A first record of *Glyphesis taoplesius* (Linyphiidae, Araneae) from Slovakia

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Abstract: This paper presents new data, characteristic features, standard body measurements and illustrations of the rare European linyphiid spider *Glyphesis taoplesius* Wunderlich, 1969; which is recorded here for the first time in Slovakia. The species was found with high abundance in pitfall traps exposed in a floodplain forest near a water reservoir in the lowland Podunajská rovina.

Keywords: Danube river basin, epigeic spiders, faunistics, rare species

Linyphiidae is the second largest spider family in the world (PLATNICK 2011) and in Slovakia, 314 linyphiid species have been recorded (HELSDINGEN 2011). The genus *Glyphesis* was described by SIMON (1926) and now includes seven species worldwide (PLATNICK 2011); five in the Palaearctic and two in the Nearctic. The extremely rare spider *G. taoplesius* Wunderlich, 1969 was reported until now from only five European countries: Germany (WUNDERLICH 1969, BLICK et al. 2004, STAUDT 2011), Hungary (LOKSA 1981, BLICK & SZINETÁR 1996, KANCSAL et al. 2010), Denmark (SCHARFF & GUDIK-SØRENSEN 2009), Poland (OLESZCZUK et al. 2011 – the paper includes a map which shows all known records), and from the European part of Russia (ESYUNIN et al. 1998). Only one species of the genus, *G. servulus* (Simon, 1881), was previously recorded from Slovakia (GAJDOŠ et al. 1999, BLICK et al. 2004). *G. taoplesius* was originally described from Germany (WUNDERLICH 1969). Thereafter it was described by LOKSA (1981) in Hungary as *Glyphesis conicus*, which is considered as a junior synonym of *G. taoplesius* (BLICK & SZINETÁR 1996).

The present paper deals with the characteristic features of *G. taoplesius*, and adds it as a new species for the Slovakian araneofauna.

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Material and methods

The research program yielding this species has been running since October 2008 until the present. Spiders were collected from two study plots (A, B). We used pitfall traps (4 % formaldehyde solution), and in plot A 20 traps were set, in plot B 15 traps; all emptied at monthly intervals. The traps comprised plastic cups with an upper diameter of 7 cm and with a wooden cover to protect traps from rainfall and litter. The distance between traps was 5 m and they were set in a line.

Both sexes were measured and the data were summarised (Tabs. 1, 2). Body length, length and width of the carapace and opisthosoma, and the length of leg segments for 25 males and 25 females were measured. Photographs and measurements were obtained with a digital camera (CANON PowerShot G9) connected to a stereomicroscope (Zeiss Stemi 2000-C) using AxioVs40 V 4.7.2.0. A scanning electron microscope (Quanta 3D 200i) was used to examine the morphology of the epigyne. All measurements are in millimetres. Nomenclature follows PLATNICK (2011).

Glyphesis taoplesius was collected only from one trap in the study plot B – a natural flooded forest.
45♂♂, 41♀♀: 7.III.–4.IV.2009, SW Slovakia, Vozokany, river basin near a water reservoir, 115 m a.s.l. (48° 06' 00.59" N, 17° 41' 02.58" E), leg. E. Énekesová, det. A. Šestáková.

Glyphesis servulus was used for comparative purposes.
2♂♂, 1♀: 28.V.1994–21.V.1995, formaldehyde pitfall trap. Czech Republic, Hřebečníky-Týřovice, Týřov castle, stony debris (49° 58' 24" N, 13° 47' 23" E) , leg. et det. V. Růžička.

The specimens of *G. taoplesius* are deposited in the Department of Zoology, Faculty of Natural Sciences at the Comenius University in Bratislava.

Habitat characteristics

The study site is situated in a floodplain forest beside a water reservoir, prone to periodic desiccation, overgrown with reeds and crossed by the brook Čierna voda near the village of Vozokany (region Galanta, SW Slovakia) in the lowland Podunajská rovina. The soil profile is composed mostly of sandy gravel from the Danube River resulting from the former activity of the river, alluvial sediments and loess loam. The floodplain forest is composed of white willow (*Salix alba*) along with white poplar (*Populus alba*). The vegetation comprising the undergrowth is formed mainly by wild garlic (*Allium ursinum*) and yellow wood anemones (*Anemone ranunculoides*).

Results

Glyphesis taoplesius is reported here for the first time from Slovakia. Although, the research program has been running since October 2008, this species was found only in March 2009. It was collected in high abundance (86 adults) from just one pitfall trap out of the set of 15 traps. The species achieved the highest dominance value (22 %) of all the spiders collected in March.

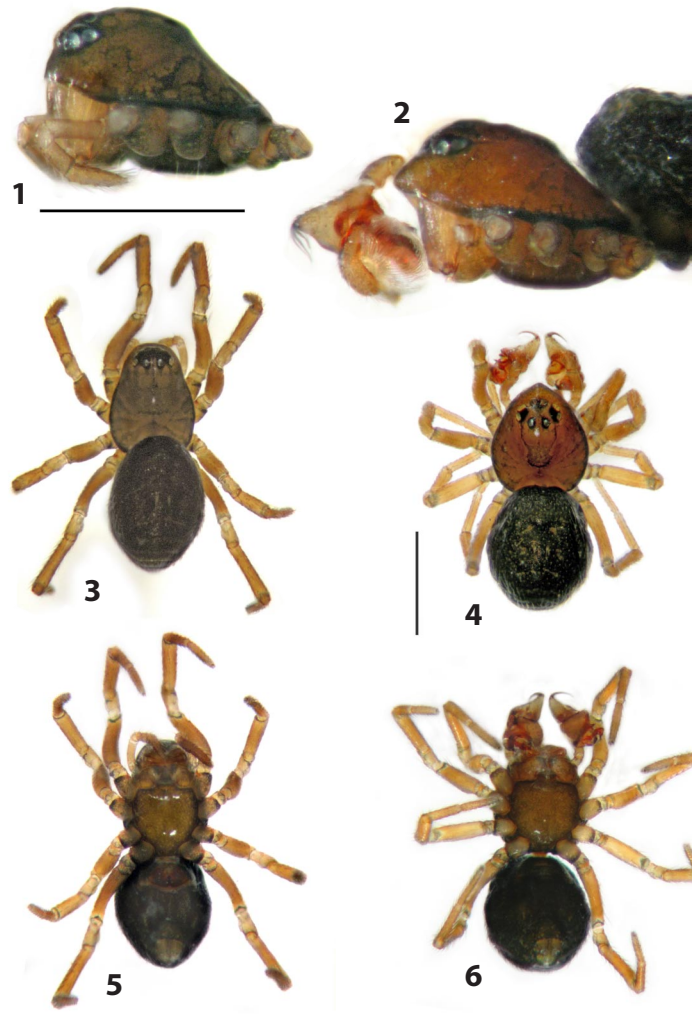


Fig. 1-6: *Glyphesis taoplesius*: 1, 3, 5 - female, 2, 4, 6 - male; 1-2 prosoma lateral view, 3-4 dorsal view, 5-6 ventral view (Scale = 0.5 mm).

Total body length of *G. taoplesius* is 1.02–1.22 in males and 1.01–1.31 in females. It has a dark-bordered brown prosoma, with post-ocular sulci and dark radial stripes in the thoracic region (Figs. 3, 4). The posterior part of the head region has a dark spot. The clypeus of the female has no specific feature (Fig. 1). However, the clypeus of the male is tapered into a cone (Figs. 2, 4), but it is not a nose-like process as in *G. servulus*. The sternum is as long as wide, brown-grey, whereas on the border it is darker. The yellowish gnathocoxae and the chelicerae are lighter than the sternum (Figs. 5, 6). The yellow-brown coloured legs are short and thick. The short oval abdomen has dark grey colouration; the ventral part is characterised by a paler tone.

The male palp is typical and unmistakable compared to other species of the genus *Glyphesis*. On the peak of the highly pointed tibial apophysis there are usually six thick, long, incurved bristles (Figs. 7, 8). Other species have a rounded hump at the tip of the tibial apophysis with (e.g. *G. servulus*) or without (e.g. *G. cottonae* (La Touche, 1946)) long bristles.

The female epigyne is not so distinct (Figs. 9–11). It resembles the epigyne of *G. servulus* (Simon, 1881). The only difference is visible from the lateral side – the epigyne of *G. taoplesius* is more protruding than the epigyne of *G. servulus* (WUNDERLICH 1969).

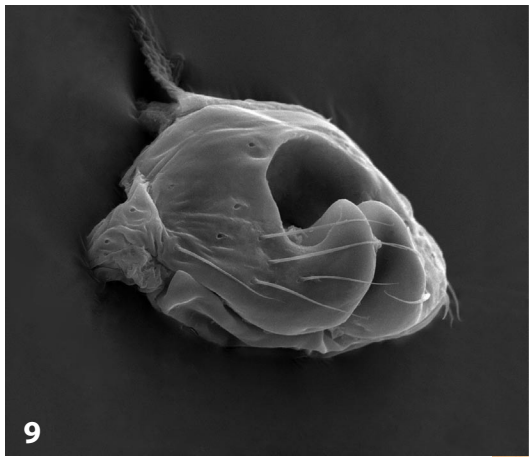
Discussion

Glyphesis taoplesius is a ground-living, European, stenotopic, hygrophilous spider that prefers biotopes like peat bogs, riparian and alder swamp forests, reed swamps or forests near rivers and lakes (WUNDERLICH 1969, LOKSA 1981, BLICK & SZINETÁR 1996, ESYUNIN et al. 1998, PLATEN & BROEN 2005, OLESZCZUK et al. 2011). It seems to occur sporadically in wet habitats. The species was recorded in Germany in a moist ulmaceous forest (Pruno-Fraxinetum) (WUNDERLICH 1969). According to his study, this spider is active from May to June. In Hungary it was found in higher abundance (45 specimens) in peat moss (*Sphagnum*) bog and alder (*Alnus*) wood near the lakes Nyírestó and Bábtava (LOKSA 1981). According to LOKSA (1981), its activity is from March to June. In Poland, only two males have been collected in May and July in a meadow and grassland complex of lower flooded terrace (OLESZCZUK et al. 2011). A single male of this species has also been found in the Middle Urals on a bank of a river in Russia (ESYUNIN et al. 1998). In Slovakia, a large number of specimens of this species (86 adults) were found in March on the bank of the water reservoir in a floodplain forest where the plant community was formed by a Salici-Populetum. The equal sex ratio in the pitfall traps is quite unusual, as males are presumably more active during the mating season. The phenomenon of equal

Tab. 1: Morphometric data for males of *Glyphesis taoplesius* (measurements in mm, n = 25)

	x	M	SD	Min	Max
Body, length	1.12	1.11	0.04	1.02	1.22
Carapax, length	0.56	0.56	0.02	0.52	0.62
Carapax, width	0.46	0.46	0.02	0.42	0.50
Opisthosoma, length	0.63	0.64	0.05	0.53	0.70
Opisthosoma, width	0.49	0.49	0.04	0.40	0.58
Femur 1	0.34	0.34	0.02	0.30	0.38
Patella 1	0.15	0.15	0.01	0.14	0.17
Tibia 1	0.27	0.27	0.01	0.22	0.29
Metatarsus 1	0.22	0.22	0.01	0.19	0.26
Tarsus 1	0.20	0.20	0.01	0.18	0.22
Femur 2	0.30	0.30	0.03	0.26	0.37
Patella 2	0.14	0.14	0.01	0.10	0.16
Tibia 2	0.23	0.23	0.02	0.18	0.26
Metatarsus 2	0.19	0.19	0.02	0.15	0.22
Tarsus 2	0.18	0.19	0.02	0.15	0.21
Femur 3	0.25	0.25	0.03	0.21	0.32
Patella 3	0.13	0.13	0.01	0.12	0.15
Tibia 3	0.18	0.18	0.01	0.16	0.19
Metatarsus 3	0.18	0.18	0.01	0.16	0.21
Tarsus 3	0.17	0.17	0.01	0.15	0.20
Femur 4	0.35	0.35	0.03	0.29	0.43
Patella 4	0.13	0.14	0.01	0.12	0.15
Tibia 4	0.30	0.30	0.02	0.25	0.33
Metatarsus 4	0.23	0.24	0.02	0.18	0.26
Tarsus 4	0.19	0.19	0.01	0.16	0.21

Fig. 7-8: *Glyphesis taoplesius*, male palp: 7 - Prolateral view, 8 - Retrolateral view (Scale = 0.2 mm).



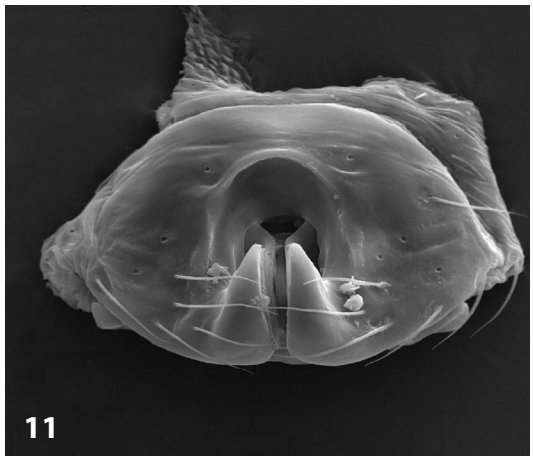


Fig. 9-11: *Glyphesis taoplesius*, female epigyne: 9 - Prolateral view, 10 - Ventral view, 11 - Dorsal view (Scale = 0.2 mm).

activity of females could refer to short mating activity. On the other hand, the enormous abundance of this species in only one single trap could point towards the presence of some special microhabitat and/or microclimatic conditions. The traps were placed parallel to the bank of the water reservoir, which suffers from periodic desiccation. We assume the humidity could be similar in all traps, however the trap with *G. taoplesius* was located nearest to the reservoir. Using the same collecting method as ours, this species has until now been collected only in small numbers (1–15 individuals per trap) (e.g. LOKSA 1981, OLESZCZUK et al. 2011), however, in Slovakia we collected it at a much higher abundance (86 in one trap). Based on our study, the main activity of *G. taoplesius* appears to be in March. Lower abundance of this species might be caused by collecting at the margins of its peak activity, or unsuitable climatic conditions. With respect to previous studies, the activity of *G. taoplesius* seems to be from March to July, with peak activity most likely in early spring; although biological and ecological requirements are still not well known.

All species of this genus have a very short body (length 1.0–1.3) with a mostly dark coloured habitus (NENTWIG et al. 2010). The body size and colours of specimens from the Slovak population of *Glyphesis taoplesius* correspond to the features of specimens from the Central Europe.

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Tab. 2: Morphometric data for females of *Glyphesis taoplesius* (measurements in mm, n = 25)

	x	M	SD	Min	Max
Body, lenght	1.13	1.11	0.08	1.01	1.31
Carapax, length	0.50	0.50	0.03	0.44	0.54
Carapax, width	0.42	0.42	0.02	0.38	0.44
Opisthosoma length	0.70	0.71	0.05	0.59	0.79
Opisthosoma width	0.52	0.51	0.06	0.44	0.62
Femur 1	0.35	0.35	0.03	0.30	0.40
Patella 1	0.15	0.15	0.01	0.13	0.17
Tibia 1	0.25	0.25	0.01	0.23	0.28
Metatarsus 1	0.21	0.21	0.01	0.19	0.26
Tarsus 1	0.20	0.20	0.01	0.18	0.23
Femur 2	0.30	0.30	0.02	0.27	0.35
Patella 2	0.15	0.15	0.01	0.13	0.17
Tibia 2	0.21	0.21	0.01	0.19	0.25
Metatarsus 2	0.19	0.19	0.01	0.15	0.22
Tarsus 2	0.18	0.19	0.01	0.15	0.20
Femur 3	0.26	0.26	0.02	0.23	0.32
Patella 3	0.14	0.14	0.01	0.12	0.15
Tibia 3	0.17	0.17	0.01	0.16	0.20
Metatarsus 3	0.17	0.18	0.02	0.14	0.22
Tarsus 3	0.17	0.17	0.01	0.14	0.21
Femur 4	0.36	0.36	0.03	0.30	0.41
Patella 4	0.14	0.14	0.01	0.11	0.17
Tibia 4	0.30	0.30	0.02	0.24	0.35
Metatarsus 4	0.23	0.23	0.02	0.19	0.27
Tarsus 4	0.19	0.19	0.01	0.16	0.22

Abbreviations: x – arithmetic mean, M – median, SD – standard deviation, Min – minimum, Max – maximum, n – number of individuals measured

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