Diversity and biogeography of *Diopatra* bristle worms (Onuphidae, Polychaeta) in Eastern Atlantic

**M.Sc project**

**Supervisors:**
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Endre Willassen, Professor

**Research Group:**
Phylogenetics Systematics and Evolution

**Project background:**
Onuphid polychaetes are tube dwelling worms inhabiting various biotopes worldwide and often reaching extremely high densities. *Diopatra* is a monophyletic and the most species-rich genus (about 50 spp.) within the family Onuphidae (Budaeva & Fauchald, 2011). It is widely distributed in tropical and subtropical shallow waters and very common in the intertidal zone. The genus has a number of morphological autapomorphies such as spiral gills and complex brush-like tubes. Nonetheless the taxonomy of *Diopatra* is poorly developed due to high degree of variation in morphological characters traditionally used in the species diagnoses.

Recently the University Museum of Bergen has received an extensive collection of marine invertebrates from the waters of Western Africa (from Morocco to Angola). The samples have been obtained during a number of cruises by R/V Dr Fridtjof Nansen in cooperation with the Guinea Current Large Marine Ecosystem (GCLME) and Canary Current Large Marine Ecosystem (CCLME) and are suitable for morphological and molecular analyses.

At least 10 morphotypes of *Diopatra* have been preliminary found within the collected material. Several species have been originally described from African Waters (Augener, 1919; Kirkegaard, 1988; Paxton et al., 1995). However, as common for all early taxonomical descriptions, information on intraspecific variation is limited and species determination is difficult. A number of taxonomical and ecological studies on *Diopatra* utilizing morphological and molecular approaches have been performed recently in South-Western Europe (Rodrigues et al., 2009; Berke, et al., 2010; Pires et al., 2012; Fauchald et al., 2012). Published data will significantly aid in species identification, lab work design and analysis of species distribution.
Objectives:
- To revise material on *Diopatra* from Western African waters and identify morphotypes based on the analysis of chaeta morphology and distribution, development and distribution of gills, structure of sensory organs;
- To sequence mitochondrial genes COI and Cytb for selected morphotypes;
- To test the congruence between traditional and molecular taxonomy in *Diopatra*;
- To perform complete species descriptions of all studied taxa;
- To assess the geographical ranges of *Diopatra* species in Eastern Atlantic based on newly obtained genetic and morphological data and recently published information.

Acquired competences:
- Systematics of polychaetes based on morphology (light microscopy, scanning electron microscopy, digital photography, scientific illustrations, species descriptions, zoological nomenclature);
- Molecular-based systematics (DNA extraction, polymerase chain reaction, gel electrophoresis, sequencing; editing and aligning of molecular sequences);
- Phylogenetic analysis (Model test, Bayesian inference, Maximum Likelihood, Parsimony).

Place of work:
Natural History Collections - Realfagbygget/ DNA lab – BIO block A

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Literature


