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Abstract.

This second contribution summarizes distributional and ecological data on 72 carabid species from the Belgian fauna. Besides distribution maps, results on distribution analyses, time analyses, morphology and ecology of the mentioned species are tabulated.

INTRODUCTION

In the framework of a detailed study on the distribution of Belgian Ground and Tiger beetles, we recently gathered as much data on these beetles as possible and revised all available specimens from collections. In a previous contribution (DESENDER, 1985) a checklist was presented in which 379 species are mentioned for our country.

The following contribution is the second in a series on the detailed distribution and ecology of our carabid beetles. Besides distribution maps and results from our analyses, we also tried to summarize the present knowledge on different morphological and ecological species characteristics. This was based on the literature as well as on own observations. In this way

we hope to make such information more accessible to all interested entomologists and students. Discussion of the results from our analyses has been kept here to a minimum because more general analyses on the entire fauna are more meaningful and will be published in the future. Nomenclature and classification in this paper were used according to our recently published checklist (DESENDER, 1985).

Necessary informations on material and methods are given in detail in our first contribution in this series (DESENDER, 1986). Summarizing this information, we first dealt with the collection and representativity of the material. After data reduction we obtained on the whole 60.298 different records on the 379 carabid species from our country, divided into 32.196 records before 1950 and 28.102 records from 1950 onwards.

After this, data processing and preparation of the distribution maps was briefly discussed, followed by the methods and sources used in distribution and time analyses. This involved on the one hand comparison of species distribution data with different abiotic and biotic factors for each U.T.M. square (altitude, most important soil type, the presence or absence of chalk in the soil, the presence or absence of acid sands or acid clay, woodland cover and woodland type, the presence of running water with high fall and finally four climatological indices), on the other hand an evaluation of changes in distribution and commonness occurring in the course of time. Furthermore the statistical analyses used were briefly outlined and some comments given on the interpretation of the results. Finally introductory information was presented on the collection and tabulation of morphological and ecological data for each species : data are incorporated on commonness and rarity, total distribution area, mean beetle size, wing developmental type, main reproductive period and habitat preference.




Comments, criticisms or complementary information and new data concerning this paper will be much appreciated.

RESULTS

a) Distribution maps

All distribution maps on species 81-152 are given on p. 12-23. Numerical and taxonomical order as well as nomenclature are according to DESENDER (1985).

The following symbols are used :

-  data before 1950 only
-  data after 1950 only
-  data from both time periods

b) Distribution analyses

All results in this respect are summarized and explained in Table I.

c) Morphology and ecology of the species

Table II. summarizes these results. Data on wing dimorphism only apply to the following species :

SPECIES	macropterous individuals	brachypterous individuals	total number of individuals checked
<u>Bembidion aeneum</u>	10	12	22
<u>Bembidion assimile</u>	103	178	281
<u>Bembidion clarki</u>	1	253	254
<u>Bembidion gilvipes</u>	8	1117	1125
<u>Bembidion guttula</u>	175	510	685
<u>Bembidion lampros</u>	80	5834	5914
<u>Bembidion obtusum</u>	12	289	301
<u>Bembidion properans</u>	1304	5295	6599
<u>Bembidion tetracolum</u>	11	760	771

Wing development in several species was not yet mentioned in literature (several constantly macropterous Tachys and Bembidion species). Bembidion laterale and Bembidion unicolor are known as wing dimorphic species but until now we only encountered brachypterous individuals in Belgium (on resp. 5 and 115 individuals).

d) Time analysis

These results are also mentioned in Table II : from this list 25 species show a relative decrease against 10 only which relatively increased during recent decades. This would at first sight not be expected because almost all species from this list are macropterous and fly often. Apparently this high dispersal power can not counteract the decrease of these species, which is therefore primarily due to the dramatic reduction of many habitat types. More general results on a time analysis for all species will be given in the future (DESENDER, in prep.).

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The final preparation of the maps was done with great care by my mother, whom I am therefore much indebted.

T. Van Gijzen kindly checked our identifications from difficult and/or new species from our country.

Finally we are especially grateful to Prof. Dr. J. Hublé for his continuous support and interest during our study, as well as to Dr. J. Van Goethem for proposing the publication of these contributions in the 'Koninklijk Belgisch Instituut voor Natuurwetenschappen' and to Dr. P. Grootaert for revision of the manuscript.

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Nr	Species	1	2	3	4	5	6	7	8	9	10	11	12
81	<i>Asaphideon flavipes</i>	95	3	L+ZL						3	3	3	3
82	<i>Asaphideon pallipes</i>	131	1	Z+ZL								6	
83	<i>Bembidion aeneum</i>	8	4	MC							2	3	2
84	<i>Bembidion argenteolum</i>	17	3	Z						3	2	2	2
85	<i>Bembidion articulatum</i>	133	3	L+ZL								1	2
86	<i>Bembidion ascendens</i>	356	-3	SL					*	-4	-4	-4	-2
87	<i>Bembidion assimile</i>	43	3	Z+ZL						2	2	2	2
88	<i>Bembidion atrocoeruleum</i>	275	-3	SL	*		2	5	*	-2	-2	-4	-2
89	<i>Bembidion biguttatum</i>	118		L+ZL						2	3		2
90	<i>Bembidion bipunctatum</i>	45	4	MC							2	2	2
91	<i>Bembidion bruxellense</i>	175				*							
92	<i>Bembidion clarki</i>	37	3	L+ZL						2	2	2	2
93	<i>Bembidion decorum</i>	235	-3	SL	*		2	1	*	-2	-2	-2	-2
94	<i>Bembidion dentellum</i>	138		AL								1	2
95	<i>Bembidion doris</i>	93	3	Z+ZL							2	3	3
96	<i>Bembidion elongatum</i>	186	-4	SL					*				-2
97	<i>Bembidion ephippium</i>	7	4	MC							2		2
98	<i>Bembidion femoratum</i>	102	1	Z+ZL						2	3	4	3
99	<i>Bembidion fluviatile</i>	205	-3	SL							-2		
100	<i>Bembidion fumigatum</i>	19	3	MC						2	3	2	2
101	<i>Bembidion genei</i>	100	4	L+ZL						2	2	2	2
102	<i>Bembidion gilvipes</i>	82	4							2	2	1	2
103	<i>Bembidion guttula</i>	123		ZL							2	1	2
104	<i>Bembidion harpaloides</i>	95	2	L+ZL						2	3	1	4
105	<i>Bembidion humerale</i>	208				*							
106	<i>Bembidion inustum</i>	348											
107	<i>Bembidion iricolor</i>	8	4	MC							2	2	1
108	<i>Bembidion lampros</i>	152	3	L+ZL						2	3	4	2
109	<i>Bembidion laterale</i>	6	4	MC						1	2	2	1
110	<i>Bembidion litorale</i>	109	3	L+ZL									3
111	<i>Bembidion lunatum</i>	31	3	L+ZL									
112	<i>Bembidion lunulatum</i>	101	4							2	2	1	1
113	<i>Bembidion maritimum</i>	14	4	MC							2	2	2
114	<i>Bembidion milleri</i>	183	-4	L								-1	-2
115	<i>Bembidion millerianum</i>	391	-2	SL			2	3	*	-3	-3	-4	-3
116	<i>Bembidion minimum</i>	7	4	MC						3	2	2	1
117	<i>Bembidion modestum</i>	603											
118	<i>Bembidion monticola</i>	220	-4	SL	*		2	5		-2	-2	-2	-3
119	<i>Bembidion nigricorne</i>	54	3	FZ		*					2	2	3
120	<i>Bembidion nitidulum</i>	245	-4	SL	*		2	5		-2	-2	-3	-3
121	<i>Bembidion normannum</i>	5	4	MC						1	2	3	1
122	<i>Bembidion obliquum</i>	139		FZ		*							
123	<i>Bembidion obtusum</i>	109	1	L+ZL							3	2	2
124	<i>Bembidion octomaculatum</i>	70	2	L+ZL						2	4	1	2
125	<i>Bembidion pallidipenne</i>	4											
126	<i>Bembidion prasinum</i>	288	-3	SL	*		2		*	-2	-2	-3	-2
127	<i>Bembidion properans</i>	127	2								3	5	
128	<i>Bembidion punctulatum</i>	215	-3	SL							-2	-2	-2
129	<i>Bembidion quadrimaculatum</i>	128	1								3	1	2
130	<i>Bembidion quadripustulatum</i>	144		L									
131	<i>Bembidion quinquestriatum</i>	120	1		*							4	
132	<i>Bembidion semipunctatum</i>	85	3	L+ZL						3	3	3	3
133	<i>Bembidion stephensi</i>	244	-3	SL	*					-2	-2	-3	-2
134	<i>Bembidion stomoides</i>	267											-2
135	<i>Bembidion tenellum</i>	10											
136	<i>Bembidion testaceum</i>	102										3	3
137	<i>Bembidion tetracolum</i>	131		L+ZL						2		4	2
138	<i>Bembidion tibiale</i>	287	-3	SL	*		2	1	*	-2	-2	-3	-2
139	<i>Bembidion unicolor</i>	198		AL		*	1				-3		
140	<i>Bembidion varium</i>	65	4	MC						2	2	2	2
141	<i>Bembidion velox</i>	13	4	Z+ZL							2	2	1
142	<i>Tachys bistriatus</i>	112	1	L+ZL						2			
143	<i>Tachys bisulcatus</i>	138	1		*								
144	<i>Tachys micros</i>	119											
145	<i>Tachys parvulus</i>	184	-4	SL	*								-1
146	<i>Tachys quadrisignatus</i>	205	-3	SL	*						-2		
147	<i>Tachys scutellaris</i>	5											
148	<i>Tachyta nana</i>	36											
149	<i>Anillus caecus</i>	36											
150	<i>Pogonus chalceus</i>	6	4	MC						2	2	3	1
151	<i>Pogonus litoralis</i>	4											
152	<i>Pogonus luridipennis</i>	4	4	MC						1	2		1

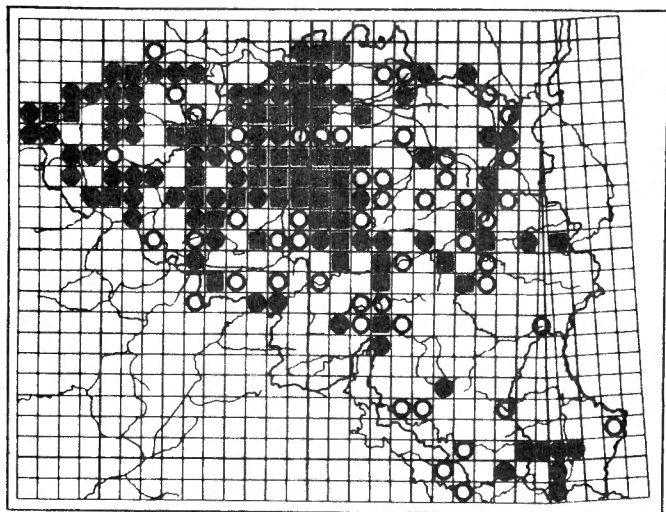
TABLE I. Results from distribution analyses based on the presence/absence data per U.T.M. 10 km square.

-
- 1 : mean altitude for each species
 - 2 : significant results after comparison of cumulative altitudinal classes with species distribution :
 - 1 = significantly more occurring below 400 m;
 - 1 = idem above 400 m
 - 2, 3, 4 = idem below respectively 300 m, 200 m, 50 m;
 - 2, -3, -4 = idem above respectively 300 m, 200 m, 50 m
 - 3 : significant reactions to most important soil type per U.T.M. square :
 MC = maritime clay, DZ = dune sand, FZ = fine sand and gravel, Z = DZ+FZ
 ZL = sand-loam mixtures, L = loam, SL = stony loam, AL = all loam mixtures
 - 4 : species significantly more occurring in U.T.M. squares with chalk in the soil (mostly species which are more or less thermophilic)
 - 5 : species significantly more occurring in U.T.M. squares with acid sands or acid clay (mainly species from oligotrophic situations)
 - 6 : significant results after comparison with cumulative classes of woodland cover :
 - 1, 2, 3 = more than respectively 1 %, 20 % or 40 % of woodland cover
 - 7 : significant positive reactions to most important woodland type :
 - 1 = oak, 2 = beech, 3 = coniferous trees, 5 = deciduous trees
 - 8 : species significantly more occurring in U.T.M. squares with rivers or rivulets with more than 50 m fall per km.
 - 9 : significant reactions to annual precipitation cumulative classes :
 - 1, 2, 3, 4 = less than respectively 700, 800, 900 or 1000 mm precipitation
 - 2, -3, -4 = more than respectively 800, 900 or 1000 mm precipitation
 - 10 : significant reactions to relative aridity index cumulative classes :
 - 1, 2, 3, 4 = less than respectively 35, 40, 45 or 50 of index value
 - 1, -2, -3, -4 = more than respectively 35, 40, 45 or 50 of index value
 - 11 : significant reactions with the first day each year a minimal temperature of 5°C is reached (in cumulative classes) :
 - 1, 2, 3, 4, 5, 6 = respectively before 5, 10, 15, 20, 25 or 30 March
 - 1, -2, -3, -4 = respectively after 5, 10, 15 or 20 March
 - 12 : significant reactions to annual number of days with frost :
 - 1, 2, 3, 4 = less than respectively 55, 65, 75 or 85 days
 - 1, -2, -3 = more than respectively 55, 65 or 75 days.
-

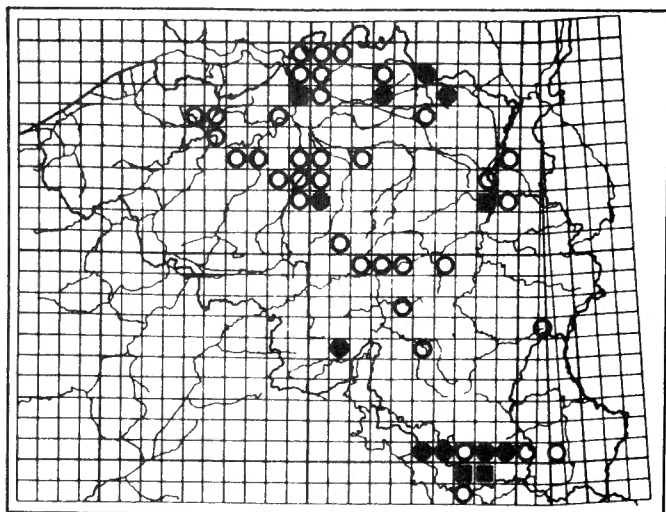
Nr	Species	1	2	3	4	5	6	7	8	9	10
81	<i>Asaphideon flavipes</i>	170	557	S	A		c	4.7	m	F	19
82	<i>Asaphideon pallipes</i>	49	72	DD	A		c	4.9	m	F	18,15
83	<i>Bembidion aeneum</i>	9	33	S	A	*	r	4.0	d-p	F	1,13
84	<i>Bembidion argenteolum</i>	19	47	D	A		c	6.8	m	F	3
85	<i>Bembidion articulatatum</i>	170	449	S	A		c	3.5	m	F	20
86	<i>Bembidion ascendens</i>	6	7	D	B		m	7.2	m	F	4
87	<i>Bembidion assimile</i>	95	174	I	A		c	3.2	d-p	F	2
88	<i>Bembidion atrocoeruleum</i>	30	57	S	B		r	4.5	m	F	4
89	<i>Bembidion biguttatum</i>	145	339	S	A		c	4.0	m	F	13,2
90	<i>Bembidion bipunctatum</i>	19	28	S	A		r	4.2	m	F	3,3
91	<i>Bembidion bruxellense</i>	104	218	S	A		c	4.6	m	F	3,4
92	<i>Bembidion clarki</i>	8	11	S	B		m	3.3	d	F	7
93	<i>Bembidion decorum</i>	61	145	DD	D		r	5.8	m	F	4
94	<i>Bembidion dentellum</i>	149	374	I	A		c	5.5	m	F	2,4
95	<i>Bembidion doris</i>	65	131	D	A		c	3.4	m	F	3
96	<i>Bembidion elongatum</i>	16	38	DD	D		m	4.0	m	F	4
97	<i>Bembidion ephippium</i>	7	17	D	D	*	c	3.0	m	F	1
98	<i>Bembidion femoratum</i>	132	515	S	A		c	4.7	m	F	3,15
99	<i>Bembidion fluviatile</i>	8	12	S	B		r	5.8	m	F	4
100	<i>Bembidion fumigatum</i>	26	49	S	A		c	3.8	m	F	1,13
101	<i>Bembidion genei</i>	121	271	I	B		c	3.9	m	F	3,19
102	<i>Bembidion gilvipes</i>	43	101	S	A		c	2.7	d	F	20,3
103	<i>Bembidion guttula</i>	105	310	S	A		c	3.2	d	F	20
104	<i>Bembidion harpaloides</i>	57	76	S	D		c	4.7	p-m	F	20,21
105	<i>Bembidion humerale</i>	11	18	D	B		r	2.8	m	F	11
106	<i>Bembidion inustum</i>	1	1		A		m	5.8	m	F	
107	<i>Bembidion iricolor</i>	18	40	S	D	*	c	5.0	m	F	1
108	<i>Bembidion lampros</i>	287	1259	I	A		c	3.5	d	F	19
109	<i>Bembidion laterale</i>	6	9		C	*	c	4.1	b-d	F	1
110	<i>Bembidion litorale</i>	24	53	DD	A		c	5.6	m	F	3
111	<i>Bembidion lunatum</i>	9	13	S	A		c	6.0	m	H	2
112	<i>Bembidion lunulatum</i>	124	387	II	D		c	3.6	m	F	20
113	<i>Bembidion maritimum</i>	15	39	DD	B	*	c	5.3	m	F	1
114	<i>Bembidion milleri</i>	24	45	S	B		m	4.3	m	F	3
115	<i>Bembidion millerianum</i>	8	11	D	B		m	5.8	m	F	4
116	<i>Bembidion minimum</i>	28	99	S	A	*	c	2.7	m	F	1,2
117	<i>Bembidion modestum</i>	1	2		B		r	4.5	m	F	4
118	<i>Bembidion monticola</i>	31	56	DD	E		m	5.0	m	F	4
119	<i>Bembidion nigricorne</i>	18	49	DD	B		m	3.5	b-d	F	8
120	<i>Bembidion nitidulum</i>	118	301	II	C		c	4.7	m	F	6
121	<i>Bembidion normannum</i>	10	29	S	D	*	c	3.0	m	F	1
122	<i>Bembidion obliquum</i>	64	182	I	A		r	3.7	m	F	3
123	<i>Bembidion obtusum</i>	118	289	S	B		c	3.2	d	F	12
124	<i>Bembidion octomaculatum</i>	32	51	S	A		r	2.7	m	F	2
125	<i>Bembidion pallidipenne</i>	4	18	DD	B	*	c	4.4	m	F	1
126	<i>Bembidion prasinum</i>	10	21	DD	A		r	4.9	m	F	4
127	<i>Bembidion properans</i>	175	394	II	A		c	3.8	d	F	13
128	<i>Bembidion punctulatum</i>	26	52	DD	C		c	5.0	m	F	4
129	<i>Bembidion quadrimaculatum</i>	177	483	II	F		c	3.2	m	F	14,12
130	<i>Bembidion quadripustulatum</i>	50	81	D	D		c	3.5	m	F	2
131	<i>Bembidion quinquestriatum</i>	42	52	S	C		c	4.3	m	F	21,12
132	<i>Bembidion semipunctatum</i>	52	172	DD	A		c	3.7	m	F	3
133	<i>Bembidion stephensi</i>	60	117	S	B		c	5.8	m	F	3
134	<i>Bembidion stomoides</i>	8	11	S	B		m	5.5	m	F	5
135	<i>Bembidion tenellum</i>	4	6	DD	B		r	2.8	m	F	1
136	<i>Bembidion testaceum</i>	10	16	DD	B		c	5.0	m	F	4
137	<i>Bembidion tetracolum</i>	251	1000	I	A		c	5.5	d	F	19,2
138	<i>Bembidion tibiale</i>	73	209	S	C		c	6.0	m	F	4
139	<i>Bembidion unicolor</i>	66	147	DD	A		c	3.1	b	F	5,7
140	<i>Bembidion varium</i>	76	172	S	A		c	4.6	m	F	1,3
141	<i>Bembidion velox</i>	7	11	S	A		c	5.8	m	F	3
142	<i>Tachys bistriatus</i>	30	56	DD	C		c	1.9	m	F	4
143	<i>Tachys bisulcatus</i>	16	20	S	C		c	2.9	m	F	4
144	<i>Tachys micros</i>	20	27	DD	D		r	2.2	m	F	
145	<i>Tachys parvulus</i>	36	50	DD	D		c	2.1	m	F	4
146	<i>Tachys quadrisignatus</i>	10	14	DD	D		m	2.5	m	F	
147	<i>Tachys scutellaris</i>	4	4		D	*	m	2.5	m	F	1
148	<i>Tachyta nana</i>	3	4		A		c	2.9	m	F	21
149	<i>Anillus caecus</i>	2	2					2.3	b		
150	<i>Pogonus chalceus</i>	17	41	S	A	*	c	6.5	p	F	1
151	<i>Pogonus litoralis</i>	4	6		A	*	m	7.2	m	F	1
152	<i>Pogonus luridipennis</i>	5	6		A	*	c	7.4	m	F	1

Table II. Commonness and rarity, recent relative increase or decrease, total distribution area, mean beetle size, wing developmental type, main reproductive period and habitat preference.

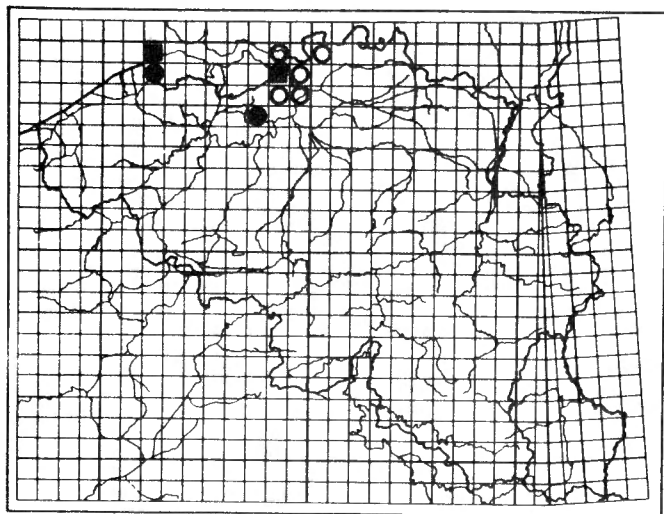
-
- 1 : number of different U.T.M. 10 km squares with the species
- 2 : number of records (locality/year data) per species
- 3 : recent relative increase , decrease or stagnation of the species in our country since 1950 :
D = significantly decreasing (based on the number of records)
DD = significantly decreasing (based on the number of records as well as based on the number of U.T.M. squares with the species)
I = idem as D but increasing
II = idem as DD but increasing
S = stagnation although there are enough data to allow statistical analysis
- 4 : total distribution area :
A = palearctic, B = entirely european, C = western palearctic, D = euro-mediterranean, E = euro-caucasian, F = circumpolar, G = amphi-atlantic
- 5 : species with a coastal distribution pattern
- 6 : position of Belgium in the total distribution area :
c = central, r = near limits (but distribution limit not across Belgium, m = marginal (distribution limit across Belgium)
- 7 : mean beetle size in mm
- 8 : wing developmental type in our country :
m = constantly macropterous, b = constantly brachypterous, d = wing dimorphic and p = wing polymorphic species; if two codes are given the first always refers to our own observations (material from our country), whereas the second refers to the literature
- 9 : main reproductive period :
F = during Spring, H = during Summer-Autumn, FH = mainly during Spring, HF = mainly during Autumn
- 10 : Habitat preference codes : species known mainly to occur in :
1 (salt marshes), 2 (eutrophic riparian habitats), 3 (oligotrophic riparian habitats), 4 (river banks near running water), 5 (woodland, stenotopic), 6 (woodland, eurytopic), 7 (meadow forests), 8 (dry heathland), 9 (wet heathland), 10 (marshland), 11 (bogs), 12 (ruderal habitats and cultivated fields), 13 (wet grasslands), 14 (dry grasslands), 15 (different habitats on dry sandy soil), 16 (dry dune habitats), 17 (beaches and dune slacks), 18 (stony slopes and chalk grasslands), 19 (different dry habitats, eurytopic), 20 (different humid habitats, eurytopic), 21 (living on trees), 22 (caves, cellars).
-



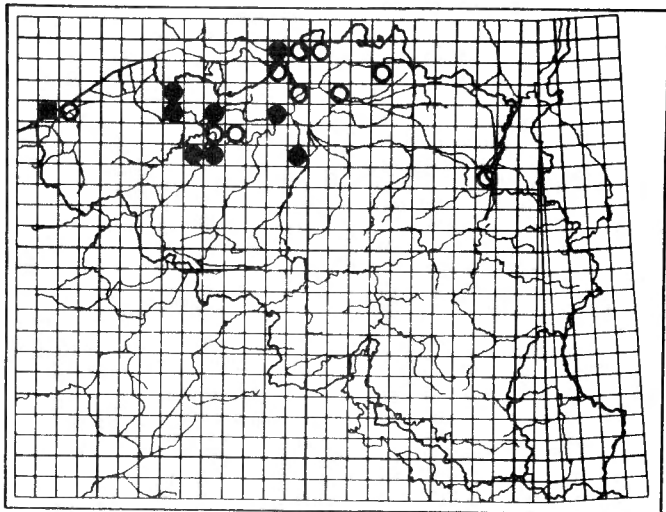
81. *ASAPHIDEON flavipes*



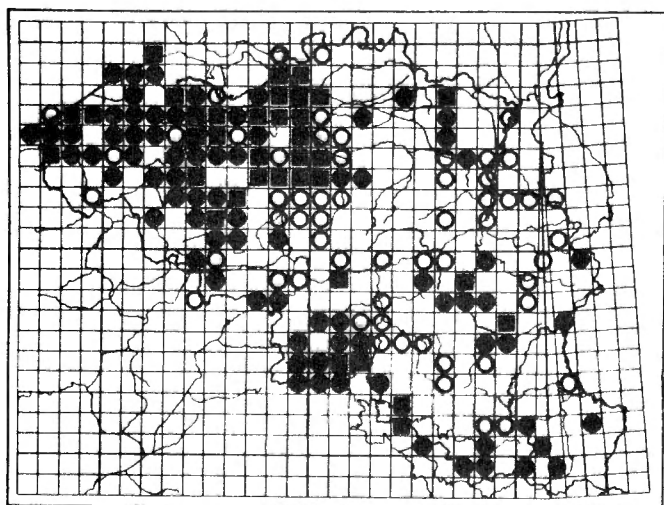
82. *ASAPHIDEON pallipes*



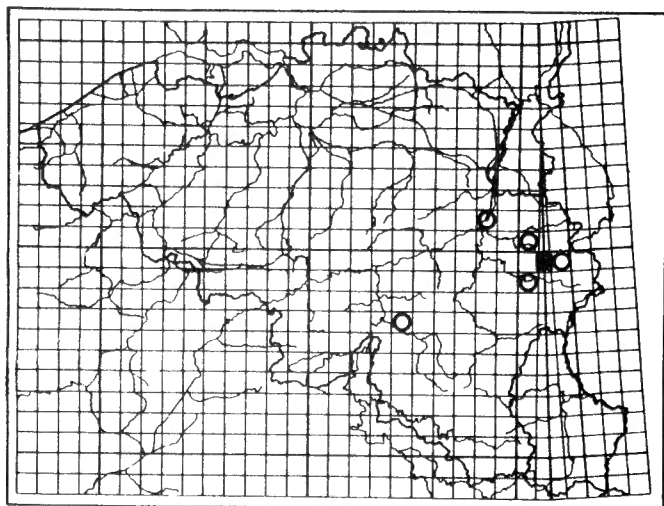
83. *BEMBIDION aeneum*



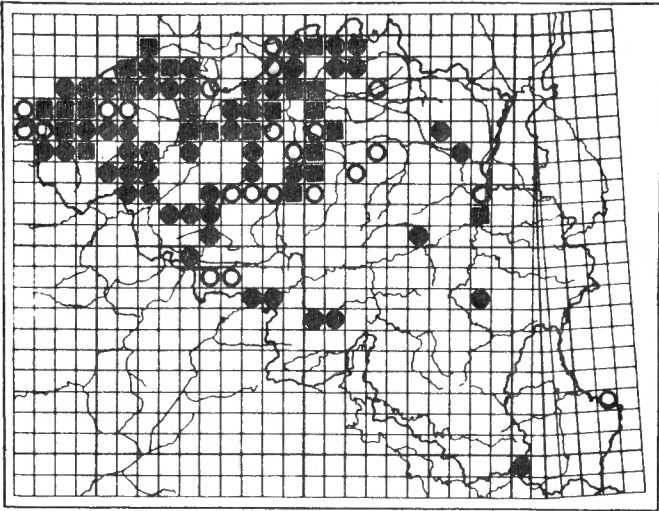
84. *BEMBIDION argenteolum*



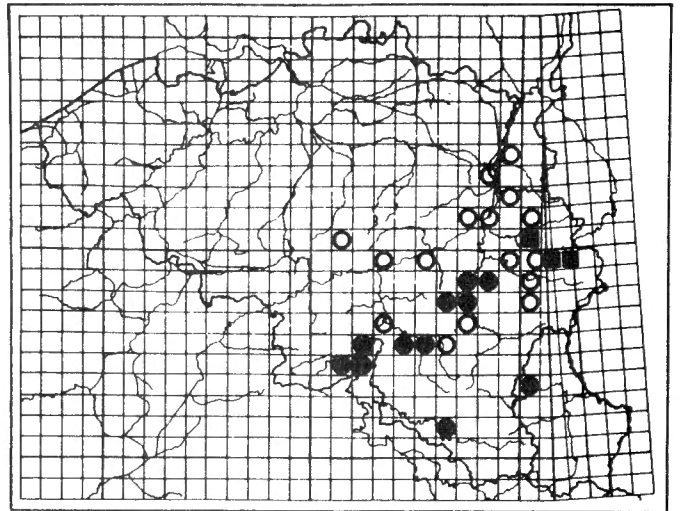
85. *BEMBIDION articulatum*



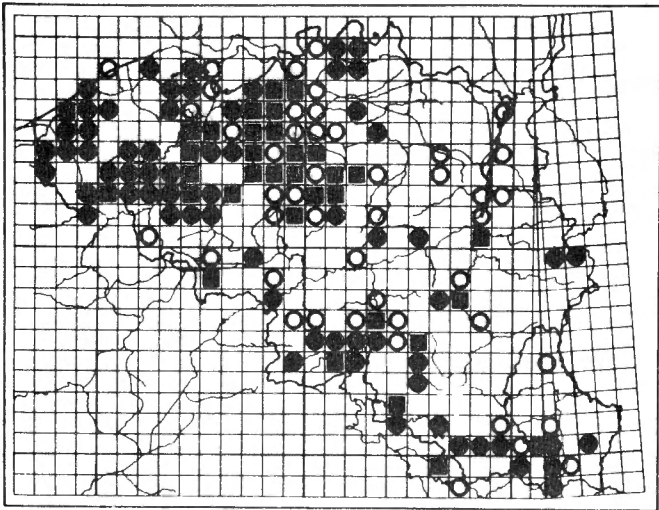
86. *BEMBIDION ascendens*



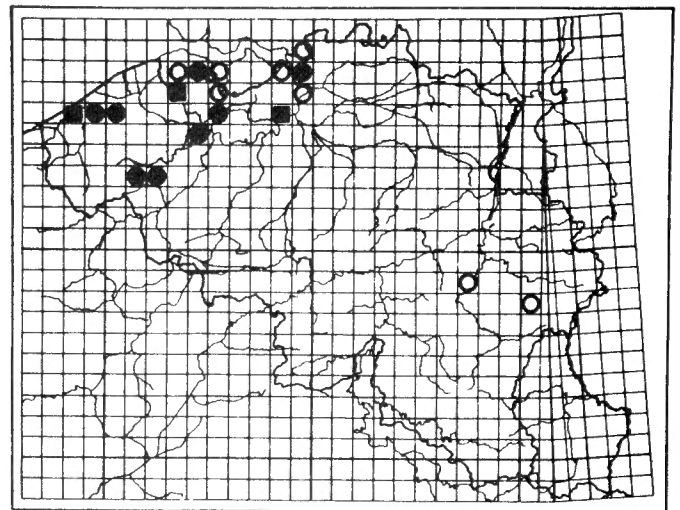
87. *BEMBIDION assimile*.



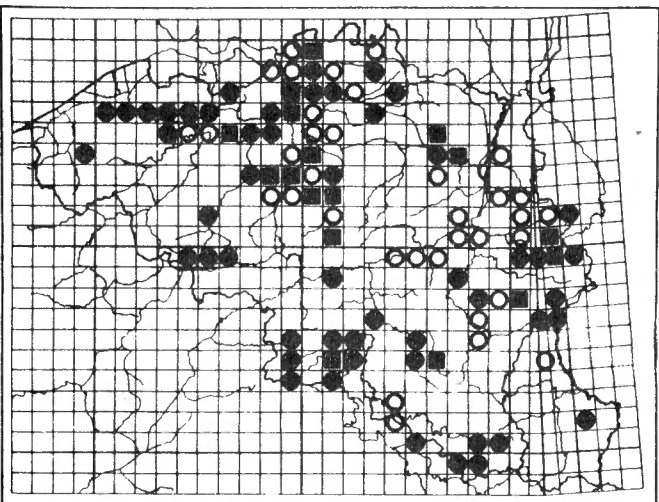
88. *BEMBIDION atrocoeruleum*



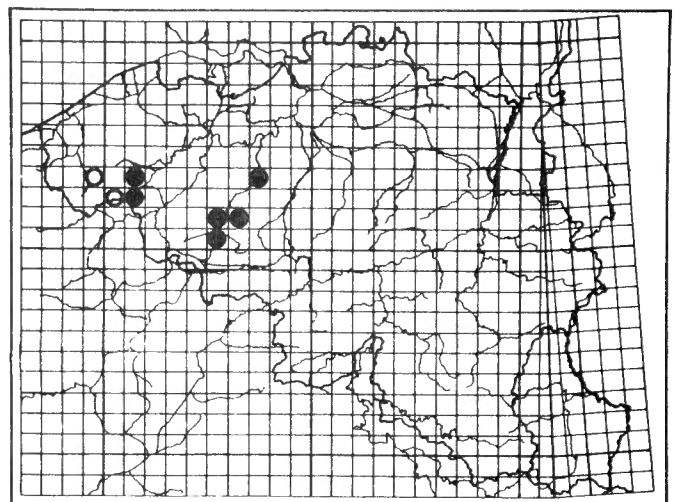
89. *BEMBIDION biguttatum*



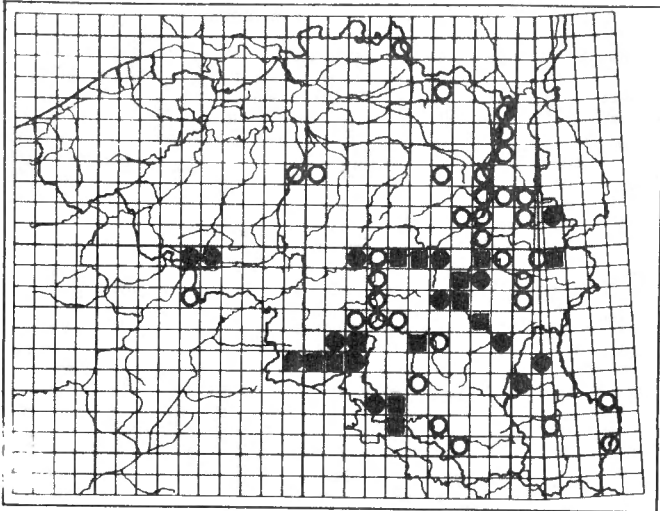
90. *BEMBIDION bipunctatum*



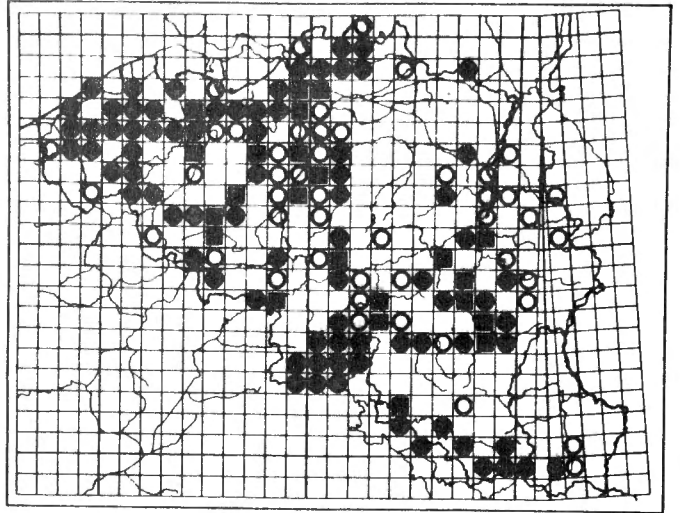
91. *BEMBIDION bruxellense*



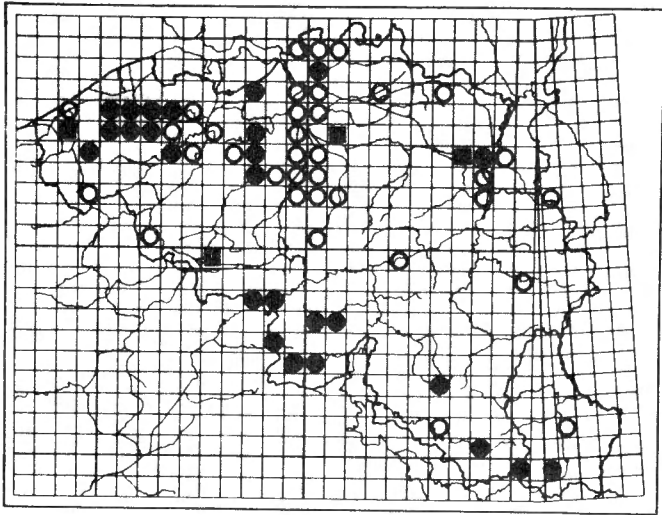
92. *BEMBIDION clarki*



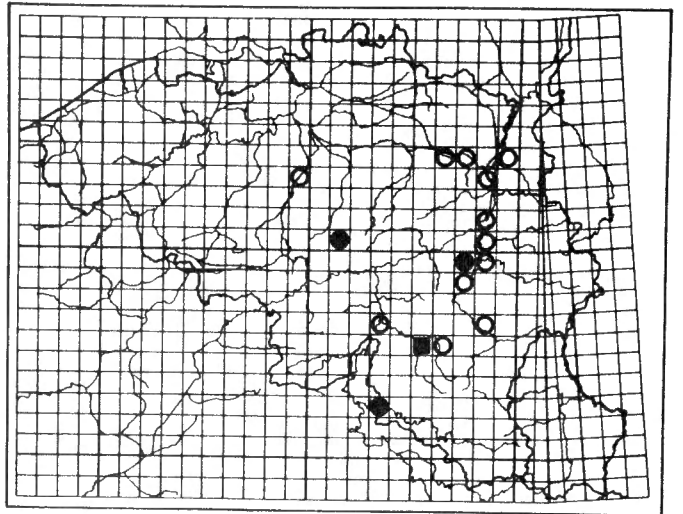
93. *BEMBIDION decorum*



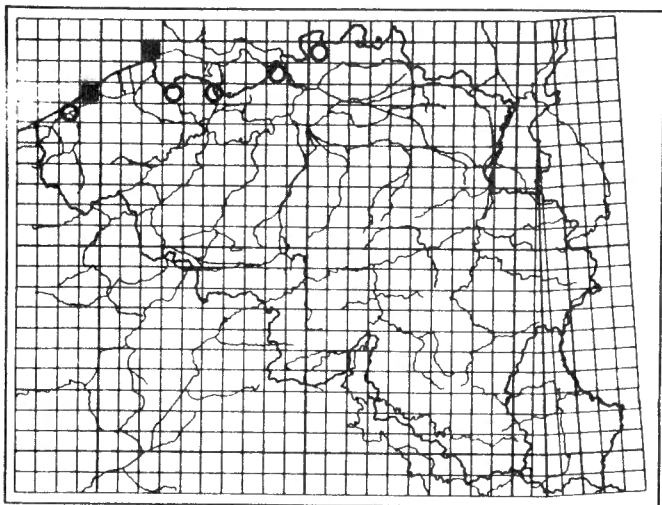
94. *BEMBIDION dentellum*



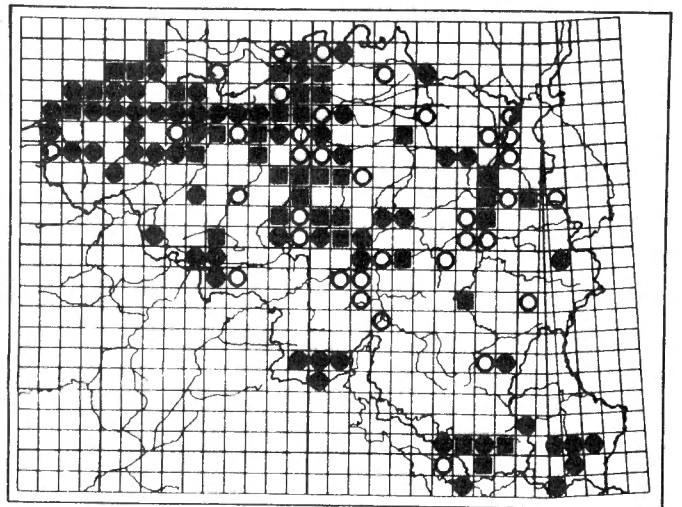
95. *BEMBIDION doris*



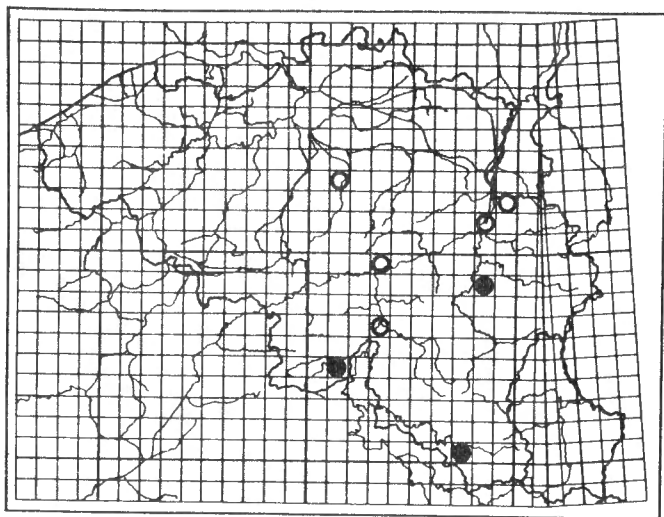
96. *BEMBIDION elongatum*



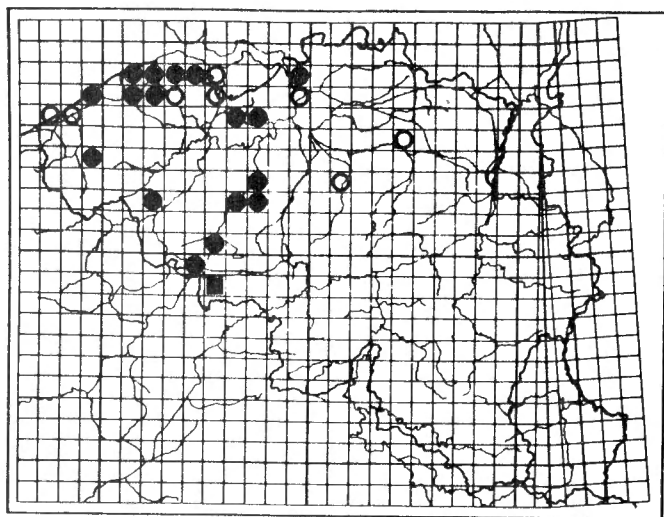
97. *BEMBIDION ephippium*



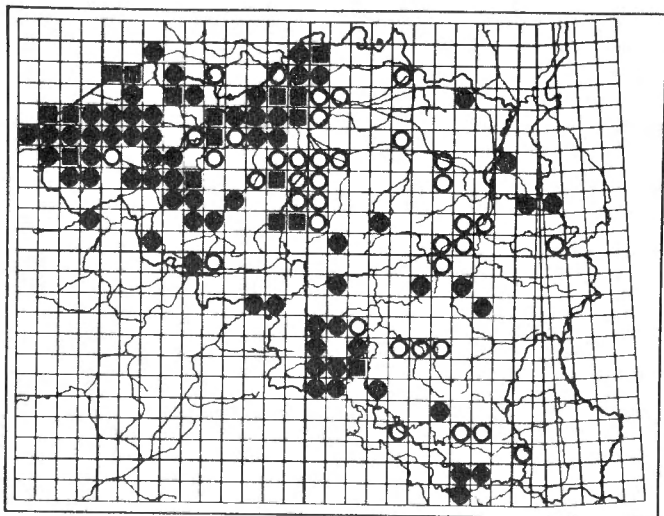
98. *BEMBIDION femoratum*



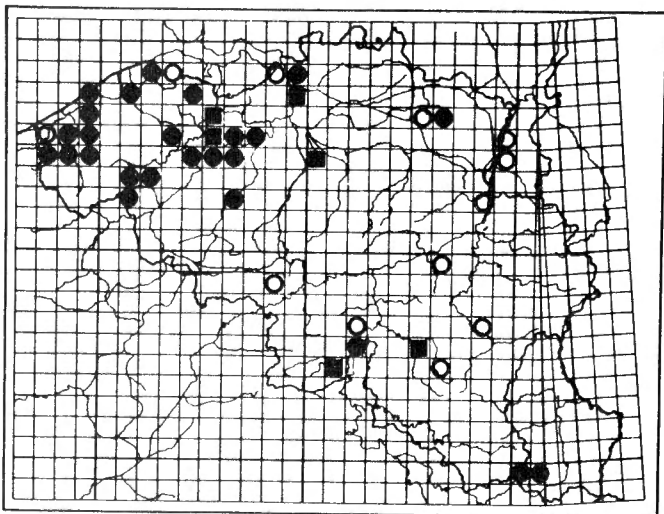
99. *BEMBIDION fluviatile*



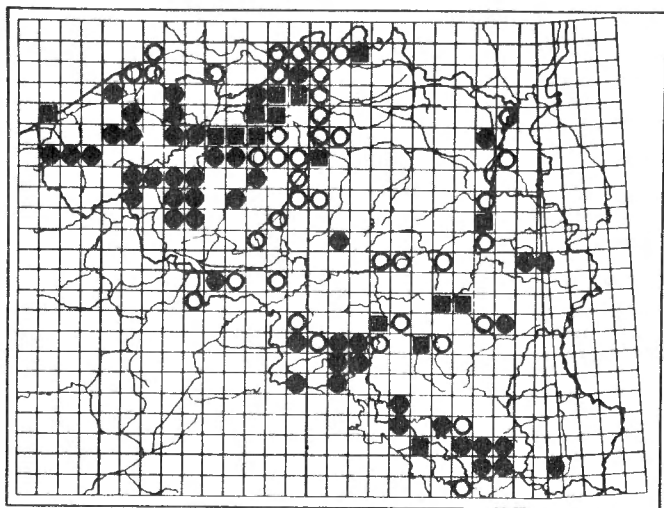
100. *BEMBIDION fumigatum*



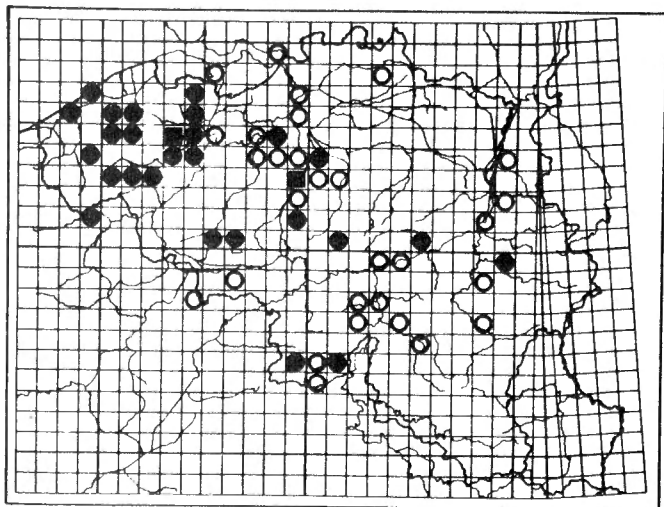
101. *BEMBIDION genei*



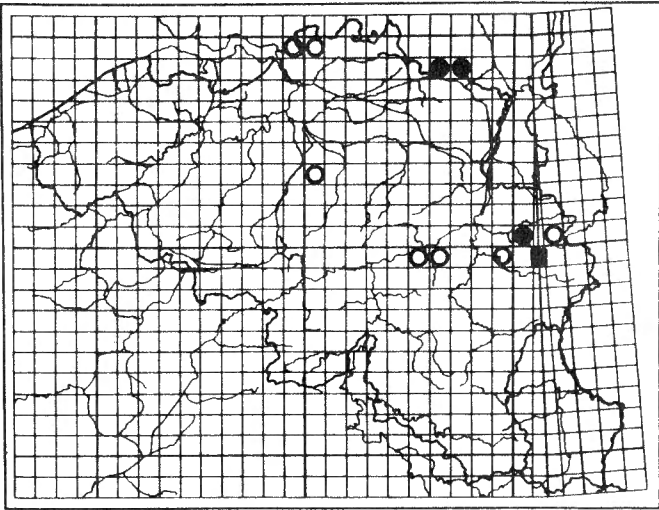
102. *BEMBIDION gilvipes*



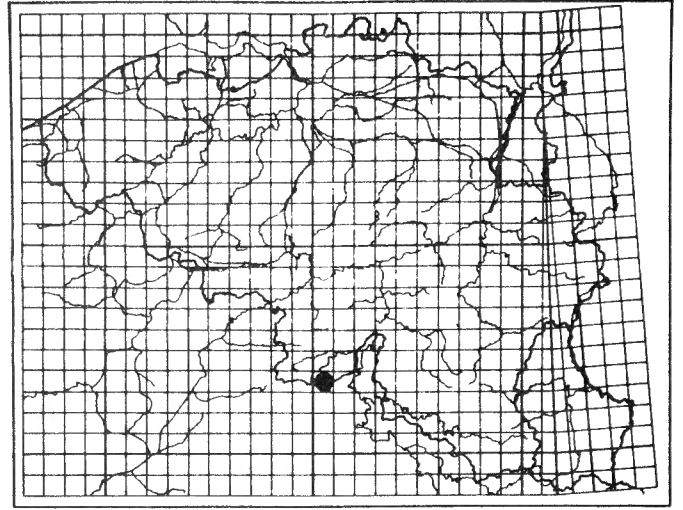
103. *BEMBIDION guttula*



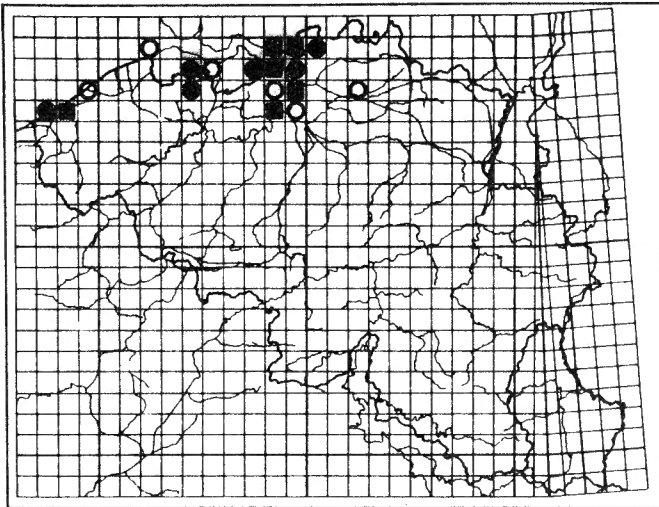
104. *BEMBIDION harpaloides*



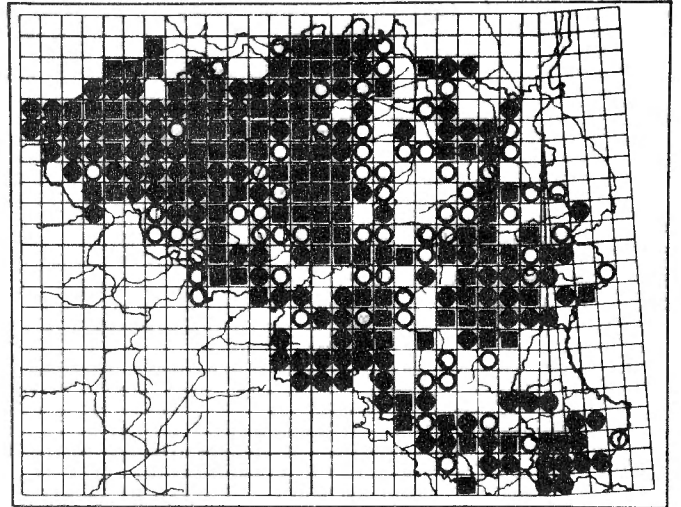
105. *BEMBIDION humerale*



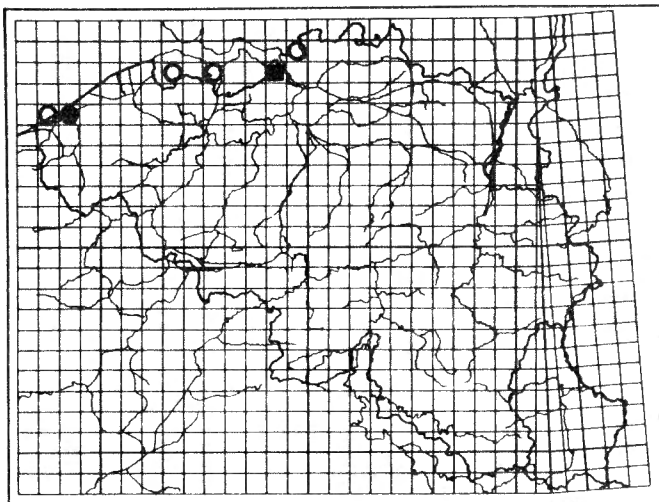
106. *BEMBIDION inustum*



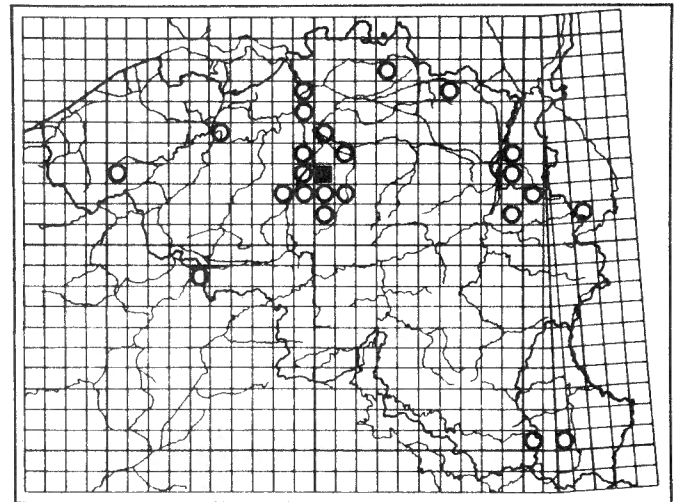
107. *BEMBIDION iricolor*



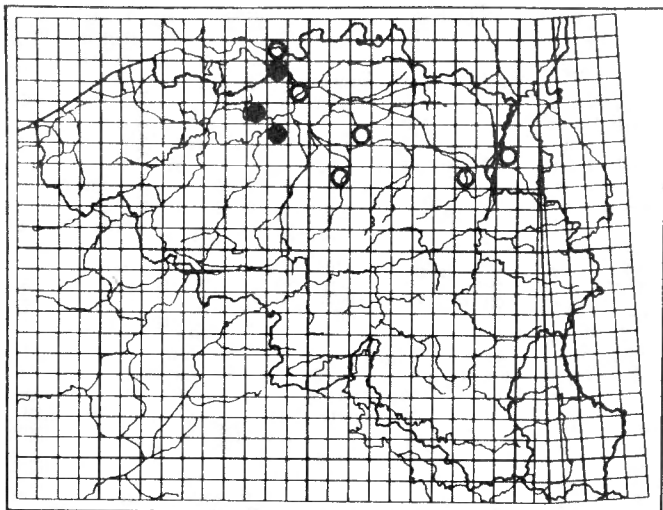
108. *BEMBIDION lampros*



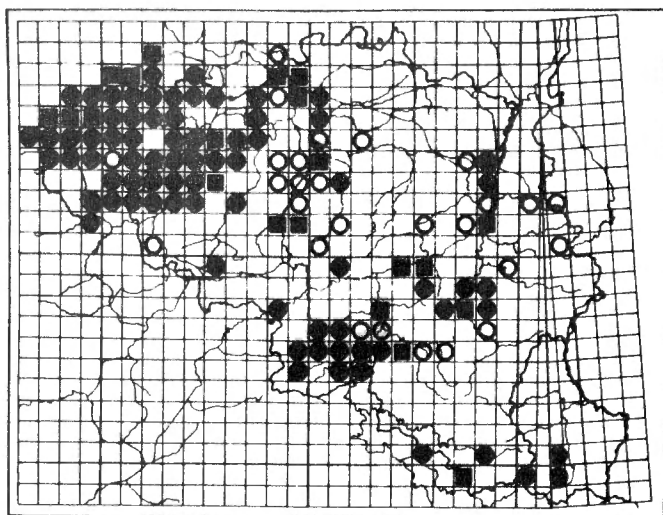
109. *BEMBIDION laterale*



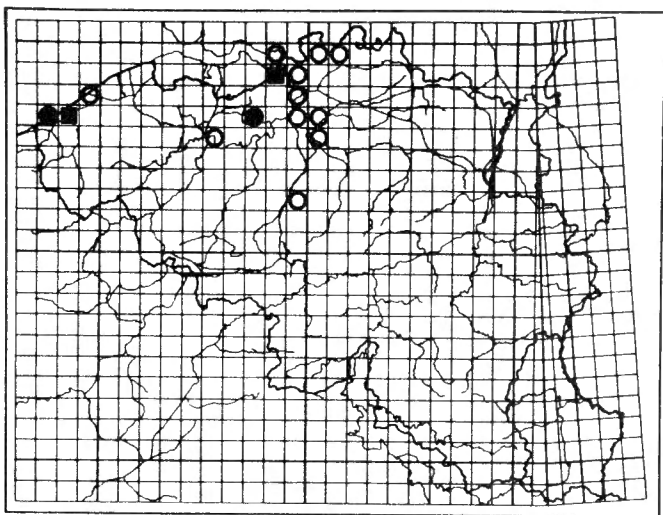
110. *BEMBIDION litorale*



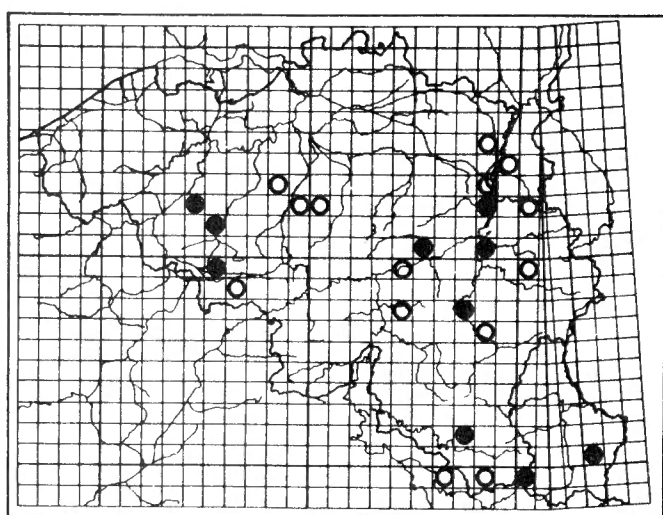
111. *BEMBIDION lunatum*



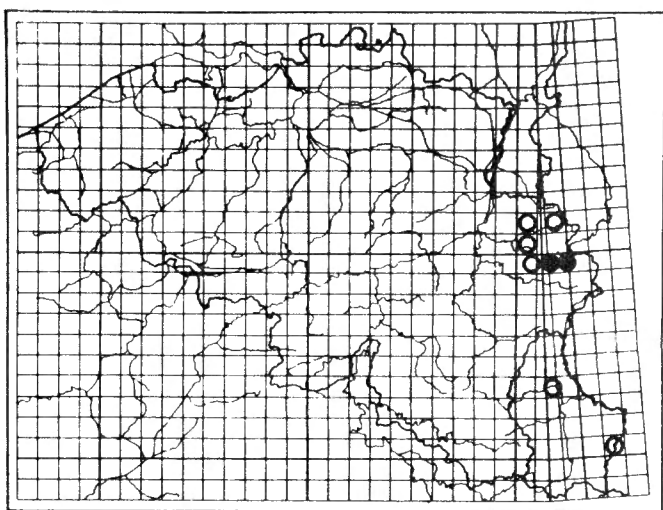
112. *BEMBIDION lunulatum*



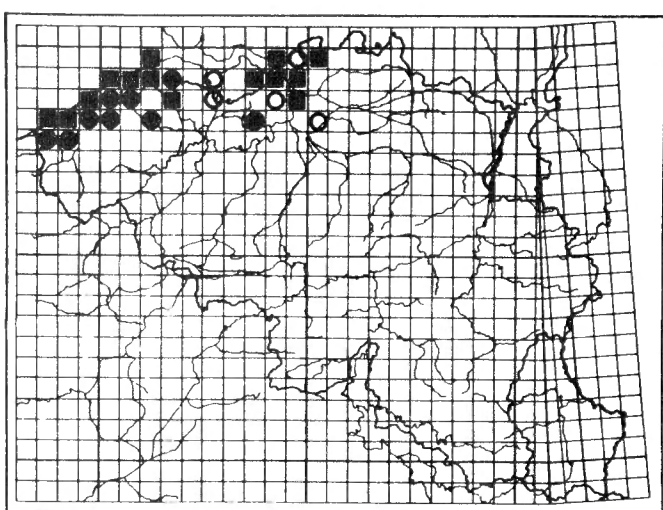
113. *BEMBIDION maritimum*



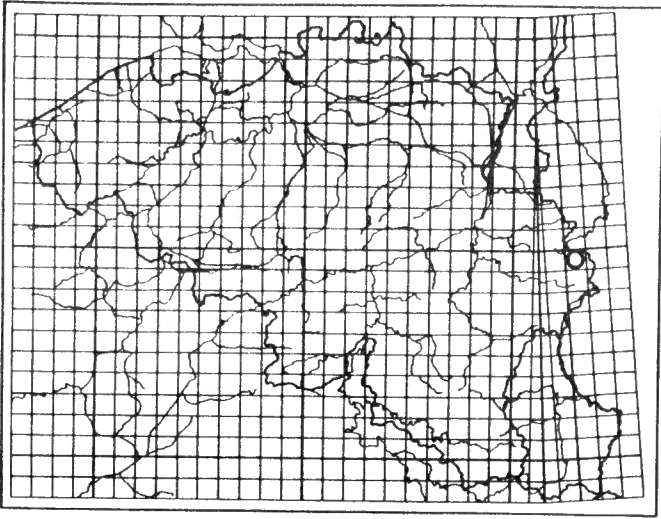
114. *BEMBIDION milleri*



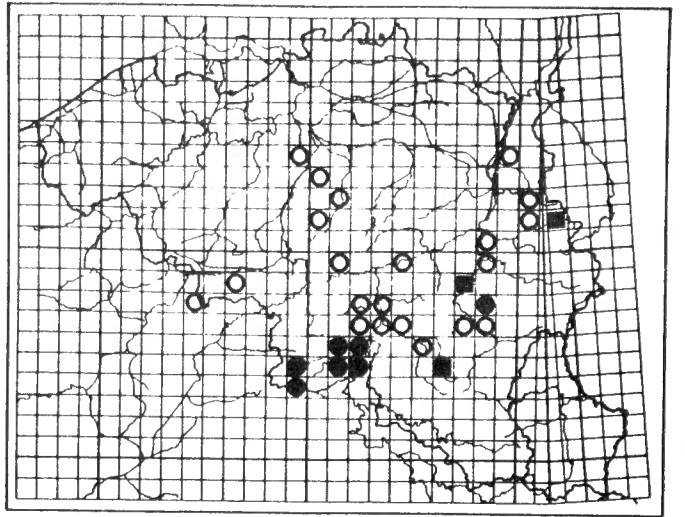
115. *BEMBIDION millerianum*



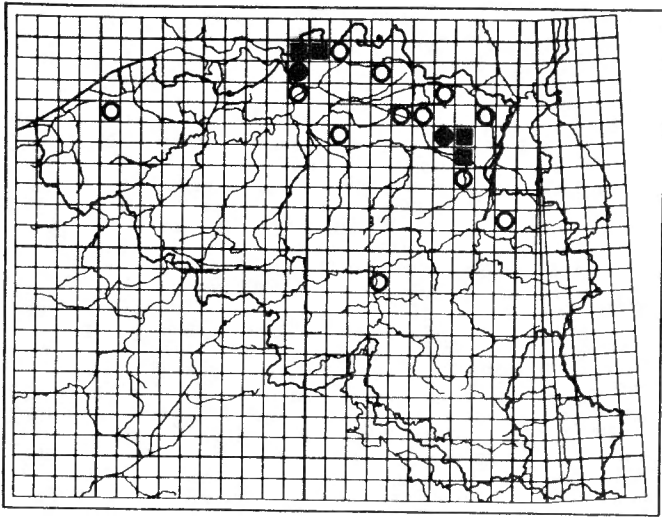
116. *BEMBIDION minimum*



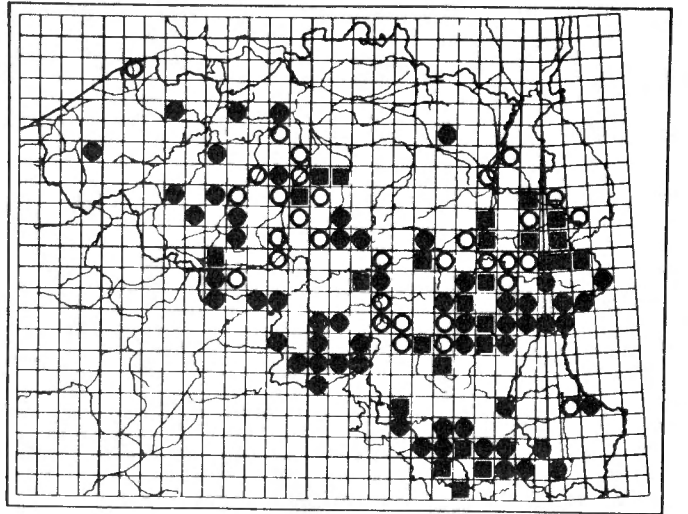
117. *BEMBIDION modestum*



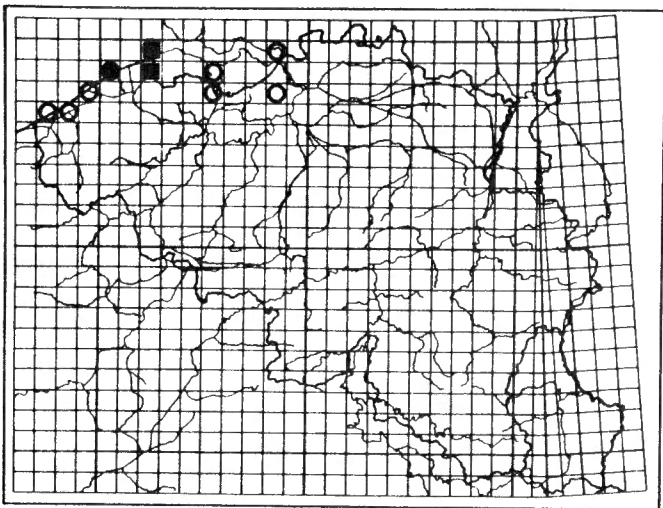
118. *BEMBIDION monticola*



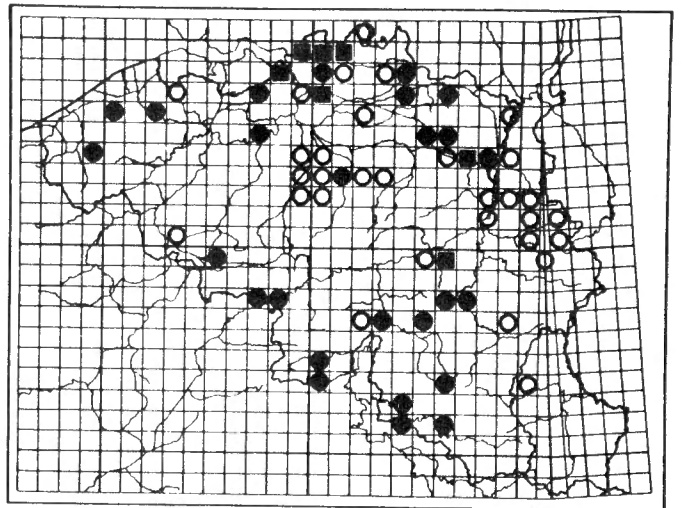
119. *BEMBIDION nigricorne*



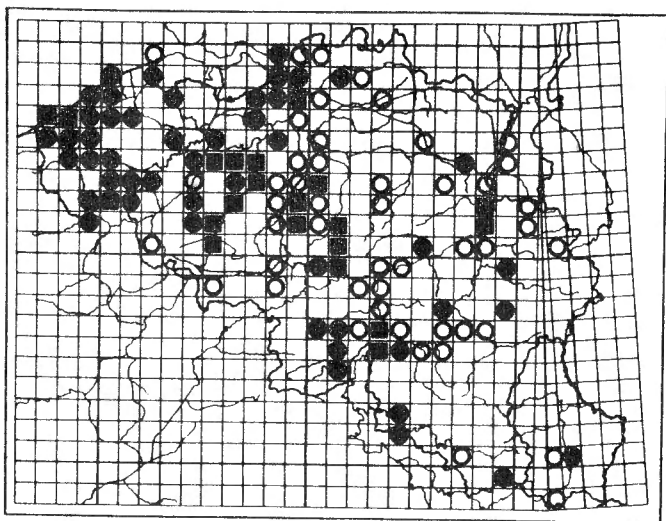
120. *BEMBIDION nitidulum*



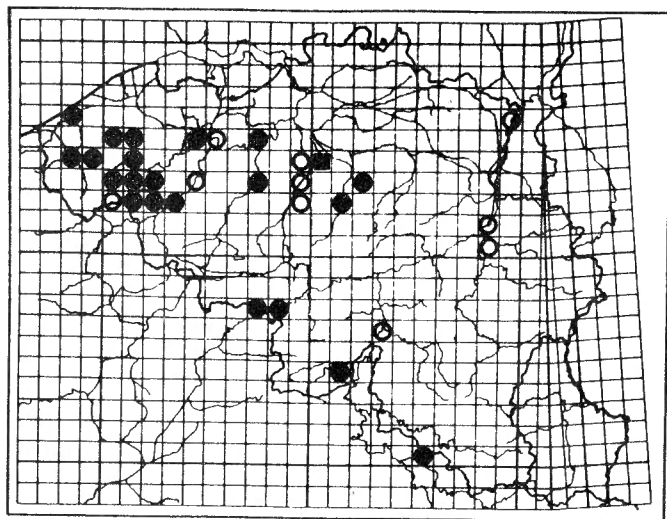
121. *BEMBIDION normannum*



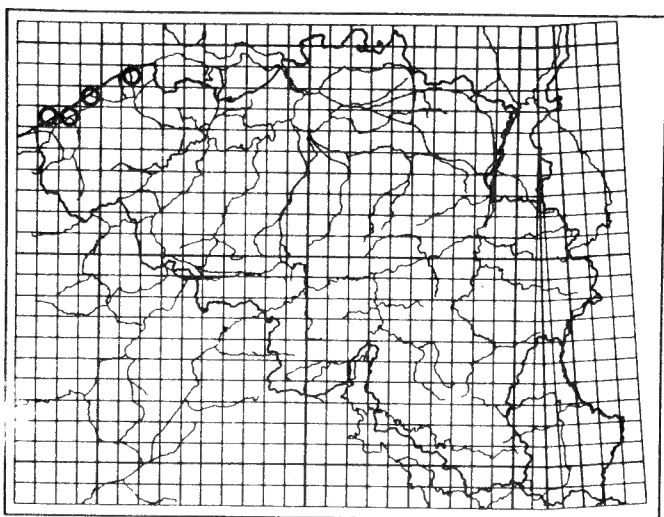
122. *BEMBIDION obliquum*



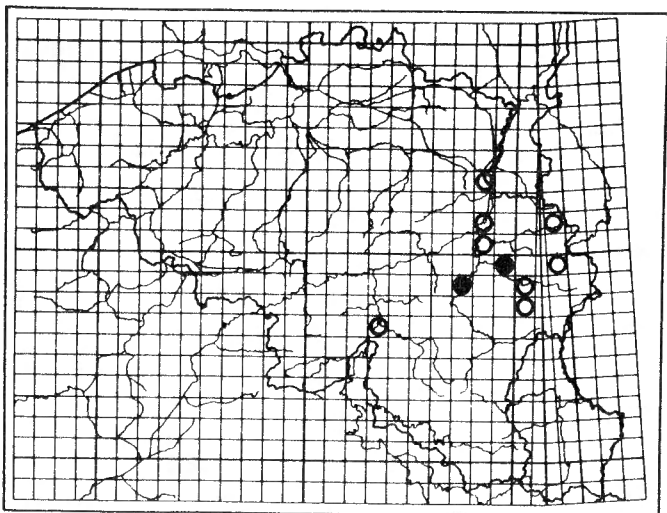
123. *BEMBIDION obtusum*



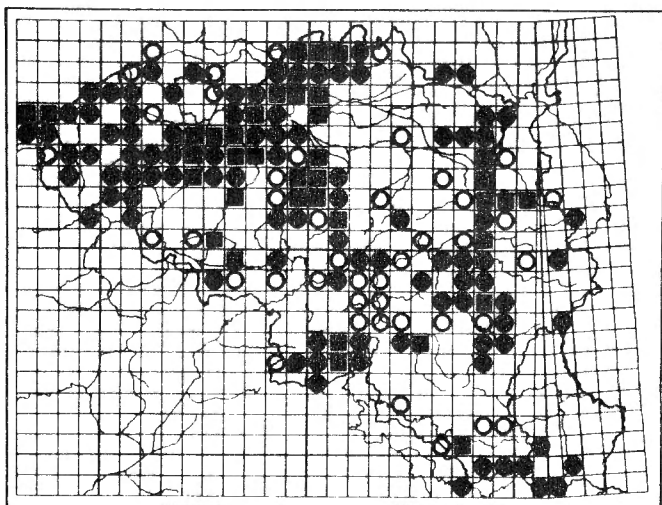
124. *BEMBIDION octomaculatum*



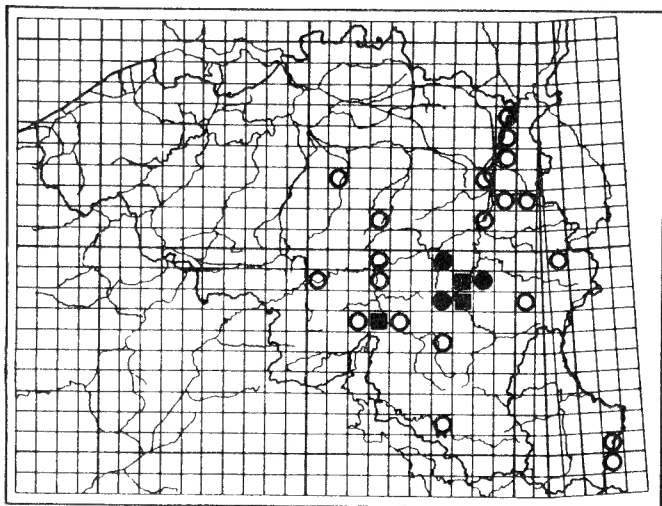
125. *BEMBIDION pallidipenne*



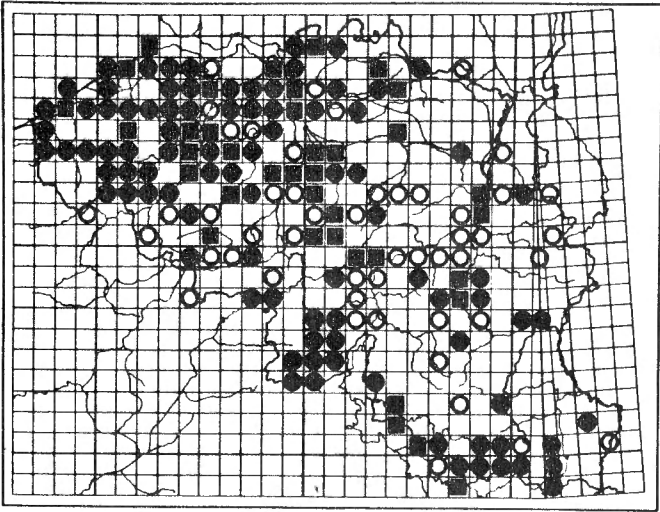
126. *BEMBIDION prasinum*



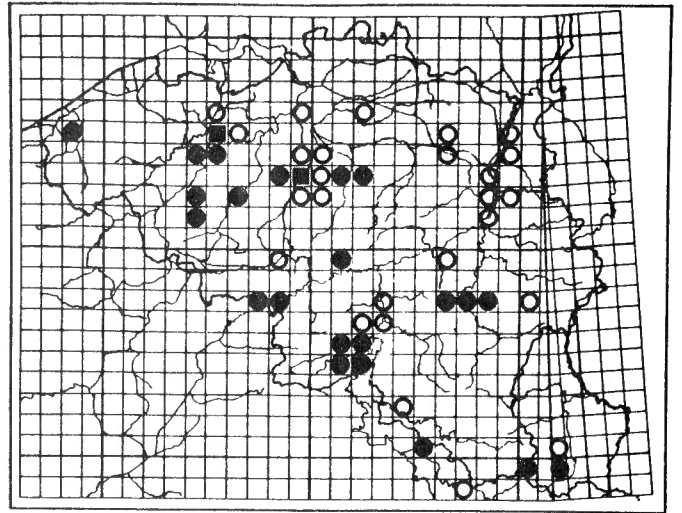
127. *BEMBIDION properans*



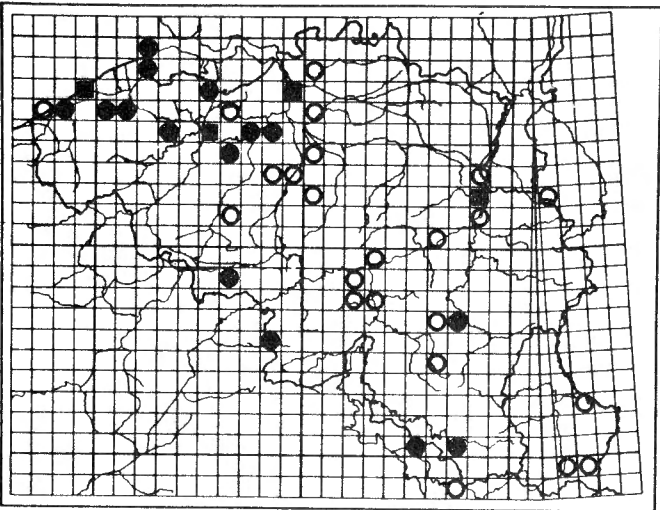
128. *BEMBIDION punctulatum*



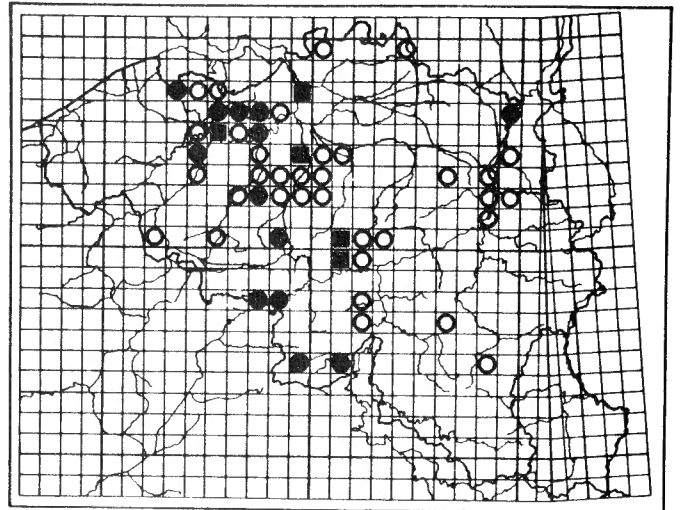
129. *BEMBIDION quadrimaculatum*



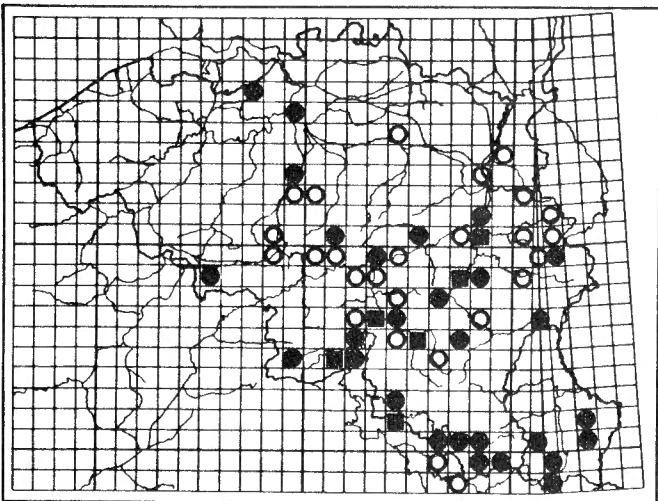
130. *BEMBIDION quadripustulatum*



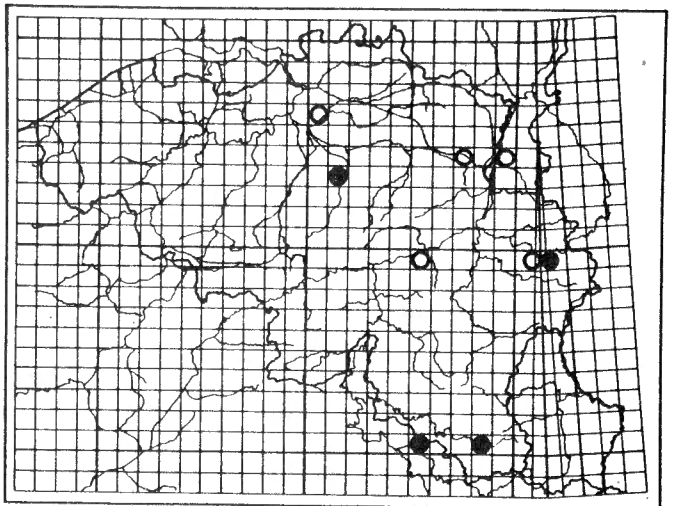
131. *BEMBIDION quinquestriatum*



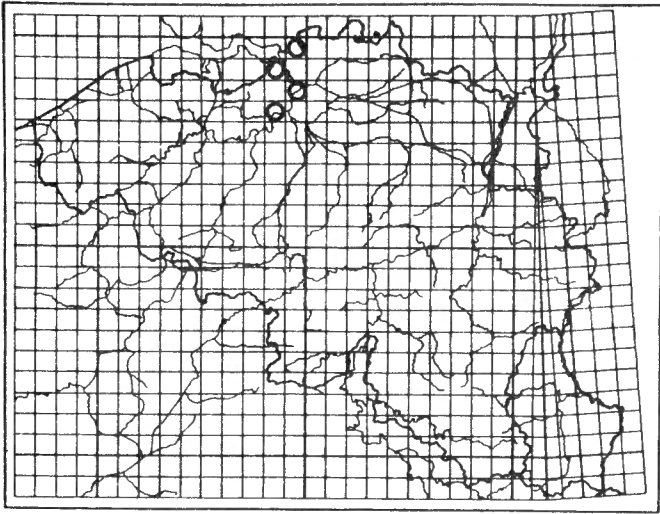
132. *BEMBIDION semipunctatum*



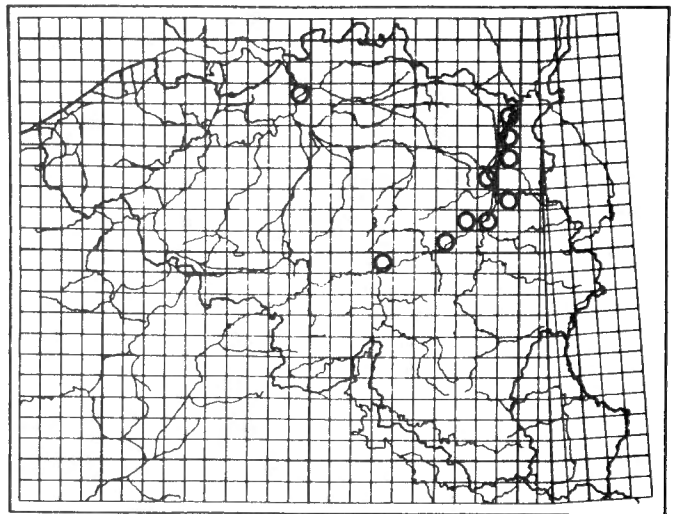
133. *BEMBIDION stephensi*



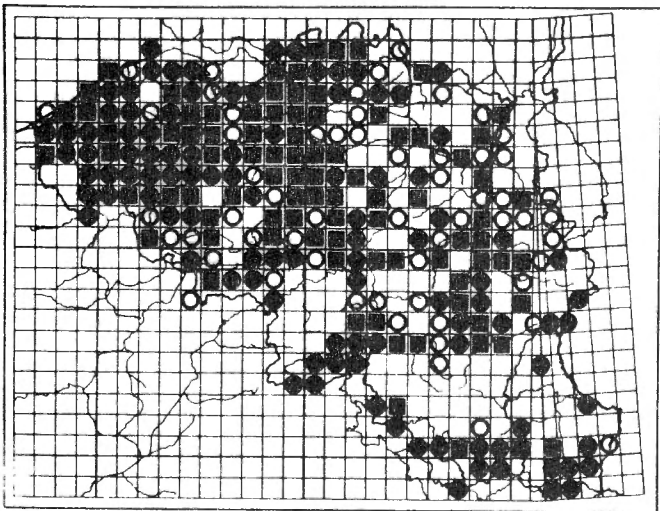
134. *BEMBIDION stomoides*



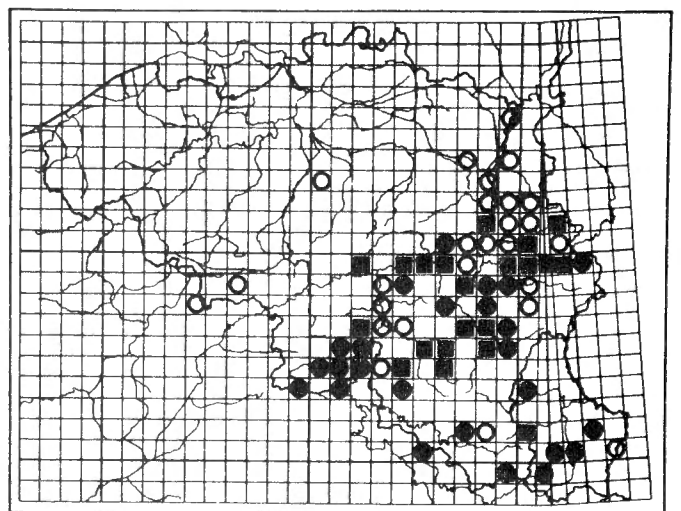
135. *BEMBIDION tenellum*



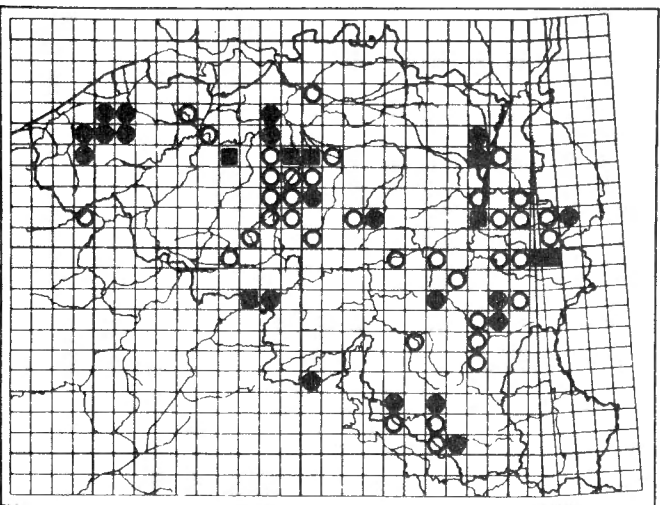
136. *BEMBIDION testaceum*



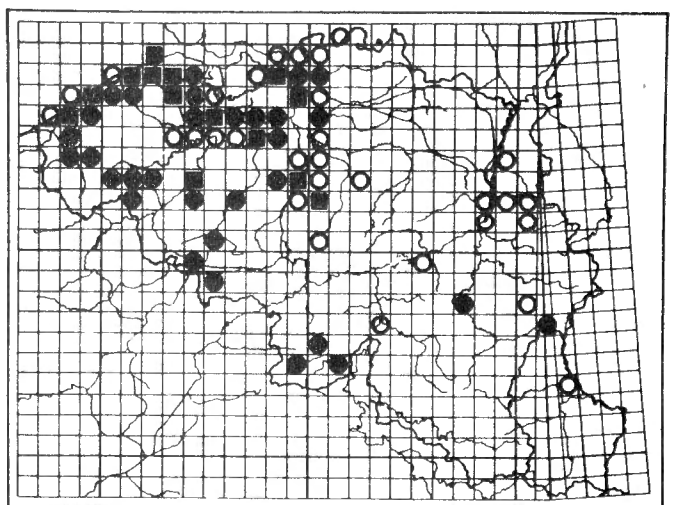
137. *BEMBIDION tetracolum*



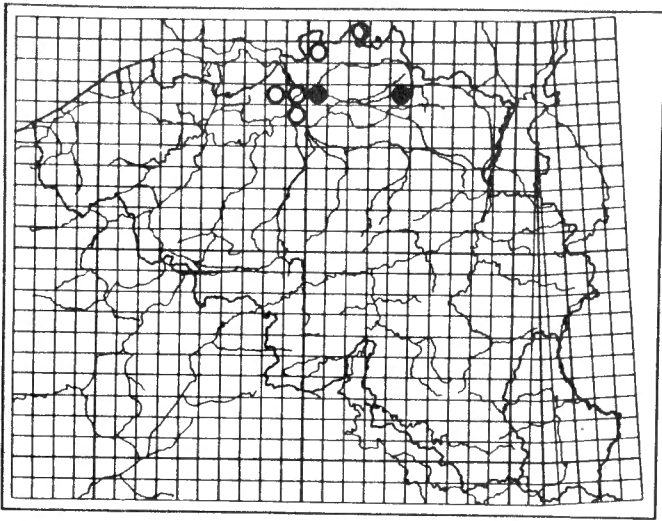
138. *BEMBIDION tibiale*



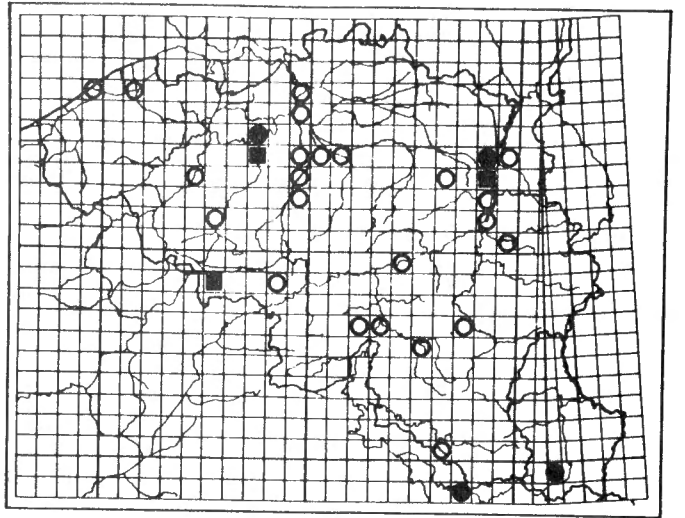
139. *BEMBIDION unicolor*



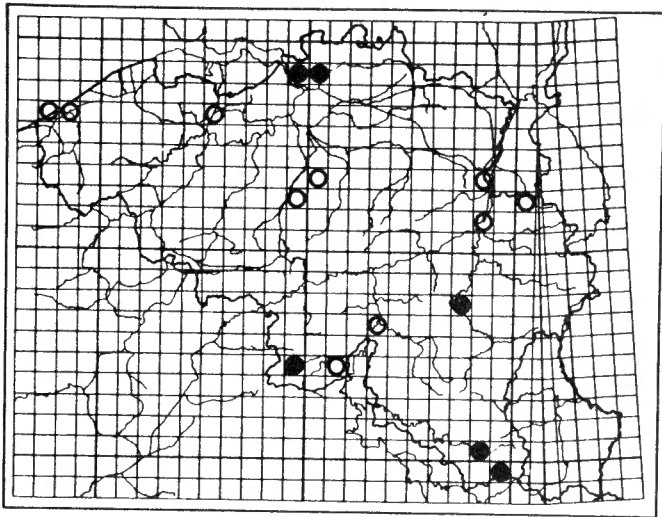
140. *BEMBIDION varium*



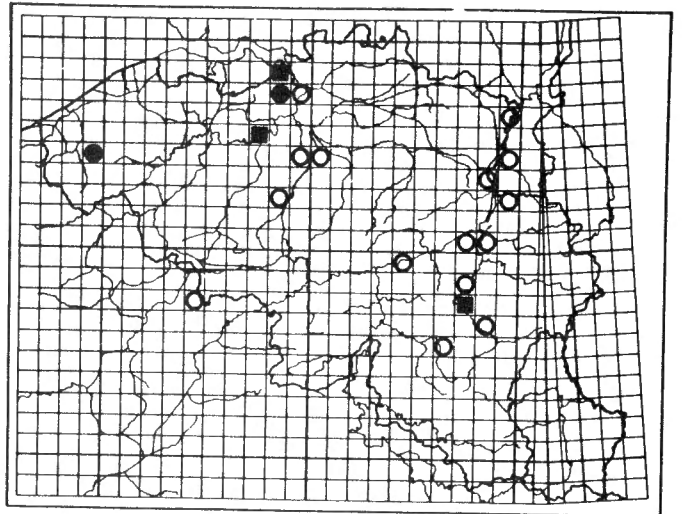
141. *BEMBIDION velox*



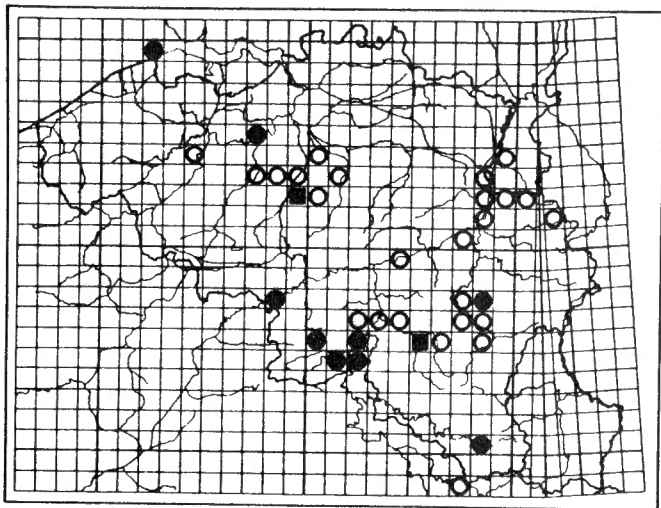
142. *TACHYS bistriatus*



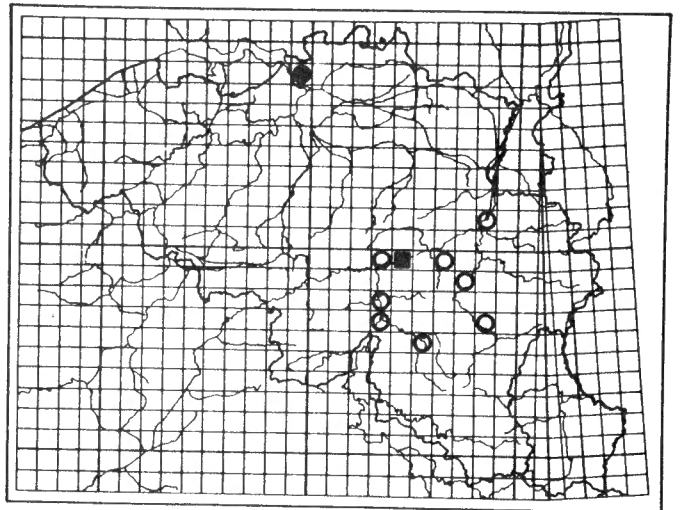
143. *TACHYS bisulcatus*



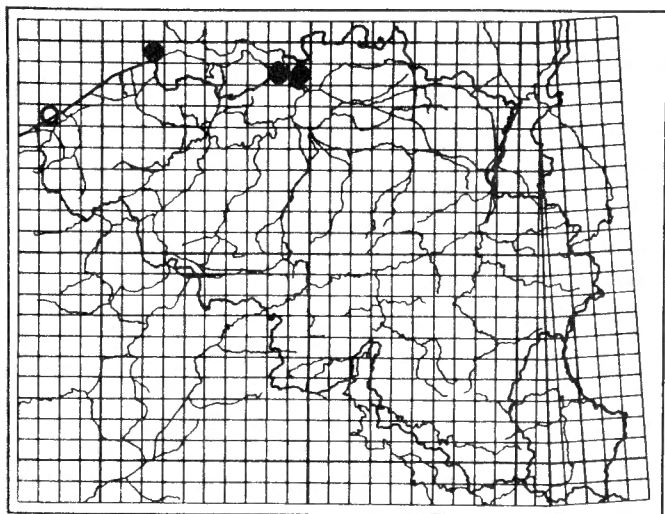
144. *TACHYS micros*



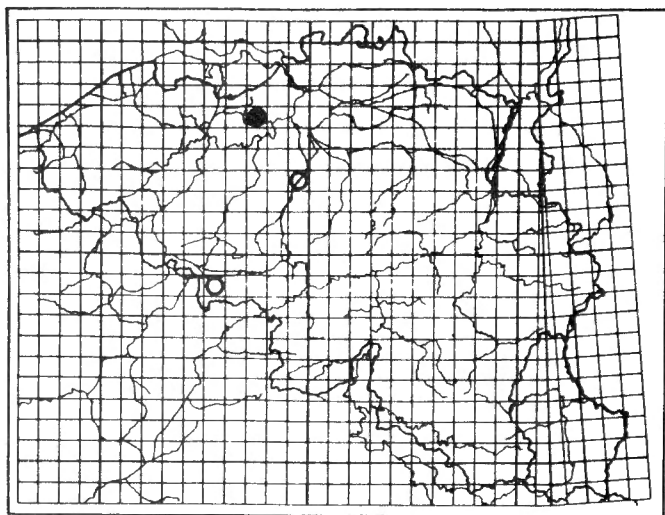
145. *TACHYS parvulus*



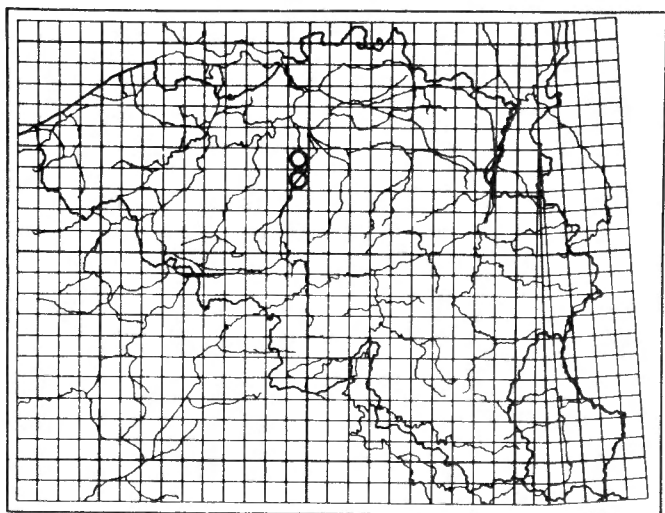
146. *TACHYS quadrisignatus*



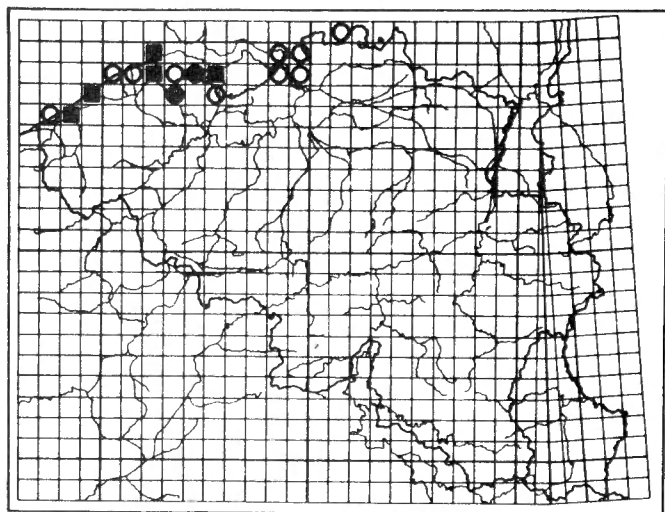
147. *TACHYS scutellaris*



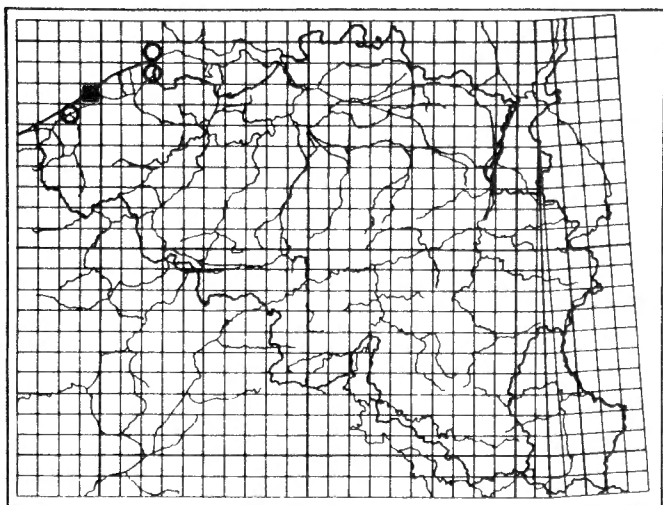
148. *TACHYTA nana*



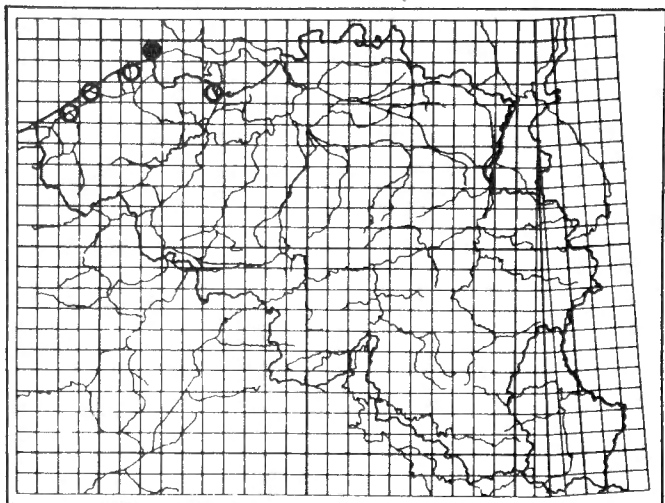
149. *ANILLUS caecus*



150. *POGONUS chalceus*



151. *POGONUS litoralis*



152. *POGONUS luridipennis*

REFERENCES

- ANONIEM - 1973 - Atlas de Belgique, Atlas van België. - Paleis der Academiën, Brussel.
- DE ROECK, M. & TILMONT, J. - 1970 - Algemene Atlas. - Wesmael Charlier, Namen.
- DESENDER, K. - 1985 - Naamlijst van de Loopkevers en Zandloopkevers van België (Coleoptera, Carabidae). - Studiedocument Nr 19, K.B.I.N., Brussel, 36 pp.
- DESENDER, K. - 1986 - Distribution and ecology of Carabid beetles in Belgium (Coleoptera, Carabidae). Part 1. Species 1-80 (Cicindelini, Omopronini, Carabini, Cychrini, Nebriini, Notiophilini, Elaphrini, Loricerini, Scaritini, Broscini, Patrobini, Trechini). - Studiedocument Nr , K.B.I.N., Brussel, 30 pp.
- FREUDE, H., HARDE, K.W. & LOHSE, G.A. - 1976 - Die Käfer Mitteleuropas. Band 2. Adephaga 1. - Goecke & Evers Verlag, Krefeld, 302 pp.
- HEATH, J. & LECLERCQ, J. - 1969 - The European Invertebrate Survey. Preliminary notice. - Biol. Records Centre, Abbots Ripton and Fac. Sci. Agron. Gembloux, 7 pp.
- LECLERCQ, J. - 1968 - Pour des atlas de répartition des Insectes de l'Europe occidentale, oeuvre coopérative. - C.R. Séances Soc. Biogéogr. 44 : 69-81.
- LINDROTH, C.H. - 1945 - Die fennoskandischen Carabidae. I. - Goteborgs Kungl. Vetensk. o Vittersamh. Handl. (6)B, 4 : 1-709.
- MOUSSET, A. - 1973 - Atlas provisoire des insectes du Grand-Duché de Luxembourg. Coleoptera. Cartes 1 à 226. - Musée d'Histoire Naturelle et de l'Administration des Eaux et Forêts, Luxembourg.
- SOKAL, R.R. & ROHLF, F.J. - 1969 - Biometry. The principles and practice of statistics in biological research. - W.H. Freeman and Company, San Francisco, 776 pp.
- TURIN, H., HAECK, J. & HENGEVELD, R. - 1977 - Atlas of the Carabid beetles of the Netherlands. - Kon. Ned. Akad. Wet., Verh. Afd. Nat., 2e reeks, 68 : 1-228.
- VAN ROMPAEY, E. & DELVOSALLE, L. - 1978 - Atlas van de Belgische en Luxemburgse Flora. Pteridofyten en Spermatofyten. Tekstgedeelte. - Nationale Plantentuin van België, Meise, 116 pp.

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