Dinosaurs May Have Been Smaller Than We Thought: New Study

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(PhysOrg.com) -- For millions of years, dinosaurs have been considered the largest creatures ever to walk on land. While they still maintain this status, a new study suggests that some dinosaurs may actually have weighed as little as half as much as previously thought.

In the study, published this week in the *Journal of Zoology*, Geoffrey Birchard, associate professor of environmental science and policy at George Mason University, was part of a team which uncovered a problem with the statistical model used by some scientists in the dinosaur community to estimate the mass of dinosaurs.

"The original equation used by scientists produces fairly accurate results when determining the mass of smaller animals, but when used on larger animals our research shows that many errors have occurred," says Birchard. "The new equation shows that dinosaurs are much smaller than we thought, but there is no mistaking that they were indeed huge animals."

Developed in 1985, the results of the original equation have been used by scientists to estimate or evaluate a variety of parameters, including brain size and egg size. The problem occurs as a result of transforming the data, which changes the properties of the original data, and creates biases that can affect the predictive results obtained from the equation.

Birchard and his colleagues realized there was an error when they used the equation to determine the weight of living animals such as a

hippopotamus and an elephant and discovered that the equation greatly overestimated the weight of these animals.

The researchers developed a new equation for calculating dinosaur mass based on bone dimensions. This equation doesn't require the transformation of data that the original equation uses.

"The best way to understand the new equation is to think about a building that is built on pillars,"
says Birchard. "The bigger the building, the larger the pillars must be to support the weight of the building. In the same way, the legs of an animal are the pillars supporting its body."

According to Birchard, this new research suggests that some dinosaurs were much more slender than had been thought. It also changes many of the factors scientists have already determined about dinosaurs such as the amount of muscle required to use their bodies and how much they ate and breathed.

More information: "Allometric equations for predicting body mass of dinosaurs" is published in the Journal of Zoology.

Source: George Mason University