



Genetic diversity maintained even after long-term captive breeding of the endangered pygmy hog

Hyderabad, 21st October, 2021: Pygmy hogs are one of the rare and endangered animals listed by the International Union for the Conservation of Nature (IUCN) and the Indian Wildlife Protection Act. The present population, including reintroduced animals, is estimated to be less than 300 in wild. The original population, which became restricted to a single locality, the Manas National Park in Assam, India, may number lesser than 50.

Efforts to save this species from extinction includes protection of its only habitat and by breeding the animals in captivity. These are undertaken by the Pygmy Hog Conservation Program (PHCP), a collaborative project with Durrell Wildlife Conservation Trust, IUCN/SSC Wild Pig Specialist Group, Forest Department, Government of Assam, the Ministry of Environment and Forests, Government of India, EcoSystems-India and Aaranyak as the key partners. Since 1996, over 500 individuals have been bred successfully and 142 captive born individuals have been released into wild as part of the conservation program. However, all these captive individuals were offspring of 7 wild caught individuals. One of the major challenges of long-term captive breeding program is to maintain genetic diversity within a population, over several generations. The loss of genetic diversity could arise from inbreeding due to mating between related individuals within a population, established with a very few founders.

CSIR-CCMB-LaCONES (Laboratory for Conservation of Endangered Species) and Pygmy Hog Conservation Programme collaborated to examine reproductive and genetic fitness of these captive bred individuals. The research group headed by Dr. G. Umamathy at CSIR-CCMB LaCONES studied genetic changes in 36 captive-bred pygmy hogs over time across eight consecutive generations. They also tested the association between genetic diversity and reproductive success to account for any fitness loss.

The study found no overall signs of genetic inbreeding between individuals across different generations. “This is possible due to strict scientific conservation breeding protocol by the Programme. They had carefully selected mating pairs that share the lowest kinship between them. But the recent generations show slightly increased relatedness. So, we recommend introduction of a few wild individuals to the breeding pool”, said Dr Umamathy.

“We carefully selected unrelated mates and bred them in separate family lines. We are glad that this study has provided evidence that it is possible to avoid genetic inbreeding in a small captive population even if the founder population is very small if strict protocol is followed year after year”, mentioned Dr. Goutam Narayan of PHCP and EcoSystems-India.

“This is the first such study on Indian animals to understand genetics effect of long-term captive breeding of endangered animals. The outcomes of the study will guide the management and optimization of breeding protocol in PHCP and other similar conservation breeding programs”, said Dr Vinay K Nandicoori, Director, CCMB.

The lead author of the study is Dr. Deepanwita Purohit and the other authors include S. Manu, M. S. Ram, S. Sharma, and H. C. Patnaik from CCMB, and Parag J. Deka, and Goutam Narayan from Pygmy Hog Conservation Programme.

Purohit D, Manu S, Ram MS, Sharma S, Patnaik HC, Deka PJ, Narayan G, Umapathy G. 2021. Genetic effects of long-term captive breeding on the endangered pygmy hog. PeerJ 9:e12212 <http://doi.org/10.7717/peerj.12212>

Fig. 1 Pygmy hog family at pygmy hog breeding and conservation centre, Guwahati.