DISTRIBUTION OF COMMON SPADEFOOT TOAD (*PELOBATES FUSCUS*) AND SOIL TYPES IN HUNGARY

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Introduction

The common spadefoot toad (*Pelobates fuscus*) (Photo 1.) occurs in areas with loose or sandy soils of Eastern and Central Europe. In Hungary it is found in lowlands as well as hilly and montane regions (Korsós 1997). Its European distribution is well shown in the 50×50 km resolution UTM grid map (Atlas of Amphibians and Reptiles in Europe), however, according to this map it is absent from a considerable part of Hungary (Gasc et al. 1997). Based on data from publications, collections and researchers we compiled the 10×10 km UTM grid map of the Common Spadefoot Toad's distribution in Hungary (Map 1.) (Schäffer & Purger 1995). The 800 pieces of data covered 312 UTM grids which is 29,6 percent of all UTM grids in the country's area. Because of widespread decline of amphibian species it is important to make exact distribution maps. (Blaustein & Wake 1990).

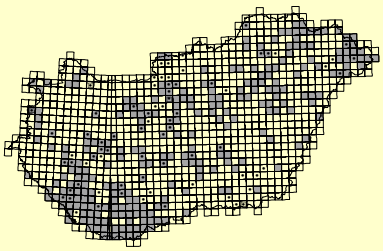
Methods

Using GIS technics we compared our 10x10 km UTM grid map (Fig. 1.) with the maps of physical soil types (Map 2.), the chemical characteristics of the soil (Map 3.) and the CORINE Land Cover (Map 4.). Data analysis were made by ArcView 8.1 software package. In every maps we analysed the area where the spadefoot are present (~30%) and the area where it is absent (~70%). We determined the ratio of the different soil types, chemical characteristics and land cover in the areas mentioned above. To compare the data we used G-test for statistical analysis where the minimum probability level of $P < 0.05$ was accepted for all the cases.

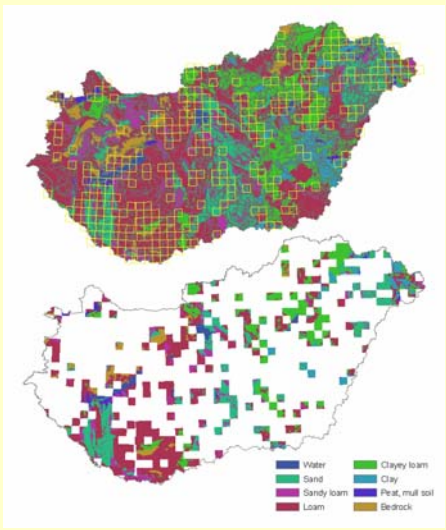
Question and Aims

We have no data about the presents of spadefoot toads about seventy percent of the country's territory. The reason of it could be the lack of investigation or the really lack of the specimens. Because the soil is play important role in life of spadefoot toad we thought there could be connection between the physical types-, the chemical characteristics of the soil, the land cover (CORINE) and the distribution of the species.

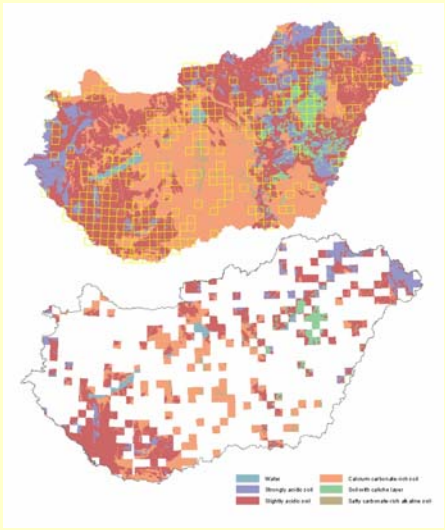
Photo 1. : The common spadefoot toad (*Pelobates fuscus*)



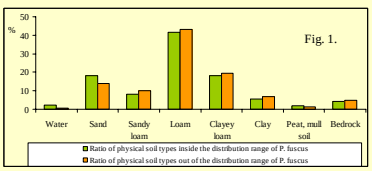
Map 1.. The distribution of Common Spadefoot Toad on the 10×10 km UTM grid map of Hungary. (Symbols refer to data from different periods. □: before 1900, ●: between 1900-1970, ■: after 1970).

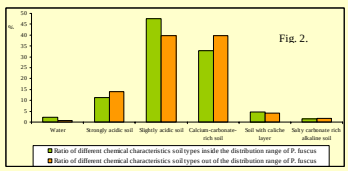


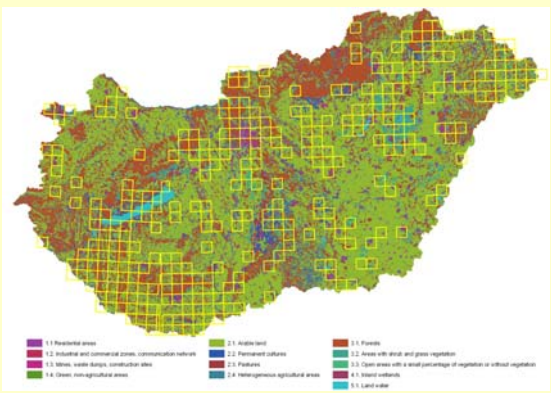
Map 2.: The distribution of physical soil types in Hungary and in the hungarian distribution area of spadefoot toad.



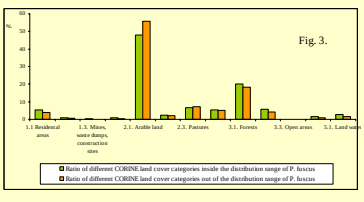
Map 3.: The distribution of chemical characteristics of soils in Hungary and in the hungarian distribution area of spadefoot toad.







Map 3.: The distribution of CORINE Land Cover categories in Hungary.



Results

Most of the spadefoot toad distribution data (~80%) come from research after 1970, so the UTM map is up to date. We did not find any difference between the areas (where the spadefoot toad are present and where it is absent) based on soil types (Fig. 1.), chemical characteristics of soil (Fig. 2.) and land cover (Fig. 3.) ratios.
Within the distribution range of the species, sandy (24%), a loam (43%) and clayey loam (19%) physical soil types were found to be dominant (Fig. 1.). In chemical characteristics of soil types the slightly acidic (47%) and calcium-carbonate-rich soil (33%) were dominant (Fig. 2.). For the simpler analysis we used only the 2nd level categories of the CORINE Land Cover map. In the distribution range of spadefoot toad the biggest Land Cover category was the arable land (48%) (Fig. 3.). It means that the human effect is very strong inside the range of spadefoot toad.

Conclusion

The lack of the spadefoot toad from great part of Hungary is come from the poor investigation not from the really lack of the species.
Based on the known distribution range of the spadefoot toad and the presented analysis it is suggests that the species occurs in all parts of Hungary.

References:

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