

HAJDAR KICAJ

Department of Biology, University "Ismael Qemali" Vlorë, Albania
e-mail *hajdarkicaj@yahoo.it*

ZOOGEOGRAPHICAL STUDY OF CENTIPEDES (CHILOPODA CLASS) IN VLORë REGION

ABSTRACT

This study provides data on the zoogeography of the centipedes and contributes in the recognition of the non-vertebral variety. The study was carried out through the collection of biological material and the systematic determination of the collected material up to order, family, genus and species. Data on zoogeographic distribution in the studied area has been compared with the data on national and the Balkan region. As comparison basis with the spreading boundaries for the defined species in the studied area it's been used the literature on zoogeographic spreading of species of the Chilopoda. Findings are also compared with their gathering places in Albania and Balkan, based on previous studies conducted in our country by local and foreign researchers. Through this study, analytic comparisons of the spread of species identified in the area are made.

Key words: *Centipede, Chilopoda, Zoogeography, Taxonomy.*

INTRODUCTION

Centipedes (class Chilopoda) represent a relatively rich class of species in the Myriapoda group. They are widespread species in terms of distribution geography but also in terms of their variety. Despite the relatively small number identified for our country, their number is thought to be greater. This is based on the similarities of climate and edaphic factors with the countries of the region. Also many species belonging to the Chilopoda class have a wide regional spread.

Centipedes are one of the largest groups of myriapods. They are among the most important of the predatory arthropods in many land habitats. They encompass approximately 3300 species belonging to five orders, with another one being extinct. Centipedes are found on all continents except for Antarctica. They are mainly classified as predators (MATIĆ *et al.*, 1966; MATIĆ, 2002).

Centipedes are found in many microhabitats. Relations with water are an im-

portant aspect of their ecology, as they quickly lose their body humidity in drought conditions. Water loss comes as a result of the absence of a smooth shell of their external skeleton and the extraction of nitrogen residues as ammonia, which requires additional water. Centipedes have solved the loss of body water through different adaptations (LEVIS, 1981). Thus, centipedes live in many types of habitats. Some Geophilomorpha, for example, have adapted to coastal areas, where they feed on ticks. Species of every order, excluding Craterostigmomorpha, have adapted to living in caves.

Knowing some basic centipede ecology features helps in zoogeographic analysis and the determination of their distribution. Centipedes are susceptible to environmental change. Due to their long lifespan and their predatory nature, centipedes serve as indicators of environmental change (ZAPPAROLI and IORIO, 2012).

MATERIALS AND METHODS

The study area covers a part of the Vlora Region. Five stations are selected for collecting material in the survey area with the baseline selection criteria for these collection stations being:

Representation of the habitat, geographic distribution, soil types (based on nutritional elements and soil structure), height above sea level (QIRIAZI, 1991; KABO *et al.*, 1991).

Individuals are preserved in bottles labeled with 75-80% alcohol in which are added a few ethereal drops, prepared in advance, which also preserve the natural color of the collected individuals. Each bottle contains the necessary information on the location, expedition date and number of individuals.

The specification of the species is done by direct observation of the external morphological features and the observation of some features under the stereomicroscope. Their definition includes: body size, body shape, number of segments and leg pairs, gonopod presence (to determine sex), color of the body, the shape of the cover and the placement of tergal plates, etc.

Further determination of similar species is done by using the definitions keys according to the characteristics of each order of the Chilopoda class. For the observation of the features is used the stereomicroscope EMZ13TR, Trinocular Zoom, Stereo on PK Stand Zoom Range: 10 to 70x.

RESULTS AND DISCUSSION

Variety

In the studied area, 60 individuals were collected and determined. Other captured individuals had injuries that hindered the observation of their features or individu-

als in the juvenile phase for whom the taxonomic definition is difficult. The table 3 gives the types found in the studied area.

Spread into the studied area

Based on the data found after the determination of species and those collected from the reference literature, the spread of the species encountered in the studied area is presented in the following table:

Table 1. Comparison of locations of species from Chilopoda class with previous expeditions

| Nr | Species | Found in the framework of this study | Collection station | Previous expedition | Reference to the studied area |
|----|---|--------------------------------------|---|--|---|
| 1 | <i>Dignathodon microcephalus</i> (Lucas, 1846) | + | Shashicë; Ullishte | Golovate, Stoev, Petrov, 1994 | ----- |
| | | | | Golovate, Stoev, Petrov, 1995 | Dukat-Vlorë |
| 2 | <i>Henia illyrica</i> (Meinert, 1870) | + | Llogara; Rrëza e kanalit | Golovate, Stoev, Petrov, 1994 ,1995 | Not referenced in the studied area |
| 3 | <i>Clinopodes flavidus</i> (C.L.Koch, 1847) | + | Tragjas | Golovate, Stoev, Petrov, 1994 ,1995 | Not referenced in the studied area |
| 4 | <i>Scolopendra cingulata</i> (Latreille, 1892) | + | Ullishte Shashicë Rreza e Kanalit Llogara | Golovate, Stoev, Petrov, 1994 | ----- |
| | | | | Golovate, Stoev, Petrov, 1995 | Dukat, Llo- gara, Dhermi - Vlorë |
| 5 | <i>Schutigera coleoptrata</i> (Linneaus, 1758) | + | Tragjas | Stoev 1994 | Dhermi- Vlorë |
| | | | | Golovate, Stoev, Petrov, 1995 | Vlorë |
| 6 | <i>Lithobius lapidicola</i> (Meinert,1872) | + | Rrëza e kana- lit; Ullishte; Llogara | Golovate, Stoev, Petrov, 1994 | ----- |
| | | | | Golovate, Stoev, Petrov, 1995 | Dukat -Vlorë |

From the comparison of the Chilopoda class locations with previous expeditions to our study area, it is noted that from the six types referred to in this study, four of them are referred to earlier in the area. Two types, *Henia illyrica* (Meinert, 1870) and *Clinopodes flavidus* (C.L.Koch, 1847), although not previously referred to the study area, are referred to other Albanian locations (STOEV, 2000).

Table 2. Comparison of species from Chilopoda class with other locations within the Country.

| No. | Type | Completed expeditions | Reference to the area | Reference to Albania |
|-----|--|-------------------------------|------------------------------|--|
| 1 | <i>Dignathodon microcephalus</i> (Lucas, 1846) | Attems, 1929 | | In the north of Albania (unspecified) |
| | | Manfredi 1932 | | In the north of Albania (unspecified) |
| | | Stoev, Zaprianova, 1994 | | Lukovë- Sarandë; Castleof Gjirokastra |
| | | Golovate, Stoev, Petrov, 1995 | Dukat –Vlorë | ----- |
| 2 | <i>Henia illyrica</i> (Meinert, 1870) | Verhoeff, 1934 | | Prespë |
| | | Attems, 1929 | | Orosh, Kulla e Lumës, Vermosh |
| | | Manfredi, 1945 | | Terpan - Berat |
| | | Beron, Petrov, 1993 | | Boge - Shkodër |
| | | Ivanova, 1995 | | Kozhnja village- Shkodër |
| | | Golovate, Stoev, Petrov, 1995 | | Dajti park - Tiranë |
| | | Golovate, Stoev, Petrov, 1995 | | Ersekë |
| 3 | <i>Clinopodes flavidus</i> (C.L.Koch, 1847) | Attems, 1929 | | Mirditë |
| | | Beron, Petrov, 1993 | | Boge - Shkodër |
| | | Zhalov, 2000 | | Taraboshi mountain-Shkodër |
| | | Golovate, Stoev, Petrov, 1995 | | Dajti National Park |
| | | Stoev, 1994 | | CastleofGjirokastra |
| 4 | <i>Scolopendra cingulata</i> (Latreille, 1892) | Golovate, Stoev, Petrov, 1995 | Dukat, Llogara& Dhërmi-Vlorë | Hotolisht-Librazhd; Botanical garden&Petrelë -Tiranë |
| | | Zhalov, 2000 | | Shkodër, Taraboshi mountain |
| 5 | <i>Schutigera coleoprata</i> (Linnaeus, 1758) | Stoev, 1994 | Vlorë | Castleof Gjirokastra |
| | | Golovate, Stoev, Petrov,1995 | Dhërmi-Vlorë | Hotolisht-Librazhd |
| | | Zhalov, 2000 | | Taraboshi mountain-Shkodër |
| 6 | <i>Lithobius lapidicola</i> (Meinert,1872) | Stoev, 1994 | | Castleof Gjirokastra |
| | | Golovate, Stoev, Petrov,1995 | Dukat-Vlorë | |

The species referred to in the studied area have been referred to earlier in our Country by foreign researches. From Tables 1 and 2 it appears that the mentioned species have a wide regional spread.

Comparison at the Balkan level

Table 3. Comparison of the spread of Chilopoda class species met in the study area with the Balkan region. Al: Albania; Mac: Macedonia; Ser: Serbia; Mn: Montenegro; Cro: Croatia, B&H: Bosnia and Herzegovina; Gr: Greece; Bul: Bulgaria.

| No. | Species | Al | Mac | Mn | Cro | B&H | Bul | Gr | Ser |
|-----|--|----|-----|----|-----|-----|-----|----|-----|
| 1 | <i>Dignathodon microcephalus</i> (Lucas, 1846) | + | - | + | + | + | + | + | + |
| 2 | <i>Henia illyrica</i> (Meinert, 1870) | + | + | + | + | + | + | + | + |
| 3 | <i>Clinopodes flavidus</i> (C.L.Koch, 1847) | + | + | + | + | + | + | ? | + |
| 4 | <i>Scolopendra cingulata</i> (Latreille, 1892) | + | + | + | + | + | + | + | - |
| 5 | <i>Schutigera coleoptrata</i> (Linnaeus, 1758) | + | + | + | + | - | + | + | - |
| 6 | <i>Lithobius lapidicola</i> (Meinert, 1872) | + | - | - | - | + | + | - | - |

From the table above and references on the available literature it is concluded that the species *Dignathodon microcephalus* (Lucas, 1846), *Clinopodes flavidus* (C.L. Koch, 1847), *Scolopendra cingulata* (Latreille, 1892), and *Henia illyrica* (Meinert, 1870) are widespread regional species (STYLIANOS *et al.*, 2011; ZAPPAROLI *et al.*, 2012).

CONCLUSIONS

There are six species in this study, four of which are also referred to earlier in the area.

Two species, *Henia illyrica* (Meinert, 1870) and *Clinopodes flavidus* (C.L. Koch, 1847), although not previously referred to the studied area, are referred to other locations in Albania.

From the literature references it is concluded that the species *Dignathodon microcephalus* (Lucas, 1846); *Clinopodes flavidus* (C.L.Koch, 1847); *Scolopendra cingulata* (Latreille, 1892); found in the collecting areas, are broad-ranging regional types.

REFERENCES

- KABO M., 1991 - *Physics Geography of Albania*, Academy of Sciences of Albania, Center for Geographical Studies, Tirana, Albania, 233-237
- LEVIS J.G., 1981 - *The Biology of Centipedes*, Cambridge University Press, London, 281-282
- MATIC Z., TEODOREANU M., 1966 - Contribution to the Connaissance of Lithobiidae (Chilopoda - Lithobuddae) of Croatia. *Biol. Glasnik* **19**: 19-26
- MITIĆ B.M., 2002 - On the diversity of centipedes (Chilopoda, Myriapoda) in Serbia. Part of o. *Archives of Biological Sciences* **54**: 13-14

- QIRIAZI P., 1991 -*Geography of Albania*. Publishing book of university library, Tirana, Albania, 137-147
- STOEV P., 2000 - Arthropoda selecta. *Russian Journal of Arthropoda research* **9** (3): 199-206
- STYLIANOS M.S., GIOKAS S., KORSÓS Z., 2011 - Morphometric and meristic diversity of the species *Scolopendracingulata* Latreille, 1829 (Chilopoda: Scolopendridae) in the Mediterranean region. *Zoologischer Anzeiger - Journal of Comparative Zoology* **250** (1): 67-79
- ZAPPAROLI M., IORIO E., 2012 - The Centipedes (Chilopoda) of Corsica: a catalog of species with faunistic, zoogeographical and ecological remarks. *International Journal of Myriapodology* **7**: 15-68.