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FAUNISTICAL, TAXONOMICAL, ECOLOGICAL AND BIOGEOGRAPHICAL STUDY OF ANNELIDS
FROM ROMANIA

HABILITATION THESIS

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SUMMARY

This habilitation thesis summarizes my most important scientific results obtained following fulfilment of the requirements for the degree of Doctor in Biology. My initial work on the **faunistic and ecological study of polychaetes** from the Romanian Black Sea coast, began in 1994 as a Bachelor student and then continued in 1996–2002 as a doctoral student. Since 2012 my research has focused on **integrative taxonomy, population biology** and the **biogeography of polychaetes**. As of 2011, I also started to work in the field of **biological invasions**. Realizing that in Romania there is a large knowledge gap in the **study of leeches**, since 2014 I have enlarged my systematic studies to also include hirudineans. Recent participation in some projects for monitoring of species of community interest has enabled me to publish some contributions in the field of **biodiversity conservation**. To outline my scientific achievements, in the main body of the thesis I have presented examples of studies referring to faunistics, taxonomy, population biology, genetics, and biogeography of annelids from Romania and evidenced the key-role that annelids play in the integrity and functioning of benthic communities.

Faunistics and taxonomy. As the result of the faunistic and taxonomic study of annelids from Romania, three new species have been described—*Scoelelepis neglecta* Surugiu, 2016, *Sphaerosyllis pontica* Surugiu & San Martín, 2017, and *Scoelelepis bellani* Surugiu, 2023. Also, the following eight species were reported as new to the Romanian fauna: *Pseudomystides limbata* (Saint-Joseph, 1888), *Eulalia clavigera* (Audouin & Milne Edwards, 1833), *Hesionides arenaria* Friedrich, 1937, *Dipolydora quadrilobata* (Jacobi, 1883), *Sphaerosyllis taylori* Perkins, 1981, *Eunereis longissima* (Johnston, 1840), *Amphiglena mediterranea* (Leydig, 1851), and *Scoelelepis mesnili* (Bellan & Lagardère, 1971). Two of them—*Sphaerosyllis taylori* and *Scoelelepis mesnili*—are also new for the entire Black Sea. I have also confirmed the presence of the European medicinal leech *Hirudo medicinalis* Linné, 1758 in Romania and assessed its current conservation status.

In a series of four papers, I have made a partial revision of the genus *Scoelelepis* from the European and adjacent waters. As the result of this revision, two new species were described, *S. tridentata* (Southern, 1914) was re-described in detail, and the neotype for *S. squamata* (O.F. Müller, 1806)—the type species of the genus—was designated for further unambiguous identification. Also, DNA barcodes were provided for two species—*Scoelelepis squamata* and *S. neglecta*—from their type localities, as well as the first molecular reconstruction of the phylogenetic relationships between different species belonging to this genus.

Population biology. We have provided the first set of data on life cycle, dynamics, secondary production, and population structure of the alien invasive species *Alitta succinea*

(Leuckart, 1847) in the Black Sea. Thus, we have indicated the existence of two recruitment periods of this species in the Black Sea: one in May–June and another in September–November.

Genetics. We have illustrated the relative importance of the mean and fluctuating currents in determining the population structuring of the polychaete *Platynereis dumerilii* (Audouin & Milne Edwards, 1833) as well as the directionality of larval dispersal at submeso-geographic scale. We have also performed the first attempt to use isozymes and RAPD markers to estimate the genetic diversity of *A. succinea* in the Black Sea.

Biogeography. The assessment of the biogeographic patterns of the Black Sea polychaetes revealed a well-defined zoogeocline from the Marmara Sea and Bosphorus Strait to the Azov Sea which is best correlated with salinity gradient and food availability.

Alien species. I have contributed to the compilation of the reviewed, updated, and validated list of alien species for the Romanian Black Sea region. The list includes 37 alien species, of which 13 are considered as invasive. We also report for Romanian Black Sea coast 29 cryptogenic and 72 crypto-expanding species. Most of the alien species are successfully established in the marine waters of Romania. Also, we have noticed that over the last 50 years there is a steady increase in the number of marine alien species. The results of this study provide the baseline list and information for addressing marine alien species at a national level and a starting point for selecting the invasive alien species for risk assessment towards an effective implementation of the IAS Regulation.

Ecology and biodiversity conservation. In a study of the fauna associated to the dwarf eelgrass (*Zostera noltei*) meadows from the Romanian Black Sea coast we have demonstrated that the abundance, richness, and diversity are strikingly higher in eelgrass-associated sediments than in surrounding bare sediments. Between-habitat differences remain significant even after the removal of epifaunal species. The results suggested that even small eelgrass beds, located in the vicinity of multiple sources of stress, can act as hotspots and make a substantial contribution to local benthic diversity.

The second part of the thesis outlines the status of my career, my future main directions for research, plans and overall goals for academic development, as well as the strategies for progressing towards those goals.

The work ends with a selection of bibliographical references associated with the content of the first two parts, including my own articles published in the field.