Thinnest eggs belonged to largest Moas

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Giant Haast's eagle attacking New Zealand moa. Artwork: John Megahan. Copyright: PLoS Biology. Via Wikipedia.

(PhysOrg.com) -- In a detailed online study published by the *Proceedings of the National Academy of Sciences* on August 30th, scientists investigate questions surrounding New Zealand's moa eggs and the results are mystifying.

The 10 known species of moas, extinct relative of the ostrich and emus, were believed to be widely diverse in size varying from a small turkey-size to eight feet tall and beyond. For over a century, scientists and esteemed colleagues have studied 36 delicate, thin-shelled eggs, discovering a few of which belonged to two of the largest, heaviest flightless bird species. Scientists scrutinized DNA from various moas found throughout New Zealand and compared each to eggshells. Their findings concluded the two thinnest eggshells belonged to the largest,

heaviest female moas, *Dinornis robustus* and *Dinornis novaezealandiae*.

This begs the question, how did these giant creatures incubate such delicate eggs -- without breaking them?

With shells ranging from only 1.41-1.06 millimeters thick, it seems implausible for an adult female moa, weighing more than 550 pounds, to safely and effectively incubate such fragile eggs.

One theory based on trace DNA evidence is that male moas, weighing in at around 165 pounds, might have been responsible for incubation and caring for the young, much like the ostrich and emu. Though, it's been said the process would have been very difficult and hasn't yet been proven. Out of the 3,434 bird species studied both living and extinct, moa eggs are the most vulnerable to breakage, thus adding to the possibility that they had very unusual nesting habits.

Researcher David Lambert, an evolutionary biologist at Griffith University in Australia who was part of the investigation, told Live Science that moa nests weren't uncommon in the way they were built. With nothing but a mere scrape in the ground surrounded by a thin layer of twigs and leaves, this is something else the moas might have had in common with ostrich and emu relatives. Lambert also added it's been thought the moas may have curled around the eggs to warm them, instead of sitting directly on top of them to keep from obliterating their unborn offspring.

Moas were killed off into extinction once the Maori colonized in New Zealand in the late 13th century, but their size mixed with curious incubation and nesting habits are a mystery scientists hope to someday solve for good.

More information: Ancient DNA reveals extreme egg morphology

and nesting behavior in New Zealand's extinct moa, *Proceedings of the National Academy of Sciences*, Published online before print August 30, 2010, doi:10.1073/pnas.0914096107