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Extinct Trogossitidae (Coleoptera) from the Pacific islands

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Our research demonstrates that islands in eastern Polynesia had been inhabited by a rich endemic insect fauna, and that the arrival of humans likely had a catastrophic impact on indigenous species. During sifting of sediments from pits, 3 to 5 m deep, we found and identified fragments of six new species of the trogossitid beetles. The age of samples is estimated to be 1,500 to 4,500 years before the present. These now extinct species were restricted to five isolated islands of the Cook, Austral and Society Island chains. Only one of the islands was inhabited by two species of this taxonomic group. In contrast to their continental relatives from the tribe Trogossitini, they were wingless, and two of them tended to gigantism. One extant new species of the group has been recently discovered in Tahiti. Although the nearest members of Trogossitini are known from Fiji, a molecular analysis based on four genes reveals a surprising relationship between the extant species and Central American fauna. We put the Tahitian species into a 4-gene data matrix comprising 160 cleroids and counted split-events in Cleroidea using a molecular clock calibrated with all known cleroid fossils from the Mesozoic and Cenozoic. The deepest estimated break-off for the Pacific group was about 41Ma, in contrast to a much lower age for the Society Islands, thus making the evolution of the newly discovered group appear convoluted. One feasible hypothesis suggests dispersal by Hawaiian biota, which has previously been demonstrated to be a stepping stone for dispersal in the Pacific. Furthermore, the American-Hawaiian-Societies hypothesis is supported by the significantly greater geological age of the Hawaiian Islands amongst other Pacific archipelagos. There is one more insular, probably recently extinct group of the trogossitid beetles, the genus *Antillipeltis* Lawrence et al., known from two Caribbean islands. Six species have been recently distributed in the Dominican Republic, Haiti and Puerto Rico, and two fossil species are known from Dominican amber. Although all attempts to find the species have been unsuccessful over the past 100 years, it may still be possible to discover some of them in Hispaniola or adjacent islands.

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