

Description of a new great ape species, the Tapanuli orangutan in Indonesia

An international team of researchers has just described¹ a new great ape species, the Tapanuli orangutan (*Pongo tapanuliensis*), found in upland forests in North Sumatra in Indonesia. With no more than 800 individuals, this species is the most endangered great ape.

An international team of scientists described the new species in *Current Biology*, based on morphological and extensive genomic evidence. The new orangutan species, *Pongo tapanuliensis*, or Tapanuli orangutan, is endemic to the three Tapanuli districts of North Sumatra, Indonesia and occurs in roughly 1,100 km² of upland forest in the Batang Toru Ecosystem.

“Despite nearly 50 years of orangutan research in Sumatra, the Batang Toru population was only ‘rediscovered’ in 1997, during a series of field surveys” says Prof. Erik Meijaard, who carried out the initial survey south of Lake Toba looking for orangutan populations. In 2005, the Sumatran Orangutan Conservation Programme (SOCP) and other non-governmental organizations intensified previous research and conservation efforts on the orangutans in the Batang Toru Ecosystem, together with several universities, and Indonesian authorities. As a part of this effort, a research station was established in 2006 by SOCP, allowing for a more detailed look at their behavioral ecology and genetics.

It was not until 2013, however, when skeletal material from an adult male orangutan killed in a human-animal conflict became available, that SOCP’s Matthew Nowak and colleagues realized the uniqueness of the Batang Toru population. “We compared this skull to other orangutan skulls.” states Anton Nurcahyo, an Indonesian PhD student from the Australian National University. “We were completely surprised to find that the skull is quite different in some characteristics from orangutan skulls we had seen before”. While this suggested that the Batang Toru population was potentially unique, much stronger evidence was required to actually determine whether the Batang Toru orangutans were indeed a different species. This was achieved by the largest genomic study of wild orangutans to date which has been made possible by decades of data collection at most of the field sites where orangutans are studied.

“For quite some time, we had been working on genomic data to investigate the genetic structure and evolutionary history of all existing orangutan populations” say Drs Maja Mattle-Greminger and Alexander Nater, responsible for the genomic analyses at the University of Zurich. “One consistent result was that we identified three very old evolutionary lineages among all orangutans, despite only having two species currently described”.

“When we realized that Batang Toru orangutans are morphologically different from all other orangutans, the pieces of the puzzle fell into place” adds Prof. Michael Krützen from the University of Zurich and responsible for the study. “The oldest evolutionary line in the genus *Pongo* is actually found in Batang Toru orangutans, which appear to be direct descendants of the first Sumatran population in the Sunda archipelago.” Extensive computer modelling carried out by Dr Nater, aimed at reconstructing the population history of orangutans, revealed that the Batang Toru population appears to have been isolated from all other Sumatran populations for at least 10-20’000 years, after which the low levels of influx of males from the northern populations had ceased. Adding additional evidence based on behavioral observations and ecological surveys from Batang Toru and other sites provided further support for the morphological and genetic findings. “It is very exciting to describe a new great ape species in the 21st century, although what must be the highest priority now is protecting this new species” caution the scientists.

A recent independent study² by Indonesian and international scientists indicated that no more than 800 individuals remain in the Batang Toru Ecosystem. With only 800 individuals alive, Tapanuli orangutans are therefore the most endangered great ape species. Conservationists have drawn attention to the fact that urgent action is required to carefully review current proposals for further developments in the area that would threaten the livelihood of the new species. There is strong anthropogenic pressure on the Tapanuli orangutan due to conversion of pristine forest for mining, plans to build a hydro-electric dam, hunting, and general human encroachment. "If steps are not taken quickly to reduce current and future threats to conserve every last remaining bit of forest" the scientists point out, "we may see the discovery and extinction of a great ape species within our lifetime."

References:

¹ Nater, A. *et al.* (2017). Morphometric, behavioral, and genomic evidence for a new orangutan species. *Current Biology*.

² Wich, S *et al.* (2016). Land-cover changes predict steep declines for the Sumatran orangutan (*Pongo abelii*). *Science Advances* 2(3), e1500789, DOI: 10.1126/sciadv.1500789.