

# Marine Intertidal Pseudoscorpions in Juneau, Alaska

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Figure 1: Marine intertidal pseudoscorpions in Juneau, Alaska

## Introduction

Pseudoscorpions, or false scorpions, are small scorpion-like members of the Class Arachnida, which includes spiders, mites, scorpions, and ticks, among others. They lack the tail-like appendage found on true scorpions and do not bite or sting people or pets. Most pseudoscorpions are less than 8 mm long. Like their cousins, pseudoscorpions have 8 legs. The body is reddish or brown in color and pear-shaped. Extending from the head are 2 long pedipalps, each ending in a pincer that is used to grab prey. Venom in the pedipalps paralyze prey.

Pseudoscorpions can be found on land and the intertidal zone. To avoid contact with water when the tide floods their habitat, marine pseudoscorpions enter silk-lined retreats. Mating and molting (shedding of the exoskeleton) also take place in these retreats.

According to the literature a single pseudoscorpion species lives in the marine intertidal areas in Juneau. It belongs in the family Neobisiidae. Its scientific name is *Halobisium occidentale* Beier, 1931. In fact it is the only representative of *Halobisium* in North America. It is known to occur in Alaska, California, Oregon, Washington and British Columbia.

It is a fascinating creature and we have been trying to document its behavior and life cycle with photographs. Here is what we have learned so far.

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## Where they live



Figure 2: Intertidal habitat where pseudoscorpions have been found under rocks in Tee Harbor, Juneau.



Figure 3: Some of the intertidal habitat in the Fish Creek Park has numerous pseudoscorpions under the rocks.



Figure 4: We usually find them under rocks. The lower portion of the rocks can be buried up to about 6 inches in the sediment.





Figure 5: On the underside of these fairly small rocks we usually see the pseudoscorpions moving about.



Figure 6: We occasionally see them partially in a small hole on the underside of the rock.



Figure 7: The location of two cocoons on substrate that was exposed when the rock on the left side of the photo was overturned.



Figure 8: Two cocoons pointed out in the previous photo. Pseudoscorpions typically build these cocoons to overwinter in and to mate and molt (shedding of the exoskeleton).



Figure 9: A pseudoscorpion inside one of the two cocoons.





Figure 10: A pseudoscorpion in a cocoon attached to the underside of a rock.



Figure 11: At the Fish Creek Park we often find numerous cocoons on the underside of these larger rocks.



Figure 12: Pseudoscorpions in cocoons attached to a rock that has been turned upside down. At the top of the cocoons is a whitish beach springtail, one of their favorite foods.





Figure 13: Numerous cocoons attached to the substrate that was under a large rock at the Fish Creek Park.



Figure 14: A closer view of a few of the cocoons attached to the substrate.



### What they eat

According to the literature they feed on these Beach Springtails which we often see on the same rocks as the pseudoscorpions.



Figure 15: Beach Springtail.

For good information about springtails look at <http://www.collembola.org/> These springtails belong to the subfamily Onychiurinae. Some are called Beach Springtails.



Figure 16: Pseudoscorpion and beach springtail.



Figure 17: Pseudoscorpion and beach springtail.



Figure 18: Beach springtails.



According to the literature, pseudoscorpions eat these red velvet mites. We often find them on the same rocks.



Figure 19: A red velvet mite.



Figure 20: A pseudoscorpion about to grab a mite.

## How they reproduce and care for their young



Figure 21: Two pseudoscorpions next to each other. We wonder if they are a male and female.

The female carries a silken egg pouch of 12 to 24 eggs on her belly for about 3 weeks.



Figure 22: This shows a female pseudoscorpion in Auke Bay carrying its eggs (photo by Aaron Baldwin).





Figure 23: We found this female with her egg pouch under a rock in Auke Nu Cove on June 2, 2024.



Figure 24: An adult pseudoscorpion with young was found under this rock in Auke Nu Cove. The rock has been turned onto its side in this photo.



Figure 25: A pseudoscorpion and her young in a cocoon that was attached to the underside of a rock in Auke Nu Cove on June 2, 2024.

The following is taken from Hughes (2017): “Pseudoscorpions have 3 juvenile instars (termed protonymph, deutonymph and tritonymph) followed by the adult life stage. The lifestage of a typical pseudoscorpion is easily discerned by examining the movable finger of the pedipalp chelae which will have 1, 2, 3, or 4 trichobothria depending on if the specimen is a protonymph, deutonymph, tritonymph or adult (Chamberlin 1931). When pseudoscorpions molt, they use silk from their chelicerate mouthparts to construct small, protective chambers within their confined habitat (Kew 1914).”

## Useful References

Anthony et al. (2016): Thermal biology and immersion tolerance of the Beringian pseudoscorpion *Wyochernes asiaticus*.

Buddle (2005): A primer on pseudoscorpions and taxonomic status in Canada.

Gallant et al. (2024): Elemental characterization of the cuticle in the marine intertidal pseudoscorpion, *Halobisium occidentale*.

Hughes (2017): Taxonomy, systematics, and venom components of neobisiid pseudoscorpions (Pseudoscorpiones: Neobisiidae).

## Life Cycle

From the Utah Pests Fact Sheet by Erin W. Hodgson (Extension Entomology Specialist), Brooke Lambert, and Alan H. Roe (Insect Diagnostician) (Hodgson et al. 2008).

Pseudoscorpions have an extended life cycle of 1 to 3 years, depending on the location and temperature.

The mating ritual for pseudoscorpions is similar to the dance of true scorpions. The male pseudoscorpion produces a spermatophore, or sperm packet, and pulls the female over it during the mating dance.

The female carries a silken egg pouch of 12 to 24 eggs on her belly for about 3 weeks.

The hatched brood ride on the females back until they get older.

The young look like the adults except smaller; they will molt three times over several years before becoming adults.



Adults live for 2 to 3 years and females may produce several broods a year.

Pseudoscorpions overwinter in silken cocoons.

## References

- Anthony SE, Buddle CM, Sinclair BJ (2016) Thermal biology and immersion tolerance of the Beringian pseudoscorpion *Wyochernes asiaticus*. *Polar Biology* 39: 1351–1355. <https://doi.org/10.1007/s00300-015-1849-y>
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- Gallant J, Hochberg R, Ada E (2024) Elemental characterization of the cuticle in the marine intertidal pseudoscorpion, *Halobisium occidentale*. *Invertebrate Biology* 135: 127–137. <https://doi.org/10.1111/ivb.12123>
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- Hughes GB (2017) *Taxonomy, Systematics, and Venom Components of Neobisiid Pseudoscorpions (Pseudoscorpiones: Neobisiidae)*. {PhD Thesis}. University of Arizona Available from: <https://repository.arizona.edu/handle/10150/625632> (February 12, 2025).
- Kew HW (1914) On the nest of Pseudoscorpiones: With historical notes on the spinning-organs and observations on the building and spinning of the nests. *Proceedings of the Zoological Society of London* 84: 93–111.