Glow worm and slow worm

Species associated to *Lampyris noctiluca* in Zürich

The Agency for Nature of the town of Zürich has a large collection of faunistic recording data. Most of these 30 thousend (!) data has been recorded during the last years or the last two decades. A lot of the data have a casual character, some bird and insects (butterflies, locusts, dragonflies) data are resulting from systematical inventarisation. Totally there were 319 species recorded. The number of records is permanently increasing. The whole data set is connected with a geographical localisation of the recording sites.

Among these faunistic data there are 388 glow worm recordings collected in this millennium. The collectors of the glow worm recordings have the impression that *Lampyris noctiluca* is a good indicator for well structured biotopes providing habitats for a high number of not so trivial species. So Stefan Hose (who is managing the faunistic data and is involved into the *Glühwürmchen Projekt* since the beginning) and I were trying to find out, wich species are associated with glow worms.

We scanned a listing of all records wich are **found in a range of 30 m from the nearest glow worm site.** As result we got a list of 145 species (> xls: recordings) wich are present close to Lampyris in maximum 53 cases (*Lacerta agilis*) or in minimum 1 case (the 48 species at the end of the list).

These results are interesting but not very convincing because some species are quite well documented in Zürich (like glow worm, reptiles, birds), other species only incompletly. So it would be interesting to compare the list of species found nearby glow worms with the list of all species recorded in Zürich. I tried to realise this with a kind of "**association index**" wich indicates the **difference between** the ranking of the numbers of records **in whole Zürich** and the ranking of the number of records in a range of **30 m from the next glow worm** site (> xls: ranking). This association index is surly not perfect – for mathematical reasons and also because the data base is not perfect, but the index is not bad and it is compatible with the experiences of glow worm watchers, wich often hear for instance *Pholidoptera* or *Tettigonia* during the summer nights on glow worm sites and allways have to be carefull not to trample toads.

The highest indices we find for some butterflies; **12 butterflies** line up among the **25 best associated species.** These butterflies require extensive grassland with high diversity of plants, wet or dry, or light forests and edges of woods, fitting exactly to the claims of *Lampyris* wich likes sites with open and closed vegetation in small distances. Two of the locusts (among the best 25) are related with small bushes and fringes of herbs and grass (*Pholidoptera* an

Tettigonia, the latter likes real bushes and big trees too), the other locusts are indicating moist or extensive grassland. The amphibians (*Bufo bufo* and *Rana temporaria*) need (like glow worms) protected rooms and more or less warm and open sites at the same place, the third one (*Rana esculenta*) shows that glow worm sites are often close to water – the presence of dragonflies in association index top positions states the same. *Picus viridis* is typical for semi-open traditional cultivated landscapes, the two other birds with high indices are very common omnipresent birds – more ore less meaningless as indicators of special situations. Atleast they need trees. Finally the two reptiles are also indicators for high structural diversity and the presence of shelters, *Lacerta agilis* with a more distinctive tendency to sunny places.

When we look the first column of this second chart (xls: ranking), we see that **only 5 of the 25 top associated species are neither "red" nor "orange"** – "red" means specified in the national Red List of endangered and rare species, "orange" corresponds to a kind of Red List for the town of Zürich, the "Orange List", created by the Agency for Nature of the town of Zürich – in the urban area it´s usefull to have a special additional classification for rare and endangered animals and plants.

As conclusion one can say that **glow worms are indicating habitats of high structural diversity**, often at **the egde of woods and close to extensivly used grassland** (wet or not) and they are **normally associated with a lot of interesting, at least regionally endangered and rare species.**

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