

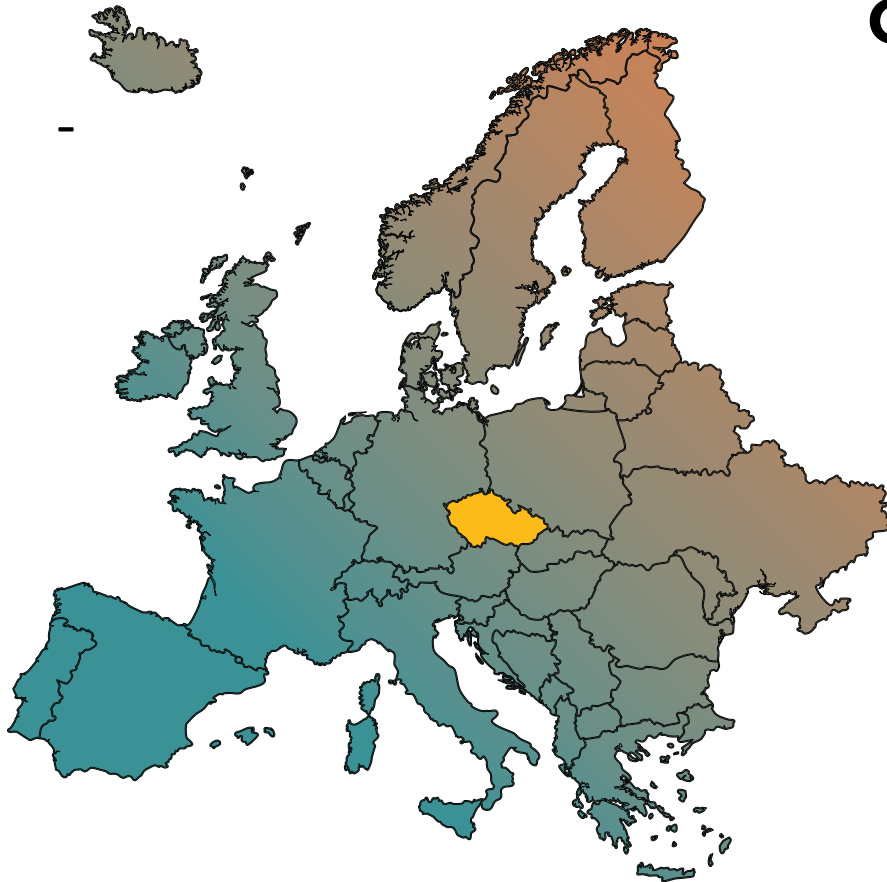
# Spiders newly observed in Czechia in recent years overlooked or invasive species?



**Milan Řezáč**, Vlastimil Růžička, Vladimír Hula, Jan Dolanský, Ondřej  
Machač, Antonín Roušar

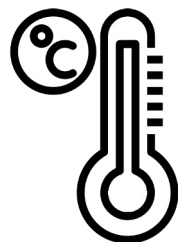
# Introduction: new species every year! But why?

Spiders are **among the best-known** invertebrate groups in **Central Europe.**



**New species** as a result of **still-incomplete** state of **faunistic research** or real **temporal changes**?

We aimed to distinguish the **overlooked species** from actual **new colonizers**.



Expansions  
global  
warming

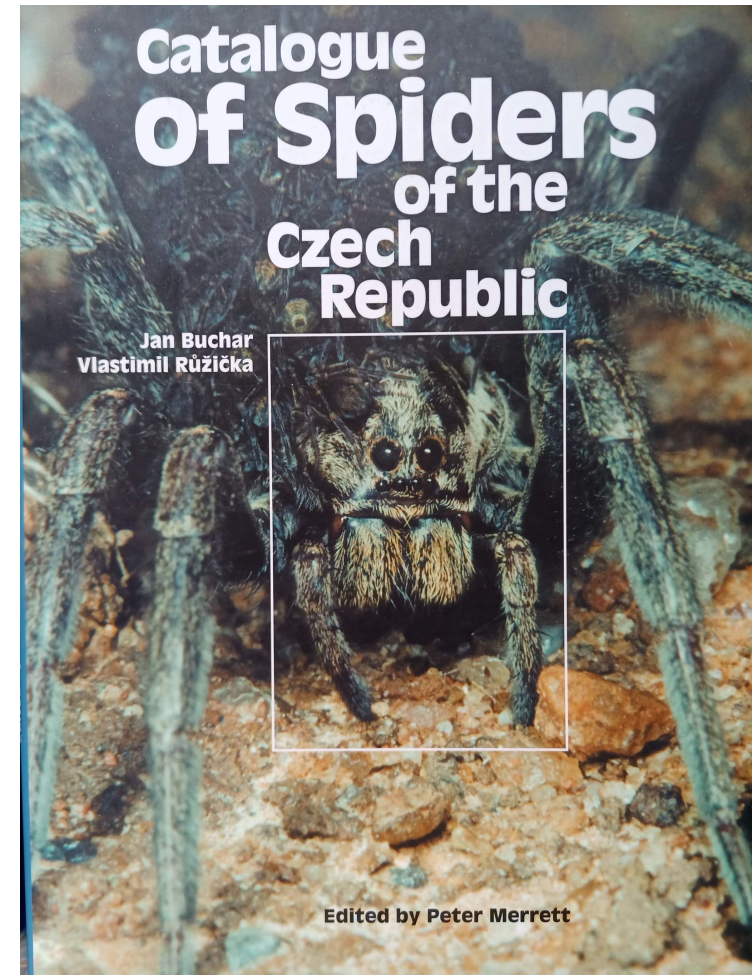
OR

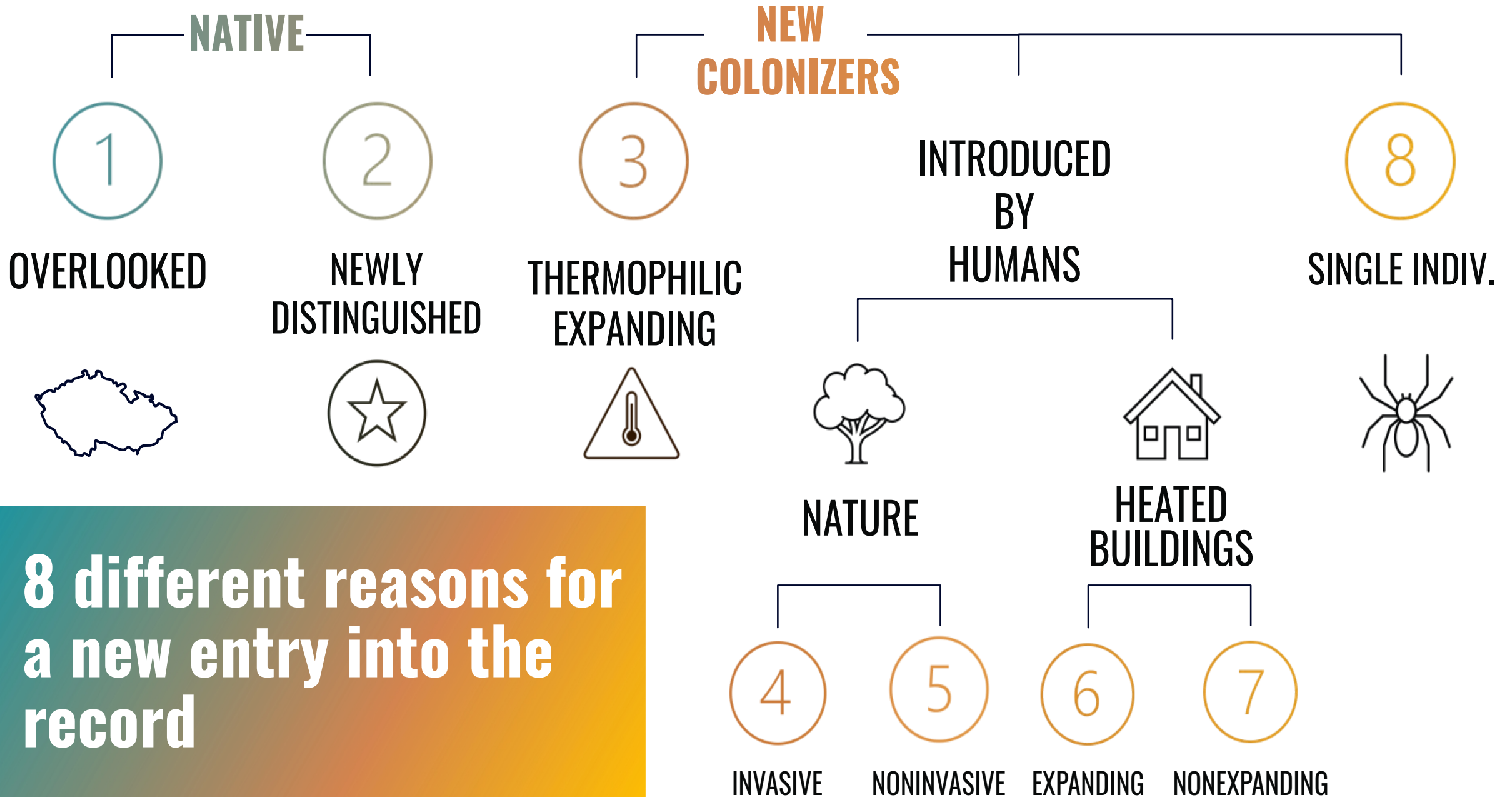
Introductions  
material  
transport



# Materials & Methods

- **Růžička and Buchar (2008)** last evaluated the Czech spider fauna.
- **New records from 2008 - 2020**
- We evaluated the **history, distribution and habitat.**

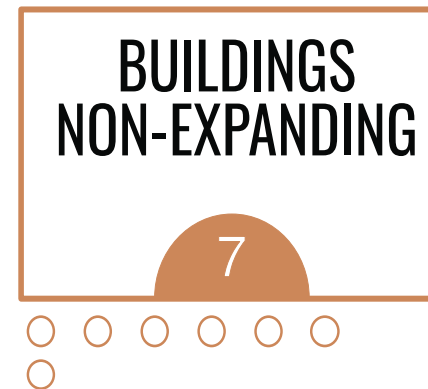
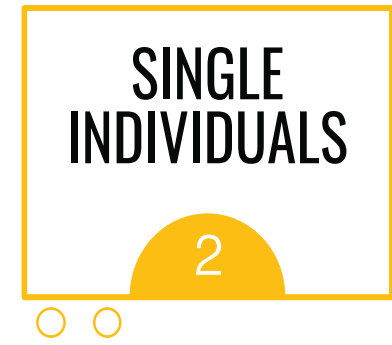
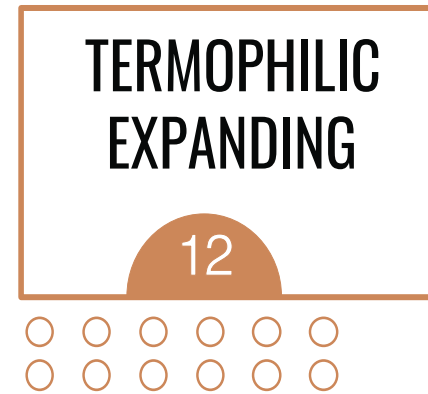




**8 different reasons for a new entry into the record**



# 47 new spider species



1

**OVERLOOKED**



**NATIVE**

**not yet observed  
species**

**14 new spider  
species**

# NATIVE: not yet observed species



*History:* present but not observed

*Habitat:* **unique or difficult to access**, arachnologically unexplored at present. Result of application of **new collection methods** or focus on **previously omitted regions**.

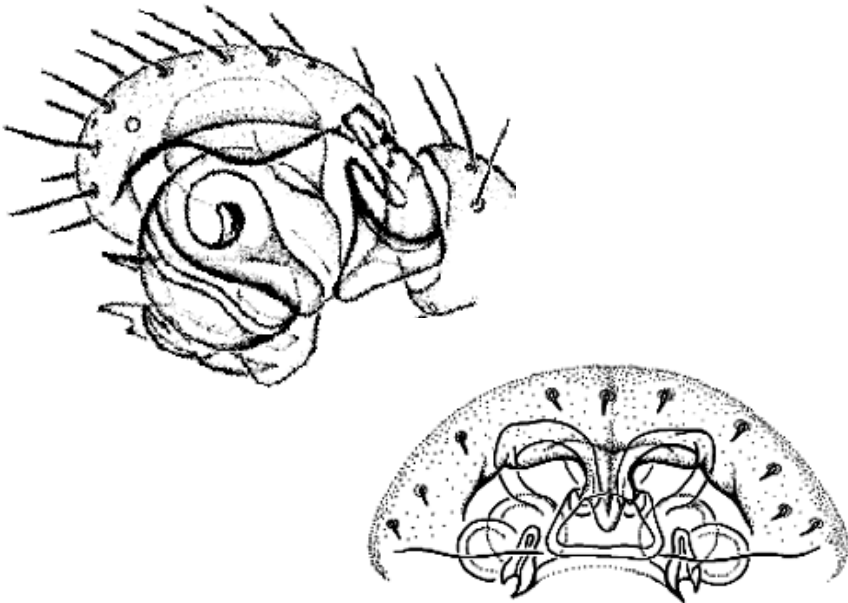
*Distribution:* **Rare, only in some regions**, often at the edge of the distributional area.

**14 new spider species**

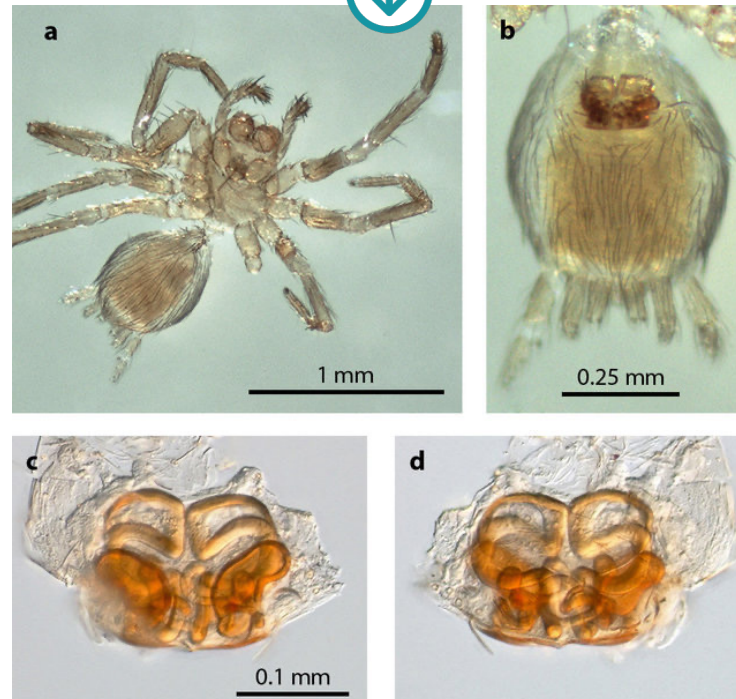
# Not yet observed: Subterranean habitats



*Centromerus piccolo*  
**loess** accumulations



*Iberina microphthalma*  
limestone and marlite



*Oreonetides*  
*quadridentatus*  
marlite bedrock





# Not yet observed: 4<sup>th</sup> Eresus for Czechia!



**new Eresus species  
observed**

*Eresus fulvus*  
**Rocky** steppes

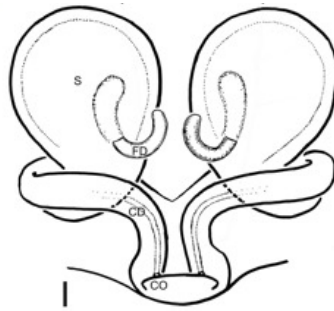
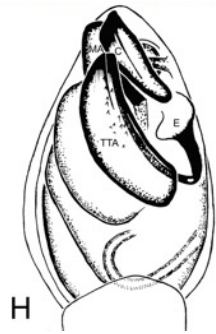


# Not yet observed: South Moravia



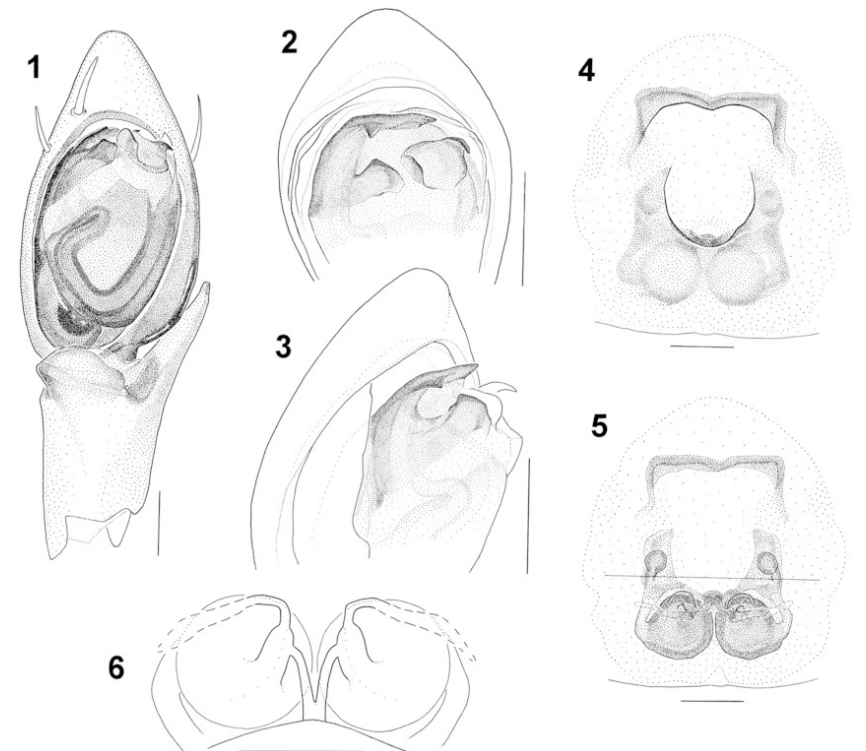
***Enoplognatha bryjai***

**NEW SPECIES**



*Zelotes mundus*

**Sandy** xerothermic habitat, southern Moravia



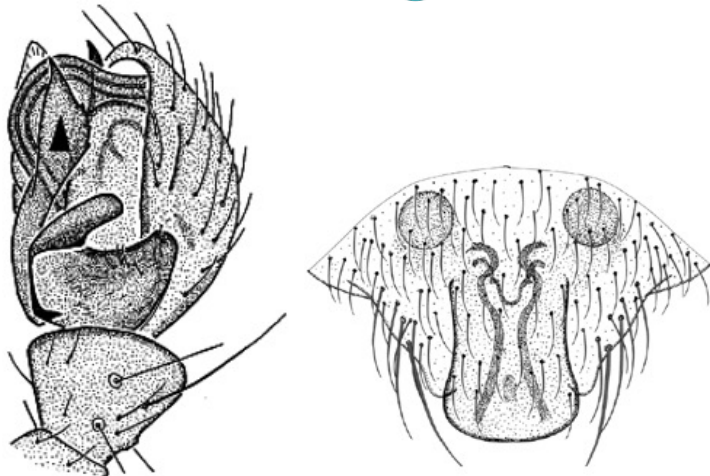


# Not yet observed: stones & mosses in Western Bohemia



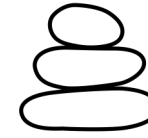
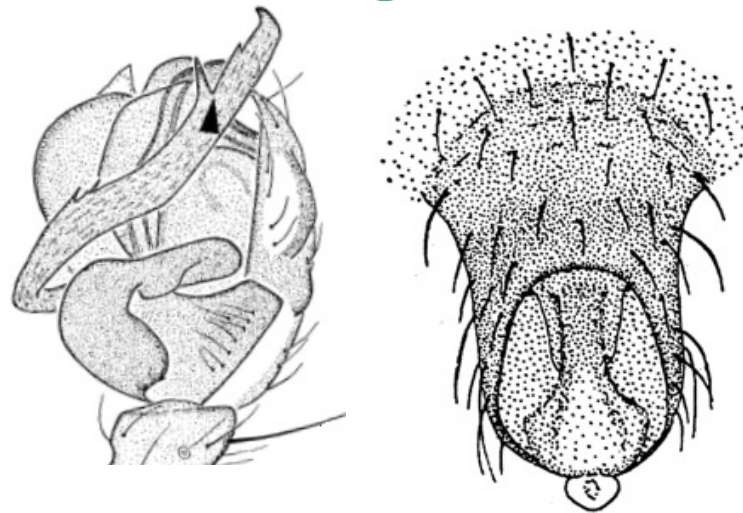
*Palliduphantes ericaeus*

In moss in a **peat bog**



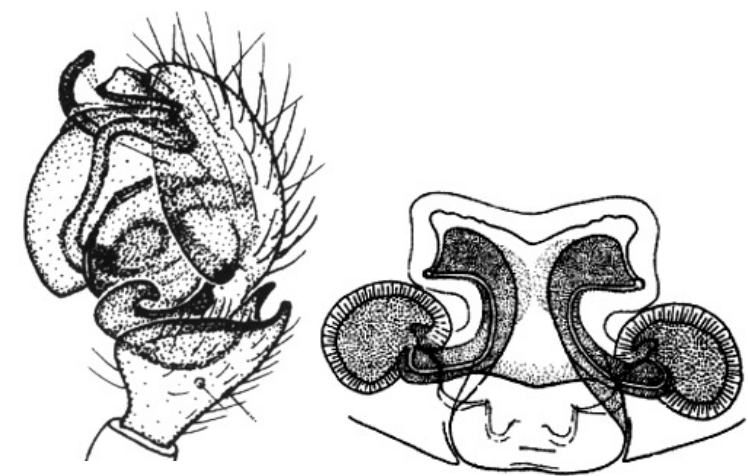
*Piniphantes pinicola*

**Scree forest**



*Tapinocyba pallens*

Natural/artificial **scree** slopes

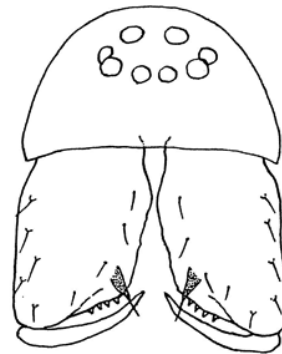


# Not yet observed: Wetlands



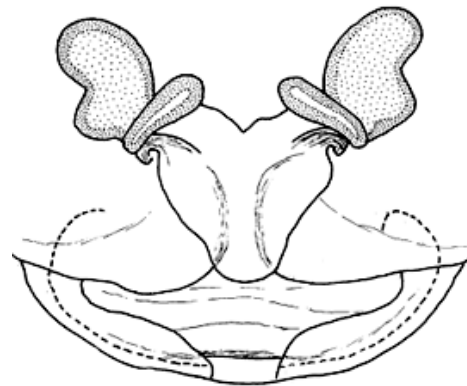
*Caviphantes saxetorum*

**Stony riverbank** in a lowland forest



*Erigone cristatopalpus*

**Glacial corrie**



*Pardosa tenuipes*

Wet **meadow** adjacent to wetlands, northern Moravia





# Not yet observed: Steppes



*Iberina  
candida*

Shrubs on **rocky  
steppe** on limestone



*Yllenus  
arenarius*

**A sand dune**

2

**NEWLY  
DISTINGUISHED**



**NEWLY  
DISTINGUISHED**

**spider species**

**2 new spider  
species**

# Newly distinguished species



2

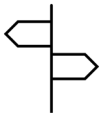
species almost indistinguishable



*History:* **Present but not distinguished from other species.** Newly distinguished due to **taxonomic progress.**



*Habitat:* Any.



*Distribution:* Any.

*Porrhoclubiona*

*leucaspis*

(sibling *P. genevensis*)

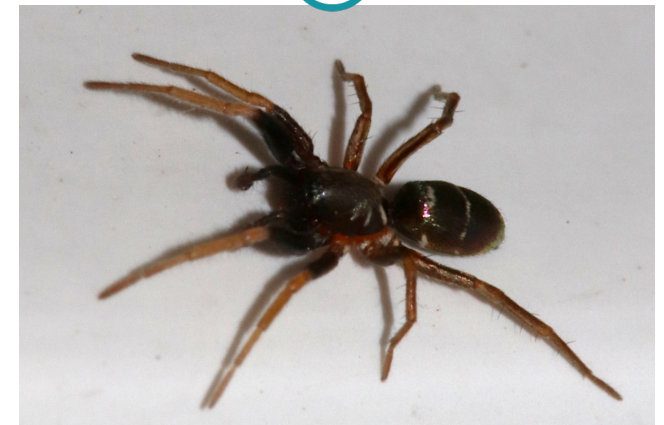
trunks of **sun-exposed trees**



*Micaria micans*

(sibling *M. pulicaria*)

**Open xerothermic** habitats



3

**THERMOPHILIC  
EXPANDING**



**NEW COLONIZERS**

**thermophilic  
expanding species**

**12 new spider  
species**



# thermophilic expanding species

3

## EXPANSIVE SPECIES - new records from Czechia



*History:* Absent from the **arachnologically well known regions** in the past. The probability that they had previously been overlooked there is very low.



*Habitat:* Often **newly created habitats such as mining areas**. They are colonised **de novo**, thus the expanding species **do not compete** with native species.



*Distribution:* Known to **occur south of Central Europe**, usually absent north of Central Europe, usually first appear in southern Moravia.

# thermophilic expanding: Orb weavers



*Larinia elegans*

**reeds** on banks of an  
artificial lake



*Leviellus thorelli*

old **solitary trees**



*Neoscona adrianta*

open **grassland habitats**



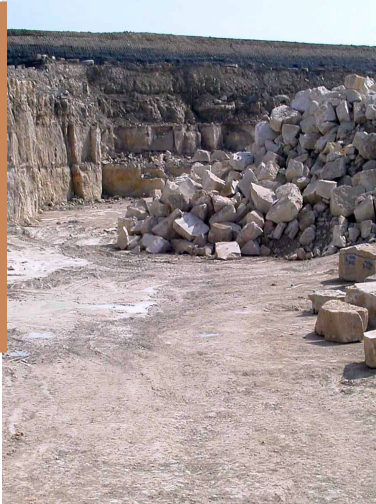


# thermophilic expanding Theridiids diversity in quarries



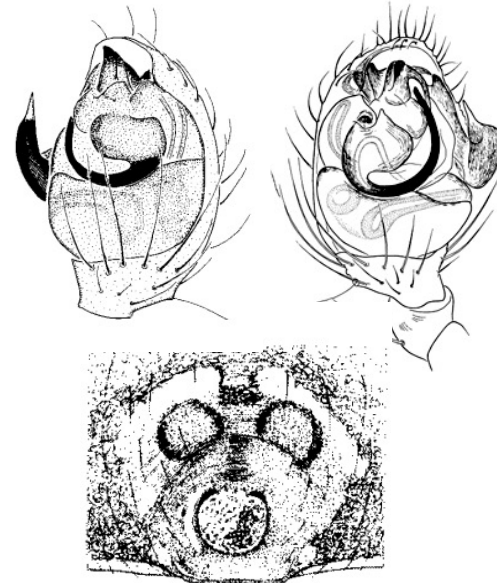
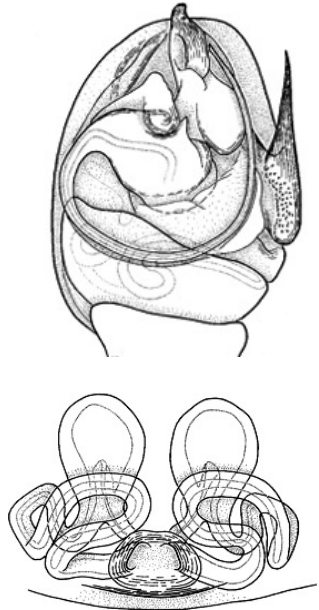
## *Theridion cinereum*

In xerothermic grassland in an abandoned **quarry**



## *Theridion hannoniae*

On rocks in **quarries**

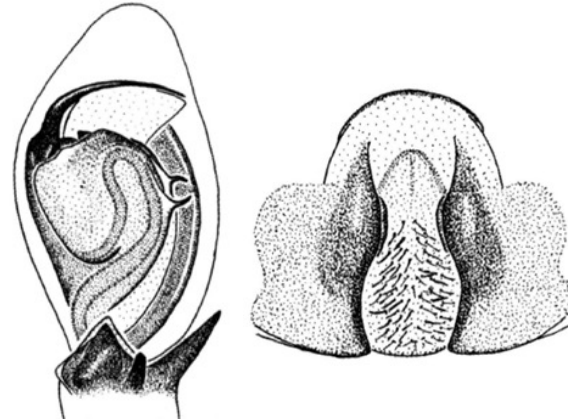
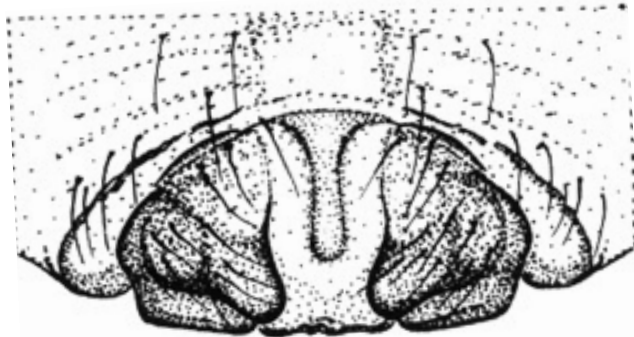


# thermophilic expanding: Also in Bohemia



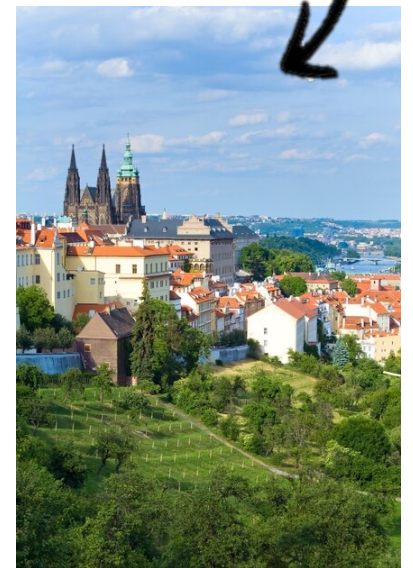
## *Collinsia inerrans*

Dry grassland, winter wheat field, also colonised the **western part of Czechia**



## *Philodromus buxi*

On trees in **city parks**





# thermophilic expanding: Clay pits



*Emblyna brevidens*

Abandoned **clay pit**



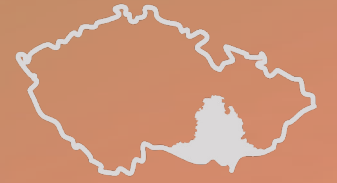
*Pardosa nebulosa*

Abandoned **clay and gravel pits** with lakes





# thermophilic expanding: Moravia



## *Gnaphosa modestior*

Open xerothermic habitats,  
**partly newly created**



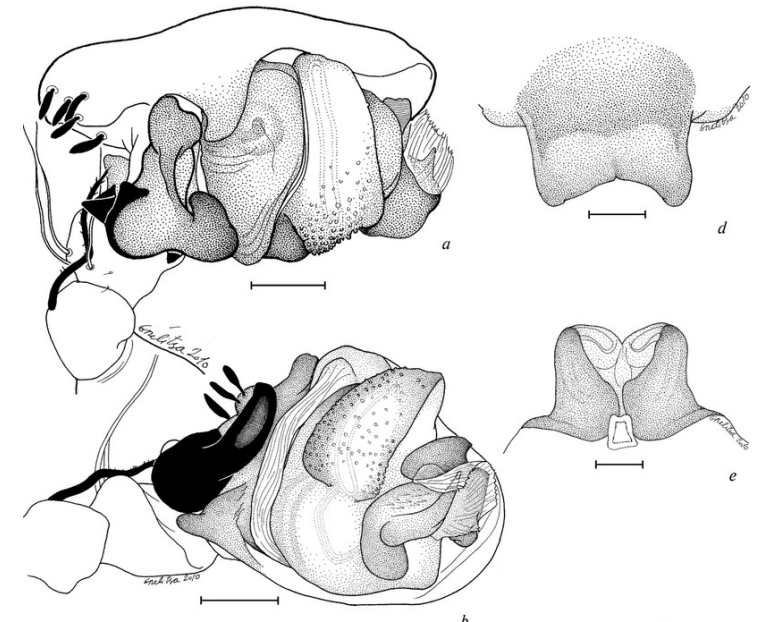
## *Heliophanus simplex*

**Grassland**



## *Sintula spiniger*

**Ruderal** vegetation adjacent  
to crop fields



4

**NATURE  
INVASIVE**



5

**NATURE  
NON-INVASIVE**



**NEW COLONIZERS**

**Introduced by  
humans to the  
NATURE**

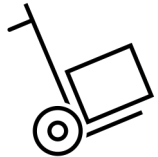
**3 new spider  
species**

# INVASIVE: Introduced by humans to natural habitats: expanding their range

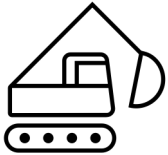


4

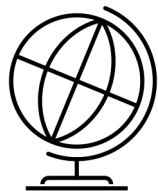
TRUE INVASIVE SPECIES – native on other continents (North America)



*History:* **Introduced** by humans and **expanding** their range.



*Habitat:* Variety of natural habitats, **often disturbed**.



*Distribution:* **Native on other continents, often North America.**



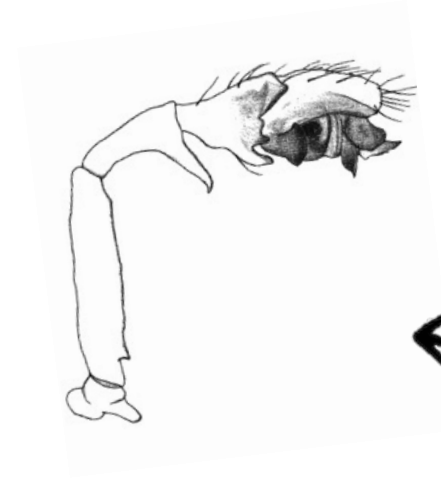


# INVASIVE: Introduced by humans to natural habitats: expanding their range



*Mermessus trilobatus*

**Various open habitats, including relict habitats** (peat bogs, heathlands, relict steppe or alpine grasslands) **or cultivated fields.**



*Erigone autumnalis*  
Dry **grassland** with shrubs

**Good ballooner, most invasive spider in Europe.**

First near **Karlsruhe in 1981, expansion eastwards, 33 km/year** (*Ostearius* 30 km/year - Růžička 1995).

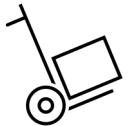
**It does not tend to be dominant.**

# NON-INVASIVE: Introduced by humans to natural habitats



5

ALIEN but NON-INVASIVE SPECIES – lack invasive tendencies



*History:* Newly introduced by humans.



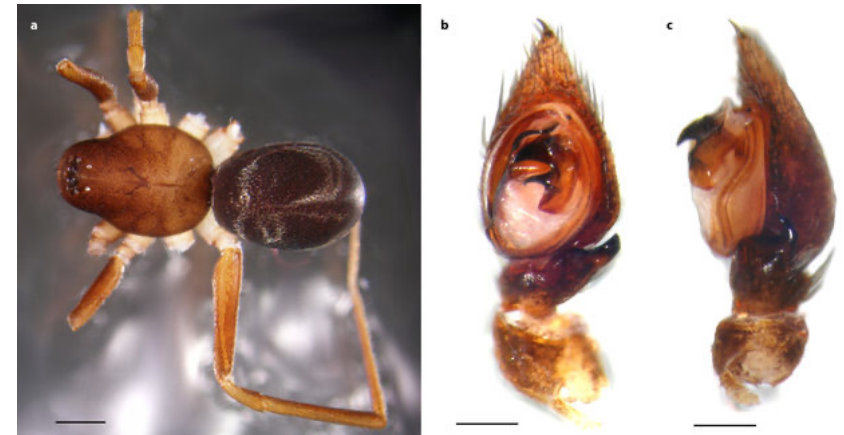
*Habitat:* **Disturbed habitats** in nature.



*Distribution:* Sites of introduction **isolated** from the continuous distribution area of the species.

## *Zodarion ohridense*

Dry abandoned **quarry**.



- ✓ **tolerance of dry environments**
- ✓ **silken shelters attached to solid objects** on the ground
- ✗ **bad dispersal abilities**



6

**BUILDINGS  
EXPANSIVE**



7

**BUILDINGS  
NON-EXPANSIVE**



**NEW COLONIZERS**

**Introduced by  
humans to the  
BUILDINGS**

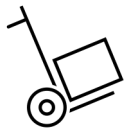
**14 new spider  
species**

# EXPANSIVE: introduced to heated buildings



6

## EXPANSIVE SPECIES – further spreading



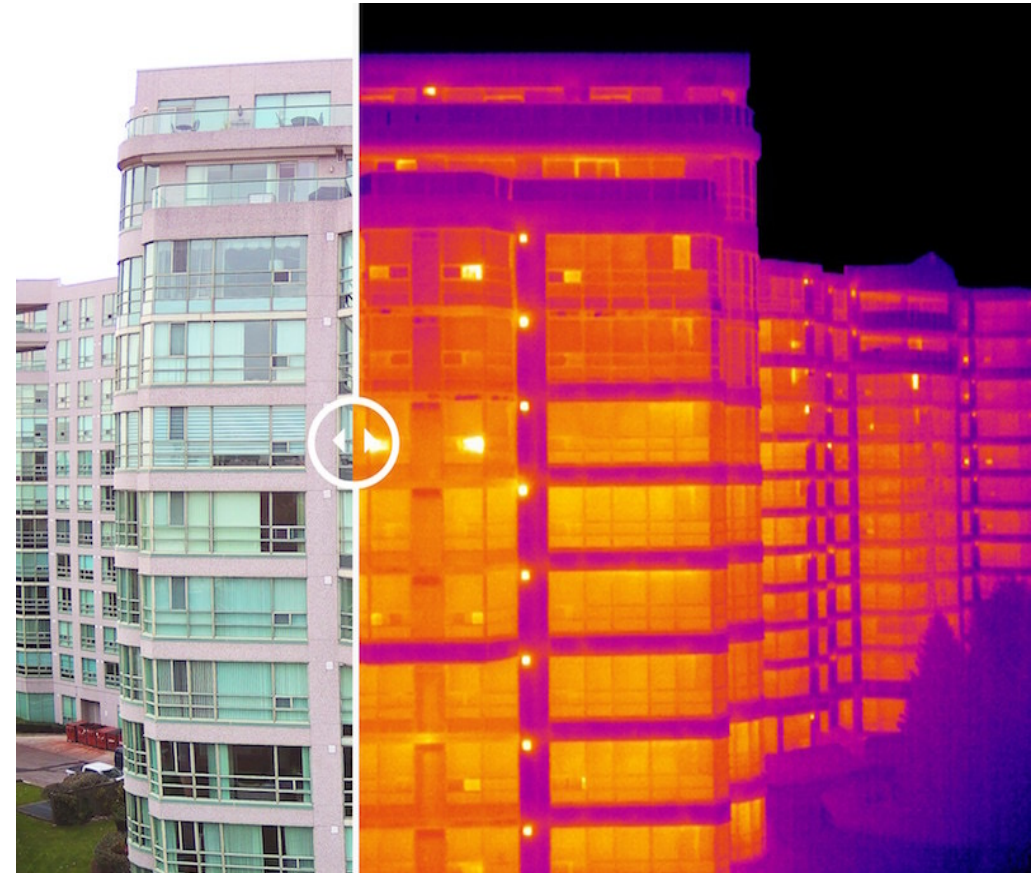
*History:* Newly introduced by humans and expanding their range.



*Habitat:* All kinds of heated buildings, **absent in nature.**



*Distribution:* **Mainly subtropical regions.**





# EXPANSIVE: introduced to heated buildings



*Paratrachelas  
maculatus*

Heated **houses**



*Steatoda  
nobilis*

Heated **houses**



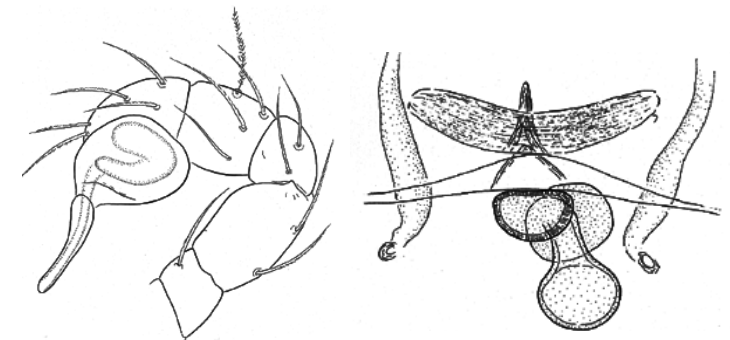
*Steatoda  
paykulliana*

Heated **houses**



*Cortestina thaleri*

**Tree trunk** in a city, area of  
**origin is not known**



# EXPANSIVE: Pholcidae



*Holocnemus pluchei*

Heated buildings



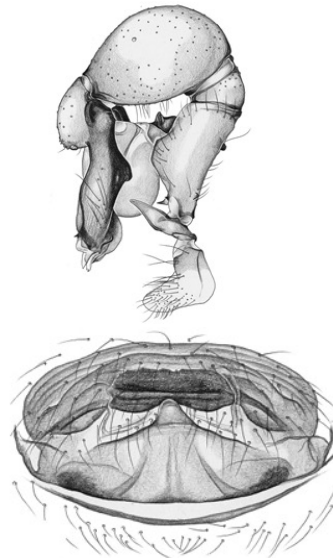
*Pholcus alticeps*

Heated houses, **misidentified as**  
***P. phalangioides***



*P. alticeps*

*P. phalangioides*



*Psilochorus simoni*

Heated buildings

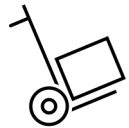


# NON-EXPANSIVE: introduced to heated buildings



7

**NON-NATIVE species – NOT expanding range**



*History:* Newly introduced by humans.



*Habitat:* Large heated buildings with complex synanthropic habitats, such as **large greenhouses** with high air humidity and rich prey resources, in **ZOO-s and botanical gardens**, absent in nature.



*Distribution:* **Mainly tropical regions.**



# NON-EXPANSIVE: introduced to heated buildings



*Thanatus vulgaris*

**Heated cricket cultures** (in  
Velvary near Prague)



*Nesticella mogera*

Heated greenhouse  
(Olomouc)



*Coleosoma floridanum*

Heated greenhouses





# NON-EXPANSIVE: Haplogynous spiders



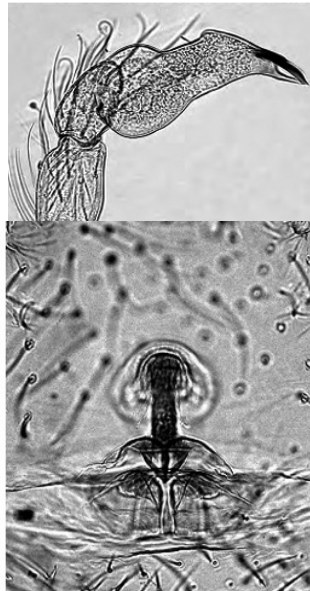
*Heteroonops  
spinimanus*

Heated **greenhouse**



*Modisimus  
culicinus*

Two **heated greenhouses**



*Physocyclus  
globosus*

**Heated laboratory**



*Theotima  
minutissima*

**parthenogenetic**



8

**SINGLE INDIV.**

No populations  
established



**SINGLE  
INDIVIDUALS**

**no populations  
established**

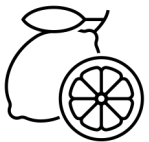
**2 new spider  
species**



# Single individuals: no populations established

8

## SINGLE INDIVIDUALS – introduced by human



*History:* Introduced with material, for example, **fruit**.



*Habitat:* Any, occurrence is limited by the life span of the introduced **individual**.



*Distribution:* Any.

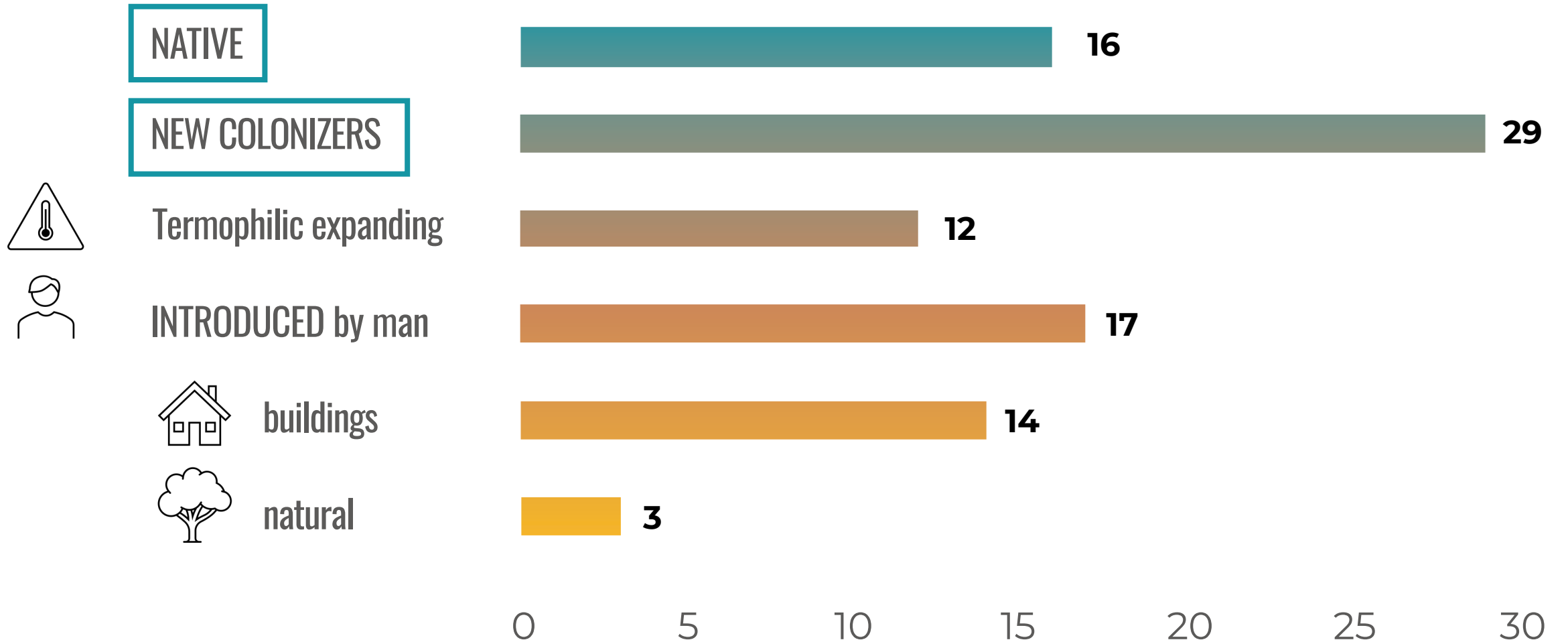


*Loxosceles rufescens*



*Tegenaria parietina*

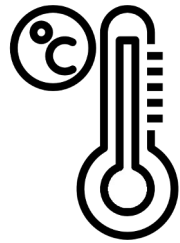
# Conclusion



# Tomorrow...

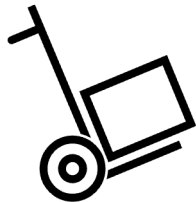


**ALIEN species expansion**

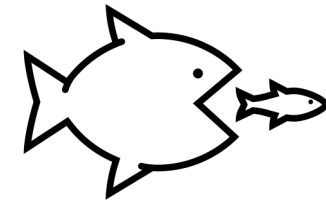
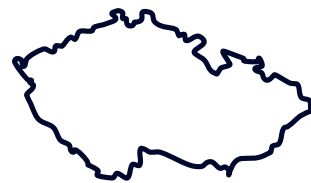


**Global warming**

**AND**



**Material transport**

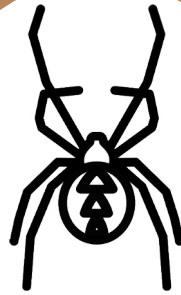


**OUTCOMPETITION**

**NATIVE species suppression**



Thank you  
for your attention



# Take-home message



Knowledge of the indigenous Central European fauna is **close to complete**.



The **majority of newly recorded species** likely came to this region **recently**.



**Half of them are likely thermophilic species** that expanded their distribution to the north, possibly due to **global warming**.



The second half are **subtropical or tropical species** introduced to **heated buildings**.



Only **few species were introduced into natural habitats** and expanded there (invasive species)

Řezáč M., Růžička V., Hula V., Dolanský J., Machač O., Roušar A. (2021): Spiders newly observed in Czechia in recent years – overlooked or invasive species? BioInvasions Records, 10(3): 555–566. DOI: <https://doi.org/10.3391/bir.2021.10.3.05>