

SUMMARY

Like all spiders, tarantulas (family Theraphosidae) synthesize silk in specialized glands and extrude it from spinnerets on their abdomen. In one species of large tarantula, *Aphonopelma seemanni*, it has been suggested that silk can also be secreted from the tarsi but this claim was later refuted. We provide evidence of silk secretion directly from spigots (nozzles) on the tarsi of three distantly related tarantula species: the Chilean rose, *Grammostola rosea*; the Indian ornamental, *Poecilotheria regalis*; and the Mexican flame knee, *Brachypelma auratum*, suggesting tarsal silk secretion is widespread among tarantulas. We demonstrate that multiple strands of silk are produced as a footprint when the spider begins to slip down a smooth vertical surface. The nozzle-like setae on the tarsi responsible for silk deposition have shanks reinforced by cuticular thickenings, which serve to prevent the shanks' internal collapse while still maintaining their flexibility. This is important as the spigots occur on the ventral surface of the tarsus, projecting beyond the finely divided setae of the dry attachment pads. We also reveal the structure and disposition of the silk-secreting spigots on the abdominal spinnerets of the three tarantula species and find they are very similar to those from the earliest known proto-spider spinneret from the Devonian period, giving another indication that silk secretion in tarantulas is close to the ancestral condition.

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