

Integrated data network for phytopathogenic fungi: a case study using Erysiphales taxa

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Central aim of this study is to establish a dataflow for primary research data from the field to a data repository. Exemplified with Erysiphales taxa, some general types of mechanisms for dataflow in distributed systems starting from gathering primary biological and ecology research data directly in the field until data presentation and exchange (including options of online data analyses) are delineated. The data acquisition in the field is organized with the component DiversityMobile having been set up to enter and modify ecological and biological monitoring data via smart phone (www.diversitymobile.net). Such field data are stored in a database on the devices. Gazetteers with definitions, e.g., standard lists of taxonomic names (e.g., www.liasnames.lias.net based on DiversityTaxonNames) and project-specific settings, give access to presets with ecological descriptor, and general scientific terms and allow for selecting reference points in digitized topographic maps. Multimedia data (images, video, and sound) as well as GPS coordinates are integrated in the data flow as well, adequate device supports preconditioned. Moreover, the user can choose to download field data of previous field campaigns from a server database (“DiversityCollection”). DiversityCollection is a component for the storage of collection and observation data within the Diversity Workbench framework (see www.diversityworkbench.net). All databased records are transferred to a repository using data synchronisation and are subsequently redistributed to end-users via various types of exchange formats and data interfaces. Experience from campaigns during one vegetation period proved that the data flow from a mobile device during field work to central biological repository databases is efficient and error unsusceptible.

Furthermore, data records are transferable to project-sided applications for statistical analyses as well as to floristic databases of other institutions and national and international web portals (e.g., GBIF, BioCase, EDIT, Inventory-Portal of the German Mycological Society). In addition, comparisons with historical data are possible now. Mapping of more-dimensional interrelations between organisms in a temporal and spatial context have been modelled and implemented.