

Kurtén B, Anderson E. 1980. Jaguar, *Panthera onca*.
Studer's Cheetah, *Acinonyx studeri*.
American Cheetah, *Acinonyx trumani*.
Lake Cat, *Felis lacustris*.
Ocelot, *Felis pardalis*.
River Cat, *Felis amnicola*.
Jaguarundi, *Felis yagouaroundi*. In: Pleistocene Mammals of North America. New York: Columbia University Press; p 192-195.

Keywords: 3NA/Am/ *Acinonyx pardinensis*/ *Acinonyx studeri*/ *Acinonyx trumani*/ American cheetah/ biogeography/ cheetah/ *Felis amnicola*/ *Felis lacustris*/ giant cheetah/ *Herpailurus yagouaroundi*/ Jaguar/ Jaguarundi/ lake cat/ *Leopardus pardalis*/ ocelot/ paleontology/ *Panthera onca*/ Pleistocene river cat/ Studer's cheetah

Abstract: The genus *Acinonyx*, was long thought to be endemic to the Old World. However, still under way, it was found that at least two North American species should be referred to this genus. In the Old World, the first *Acinonyx* appear at the beginning of the Villafranchian. It is possible that a common ancestor lived in North America in Hemphillian times. The Studer's cheetah (*Acinonyx studeri*) is a large form, close to the Old World *Acinonyx pardinensis* in size. The American cheetah (*Acinonyx trumani*) evidently descended from *Acinonyx studeri*, from which it differs mainly in its smaller size. A similar reduction may be observed in Old World cheetahs. The mode of life of the American species probably resembled that of the living cheetah.

indicates that the lion was present in Beringia at the height of the Wisconsin glacial. It persisted in Beringia to the end of the Pleistocene, as indicated by a date of $10,370 \pm 160$ years B.P. from Lost Chicken Creek. Its extinction in the New World thus appears to have occurred about 10,000 years B.P. (Harrington, 1971a and personal communication, 1971; Hemmer, 1974; Merriam and Stock, 1932; Whitmore and Foster, 1967; Vereshchagin, 1971.)

Jaguar, *Panthera onca* (Linnaeus), 1758 (*Felis onca*; *F. augustus* Leidy, 1872; *F. veronii* Hay, 1919)

The jaguar may be distinguished from the lion by its smaller size and shorter, stockier limb bones. It is present in the early Irvingtonian (Curtis Ranch, Port Kennedy), and later Irvingtonian sites include Coleman IIA, Conard Fissure, Cumberland, Delight, Gordon, Irvington, and probably the Rome Beds, in Oregon. There are over 30 Rancholabrean localities in Florida, Georgia, Kansas, Mexico, Missouri, Nebraska, Nevada, New Mexico, Oregon, South Carolina, Tennessee, and Texas; the species is also found in the Pleistocene of South America. It may be noted that pre-Wisconsinian jaguars ranged much farther north than those of the Wisconsinian; the range of the pre-Wisconsinian jaguars extended to Washington-Nebraska-Pennsylvania-Maryland, whereas that of the Wisconsinian jaguars extended only to Nevada-Kansas-Missouri-Tennessee. The present-day limit is still farther to the south, so the evidence indicates a gradual restriction of jaguar range in the Pleistocene and Holocene, even though this general trend probably was influenced by a sequence of glacial-interglacial shifts.

The earliest Irvingtonian jaguars may be conspecific with the contemporaneous (late Villafranchian to Cromerian) Palearctic jaguar *Panthera gombastegensis* (Kretzoi). The American form may thus be seen as a relict of what was at one time a Holarctic-Neotropical population. There is a progressive size reduction throughout this sequence in the Nearctic, and this tendency is particularly pronounced in the Holocene, where specimens from Devil's Den are intermediate in size between Wisconsinian and living jaguars. Also, there is a gradual shortening of the limbs, especially the metapodials, leading from a more generalized type (e.g., at Coleman IIA) to the characteristic jaguar form, adapted to a life in the forests, streams, and broken country.

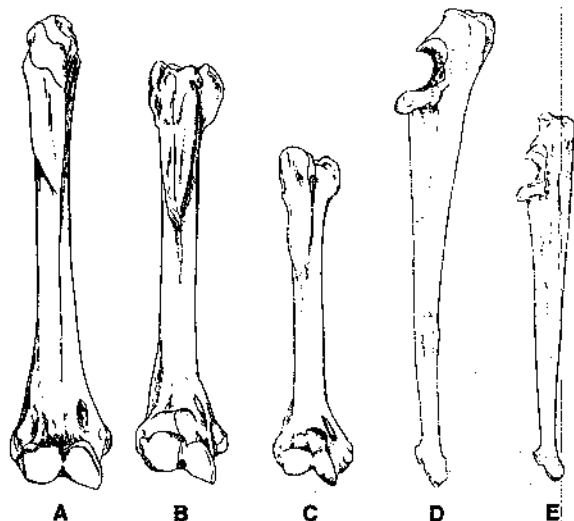
The large Pleistocene jaguar of the Nearctic is usually called *Panthera onca augustus*; the type of the subspecies is late Irvingtonian. The Wisconsinian jaguars exceeded the living in size by 15 or 20 percent, and earlier jaguars are still larger.

The jaguar is conspicuously absent in the rich Californian faunas of the Rancholabrean, where the lion is common, yet was present in northern California in the Irvingtonian. On the other hand, the most abundant record of late Pleistocene jaguar comes from peninsular Florida and Texas and Tennessee, areas where the lion is scarce or absent. Only rarely are the two species found together (Cedazo, Cragin Quarry, San Josecito, Santa Fe River IIA).

The changes in the geographic distribution of jaguars during and after the Pleistocene may be due to environmental changes, changes in the animal's adaptation, or, most probably, both. (Guilday and McGinnis, 1972; Hemmer, 1971; Kurtén, 1965, 1973a; Simpson, 1941c.)

†Studer's Cheetah, *Acinonyx studeri* (Savage), 1960 (*Felis studeri*; *Uncia inespaciata* Cope, 1895?)

The genus *Acinonyx*, with the living species *Acinonyx jubatus* (Schreber) and the fossil *Acinonyx pardiniensis* (Croizet and Jobert), was long thought to be endemic to the Old



11.19 Felidae. A-C, right humeri, anterior view; D-E, left ulna, radial view. A, *Ischyromys* sp., Blancan, Cita Canyon. B, D, *Acinonyx studeri*, Blancan, Cita Canyon. C, E, *Felis concolor*, Rancholabrean, San Josecito Cave. After Kurtén (1970). All 0.35x.

World. However, in recent work, still under way, Adams (personal communication, 1977) has found that at least two North American species should be referred to this genus. *Acinonyx* is distinguished from other cats mainly by characters related to a highly cursorial mode of predation, most clearly reflected in the extremely elongated and slim limb bones, light body, and small head (see fig. 11.19). Cranial and dental characters include a vaulted, broad-fronted skull, a larger outer chamber and a small inner chamber in the internal bulla, small canines, and a reduced protocone in P₄.

The American forms are referred to a distinct subgenus, *Miracinonyx*, which differs from the nominate subgenus in having a less inflated bulla and frontal sinus and fully retractile claws; in the Old World forms, the claws are not fully retractile (Adams, 1979, and personal communication, 1979). The characters of *Miracinonyx* could be regarded as primitive, and so would suggest that cheetahs originally arose in the New World. The apparently close relationship to pumas, an endemic New World group of cats, supports this conclusion. In the Old World, the first *Acinonyx* appear at the beginning of the Villafranchian. It is possible that a common ancestor lived in North America in Hemphillian times.

Acinonyx studeri is a large form, close to the Old World *Acinonyx pardiniensis* in size. It is known from the Blancan (Cita Canyon) but may have survived in the very early Irving-

tonian (Curtis Ranch, Gilliland, Port Kennedy). Late Irvingtonian finds from Conard Fissure, Cumberland Cave, and Mullen may be this species or the American cheetah (see below). (Adams, 1979 and personal communications, 1977, 1979; Kurtén, 1976; Savage, 1960.)

† American Cheetah, *Acinonyx trumani* (Orr), 1969 (*Felis trumani*; *Felis longior* Brown, 1908; *Smilodontopsis mooreheadi* Hay, 1920?)

This species was slightly smaller than *Acinonyx studei* and close to the living cheetah in size but shares the characters of the subgenus *Miracononyx*. The type specimen, a skull from Crypt Cave, Pershing Co., Nevada, has been radiocarbon dated at $19,705 \pm 650$ years B.P. Extensive skeletal material of the same species has recently been unearthed in Natural Trap Cave in north-central Wyoming (Martin, Gilbert, and Adams, 1977) and is currently being studied by D. B. Adams (1979, and personal communications, 1977, 1979; Martin, Gilbert, and Adams, 1977); the material is of Rancholabrean age.

Three additional species, based on isolated P⁴ with reduced protocone, have been tentatively included in the synonymies above: *Uncia inexpectata* (Port Kennedy), *Felis longior* (Conard Fissure), and *Smilodontopsis mooreheadi* (Cavetown). This character, as well as the size of the teeth, suggests that the animals are cheetahs; however, as Adams (1979 and personal communication, 1977) has pointed out, some pumas also have a reduced protocone in P⁴. Additional material from Ladds, Cumberland, and Mullen may also pertain to cheetah.

The American cheetah evidently descended from *Acinonyx studei*, from which it differs mainly in its smaller size. A similar size reduction may be observed in Old World cheetahs. The mode of life of the American species probably resembled that of the living cheetah. (Adams, 1979, and personal communications, 1977, 1979; Martin, Gilbert, and Adams, 1977; Orr, 1969.)

Puma, Cougar, or Mountain Lion, *Felis concolor* Linnaeus, 1758 (*F. hawveri* Stock, 1918; *F. daggetti* Merriam, 1918; *F. bituminosa* Merriam and Stock, 1932)

The genus *Felis sensu lato*, in the view of some authorities (e.g., Van Gelder, 1977), includes most of the living cats (including *Panthera* and *Lynx*). Other workers have had the genus comprise the "small cats," with the puma (subgenus *Puma*) as the largest member, and still others prefer to recognize a large number of genera.

Puma (*Felis concolor*) has been recorded from about 30 sites of Rancholabrean age in Arizona, California, Colorado, Florida, Idaho, Kansas, Kentucky, Mexico, Missouri, Nevada, New Mexico, Texas, and Wyoming. The earliest finds are probably from the Sangamonian (Cragin Quarry, Reddick); Irvingtonian records are uncertain. At the present day, the puma is one of the most wide-ranging carnivore species in the world, with a distribution extending from British Columbia to Patagonia. A large fossil sample comes from San Josecito. There are also numerous specimens from Rancho La Brea. Other records are based on one or a few specimens, most of them from caves and fissure fillings.

D. B. Adams (personal communication, 1979) has suggested that the puma and *Acinonyx* have a common origin, and *Acinonyx studei* does have a number of pumalike characters (Savage, 1960). However, the evolution of the subgenus *Puma* is largely unknown. Fossil puma is present in South America, but its history there remains to be worked out.

The Rancholabrean pumas have canines smaller than those of Recent animals (a character reminiscent of *Acinonyx*) and are on average, larger than animals found in the same area today. In living pumas, average size is correlated with geographic latitude, size increasing to the north and south of the equator, and there is evidence of a similar cline in the Rancholabrean.

Although highly eurytopic, the puma prefers forest, especially in the mountains, and tallgrass prairie. Originally, its habits seem to have been mostly diurnal, another possible indication of a cheetahlike ancestor; civilization has tended to make it more nocturnal in habits. It is a good tree and broken-country climber and takes its prey (ranging in size from rodents to mule deer and wapiti) mainly by ambush.

Frequent cave-denning is indicated by the large number of finds in caves. At a few sites, the remains may be animals killed by man. (Adams, personal communication, 1979; Kurtén, 1973b, 1976; Simpson, 1941c; Savage, 1960; Van Gelder, 1977.)

† Lake Cat, *Felis lacustris* Gazin, 1933 (*F. rexroadensis* Stephens, 1959)

This species, well represented at Hagerman, the type locality (early Blancan), has also been found at Blanco, Rexroad, Curtis Ranch, and Cita Canyon and thus existed in the earliest Irvingtonian. A lynx-sized cat, it shows some resemblance to pumas as well as lynxes. The great reduction of P⁴ (which is absent in lynxes) may be noted, as well as the relatively high, compressed shape of the premolars. The limb bones do not have the distal elongation typical of the lynxes, but the same is true of *Lynx issiodorensis*. On the other hand, a relationship to the pumas cannot be excluded. (Bjork, 1970; Gazin, 1933b; Stephens, 1959; Werdelin, personal communication, 1979.)

Ocelot, *Felis pardalis* Linnaeus, 1758

The species was recorded at Reddick and thus ranged to Florida in the Sangamonian. Its present range is mainly Neotropical but extends into Texas and Arizona. The ocelot is a medium-sized, forest-living cat. Of about the same size as *Lynx rufus*, it differs from the latter in its relatively larger, differently proportioned premolars. (Ray, Olsen, and Gut, 1963.)

† River Cat, *Felis amnicola* Gillette, 1976

A small cat in the jaguarundi-margay size range, this species has been reported at Aucilla River, Ichetucknee, Rock Springs, Merritt Island, Melbourne, and Wacatausa River, all in Florida, and, with less certainty, from Ladds in Georgia. All the localities are Rancholabrean in age. Much of the material had previously been referred to *Felis yagouaroundi*, which has a similar, rather deep and robust mandible, but the dentition differs from that of the jaguarundi in the proportionately taller lower canine, the great length of P₄, and the disposition of the principal cusps of the lower cheek teeth in a straight line. These characters are more like those found in the margay, which, although somewhat smaller, may be the closest living relative of the river cat. (Gillette, 1976; Ray, 1964b, 1967.)

Jaguarundi, *Felis yagouaroundi* Lacépède, 1808

Jaguarundi is found in the fossil state in the late Rancholabrean of Mexico (San Josecito Cave) and Texas (Schulze Cave). Its present range extends north into the southernmost part of Texas. Like the ocelot, it is a mainly Neotropical form but is somewhat less arboreal in habits. In size, it is intermediate between the bobcat and the margay. An early Irvingtonian form at Port Kennedy Cave (referred to *Felis lynx* by