

New protein found in strongest spider web material

July 26 2019, by Bob Yirka



Credit: CC0 Public Domain

A team of researchers affiliated with several institutions in the U.S. and

Slovenia has found a previously unknown protein in the strongest known spider web material. In their paper published in the journal *Communications Biology*, the group describes their study of Darwin's bark spider silk and the glands that produce it.

Humans have been impressed by the [silk](#) made from spiders for thousands of years—so much so that a lot of effort has been put into harvesting it from spiders for use in making clothing—and in reproducing it in a lab to create new strong materials. In this new effort, the researchers focused their efforts on Darwin's [bark](#) spiders, their silk-producing glands and the silk that is produced.

Darwin's bark spiders are a type of orb [spider](#), which means they make their spider webs in the shape of a spoked wheel. They make the largest known orb webs of any spider, which they spin above the surfaces of streams. Prior research has shown that the spider actually makes seven different kinds of silk for use in different parts of its web. One of those silk types, called dragline, is used to build the spokes that give the wheel its strength. Prior research has shown it to be the strongest spider silk in existence. In this new effort, the researchers took a closer look at the dragline silk and the [gland](#) that produces it.

The researchers found two familiar types of spidroins—types of repetitive proteins—called MaSp1 and MaSp2, which are found in many spider silks. But in the dragline from Darwin's bark spiders, they found another spidroin, which they named MaSp4a. Study of this [protein](#) revealed that contained high quantities of an amino acid called proline, which prior research has shown is generally associated with elasticity. The protein also had less of some of the other components found in MaSp1 and MaSp2, which made it quite unique.

The researchers also found that the gland that produces the silk—the ampullae—is longer than in other spiders, perhaps providing another

clue to the strength of the silk that is produced.

More information: Jessica E. Garb et al. The transcriptome of Darwin's bark spider silk glands predicts proteins contributing to dragline silk toughness, *Communications Biology* (2019). [DOI: 10.1038/s42003-019-0496-1](https://doi.org/10.1038/s42003-019-0496-1)

© 2019 Science X Network

Citation: New protein found in strongest spider web material (2019, July 26) retrieved 27 April 2024 from <https://phys.org/news/2019-07-protein-strongest-spider-web-material.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.