NOTE

An Interesting Deformity in *Alobates pennsylvanica* (DeGeer), 1775 (Coleoptera: Tenebrionidae)[1]

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Alobates pennsylvanica (DeGeer) is one of the largest (20 - 23 mm) and most familiar tenebrionids (Coleoptera: Tenebrionidae) in the eastern U.S. These conspicuous black beetles are generally encountered under the bark of dead trees or inside old stumps and fallen logs where both larvae and adults feed primarily on other insects (Dillon and Dillon 1972, p. 473, *In* A Manual of Common Beetles of Eastern North America, Dover Publications; Arnett 2000, p. 468, *In* American Insects, CRC Press). During a survey of saproxylic beetles in South Carolina by MDU, an unusual specimen of *A. pennsylvanica* emerged from a section of wood taken from the base of an ~11-month-old sweetgum (*Liquidambar styraciflua* L.) snag (33°8.641' N, 81°40.162' W). Verbatim label data are as follows: USA, SC, Barnwell Co.; Savannah River Site; Bmland hardwood for.; ~11 month old logs; 8-V-07, SS4 L; Coll: MD Ulyshen.

This particular specimen is unique because it has a mutation resulting in the development of supernumerary ectopic femora on the right prothoracic leg, all originating from the same trochanter (Fig. 1). Only the most dorsad femur is fully formed and articulated with a normally developed tibia and tarsus. The remaining 2 femora are fused along the basal half of their lengths and vary from each other in their relative sizes and development. The posteroventral femur is nearly as long as the normal dorsal femur and includes a fully articulated femoro-tibial joint and the basal 1/8 of a rudimentary tibia. The poorly developed anteroventral femur is the smallest of the 3 and includes a well-developed apex with a prominent socket, but no vestigial tibia is visible inside the aperture.

Ectopic legs are the result of a genetic mutation in one or more genes involved in ventral appendage formation and elongation during normal development. In *Drosophila*, ectopic leg duplication may be caused by aberrant expression of any number of genes, including *Distal-less* (Gorfienkiel et al. 1997, Gen. and Dev. 11: 2259 - 2271), *four-jointed* (Buckles et al. 2001, Dev. 128: 3,533 - 3,542), and *teashirt* (Erkner et al. 1999, Dev. Biol. 215: 221 - 232), among others. Generally, this mutation results in the development of rudimentary supernumerary appendages which may originate from

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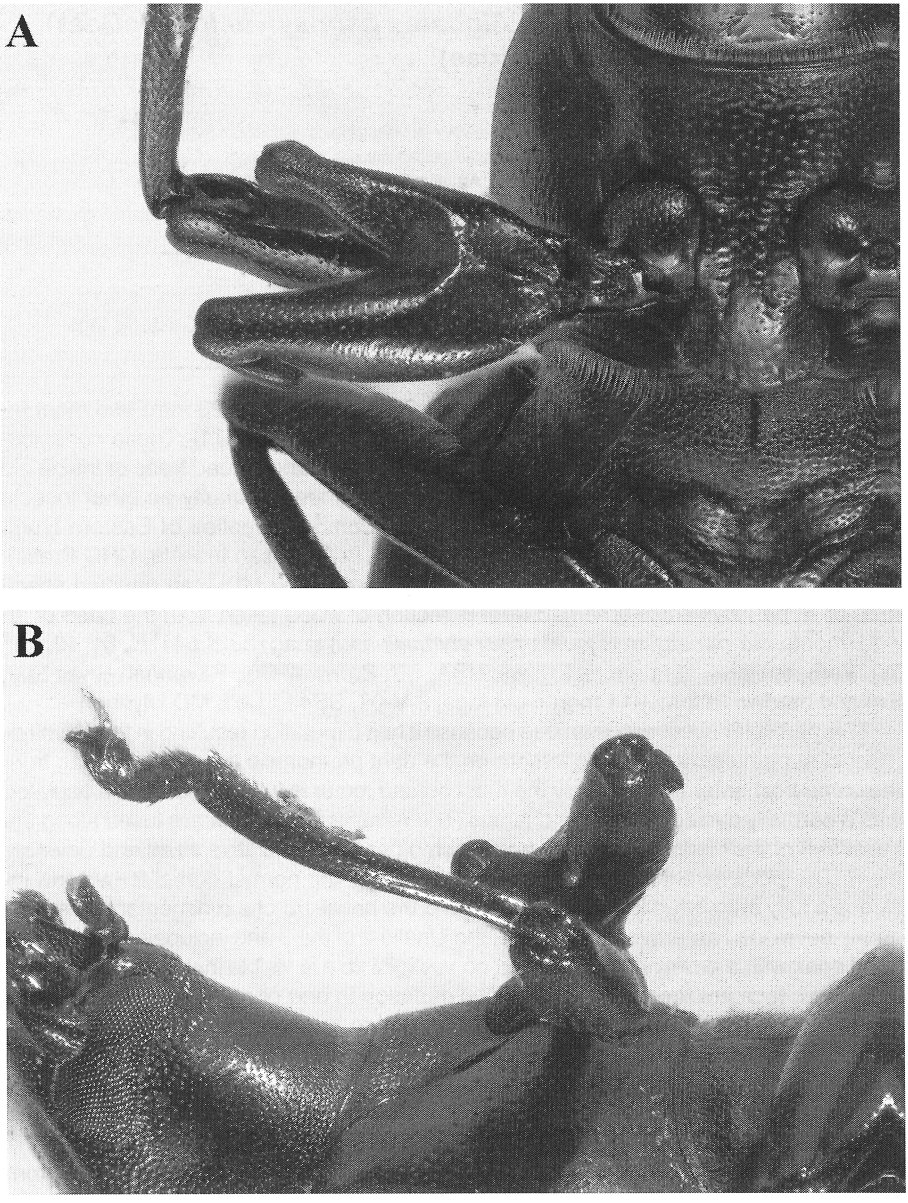

Fig. 1. Right prothoracic leg deformity in an adult of *Alobates pennsylvanica* (DeGeer). (A) Ventral view. (B) Lateral view.

the same domain as their normal counterparts, and some genetic mutations can cause leg development from nonlocomotory appendages such as antennae (caused by mutant expression of the gene *Antennapedia*) (Gorfienkiel et al. 1997).

Within Coleoptera, ectopic appendage development as a result of genetic mutation has only been discussed in *Tribolium castaneum* (Herbst), and even then only in the embryonic and larval stages (Brown and Denell 1996, Cell and Dev. Biol. 7: 553 - 560; Brown et al. 2002, Mol. Phyl. and Evol. 24: 384 - 387; Patel et al. 2007, Dev. Biol. 309: 56 - 69). This finding is not surprising given that *T. castaneum* has quickly become the *Drosophila*-equivalent model for genetic studies in beetles. We were unable to locate any records for leg ectopia in adult beetles, particularly those that were field-collected, so this note may in fact constitute the first specific record of such a mutation in any adult beetle.

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