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**A CONTRIBUTION TO THE TAXONOMY OF THE ANDEAN BEAR,
TREMARCTOS ORNATUS (CARNIVORA, URSIDAE)**

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A Contribution to the Taxonomy of the Andean Bear, *Tremarctos ornatus* (Carnivora, Ursidae). Brandstaetter, F. — The Andean bear's taxonomy is discussed with some nomenclatorial corrections and discussions of some common names for the species. The most widely used common name has been changed from spectacled bear to Andean bear in favour of the animal's importance in conservation issues for the Andean region.

Key words: Andean bear, taxonomy, nomenclature, *Tremarctos ornatus*, conservation.

The Andean bear, *Tremarctos ornatus* (Cuvier, 1825), is an enigmatic species of the Andes. It has even been declared an umbrella species for the conservation of the whole Andean ecosystem (Troya et al., 2004; Ruiz-Garcia et al., 2005). Being the only true bear species in South America the Andean bear is unique in its perception and as a representative of the South American fauna.

As Morrison III et al. (2009) and Kitchener (2010) have pointed out, taxonomy is fundamental to conservation. Scientific names are the device to clearly determine a species (Ng, 1994). All communication about animals, biodiversity and conservation is based on the stability and exactness of scientific names and the whole community is responsible for a proper use (Welter-Schultes, 2013).

With regard to this, the taxonomy of the Andean bear is analyzed in the following.

Classification of the Andean bear

Family Ursidae (Bears)

Subfamily Tremarctinae (Short-faced bears)

Genus *Tremarctos* Gervais, 1855 (Spectacled bears)

Species *Tremarctos ornatus* (F. Cuvier, 1825) (Andean bear)

Family Ursidae

(latin *ursus* — bear)

The first one to come up with the idea of separating bears (i.e. the large bears) from all other carnivores was Fischer (1817). He put all species of the genus *Ursus* into a group he named Ursini and treated them as a subgroup of the order Plantigrada, in which he also included animals like hedgehogs, anteaters and pangolins (remark: as a matter of fact the giant anteater has sometimes been called „ant-bear“ as first used by Dampier (1699) and is still called „Ameisenbaer“ in German).

Gray (1825) recognized the family rank of Fischer’s Ursini and corrected it to Ursidae with the ending -idae being the appropriate ending of family rank names according to the rules of the International Commission on Zoological Nomenclature (ICZN) based on Simpsons recommendations for stability (Simpson, 1945). According to the principle of priority of the ICZN the family name is to be referred to Fischer as he was the first to recognize the monophyly of the (large) bear species (Asher & Helgen, 2010).

Therefore, the quotation would be **Ursidae** Fischer, 1817.

Sometimes you can find the quotation “Ursidae Fischer de Waldheim, 181”. Although Fischer had been nobilized to “von Waldheim” later in 1817 he didn’t use the name before 1835 (Grämer, 1978). As authors’ names should be spelled as published in the original work (Welter-Schultes, 2013) “de Waldheim” or “von Waldheim” must be omitted in this case.

According to the recommendation of the ICZN (1999) ranks higher than species group not necessarily to be quoted for the first time with the author’s name. Thus, the family rank is sufficiently named as Ursidae.

Subfamily Tremarctinae

(greek *trema* — hole, greek *arctos* — bear)

Kurten (1966) and Thenius (1976) finally established the subfamily Tremarctinae (which had originally been set-up by Merriam & Stock in 1925 for some related but extinct species) to include the only extant species *Tremarctos ornatus*, the Andean bear. While Garcia-Rangel (2012) distinguishes between the spectacled bears sensu stricto (genera *Tremarctos* and *Plionarctos*†) and the short-faced bears (genera *Arctodus*† and *Arctotherium*†) as two separate groups of the Tremarctinae, Thenius attributes the name short-faced bears to all members of that subfamily (Thenius, 1976). The term is now widely used by most authors sensu Thenius. (e. g., Domco, Newman, 1990; Kitchener, 2000; Schliemann, 2004; Garshelis, 2009; Mitchell et al., 2016). The vernacular name is short-faced bears because of the convex visceral part of the skull and the relative shortness of the skull in total in comparison to other ursids (Garcia-Rangel, 2012) resulting in a short and broad snout (Harington, 1996) due to high insertion of the mandibular (Welter et al., 2010). Cope (1879) even named a member of the extinct tremarctine genus *Arctodus* “bulldog bear”.

Morphologically, the Tremarctinae are defined by an entepicondylar foramen in the humerus first described by Gervais (1855): “son humerus est percé d’un trou suscondyliens qui manque à tous les autres ursides”. The uniqueness of that foramen amongst ursids occurring only in members of the Tremarctinae has been confirmed by Lambe (1911). Nevertheless, its function is still subject to debate. According to Landry (1958) this opening

in the distal end of the humerus bone serves as a passage for the median nerve and protects the latter from sliding over the edge of the elbow. The entepicondylar foramen is widely considered a primitive character which can be found in most marsupials, all monotremes and the primitive forms of higher mammals (Koretsky et al., 2016). Its function is still not clear (Vymazalova et al., 2015).

As with the family name the authors of the subfamilial rank name need not be mentioned. Thus, it is sufficient to quote the subfamily as Tremarctinae.

Genus *Tremarctos* Gervais, 1855

The entepicondylar foramen is used as the name giving trait for the genus *Tremarctos* which in itself is the type genus of the subfamily (*trema*, gr. — hole). (Note that Rabeder et al., 2000, wrongly translated *trema* as “spectacles” or “glasses” due to a fatal misconception drawn from the common name spectacled bear.)

Although the generic name has been established by Gervais (1855) it was not used before the 1970s as the clear distinction between the Andean bear and the other ursid species has been confirmed (Garcia-Rangel, 2012).

According to the rules of the ICZN generic names are only complete with mentioning the author in the string.

Species *Tremarctos ornatus* (F. Cuvier, 1825) (latin *ornatus* — decorated)

A species binominal name must include genus – specific epithet — author’s name — year of description. It is common practice to separate author and year by a comma (Welter-Schultes, 2013). The full name has to be mentioned at least once in a scientific publication. In any further mentioning the author’s name and year can be omitted and the genus can be shortened to its initial (e. g. *T. ornatus*). The combination of genus and specific name to properly identify a species is fundamental in binominal nomenclature.

The species epithet (or specific name) *ornatus* refers to the white-yellowish markings in the face and on neck and breast of the animals. It has first been given by Frederic Cuvier referring to the “two circles in the face” as *Ursus ornatus* (in: Geoffroy Saint-Hilaire, Cuvier, 1825). Later this species name was transferred to the genus *Tremarctos*. Currently, it is considered as *Tremarctos ornatus* (Cuvier, 1825).

The author’s name is sometimes given as F. Cuvier or F. G. Cuvier to distinguish him from his brother Georges who was an even more important zoologist of the 19th century (Flourens, 1840). According to the analysis of Welter-Schultes (2013) initials are not important and should be omitted.

Further, although the printed work named Étienne Geoffroy Saint-Hilaire and Frederic Cuvier as authors it is remarked on page 11 of the first volume that all contributions without signature are by Frederic Cuvier (Geoffroy Saint-Hilaire, Cuvier, 1824). Such is the case for the chapter on the “ours des cordilières du Chili” which includes the first known (and accepted) description of the Andean bear.

It is a bit confusing that Cuvier named it in fact *ours des cordilières du Chili* as Andean bears are not known to occur in Chile. Cabrera (1957) redefined the given type locality to be in Peru. This is consistent with the known range of the Andean bear.

The markings have also been widely used for the common names of the species:

It is called *spectacled bear* with reference to the markings sometimes surrounding the eyes of the animal like glasses. The name has equivalently been used in German as *Brillennbär*, in French as *ours à lunettes* and in Spanish as *oso de anteojos*. (Remark: English names as well as those from most other languages do not have capital initials (upper-case letters) (Grubb, 2006). German language treats them all as personal names and consistently writes common names with upper-case letters.)

The name has been widely used until the early 2000s when it was replaced by the term *Andean bear*. Scientific authorities have decided to use that name for two reasons: firstly, not all Andean bears show the glasses markings around the eyes (particularly those in Bolivia are often lacking the markings: see Dathe, 1968). Even more so, the markings are highly variable and individual (van Horn et al., 2014). Secondly, Andean bears are good representatives of the Andean fauna as they are distributed over the major part of the South American Andes. They can also be found in all types of habitat of the Andes (Troya et al., 2004). They count as an iconic species of the Andes (Jones, 2010) representing the whole Andean ecosystem. Thus, the name spectacled bear masks the true importance of the Andean bear as an umbrella species for the conservation of the whole Andean ecosystem (Duckworth et al., 2014) and the name Andean bear gives the species a stronger identity in the sense of Kortlandt (1998).

The term Andean bear is in common use at least since the early 2000s. Its German equivalent *Andenbär* has been used as early as 1968 by Dathe and was in parallel use alongside with *Brillenbär* for four decades. It was not until recently that the EEP decided to follow the SSPs decision to use the alternative name *Andean bear* to clearly design conservation purposes (Kolter, 2017). The Spanish equivalent is *oso andino* (e. g. Figueroa, 2014).

One of the indigenous names for the Andean bear is *ucumari* which has been mentioned by Tschudi (1844). According to Tschudi *ucu mari* means “something that lies in (*ucu*) the forehead (*mari*)” referring to the markings on the forehead. Other names are *oso achupayero* which means “bromelia eating bear” (Kolter, 2000) referring to the preferred food of Andean bears in the wild, and *el salvaje* (the wild one) which has been confirmed for Venezuela (Massot, 2017).

According to Reitz (2005) the Andean bear is sometimes called *mappinguri* in Bolivia. This reference is interesting with regard to the fact that there is a mythological creature called the *Mapinguari* in the Amazon basin which has been described as a big mammal, walking on two legs, being strong and dangerous. This creature has been identified as a species of giant ground sloth by cryptozoologists (Oren, 2001) which is thought to have survived the extinction of the genus until recently.

Particularly interesting is the word *puma* which is commonly attributed to the cougar (*Puma concolor*). According to Paisley & Saunders (2010) the Quechua word *puma* means „strong animal force“ and has been equally used to designate the cougar, the jaguar (*Panthera onca*) and the Andean bear — the three apex predators of South America. This could be of particular interest in conservation management as it might contribute to errors in the traditional perception of the bears in rural societies.

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