

Migration and wintering of released Italian Egyptian Vultures *Neophron percnopterus*. First results

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Abstract – The migration of two young Egyptian vultures *Neophron percnopterus* (Barbara and Arianna) born in captivity could be studied for the first time by means of satellite telemetry. The two females were born in 2006 in the captive breeding station of Rocchette di Fazio (GR, Italy) from parents of Spanish origin and released two months later through the hacking method in Laterza (Puglia Region, Italy). The two vultures were inserted in a hollow of a rock-face on 30 July. After flying in the neighbourhood of the hack site for about two weeks, Barbara and Arianna started migrating south-west on 23 August. Barbara reached Sicily on 31 August and in the next days she wandered along the south-west coast of the island. The satellites got the last signals on 16 September. Arianna arrived in Sicily on 30 August and reached the island of Marettimo (Egadi) on 1 September. She then crossed Sicily Strait and reached Tunisia. After having crossed Tunisia and Algeria, Arianna arrived on 16 September in Mali, 25 days after the beginning of the migration. She reached the wintering grounds in central-east Mali four days later. The distance covered from the hack site to the wintering area is of 3915 km. After a short stay in Niger and Burkina Faso she returned to central-east of Mali where she spent the whole winter. The migration of Arianna seems to suggest that the vultures born in captivity are perfectly fit to be released and that the hacking method is efficient. Furthermore, this allowed us to discover for the first time the wintering area of an Italian born in captivity Egyptian vulture.

INTRODUCTION

The Italian breeding population of the Egyptian vulture *Neophron percnopterus* declined critically during the last 50 years (Liberatori and Penteriani 2001). In the 1970ies, about 70 breeding pairs were estimated, in 2006 only ten pairs have been counted, all distributed in Southern Italy (Calabria, Basilicata, Sicily) (Ceccolini *et al.* 2006). Such a worrying decline concerns also other European populations and especially the Spanish one (Del Moral 2000). The Egyptian vulture is classified as an endangered species with an “unfavourable conservation status” (SPEC 3) (BirdLife International 2004). Considering the serious situation of the species in Italy and the complete lack of information about the migration and wintering in Africa, we studied the movements of two nestlings females born in captivity by means of satellite telemetry. They were released in Puglia (TA, Italy) in 2006 by the hacking method (Ceccolini e Cenerini 2005). The two young vultures came from a captive breeding station located at Rocchette di Fazio (municipality of Semproniano, GR, Italy). The project is supported by the Province of Grosseto and it has

allowed the release of eight young vultures in Sicily, Tuscany and Puglia between 2003 and 2006.

METHODS

The two nestlings were equipped with satellite transmitters in July 2006 at the age of 10 weeks and released in Puglia (Italy) on 30 July. Barbara was equipped with a 40 g solar-powered transmitter made by North Star Science and Technology, USA, and Arianna with a 35 g solar-powered transmitter made by Microwave Telemetry, USA. Barbara's tag worked every day as soon as there was enough light. The repetition rate was 60 seconds. Arianna's tag had an on/off cycle of 10 hours on followed by 24 hours off. The repetition period was 47 seconds. The locations were calculated and provided by the Argos system (www.argos-system.org). We only used fixes of the four most accurate location classes. According to Argos, the location errors of this location classes follow a normal distribution with the standard deviation being less than 1 km.

Arianna's tag provided 1.012 locations, 53.8 % of

which were of the three best accuracy classes. Barbara was localised 253 times, but only 39 (15.4 %) out of them stemmed from the four best accuracy classes. Barbara's transmitter turned out on 16 September, supposedly because of the death of the bird. The overall quality of the data was excellent, with the exception of the ones provided on the Italian route because of background noise in Southern Italy.

We used Google Earth Plus online software program to plot the locations, map out the route and to measure distances in digital map.

RESULTS

Migration

The two young vultures Barbara and Arianna were inserted in a hollow of a rock-face in Puglia (TA, Italy) on 30 July. After flying in the neighbourhood of the hack site for about two weeks, they migrated south-west on 23 August. Barbara reached Sicily on 31 August and wandered in the next days along the south-west coast of the island (Fig. 1). On 16 September the satellite signals stopped. Arianna arrived in Sicily on 30 August (Fig. 2) and on 1 September she reached the island of Marettimo (Egadi Archipelago; 37°97'N/12°06'E), a mountainous island located about 30 km off western Sicily, 130 km NE of Cap Bon Promontory (Tunisia). She then crossed Sicily Channel and reached Tu-

nisia on 3 September (at 36°04'N/10°43'E, 13h38 GMT). In Tunisia Arianna had 4 resting days close to the city of Sbeitla (at 35°19'N/9°20'E) from 4 to 7 September. She then crossed Tunisia and Algeria and arrived in Mali on 16 September, 25 days after the beginning of migration.

On 20 September, she reached the wintering grounds. Between the hack site and the wintering grounds, she covered the distance of 3915 km. The vulture flew an average of 163 km each day (excluding 5 resting days). The maximum daily distance was covered on 9 and 10 September, while crossing Sahara desert in Tunisia and Algeria, when she flew a total distance of 923 km, i.e. a mean daily distance of 461 km. From the locations we could calculate that she reached the maximum speed of 79,03 km/h in the Algerian desert (date 10/09/2006, first point 30°12'N/4°32', 14.10 h, LC 0, second point 29°29'N/3°0,4'E, 16.07 h, LC 0: 154,12 km covered in 1 h 57').

Sojourn in Africa

Arianna spent most of the 2006-2007 winter season (20/09/06-25/04/07) in a semi-desert area of central-east Mali (eight inhabitants per km²), close to the border to Niger (Fig. 2). She used mostly grasslands, shrublands and savannah. The home range extended 200 km NE/SW and 110 km NW/SE (about 20.000 km²). Two cores were identified: the first one extended 80 km NE/SW and 45 km NW/SE with the centre at 16°46'N/2°66'E, the second one extended 70 km NE/SW and 65 km NW/SE with the cen-

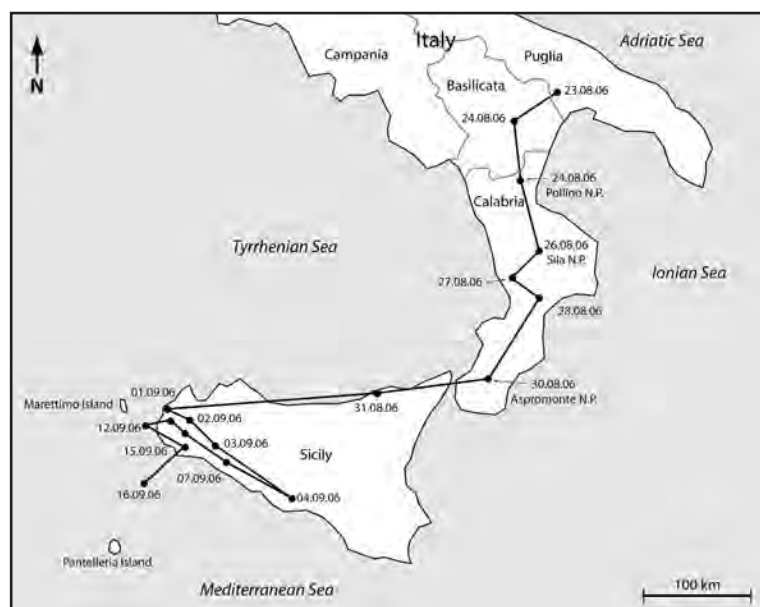


Figure 1. Barbara's migration route.

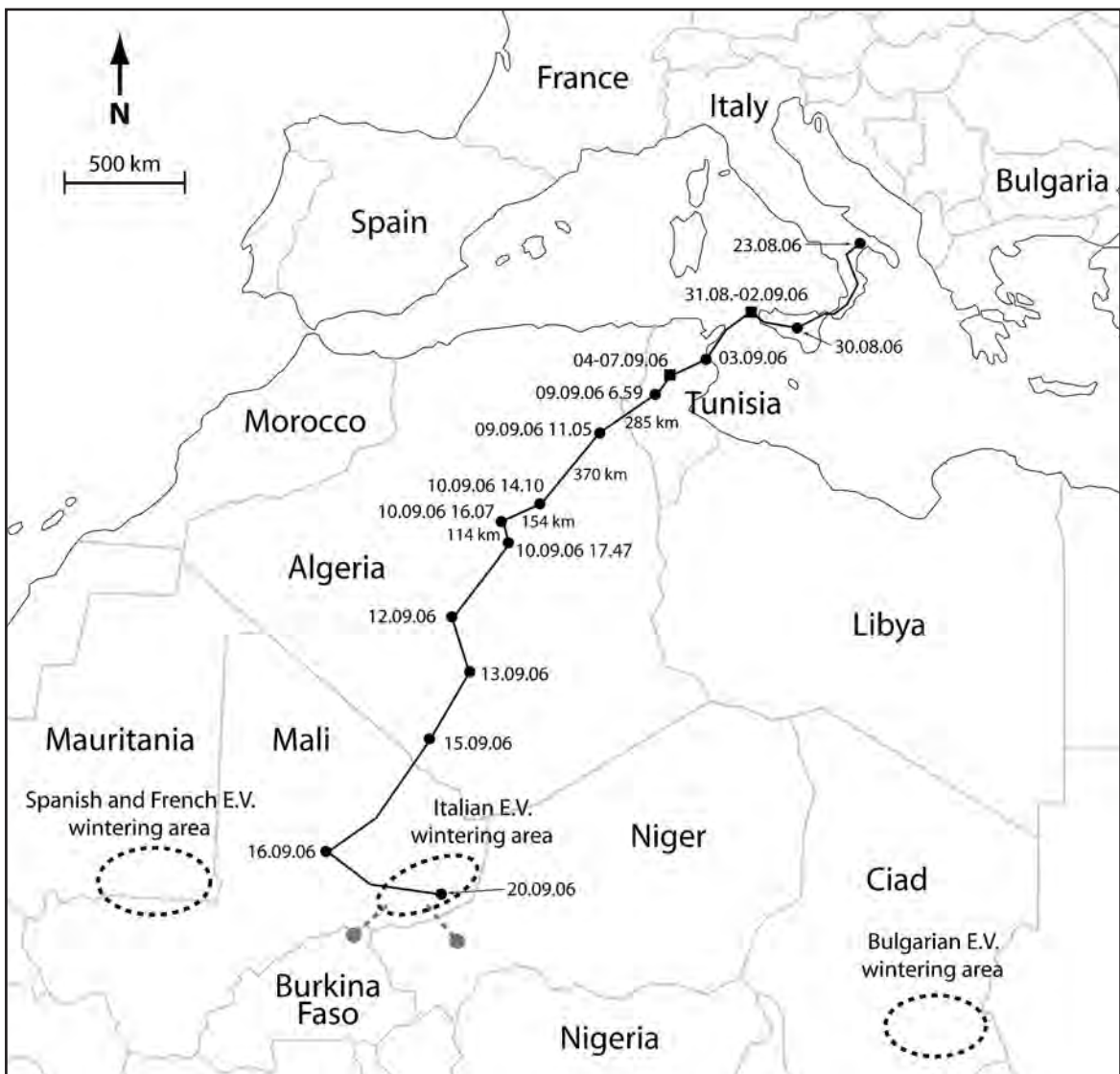


Figure 2. Arianna's migration route and wintering area. The map shows the resting places during migration (squares), the areas visited during the sojourn in Africa (grey) and the wintering areas of the Spanish, French and Bulgarian E. vultures (Benitez *et al.* 2004, Meyburg *et al.* 2004).

tre at 15°93'N/1°47'E. These two core areas are located on the east side of the Niger river, not far from the village of Menaka (Gao region). Within this area, Arianna moved only short distances. On 3 October she left the area of Menaka, crossed the border and reached the furthestmost point from its home range in Niger at 14°12'N/4°73'E. She came back 6 days later, covering a total distance of 940 km. On 28 January she moved to the southwest crossing the Niger river and reaching Burkina Faso. She spent there three days at 15°N/0°2'W. She flew back on 6 February, covering a total distance of about 203 km.

DISCUSSION

Autumn migration

The two young vultures left the hack site on 23 August 2006, 17 days after fledging. This is in agreement with the beginning of the migration of four other nestlings born in captivity and released in Tuscany and Puglia in 2004 and 2005. These four birds left the hack site between 22 August and 7 September, 12-16 days after fledging. The migratory route coincided with the route followed by almost all the wild Italian Egyptian vultures. Messina Strait

and Marettimo Island (Egadi, west off Sicily) are in fact the two main crossings for their migration (Agostini *et al.* 2000, 2004). On 1 September, Arianna arrived in Marettimo and Barbara arrived in the neighbourhood of the island. On 2 September, a mixed-age flock composed of 4 adults and 3 young E. vultures was sighted by several people over Marettimo (Vaccaro V., pers. com.). Laerte, a male born in captivity and released in Puglia in 2004, was sighted over Marettimo on 2 September 2004 in a flock of three adults. One day later Laerte left the island towards Tunisia together with eight adults (Mastropasqua F., pers. com.).

It's not sure but Barbara probably failed its migration attempting crossing the Sicilian Channel. Anyway the survival of only one of the two released young vultures would be lined up with the percentage of surviving Spanish E. vultures during the first migration (Benítez *et al.* 2004).

Wintering areas

The satellite tracking of Arianna has allowed to discover the location of the Italian born in captivity Egyptian vultures' wintering grounds in central-east Mali. These grounds add to the two wintering areas up to now known for some European Egyptian vulture populations (Fig. 2): the border area between south-east Mauritania and Mali for the Spanish and French Egyptian vultures (Benítez *et al.* 2004; Meyburg *et al.* 2004) and south-east Chad for the Bulgarian ones (Meyburg *et al.* 2004). Arianna's wintering ground seems to extend more or less on the same latitude as the Spanish and French tracked vultures' wintering grounds, i.e. between 14N° and 17N°.

Conservation implications

The results of this study as well as the visual observations of Laerte in 2004 are encouraging though other trial releases are necessary to finally demonstrate that Egyptian vultures born of Spanish parents in captivity are fit for wild life and can set out the right migratory route towards Africa.

For finding the right way during migration, adult vultures may play a basic role. The vicissitudes of Laerte and Arianna (unpublished) confirms what previous observations of mixed-age flocks suggested: the young vultures probably learn the migratory route by following adult birds during their first migration (Agostini *et al.* 2000, 2004). Therefore, the survival of the species in Italy can be favoured by plans of continuous and timely releases. Young do have the possibility of meeting and following adults.

The migratory route covered by Barbara and Arianna passed through the main protected areas of the Italian Pe-

ninsula (Pollino National Park, Sila Piccola N. P., Aspromonte N.P.) which consequently represent very important sites for the protection of the species. In these areas, it would be useful to create a network of artificial feeding sites in order to support the vultures during the migration and decrease the mortality, especially due to poisoning. This measure, together with the nest guarding, as already been taken in France (Liberatori and Penteriani 2001), should be part of a conservation strategy which seems to be absolutely necessary in order to avoid the extinction of the Italian Egyptian vulture population.

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