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## Current Controversies

### IS TAXONOMY REALLY SCIENTIFIC?

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If the diagnostic characteristic of “science” is the construction of hypotheses and theories that are based on, and testable by observations, then some of the traditional methods of taxonomy bring its scientific nature into question.

The delimitation of new species, the determination of relationships, and the construction of phylogenies are all hypotheses that should be objectively testable especially by others, if the hypotheses are to be considered scientific. The observational evidence for taxonomy is characters that are compared among taxa, whether they be morphological, ecological, behavioral, or molecular. Thus, the crucial feature of taxonomy must be in the comparison of those characters. For example, it should be expected that members of a species share more than a single distinctive character, that members of higher taxa also share several distinctive characters, or conditions derivable from those characters. Surely the vast majority of taxonomists state these facts explicitly in their diagnoses and their discussions of relationships.

But do taxonomists otherwise present their characters in a way that would facilitate testing by other interested taxonomists of those hypotheses using the same characters? The traditional method of taxonomy is the paragraphic diagnosis and description, but this method makes it extremely time consuming for anyone else to check the distribution of characters used by a taxonomist in erecting hypotheses. For example, merely to determine if a diagnostic character of a species character is indeed unique, one must wade through many pages of descriptions of all species of the genus. This becomes virtually impossible in a large taxon such as *Melanoplus* which has hundreds of species, even if all the species were adequately described (and the majority are not). The same problem is encountered when one wishes to test hypotheses of relationship using other characters in the descriptions, or to identify convergence in various characters. The same