

9.7

### A preliminary analysis of the fate of European bumblebees.

Rasmont P\*, Smet J, Iserbyt S, Roberts SPM, Schweiger O, Biesmeijer JC, Castro L, Cederberg B, Dvorak L, Fitzpatrick U, Gonseth Y, Laget D, Mahé G, Manino A, Neumayer J, Odegaard F, Paukkunen J, Pawlikowski T, Reemer M, Sima P, Straka J, Potts SG

Email: pierre.rasmont@umons.ac.be

The authors gathered all the distribution data on European bumblebees (*Bombus*). The resulting data base includes information on nearly 900.000 specimens from all parts of the West Palaearctic. There are 77 bumblebee species in the studied region, including twelve social obligate parasites (ten from subg. *Psithyrus*, and two others). Species have been mapped using a 50km UTM grid. Three time intervals have been considered: (i) before 1950, (ii) from 1950 until 1989, and (iii) since 1990. All these maps are available at: <http://www.zoologie.umh.ac.be/hymenoptera/page.asp?id=169>.

Based on these maps, it is possible to present a preliminary assessment of the fate of most species using an analysis of the number of squares occupied by each species across the three time periods. The species showing the greatest contraction in range are bumblebees from step-pic areas and dry grasslands, and include *Bombus armeniacus*, *B. confusus*, *B. cullumanus*, *B. fragrans*, *B. laesus* and *B. mocsaryi*. Some species from cold areas in high latitudes or altitudes are also at risk, e.g. *B. monticola*, *B. mesomelas* and *B. polaris*. There is an impoverished area in Western and Central Europe that is roughly defined between the 45° and 55° latitudes. In contrast, there are several species (e.g. *B. haematurus*, *B. hypnorum* and *B. semenoviellus*) that show a recent and conspicuous range expansion. The observed shifts in many cases are related to the known life history traits of this genus, and the changing environmental conditions in Europe.

9.8

### Economic consequences of pollination service declines - advances from the STEP project.

Breeze TD\*, Gallai N, Bommarco R

Email: t.d.breeze@reading.ac.uk

Pollination is widely recognised as an economically significant ecosystem service, influencing the productivity of agriculture and the aesthetic quality of the wider landscape. Past studies have used a range of simple bio-economic methods to assess the economic benefits of pollination services, however many of these studies are limited by data and methodology, resulting in vague and limited value estimates of these benefits to only a core handful of outcomes. A core objective of the STEP project is to augment and expand upon these methods to provide more comprehensive analyses of the impacts of pollination services on human societies. In particular the project has undertaken several studies into the value of pollination services beyond the crop market, including the benefits to small holders and seed producers in France and the non-market benefits of landscape aesthetics and local food availability in the general public of the UK.

for your remarks: