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Six legs good

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Hexapods - six-legged arthropods that include all the insects and a few allied groups - have long been assumed to be a monophyletic group, whose evolutionary tree, if traced to its single [ancestral root](#), would include every member of this vast and varied taxon. In the March 21 issue of [Science](#), Francesco Nardi and colleagues at the [University of Siena](#), Italy, show that at least one hexapod group, the Collembola, diverged from the insect line even before lobsters and crabs did, and their development of a matching body plan is likely to be the result of convergent evolution rather than direct ancestry (*Science*, **299**:1887-1889, March 21, 2003).

Nardi *et al.* performed whole-mitochondrial sequencing on *Gomphiocephalus hodgsoni* (a collembolan) and an insect with ancient roots, a member of the Zygentoma order. They combined these data with published sequences for 33 other arthropods to create a phylogenetic tree showing the most likely lineages and branching points. The Collembola, Insecta, and Crustacea all diverged early from other arthropods groups. The collembolans split off first, leaving insects and crustaceans to evolve together before they too diverged.

The authors suggest that the parallel development of a three-segment body plan with six legs in both insects and collembolans represents a convergent arrival at the same solution to living on land.

References

1. Analysis of molecular marker expression reveals neuronal homology in distantly related arthropods.
2. *Science*, [<http://www.sciencemag.org>]
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