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First record of *Neoscona byzanthina* (Araneae: Araneidae) in Romania

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Abstract. This work reports the presence of *Neoscona byzanthina* (Pavesi, 1876) in Romania, partly based on records provided by citizen scientists. The species was found at five different locations. Further, morphological differences to the other species of the genus are summarized and some data on the ecology of this species together with an up-to-date distribution in Europe are presented. This is the third *Neoscona* species recorded in Romania and comparative pictures of the epigyne of all these species are provided.

Key words: Arachnida, citizen science, orb-web spider, species distribution

Zusammenfassung. Erstnachweis von *Neoscona byzanthina* (Araneae: Araneidae) in Rumänien. Diese Arbeit berichtet über die Präsenz von *Neoscona byzanthina* in Rumänien, teilweise basierend auf Nachweisen erbracht durch Citizen scientists (Bürgerwissenschaftler*innen). Die Art wurde an fünf verschiedenen Orten gefunden. Außerdem werden die morphologischen Unterschiede zu den anderen Arten der Gattung zusammengefasst sowie einige Daten zur Ökologie der Art zusammen mit einer aktuellen europäischen Verbreitungskarte präsentiert. Dies ist der dritte Nachweis einer Art der Gattung *Neoscona* in Rumänien und für alle Arten werden diagnostische Fotos der Epigyne bereitgestellt.

Rezumat. Prima semnalare a speciei *Neoscona byzanthina* (Araneae: Araneidae) în România. Lucrarea de față semnalează prezența speciei *Neoscona byzanthina* (Pavesi, 1876) în România, bazată parțial pe observații de tipul citizen science. Specia a fost identificată în cinci locații diferite. Sunt sumarizate diferențele morfologice față de alte specii ale genului și sunt prezentate date privind ecologia speciei împreună cu distribuția actualizată a acesteia în Europa. Fiind a treia specie de *Neoscona* identificată în România, sunt prezentate imagini comparative cu epiginele celor trei specii.

There are currently more than 1000 spider species known from Romania, of which 44 from 15 genera belong to Araneidae (Weiss & Urák 2000, Moscaliuc 2013). The genus *Neoscona* Simon, 1864 currently comprises four species in Europe: *N. adianta* (Walckenaer, 1802), *N. byzanthina* (Pavesi, 1876), *N. subfusca* (C. L. Koch, 1837) and *N. theisi* (Walckenaer, 1841) (Nentwig et al. 2021). Two of them (*N. adianta* and *N. subfusca*) were already known from Romania (Weiss & Urák 2000). Here we present the first data of a third, hitherto overlooked species, *Neoscona byzanthina*, which also occurs in Romania.

Material and methods

The sampled specimen was preserved in 70% ethanol and added to the collection of the second author. The pictures of the epigyne of *N. byzanthina* (Fig. 2) and *N. adianta* (Fig. 3) were taken with a Nikon D5600 camera attached to a Nikon SMZ1270 stereomicroscope. The pictures of the epigyne of *N. subfusca* (Fig. 4) come from the website “Les araignées de Belgique et de France” (Oger 2021). We also found some further records of this species in Romania by using citizen science data (mybiOSis 2021, Spiders of Romania and Europe 2021). The map was created using Google Earth Pro and Adobe Photoshop, based on d-maps.com. For an updated distribution of the species in France, we used data from the National inventory of natural heritage (INPN) (MNHN & OFB 2022).

Results

Neoscona byzanthina (Pavesi, 1876) (Figs 1-2)

Material examined. ROMANIA: 1 ♀ (collected, Figs 1d, 2),

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Hunedoara county, Mintia (Fig. 5b: N^o 4,) (45.9189°N, 22.8675°E, 180 m a.s.l.), 19. Aug. 2019, leg. Alexandru-Mihai Pintilioaie; 1 specimen (photographed, not collected, Fig. 1a), Constanța county, Rariștea (Fig. 5b: N^o 1) (44.0907°N, 27.8039°E, 50 m a.s.l.), 13. Sep. 2010, observed by Adrian Vintilă; 1 specimen (photographed, not collected, Fig. 1b), Tulcea county, Telița (Fig. 5b: N^o 2) (45.1071°N, 28.5775°E, 210 m a.s.l.), 6. Aug. 2017, observed by Gabriel Gigea; 1 specimen (photographed, not collected, Fig. 1c), Bacău county, Comănești (Fig. 5b: N^o 3) (46.4270°N, 26.4420°E, 450 m a.s.l.), 18. Aug. 2018, observed by Alexandru-Mihai Pintilioaie; 1 specimen (photographed, not collected, Fig. 1e), Teleorman county, Bujoru (Fig. 5b: N^o 5) (43.6983°N, 25.5282°E, 30 m a.s.l.), 22. Sep. 2019, observed by Cristian Torica.

Determination

Neoscona byzanthina is easily distinguishable from the other two species of this genus present in Romania. The morphologically most different species is *N. subfusca* with its characteristic angular shape of the opisthosoma, brownish colour and absence of the white spotted pattern that is present in *N. adianta* and *N. byzanthina*. *Neoscona byzanthina* usually differs from *N. adianta* by its larger size, the opisthosoma pattern (the first extensions of the bands are a little bit smaller and the pattern is more variable than in *N. adianta*) and the femora, which are usually apically darker (Mora-Rubio et al. 2019). The colour of the opisthosoma and femora should be verified by an additional study of the pedipalps in males and epigyne in females, if possible, to provide reliable identification of the specimens (Ledoux 2008, Mora-Rubio et al. 2019, Geci & Naumova 2021). The epigyne of *N. subfusca* has a longer scape that narrows in the middle part, compared to a shorter and triangular one in *N. adianta* and an evenly elongated one in *N. byzanthina* (Bosmans & Hervé 2021) (Figs 2, 3, 4). Also, in *N. byzanthina* there seems to be a bulge on the lateral side of the scapus of the epigyne (Fig. 2b), but more specimens are needed to be studied to see if this character is constant and characteristic for this species.



Fig. 1: Specimens of *Neoscona byzantina* from Romania. **a.** specimen from Rarișteea; **b.** specimen from Telița; **c.** specimen from Comănești; **d.** specimen from Mintia; **e.** specimen from Bujoru

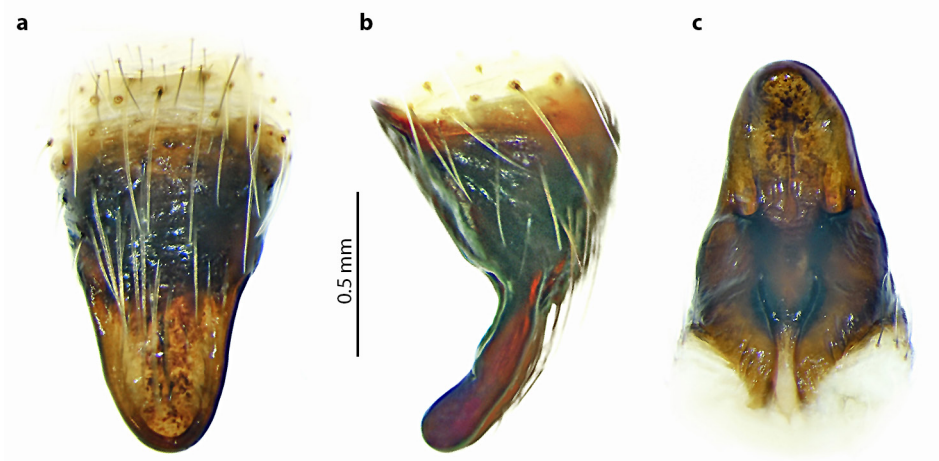


Fig. 2: *Neoscona byzantina* from Romania, epigyne. **a.** ventral; **b.** lateral; **c.** posterior view

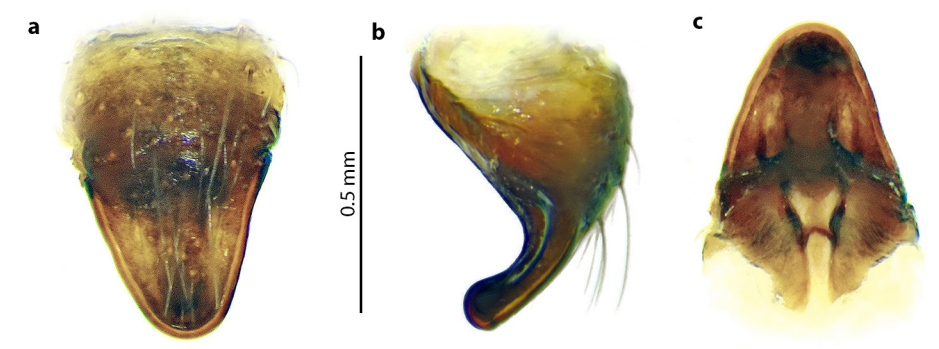


Fig. 3: *Neoscona adianta* from Romania, epigyne. **a.** ventral; **b.** lateral; **c.** posterior view

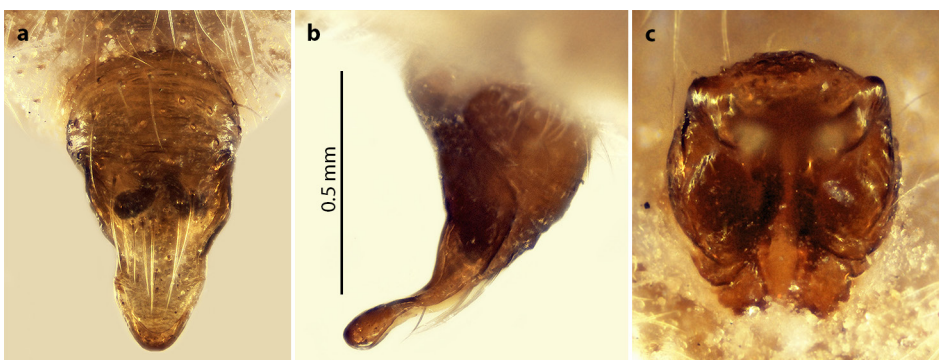


Fig. 4: *Neoscona subfusca* from Tunisia, epigyne. **a.** ventral; **b.** lateral; **c.** posterior view (Oger 2021)

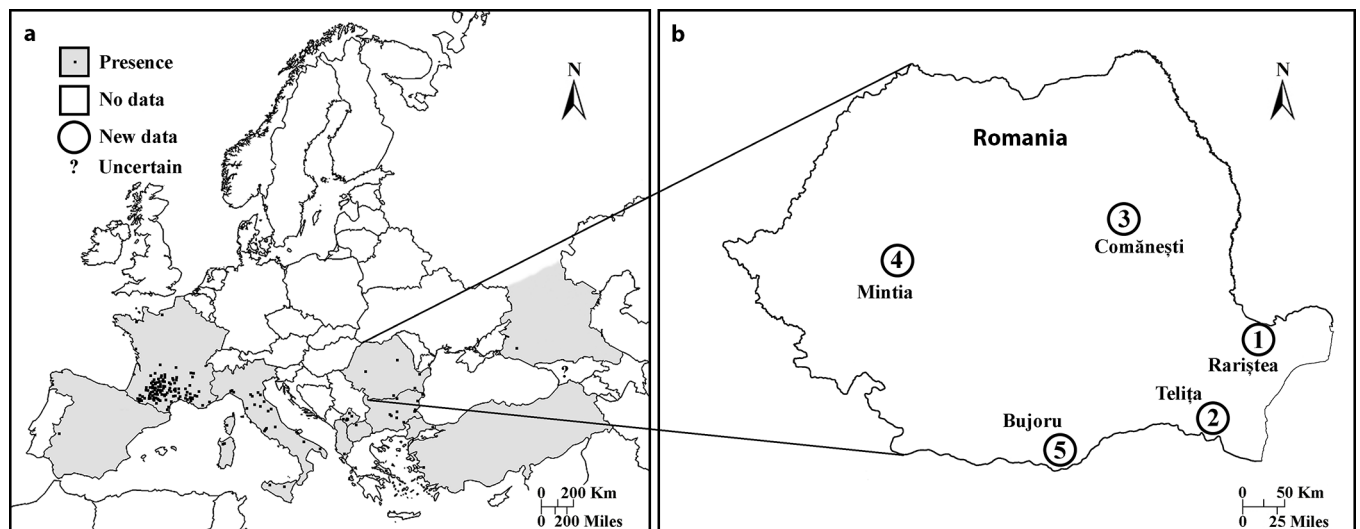


Fig. 5: Records of *Neoscona byzanthina*. **a.** in Europe and western Asia; **b.** in Romania

Discussion

In Europe, *Neoscona byzanthina* was recorded so far from the European part of Turkey, Greece (Evia (Euboea) Island) (as *Epeira byzanthina*) (Simon 1885), France (Ledoux 2008), Spain (Mora-Rubio et al. 2019), Italy (Bolognin et al. 2021), Russia (Caucasus) (Nentwig et al. 2021: Krasnov unpubl.), Albania, Bulgaria, Kosovo and North Macedonia (Geci & Naumova 2021) (Fig. 5a). A few records are known also from Georgia (Mcheidze 2014), but they should be treated with caution because of the poor figure and description of the species in her book. Further study is needed to confirm the presence of the species there. These data reveal that this species occurs both in humid (such as in the vicinity of the sea and rivers in France) and dry (grasslands in Spain and Italy) habitats (Ledoux 2008, Mora-Rubio et al. 2019, Bolognin et al. 2021). In Romania we found this species in both types of habitats (humid and dry places). Scattered trees or scrub vegetation were present at all locations and frequently used by the species to attach its orb web.

Our specimens were observed in mid-August and September. Future fieldwork carried out in these months would probably provide evidence that the species is more widespread in Romania and earlier fieldwork could result in finding males.

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