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Practice-oriented controversies and borrowed epistemic support in current evolutionary biology: phylogeography as a case study.

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Abstract

Although there is increasing recognition that theory and practice in science are often inseparably intertwined, discussions of scientific controversies often continue to focus on theory, and not practice or methodologies. As a contribution to constructing a framework towards understanding controversies linked to scientific practices, we introduce the notion of borrowed epistemic credibility (BEC), to describe the situation in which scientists exploit fallacious similarities between accepted tenets in other fields to garner support for a given position in their own field. Our proposal is based on the analysis of a recent controversy in phylogeography, a biological subdiscipline concerned with the study of the historical causes of variation in genetic diversity within species in concrete biogeographical locations. Through a review of the arguments that support the two conflicting phylogeographic schools, we show that ‘theory’ plays essentially no role as a foundation of the controversy, whereas both sides borrow epistemic credibility from sources such as formal logic, similarity of results to those in other scientific areas, the authority of prominent scientists, or the presumed superiority of quantitative vs. verbal reasoning. Our case study underscores the indivisibility of theory and practice and provide a means to re-examine important philosophical issues such as the meaning of inference, rationality, justification, and objectivity in scientific practice.

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