

## **Spectrum of hymenopterous parasitoids on urban stands of horse chestnut trees**

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### **INTRODUCTION**

The spectrum of beneficial organisms which attack the horse chestnut leaf miner (*Cameraria ohridella*) in the city of Berlin (most of which are hymenopterous parasitoids) is currently being studied within the project BerlinCam (funded by the European Commission as part of the EFRE programme and by the Senate Department of Urban Development by means of the 'Umweltentlastungsprogramm'). The project involved intensive field and laboratory studies, spanning three vegetative periods, and are being done to understand the influence of abiotic and environmental factors on such organisms.

### **MATERIAL AND METHODS**

Seven stands of horse chestnut trees in Berlin were selected, each within different types of habitat (including streets, parks and places in the city centre, as well as a landscaped park and a forest outside the city). The parasitoid complex of the pest was determined three times a year. In total, 250 host larvae were dissected in the laboratory to assess the rates of parasitism. In addition, infested (mined) leaves were put into photoelectors and all adult parasitoids that emerged from the mines were isolated and identified. Temperatures and relative humidity at the field sites were measured during the entire season, and environmental factors (e.g. the surrounding vegetation at the various field locations), were estimated visually.

### **RESULTS AND DISCUSSION**

The rates of parasitism of larvae were, on average, lower in 2004 than in 2003 (Table 1). In addition, four times as many parasitoids were recorded in 2003 than in 2004; numbers of parasitoid species were also different between years (13 species in 2003; 9 in 2004). The parasitism rate of larvae seems to depend on the weather conditions and the kind of location. Highest rates of parasitism were measured along streets in both years, but the reason for this surprising result is still unclear; temperatures, which are higher at inner-city stands, may play an important role (Figure 1).

Fourteen parasitoid species were reared from *Cameraria* in the city of Berlin. These were: *Itoplectus alternans* and *Scambus annulatus* (Ichneumonidae); *Pteromalus semotus* (Pteromalidae); *Chrysocharis nephereus*, *Closterocerus trifasciatus*, *Neochrysocharis chlorogaster* and *Pediobius saulius* (Eulophidae – Entedoninae); *Cirrospilus elegantissimus*, *C. pictus*, *C. viticola*, *Elachertus inunctus*, *Pnigalio agraulis* and *Sympiesis sericeicornis*

(Eulophidae – Eulophinae); *Minotetrastichus frontalis* (Eulophidae – Tetrastichinae). *P. saulius* (which is a parasitoid of pupae) was found for the first time in 2003; this parasitoid dominates the *Cameraria* parasitoid complex in south-eastern Europe, but is normally absent in samples from northern and western Europe.

Table 1. Rates of parasitism (%) of *Cameraria ohridella* larvae in relation to habitat type and the time of collection in Berlin (2003 and 2004)

	2003			2004	
	August	September	July	September	October
Place A in city	6,8	13.6	0	6.3	0.8
Place B in city	3.6	13.6	-	10.4	3.1
Street A in city	3.8	12.4	4.5	19.7	3.7
Street B in city	12.0	49.6	8.2	18.6	8.3
Park in city	5.0	12.0	1.3	2.0	0.4
Landscaped park outside city	8.4	13.2	1.0	3.2	1.9
Forest outside city	5.6	18.0	0.6	2.9	3.7
Mean	6.5	18.9	2.6	8.8	3.1

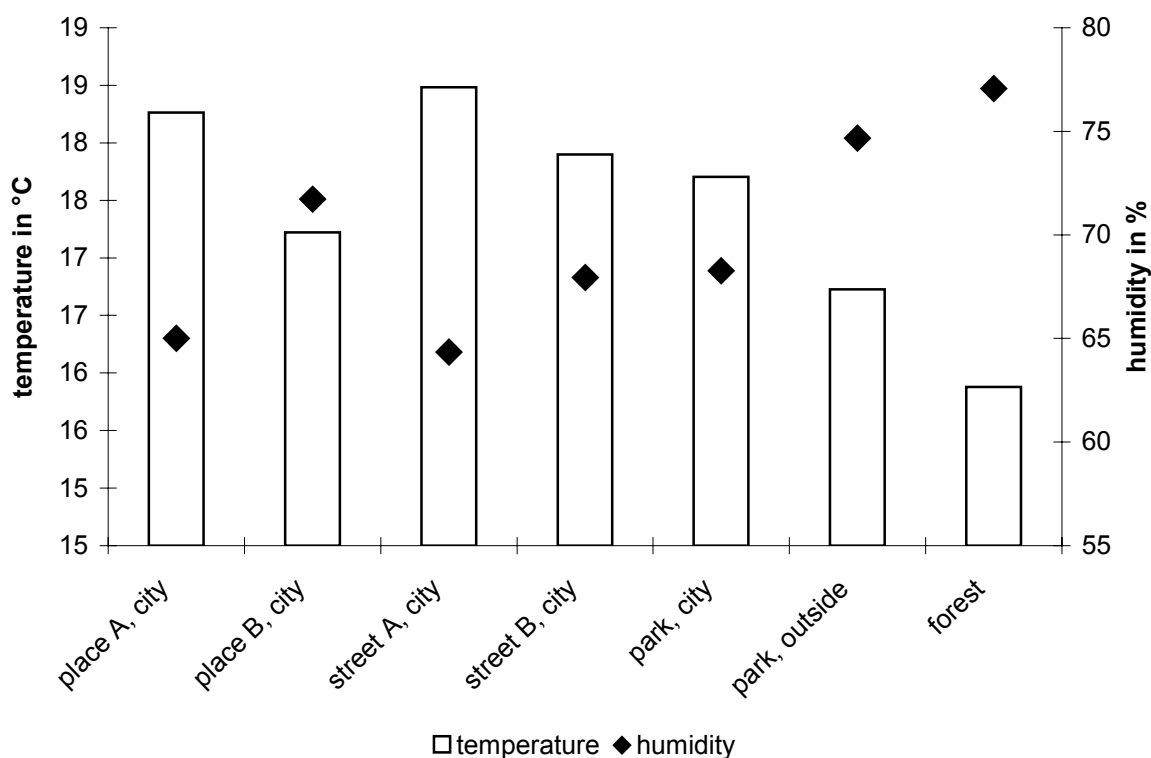


Figure 1. Mean temperature and relative humidity at the investigated locations in Berlin (August, 2004)