

Cerdocyon thous. By Annalisa Berta

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***Cerdocyon* Hamilton Smith, 1839**

Cerdocyon Hamilton Smith, 1839:259. Type species *Canis azarae* Wied by subsequent designation (Thomas, 1914:351).
Carcinocyon Allen, 1905:153. Type species *Canis thous* L. by original designation.

CONTEXT AND CONTENT. Order Carnivora, Family Canidae. The genus *Cerdocyon* includes one living species (Fig. 1).

***Cerdocyon thous* Hamilton Smith, 1839**

Crab-eating Fox

- Canis thous* Linnaeus, 1766:60. Type locality Surinam.
Viverra cancrivorus Brongniart, 1792:115. Type locality not known to author; paper not seen.
Canis azarae Wied, 1824:text to pl. 23. Type locality Bahia, Brazil.
Cerdocyon guaraxa Hamilton Smith, 1839:262. Type locality northern Brazil.
Canis melampus Wagner, 1841:pl. 92, E. Type locality Matto Grosso, Brazil.
Canis brachyteles Blainville, 1843:30. Type locality Cayenne, French Guiana.
Canis robustior Lund, 1843:33. Type locality Lagoa Santa Caves, Brazil.
Canis melanostomus Wagner, 1843:358. Type locality not known to author; paper not seen.
Canis entrerianus Burmeister, 1861:400. Type locality Paraná, Argentina.
Canis rudis Günther, 1879:316. Type locality Demerara, British Guiana.
Urocyon aquilus Bangs, 1898:93. Type locality Santa Marta, Colombia.
Lycalopex vetulus Studer, 1905:2 (not Lund, 1842). Type locality Marajó Island, Brazil.
Cerdocyon mimax Thomas, 1914:355. Type locality Chapada, Matto Grosso, Brazil.
Cerdocyon apollinaris Thomas, 1918:371. Type locality Choachi, Colombia.
Cerdocyon tucumanus Thomas, 1921:382. Type locality Vipos, Argentina.

CONTEXT AND CONTENT. Context given above in generic account. Five subspecies of *C. thous* are recognized as follows (Langguth, 1969).

- C. t. aquilus* (Bangs, 1898:93), see above (*apollinaris* Thomas a synonym).
C. t. azarae (Wied, 1824), see above (*guaraxa* Hamilton Smith, *brachyteles* Blainville, *melanostomus* Wagner, *angulensis* Thomas, and *robustior* Lund are synonyms).
C. t. entrerianus (Burmeister, 1861:400), see above (*riograndensis* Ihering, *mimax* Thomas, *fronto* Lönnberg, *tucumanus* Thomas, *jucundus* Thomas, *fulvogriseus* Zukowsky, and *melampus* Wagner are synonyms).
C. t. germanus Allen, 1923:55. Type locality savanna of Bogota, Colombia.
C. t. thous (Linnaeus, 1766:60), see above (*cancrivorus* Brongniart, *rudis* Günther, *guaraxa* Hamilton Smith, *savannarum* Thomas, *vetulus* Studer, and *lunaris* Thomas are synonyms).

DIAGNOSIS. Because the genus is monotypic, the following diagnostic characters apply to genus and species: skull with a relatively short muzzle narrowing anteriorly (Fig. 2); sagittal area flattened and lyrifform, its outer boundaries usually heavily ribbed; forehead convex owing to development of a large frontal sinus that does not penetrate the postorbital process; palatine shorter than toothrow.

The dental formula is $i\ 3/3, c\ 1/1, p\ 4/4, m\ 3/3$, total 44. Canines are small relative to cheekteeth. Slender, attenuate premolars are separated by diastemata. Carnassials are small relative to molars, their lengths always less than the combined lengths of M^{1-2} . Protocone of P^4 is small, has a well-rounded anterobuccal border, and is oriented anterolingually. Upper molars are very broad for their lengths with strong cingula developed. Large hypocones are present (Fig. 2).

Mandible has subangular lobe (sensu Huxley, 1880) developed. Mandibular condyle is above level of alveolar border and angular process has pterygoid fossa expanded (Type D of Gaspard, 1964, fig. 24). Coronoid process is anteroposteriorly broad and dorsoventrally low. Lower molars have mesoconid (Fig. 3); M_2 has strong paracristid and large metaconid positioned slightly posterior to the protoconid. Anterobuccal cingulum is well developed.

GENERAL CHARACTERS. The back and sides of the body are brindled gray and pale bay, a mixture of yellowish white and black hairs with more black along the back and at base of tail. The face, ears, and fronts of legs are reddish, whereas the throat and belly are pale or whitish. Tips of the ears, backs of legs, and the region between the jaws are black. Within this pattern there is a great deal of variation among individuals; some are quite pale and others are much darker with nearly black legs and ears (Buehler, 1973; Cabrera and Yepes, 1960) (Fig. 1).

Langguth (1970) listed the following mean external measurements (in mm) based on 20 specimens of *C. thous* compiled from the literature and in collections: length of head and body, 643; length of tail, 285; length of hindfoot, 132; length of ear, 67. Mean and extreme (in parentheses) measurements in mm for cranial and tooth measurements for *C. thous aquilus* ($n = 20$) from Colombia are: condylobasal length, 109.1 (103.0 to 122.8); greatest length of skull, 123.1 (111.8 to 138.3); breadth of braincase, 45.9 (44.5 to 47.0); least interorbital breadth, 26.0 (24.1 to 29.4); postorbital constriction, 31.8 (29.3 to 34.3); width of zygoma, 68.4 (65.0 to 76.1); length of mandible, 102.1 (89.6 to 105.9); length of mandibular toothrow, 64.0 (56.5 to 67.2).

DISTRIBUTION. Crab-eating foxes inhabit the savannah and woodland areas of northeastern South America (Fig. 4). Their range extends from Colombia and Venezuela south into Brazil, Paraguay, northern Argentina, and Uruguay.

FOSSIL RECORD. Two fossil species referred to this genus, *C. ensenadensis* (Ameghino, 1885) and *C. lydekkeri* (Ameghino, 1889), compare closely with the living species, *C. thous*. *Cerdocyon* is recorded in North America from Hemphillian de-



FIGURE 1. Adult male *Cerdocyon thous*. Photo courtesy of Ingrid Porton.

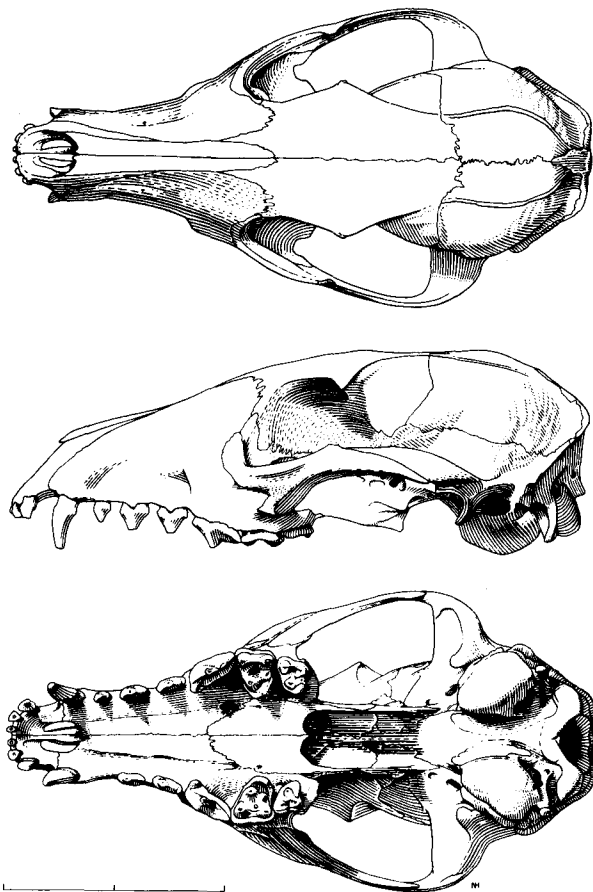


FIGURE 2. Skull of *Cerdocyon thous thous* (AMNH 130475, female from Auyantepui, Venezuela) in dorsal, lateral, and ventral views. Scale is 5 cm. Drawn by Nancy Halliday.

posits in Arizona and from Blancan deposits in Baja California, Mexico (Tedford, in litt; Torres-R. and Ferrusquia-V., 1981).

FORM. Langguth (1969) included comments relative to the cranial and postcranial anatomy of *C. thous* in his study of South American canids (for a summary, see Tables 4 and 8 in Langguth, 1969). Adaptations in the masticatory and locomotor apparatus of *C. thous* are in accord with its role as an omnivorous ground-dwelling carnivore inhabiting forested areas. The short, robust limbs seen in *C. thous* facilitate movement in dense forests. *Cerdocyon thous* is similar to *Atelocynus*, *Speothos*, and *Chrysocyon*

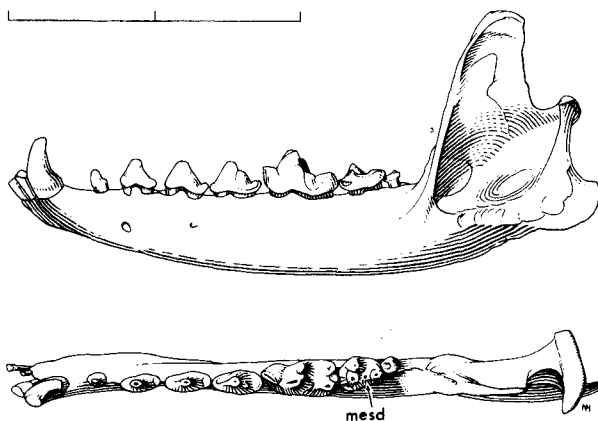


FIGURE 3. Left lower jaw of *Cerdocyon thous thous* (AMNH 130475) in lateral and occlusal views. Scale is 5 cm. Drawn by Nancy Halliday.

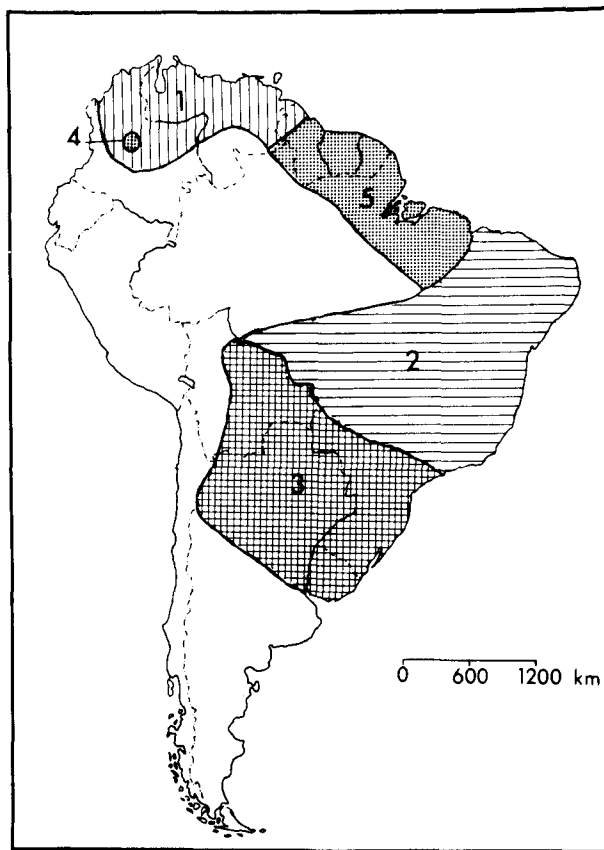


FIGURE 4. Map showing the geographic distribution of *Cerdocyon thous*. Numbers refer to subspecies ranges compiled by Cabrera (1931, 1957): 1, *C. t. aquilus*; 2, *C. t. azarae*; 3, *C. t. entrerianus*; 4, *C. t. germanus*; 5, *C. t. thous*.

in having a short, uncoiled caecum; this contrasts with the long, coiled caecum typical of other canids.

ONTOGENY AND REPRODUCTION. The little information that is available on the reproductive habits of this animal comes from observations of captives in zoos. The following discussion is based on reproductive data for three females reared at the National Zoological Park, Washington, D.C. (Brady, 1978). In captivity, they produced two litters of three to six pups a year with a 7 to 8 month interbirth interval. The available information suggests a peak in births in January or February, but it is not known if another peak occurs in July and August. Both sexes became sexually mature during their first year. The appearance of raised leg urination, common to both sexes, indicated the onset of sexual maturity. The average gestation period was 56 days but varied from 52 to 59.

Pups of crab-eating foxes are born with the eyes and ears closed and without teeth. They weigh between 120 and 160 g at birth. The natal coat is charcoal grey with a buff patch in the inguinal region. Beginning with day 20, the pelage begins to change color, and by day 35 the adult pelage is attained. Body measurements and data on tooth eruption were presented by Brady (1978) for the three litters.

Development of the young is divisible into three stages: (1) early nesting stage (days 1 to 30 after birth), when the young are completely dependent on mother's milk; (2) mixed nutritional dependency stage (days 30 to 90), when the pups are completely weaned; and (3) postweaning dependency stage (90 days to 5 months after birth), when the pups subsist almost entirely on solid foods.

ECOLOGY. *Cerdocyon thous* is a ground-dwelling carnivore, living in the forest and forest edge, open woodlands and wooded savannas. It preys on small mammals, eats fruits and invertebrates, and scavenges.

Normally nocturnal, crab-eating foxes are opportunistic hunters. Mondolfi (in Walker, 1975) reported that the stomachs of 19 foxes contained, in descending order of abundance, small

rodents (field mice and rats), insects (mostly grasshoppers), fruits (figs, small berries, bananas, guasimo, and mangos), lizards, frogs, crabs, and birds. Brady (1979) suggested that crab-eating foxes shifted their food seasonally on the llanos of central Venezuela in accordance with availability. During the wet season, foxes relied primarily on insects which were abundant and easily captured in the drier areas of their home ranges. During the dry season, when insects became scarce, foxes shifted their hunting activities to the lowlands where crabs and vertebrates were abundant.

Although the fur of *C. thous* has little commercial value, crab-eating foxes are subject to constant and intense hunting pressure.

BEHAVIOR. Observations on the behavior of *C. thous* are based primarily on Brady's (1979) study in Venezuela. His data suggest that adult foxes most often travelled in pairs but hunted individually. Either sex led foraging movements, and frequent changes in the lead occurred. Foxes usually foraged from 1800 to 2400 h with intermittent rest periods. The home ranges of the three pairs studied by Brady were in close proximity to one another, with some overlap. Different types of terrain were occupied by each pair, ranging from wet, muddy lowlands to open, grassy highlands. Seasonal shifts in utilization of home range appear to be correlated with changes in availability and distribution of prey. During the wet season, 85% of sighting of foxes were in dry highlands, compared with the dry season when 66% of sightings were in dry lowlands. Several intergroup encounters were observed; most occurred during the wet season when range overlap was greatest.

Langguth (1975) reported that in many areas, crab-eating foxes occur sympatrically with the pampas fox, *Dusicyon gymnocerus*. He suggested that because these two species of foxes utilize similar foods competitive exclusion may occur in some areas.

GENETICS. The crab-eating fox has a diploid number of 74 chromosomes and a fundamental number of 110. The karyotype comprises 36 metacentric and submetacentric and 38 autocentric autosomes; the X chromosome has not been identified (Wurster-Hill, 1973).

REMARKS. The taxonomic position of the genus *Cerdocyon* within the family Canidae is unresolved. In Langguth's (1969) classification, *Cerdocyon thous* was given subgeneric rank in the genus *Cerdocyon*, which also included the subgenera *Atelocynus* and *Speothos*. In a later classification, Langguth (1975) elevated *Cerdocyon (Cerdocyon)* to generic rank, recognizing *C. thous* as the only species in the genus. A numerical classification of the family by Clutton-Brock et al. (1976) followed Simpson's (1945) arrangement of species, recognizing *C. thous* as a valid species, and differed from Langguth (1975) by including *C. thous* in the genus *Dusicyon*. Van Gelder (1978) recognized *Cerdocyon* as subgenus of *Canis*. Preliminary studies of recent and fossil forms of *Cerdocyon* (Berta, pers. observ.; Tedford and Taylor, in litt.) support recognition of *Cerdocyon* as a genus and suggest that *C. thous* is generically distinct from both *Dusicyon* and *Canis* and most closely related to the Asian raccoon dog, *Nyctereutes*.

The generic name *Cerdocyon* is formed from the Greek words *kerdo* (meaning fox) and *cyon* (dog) referring to the dog and fox-like characters of this animal. The specific name *thous* is formed from the Greek word *thoos* and means jackal. Other vernaculars include Zorro de Monte, Common zorro, Forest fox, and Azara's fox.

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Principal editors of this account were DANIEL F. WILLIAMS and SYDNEY ANDERSON. Bibliographic assistance was provided by MARIE LAWRENCE. Managing Editor was TIMOTHY E. LAWLOR.

ANNALISA BERTA, DEPARTMENT OF NATURAL SCIENCES, FLORIDA STATE MUSEUM, UNIVERSITY OF FLORIDA, GAINESVILLE 32611.