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# First observation of the jumping spider

## *Carrhotus xanthogramma* (Latreille, 1819) in Belgium

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### Abstract

*Carrhotus xanthogramma* (Latreille, 1819) is recorded for the first time in Belgium. The authors describe how to identify the species in the field and briefly discuss its ecology and distribution. This jumping spider is likely another example of a species expanding its range as a result of climate change.

### Samenvatting

De Tweekleurige springspin, *Carrhotus xanthogramma* (Latreille, 1819), wordt voor het eerst gemeld in België. De auteurs beschrijven hoe de soort in het veld te identificeren en bespreken kort de ecologie en verspreiding. Deze spin is waarschijnlijk een nieuw voorbeeld van een soort die zijn verspreidingsgebied uitbreidt als gevolg van klimaatsverandering.

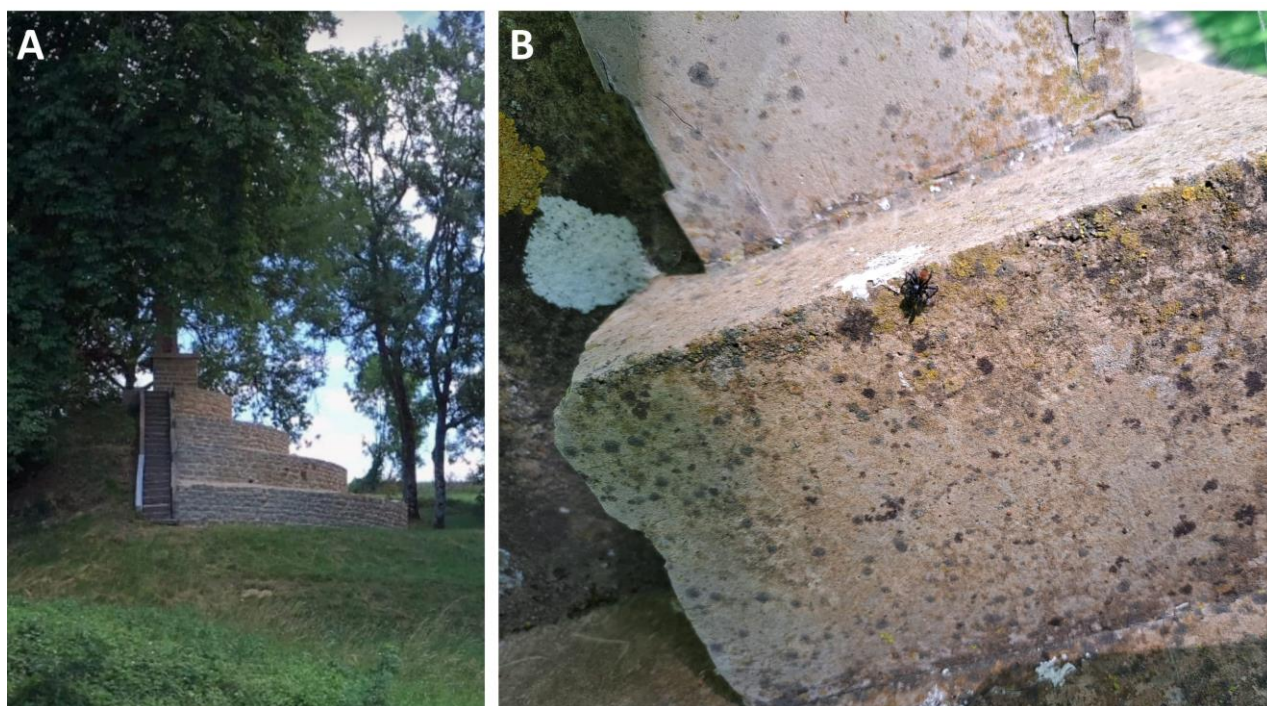
### Résumé

La Saltique orangé, *Carrhotus xanthogramma* (Latreille, 1819), est signalée pour la première fois en Belgique. Les auteurs décrivent comment identifier l'espèce sur le terrain et discutent de son écologie et de sa répartition. Cette araignée est probablement un autre exemple d'une espèce qui étend son aire de répartition en raison du changement climatique.

### Introduction

On May 11, 2024, the second author discovered an unfamiliar male jumping spider near the Raymond Mayné nature reserve in Torgny, the southernmost village in Belgium. The spider was observed hunting among lichens on the central structure of a stone monument, which was elevated from street level and shaded by surrounding trees (Figs. 1A-B). Several attempts were made to identify the spider using ObsID, which consistently pointed to *Philaeus chrysops* (Poda, 1761). Although this southern Salticidae species has occasionally been recorded from Belgium as an accidental import (WAARNEMINGEN.BE 2024), there were clear differences in this spider's appearance. To clarify, the iNaturalist's image recognition tool was employed, identifying the spider as *Carrhotus xanthogramma* (Latreille, 1819). Since this species had not previously been documented in Belgium, the spider was collected and preserved in ethanol for verification. Upon later examination of this collected individual, the first author confirmed that it was indeed an adult male *Carrhotus xanthogramma*, marking the first recorded occurrence of this species in Belgium.

We propose the Dutch vernacular name "Tweekleurige springspin", which means "bicoloured jumping spider" in English. The name refers to the striking contrast in colour between the male's prosoma and opisthosoma, as well as the pronounced sexual dimorphism within the species. Additionally, it is a reference to the species' original designation as *Aranea bicolor* Walckenaer, 1802 (WSC 2024).



**Figure 1:** Capture site of *Carrhotus xanthogramma* at Torgny **A.** Stone monument where the spider was discovered **B.** Detail of the central structure, showing the male *Carrhotus xanthogramma* hunting on the lichen-covered stones.

## Identification

The genus *Carrhotus* Thorell, 1891 currently includes 37 distinct species, most of which have been recorded in regions of Eastern and Southern Asia (WSC 2024). However, within Europe, the genus is monotypic, with *Carrhotus xanthogramma* being the sole representative (NENTWIG et al. 2024). This simplifies identification, as confusion with other European Salticidae is highly unlikely. Furthermore, both males and females are uniquely coloured, making them stand out from other European Salticidae. Males possess a glossy black prosoma that contrasts sharply with the brownish red opisthosoma (Fig. 2A). The front of the abdomen has a white margin that transitions to black towards the middle, and there are characteristic tufts of brown hairs beneath each of the posterior eyes (BREITLING et al. 2016). The female opisthosoma is typically bright yellow to orange, with black markings that vary in shape and contrast among individuals. The colour of the female's prosoma is quite variable but generally darker than the abdomen, as seen in males. Yellow spots and lines are usually present on the prosoma, though their shape, size and arrangement can vary significantly. Despite this variability, few Salticidae species in Europe closely resemble *Carrhotus xanthogramma*, making its habitus generally reliable for identification. However, this applies primarily to observations within Europe, as other *Carrhotus* species documented worldwide may bear a closer resemblance to *C. xanthogramma*.

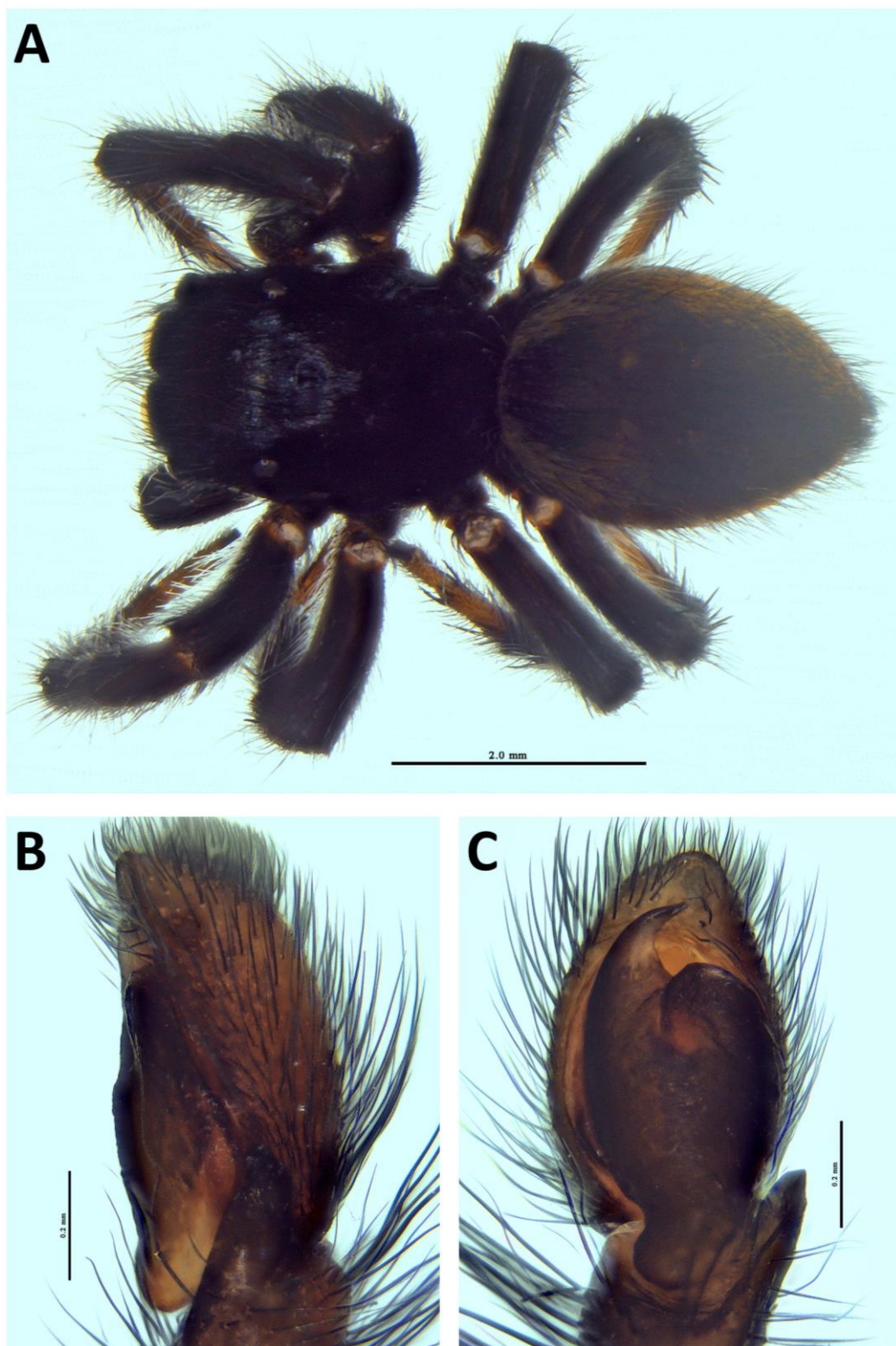
Given the species' variability in appearance, it is advisable to examine the genitalia if there is any uncertainty. The genitalia of both males and females are quite distinctive, particularly in comparison to other European Salticidae species. Male palps are characterized by a prominent chisel-like tibial apophysis and are densely covered with dark hairs (Figs. 2B-C), while the female epigyne features two characteristic depressions that set it apart from other European Salticidae (NENTWIG et al. 2024).

## Ecology

*Carrhotus xanthogramma* is primarily considered an arboreal species, typically found by beating the branches of trees or shrubs (NENTWIG et al. 2024; YOSHIDA & SUZUKI 1981). It has been documented in a variety of habitats, including anthropogenic environments like orchards (MEZŐFI et al. 2019). At first glance, the discovery in Torgny on a stone monument might seem inconsistent with its known habitat. This could suggest that the individual was a vagrant, possibly landing on the stones during ballooning. However, since the



monument was surrounded by trees, it is also likely that the spider fell from a nearby tree and a reproducing population is present at the site. Additional targeted searches using beating sheets or arboreal pit fall traps around the Raymond Mayné reserve could help determine whether this is indeed the case. Typical for European Salticidae, *Carrhotus xanthogramma* is diurnal and adult in spring and early summer (MEZŐFI et al. 2019; NENTWIG et al. 2024). Adult males are found from April to July, while adult females can be observed until August.



**Figure 2:** Male *Carrhotus xanthogramma*, captured near the Raymond Mayné reserve in Torgny **A.** Habitus, dorsal view **B.** Male palp, retrolateral view **C.** Same, ventral view © Pierre Oger

## Distribution

The distribution of *Carrhotus xanthogramma* is Palearctic, with the species occurring across most of Europe, extending to the Middle East and even Far Eastern countries like China and Japan (NENTWIG et al. 2024). As a thermophilic species, it is notably absent from the colder northern regions of Europe. It seems likely that *C. xanthogramma* is able to expand its range due to climate change, similar to the now widespread orbweaver *Argiope bruennichi* (Scopoli, 1772) (KUMSCHICK et al. 2010). In this context, a first arrival in Torgny would be logical, as it is the southernmost point in Belgium and a haven for rare thermophilic species such as *Cheiracanthium punctorium* (Villers, 1789) (VAN KEER 2019). Time will tell whether *C. xanthogramma* will successfully colonize the warming northern regions.

## Acknowledgments

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