

Cladistic Analysis: Determination of Character State Polarity

The approximately 480 species of *Harpalus* occur in a total of four faunal regions (Noonan 1976), and many are in inadequately sampled areas of the world. The multitude of species and the current impossibility of obtaining adequate samples of many of them make a worldwide cladistic analysis impossible. The present analysis is therefore restricted to the 39 native species of North America north of Mexico that are not in the subgenera *Glanodes* or *Pseudophonus*.

To conduct such an analysis, it was necessary to formulate hypotheses specifying the apomorphic and plesiomorphic states for characters used in the study. Watrous & Wheeler (1981) have demonstrated the importance of out-group comparison for determining polarity of characters. To determine character state polarity for the present study, I treated the native species of North America north of Mexico as an initial taxonomic in-group and 44 Palearctic species of *Harpalus* (see Table 2 for list) as a taxonomic out-group. I also made use of data gathered during a continuing cladistic analysis of genera and subgenera presently placed (Noonan 1976, 1985a, b) in the Harpali Group of the subtribe Harpalina and thought to be related to *Harpalus*. Examination of adults from these functional taxonomic out-groups facilitated the present determination of character state polarity. I am aware that the ideal situation would be to examine all 400 or more species of *Harpalus* and all those in a clearly defined sister group. Such a procedure is