

The leggiest animal on Earth lives in the outskirts of Silicon Valley

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This is the habitat of *Illacme plenipes*. Oak forest in California where *I. plenipes* were encountered (composite stitched landscape image of three photos, image sides slightly distorted). Credit: Dr. Paul Marek et al.

With 750 legs, the millipede *Illacme plenipes* is the leggiest animal on Earth. Once believed extinct, scientists rediscovered the species in 2005—more than 80 years after it was first described. This exceedingly rare millipede is known from a single 4.5 km² area in California, and based on new details recently published in the open access journal ZooKeys, the millipede has a beautifully intricate anatomy including the ability to spin silk from long hairs covering its back.

The leggiest animal in the world, the millipede [Illacme plenipes](#), was re-discovered several years ago in California by Paul Marek. Now, Marek and his colleagues provide further details of the surprisingly complex [anatomy](#) of this diminutive creature and its extreme rarity, limited to a handful of spots just south of San Francisco. More details about the

[species](#) and its biology can be read in an article that was recently published in the [open access](#) journal *ZooKeys*.

[Millipedes](#) have the most legs of any [animal group](#). From their [ancestors](#) with just one pair of legs per body segment, [millipedes](#) evolved two pairs (four total) through segmental fusion. This [coalescence](#) of segments happened deep in the [evolutionary history](#) of millipedes, more than 400 million years ago. Four legs provide more thrust on a per segment basis, which benefits millipedes to help them burrow underground—e.g., to escape [predators](#) or access new resources. Those individuals with a coalescence of segments and hence a better burrowing ability, were able to persist in this early primordial ecosystem.

The most noticeable thing about millipedes are their number of legs, which lined up along their bodysides step in synchronous "[metachronal waves](#)". The acme of legginess in millipedes, and all animals for that matter, is the Californian species *Illacme plenipes* (literally meaning "in highest fulfillment of feet"). The females have up to an astounding 750 legs, outclassing the males who only have a maximum leg count of 562. The proliferation of legs may be an adaptation for its lifestyle spent burrowing underground or (based on the presence of features like legs with bifurcate claws and other traits known to be associated with rock-climbing in millipedes) enable it to cling tightly to the sandstone boulders found exclusively associated with the species in its habitat

"This [relict](#) species is the only representative of its family in the Western Hemisphere. Its closest presumed relative, *Nematozonium filum*, lives in South Africa and this early relationship was established more than 200 million years ago when the continents coalesced in the landmass [Pangaea](#)", said the lead author Dr Paul Marek, from the University of Arizona.

Not only is this species the leggiest animal known on the planet, it also has surprising anatomical features: body hairs that produce silk, a jagged

and scaly translucent exoskeleton, and comparatively massive (given its diminutive size) antennae that are used to feel its way through the dark because it lacks eyes. Its mouth, unlike other millipedes that chew with developed grinding mouthparts, is rudimentary and fused into structures that are probably used for piercing and sucking plant or fungal tissues.

This rare and ancient-looking creature's home is California, on the outskirts of Silicon Valley. The species is exceedingly scarce and limited to just a single tiny area near [San Juan Bautista](#), just east of the San Andreas Fault. Based on the known environmental conditions where it lives, the species' probable distribution elsewhere in California was inferred. Yet still restricted to a small geographical range, the analysis indicated other areas of suitability limited to the terrestrial areas on the edge of [Monterey Bay](#) eastward to San Juan Bautista and throughout the [Salinas Valley](#). What's unique about this area, and seems to be correlated with the model's area of highest suitability, is the thick layer of fog that accumulates in the area—like soup in a deep bowl. The fog and the species' unique set of features in its habitat (oak forests, sandstone boulders, and fine sandy soil) make this area a special place and certainly deserving of attention as the home of this rare and superlative beast.

More information: Marek PE, Shear WA, Bond JE (2012) A redescription of the leggiest animal, the millipede *Illacme plenipes*, with notes on its natural history and biogeography (Diplopoda, Siphonophorida, Siphonorhinidae). *ZooKeys* 241: 77. [doi: 10.3897/zookeys.241.3831](https://doi.org/10.3897/zookeys.241.3831)

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