frustrated“, or thwarted in any way. In older animals these rather unspecific calls are replaced by more specific ones elicited by more obvious stimuli.

The B—a—a—a call in the tayra seems to be such a call. This is a low pitched, segmented call, similar to the „baaa“ of a sheep, made with the mouth open. It was heard frequently when one of our tayras was locked alone in a cage. Juvenile distress in the grison was indicated by the nasal Anh-anh call. Usually only two syllables were given, but occasionally long strings of them were heard. This call was typically given when, for example, the tame young grison was separated from us. Individuals of both species used these calls far less frequently as they got older.

**Alarm:** Both the tayras and grisons, when suddenly alarmed, Snorted and jumped back, and in extreme cases emitted a strong smelling musk from their anal glands. They also fluffed out the hairs on their tails. DALQUEST & ROBERTS reported that their female grison squirted musk at cats and chickens until three months old, but that their males never had any musky odor. All three of our males continued to use musk as long as we had them.

Both wild and captive tayras typically leaped onto a nearby tree trunk when the source of alarm was unknown (as a sudden sound), and then retreated either on the ground or through the tree tops (rarely) when the source of alarm had been located. Coatis showed this same reaction in similar situations.

Our tayras and grisons assumed an apparently submissive posture, with the whole ventral surface, including the chin, flat on the ground, when we struck them after they attacked us. This posture is apparently what DALQUEST & ROBERTS called the „fighting posture“, as exhibited by their female in disputes with the male. She put her chin and chest on the floor, arched the posterior part of her body, raised her tail, and spread her legs and toes.

**Aggression:** In our observations of these mustelids (and also of the procyonids we studied), the different intensities of aggression seemed to be expressed by a series of vocal signals. As the intensity of aggression increased, the signals replaced each other in the following predictable sequences.

The tayras made a rapid series of Clicking noises in aggressive situations. In mildly aggressive situations the clicks sounded like the loud ticking of a clock, and were given at a rate of about three per second. As the intensity of aggression rose the clicks became slower and lower in pitch. The highest intensity of aggression was expressed by a low pitched rumbling Snarl („grrr“) in which individual syllables could not be separated by ear. This sound, made with the mouth closed, but the lips pulled back exposing the teeth, was the last call in the series before actual attack. This complete series of calls was heard from wild tayras on one occasion (see Sexual behavior), and parts of it at various other times.

The grisons used a series of motor-like sounds in mildly aggressive situations. The lowest intensity of aggression was expressed by a sound very similar to that of a small gasoline motor at slow speed. As the intensity increased, this Low Motor graded into a High Motor, in which the syllables were louder, higher in pitch, and less rapid. The High Motor sounded much like a series of short, high pitched Barks. As the intensity continued to rise the signal changed to a single, sharp, high pitched Bark very similar to the "hydrogen bark" given off when a small amount of hydrogen is ignited.
While giving High Motor sounds and Barks the grisons held their tails in a stiff "S" curve. The highest intensity of aggression was expressed by a loud, shrill Scream, made with the mouth open and the teeth bared, which immediately preceded and accompanied actual attack.

Dalquest & Roberts described three vocal patterns given by their grisons. The first they called a "purr" and reported that it was given only by the "more affectionate" female when she was handled. From their description of the sound we believe it to be a Low Motor, indicating mild hostility. The "panting" sounds made by their male were apparently a more intense Motor sound, indicating a higher level of hostility, and the "squeal" is plainly what we have called a Scream. Although our grisons used this sound only when actually attacking, Dalquest's grisons also used it when playing with inanimate objects, and with each other. At such times it was less shrill and loud than during fights.

In any given aggressive encounter of either species a variety of vocal signals may be used, their relative frequency of use depending on the prevailing intensities of aggression which they represent. For example, the grison, in a mildly aggressive situation, may use both Low Motors and High Motors. As its intensity of aggression rises, the Low Motors may drop out and the predominant sounds are High Motors and Barks. Besides the signals in the aggressive series, alarm Snorts may also be used. These Snorts may be interspersed anywhere in the aggressive series, depending on the level of alarm, which apparently has no consistent relation to the intensity of aggression, but varies in intensity according to the context of the particular encounter. On three occasions the tayras switched their tails rapidly back and forth in situations apparently involving a combination of alarm and aggression.

During "play fights" with each other Dalquest's grisons seized a fold of skin, usually on the other's neck, in their teeth and shook hard. Our tame grison did the same thing with an old stuffed sock we gave him, but the other two never fought, even in play.

**Discussion**

Since we are primarily interested in the natural behavior of these species in the wild, information gained from studies of captive animals is of limited value. We found significant quantitative and qualitative differences in several types of behavior (e.g. feeding behavior, and social, including sexual, behavior) observed in wild and captive coatis (Kaufmann & Kaufmann, 1963). Some behavior observed only in caged mustelids (e.g. water splashing, and certain vocalizations we have not discussed here) could not be interpreted, but the significance of other behavior was clarified by observing the same individuals during their periods of freedom.

Certain tentative conclusions can be drawn from our results about the behavior of these species in the wild. Tayras seem to be relatively wide ranging forest dwellers with marked arboreal tendencies; they have no known affinity for water despite their partially webbed feet. Grisons are apparently relatively localized inhabitants of open areas near water, with strongly terrestrial (as opposed to arboreal) habits. Gaumer, Alvarez del Toro, and Cabrera & Yepes all reported that tayras are found in forested areas, and the latter two sources also reported their presence in grassy fields. Grisons were reported by Leopold (1959) to live in humid forests, cane fields, and other open areas; by Alvarez del Toro to live near rivers and in wet lowlands; and by Cabrera & Yepes (writing of the South American species) to frequent forests, open fields, and esteros.

These conclusions are supported by several types of evidence. Morphologically, tayras are relatively slender, long legged, agile animals, with a long tail well adapted
for use as a balancing rod; grisons, on the other hand, are relatively chunky animals with short legs and tail and more completely webbed feet, but a long neck which is valuable for seeing above grass. In their daily activities, both wild and tame tayras have shown themselves to be agile and frequent climbers. Wild tayras may be even more arboreal than our captives were when released, since even some hand raised kinkajous, which are apparently completely arboreal in the wild, preferred the ground to trees when they had a choice. The tame tayras preferred elevated sleeping places both in their cages and when running free. The grisons, however, always rested on the ground in dark corners indoors, and in burrows exclusively when released. The grisons climbed on the sides of their small cages, but so will most mammals when greatly restricted. Our grisons never climbed in their larger pen, or when running free. Our youngest grison showed no respect for heights, while captive infant coatis, which spend their first five to six weeks in tree nests in the wild, moved around very little and avoided falling from the tops of objects. The tayras defecated anywhere when free and only localized their feces to a small degree when caged. In this their behavior resembled that of coatis, another mammal with partly arboreal tendencies. The grisons, on the other hand, were highly localized in their choice of defecation sites, which one would expect of an animal which lived in burrows and had some need of sanitary habits.

One should not attach undue significance to the list of species which may be chased by predatory animals. Thus, our tame grison on three occasions chased wild, adult, male coatis. Many animals will run from any animal which runs toward them, or toward any animal which runs from them. We have seen wild coatis chase adult agoutis and armadillos and then turn aside after coming up to them, tame coatis chase large dogs and deer, wild capuchin monkeys chase coatis, tame tayras chase wild capuchin monkeys, and vice versa. It is unlikely that any of these species normally prey on the pursued animals. Perhaps the incident reported by Villa in which a tayra chased a brocket (Mazama) was of a similar nature.

Our observations do not indicate that either species is very sociable, although our information on this point, especially for the grison, is very poor. Wild tayras were usually seen singly; once a female and a half grown male (her son?) were seen together, and once three adults were seen together in an apparent breeding situation marked by strong hostility. Leopold saw four tayras hunting together and believed they might have been a female and her grown young. Alston mentioned reports of troups of 15—20 tayras hunting together, but Cabrera & Yepes claim that similar reports by Hudson are erroneous, and that tayras are usually found alone or in pairs. The same authors reported that the South American grisons also hunt singly or in pairs, but mention a report by Hudson of a “dance” performed by a dozen grisons. What Hudson actually witnessed is not clear. Social grooming was observed twice between our captive tayras, but no social grooming was observed in the male grisons.

Acknowledgements

This study was conducted at the Smithsonian Institution's research station on Barro Colorado Island, and was completed while the senior author was employed as a research assistant to Dr. Martin H. Moynihan, under NSF research grant no. 10944, April—July, 1960. Dr. Moynihan, resident director of the Canal Zone Biological Area, provided helpful advice during the study and critically read the manuscript. The excellent drawings were made by Gene M. Christman, from photographs of animals used in this study.
Observations of the behavior of Tayras and Grisons

Summary

Observations of wild free-ranging tayras (*Eira barbara*) and of captive tayras and grisons (*Galictes canaster*) were made on Barro Colorado Island, Panama. The tayras ranged widely through the forest and climbed trees frequently and agilely, while the grisons were strictly terrestrial and spent much time in burrows and in grassy areas. Both species were chiefly diurnal; the tayras were more consistently active, while the grisons tended to be more inactive during the middle of the day. Both tayras and grisons stretched their necks vertically, with the body flat on the ground, when exploring in tall grass, but only the tayras investigated by standing upright on their hind legs. Both species were willing and able to handle vertebrate prey; the tayras also ate much fruit. The tayras did not localize their feces, but the grisons defecated in tight corners, and almost always in the same place. Both species marked objects with anal musk. Neither species seemed to be very sociable. Both species had characteristic hostile displays, chiefly vocalizations. The alarm signals and aggressive vocal series had several points of similarity between the two species.

Zusammenfassung


References


Authors address: Prof. John H. Kaufmann and Arleen Kaufmann, Department of Biology, University of Florida, Gainesville, USA