

Oral presentation

GBOL offers a comprehensive perspective on spider mitochondrial diversity in Germany

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The German Barcode of Life (GBOL) project is a national network of 17 biodiversity research institutions, aided by 200 taxon specialists with the aim to establish a DNA barcode library of as many animal, fungal and plant species as possible that occur in Germany. During the first period of the project (2012-2015), more than 3500 COI barcodes of 561 morphologically determined species of spiders and 38 species of harvestmen have been generated. With species coverages of 57 % in spiders and 75 % in harvestmen these are the most comprehensive barcoding datasets that have been produced so far for these arachnid groups at any national scale. Sampling scheme was designed to capture intraspecific geographic variation within the country effectively. The mean number of sequences obtained per species was 6 (range: 1-48; 116 singletons). As expected, interspecific divergence (median 17.8 %, p-distance) exceeds intraspecific divergence (median 0.3 %) by more than one order of magnitude, and the lower 95% percentile of interspecific variation (13.8 %) does not overlap with the upper 95% percentile of intraspecific variation (2.6 %). However, the barcoding gap was not complete, as in 47 species some pairwise intraspecific distances exceeded 3% (max 10%). On the other hand, 50 species included pairwise distances of < 3 % as compared with the closest congener. In four congeneric species pairs identical sequences were even found (*Enoplognatha latimana/ovata*, *Pardosa lugubris/saltans*, *Tibellus maritimus/oblongus*, *Xysticus audax/cristatus*). This shows that some of the species which pose challenges to morphological determination are not easier to identify molecularly (while barcoding helps in corroborating synonymy suspicions). Of particular interest is the finding that some species pairs of common wolf spiders with discrete morphological differences were not separable by their COI barcodes, including *Alopecosa cuneata/pulverulenta* and *Pardosa prativaga/riparia*. This discrepancy may be caused by the complex visual courtship behaviour in these wolf spiders and constitutes a promising subject for evolutionary and behavioural studies. Species with deep intraspecific clustering include *Aelurillus v-insignitus*, *Mitopus morio*, *Phalangium opilio*, *Steatoda bipunctata*, *Tmarus piger*, *Clubiona corticalis*, *Nemastoma lugubre*, *Micaria pulicaria* and *Diplocephalus latifrons* (in order of descending intraspecific distance maximum). These taxa deserve thorough taxonomic and biogeographic reconsideration.