

**Faunistic, zoogeographical and ecological studies on family Pteromalidae
(Hymenoptera: Chalcidoidea) from Vitosha Mountain, Bulgaria**

(Summary)

Family Pteromalidae has not been studied in Bulgaria previously. 103 species are known from this country before our research, 13 of which are recorded from Vitosha Mt. The aim of the study was to determine the number of species and their distributional patterns, the zoogeographical structure and phenology of the pteromalid fauna, as well as to analyze some ecological characteristics of this fauna in five grassland habitats in the mountain.

This research was made during 2010, 2011 and 2012. The collection of the insects was realized by sweeping net, Malaise traps, hand samples and emergence from some hosts (inflorescences and galls). As a result, 2721 individuals of 7 subfamilies, 51 genera and 124 species were caught. 120 of them are new for the pteromalid fauna of the Vitosha Mt. (marked with one asterisk in the list of species), 97 are new for the Bulgarian fauna (marked with two asterisks) and 52 species are new for the Balkan Peninsula (marked with three asterisks). The most numbered taxa are *Spintherus dubius* (104 individuals) and *Mesopolobus* (168 individuals). The richest genus is *Pteromalus* – 15 spp. Species *Notanisus versicolor*, *Halticoptera circulus*, *Semiotellus fumipennis*, *S. laevicollis*, *Coruna clavata* and *Metastenus concinnus* were caught by Malaise traps only. On the other hand *Caenacis inflexa*, *Mesopolobus sericeus* and *Pteromalus bedeguaris* were yielded only from host galls and *Callimerismus fronto*, *Gastrancistrus vulgaris*, *Sphegigaster intersita* and *Stictomischus groschkei* were gathered only by sweeping through selected plants or by aspiration with an exhaustor.

Two species – *Caenacis inflexa* and *Pteromalus bedeguaris* were established as members of the gall community of the bedeguar wasp *Diplolepis rosae*. We found that their abundance (*C. inflexa* – 7.80%, *P. bedeguaris* – 17.74%) is clearly higher than the mean value in Europe. The conducted statistical analysis (ANOVA, Spearman test) showed positive correlations between *P. bedeguaris* and *Glyphomerus stigma* (Torymidae) ($r = 0.582$; $P = 0.018$) and between *P. bedeguaris* and rate of parasitization ($r = 0.506$; $P = 0.044$). *P. bedeguaris* was more abundant in galls from open lands than to galls from shadowed forest ridges ($P = 0.045$). On the other hand a negative correlation was found between the total number of *Eurytoma rosae* (Eurytomidae) and *C. inflexa* compared to the gall maker *Diplolepis rosae* ($r = -0.526$; $P = 0.035$).

As a result of the zoogeographical analysis we included all pteromalids into 25 categories. The most numerous category was composed of European chorotypes, followed by holarctic, western-euroasian and europaen-anatolian chorotypes (mediterranean species were not found). Seven species - *Semiotellus fumipennis*, *S. laevicollis*, *Gastrancistrus affinis*, *G. clavellatus*, *Lampoterma bianellatum*, *Pteromalus temporalis*, *Callimerismus fronto* and *Coelopisthia caledonica* are supposed to have a boreo-mountain distribution.

As regards to the phenology of the pteromalid species on the Vitosha Mt., we found 5 groups as follows – spring active (1.5 %), spring-summer active (21.1%), summer active (21.8%), spring-autumn active (27.8%) and summer-autumn active (27.8%).

The analysis of the distribution of pteromalids through the parts, forest belts and climatic zones showed that the most species prefer the east part, the meadows into the beech forest belt and the lower climatic zone (max. altitude - 1450 m.) of the Vitosha Mt.. We found positive correlation between species richness and altitude ($r=0.554$; $p=0.06$) and higher number of species in the middle climatic zone (1450-1850 m.).

The results of the calculation of biodiversity, dominance and equability indexes (Simson, Shannon, Berger-Parker and Pielou (Equability J) have shown that the pteromalid fauna of the Vitosha Mt. is characterized with low dominance and high species diversity. Cluster analysis revealed distinctive similarity between grassland habitats near coniferous forests and open lands.