Acta entomologica serbica, 2001, 6 (1/2): 151-155 UDC 595.773 (497.11)

STUDIES OF DROSOPHILIDAE (DIPTERA) IN SERBIA AND MONTENEGRO. XVIII. COLLECTIONS FROM KRAGUJEVAC

SNEŽANA STANIĆ[1], VLADIMIR KEKIĆ[2] AND SOFIJA PAVKOVIĆ-LUČIĆ[2]

[1]Faculty of Science, University of Kragujevac, R. Domanović12, 34000 Kragujevac
[2]Institute of Zoology, Faculty of Biology, University of Belgrade, Studenski trg 16, 11000 Belgrade, Serbia and Montenegro

This paper presents the first faunistic-ecological data of drosophilids from Kragujevac Basin. Among more than 2300 collected specimens there is a total of 18 *Drosophila* species identified. The differences in the composition of species between three various localities are discussed in respect of their ecology.

KEY WORDS: *Drosophila* ecology, spatial distribution.

Having in mind the importance of certain representatives of *Drosophilidae* family, especially the species of *Drosophila* (see e.g. ASHBURNER et al., 1976 – 1986; POWELL, 1997), and the fact that the territory of Serbia and Montenegro is still a poorly investigated part of Europe (see KEKIĆ, 2002), we continued our faunistic-ecological studies, and this time we paid our attention to *Drosophilidae* in the basin of Kragujevac which is situated in the central part of Serbia, i.e. the central part of the Balkan Peninsula.

This paper presents results of our studies in the town of Kragujevac (around 140 km south of Belgrade) in the period from 7th to 12th September 1999. Flies were collected at three localities: (1) in the garden of a house in the part of the town called "Stara radnička kolonija", (2) on the banks of the Lepenica river that flows through the town, in the part downstream of the confluence of the Ždraljica river into the Lepenica river and (3) in the oak forest Šumarice near the town. It is important to mention that Kragujevac (and whole Serbia and Montenegro) was bombed by NATO alliance in the period from March to June 1999 and this bombing caused outflow of pyralene in river Ždraljica, a very toxic and mutagenic sub-

stance even in small quantities. Places at which the flies were caught are situated at the apexes of an isosceles triangle, so there is around 2 km between the most distant ones - the Lepenica and Šumarice, while the house with the garden is between these localities, at around 1 km from each of them.

To catch the flies we used fermented fruit, which is a powerful attractant for a large number of *Drosophilidae* species because there they find food, mating partners and/or the place where the females lay eggs (BURLA & BÄCHLI, 1985). Already prepared mixture of season fruits (peaches and plums with a small amount of sugar and baker's yeast) was placed on plates (around 200 gr. per plate) and distributed across the studied habitat. The capture of the flies around these traps was carried out with an entomological net, twice a day in the morning (from 7 to 8 AM) and in the evening (from 6 and 7 PM), i.e. during time periods when they are most active. Until determination the flies were kept in flacons in 70% ethanol.

Table 1 shows results of identification of the collected flies. It can be noticed that out of 2 300 caught individuals 18 species were found, all of them of *Drosophila* genus.

The greatest number of species, 12, was caught in the oak forest at the locality of Šumarice, then at the bank of the Lepenica River – 10 species, and the smallest number of species – 9 in the garden in the old residential part of the town, which is totally opposite to the proportion of the caught individuals at these localities.

When we consider Table 1, it is obvious that two species dominate at each of the studied habitats: *D. melanogaster* which makes more than 83% of all caught flies and *D. immigrans* which make around 9% of them. It is interesting that distribution of these flies is inverse, the greater the number of the members of one species the smaller the number of the other, starting from the first to the third locality.

These two species belong to the so-called *cosmopolitan* species (PATTERSON & STONE, 1952). Besides them only six more of *Drosophila* species bear this name: *simulans, busckii, funebris, replete, hydei and ananassae* (see also PARSONS & STANLEY, 1981). In this investigation covering the area of Kragujevac, the first four have been found; *hydei* has not been found yet, but it must be present in some other microhabitats of Kragujevac; *ananassae* has been found neither in Serbia and Montenegro nor in the localities of former Yugoslavia (KEKIĆ, 2002).

DOBZHANSKY (1965) refers to these cosmopolitan species as "*domestic*", colonizing species or "animal weeds" which occur around human habituations

including orchards, city parks, gardens, market-places, garbage dumps, wine cellars, even rooms in residential houses.

Here, "the level of domesticity" of different species varies significantly and it depends upon many different factors, such as resources available, degree of habitat disturbance and physical environmental conditions.

Table I
The list of *Drosophila* species collected in three localities in Kragujevac

SPECIES	L o c a l i t i e s						TOTAL	
	Oak forest Šumarice		Lepenica river		Cyti Garden			
	N	%	N	%	N	%	N	%
DROSOPHILA								
D. busckii					**1**	***0.1***	**1**	***0.04***
D. deflexa	25	*7.8*	3	*0.4*			28	*1.20*
D. funebris			**1**	***0.1***	**13**	***1.1***	**14**	***0.60***
D. helvetica	2	*0.6*					2	*0.09*
D. immigrans	**119**	***37.1***	**78**	***9.5***	**21**	***1.8***	**218**	***9.34***
D. kuntzei	14	*4.4*					14	*0.60*
D. limbata	2	*0.6*	1	*0.1*			3	*0.13*
D. littoralis					2	*0.2*	2	*0.09*
D. melanogaster	**108**	***33.6***	**694**	***84.2***	**1143**	***96.0***	**1945**	***83.33***
D. obscura	6	*1.9*	1	*0.1*			7	*0.30*
D. phalerata	14	*4.4*	4	*0.5*	1	*0.1*	19	*0.81*
D. repleta					**5**	***0.4***	**5**	***0.22***
D. rufifrons	2	*0.6*			2	*0.2*	4	*0.17*
D. simulans	**10**	***3.1***	**40**	***4.9***	**1**	***0.1***	**51**	***2.18***
D. subobscura	9	*2.8*	1	*0.1*			10	*0.43*
D. testacea	7	*2.2*	1	*0.1*			8	*0.34*
D. sp. KG-01	2	*0.6*					2	*0.09*
D. sp. KG-02	1	*0.3*					1	*0.04*
TOTAL	**321**	*100*	**824**	*100*	**1189**	*100*	**2334**	*100*

Based on our long term faunistic-ecological studies of *Drosophila* at the localities of former Yugoslavia, the order of the species according to domesticity is *busckii* > *repleta* > *melanogaster* > *funebris* > *hydei* > *simulans* > *immigrans,* where *busckii* is the most domestic, *simulans* is prevalently a "semidomestic" species and *immigrans* is found in greater proportion than all the others in "wild" habitats of the central and western part of the Balkans. (KEKIĆ, 2002).

Out of six "domestic" *Drosophila* species caught in Kragujevac, all of them were caught in the garden, four at the bank of the Lepenica and three in Šumarice.

It is interesting that out of 18 discovered species only four of them appear at each of the studied localities: *melanogaster*, *immigrans, simulans,* and *phalerata.* Among them only *phalerata* is a "wild" species (KEKIĆ, 2002). Its proportion in collections significantly increases starting from the city garden to the oak forest of Šumarice (Table 1).

A specific feature of the collection from the forest of Šumarice is an extremely great number of individuals of *deflexa* species, even 25! How great this number is becomes clear if we know that out of more than 175 000 of *Drosophilidae* individuals caught in "wild" or "semidomestic" habitats all over former Yugoslavia, only 31 of them were of this species (KEKIĆ, 2002).

This study represents the first faunistic-ecological information on *Drosophilidae* flies in the basin of Kragujevac. Our further investigations of this part of Serbia, at the same and some new localities should give us some new data and a more detailed picture of biodiversity of *Drosophilae* and an ecological picture of Kragujevac and its surroundings.

REFERENCES - ASHBURNER, M. et al. (eds.). 1976-1986. The Genetics and Biology of Drosophila. Vol. 1-3. Academic Press, London. BÄCHLI, G. & BURLA, H.,1985. Diptera Drosophilidae. Insecta Helvetica, Zurich. DOBZHANSKY, TH., 1965. *In*: Baker, H. G. & Stebins, G. L. (eds.): The Genetics of Colonizing Species. Academic Press, New York and London. KEKIĆ, V., 2002. In: Genetics, Ecology, Evolution (Eds. B.P.M. Ćurčić and Anđelković, M.), Monographs, Vol. VI, Institute of Zoology, pp. 109-120. Belgrade. PARSONS, P. A. & STANLEY, S. M., 1981. *In*: Ashburner, M., Carson, H. L., and Thompson, J. N. (eds.): The Genetics and Biology of Drosophila 3a, 349-393. Academic Press, London. PATTERSON, J. T., & STONE, W. S. 1952. Evolution in the genenus *Drosophila*. MacMillan, New York. POWELL, J. R., 1997. Progress and Prospects in Evolutionary Biology. The Drosophila Model. Oxford University Press, Oxford, New York.

Received November 5, 2001
Accepted December 20, 2001