

# A case of exceptionally sized cutaneous horn in Alpine chamois?

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## ABSTRACT

We report the case of an adult female chamois *Rupicapra rupicapra* within the Gran Paradiso National Park (Italy), showing an abnormal horn-like growth hanging from the skin of the region between the right shoulder and the neck. Similar cases have previously been reported in both domestic and wild animals, including Alpine chamois. The singularity of this case lies in the remarkable size of the structure, normally much shorter and thinner. Based on macroscopic appearance of the mass, we hypothesise the occurrence of a cutaneous horn. In the absence of proper biopsy, however, we have no indications as for the origin of this abnormal growth.

**Keywords:** *Rupicapra rupicapra*, cutaneous horn, growth, pathology

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In this short note, we report the case of an Alpine chamois *Rupicapra rupicapra* showing an exceptionally sized horn-like growth. We describe its appearance and discuss its possible origin in the light of the available literature.

Abnormal horn-like structures can be classified as congenital or acquired. The former may take the shape of supernumerary horns, with proper sheath and bone – as in regular horns. These structures, albeit rare, have been found in different even-toed ungulates, such as pronghorn *Antilocapra americana* (Lewis 1995) and Alpine chamois (Couturier 1938).

Acquired lesions, on the other hand, may be found in the form of cutaneous horns, clinically identified as cone-shaped cohesive masses of cornified material – but without bone peg – protruding from the surface of the skin (De Voos and Kloppers 1971, Schosser *et al.* 1979) and caused by hyperplasia of the epidermis. A cutaneous horn is merely a clinical phenomenon, classified as a benign, malignant or pre-malignant lesion according to the underlying pathologic process. In humans, at the origin of the same phenomenon we may identify processes resulting in benign lesions (e.g., keratosis), pre-malignant lesions (e.g., actinic keratosis) and malignant lesions (e.g., squamous cell carcinoma) (Schosser *et al.* 1979). According to the same authors, actinic keratosis appears to have the highest incidence, at least in humans.

Literature reporting similar lesions in wild animals is poor. A number of studies, however, report the occurrence of cutaneous horns in domestic animals (especially cattle, sheep, goats and birds). In domestic species, cutaneous horns are commonly reported to be hard neoformations, whose height is greater than the diameter, growing in any part of the skin, but especially on paws (i.e. in cats) and ears (e.g. in goats) (Jackson 1936, in De Voos and Kloppers 1971). The horn constitutes multiple layers of compact corneous material, and its base can be a hyperplastic, neoplastic or inflammatory lesion. In ruminants, it may be related to infections caused by *Dermatophilus* or *Papillomavirus* (McGavin *et al.* 2000). Al-Ani *et al.* (1998) report the case of a four-year old crossbred goat with three ectopic horns on the apex of the pinna of the left ear, but give no explanation for the origins of such formations.

In wild animals, cases of cutaneous horns have been reported in taxa as diverse as reptiles and ungulates (De Voos and Kloppers 1971, Martinez-Silvestre and Frye 2002). De Voos and Kloppers (1971) describe a case of cutaneous horn on the mandibular region of a kudu *Tragelaphus strepsiceros* shot in the Kruger National Park, South Africa. Such a neoformation consisted of a stalk, horny part and a core part of yellowish tissue with fatty appearance; they could not, however, find a conclusive explanation for the pathogenesis of the horn.

Couturier (1938) reports two cases of cutaneous horns, located on the fore leg and on the right thigh, in Alpine chamois of the Swiss Alps. Despite the author's claims that such neoformations are not rare in chamois, we could find only a few other cases in the available literature. Knaus and Schröder (1983, pag. 30) report the case of a chamois shot on August 11, 1952 in Gaistal-Steinernes Hüttel (Austria), but they do not provide any other information on this particular specimen in the text. The same authors also mention the case of a chamois shot in the Tyrol in

1956, with a cutaneous horn (diameter of 23 cm and length of 11 cm) in the proximity of the shoulder. In the Jagd- und Fischereimuseum in Munich (Germany), a specimen of a chamois (possibly an adult male) shows a horn-like structure protruding from the left of the neck (Fig. 1). More recently, a 16-year-old female without kid was shot on October 31, 2009 in the National Park Hohe Tauern (Karinthia, Austria). The animal showed a horn-like abnormal growth on the back, 5.5 cm long (Fig. 2). This type of cutaneous horn, whose length is much greater than the base, is the most frequently described in the literature (McGavin *et al.* 2000). The specimen is now displayed in the park's museum BIOS in Mallnitz (Austria).

On May 31, 2012, in the Upper Orco Valley – Gran Paradiso National Park (Western Italian Alps, 45°26 N, 7°08 E)– we observed a female chamois (aged 8–10 years) with a horn-like growth protruding from the region between the right shoulder and the neck (Fig. 3). Cutaneous horns are movable in the skin (De Vos and Kloppers 1971): this structure was clearly hanging from the skin, moving when the animal walked. This horn (Fig. 4) was grey-brown coloured, hairless, cone-shaped with the distal part tapering to an off-centre point. Quite differently



**Figure 1** A chamois specimen in the Jagd- und Fischereimuseum in Munich shows a neofornation protruding from the left of the neck (Photo: © Christine Miller).



**Figure 2** A 16-year-old female without kid, shot on October 31, 2009 in the National Park Hohe Tauern (Karinthia, Austria). The animal showed a horn-like abnormal growth on the back, 5.5 cm long (Photo: © Dietmar Streitmaier).

from the cases reported above, however, this growth had a massive base, almost as broad as its length. Although we could not capture the animal and proceed with the measurement of the structure, we estimated its size using, as a comparison, a specimen of adult male chamois available in the Gran Paradiso National Park. The skeletal size of males and females is nearly identical, the sexual-size dimorphism being highly seasonal and mainly due to fat and muscles mass accumulated by males over summer (Rughetti and Festa-Bianchet 2011). For the target animal, we estimated a structure as broad as ca. 15 cm at the base, and as long as ca. 18 cm. This information, though approximate, highlights the exceptional size of the observed structure: to our knowledge, this is the first time a horn-like growth with similar size and shape has been reported in chamois. Despite this peculiar characteristic, the chamois appeared in good conditions and there was no evidence of other macroscopic lesions. It was observed for some 30 minutes, feeding, within a group of other females, and showed no anomalous behaviours. An opportunistic sighting of the same individual, occurred in the following summer, confirmed the overwinter survival of the animal.



**Figure 3** The horn-like mass protruding from the right shoulder of an adult female chamois (Photo: © Luca Corlatti).

Based on macroscopic appearance, we hypothesise the occurrence of a cutaneous horn, as the mass was horn-shaped, entirely supported by the skin and movable. In the absence of proper biopsy we cannot, however, give indications as to the origin of this abnormal growth. Indeed, biopsy would be the only way to describe in detail the structure of the horn, study its histology and identify its actual etiopathogenesis.



**Figure 4** The horn-like structure, grey-brown coloured, hairless and cone-shaped had the distal part tapering to an off-centre point (Photo: © Luca Corlatti).

## LITERATURE CITED

- Al-Ani F. K., Khamas W. A., Al-Qudah K. M. and Al-Rawashdeh, O. (1998) Occurrence of congenital anomalies in Shami breed goats: 211 cases investigated in 19 herds. *Small Ruminant Research* 28, 225–232.
- Couturier, M. (1938) *Le chamois*. Arthaud, Grenoble.
- De Voos V. and Kloppers J. J. (1971) Cornu cutaneum on the mandibular region of a Greater Kudu *Tragelaphus strepsiceros*. *Koedoe* 14, 49–54.
- Edward, G. E. (1995) A four-horned specimen of *Antilocapra americana*. *Proceedings of the Denver Museum of Natural History* 9, 1–3.

- Knaus W. and Schröder W. (1983) *Das Gamswild*. Verlag Paul Parey: Hamburg and Berlin.
- Martínez-Silvestre A. and Frye F. L. (2002) A case of calcinosis cutis and pseudocutaneous horn in a captive red-eared slider (*Trachemys scripta elegans*). *Boletín de la Asociación Herpetológica Española* 13, 45–47.
- McGavin D. M., Carlton W. and Zachary J. F. (2000) *Thompson's Special Veterinary Pathology*. Mosby: St. Louis, USA.
- Rughetti, M. and Festa-Bianchet, M. (2011) Seasonal changes in sexual-size dimorphism in northern chamois. *Journal of Zoology* 284, 257–264.
- Shosser R. H., Hodge S. J., Gaba C. R. and Owen L. G. (1979) Cutaneous horns: an histopathologic study. *Southern Medical Journal* 72, 1129–1131.

