

Faunistic and Zoogeographical Analyses of Linyphiidae (Araneae) in the Tirana District of Albania

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Abstract: Linyphiidae is a spider family with many genera (587) and species (4,412) known worldwide, but insufficiently studied in Albania. Records of 35 species have been published in several papers on Albanian spiders. Based on the Roewer collection at the Senckenberg Naturmuseum – which includes two new species of Linyphiidae for Albania – and previously and recently published data including material from the first author’s doctoral study (2010–2011), a total of 18 species are known so far from the Tirana district. Seven of these are newly-established both for this district and Albania in general. Spiders of the Tirana district can be classified into six zoogeographical categories combined into two chorological complexes. The composition of the fauna shows a Holarctic and European character.

Keywords: *Balkans, Tirana District, Holarctic, faunistic, linyphiids, distribution*

Introduction

The linyphiid spider fauna in the Tirana district has been poorly studied. The first data concerning linyphiids in Albania were published by Caporiacco (1932), who reported three species. Recent publications (Vrenozi & Haxhiu 2008, Deltshev *et al.* 2011, Vrenozi in prep. and Vrenozi & Jäger a, b, in prep.) have increased the number of linyphiids in Albania. The current paper aims to present the faunistic diversity and zoogeographical distribution of linyphiids in the Tirana district based on historical and recently published papers, and a collection associated with the first author’s doctoral thesis. The first part of this paper comprises a detailed faunistic list with some data for new species. The second part covers their zoogeographical characteristics.

Material and Methods

The material analysed in this paper comprises data, partly from a review of the above-mentioned papers on linyphiids of the Tirana district, and mostly from collections made during the first author’s doctoral studies. Specimens were collected using 35 pitfall traps during the period 2010 - 2011 at seven localities (Figure 1) from north-western, central and north-eastern parts of Tirana city (see also Vrenozi & Jäger, in prep.; Vrenozi *et al.* 2012, in press). The material is preserved in 75% ethanol and deposited in the Museum of Natural Sciences, Tirana.

Data on general distribution and chorological classification of spiders are taken from Deltshev *et al.* (2011), Helsdingen (2011), Platnick (2012) and Taglianti *et al.* (1999). The main literature used for species identification was Heimer & Nentwig (1991), Nentwig *et al.* (2011), Özkütük (2011) and Roberts (1987; 1995). All species were identified by the authors, unless stated otherwise.

Results and Discussion

Faunistic composition

Linyphiidae is currently represented by a total of 18 species in the Tirana district, belonging to 14 genera (*Bolyphantes* 1, *Dyplostyla* 1, *Floronia* 1, *Frontinellina* 1, *Lepthyphantes* 2, *Linyphia* 1, *Microneta* 1, *Neriene* 1, *Pelecopsis* 1, *Prinerigone* 1, *Sintula* 2, *Tallusia* 1, *Tenuiphantes* 2, *Trichoncus* 2). Seven species (5♂, 7♀) proved to be new to both the Tirana and Albanian spider fauna. These are marked in the list with an asterisk. Of the twelve species collected in the Tirana district, five were found in the Vora hills, three in Tirana city and three others in both these areas. Only one species was collected on Dajti Mountain. Most of the new species records were collected in

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the Vora hills (*Nerienne furtiva*, *Pelecopsis elongata*, *Sintula spiniger* and *Trichoncus sordidus*), whereas two new species were found in Tirana city (*Lepthyphantes nodifer* and *Tenuiphantes floriana*) and only one species was collected in both areas (*Sintula retroversus*). These results are quite similar to the previous studies (Kumschick *et al.* 2009; Varet *et al.* 2011), which has shown that the frequently disturbed habitats, such as urban and suburban areas in the Tirana city, have lower number of specimens which is close related to the highest anthropogenic intervention, in comparison with natural and rural habitats, in the Vora hills, with less habitat disturbance.

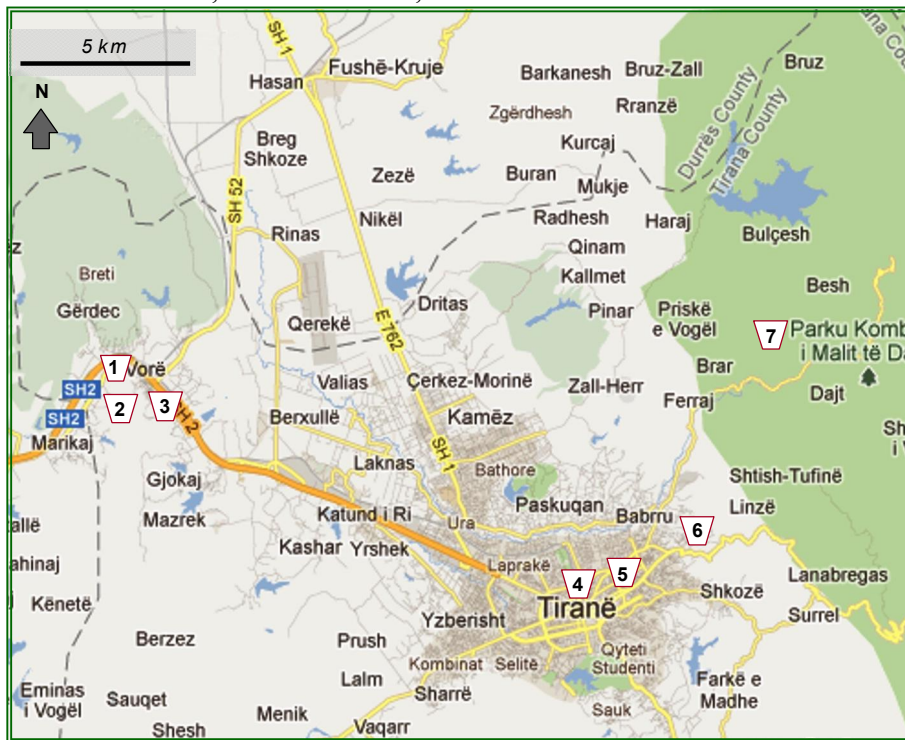


Figure 1. Map of the Tirana District showing the collecting localities (prepared by Aleko Miho)

Abbreviations: *det.* - determinavit (Latin for “determined”); *leg.* - legit (Latin for “collected”); *Localities* - *L.*
Localities (Fig. 1): *L1:* Vora hills, degraded forest of associations of *Arbutus unedo* and *Erica arborea*, 195 m altitude, N 41°22.922', E 19°38.966'; *L2:* Vora hills, protected forest with *Robinia pseudoacacia*, 157 m altitude, N 41°22.710', E 19°39.298'; *L3:* Vora hills, rural area with *Olea europaea*, 144 m altitude, N 41°22.934', E 19°39.284'; *L4:* Tirana city, urban area, *Nerium oleander*, *Ligustrum lucidum* etc., 106 m altitude, N 41°19.611', E 19°48.338'; *L5:* Tirana city, urban area, *Ligustrum sinense*, 134 m altitude, N 41°20.483', E 19°49.972'; *L6:* Tirana city, suburban area with *Rubus ulmifolius* and *Olea europaea*, 167 m altitude, N 41°20.814', E 19°51.179'; *L7:* Dajti Mountain, National park with *Fagus sylvatica*, 1584 m altitude, N 41°23.421', E 19°55.334'.

Some important faunistic and zoogeographical distributions of the new records are as follows. *Lepthyphantes nodifer* has a European distribution and *Sintula retroversus* is widespread in Europe with a few records in Azerbaijan. In Albania these species have been recorded in a suburban area (L6). *Trichoncus sordidus* has a European distribution and *Pelecopsis elongata* is widespread in Europe and Russia. Both species were collected in the natural habitats with degraded forest (L1). *Nerienne furtiva* has a west Palaearctic distribution, comprising Europe, North Africa, Russia and Ukraine. Material was collected in rural habitats (L3). *Sintula spiniger* has a central–eastern European distribution comprising Austria and Eastern Europe. Material was collected in the protected forest (L2). *Tenuiphantes floriana* has a south-eastern European distribution including Romania, Bulgaria and Serbia. The material was collected in urban area (L4).

Based on the faunistic composition, 65% of the recorded species inhabit Tirana city; mainly in the suburban areas.

Faunistic species list with nomenclature according to Platnick (2012), and literature records of linyphiids from the Tirana district (*new species records for both the Tirana district and Albania):

1. *Bolyphantes luteolus* (Blackwall, 1833): Vrenozi & Haxhiu 2008; Deltshev et al. 2011; Vrenozi unpublished.
2. *Dyplostyla concolor* (Wider, 1834): 1♀, L6, 167 m, B. Vrenozi & E. Vrenozi leg. 08.08.2010, det. 06.04.2011; 2♂, L3, 144 m, B. Vrenozi & I. Haxhiu leg. 09.01.2011, det. 13.04.2011; Deltshev et al. 2011.
3. *Floronia bucculenta* (Clerck, 1757): Vrenozi & Haxhiu 2008; Deltshev et al. 2011; Vrenozi unpublished.
4. *Frontinellina frutetorum* (C. L. Koch, 1834): Vrenozi & Haxhiu 2008; Deltshev et al. 2011; Vrenozi unpublished.
5. *Lepthyphantes minutus* (Blackwall, 1833): Vrenozi & Haxhiu 2008; Deltshev et al. 2011; Vrenozi unpublished.
6. **Lepthyphantes nodifer* Simon, 1884: 2♀, L6, 167 m, B. Vrenozi & E. Vrenozi leg. 08.01.2011, det. 13.04.2011.
7. *Linyphia triangularis* (Clerck, 1757): 1♀, L3, 144 m, B. Vrenozi & I. Haxhiu leg. 11.12.2010, det. 08.04.2011; Vrenozi & Haxhiu 2008; Deltshev et al. 2011.
8. *Microneta viaria* (Blackwall, 1841): 1♀, L7, 1584 m, B. Vrenozi & I. Haxhiu leg. 14.06.2010, det. 06.04.2011; Deltshev et al. 2011.
9. **Neriene furtiva* (O. P.-Cambridge, 1871): 1♀, L3, 144 m, B. Vrenozi & I. Haxhiu leg. 09.01.2011, det. 13.04.2011.
10. **Pelecopsis elongata* (Wider, 1834): 1♀, L1, 195 m, B. Vrenozi & I. Haxhiu leg. 08.06.2010, det. 06.04.2011.
11. *Prinerigone varians* (Audouin, 1826): Deltshev et al. 2011.
12. **Sintula retroversus* (O. P.-Cambridge, 1875): 1♀, L6, 167 m, B. Vrenozi & E. Vrenozi leg. 08.01.2011, det. 13.04.2011; 1♂, L3, 144 m, B. Vrenozi & I. Haxhiu leg. 09.01.2011, det. 13.04.2011.
13. **Sintula spiniger* (Balogh, 1935): 2♂, 1♀, L2, 157 m, B. Vrenozi & I. Haxhiu leg. 07.02.2010, det. 06.04.2011; 1♂, 1♀, L2, 157 m, B. Vrenozi & I. Haxhiu leg. 09.01.2011, det. 13.04.2011.
14. *Tallusia vindobonensis* (Kulczynski, 1898): 1♀, L4, 106 m, B. Vrenozi leg. 11.02.2010, B. Vrenozi & P. Jäger det. 31.08.2010; 1♀, L4, 106 m, B. Vrenozi leg. 09.03.2010, B. Vrenozi & P. Jäger det. 06.09.2010; 2♀, L5, 134 m, B. Vrenozi & I. Haxhiu leg. 11.02.2010, B. Vrenozi & P. Jäger det. 02.09.2010; 11♂, 2♀, L6, 167 m, B. Vrenozi & I. Haxhiu leg. 11.02.2010, B. Vrenozi & P. Jäger det. 31.08.2010; 1♂, L4, 106 m, B. Vrenozi leg. 10.01.2011, det. 13.04.2011; 2♂, L5, 134 m, B. Vrenozi & E. Vrenozi leg. 08.01.2011, det. 14.04.2011; Vrenozi & Jäger unpublished.
15. **Tenuiphantes floriana* (van Helsdingen, 1977): 1♂, L5, 134 m, B. Vrenozi & E. Vrenozi leg. 08.08.2010, det. 06.04.2011.
16. *Tenuiphantes tenuis* (Blackwall, 1852): 1♀, L4, 106 m, B. Vrenozi leg. 13.04.2010, B. Vrenozi & P. Jäger det. 16.09.2010; 1♀, L3, 144 m, B. Vrenozi & I. Haxhiu leg. 09.01.2011, det. 13.04.2011; 1♀, L4, 106 m, B. Vrenozi leg. 10.01.2011, det. 13.04.2011; Deltshev et al. 2011; Vrenozi & Jäger unpublished.
17. *Trichoncus affinis* Kulczynski, 1894: Deltshev et al. 2011.
18. **Trichoncus sordidus* Simon, 1884: 1♂, L1, 195 m, B. Vrenozi & I. Haxhiu leg. 10.10.2010, det. 11.04.2011.

Zoogeographical analysis

According to their distributions, these 18 species can be classified into six zoogeographical categories; grouped into two chorological complexes (I, Holarctic; II, European) (Table 1). The *Holarctic species complex* is the best represented and comprises 55.6 % of the species collected in the Tirana district. Holarctic species typically inhabit the rural habitats of the Vora hills (L3) to the north-west of Tirana city. The *European species complex* comprises 38.9 % of the linyphiid spider fauna of the Tirana district. These species are found in greater numbers in urban (L4, L5) and suburban (L6) areas of Tirana city.

Table 1. Zoogeographic composition of spiders in the Tirana district (HOL–Holarctic; PAL–Palaeartic; WPA–West-Palaeartic; EUR–European; MEE–Middle East European; SEE–South East European)

| Complexes | Zoogeographical categories | Code | Species | % |
|--------------|----------------------------|------|-----------|-------------|
| Holarctic | Holarctic | HOL | 3 | 16.7 |
| | Palaeartic | PAL | 5 | 27.7 |
| | West Palaeartic | WPA | 2 | 11.1 |
| Total | | | 10 | 55.6 |
| European | European | EUR | 5 | 27.8 |
| | Middle East European | MEE | 2 | 11.2 |
| | South East European | SEE | 1 | 5.6 |
| Total | | | 8 | 44.5 |

Conclusions

The faunistic diversity of 18 linyphiid spiders in the Tirana district shows that these areas are poorly investigated. Records from the Vora hills comprise the largest number of the total collected spider species and of the new species, which indicate that this area represents the preferred habitats of several species and thus merits further studies in the future. With respect to the zoogeographical character of the linyphiid spider fauna, it is defined mainly by the presence of Holarctic (55.6%) and European (44.5%) taxa. These species are well represented in urban areas. This detailed faunistic survey of the spiders is pre-requisite for understanding their potential use as indicators species for, e.g., bio monitoring or nature protection policies.

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