



Communications specialists in wildlife
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Asiatic Raccoon Fact Sheet May 2008

A recent controversy has emerged regarding the taxonomy of the Asiatic Raccoon, *Nyctereutes procyonoides*, (also known as the Finn Raccoon, Raccoon Dog and Tanuki).

The Asiatic Raccoon has been purposely mis-identified by some groups as the same species as the domestic dog (*Canis lupus familiaris*) in order to eliminate its use in the international and domestic fur trade through restrictive legislation or regulation. However, there is no confusion within the scientific community; ***the Asiatic Raccoon and domestic dog are two distinct species.***

Both species belong to the *Canidae* family, along with more than 30 other recognized species^{1 2}. However, Asiatic Raccoons and domestic dogs are only distantly related^{3 4}.

The *Canidae* family (also called canids) contains more than 30 species of dogs, wolves, foxes, coyotes, dingoes, jackals, African wild dogs, and two species of primitive canids⁵. The Asiatic Raccoon is one of the primitive species contained in the *Canidae* family. Evidence suggests that *Nyctereutes procyonoides* branched off of the *Canidae* family tree to form its own single-genus, single-species branch approximately seven to ten million years ago⁶.

The domestic dog belongs to the “true dog” (*Canini*) branch of the *Canidae* family and is a direct descendent of the Gray Wolf (*Canis lupus lupus*). Some scientists classify the domestic dog as its own distinct species (*Canis familiaris*), while others classify it as a sub-species of the Gray Wolf, and classify it as *Canis lupus familiaris*⁷. Wolves and domestic dogs can readily inter-breed, which lends strong support to the sub-species classification.

Genetic evidence implies that the domestic dog branched from the Gray wolf line approximately 135,000 years ago⁸. However, morphological distinctions between the two species (or sub-species) did not appear until 10,000 to 15,000 years ago. These morphological distinctions came about concurrent with the development of a more sedentary human agricultural society that may have imposed the beginnings of new selective breeding regimes on dogs⁹.

In any case, the evolutionary relationship between these two distinct species, the Asiatic Raccoon (*Nyctereutes procyonoides*) and domestic dog (*Canis lupus familiaris*), is distant at best^{10 11}.

Taxonomic Classification:

Asiatic raccoon: Order: *Carnivora*, Family *Canidae*, Genus: *Nyctereutes*, Species: *Nyctereutes procyonoides*.

Six recognized subspecies¹²: *N. p. procyonoides* (China and northern Indochina), *N. p. albus* (northern Japan), *N. p. koreensis* (Korean peninsula), *N. p. orestes* (south-west China), *N. p. ussuriensis* (southern Russia, eastern China; introduced into western Russia, Baltic region and Europe), *N. p. viverrinus* (southern Japan).

Domestic dog: Order: *Carnivora*, Family *Canidae*, Genus: *Canis*, Species: *Canis lupus*, Subspecies: *Canis lupus familiaris*.

More than 150 recognized breeds.

Common Name(s):

The scientific community has adopted a “binomial nomenclature” system that allows people throughout the world to communicate unambiguously about a specific species. Inherently, common names cause confusion and are often misused or confused. For example, in North America, most people believe the “buffalo” once roamed the Great Plains. However, this is scientifically incorrect. In North America, there are *Bison*; true buffaloes belong to the genus *Bubalus*, which are generally found India, Southeast Asia and Africa – not North America.

The Asiatic Raccoon has at least 24 different common names that are used throughout its range depending on the country and language¹³. In English, it is commonly referred to as either the Asiatic Raccoon or Raccoon Dog. The name Raccoon Dog appears to be used more frequently. However, in the US fur trade, it is required by Federal Trade Commission regulations to be labelled as Asiatic Raccoon¹⁴. This Fact Sheet uses the term Asiatic Raccoon whenever possible because of the Federal Trade Commission’s regulations. Generally, when other terms are used it is because the original author used them in their text.

Unfortunately, Asiatic Raccoon fur is sometimes mis-labelled. This mis-labelling is most often as “raccoon,” especially when it is imported from China or other non-English speaking countries. Whenever mis-labelling occurs, it is generally believed to be a result from confusion caused by the use of common names and language difficulties rather than confusion about the product. The fur industry has a long-standing, on-going educational effort underway to improve the labelling of all fur products¹⁵.

The “raccoon” portion of the common name “Asiatic Raccoon” is derived from a similar, dark facial-mask that both the Asiatic Raccoon and the North American Raccoon (*Procyon lotor*¹⁶) possess. However, these two species are not related.

Additional Differences:

There are numerous additional genetic, phenotypic and behavioral differences between Asiatic Raccoons and domestic dogs. These are summarized in the chart below, as well as discussed in greater detail later in this fact sheet. References are provided in the text.

Additional differences between Asiatic Raccoons and Domestic Dogs

Trait	Asiatic Raccoon	Domestic Dog
Chromosomes	Subspecies have different chromosome numbers: one has 54 and the other 38. Both have additional supernumary chromosomes.	Generally have 78 chromosomes.
Teeth	Dentition contains 42 teeth in adults. Mandible is more robust and molars are more flattened to grind vegetative matter; carnassial teeth are weaker.	Dentition contains 42 teeth in adults. Generally, carnassial teeth are robust to slice, tear and masticate flesh.
Reproduction	Generally considered a prolific canid. Average litter size is 5 to 7 pups. Up 19 pups have been reported.	Liter sizes highly variable depending on breed.
Anatomical conformation	Round plump body-type with short legs.	Highly variable depending on breed.
Fur	Generally yellow-brown with dark facial mask. Uniformly thick under fur in winter.	Highly variable depending on breed. Often lacks distinguishable under fur.
Hibernates	Is the only canid that hibernates. May become active during winter thaws.	Remains active all winter. Does not hibernate.
Tree Climbing	Readily climbs trees. Gray fox is the only other canid that can climb trees.	Cannot climb trees.
Barking	Does not bark. Vocalizations are high-pitched whines and mews.	Readily barks during a variety of situations.

Trait	Asiatic Raccoon	Domestic Dog
Tail wagging	Does not wag tail as submissive gesture or greeting.	Frequently wags tail as greeting, as submissive behavior, or on other occasions.
Diet	True omnivore, in many areas it is highly dependent on berry, grain and fruit crops.	Strongly carnivorous. Process foods may contain a variety of vegetable matter, but generally prefers meat products.
Gait	Described as “not a swift canid” and “clumsy.”	Highly variable depending on breed. Often very swift runner.

Chromosomal Differences:

The more common mainland sub-species of Asiatic Raccoon, (*N. p. procyonoides*, *N. p. korensis*, *N. p. orestes*, *N. p. ussuriensis*) have 54 chromosomes ($2n = 54 + Bs$) while the Japan sub-species (*N. p. viverrinus* and *N. p. albus*) possesses 38 chromosomes ($2n = 38 + Bs$)^{17 18}. This variation is likely due to the genetic isolation of the Japanese populations. The sub-species most common in captive breeding facilities are *N. p. ussuriensis* and *N. p. procyonoides*.

Domestic dogs have high number of diploid chromosomes ($2n = 78$)^{19 20}.

Teeth:

Generally, similar dentition is taxonomic trait for all members of the *Canidae* family. All adult canids have 42 teeth. However, the form and specific function of specific teeth can vary among different species. The teeth in Asiatic Raccoons are small in comparison with other canids, the carnassial blades are reduced in size and the molars are relative large^{21 22}. These adaptations are likely the result of a more omnivorous diet^{23 24} than other canids.

Adult domestic dogs have 42 teeth. However, their form and function are very similar to those of Grey Wolves and largely adapted to efficiently process a meat diet.

Reproduction:

Asiatic Raccoons are monestrous, coming into breeding condition only during late winter or early spring²⁵. Domestic dogs are diestrous, being able to breed year-round at approximate six-month intervals²⁶.

The Asiatic Raccoon has an extremely high reproductive capacity compared to other canids of corresponding size²⁷. The average litter size of similarly sized canids is four to six; while the average litter sizes of raccoon dogs studied in Finland were more than 8²⁸. Other researchers reported litter sizes of five to seven in the raccoon dog²⁹. However, productivity appears to be a function of severity of the winter and abundance of food supplies the preceding fall^{30 31}.

Anatomical Conformation:

The Asiatic Raccoon is about the size of a small fox averaging 2.5 to 8.4 kg for all sub-species. Weights can vary considerably between late fall and spring, especially for lactating females. Captive breed animals tend to be larger than wild specimens of the same sub-species. Adults have a total length of approximately 560 mm, of which approximately 25% is their tail. Adults average about 380 mm at the shoulder³². In the fall, the animals are generally very fat and have thick fur, giving an expression of a round animal with short and thin legs. The black facial mask, small rounded ears and pointed muzzle are typical for the species. Hair is long on cheeks. The body color varies from yellow to gray or reddish. There are black hairs on the back and shoulders and also dorsally on the tail. Legs, feet and chest are dark. The thick under fur is gray or reddish³³. The face of the Asiatic Raccoon resembles that of the North American raccoon: a black mask covers the eyes and extends beneath the muzzle, but that is the only physical similarity between these two, non-related species³⁴.

Generalizing about the physical appearance of the domestic dog is extremely difficult. Selective and non-selective breeding has resulted in more than 150 recognized breeds³⁵ and countless mixes that vary considerably in size, conformation, coat type and colour^{36 37}.

Fur:

In cold climates, the Asiatic Raccoon develops a heavy thick winter coat of thick and soft under fur and long guard hairs³⁸. The length of hairs in various parts of the body differs greatly. The hairs are three times as long on the back as on the belly. The average winter coat contains seven different hair length-zones. The length of the guard hairs varies from 95 to 107 mm. The thickness of the under fur averages 33-78 mm. The guard hairs are slightly wavy, oval in section in the granna (distal) section, and round in the main section. The pile hairs have a wavy shaft. The hairs in the skin grow in tufts and groups. The average hair group contains one guard hair, 2-3 pile hairs and 65-68 fur hairs. There are about 7200–8500 hairs per 1 cm² in December when the fur is fully grown and thickest. The thickness of guard hair is 116-156 μ³⁹.

The dimensions, shape, denseness and thickness of the hairs, as well as the quality of the fur can vary widely in domestic dogs because of the variety of breeds and mixes⁴¹. However, it is possible to make comparisons between the fur of Finn Raccoon and the fur of some individual dog breeds. For example, Rekila (2007) described the skin of the

collie as being covered with coarse hairs, of which the longest are 35–70 mm long. The fine under-fur is present but a separate layer is not distinguishable. The intermediate fibres are 50–70 µm in diameter and have ellipsoidal cross-sectional outline. The guard hairs are ellipsoid in cross-section with a diameter of 80–140 µm⁴².

Behavioural Differences:

Asiatic Raccoons are behaviourally unique among the canids in several ways. Probably the most important is that they are the only canid that stores fat in the fall and hibernates during colder portions of winter^{43 44 45}. Hibernation allows them live in areas where the average mean temperature is a little above zero and the duration of snow cover is about 175 days⁴⁶. Hibernation also prevents them from having to compete directly with other meso-carnivores like the red fox^{47 48} during the winter when resources are scarce.

The Asiatic Raccoon is only one of two canids that can climb trees. They share this ability with the Gray Fox, *Urocyon cinereoargenteus*. Domestic dogs lack this ability. This ability is likely directly related to their omnivorous food habits, where fruits and berries are extremely important food items⁴⁹.

In addition, three other behavioural traits make the Asiatic Raccoon unique among canids. First, they regularly participate in social grooming. This trait is shared with only one other canid: the Bat-eared Fox, *Otocyon megalotis*^{50 51}. Second, their vocalizations are limited to high-pitched whines and mewing sounds; they cannot bark^{52 53}. And lastly, they do not engage in tail-wagging as a greeting or submissive posture⁵⁴.

Domestic dogs *do not* participate in social grooming, frequently engage in barking in response to a variety of stimuli and frequently engage in tail-wagging.

The gait of the Asiatic Raccoon, because of its short legs, is described as “not swift⁵⁵” or “clumsy⁵⁶.” Depending on the breed, domestic dogs are generally regarded as agile and swift runners.

Diet:

Asiatic Raccoons are true omnivores and opportunistic feeders, often relying heavily on fruits, nuts, grains, berries, seeds and roots^{57 58 59 60}. The importance of plant material in their diets is confirmed by the determination that the abundance of wild berries is a dominant factor in their abundance and productivity in parts of Finland⁶¹. This food source allows the Asiatic Raccoon to accumulate large fat reserves in the autumn and spend part of the winter dormant⁶². Accumulating this fat reserve also allows females to emerge from hibernation in the spring in good condition, which in turn, supports high reproductive success^{63 64}.

Asiatic Raccoon also consume a variety of small mammals, carrion, eggs and occasionally birds^{66 67 68}. Asiatic Raccoons also are skilled at capturing fish, amphibians, crabs and insects^{69 70}.

Status in the Wild:

Wild population of Asiatic Raccoons are stable or increasing in all parts of their range⁷¹. They are considered as an introduced/invasive species in Belgium⁷² and other areas where they have been introduced. Unfortunately, wild population estimations are not readily available. However, the population in portions of Siberia and Russian Far-east were estimated to be 110,000 – 130,000 and 18,000 respectively. The populations in both areas are considered to be stable⁷³.

The World Conservation Union's (IUCN) most recent Red List of Threatened Species (1996) lists the Asiatic Raccoon (all sub-species) as being "Lower Risk/Least Concern"^{74 75}. They are not listed on any CITES (Convention on International Trade in Endangered Fauna and Flora) Appendices because of their abundance both in the wild and in captive breeding facilities⁷⁶. No special conservation measures have been developed⁷⁷.

Trade:

Products made from Asiatic Raccoon are important items in the international fur trade. Pelts are obtained from both wild harvested animals as well as captive-bred, ranch raised animals⁷⁸. They were introduced into western Russia and Europe because of their desirability as a fur bearing animal⁷⁹.

Because no CITES permits are required, it is difficult to obtain reliable, verifiable statistics on the volume of trade. This is exacerbated by the complexity of the international fur trade, where a single pelt may be exported and imported many times through several different countries, as it processed and manufactured into different products.

Unofficial industry sources indicate that Finland, Russia and China have well established captive-bred operations for this species. Approximately 100 fur farms are in operation in Finland which produces approximately 160,000 pelts per year⁸⁰. The number of fur farms in China is reportedly higher, but the information is unverified.

Fur farms operating in European Union countries are well regulated, and operate according to rigorous government standards for animal welfare⁸¹. Animal husbandry standards of care are in place in Russia and required cage sizes are reported to be higher than European standards⁸². The levels of care in China are reportedly highly variable, with larger operations operating at higher levels. The standards on family run, smaller fur farms generally lag behind. However, the Chinese Fur Commission asserts that a regulatory framework now exists to improve animal welfare standards^{83 84}.

Conclusion:

While the Asiatic Raccoon is a member of the *Canidae* family, it is one of the more primitive members of the group. Genetically, it separated from the “true dog” evolutionary line between seven and ten million years ago. It is not considered to be part of the “true dog” group of species.

Its evolutionary line is a single Genus with a single species. It is only distantly related to any other species.

Behaviourally, the Asiatic Raccoon has numerous additional traits that separate it from domestic dogs. Chief among these are its ability to hibernate and climb trees. In addition, it frequently participates in social grooming and it cannot bark. It also does not wag its tail.

While it has physical (facial mask and well-furred body) and behavioural traits (climbing trees, hibernation and is skilled at catching fish) similar to the North American Raccoon, it is not related to that species.

In the final analysis, it is a failure of our language that has labelled *Nyctereutes procyonoides* as the “Asiatic Raccoon” or “Raccoon Dog.” It is neither a raccoon nor a dog, but rather, a unique species within a unique genus and should not be confused with any other species.

End Notes:

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¹¹ Wayne & Ostrander. op. cit.

¹² Some experts only recognize 5 sub-species.

¹³ Sillero-Zubiri, op. cit.

¹⁴ 16CFR301.0 (GPO Title 16. Chapter 1. Part 301.0. pp. 222-224)

¹⁵ See: www.iftf.com/iftf_5_3_2.php

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About the Author:

Robert Byrne is a wildlife biologist with more than 30 years experience working in the field of wildlife conservation. During this time he has worked for state wildlife agencies, and domestic and international non-government conservation organizations. His duties have included wildlife research, law enforcement, program development, wildlife education, media relations, and policy development. He has conducted or supervised numerous programmatic reviews or reviews of scientific literature. He is a 1973 graduate of West Virginia University. He is currently employed by D. J Case & Associates, a conservation communications firm that specializes in advancing conservation initiatives through improved communications. He can be reached at bob@djcase.com.