

ON THE ORTHOPTERA FAUNA OF THE TIHANY PENINSULA  
(LAKE BALATON, WESTERN HUNGARY).

By BARNABÁS NAGY (Zoological Institute, Debrecen, Hungary).

(From the Zoological Institute of the University of Debrecen and the  
Hungarian Biological Research Institute, Tihany, Lake Balaton.)

With 1 Table in the text.

(Received for publication 15th December, 1947.)

In 1943 and 1947 I collected some thousand specimens of locusts and grasshoppers on the Tihany peninsula\* of Lake Balaton, which abounds in biotop- (= biochorion) types, for research in ecology and biosociology. Collection of the material was done in a few weeks of the vegetation season (17—25. VIII 1943 and 22 VII—21 VIII 1947), but the great number of insects collected and the fact that at this time the greatest part of the Orthoptera were fully developed are the guarantee that the species which will be enumerated here are essentially representative.

The Orthoptera — in both developed and undeveloped condition — are bound fairly closely to their respective biotop-types, so that if we know the peculiarities of their habitats we can find the species almost regularly.

In the following Table I enumerate in systematical order the species observed and collected according to the nomenclature of W. RAMME (1927), and partly of L. CHOPARD'S (1922) and J. REDTENBACHER'S (1900) works. The result of the ecological and biocoenotical investigation I shall communicate on another occasion.

From the Table we see that the hills and hillsides (I) are richer in species than the flat meadows (II). This relative richness in species is caused very probably by the varied level of the biotops of hills.

\* I do not give even a rough description of this district, as full information on it is to be found in former volumes of this periodical, e. g. geology: vol. 4, 1931, soil: vol. 14, 1942, vegetation: vol. 5, 1932, etc.



TABLE  
Orthoptera species of the Tihany peninsula.

	I.			II.	
	1.	2.	3.	1.	2.
FORFICULIDAE					
<i>Forficula auricularia</i> L.					
BLATTIDAE					
<i>Blatta orientalis</i> L.					
MANTIDAE					
<i>Mantis religiosa</i> L.	+				
ACRIDIDAE					
<i>Acrida turrata</i> L.	+				
<i>Acrydium subulatum</i> L.				+	
" <i>bipunctatum</i> L.				+	
<i>Parapleurus alliaceus</i> Germ.					+
<i>Chrysochraon dispar</i> Germ.				(+)	+
<i>Stenobothrus lineatus</i> Panz.	+	(+)			
" <i>crassipes</i> Ocsk.	+				
" <i>stimaticus</i> Ramb.	+				
" <i>nigromaculatus</i> H.—S.	+				
<i>Omocestus rufipes</i> Zett.	+	+	+	+	
" <i>haemorrhoidalis</i> Charp.	+			+	
" <i>petraeus</i> Bris.	+				
<i>Stauroderus biguttulus</i> L.	+				
" <i>bicolor</i> Charp.	+	(+)	(+)	+	
" <i>mollis</i> Charp.	+			(+)	
<i>Chortippus dorsatus</i> Zett.				+	
" <i>parallelus</i> Zett.				+	
" <i>longicornis</i> Latr.				+	
" <i>elegans</i> Charp.				+	
" <i>declivus</i> Fisch.				+	
<i>Gomphocerus maculatus</i> Thbg.	+				
" <i>rufus</i> L.	+		+		
<i>Dociostaurus crucigerus brevicollis</i> Eversm.	+				
<i>Mecosthetus grossus</i> L.				+	(+)
<i>Aeolopus thalassinus</i> Fbr.				+	
<i>Oedipoda coerulescens</i> L.	+				
<i>Oedaleus nigrofasciatus</i> de Geer	+				
<i>Calliptamus italicus</i> L.	+			+	
<i>Pezotettix giornai</i> Rossi	+			+	



	I.			II.	
	1.	2.	3.	1.	2.
<b>TETTIGONIIDAE</b>					
<i>Leptophyes albovittata</i> Koll.	+				
<i>Phaneroptera falcata</i> Scop.		+			
" <i>quadripunctata</i> Br.		+			
<i>Coconephalus fuscus</i> Fbr.				+	+
" <i>dorsalis</i> Latr.				+	+
<i>Homocoryphus nitidulus</i> Scop.				(+)	+
<i>Tettigonia viridissima</i> L.			+		
<i>Rhacocleis germanica</i> H.—S.		+	+		
<i>Pholidoptera cinerea</i> L.			+		
<i>Metrioptera grisea</i> Fabr.	+	(+)			
" <i>affinis</i> Fieb.	+	(+)			
" <i>vittata</i> Charp.	+				
" <i>roeselii</i> Hgb.				+	+
<i>Decticus verrucivorus</i> L.	(+)			+	
<i>Ephippigera vitium</i> Serv.		+			
<b>GRYLLIDAE</b>					
<i>Oecanthus pellucens</i> Scop.		+			
<i>Pteronemobius heydeni</i> Fisch.				+	+
<i>Liogryllus campestris</i> L.	+			+	
<i>Gryllus desertus</i> Pall.				+	
<i>Gryllotalpa vulgaris</i> L.				+	

I. = Hilltops and slopes: 1. = grassy surfaces, 2. = bushy (+ grass) surfaces, 3. = woody (+ bush and grass) surfaces. II. = Mesophil and hygrophil meadows (marshy vegetation): 1. = Essentially low-grass (20—40 cm), 2. = Essentially high-grass (40—100 cm).



Although the two main biotop-types (hillsides, meadows) are mostly coherent, the species of the two main groups are regularly limited to the one or other main type in their occurrence. An exception is found only in some eurytop species (mainly: *Omocestus haemorrhoidalis*, *O. rufipes*, *Stauroderus bicolor*, *Chortippus declivus*, *Calliptamus italicus*, *Pezotettix giornai*) which occur in both main biotop types. The species *Stenobothrus lineatus*, *St. crassipes*, *Stauroderus mollis*, *Metrioptera grisea*, *M. affinis* live first of all on the hillsides but one can find them on the coherent, drier meadows too.

The Orthoptera fauna of the small peninsula (about 12 sq. km.), which is almost entirely encircled by the lake, is rich enough, because, of the about 130 Orthoptera species of the Carpathian Basin till now, 52 species have been found in the collections which I made at the end of July and in August. This is scarcely less than the 66 species observed by S. PONGRÁCZ (1940) in the Kőszegi-hegység mountains (the easternmost part of the Alps). The comparative richness of the Orthoptera fauna of the peninsula is the result of the great number of most varied biotop types and their mosaic-like arrangement.

The Orthoptera fauna of the Tihany peninsula consists mostly of species peculiar to Euro-Asia, but the faunistic character is given by "Mediterranean" and "Pontic" species which reach their northernmost resp. westernmost extent in this district.

Among the palaeotropical species *Mantis*, *Acrida* and *Homocoryphus* must be mentioned, the two latter of which reach their northern limit in our longitudes in the Magyar-Középhegység (Hungarian Central Mountains). I found only one specimen (in the last larval stadium) of *Acrida* on the southern slope of the "Óvár" hill, on a pasture of dwarf grass, but according to O. SEBESTYÉN (in litt.) in 1930 this species was also frequent in the park of the Biological Research Institute.

Among the Ponto-Mediterranean and Mediterranean species we must mention especially the *Chortippus declivus*, *Pezotettix giornai* and *Gryllus desertus*, because these are of great importance among the Orthoptera, occurring in great numbers on the suitable biotops of the peninsula. The *Pezotettix* scarcely occurs further north than the Magyar-Középhegység mountains, while the *Chortippus declivus* and *Gryllus desertus* with some Pontic and Mediterranean species reach sporadically as far as the Vienna Basin, even Moravia (*Stenobothrus crassipes*, *Metrioptera affinis*, *M. vittata*). The northern limit of the



species *Pteronemobius heydeni* is also the Magyar-Középhegység mountains. We may mention, as a characteristic species, *Omocestus petraeus* which, though it extends in a broad belt across Euro-Asia, in Central Europe does not reach districts further north than the Carpathians and the Vienna Basin; on the low, grassy regions of the peninsula it is as frequent as on the "Hortobágy puszta" (B. NAGY, 1944).

The occurrence of the *Phaneroptera quadripunctata* in Hungary — a species of exclusively Mediterranean origin — is quite new. The shores of the Adriatic which until now were considered the northernmost limit for the continuous distribution of this species — are 300 kms from the Tihany peninsula. But *Phaneroptera* are relatively good fliers. The wings serve not only for prolonging the jumps, but are active organs of flight. I observed on several occasions that disturbed individuals rose to a height of 30—40 m and disappeared. So we can suppose as explanation that in suitably warm summers and seasons the *Phaneroptera* finds its way to the north.

Among the peninsular Orthoptera species the *Rhacocleis germanica* has the smaller area of distribution. The Magyar-középhegység mountains are the northern limit of its extent, although the Fauna Regni Hungariae (PUNGUR, 1918) has noted its occurrence at Bártfa (= Bardejov, Slovakia).\*

It must be noted that most of the specimens of the *Stauroderus bicolor* and *mollis* species form a transition, as to size, between the two species, so that it is very difficult to identify them exactly.

#### SHORT-WINGED (BRACHYPTEROUS) SPECIES.

Disregarding the *Forficula* and *Blatta*, 14 of 50 species have rudimentary wings (28 %). B. P. UVAROV (ap. FR. ZACHER, 1947) observes on the deserts and steppes of Trans-Caspian districts some 25 %, R. PUSCHNIG (ibid.) in the wooded part of Carinthia 54 %, Z. KOZMINSKI (1925) in the forest of Bialowieza 35.5 % brachypterous species. In the Kőszegi-hegység mountains (Western Hungary) 37 % are brachypterous Saltatoria.

\* J. OBERBERGER does not mention this species in the O. fauna of Czechoslovakia, while enumerating some 40 species which have a doubtful or possible occurrence.



The percentages for the Trans-Caspian and Tihany districts are superficially similar. The low percentage of the brachypterous species of the two districts, which are many thousand kilometres distant from one another, can be partly explained by the fact that in both faunas the xerophilous and normal-winged species predominate. These are missing in Carinthia and the Kőszegi-hegység mountains to a smaller extent and in the Bialowieza forest for the most part.

To obtain a correct estimate of the proportional number of the brachypterous species, it is necessary to point out the relation between the brachypterous species and their habitat, and furthermore, by establishing the district centres which played a great part in the origin of the brachypterous Saltatoria. The absence of certain biotope types may be the cause for the absence of brachypterous species too, even though there is no difficulty zoogeographically for their occurrence. For the high percentage of the brachypterous species of the Orthoptera fauna in Carinthia (and in smaller part in the Kőszegi-hegység mountains too) the direct territorial influence of the Balkans and surrounding country might be responsible, that district being the radiation centre for brachypterous genera.

Grateful acknowledgment is made to Mrs. J. THOMPSON VASS for revision of the English text.

#### REFERENCES.

- CHOPARD, L. (1922): *Orthopt. et Dermapt. Faune de France* 3. 212.
- KOZMINSKI, Z. (1925): *Bull. Acad. Polon. Sci. Lettres, Cl. Sci. Mathém. et Natur., Cracovie, Ser. B*, 447.
- NAGY, B. (1944): *Acta Sci. Math. Nat. Kolozsvár*, 26. 1.
- OBENBERGER, J. (1926): *Orthopt. et Dermapt. et la Républ. Tschécoslov. Fauna et Flora Cechoslovenica* I. Praha. 126.
- PONGRÁCZ, S. (1940): *Publ. Mus. Günsiensis, (Dunántúli Szemle, VII, Kőszeg, Hungary) Ser. II* 3. 297.
- PUNGUR, GY. (1918): *Orthoptera. Fauna Regni Hungariae*, 3. 1.
- RAMME, W. (1927): *Geradflügler, Orthoptera*. P. BROHMER, P. EHRMANN & G. ULMER: *Die Tierwelt Mitteleuropas. Leipzig* 4. VI 22.
- REDTENBACHER, J. (1900): *Die Dermapteren und Orthopteren (Ohrwürmer und Geradflügler) von Österreich-Ungarn und Deutschland. Wien*. 148.
- ZACHER, FR. (1917): *Die Geradflügler Deutschlands und ihre Verbreitung. Jena*. 287.