

Short Communication

New observations of the 'extinct' Barbary sheep *Ammotragus lervia ornata* in Egypt

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Abstract The Barbary sheep or aoudad *Ammotragus lervia* is widely distributed in the mountains of the Sahara and North Africa. The 2000 IUCN Red List assessment of the Egyptian subspecies *A. l. ornata* categorized this taxon as Extinct in the Wild. We present new evidence, collected during 1997–2000, that this subspecies is extant in both the extreme south-east and south-west of Egypt, and reassess the status of captive aoudad in

Egypt. We recommend that the category of *A. l. ornata* on the IUCN Red List be changed to Critically Endangered, that conservation of wild aoudad in Egypt be prioritized, and that the subspecific status of both the wild and captive stocks in Egypt be reassessed.

Keywords *Ammotragus lervia ornata*, aoudad, Barbary sheep, Egypt, Gebel Elba, Red List.

The Barbary sheep or aoudad *Ammotragus lervia* has a wide distribution across isolated mountain ranges of the Sahara and North Africa. In Egypt it was formerly an inhabitant of most of the Eastern Desert, and of areas of rugged terrain in the Western Desert (Osborn & Helmy, 1980; Fig. 1). Inconsistency and confusion surround the taxonomy of this genus (Amer, 1997; Kingdon, 1997; Nimir, 1997; Shackleton, 1997; Shackleton & de Smet, 1997; Cassinello, 1998; IUCN, 2000): the history of the nomenclature is summarized in Table 1. The type localities of subspecies are given in Fig. 1. The validity of these subspecific differences is already under question (IUCN, 2000).

Historically the population in the desert east of the Nile has been distinguished as the subspecies *A. l. ornata* on the basis of a single specimen killed near Cairo in the early 19th century, although the author expressed doubt about whether the species was normally found so close to Cairo (I. Geoffroy St. Hilaire, 1827). Sclater (1895) confirmed the existence of the Barbary sheep in Egypt and recorded it from several localities in the desert east of the Nile. The species was extensively hunted, and by 1910 was described as extremely scarce with only a few sightings or other physical signs (Flower,

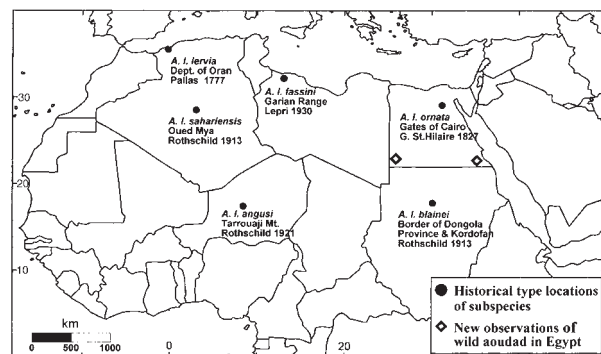


Fig. 1 Type localities (filled circles) of the subspecies of *Ammotragus lervia* (Rothschild, 1913, 1921; Lepri, 1930; Harper, 1940; Gray & Simpson, 1980) across the Sahara and North Africa, and recent records (open circles) of *A. lervia* in Egypt that conform to the description of the subspecies *A. l. ornata*.

1932). The last published record for the Eastern Desert was an observation in Wadi Asyuti in 1969 (Osborn & Helmy, 1980). Hoogstraal (1964) indicated that local people believed that 'wild sheep' were present in the extreme south of the eastern desert in the Gebel Elba region, but was unable to confirm their accounts. Goodman (1985) reported that the species was probably extinct in Gebel Elba but that small numbers might still occur in adjacent areas.

Records in Osborn & Helmy (1980) indicate that the species persisted in the extreme south-west of the western desert of Egypt up to the late 1960s. Isolated sightings at this time in the central Western Desert suggest that the species was also still present in unknown numbers near the central depressions. The existence of Barbary sheep of unknown type in the Qattara

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Table 1 Summary of phenotypic characters used to name subspecies of *Ammitragus lesvai*, based on original sources for all subspecies other than nominate. For type specimen localities see Figure 1.

Name, authority and locality	Body colour	Face colour	Beard colour	Horn shape
<i>A. l. lesvai</i> Pallas 1777 Dept. of Oran, Algeria (Harper, 1940)	Mid-tawny	Indistinct dark median face stripe	Uniform sandy	'Hardly' or not at all depressed
<i>A. l. ornata</i> I. Geoffroy St. Hilaire 1827 'Gates of Cairo', Egypt	Warm sandy rufous, deeper than <i>sahariensis</i> , no white patch below ear	No face stripe	Uniform sandy	Strongly depressed
<i>A. l. sahariensis</i> Rothschild 1913 Oued Mya, 20°30'N 3°E, Algeria	Uniform pale sandy rufous with a white patch below and somewhat behind ear; lighter than <i>fassini</i>	No trace of a median facial stripe, uniform with body	Uniform sandy	Strongly depressed in adult male, turning sharply down before bending backwards
<i>A. l. blainei</i> Rothschild 1913 Border of Dongola Province and Kordofan, Sudan	'Brownish-grey', less rufous than any previously named race with brownish mane	No face stripe but sides of head, face and mask dark owing to admixture of blackish hairs, and contrast with body	Black on lower jaw	Stongly depressed in adult male but not bent backwards so much as in previously named races
<i>A. l. angusi</i> Rothschild 1921 Tarrouaji Mt., Niger	Very deep rufous, darker than <i>ornata</i> , dorsal crest mixed with black, more strongly on front half; leg hair apparently sparse	No face stripe	Cinnamon rufous on sides of lower jaw	Much more upright on head than previously named races and curving farther backwards and inwards
<i>A. l. fassini</i> Leprie 1930 Garian Range, NW Libya	Light tanwy reddish, more rufous than <i>sahariensis</i> and <i>blainei</i> , spot below ear obscure	Face washed brownish by mixture of brownish and rufous hair, contrasts with body	Black chin, mixture of tawny and brown on jaw	Horns more backward turned than <i>blainei</i> , less depressed than <i>sahariensis</i>

Depression of the northern Western Desert rests solely on the report that an old set of horns was found there in 1927 (Osborn & Helmy, 1980).

The recent history of global conservation status assessments of *A. lervia* by IUCN is summarized in Table 2. *A. lervia* is categorized as Vulnerable on the 2000 IUCN Red List (Hilton-Taylor, 2000), based on criteria A2cd, i.e. a reduction of at least 20% expected within the next 10 years or three generations, based on a decline in extent of occurrence and levels of exploitation. The same Red List categorized *A. l. ornata* as Extinct in the Wild on the basis that the taxon only exists as part of a captive breeding programme at Giza Zoological Garden, Cairo.

Here we present new evidence indicating that small wild populations of *A. lervia* are extant on both sides of the Nile in Egypt. Table 3 summarizes these recent observations from the extreme south-west of the Western Desert (Gilf Kebir and Uweinat) and in Gebel Elba east of the Nile. A long-range photograph of wild aoudad, putatively *A. l. ornata*, was taken in the Gebel Elba area in December 1999 and is available from the authors, and a captive individual that matches the description of *A. l. ornata* was found for sale in a market near Gebel Elba by G.M. in April 2000.

We examined the aoudad on public display at Giza Zoo; the two groups numbered 33 and 35 in November 2000 and were composed of mixed sex groups with young. In appearance they conform to the description of *A. l. ornata* (Geoffroy St. Hilaire, 1827; Rothschild, 1913). They clearly differ from a dark-faced specimen, attributed to *A. l. fassini*, photographed in captivity in Tunisia (S. Wakefield, pers. comm.) and a dark-faced animal of unknown origin photographed in the El Arish Zoo, Sinai (G.M.). Recent work on the taxonomy of

other mountain ungulates, notably the species level split between Nubian and Alpine ibex (Manceau, *et al.*, 1999; IUCN, 2000), indicates that caution is required when contemplating the use of captive aoudad for reintroduction or reinforcement of populations in Egypt.

We recommend that the IUCN Red List status and background information on the subspecies *ornata* should be amended. Taxonomic concerns notwithstanding, the status of *A. l. ornata* should be revised from Extinct in the Wild to Critically Endangered, based on criterion D (estimated population of *c.* 50). A comment reflecting the need for verification of taxonomic status, particularly with reference to comparison of wild and captive stocks, needs to be included with the assessment. We also advocate that the captive stock at Giza should be maintained carefully as a valuable conservation resource, but that their use for reintroduction must be avoided until their relationship to extant wild animals is clarified using modern techniques of genetic analysis.

Finally, we recommend that effective *in situ* protection and study of wild populations is a priority for conservation of the wild stocks of Barbary sheep in Egypt. *A. l. ornata* is technically protected under Egyptian legislation, but action needs to be taken to implement this protection regardless of the subspecies. The aoudad in Egypt are likely to be subject to direct threats, not least because hunting pressure may well increase in response to fresh news of their presence. Surveys are needed to determine the area of occupancy in relation to protected area boundaries and to assess population sizes. In addition to attempting to confirm details of typical appearance in each population, for which camera trap studies would be valuable, opportunities should be taken to obtain DNA from freshly shed hairs at bedding

Table 2 Summary of recent IUCN Red List conservation status assessments for *Ammotragus lervia*.

Year	Taxon	Category	Criteria	Reference
1994	<i>A. l. ornata</i>	Extinct	–	Groombridge, 1993
1996	<i>A. l. ornata</i>	Not Evaluated	–	IUCN, 1996
2000	<i>A. lervia</i>	Vulnerable	A2cd	Hilton-Taylor, 2000
2000	<i>A. l. ornata</i>	Extinct in the wild	–	Hilton-Taylor, 2000

Table 3 Summary of information about wild *Ammotragus lervia* seen or reported in Egypt since 1997.

Location	Year	Observation	Source/Reference
Gilf Kebir & Uweinat	1997	Tracks and fresh faeces found	Baha El Din, 1997a
Uweinat	2000	Population estimate of 50	Leonard, 2000
Gebel Elba	1997	Aoudad reported by locals	Baha El Din, 1997b
Gebel Elba	1999 (Dec)	Live wild aoudad photographed	Gabriel Mikhail
Gebel Elba	2000 (Apr)	Locally caught aoudad photographed in Shalatein market and subsequently released	Gabriel Mikhail
Gebel Elba	2000 (Nov)	Further local reports of aoudad	Baha El Din & Gabriel Mikhail

sites or from cases of natural mortality. Storage of genetic material will facilitate future reassessment of the subspecies of *Ammotragus ornata*. This information will improve decision-making when determining the conservation use of captive stocks.

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Biographical sketches

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