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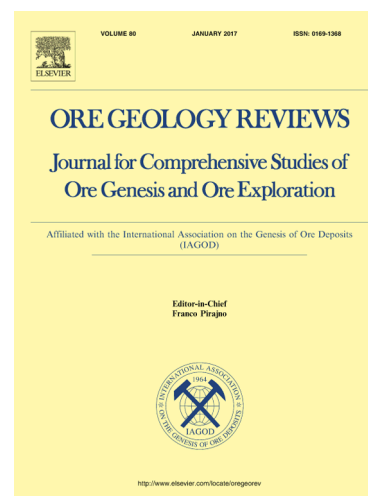
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Discovery and prospecting significance of metal-bearing nanoparticles
within natural invertebrate tissues

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Abstract: Prospecting methods for detecting deep-seated mineralization have become a focus of attention along with the gradual depletion of surface exposures. The correct interpretation of anomalies has always been a major challenge for traditional biogeochemical prospecting. In this study, natural invertebrate samples (earthworms, ants and spiders) were collected from the Chinese Fankou deposit and a background area, and earthworms were also collected in the unexploited areas of the Liushutang and Kangjiawan deposits for comparison. High-resolution transmission electron microscopy (TEM) was used to analyze the nanoparticles contained in the tissues of these invertebrate samples, including the morphological features and chemical compositions. In this report, we present evidence of mineralization-related elements contained within living invertebrate tissues in the form of nanoparticles. Nanoparticles contained in the samples from three ore deposits were dominantly composed of the ore-forming elements of their corresponding deposits, namely, metal-bearing nanoparticles. Nanoparticles from the background area have morphological features similar to the nanoparticles from the ore district, but they show obvious disparities in their chemical compositions, with no special ore-forming elements being detected. Thus, a close relationship between the metal-bearing nanoparticles found in invertebrate tissues and the known ore-body beneath the sampling site was confirmed. Additionally, this research establishes a new method for

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