

***Larinia* species (Araneidae, Araneae) in Hungary. Morphology, phenology and habitats of *Larinia jeskovi* Marusik, 1986, *Larinia elegans* Spassky, 1939, and *Larinia bonneti* Spassky, 1939**

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Abstract

A recent, systematic investigation of reeds revealed three *Larinia* species in Hungary. The paper presents the original figures demonstrating the copulatory organs of specimens from the Hungarian population, describes their phenology in the Carpathian-Basin, and also points out their habitat preferences.

Key words: *Larinia jeskovi*, *Larinia elegans*, *Larinia bonneti*, reed marshland, orb-weavers

INTRODUCTION

Species of the *Larinia* genus were unknown to the Central European spider fauna for a long time. First, Kupryjanowicz (1995) indicated the occurrence of *Larinia jeskovi* Marusik, 1986 from Northern Poland. The same year, Jäger (1995) reported the occurrence of *Larinia bonneti* Spassky, 1939 from the Lake Fertő (Neusiedlersee), (Austria), referring at the same time to the fact that *Singa phragmiteti* Nemenz, 1956, described from the same location is in fact junior synonym of *Larinia elegans* Spassky, 1939. The need for more information on European *Larinia* spp. is exemplified by the fact that the only *Larinia* species included in the 'Guide to Central European Spiders' on the Internet, currently is only *L. jeskovi* (Nentwig et al. 2003). From Hungary there are data regarding *L. jeskovi*, and *L. elegans* specimens since 1996 and 1997, respectively and *L. bonneti* is also known from several locations. A publication was issued based on data collected from the Balaton population of *L. jeskovi* (Szinetár 2000). The present publication aims

to summarise all biological information on the three Central European *Larinia* species.

MATERIAL AND METHODS

Study area and sampling

The sampling sites were located in four regions of Hungary: marshlands related to Lake Balaton, Lake Fertő, Lake Velencei and the Kiskunság area. For the exact geographical location of the sites, the plant associations examined and the years of the samplings see Table 1 and Map 1. The surveys took place between 1996 and 2003.

Knowing the daily activity of the *Larinia* species, data collection meant mostly nocturnal observation with the help of a torch but sampling by sweep-netting was also used.

RESULTS

Larinia jeskovi

The morphology of this species has already been described in several publications (Marusik 1986, Tanikawa 1989, Kupryjanowicz 1995). The copulatory organs of the

specimens from Hungary can be seen in Figs. 1-2. Fig. 2Ab shows the epigyne with a broken scape. Both Marusik (1986) and Kupryjanowicz (1995) published drawings of the epigyne with intact scapes. The intact scape is short and V-shaped. Out of the three species described, the damaged scape of the females having already copulated is the least striking in this species. European populations seem to be somewhat different from those in Asia. We, however, believe that it would be unjustified

to describe it as a new taxon. For this species only one location is known in Hungary in the reed bed at the shore of Lake Balaton (Balatonyörök). Population density was rather high (0.4 specimens/m²) between 1996 and 1998. The decrease of the water levels of Lake Balaton, experienced from 1998 on, resulted in a significant withdrawal of the population. It is a regrettable fact that the permanently low water levels of the lake has transformed (dried up) the characteristic habitat of

Table 1. Sampling sites, years and habitats of *Larinia* species in Hungary.

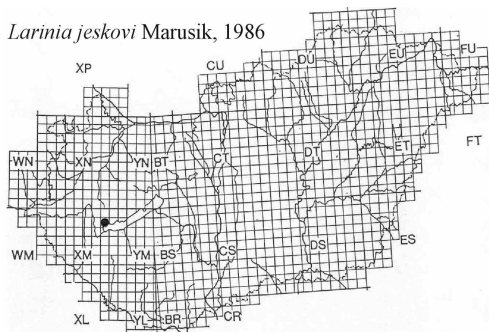
Sampling sites and years of samplings (Lake or region and the settlement)	UTM code	Habitat or plants	<i>L. jeskovi</i>	<i>L. elegans</i>	<i>L. bonneti</i>
Lake Balaton Balatonyörök 1996-2003.	XM 78	<i>Caricetum elatae typhaetusum angustifoliae</i> (on different plants,	+		+
Lake Balaton Fenépuszta 2001-2003.	XM 77	<i>Phargmitetum communis</i> (on different plants)		+	
Lake Balaton Tihany 2001-2002.	YM 19	<i>Phargmitetum communis</i> (on different plants)		+	
Lake Fertő (Herlakli-tó) 1996-2001.	XN 28	<i>Schoenoplectus litoralis</i>		+	
Lake Fertő Csárda-csatorna 1997.	XN 28	<i>Schoenoplectetum tabernaemontani-litoralis</i>			+
Lake Fertő Fertőboz 2000.	XN 27	<i>Schoenoplectetum tabernaemontani-litoralis</i>			+
Kiskunság Fülöpszállás 1998.	CS 68	<i>Bolboschoenetum maritimi</i>			+
Kiskunság Mikla-puszta 2003.	CS 67	<i>Bolboschoenetum maritimi</i>			+
Kiskunság Kiskunfehértó (Nemenz & Pühringer 1973) 1973.	CS 73	–		+(!) (only one juvenile specimen)	
Lake Velencei Dinnyés 2003.	CT 12	<i>Phargmitetum communis</i>			+
Lake Velencei Agárd 2003.	CT 12	<i>Phargmitetum communis</i>		+	+

this species (*Caricetum elatae typhaetusum angustifoliae*) resulting in a dramatic decrease in the species' abundance between 1999 and 2001. In 2001 collections at the sampling sites yielded 2 specimens only and none in 2002. In 2003 the examination of the entire shore examined in earlier years yielded one female specimen. Continuous observations seem to prove that this species has a one-year growth period, with the main copulation period at the beginning of August (Szinetár 2000). For the phenology of the species see Fig. 3. The system used by Toft (1976) was adopted for the presentation of phenological data. Our earlier paper looks thoroughly into the species's daily activity and into their selection of the web site (Szinetár 2000).

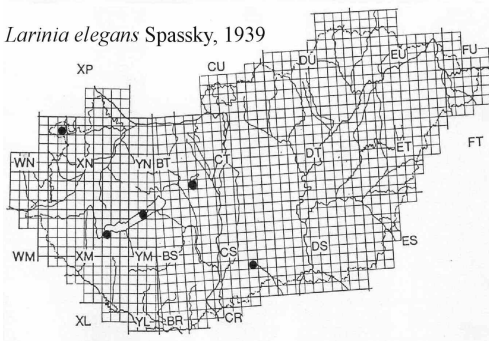
Larinia elegans

We have our own data of *Larinia elegans* from the Hungarian side of the Lake Fertő since 1996. Eighty percent of the Hungarian side of the lake is covered by reed including several internal ponds, varying in size. Homogeneous populations of *Schonoplectus litoralis* are typical of these ponds. The species can be found on this plant in the daytime period, as well, because it represents a less than excellent hiding place compared to the reed. Besides the Lake Fertő population of *L. elegans* (1996-2001), further two strong populations of the species were also found in the Balaton region in 2001, and one at Lake Velencei in 2003. The species lives in the deeper water zone, therefore it is less sensitive to the water level fluctuations of the lakes. It is important to note that the known Balaton habitats belong to the highly protected areas of the Balaton-felvidék National Park, with no chemical spraying against mosquitoes at all. Adult females and juveniles can be observed throughout the summer. Previously we collected female and young specimens only, although we have found some subadult male specimens in the autumns of 2001 and 2002 at Lake Balaton. The epigyne of this species collected at Lake Balaton and Lake Fertő are shown in Fig. 2Bb, and in Fig. 2Bi,

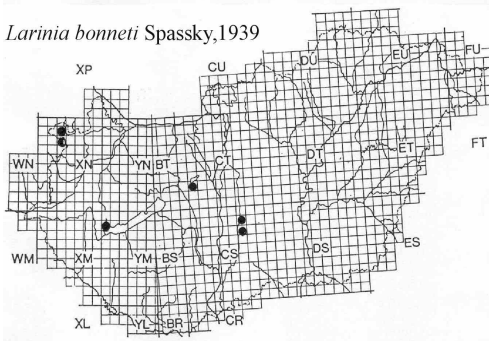
Larinia jeskovi Marusik, 1986



Larinia elegans Spassky, 1939



Larinia bonneti Spassky, 1939



Map. 1. Study sites of *Larinia* species in Hungary.

respectively. The epigyne is shown after copulation in Fig. 2Bb. For the genus *Larinia* it is rather characteristic that the scape of the epigyne is torn off after copulation (Marusik 1986). The scape of the virgin females of *L. elegans* (Fig. 2Bi) is fine and transparent, 1.5-2 times wider than high. During copulation it gets torn off almost in a regular crescent shape, and this is why the lack of the scape is less conspicuous than in the case of *L. bonneti*, where the torn surface is assymetric (Figs. 2C, 2B1,2). In the summer of 2003 we managed to collect male specimens in Hungary for the first

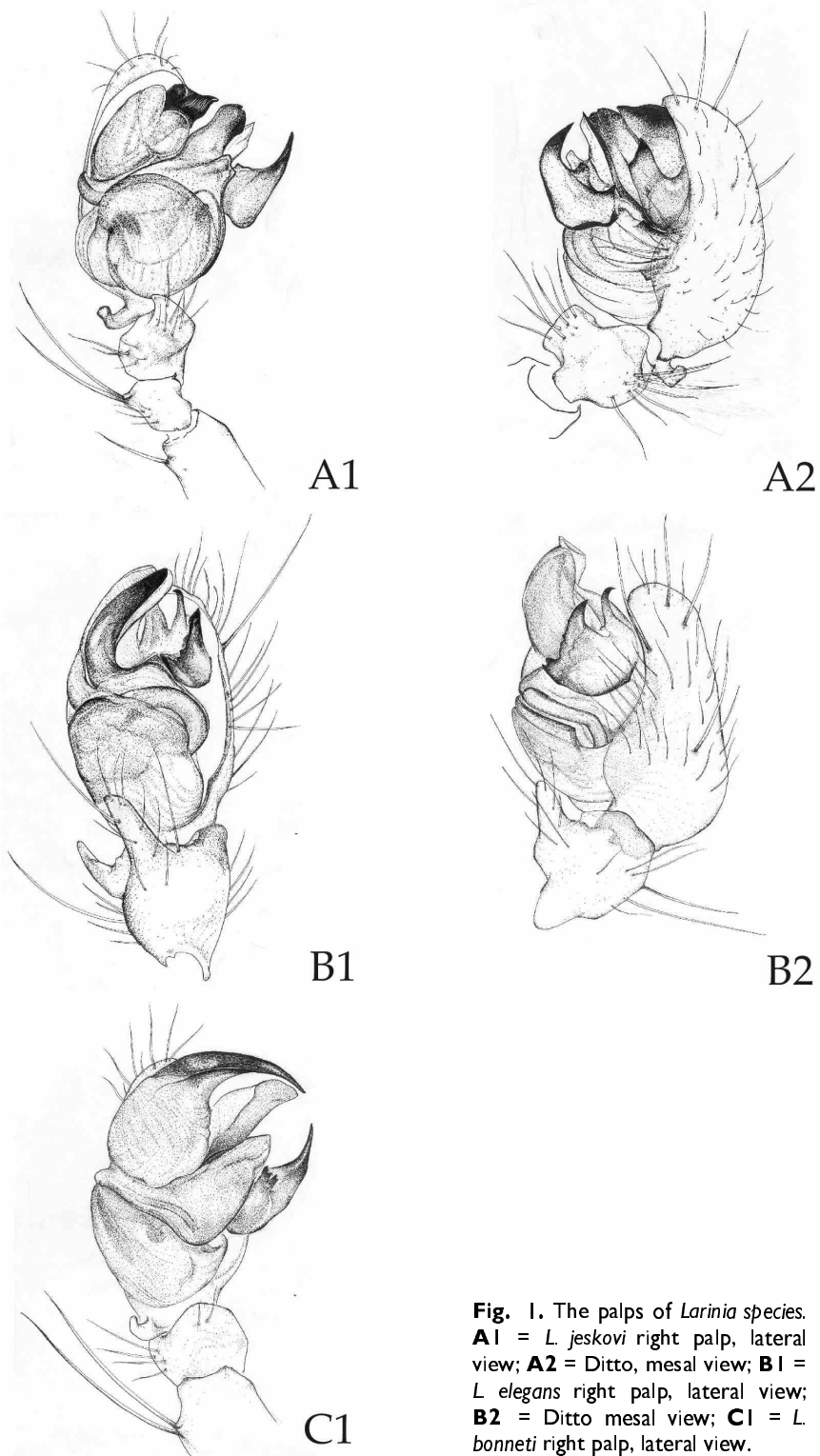


Fig. 1. The palps of *Larinia* species. **A1** = *L. jeskovi* right palp, lateral view; **A2** = Ditto, mesal view; **B1** = *L. elegans* right palp, lateral view; **B2** = Ditto mesal view; **C1** = *L. bonneti* right palp, lateral view.

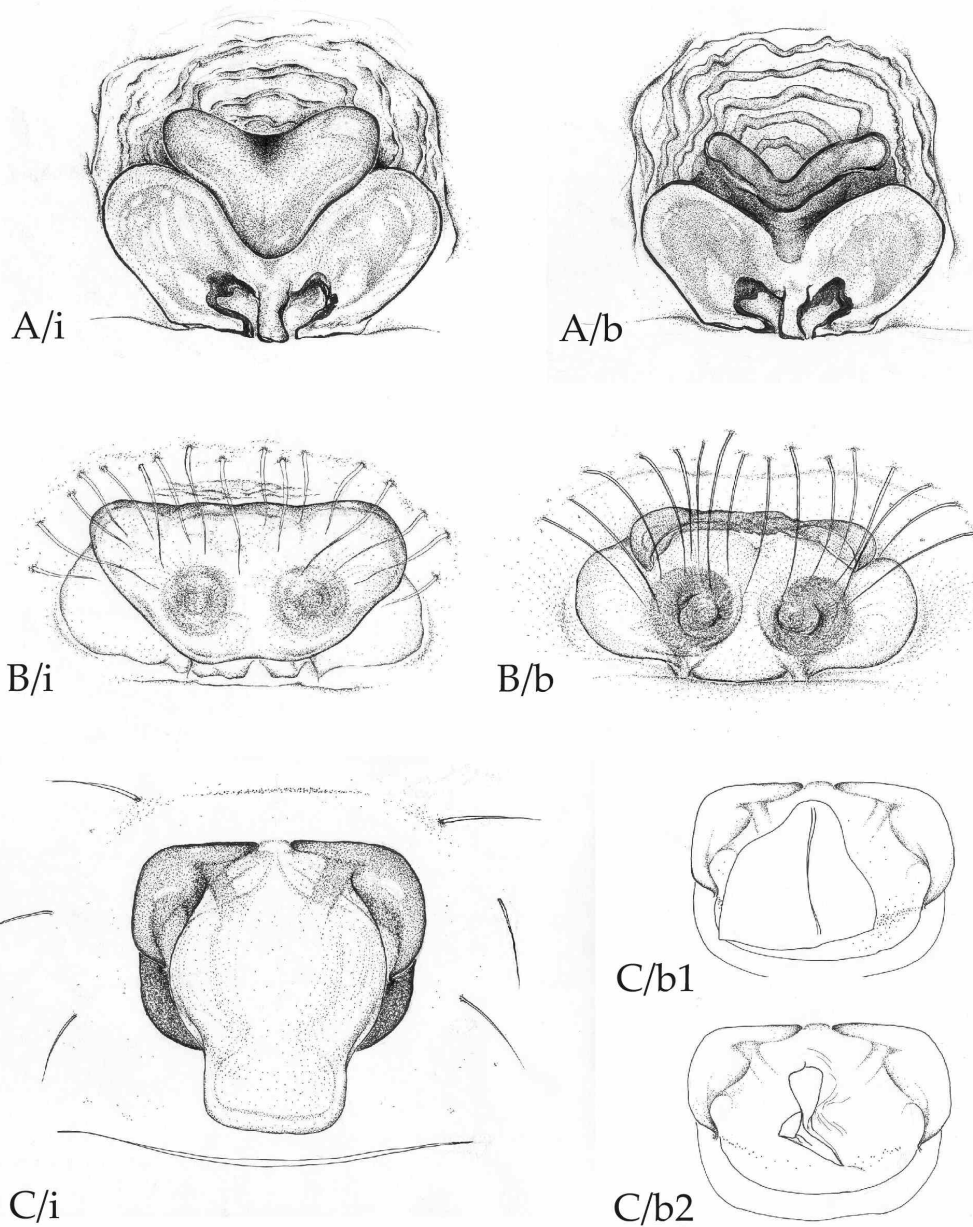


Fig. 2. The epigyne of *Larinia* species. (i = intact epigyne; b = epigyne with broken scape); **A** = *L. jeskovi*; **B** = *L. elegans*; **C** = *L. bonneti*.

time (Lake Velencei, Agárd). The palp of this specimen is shown in Figs. 1B1-2. For the phenology of the species, see Fig. 3. As we have pointed out in the Introduction, Jäger (1995) has already noted that *Singa phragmiteti* reported from the Austrian part of Lake Fertő by Nemenz (1956), is the junior synonym of *Larinia elegans* Spassky, 1939. Based on Hungarian examinations we have already supported the synonymy (Szita et al. 2002). On the basis of male specimens collected in Hungary in 2003, and based on the biological description of the species by Nemenz and Pühringer (1973) we are confident to take the position that *Singa phragmiteti* Nemenz, 1956 is the junior synonym for the *Larinia elegans* Spassky, 1939. It must be noted that the drawings made of the pedipalp of the male *Singa phragmiteti* Nemenz, 1956 (Nemenz 1956; Nemenz & Pühringer 1973) are not detailed enough. This probably accounts for Platnick's (2003) the synonymy reluctance to accept and include it in the World Spider Catalogue. Given the synonymy, Nemenz and Pühringer (1973) were the first to collect a juvenile specimen of *L. elegans* in Hungary at Kiskunfehértó. With this data together we have five recorded occurrences of *L. elegans* in the Carpathian-Basin.

Larinia bonneti

L. bonneti is known from seven locations in Hungary up to this date. The specimens were collected by sweep-netting at five sites, from water-covered zones located along shores. We also carried out two nocturnal observations with the help of a torch. For the copulatory organs of the species see Figs. 1-2. At Lake Fertő and in the Kiskunság area (Fülöpszállás) the species inhabits plants of saline marshlands (*Schoenoplectetum tabernaemontani-litoralis*; *Bolboschoenetum maritimi*). The only occurrence from the Balaton site comes from the high sedgy habitat of *L. jeskovi* (*Caricetum elatae typhaetusum angustifoliae*). At Lake Velencei we collected specimens of the species from reedy parts at two sites (Dinnyési Fertő, Agárd). Adult specimens of both sexes can be found at

the end of May, beginning of June. In mid-June only females can be found, with the scape of their epigyne torn off. Laying of cocoons was observed at the end of June – the spiderlings hatch in mid-July. It is supposed that the species overwinters in young or subadult state, and the only copulation period is the aforementioned one. For the phenology of the species see Fig. 3.

DISCUSSION

All three *Larinia* species seems to be linked to wetland habitats. Former arachnological examinations in Hungary failed to pay due attention to these habitats. Our own data suggest that both *L. jeskovi* and *L. elegans* are species with nocturnal activity and make typical orb webs, like all other European Araneidea. We have little data on the daily activity of the *L. bonneti*, but we suppose that just like the other two, this species is an exclusive nocturnal web builder, too. We observed specimens of *L. bonneti* in its web on two occasions only, both during night; other data on the species resulted from sweep-netting. Nocturnal activity can be another reason why the populations of *Larinia* species in the Carpathian-Basin remained untraced and unrecorded for such a long time. The geographical range of the three *Larinia* species is partially modified by data from Hungary. Platnick (2002) listed *L. jeskovi* as a species with a range from Eastern-Europe to Japan. We hold the view that other lakes in Central-Europe could possibly be homes to the species. Although the distribution of *L. elegans* has been cleared, Platnick (2002) mentions it in Russia and in China only. For this species Lake Fertő as the last shallow steppe lake, so typical of Central Asia, seems to be the westernmost boundary of its spread. For *L. bonneti* Platnick (2002) mentions occurrences in Austria (Lake Fertő), in Russia, in Georgia and in Japan. This species has not been found between the Caucasus and Far East. We believe that the latter two species have a continuous area typical of the shores of the salty lakes in Eurasia. They show considerable

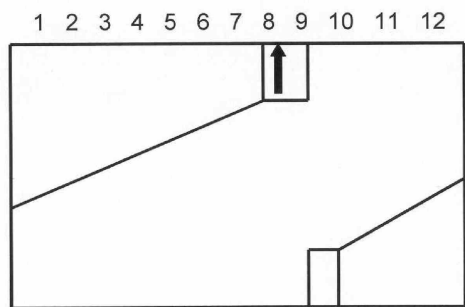
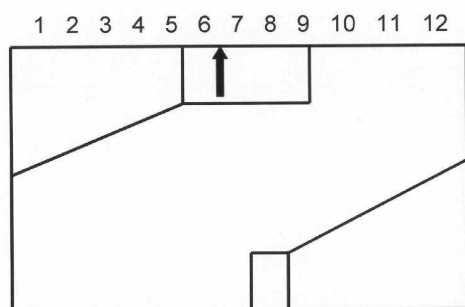
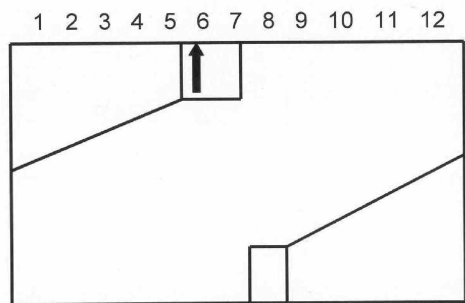
*Larinia jeskovi**Larinia elegans**Larinia bonneti*

Fig. 3. Phenology of *Larinia* species. (The figure covers one year. Small rectangle at the upper part of the figure = period of adulthood, the arrow in it = time of copulation. Small rectangle at the bottom = egg-laying period. Solid line = rate of development.)

abundance provided the conditions are favourable for them. This fact assigns these *Larinia* species a major role in the habitats of the shores of shallow lakes.

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REFERENCES

- Kupryjanowicz, J. 1995. *Larinia jeskovi* Marusik, 1986, a spider species new to Europe (Araneae: Araneidea). *Bulletin of the British Arachnological Society* 10(2), 78-80.
- Jäger, P. 1995. Spinnenaufsammlungen aus Ostösterreich mit vier Ernstnachweisen für Österreich. *Arachnologische Mitteilungen* 9, 12-25.
- Marusik, Yu.M. 1986. The orb-weaver genus *Larinia* Simon in the USSR (Aranei, Araneidae). *Spixiana* 9(3), 245-254.
- Nemenz, A. & Pühringer, G. 1973. Zur Taxonomie und Ökologie von *Singaphragmiteti* Nemenz, 1956. *Sitz. Ber. Öst. Akad. Wiss.* 181, 101-109.
- Nentwig, W., Hänggi, A., Kropf, C. & Blick, T. 2003. *Central European Spiders – Determination Key. version 8.01.2003* <http://www.araneae.unibe.ch/index.html>.
- Platnick, I. N. 2003. *The World Spider Catalog. version 4.0.* <http://research.amnh.org/entomology/spiders/catalog81-87/index.html>
- Szinetár, Cs. 2000. Data on the biology of *Larinia jeskovi* Marusik, 1986 (Araneae: Araneidae) from the reed belts of Lake Balaton. *Ekologia (Bratislava)* 19(suppl.4), 105-110.
- Szita, É., Szinetár, Cs. & Szűts, T. 2002. Faunistical investigation on the spider fauna (Araneae) of the Fertő-Hanság National

- Park. In: *The fauna of the Fertő-Hanság National Park* (S. Mahunka eds.) pp. 231-244. Akadémiai Kiadó, Budapest.
- Tanikawa, A. 1989. Japanese spiders of the genus *Larinia* Simon (Araneae: Araneidae). *Acta arachn. Tokyo* 38, 31-47.
- Toft, S. 1976. Life-histories of spiders in a Danish beech wood. *Nat. Jutl.* 19, 5-40.