

Flightless Birds

by: Oliver Haddrath
Technician, Ornithology
Royal Ontario Museum

[Animated ROM logo appears with sound sting]

[Camera shot of map of flightless birds in all the different regions of the world, and as Oliver talks, he gestures to different images of birds on the map]

One of the most problematic groups there, in ornithology, are the large flightless birds. The moa was the tallest of the large flightless birds, it's found in New Zealand. *[picture-in-picture images of a kiwi, a cassowary, an emu, an ostridge and a rhea]* The kiwi's found in New Zealand too; the cassowary and emu are found in Australia; the ostridge is found in Africa, and the rhea are found in South America. As you can see, these birds are very widely distributed across the world, and there are no obvious land bridges how these large, flightless birds could have actually spread from one place to another. And that's why, for early ornithologists, they were a real difficulty, and many ornithologists didn't think they were closely related to each other. But in the last thirty years, a lot of DNA markers have actually indicated that they are in fact each other's closest relative. *[picture-in-picture image of a graph of a mitochondrial genome, with text, "Mitochondrial Genome is used to track maternal inheritance" next to it]* One of the projects we did here at the Royal Ontario Museum is we sequenced the complete mitochondrial genome, from every single one of these birds - or a representative of every single one of these birds - and from two extinct moas. We reconstructed their family tree and using molecular data, we worked back to when their common ancestor was. *[animated image of a rotating planet Earth, showing the gradual movement of today's land masses to form the super-continent Gondwana. Beside this graphic is a scale denoting the passage of millions of years]* And their common ancestor existed something like 80 to 90,000 million years ago, when all the continental fragments you see now where joined as a super-continent called Gondwana. And as Gondwana broke up, and the fragments such as Africa and South America broke away, the large flightless birds that were on them, rafted away with the land masses and then evolved into their modern forms.

[Video ends with animated ROM logo and sound sting]