Linyphia triangularis **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Linyphiidae

Common name European hammock spider (English), sheet-web spider (English)

Synonym

Similar species

Summary *Linyphia triangularis*, the European hammock spider or sheet-web spider, named so for its sheet-like web has been introduced to Maine (United States). Its large size, competitive ability, and aggressive nature may have contributed to its success in Maine where it is established in 15 of 16 counties. It can reach very high densities; causing native linyphiid spiders to become scarce or virtually absent in areas it invades.

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Species Description
The colour pattern of *Linyphia triangularis* closely resembles that of North American *Pityohyphantes costatus* and *P. phrygianus*. Both species have a bifurcated “tuning-fork” marking on the dorsal surface of the carapace, which is less obvious in *L. triangularis* males. The ventral surface of the femora are devoid of dark spots, while black or brown spots are usually present in *P. costatus* and *P. phrygianus*. Unlike *Pityohyphantes*, the tuning-fork markings do not extend to the posterior eye rows in *L. triangularis* (Jennings *et al*., 2003).
The web of *L. triangularis* consists of a flattened sheet, slightly arched in the centre and held in place by scaffolding thread above and below the sheet. The web lacks a retreat, with the resident spider hanging upside-down near the center of the sheet. The webs of *L. triangularis* in Maine resemble the webs of *Pityohyphantes* species (Jennings *et al*., 2003).
Please follow this link to view images of *Linyphia triangularis*

Notes
“*Linyphia triangularis* meets 7 of the 8 criteria that characterize a successful invader (Ehrlich 1986), i.e., 1) abundant in original range; 2) polyphagous instead of monophagous or oligophagous; 3) short generation time; 4) fertilized female able to colonize alone; 5) larger than most relatives; 6) associated with Homo sapiens; and 7) able to function in a wide range of physical conditions. Only its genetic variability, compared to that of non-invaders, remains to be ascertained” (Bednarski *et al*., 2010).

Lifecycle Stages
Linyphia triangularis is univoltine in Europe. It overwinters as eggs in leaf-litter beneath trees and shrubs. Juvenile spiderlings emerge from the egg sac in the spring (May), and reach maturity by late July or August. Development is protandrous, with males reaching adulthood about a week earlier than females. The sexually mature males enter the webs of subadult females, where they remain until the female reaches maturity. Mating takes place in the web, and oviposition occurs in October or November. The life history of this species in North America has not yet been investigated (Jennings *et al*., 2003 and references therein).

Habitat Description
The most favourable habitat for *L. triangularis* in Maine is along coastal margins, roadsides and forest-edge areas. Webs are found in seedlings, saplings, shrubs, forbs, ferns and other low vegetation (Bednarski *et al*., 2010; Houser *et al*., 2005). Specimens have also been collected from the lower-crown foliage of red spruce (*Picea rubens*) and in loose bark and tree boles of paper birch (*Betula papyrifera*) (Jennings *et al*., 2003).

General Impacts
The large size, competitive ability, and aggressive nature of *Linyphia triangularis* may have contributed to its successful establishment in Maine (Bednarksi *et al*., 2010). This invasive spider can reach very high densities, e.g. in parts of Acadia National Park, Maine population densities can reach 12 individuals/m2 (Houser *et al*., 2005). Correlational evidence suggests that *L. triangularis* has a negative effect on native spiders; in areas with high density of *L. triangularis* native linyphiid spiders are scarce (Houser *et al*., 2005) or virtually absent (Jakob, *in prep* in Bednarksi *et al*., 2010).
Reductions in native spider density are likely to be due to competitive displacement by *L. triangularis*. It exhibits aggressive behaviour including web “takeovers” towards conspecifics and congenerics (Jennings *et al*., 2003). Bednarski *et al*. (2010) found that native *Frontinella communis* spiders abandoned their webs when *L. triangularis* were added to plots and were less likely to establish webs in plots containing *L. triangularis*. Where *L. triangularis* took over webs, they evicted (or possibly consumed) *F. communis*, and reshaped the web to their own typical shaped webs, thereby making use of energetically valuable silk. Loss of a web comes at great fitness cost to spiders, in terms of time and calories (Venner *et al*., 2003 in Bednarksi *et al*., 2010).
The high density that *L. triangularis* populations reach in some habitats may mean that it reduces the amount of insect prey available for native spiders. However, sticky trap censuses found no evidence that *L. triangularis* reduces flying insect abundances (Houser *et al*., 2007 in Bednarski *et al*., 2010). Further work is needed to establish definitively whether competition for prey is important in Maine spider communities (Bednarski *et al*., 2010).
Competition and predation by *L. triangularis* on native sheet-line weavers and other spiders could lead to displacement of these species, and thus lead to a decline in biodiversity in invaded areas (Jennings *et al*., 2003).

Management Info
Members of the *Argyrodes* genus are known for their diverse foraging strategies, including kleptoparasitism, web-stealing and predation on other spiders species. In Maine, the native spider *A. trigonum* was noted inhabiting some *Linyphia triangularis* webs. Surveys conducted in 2003 found that overall 27.0% of *L. triangularis* webs contained *A. trigonum*. As *A. trigonum* uses both *L. triangularis* and native spider webs, it could reduce or increase the effects of the invader on native populations. Further studies investigating preferences for different host webs would be useful in assessment of the impact. However, because of its generalist behaviour, the regulatory effect of *A. trigonum* on populations of *L. triangularis* is suspected to be minimal (Houser *et al*., 2005).
Instead, assemblages of natural enemies (e.g., parasites, parasitoids, predators, and pathogens) may be needed for control or containment of this invasive spider (Houser *et al*., 2005).

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ALIEN RANGE

[1] UNITED STATES

BIBLIOGRAPHY

4 references found for **Linyphia triangularis**

Managment information

General information

Bednarski, J. Ginsberg, H. & Jakob, E.M. 2010. Competitive interactions between a native spider (*Frontinella communis*, Araneae: Linyphiidae) and an invasive spider (*Linyphia triangularis*, Araneae: Linyphiidae). Biological Invasions, 12(4): 905-912.

Encyclopedia of Life (EOL), 2010. *Linyphia triangularis* (Clerck, 1757).

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Houser, J.D., Jennings, D.T. & Jakob, E.M. 2005. Predation by *Argyrodes trigonum* on *Linyphia triangularis*, an invasive sheet-web weaver in coastal Maine. Journal of Arachnology, 33(1): 193-195.

Jennings, D.T., Catley, K.M. & Graham Jr., F. 2002. *Linyphia triangularis*, a Palearctic spider (Araneae, Linyphiidae) new to North America. Journal of Arachnology., 30(3): 455-460.