

THE PYGMY HIPPOPOTAMUS AT ROME ZOOLOGICAL GARDEN

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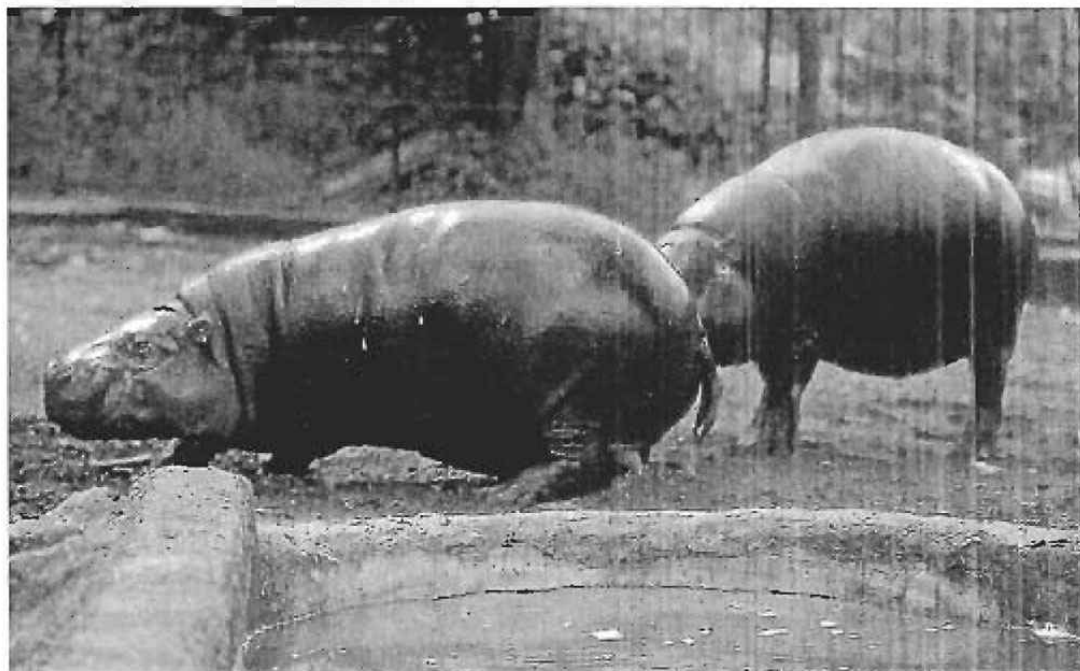
Introduction

The pygmy hippopotamus (*Hexaprotodon liberiensis*) is considered Vulnerable by the 1996 IUCN Red List of Threatened Animals (Baillie and Groombridge, 1996). Nothing is known about the Nigerian subspecies (*H. l. heslopi*), only described in 1969, which could be already extinct (Eltringham, 1993). The nominate subspecies occurs in four countries (Guinea, Sierra Leone, Liberia and Ivory Coast), and it is everywhere decreasing, with the possible exception of Guinea. Captive breeding could play a relevant role in the long-term conservation of the species. However, despite seventy years of breeding history, the husbandry of the pygmy hippo needs to be enhanced to maintain the species in more appropriate physical and social conditions (Eltringham, 1993). Here we report on pygmy hippopotamus maintenance in the Rome Municipal Zoological Garden in the years 1983-1997.

History of the pygmy hippopotamus at Rome Zoo

Rome Zoo received its first pygmy hippo in 1937 from London Zoo. This female (Lond 5) died in 1949, killed by a male common hippo, and not by an adult male of her own species, as reported in the International Studbook (Tobler, 1985). In 1973 a pair of wild-caught individuals arrived from Liberia, but the male survived for only 25 days. The female, Pupa (Lib 62), was housed in the new pachyderm house with both indoor and outdoor areas, including a large indoor heated pool. In 1980 a young male was received from Munich, but he survived for only two months. Another adult male, Omero (Berlin-Z 16), was received in October 1983. The indoor stall was divided by wire mesh to allow the two animals to familiarise with one another. At that time, the outdoor enclosure was used by a black rhinoceros, and it was felt that the indoor land area alone was too small (16 m²) to permit the pairing of the two animals. In April 1984 the two hippos were transferred to the tapir section, where they were given access to two small stalls (2 × 2 m) and a paddock of about 150 m² (hereafter referred to as paddock A), provided with a circular pool three metres in diameter and one metre deep, ramped for easy access. Integration was achieved without problems, but at night one of the animals was locked in the stall. The breeding history of Rome pygmy hippos is summarised in Table 1.

In 1990, the original quarters became too small to accommodate three pygmy hippos (and a growing number of tapirs). Close to the tapir section stood the old pachyderm house, with an outdoor area of more



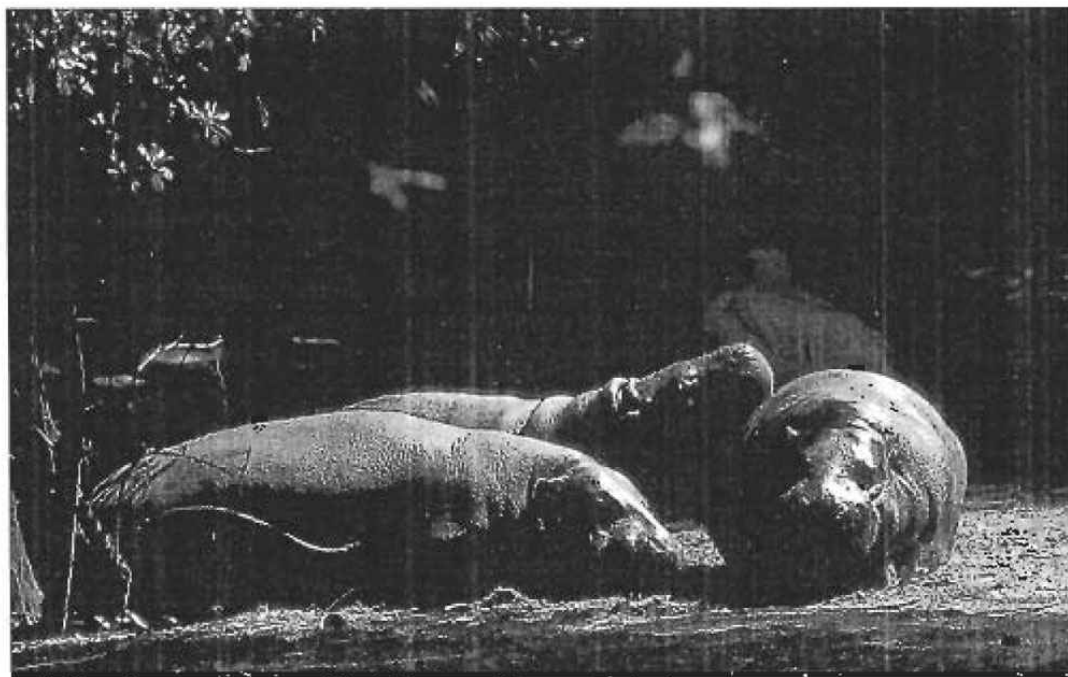
Courtship behaviour in pygmy hippos at Rome Zoo; the male, Omero, is on the left (2 April 1988). (Photo: S. Gippoliti)

than 500 m², then housing pelicans of various species and demoiselle cranes. A stall of about 12 m² was also available, as well as a narrow pool more than 15 m long. So all three animals were transferred there (paddock B). In 1991, owing to repair works in the tapir section, we could not move Pupa into the stall there before she gave birth. We felt that the present stall was not ideal for rearing, and, in fact, the newborn calf was killed by the mother. Eleven months later, Pupa was moved into the tapir section, where she successfully reared a female calf (Francesca). In 1995 it was necessary to divide paddock B because of the impossibility of reintegrating the female Andreina with Omero and Francesca.

Husbandry

The animals were never locked in the sheds, except in very cold weather or in late pregnancy. Mean minimum temperature in Rome is 2.8°C in January, the mean maximum is 30.6°C in August. Mean relative humidity ranges from 87% to 60% during the year. The hippos are fed twice a day, at about 10.00 and 16.00 hours. The staple diet includes lucerne hay (c. 8 kg per animal), carrots, apples and different kinds of vegetable (broccoli, lettuce, endive, fennel etc.). Food is offered either in the sheds or in the paddocks, according to weather or husbandry requirements. It seems advisable to disperse certain kinds of food, e.g. apples, all over the paddock area, to encourage searching activity by the hippos. Occasionally, the hippos have been observed eating the fish destined for the pelicans. The sheds are partially cleaned every morning, and the pools every week. The sheds are not heated, but straw is provided as bedding material. Until now, the only health problem encountered has been the occurrence of boils and abscesses, which have been treated with injections of antibiotics. As suggested by Partridge (1983), these problems seem to be

associated with the cold months of the year, when the hippos do not bathe in the cold water, so that their skin dries up and then flakes. Another medical problem was represented by Andreina's first calf which, at autopsy, was found to have her vaginal tract obstructed.



Omero (on the right), Pupa and Andreina resting together in the sun (April 1991). (Photo: S. Gippoliti)

Discussion

According to Robinson (1970, cited in Eltringham, 1993), the pygmy hippo shows a closer resemblance in its ecology and behaviour to tapirs than to the common hippo, although, in our opinion, it is more adapted to grazing than to browsing. Our experience confirms that the captive habitat requirements of *Tapirus* and *Hexaprotodon* are very similar, and that land area size is of fundamental importance for the welfare of pygmy hippos in zoos. In Rome, the hippos spend much of their time on land, eventually preferring to rest in mud holes, but not in the pool. A similar behaviour pattern is reported in the new exhibit at Melbourne Zoo (Arnott *et al.*, 1994). Reports of animals spending much of their time in water (Rahn, 1978) are probably due to the limited size and *quality* of the land area. Similarly, giving birth in water is rightly attributed by Greed (1982) to the female's 'feeling of insecurity'. Killing of offspring by the mother may have the same origin; Pupa killed her calf on the only occasion when she had not been transferred to the shed in the tapir section. It should also be stressed that solitary species are not necessarily asocial. We had no problems in keeping together small family groups consisting of the adult pair, a subadult, and a juvenile (both females). It was not an unusual sight to see three hippos resting together in the mud (see photo, above). Serious fighting occurred only between Andreina and her father in 1995, and again in May 1996 (due mainly to the presence of the younger female Francesca). It seems likely that females develop

a social hierarchy that can be broken up when separation for giving birth occurs. Housing of adult pygmy hippos of the same sex in adjoining enclosures may result in higher levels of aggressive and stereotyped behaviour, and possibly maternal behaviour can be compromised.

We feel that, although still not ideal, the husbandry and housing of pygmy hippos in Rome is a step towards the better management of the species in captivity. Improvements in the housing in Rome should include a deeper and wider pool in paddock B and enlargement of the indoor areas. In particular, a heated small pool or shower should be available in the sheds. Up to now, the major disappointment has been Andreina's failure to rear her calf. Although unsuccessful rearing is common in primiparous females, Andreina showed a high degree of aggressive and stereotyped behaviour towards her mother, housed in paddock B, while in the meantime neglecting the calf.

Conclusions

Hexaprotodon liberiensis is an endemic and endangered species of the Upper Guinean forest, a region recognized as both an EBA (Endemic Bird Area) and a 'hotspot' for plant biodiversity conservation (Myers, 1990; Stattersfield *et al.*, 1998). Therefore this taxon could serve as a flagship species for one of the most rich and threatened biota on earth. There is a great potential to create multispecies exhibits mixing pygmy hippo with other West African species, as was recently done in Melbourne Zoo (Arnott *et al.*, 1994). Endemic taxa of the Upper Guinean block suitable for this purpose include ursine colobus (*Colobus polykomos*), both subspecies of diana monkey (*Cercopithecus diana*), white-breasted guineafowl (*Agelastes meleagrides*) and brown-cheeked hornbill (*Ceratogymna cylindricus*). Focus on this region may also lead to support of field efforts which are critical for the survival of the pygmy hippo in the wild. In particular, the distinctive relict Nigerian population may still survive in a little-known area which has revealed many surprises in recent years (Powell, 1997), and therefore deserves the urgent involvement of the zoo community in conservation activities in the Niger Delta. On the *ex situ* side, although it is not possible at present to suggest definitive guidelines for the management of the species, we propose that more adequate housing than usually described (e.g. Stroman and Slaughter, 1972) is necessary to achieve the welfare of the pygmy hippo and to enhance the 'exhibition value' and fulfil the educational potential of this species in zoos.

Acknowledgements

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Table 1. Births of pygmy hippo at Rome Zoo.

Name	Sex	Parents	Born	Died (or left zoo)
–	F	Omero & Pupa	13.03.86	17.03.86
Alfiero	M	Omero & Pupa	13.11.86	21.03.88(sold)
Andreina	F	Omero & Pupa	16.10.88	–
–	M	Omero & Pupa	17.01.91	17.01.91
Francesca	F	Omero & Pupa	18.12.91	–
–	F	Omero & Andreina	02-09-94	21.09.94
Nicola	M	Omero & Pupa	27.01.95	17.03.97 (breeding loan)
–	–	Omero & Francesca	01.10.97	(abortion)