



Big horns trump smooth pickup lines every time

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EAST LANSING, Mich. — Elk and rhinoceros beetles aren't diabetic, but to grow big horns and attract mates it appears that the males are insulin-dependent.

Ian Dworkin, Michigan State University zoologist, was part of a team that for the first time ever showed why horns – from elk to rhinoceros beetles – and other decorative, mate-attracting structures are sensitive to changes in nutrition. As reported in the current issue of *Science*, the key ingredient for this growth is insulin, Dworkin said.

"Clearly elk antlers, peacock tail feathers and beetle horns are very different, but it appears that they do share similar mechanisms to make these structures so big," he said. "And lowering insulin levels dramatically reduced the size of their ornate structures."

Sexual selection has roots back to Darwin's research. Subsequent research revealed the so-called "handicap principle," which labeled the males as burdened for toting such unwieldy baggage. Dworkin's team, however, believes that when insulin-dependence is part of the picture, the showy males are not in fact handicapped. Instead this insulin-dependence of these big horns provides a way for the males to show how great they are.

"It's a sign that these males are thriving, made of some pretty sturdy stuff and certainly mate-worthy," said Dworkin, who conducted the research at [BEACON](http://beacon-center.org/) (<http://beacon-center.org/>), MSU's National Science Foundation Center for the Study of Evolution in Action.

Dworkin and the team determined that each time such exaggerated traits evolve, they repeatedly, but independently, seem to use insulin-dependence. This suggests that the traits are more likely to have evolved as honest indicators of quality rather than handicaps.

"While more work needs to be done, our results provide an important way of linking genetic mechanism with the ultimate evolutionary reason for the trait exaggeration," Dworkin said.

Researchers from the University of Montana and Washington State University contributed to this study.

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Lowering insulin levels dramatically reduces size of beetle horns, elk antlers and peacock tail feathers. Photo courtesy of MSU.

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