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'Secondary' sex characters may be behind evolution of new species

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Washington, August 26 (ANI): Two biologists at Indiana University Bloomington say that sometimes secondary sex characters - which improve a creature's chances of finding a mate - may also drive the reproductive separation of populations, and the evolution of new species.

The researchers say that the beetles have diverged significantly in the size of the male copulatory organ, and natural selection operating on the other end of the animal-horns atop their heads-seem to be driving it.

Biologists have known that in these beetles there is an investment trade-off between secondary sexual characters and primary sexual characters. As horns get bigger, copulatory organs get smaller, or vice versa. What was not known was how frequently and how fast this can occur in nature, and whether this can drive the evolution of new species, Moczek said.

Structures directly involved in mating are known as primary sexual characters, whereas combat structures like horns are known as secondary sexual characters, according to background information in a research article in the online edition of the journal Evolution.

Evolutionary biologists believe changes in copulatory organ size and shape can spur speciation by making individuals from different populations sexually incompatible.

For their study, Moczek and Parzer studied four O. taurus populations in the U.S. (North Carolina), Italy, and western and eastern Australia.

The researchers found that the four populations exhibited substantial changes in both horn and genitalia length.

They further examined 10 other Onthophagus species, and found vast differences between the species regarding horn and male copulatory organ size.

Based on those observations, Moczek said that that suggested that trade-offs between primary and secondary sexual traits continued to shape the way species diverged well after speciation had occurred.

In terms of the integrity of a species, it's important for these things not to change too much. So there is a lot of evidence suggesting that within species or within the populations of species, natural selection maintains genital characters. But if these primary sex characters are linked to other characters that can change readily, then you've got what we think is a very exciting mechanism that could prime populations for reproductive isolation,



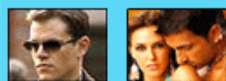
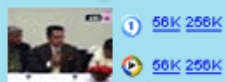
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Moczek says.

The researcher says that horn length and shape can change for many reasons.

Moczek says that among densely populated species, fighting may not be an effective strategy for winning mates.

As combative males fight each other, the researcher adds, a smaller-horned male could simply employ a sneaking strategy to gain access to unguarded females.

Under such circumstances, reduced investment in horns seems to result in larger copulatory organs.

In lower density populations, where most male beetles spend a great deal of time fighting, longer horns could serve them well, and also lead to smaller genitalia.

If this is all it takes to change genitalia, it may be easier to make new species than we thought, Moczek said. (ANI)

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