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Nelima semproni SZALAY, 1951 (Opiliones: Gagrellidae) in Warszawa

[With 9 text-figures and 1 table]

From the territory of the center of Warszawa until now 8 species of harvestmen had been known: *Leiobunum rotundum* (LATR.), *L. rupestre* (HB.), *L. blackwalli* MEADE, *Oligolophus tridens* (C.L.K.), *Lacinius horridus* (PANZ.), *Phalangium opilio* L., *Opilio parietinus* (DE GEER) and *O. saxatilis* C.L.K., from the entire city of Warszawa however 15 species had been reported (STAREGA 1963).

During the years of 1974–1975 while the extensive studies entitled „The fauna of the green areas of Warszawa as indicator of the condition of the environment” had been carried out by the Institute of Zoology of the Polish Academy of Sciences, a new faunal element — *Nelima semproni* SZAL. has been discovered, a species formerly not reported from Poland.

The research covered a variety of the municipal green areas: parks, lawns along the streets, green areas surrounding the settlements, etc.

Of the various methods of collecting we will deal herein only with the pit-fall traps because all specimens of *N. semproni* had been taken that way. These traps (glass cylinders 4 cm. in diameter and 120 c.c. in capacity) were dug into the ground with an aid of an instrument which serves to take soil samples, and filled up to $\frac{1}{3}$ of their capacity with ethylene glycol as a preservative. The traps were emptied every fortnight (with small variations). In this way continuity of captures was assured, which in 1974 commenced early in July and continued well into October. The pit-fall traps got arranged in rows, set one meter apart, about 10–15 on each green or lawn according to its size. In 1975 the research begun earlier, already in April but retaining the

same arrangement of the traps and the same number. However, „non-stop” captures were discarded in favour of two weeks capture once a month.

Since *N. semproni* is a little known species we are giving here its description and morphological illustrations.

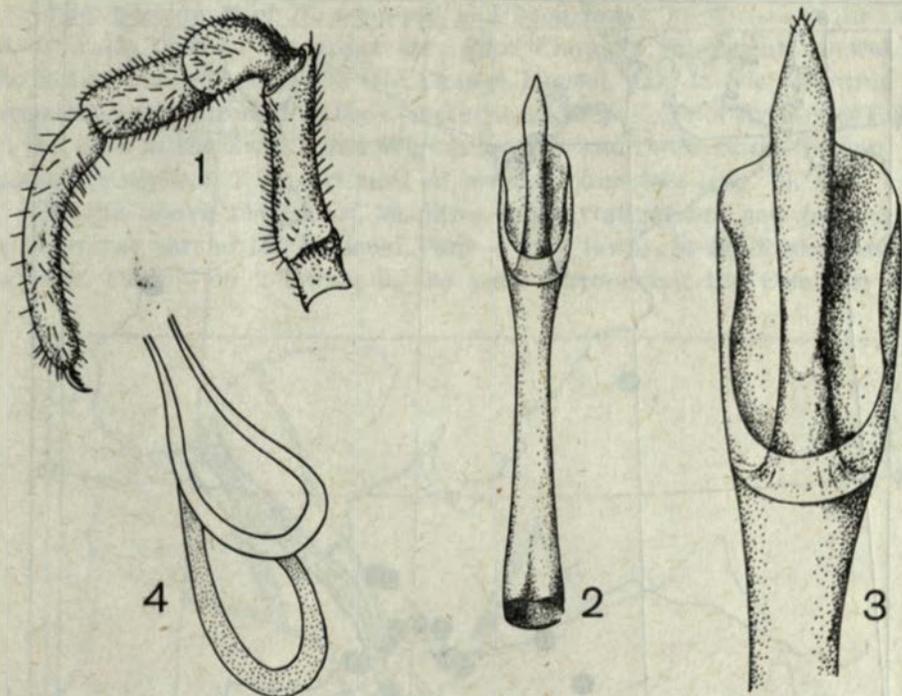
Body of male little convex, 3.0–3.9 mm. long and 2.1 mm. wide, that of female egg-like in shape, 5.0–6.2 mm. long and 2.3–2.7 mm. wide. Dorsum covered with well marked granules, much larger in the male. Eye tubercle distant from the front margin of the body by about 1.5 of its length, slightly broader than its length and height; supraocular rings with few small granules and hairs. Venter smooth, abdominal sternites with short hairs arranged in transverse rows. Similar hairs on the coxae, much longer in the area of the mouth and genital openings. Cephalothorax in both sexes brown-yellow, front margin of the body dark brown. Silver spot in form of letter Y in front of the eye tubercle, reaching with its single arm the also silvery eye tubercle. Dark brown shading extends from this light spot parallel to the margins of the cephalothorax. Abdomen in the male brown-yellow with indistinct brown shading and silvery-yellow spots. In the female the abdomen is almost brown, with indistinct goldenish long stripe along the median line and golden spots along the sides. On the Vth tergite begins a large golden spot, its top reaching the anal opening. Venter in both sexes yellowish, with faint silvery glitter, more distinct in the female. Coxae with indistinct, subapical, brown rings and in females with washed out silvery basal spots, especially on the hind coxae.

Chelicerae of both sexes yellow with black apices of the pincers. Second segment with numerous hairs on the entire frontal surface.

Palpus (Fig. 1) covered with hairs, yellowish, apical part of femur, patella and tibia shaded with brown. In the males tarsus characteristically bent. Length of the palpus in male 3.2–3.7 mm. (femur 0.9–1.2 mm.), in female 3.7–4.1 mm. (femur 1.1 mm.).

Legs of moderate length, all their segments cylindrical. Femora with longitudinal rows of spiky granules, the remaining segments with hairs. Legs yellow-brown, distal ends of the femora, patellae and tibiae darker, without white apical rings. Tibia II with 8–9 false articulations. Length of legs — male: I pair 18.1–21.3 (femur 3.4–4.1), II pair 29.3–39.1 (femur 5.9–6.9), III pair 18.3–20.9 (femur 3.5–4.3), IV pair 21.5–30.0 mm. (femur 4.1–6.6 mm.); female: I pair 19.2–21.1 (femur 3.5–4.1), II pair 35.5–40.1 (femur 6.4–7.4), III pair 19.3–21.7 (femur 3.7–4.4), IV pair 27.7–30.7 mm. (femur 5.8–7.1 mm.).

Penis (Fig. 2) with alate part equal to $\frac{1}{3}$ the length of the shaft, stick-like with slightly widened base. Glans (Fig. 3) clearly separated, slightly bent dorsally. Stylus indistinctly separated. Length of penis 2.2 mm., colour uniformly yellowish, only sides of the alate part slightly darker. Ovipositor light yellow, 2.8 mm. long and 0.4 mm. wide, consisting of 24 segments; 11 terminal segments with transversal rows of hairs. Seminal receptacle (Fig. 4) located between the I and II full segments, with two bladdery, thick-walled sacs.



Figs. 1-4. *Nelima semproni* SZAL.: 1 — palpus of the male; 2-3 — penis; 4 — seminal receptacle.

The species described from western Hungary (locus typicus: Sopron; SZALAY 1951), for long time was not distinguished from the related *Nelima silvatica* (SIM.), and cited under this name (e.g.: ŠILHAVÝ 1956, NEMENZ 1959, GRUBER 1960, BROEN and MORITZ 1965). Only recently MARTENS (1969) established its differences. *N. semproni* is a Central European species, so far known from the following localities (Fig. 5). Italy: Firenze (CAPORIAMCO 1924, 1936), Alpi Carniche (CAPORIAMCO 1926), Venezia (CAPORIAMCO 1934), Verona (CAPORIAMCO 1940), Forlì (CAPORIAMCO 1949), Genova (TROSSARELLI 1943), Toricella (CAPORIAMCO 1950a), Oltone (CAPORIAMCO 1950b), Casentino (KIRCHNER and SALZER 1967, MARTENS 1969), Velino and Ernici Mts. (MARCELLINO 1971), Isl. Elba (MARTENS 1969). Yugoslavia: cave Vilinska jama near Krapina (in Croatia; BABIĆ 1916), Varaždin (MARTENS 1969), Rovinj (KOLOSVÁRY 1938), Dubrovnik (ROEWER 1957), valley of Morava River (ROEWER 1957, MARTENS 1969). Austria: Innsbruck (ROEWER 1957, GRUBER 1960, MARTENS 1969), Leithagebirge (NEMENZ 1959, GRUBER 1960, MARTENS 1969), Hainburger Berge, Wienerwald, Melk (GRUBER 1960), Salzburg, Wien, Gailtal, numerous localities in the foothills of the Eastern Alps (MARTENS 1969). Hungary: Sopron, Nagyfüzes (SZALAY 1951). Czechoslovakia: Pouzdřany, Rajhrad (ŠILHAVÝ 1971). G.D.R.: Böhlen near Leipzig (BROEN and MORITZ 1965, MARTENS 1969), Berlin (MARTENS 1969). Poland: Warszawa (STARŃGA 1976 — a general evidence of its presence based upon the material discussed in greater detail in the present paper).

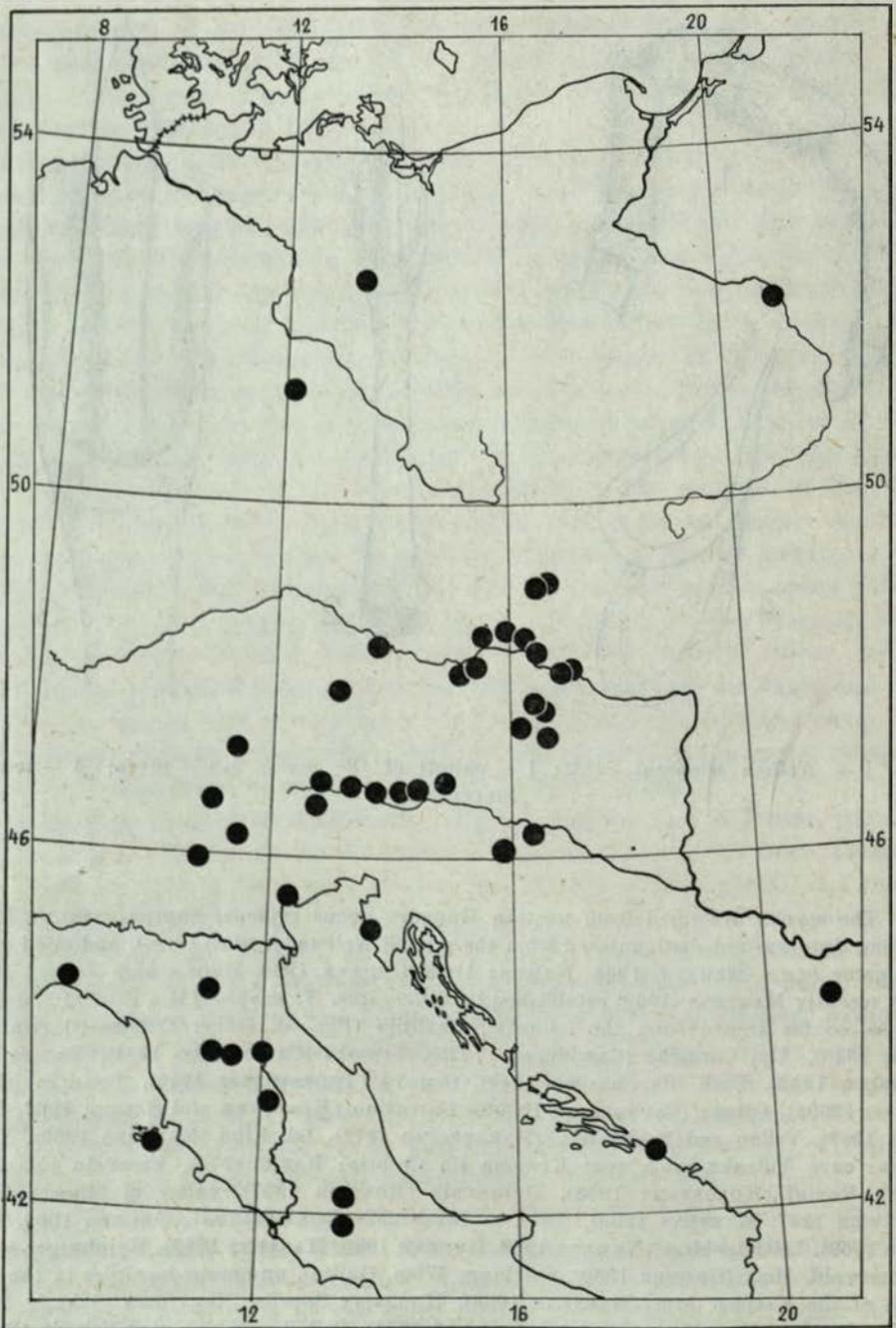


Fig. 5. Distribution of *Nelima semproni* Szal.

Soviet Soldiers — on 3 lawns, in the Żwirko and Wigura Avenue — on 1 lawn and in the Saski Garden — on 3 lawns.

In 1974 individuals of *N. semproni* in the Łazienki Park had been found on all investigated lawns, on the Soviet Soldiers' Cemetery on two lawns near each other (the third on which the species in question was not found in 1974 was not included in later calculations). In the Żwirko and Wigura Avenue the captures had been carried out along the lawn running parallel to the avenue, in the immediate neighbourhood of the Soviet Soldiers' Cemetery. In the Saski Garden the presence of *N. semproni* was established only on one of the three studied lawns.

Altogether in 1974, during 4 months' investigations, 48 individuals of *N. semproni* were captured of which the majority, 31 individuals, in the upper area of the Łazienki Park. In the lower section of this park only 4 individuals got caught, in the Soviet Soldiers' Cemetery 12, and 1 individual each on the Żwirko and Wigura Avenue and in the Saski Garden.

The research carried out during 1975 showed decrease in the numbers of all species of harvestmen in the parks, including the Łazienki Park and the Soviet Soldiers' Cemetery. On the other hand, in many other areas, including the lawns running along the streets, no marked difference in this respect was established. This suggests that the reduction in the number of the harvestmen in the city parks is probably due to the human factor and has to do with the conservation and cleaning work carried out in these parks. It might be that they are sensitive to the chemical compound used specifically in the parks of Warszawa, during the spring spraying of the lawns with herbicides. It is also possible, or even probable, that the fauna of the parks got destroyed in large percentage during the mechanical lawn-mowing. In the spring and summer season of 1975 this action was much intensified by comparison with the 1974. Considering the extremely hot weather and the extreme draught during that time, frequent lawn-mowing lead to the intensive drying up the habitats, resulting in the unfavourable conditions for the majority of the harvestmen occurring in the area. It is likely that they emigrated from such habitats to those more favourable to them: this means shaded and sheltered by bushes where they became inaccessible to the traps. During just that time on the wooded and abandoned lawn in the Żwirko and Wigura Avenue (near the Soviet Soldiers' Cemetery) it was shown that the dominant *Phalangium opilio* increased in numbers.

Altogether during 1975 only 11 specimens of *N. semproni* were caught: of these 6 in the upper part of the Łazienki Park, 1 in its lower area, and 4 in the Soviet Soldiers' Cemetery (here, this time the occurrence of this species was also shown on the third lawn).

Considering the minimal number of the captured specimens both of *N. semproni* as well as other harvestmen, the detail analysis was applied only to the results from 1974.

The juveniles of *N. semproni* for the first time were found in the traps in the second half of July. It is possible that they occurred earlier but in view of the sporadic occurrence of this species they were not recorded.

Relative density of individuals of *N. semproni* in the localities in which it occurred relatively frequently was (in relation to a single trap during two week cycle in 1974):

Lazienki (upper area)	— 0.175
Soviet Soldiers' Cemetery	— 0.085
Lazienki (lower area)	— 0.024

The detailed data are given in the Table I.

Table I. Numbers of individuals of *Nelima semproni* SZAL. in the pit-fall traps in the localities in Warszawa where in 1974 it was most numerous

Investigated surface		Lazienki Park Upper area				Lazienki Park Lower area				Soviet Soldiers' Cemetery			
Month	Half of the month	N		n	t	N		n	t	N		n	t
		juv.	ad.			juv.	ad.			juv.	ad.		
July	I	—	—	25	13	—	—	25	14	—	—	20	17
	II	—	—	25	14	—	—	25	14	1	—	19	10
August	I	—	—	25	14	—	—	19	14	—	—	9	14
	II	10	2 ♀♀	24	13	—	—	17	17	1	—	15	13
September	I	1	4♂♂, 1♀	16	15	—	1♀	20	13	—	—	18	12
	II	—	6♂♂, 2♀♀	20	14	—	1♀	20	14	—	—	20	17
October	I	—	3♂♂, 1♀	20	13	—	1♀	20	14	—	2♀♀	20	13
	II	—	1♀	22	14	—	1♀	18	14	—	8♀♀	20	14

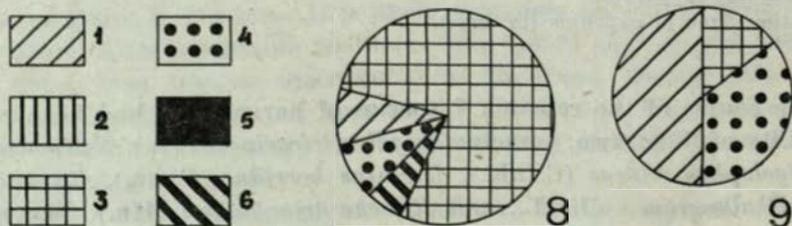
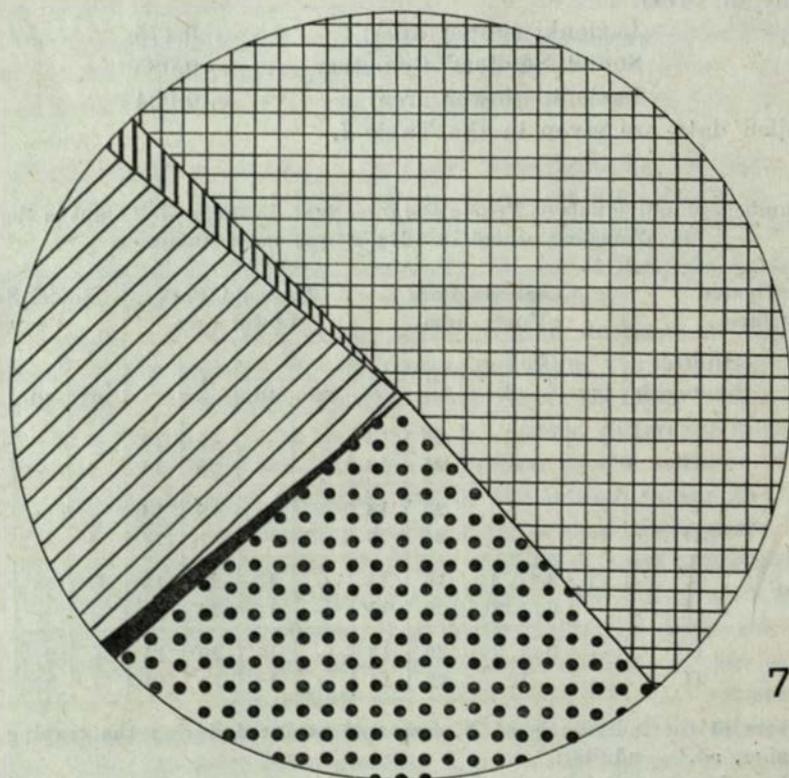
N — numbers of the individuals of *N. semproni* captured during the trapping (juv. — juveniles, ad. — adults);

n — number of active pit-fall traps (some traps were damaged during the garden work carried out in parks);

t — duration time of captures (in days).

In the course of the research 7 species of harvestmen had been recorded from the City of Warszawa, namely: *Trogulus tricarinatus* (L.), *Nelima semproni* SZAL., *Oligolophus tridens* (C.L.K.), *Lacinius horridus* (PANZ.), *L. ephippiatus* (C.L.K.), *Phalangium opilio* L., and *Rilaena triangularis* (HB.). The material all comes from the pit-fall traps which inevitably capture the epigeic forms and this explains the absence of the long-legged harvestmen which live on the walls, bushes and trees, such as: *Leiobunum rotundum* (LATR.), *L. rupestre* (HB.), *L. blackwalli* MEADE and *Opilio parietinus* (DE GEER) — it is possible that these species will be found among the materials obtained by other means, which as yet has not been worked over and will be subject to a separate analysis.

Trogulus tricarinatus was captured in the upper part of the Łazienki Park on the lawn near the sizable cluster of trees and bushes under which there accumulated relatively dense layer of leaf litter. This location is just above the slope of the Vistula River valley and it is possibly of natural origin. *T. tricarinatus* recently was found in a similar habitat in the Bielany Forest,



Figs. 7-9. Numbers of *Opiliones* individuals of several species in the localities in Warszawa where *Nelima semproni* SZAL. was found (data from 1974) — Łazienki Park — upper area (7), Łazienki Park — lower area (8), Soviet Soldiers' Cemetery (9): 1 — *Nelima semproni*; 2 — *Trogulus tricarinatus*; 3 — *Oligolophus tridens*; 4 — *Phalangium opilio*, 5 — *Rilaena triangularis*; 6 — *Lacinius horridus*. (The diameters of circles are proportional to numbers of all individuals).

which is a leftover of the primeval forest biotopes. It is possible however, that this harvestman, a typical inhabitant of the soil and leaf litter, got into the Łazienki Park with the soils brought over for the gardening purposes.

Oligolophus tridens and *Lacinius ephippiatus* are very similar in their environmental requirements — both live in the leaf litter and among low vegetation in wet and shaded places. *O. tridens* is common in all discussed habitats, in the Łazienki Park it is even a dominant (Figs. 7 and 8), *L. ephippiatus* on the other hand had been reported only once, a single female, on the street lawn in the Ujazdowskie Avenue adjacent to the Łazienki Park.

Lacinius horridus was also captured only once: a single male and a single female, on the xerothermic habitat in the lower part of the Łazienki Park (below the slope of Vistula valley). This habitat is according to the natural preference shown by this species, which favours dry and well sunlit places.

The ubiquitous *Phalangium opilio* most frequently appears on all street lawns where it is usually the only representative of the *Opiliones*. It is also among the most frequently encountered representatives of this group although occasionally it is outmatched in numbers by *Oligolophus tridens* (Łazienki Park) or *Nelima semproni* (Soviet Soldiers' Cemetery) (Figs. 7–9).

Rilaena triangularis is, at least as adult, an accidental introduction on the investigated lawns, because it lives mainly on trees and bushes. Only isolated specimens of this species had been found in the upper part of the Łazienki Park and in the Soviet Soldiers' Cemetery.

On the entire territory of the Łazienki Park the most dominant form in 1974 was *Oligolophus tridens*, but on the Soviet Soldiers' Cemetery numerically dominated *N. semproni*. On the Figures 7–9 are shown the total numbers and the relative number relationships among the harvestmen on the territory of both parts of the Łazienki Park and in the Soviet Soldiers' Cemetery. It is obvious that the greatest numbers of the harvestmen inhabit the upper part of the Łazienki Park. This area is the most humid of all discussed habitats. On the other hand, the lawns in the lower part of this park where the animals are least numerous, have certain xerothermic features.

Detailed studies of the harvestmen in the vicinity of Warszawa carried out during the years 1959–1961 (STAREGA 1963), did not record *N. semproni*. We can surmise that this species was introduced into Poland very recently, all the more that as yet, it is encountered in very few habitats within the city of Warszawa. The fact that it is numerous found in the upper part of the Łazienki Park, adjacent to the Botanical Garden, suggests that probably the Botanical Garden was the original area where it got introduced and from which it spread out (no research has been carried out yet in the Botanical Garden). Perhaps *N. semproni* after taking over the Łazienki Park is spreading out to ever new green areas of the city of Warszawa by means of gardening equipment or seedlings (as eggs).

The park surrounding the Soviet Soldiers' Cemetery and Mausoleum was

established relatively recently. Therefore it may represent a succession environment where the faunal components are as yet not well established. By comparison with the other old parks in the city of Warszawa its fauna of the harvestmen is very limited, yet *N. semproni* is a dominant there. It is likely that being an introduced form, it expands dynamically its area and that it found in the Soviet Soldiers' Cemetery especially favourable habitats as yet not filled by the representatives of the native fauna.

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STRESZCZENIE

[Tytuł: *Nelima semproni* SZALAY, 1951 (*Opiliones: Gagrellidae*) w Warszawie]

Praca zawiera dane o rozmieszczeniu w Warszawie nowego dla fauny Polski gatunku kosarza – *Nelima semproni* SZAL. Przedstawione tu wyniki uzyskano na podstawie badań przeprowadzonych w latach 1974-1975. *N. semproni* jest gatunkiem środkowoeuropejskim, zasiedlającym północne Włochy, Jugosławię, zachodnie Węgry, Austrię i Czechosłowację. Znane są również dwa stanowiska w NRD. W Warszawie kosarz ten znalazł się zapewne przypadkowo, zawleczony prawdopodobnie z sadzonkami roślin, jego występowanie stwierdzono bowiem m.in. w Parku Łazienkowskim – bezpośrednio przylegającym do Ogrodu Botanicznego (w samym Ogrodzie badań nie prowadzono). Ponadto *N. semproni* znajdowana była na trawnikach w parku przy Omentarzu Mauzoleum Żołnierzy Radzieckich i w sąsiedztwie tego parku – na trawniku przy jezdni w alei Żwirki i Wigury, a także w Ogrodzie Saskim. Poszczególne te punkty oddalone są od siebie o kilka kilometrów (rys. 6). Przyпуска się, że w obrębie zieleni miejskiej Warszawy *N. semproni* rozwleczona została za pośrednictwem sprzętu ogrodniczego lub sadzonek.

Oprócz *N. semproni* na terenach zielonych w centrum miasta stwierdzono występowanie 6 innych gatunków kosarzy: *Trogulus tricarinatus* (L.), *Oligolophus tridens* (C.L.K.), *Lacinius horridus* (PANZ.), *L. ephippiatus* (C.L.K.), *Phalangium opilio* L. i *Rilaena triangularis* (HB.).

[Заглавие: *Nelima semproni* SZALAY, 1951 (*Opiliones: Gagrellidae*) в Варшаве]

В работе представлены данные о размещении в Варшаве нового для фауны Польши сенокосца — *Nelima semproni* SZAL., собранные путем исследований, произведенных в 1974—1975 гг. *N. semproni* является среднеевропейским видом, распространенным в северной Италии, Югославии, на западе Венгрии, в Австрии и Чехословакии. Известны также два местонахождения из ГДР. В Варшаве он оказался, по-видимому, случайно, будучи завлеченным с саженцами растений, поскольку был найден в парке Лазенки, примыкающем непосредственно к Ботаническому саду (в самом Ботсаду исследования не проводились). Кроме того *N. semproni* найден на газонах парка возле Памятника-мавзолея Советских воинов и по соседству этого парка на проспекте Жwirки и Вигуры, на газоне, прилегающем к мостовой, а также в Сасском парке. Отдельные местонахождения удалены друг от друга на несколько километров (рис. 6). Авторы предполагают, что *N. semproni* в пределах городских озеленений был завлечен посредством огороднического инвентаря или саженцев.

На территории зеленых насаждений в Варшаве найдены кроме *N. semproni* еще 6 других видов сенокосцев: *Trogulus tricarinatus* (L.), *Oligolophus tridens* (C.L.K.), *Lacinius horridus* (PANZ.), *L. ehippiatus* (C.L.K.), *Phalangium opilio* L. и *Rilaena triangularis* (НВ.).

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