

Ekologia a system rozrodczy wodniczki

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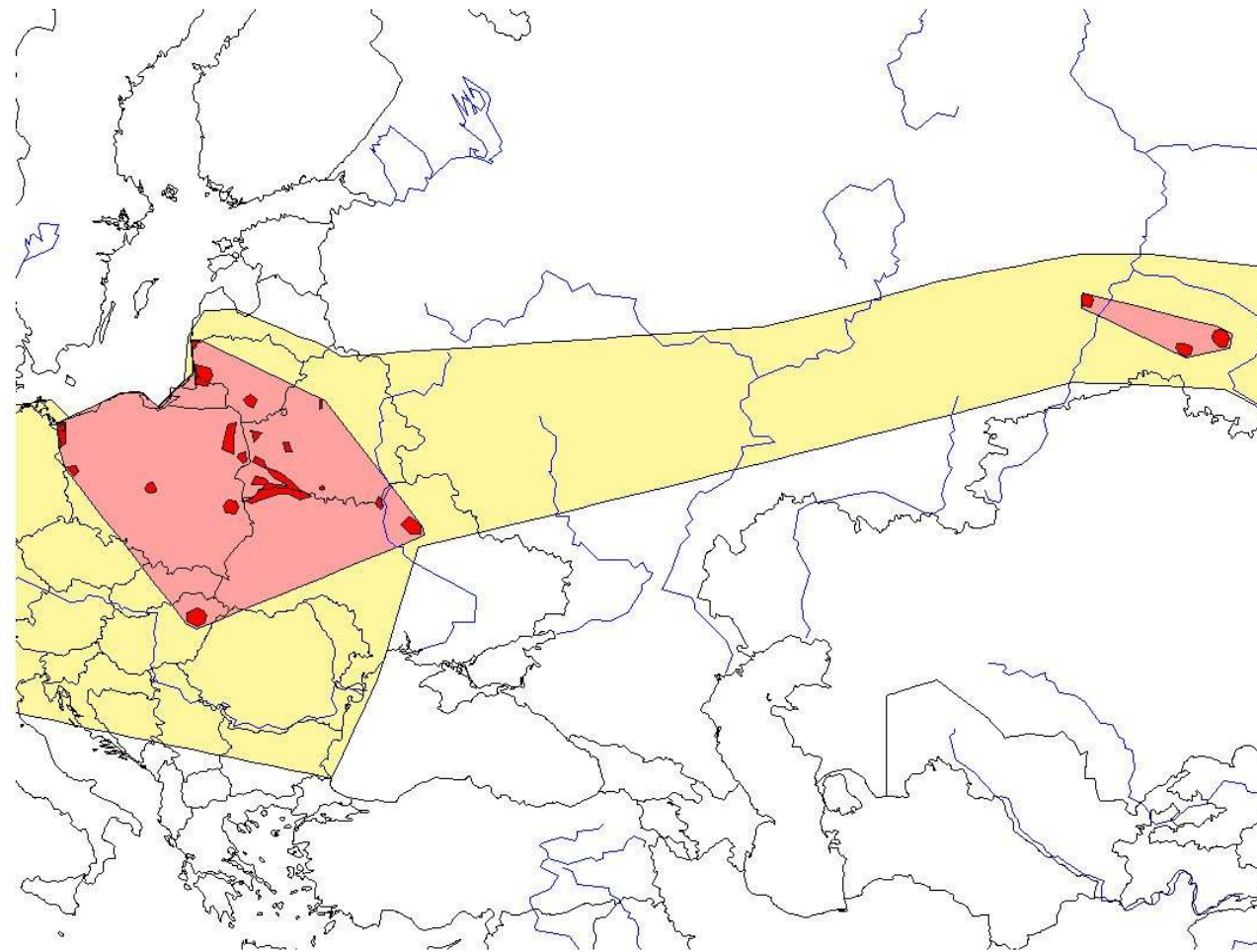









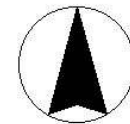


Actual breeding range of the Aquatic Warbler (*Acrocephalus paludicola*)



-  breeding sites 1997-2002
-  current distribution range
-  former distribution range

0 2000 4000 6000 8000 10000 Kilometer



Aquatic Warbler

Current population estimates (31 January 2004)

Country	population estimate 1998 - 2002	geometric mean	proportion	Trend 1996 - 2003
Belarus	6,600 - 12,500	9,083	57.5 %	⇒
Poland (1997/98)	2,800 - 3,000	2,898	18.3 %	NE-Poland ⇒ NW-Poland ↓
Ukraine (1996/02)	2,100 - 3,540	2,727	17.3 %	⇒
Hungary (2001-03)	350-700	495	3.1 %	until 2002 ↑ 2003 ↓
Lithuania	225 - 280	251	1.4 %	↓
Russia/W-Siberia	50 - 500	158	1.0 %	↓
Germany	9 - 25	15	0.1 %	↓
Latvia	0-10		<0.1 %	?
total population	12,134 - 20,555	15,793	100 %	↓

Table 1. Number of songs of three individually ringed male Aquatic Warblers on selected days during the breeding season in 1988 and 1989 (2-h samples, started 1 h before sunset) and 1991 (2-h samples started 4 h before sunset)

Date	Number of songs	Type of song ¹ (%)		
		A	B	C
3 June 1988	955	54.7		45.3
8 June 1988	1177	77.1		22.9
17 June 1988	1000	56.9	25.6	17.5
26 June 1988	1160	56.8	32.9	10.3
3 July 1988	1003	57.5	33.4	9.1
18 July 1988	996	63.6	30.4	6.0
13 May 1989	468	52.4	31.8	15.8
19 May 1989	821	48.1	46.5	5.4
29 May 1989	927	38.8	50.6	10.6
15 June 1989	660	27.4	64.4	8.2
30 June 1989	1287	45.1	48.9	6.0
8 May 1991	193	43.5	27.5	29.0
10 May 1991	265	56.6	21.9	21.5
12 May 1991	262	43.5	20.6	35.9
18 May 1991	257	52.6	20.2	27.2
22 May 1991	185	66.5	10.8	22.7
25 May 1991	374	46.3	21.7	32.1
29 May 1991	319	48.9	16.9	34.2
1 June 1991	544	56.8	22.1	21.1
5 June 1991	295	57.3	13.6	29.2
12 June 1991	376	39.9	21.0	39.1
21 June 1991	513	50.5	18.9	30.6
12 July 1991	382	59.2	18.6	22.3
21 July 1991	430	56.5	18.1	25.3
24 July 1991	326	37.4	29.8	32.8



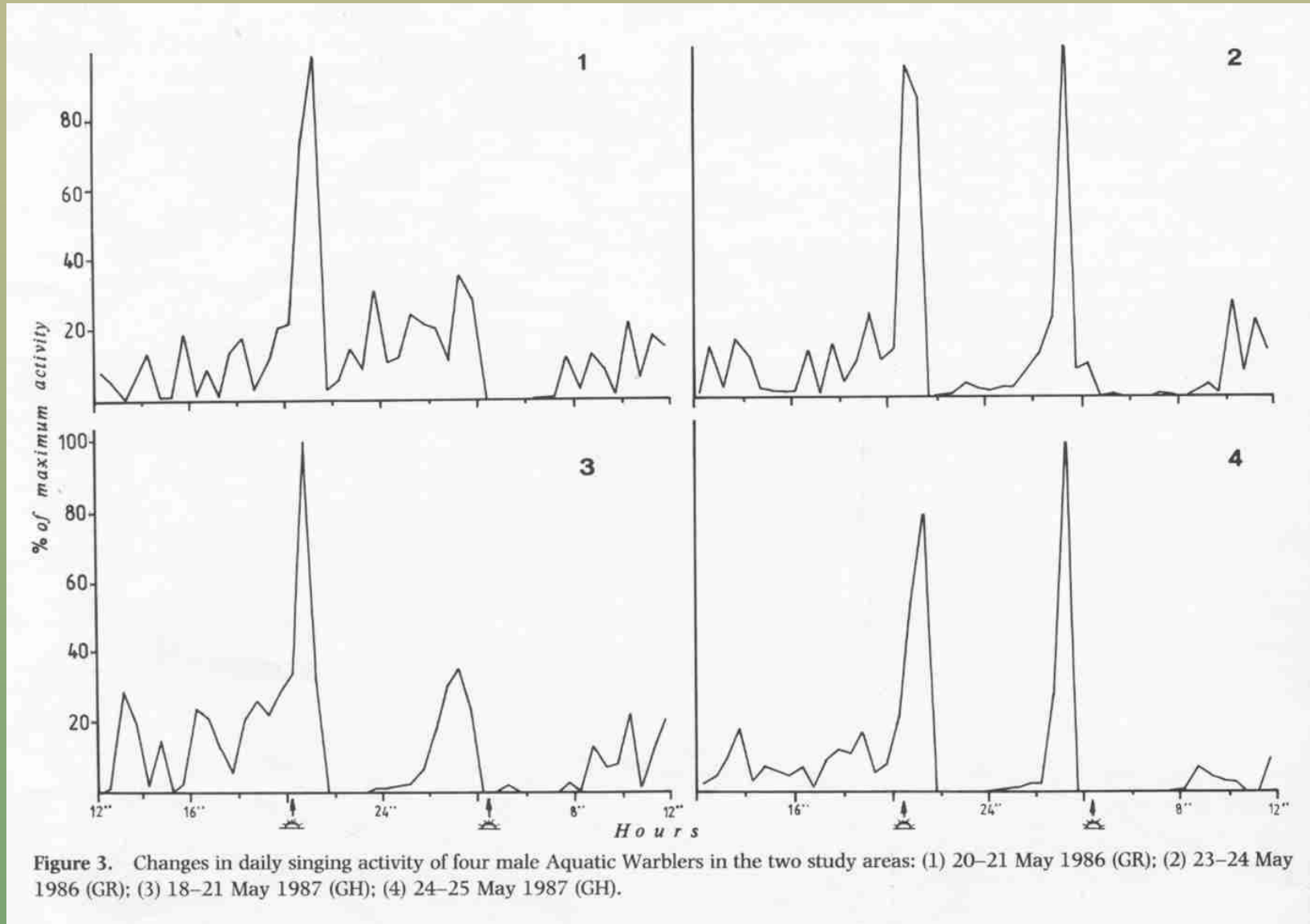
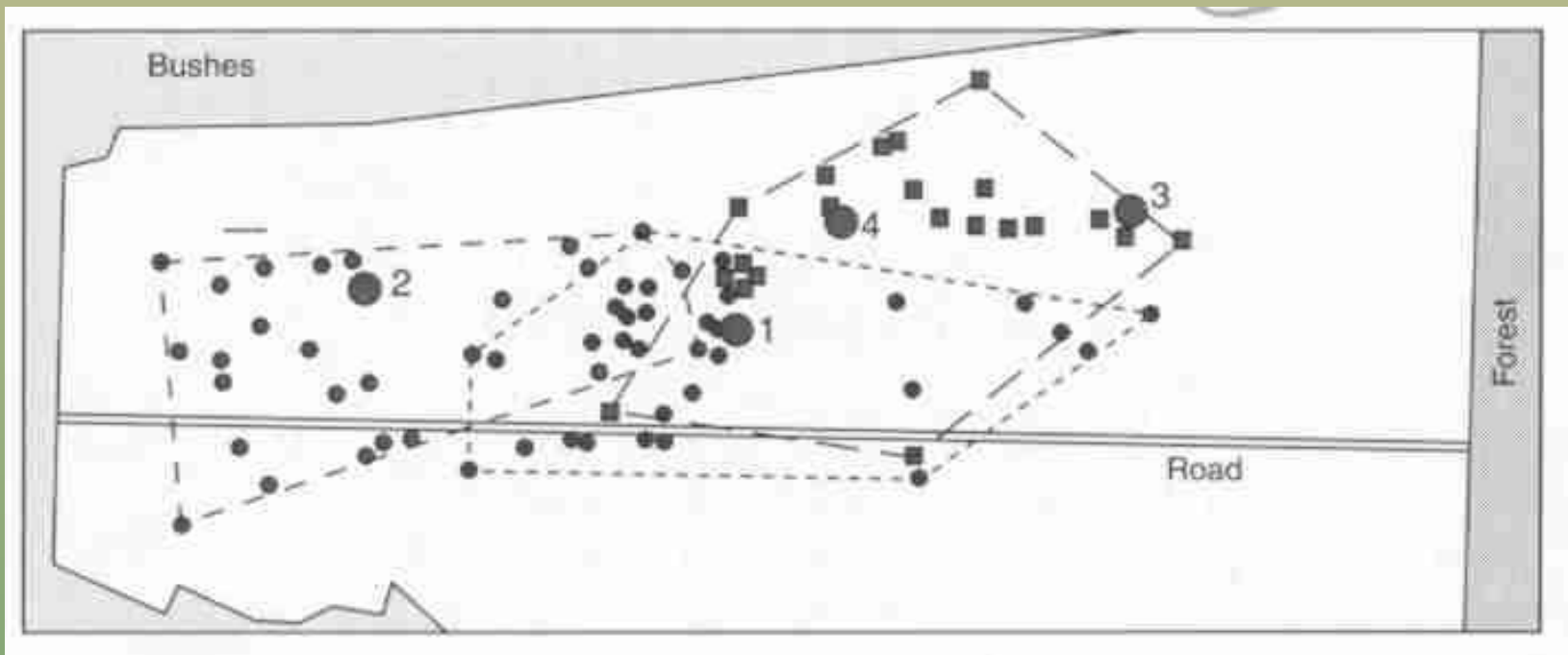
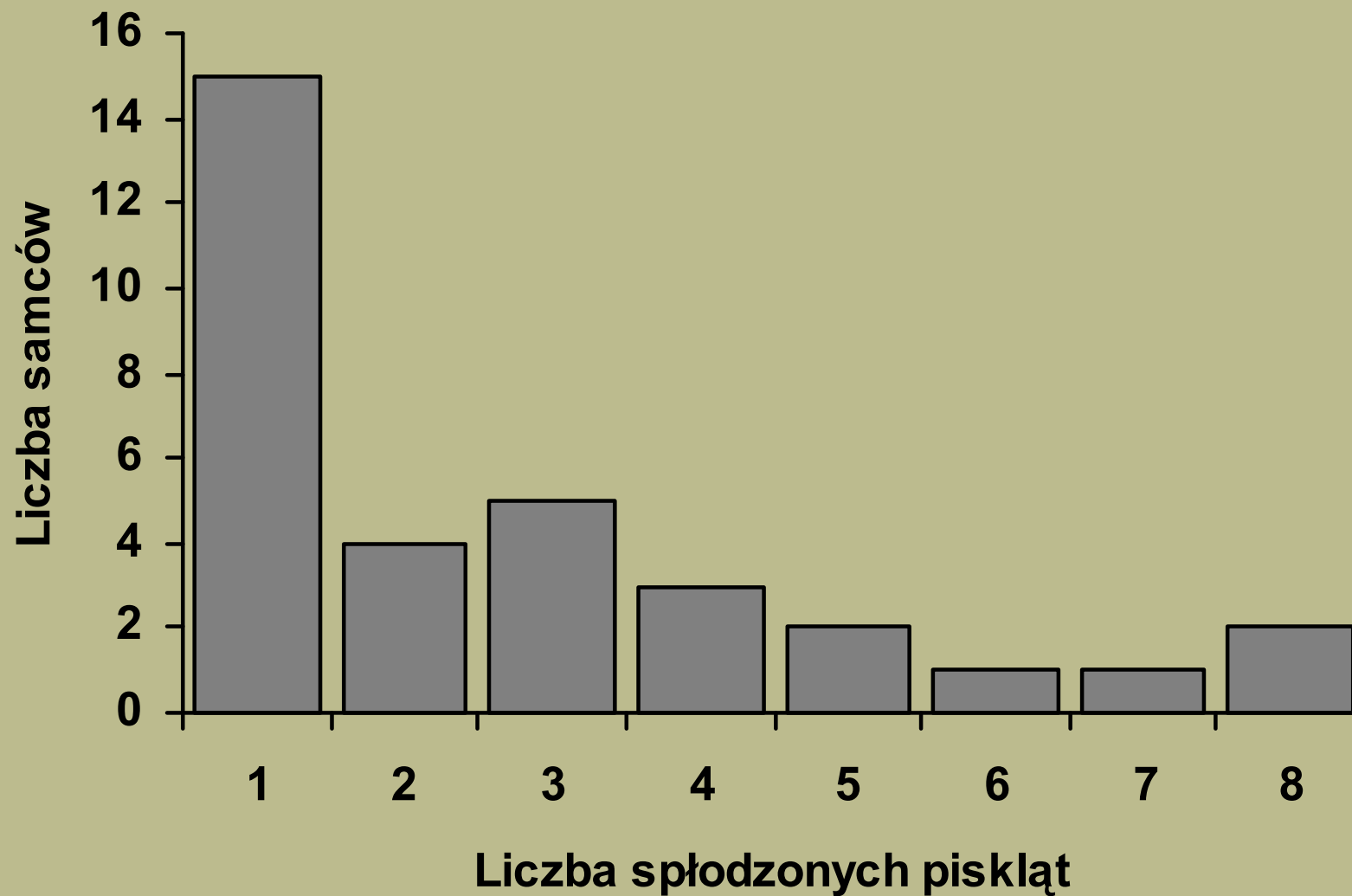


Figure 3. Changes in daily singing activity of four male Aquatic Warblers in the two study areas: (1) 20–21 May 1986 (GR); (2) 23–24 May 1986 (GR); (3) 18–21 May 1987 (GH); (4) 24–25 May 1987 (GH).



Liczba ojców	Liczba lęgów	Udział (%)
1	14	21,9
2	22	34,4
3	16	25,0
4	7	10,9
5	5	7,8



Sukces rozrodczy poszczególnych samców wodniczki

**Korelacje między liczbą spłodzonych piskląt a zmiennymi opisującymi
cechy morfologiczne samca**

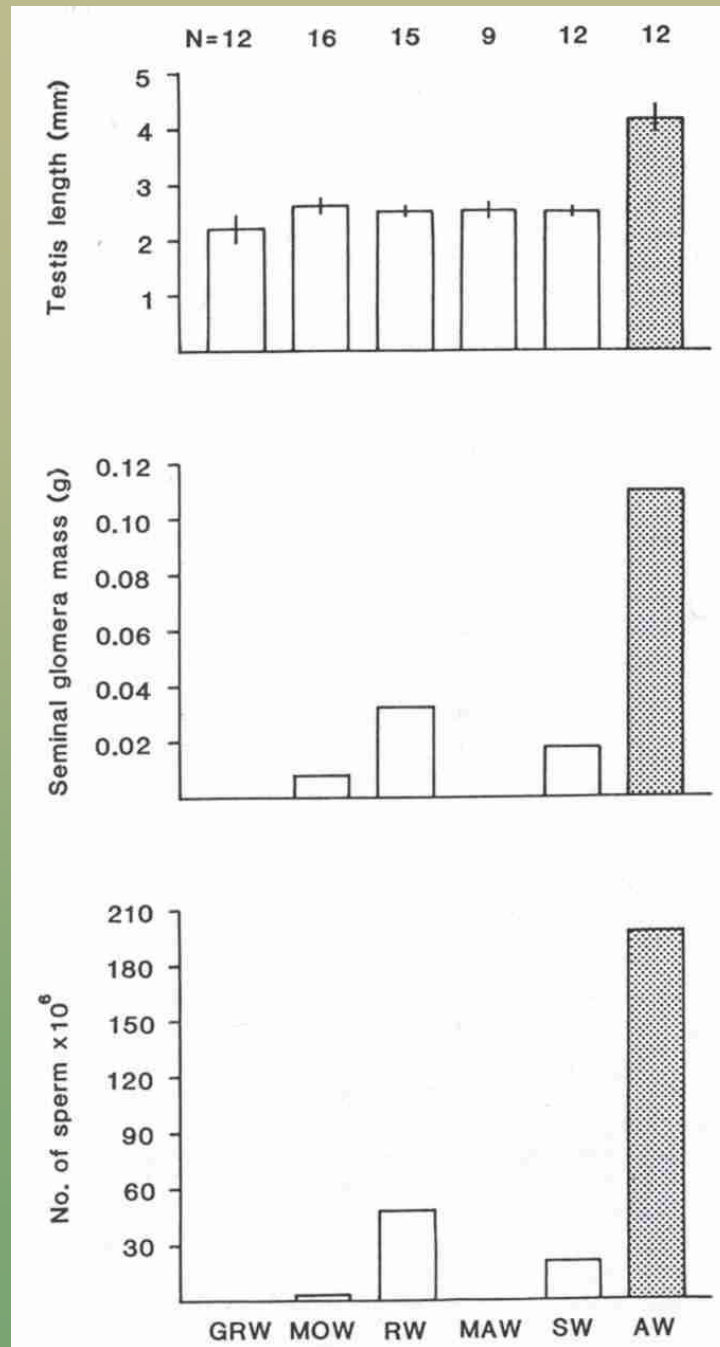
Zmienne	r	n	P
Masa	0.0779	31	0.677
Otłuszczenie	0.3770	33	0.031 *
Skrzydło	0.3655	33	0.036 *
Asymetria skrzydła	0.0778	33	0.667
Dziób	-0.0403	31	0.830
Skok (tarsus)	0.1307	31	0.483
Asymetria skoku	-0.1344	30	0.479
Ogon	0.2116	31	0.253
Asymetria ogona	0.0512	30	0.788
Data zniesienia 1-go jaja	-0.5330	32	0.002 *

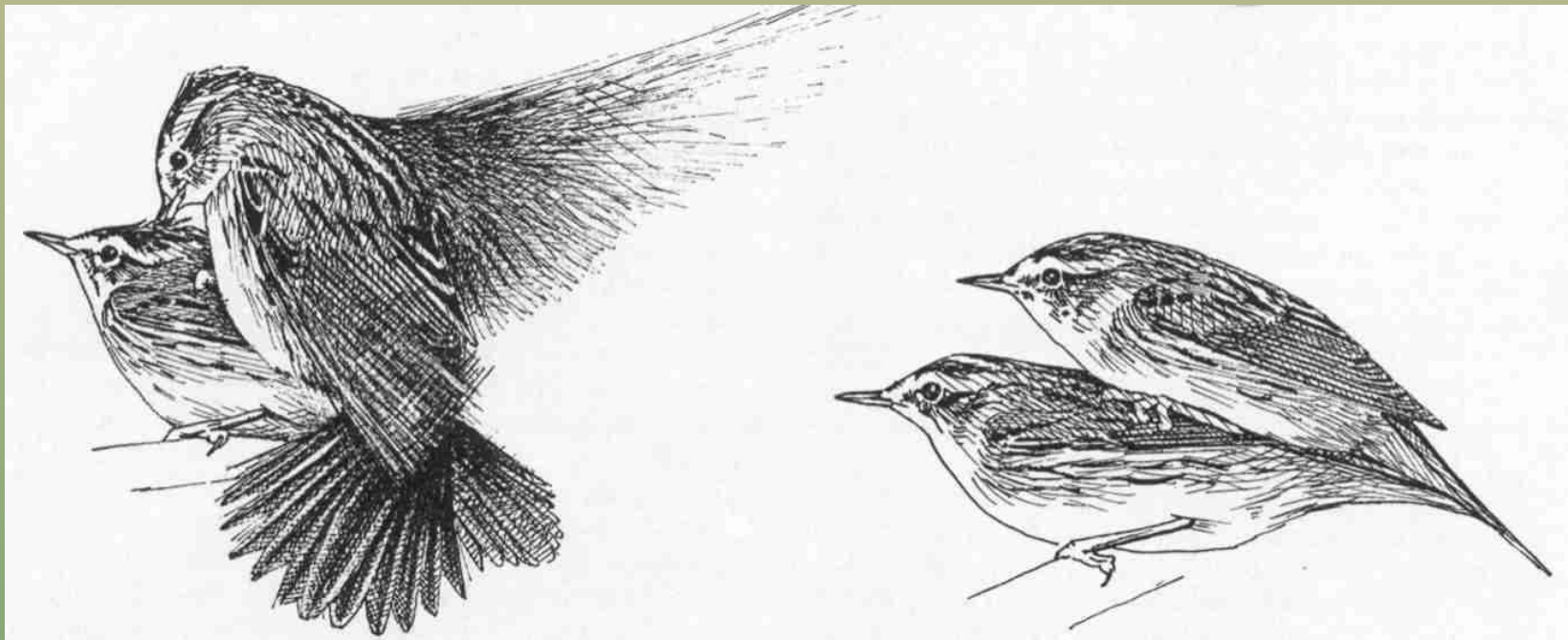
* – $P < 0.05$

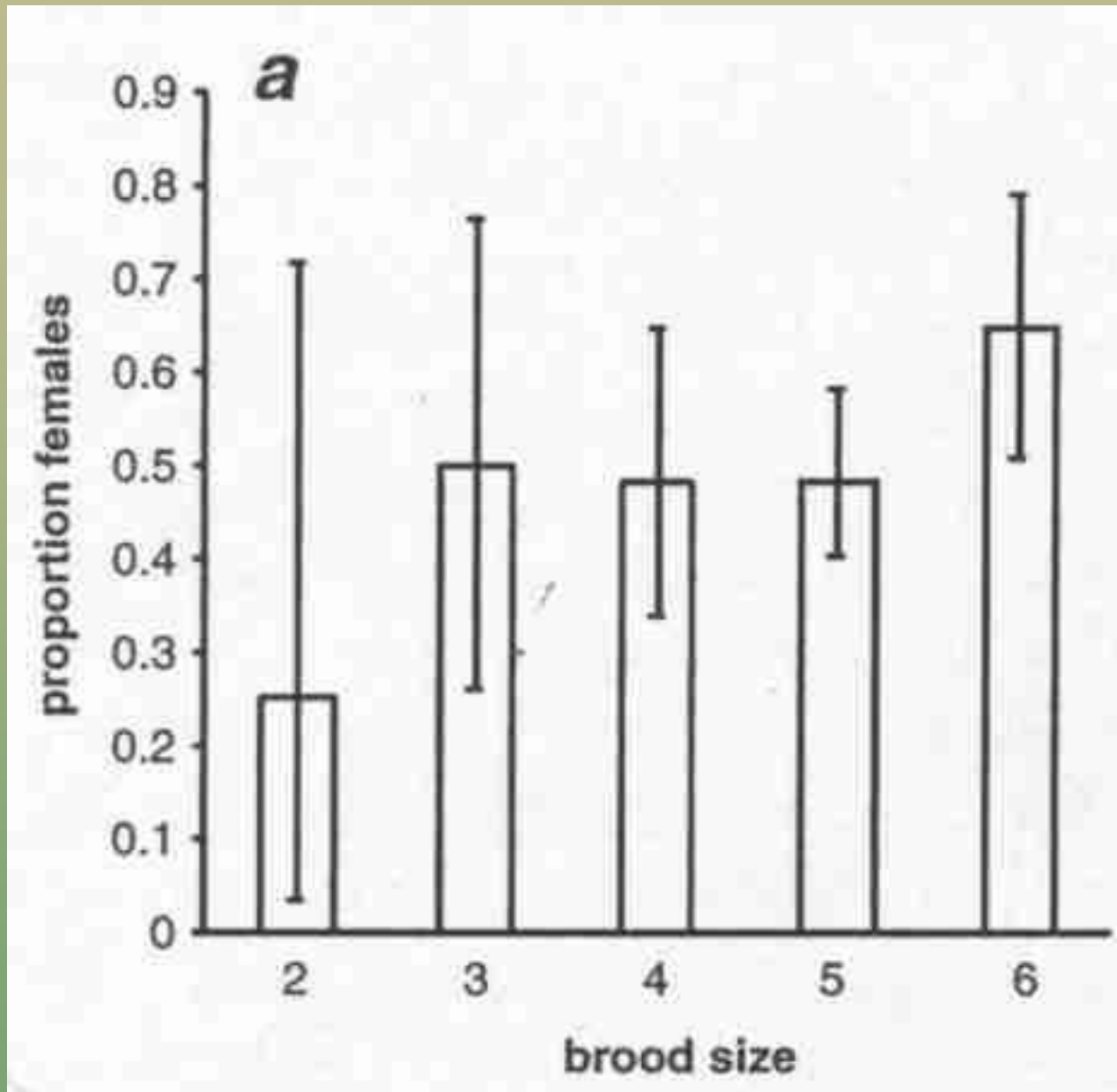
**Korelacje między cechami mogącymi mieć związek z dostosowaniem samców
a zainfekowaniem przez *Trypanosoma***

	Nie zakażone		Zakażone		U	n		P
	\bar{x}	SD	\bar{x}	SD		Nie zakażone	Zakażone	
Liczba splotzonych piskląt	3.60	2.59	2.06	1.44	76.5	15	16	0.04*
Masa (g)	12.70	0.80	11.98	0.47	48.5	14	16	0.004*
Otluszczenie	1.40	1.24	0.94	0.68	94.5	15	16	0.14
Skrzydło (mm)	62.62	1.32	62.17	1.30	95.0	15	16	0.16
Asymetria skrzydła	0.75	0.77	0.76	0.69	116.0	15	16	0.44
Dziób	9.18	0.73	9.37	0.53	86.0	15	14	0.20
Skok (tarsus)	19.63	0.40	19.54	0.71	100.5	15	14	0.42
Asymetria skoku	0.25	0.18	0.30	0.24	89.0	14	14	0.34
Ogon	49.42	3.26	48.84	1.44	103.0	14	15	0.47
Asymetria ogona	0.52	0.42	0.48	0.53	86.5	14	14	0.29
Data złożenia 1-go jaja przez samicę	5.9 (Maj)	4.28	10.7 (Maj)	6.62	61.5	15	15	0.016*

* – $P < 0.05$









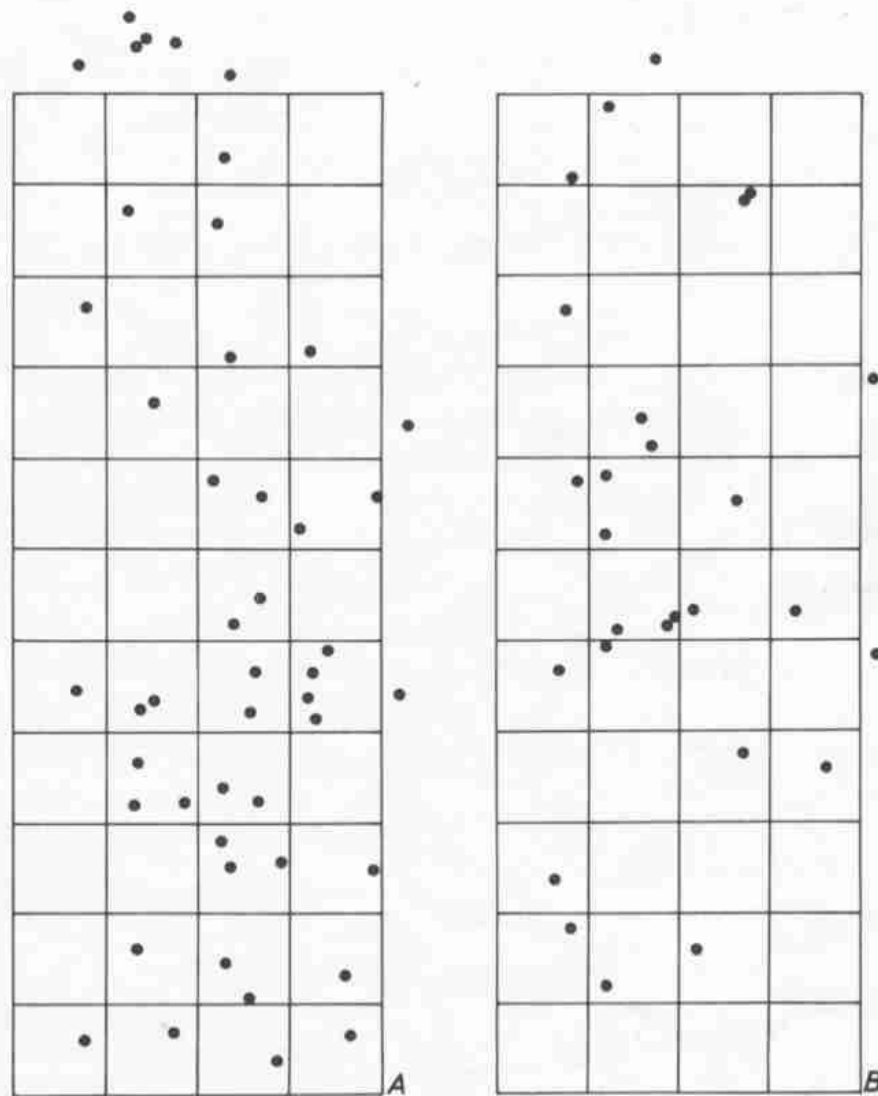


Figure 4. Distribution of Aquatic Warbler nests on the optimum plot (GH) in 1990 (squares 100 × 100 m). (A) First brood; (B) Second brood.

Table 4. Occurrence of potential food for Aquatic Warblers in the optimal sampling area (GH) in 1991

	Dry weight (mg)	Significance
At the nest (n = 30)	81.1 ± 61.80	$t_{73} = 1.62, \text{ n.s.}$
Within 30 m of the nest (n = 45)	107.9 ± 74.99	
At nest aggrega- tions ¹ (n = 15)	155.6 ± 61.17	$t_{43} = 2.98, P < 0.01$
At scattered nests ¹ (n = 30)	87.1 ± 77.80	
First brood ² (n = 55)	111.1 ± 74.01	$t_{73} = 6.75, P < 0.001$
Second brood ² (n = 20)	58.8 ± 42.98	

¹ Grouped nests were not more than 30 m apart; scattered nests were 50 m or more apart; intermediate cases were not considered.

² Samples taken at the nest and at a distance from the nest combined.

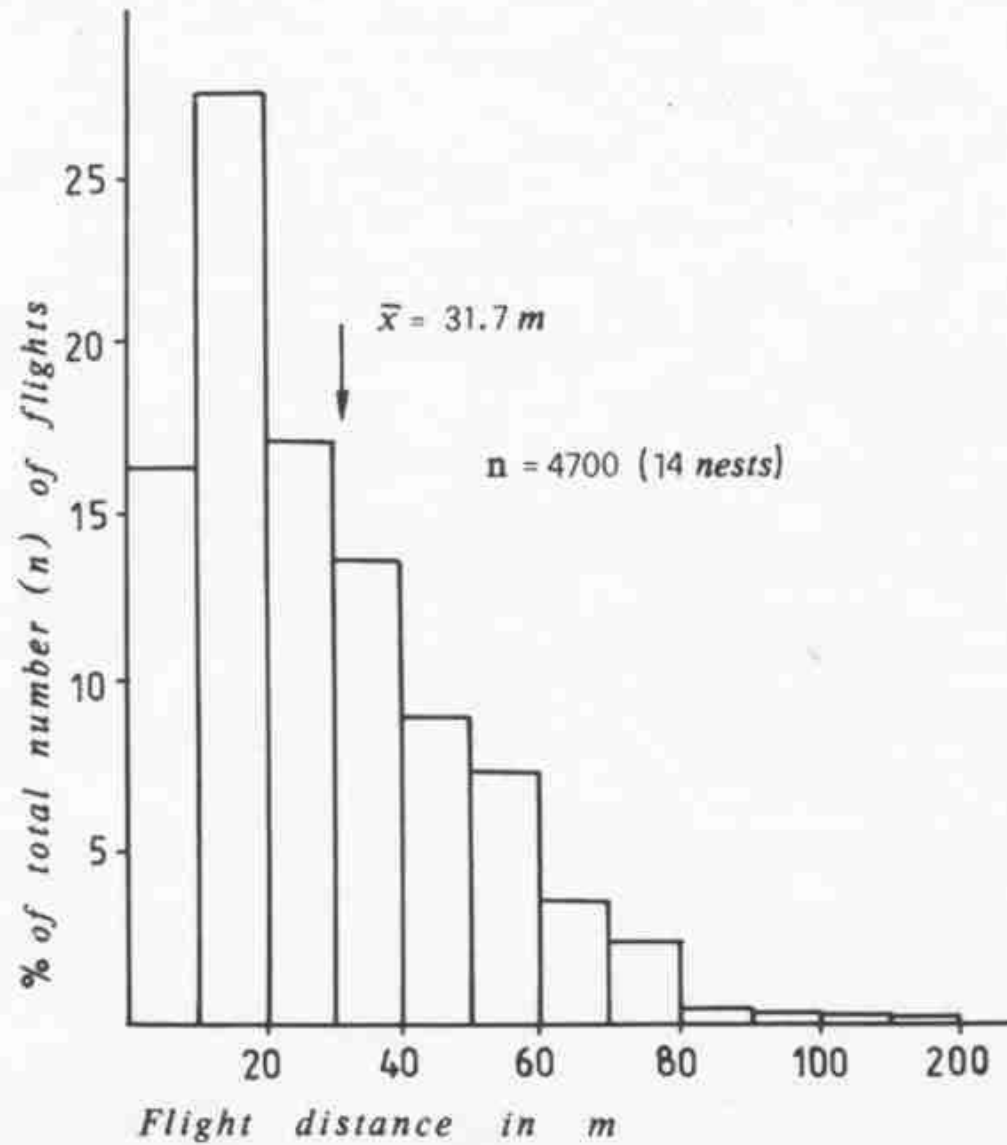


Figure 5. Distances of feeding flights of female Aquatic Warblers.

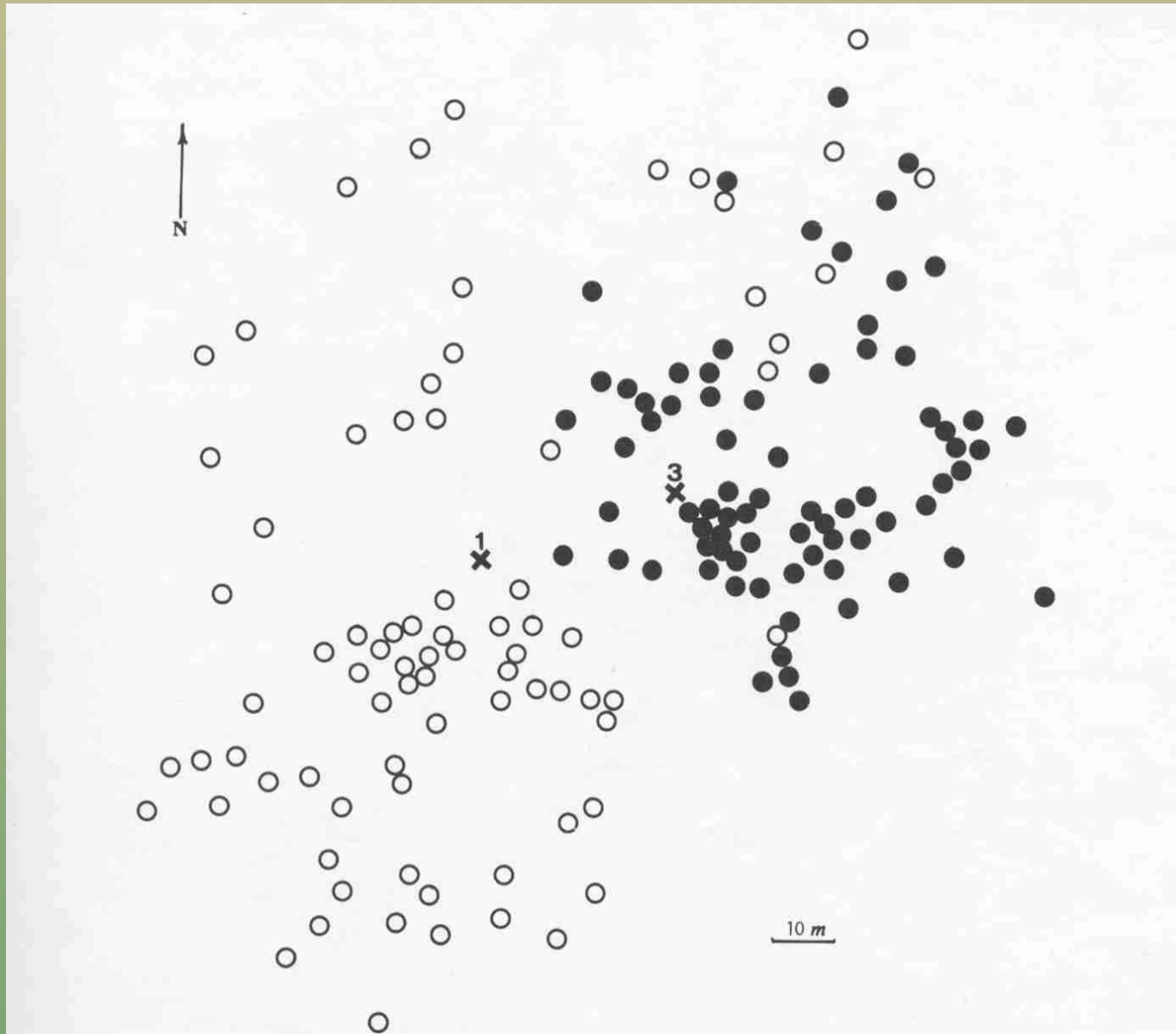


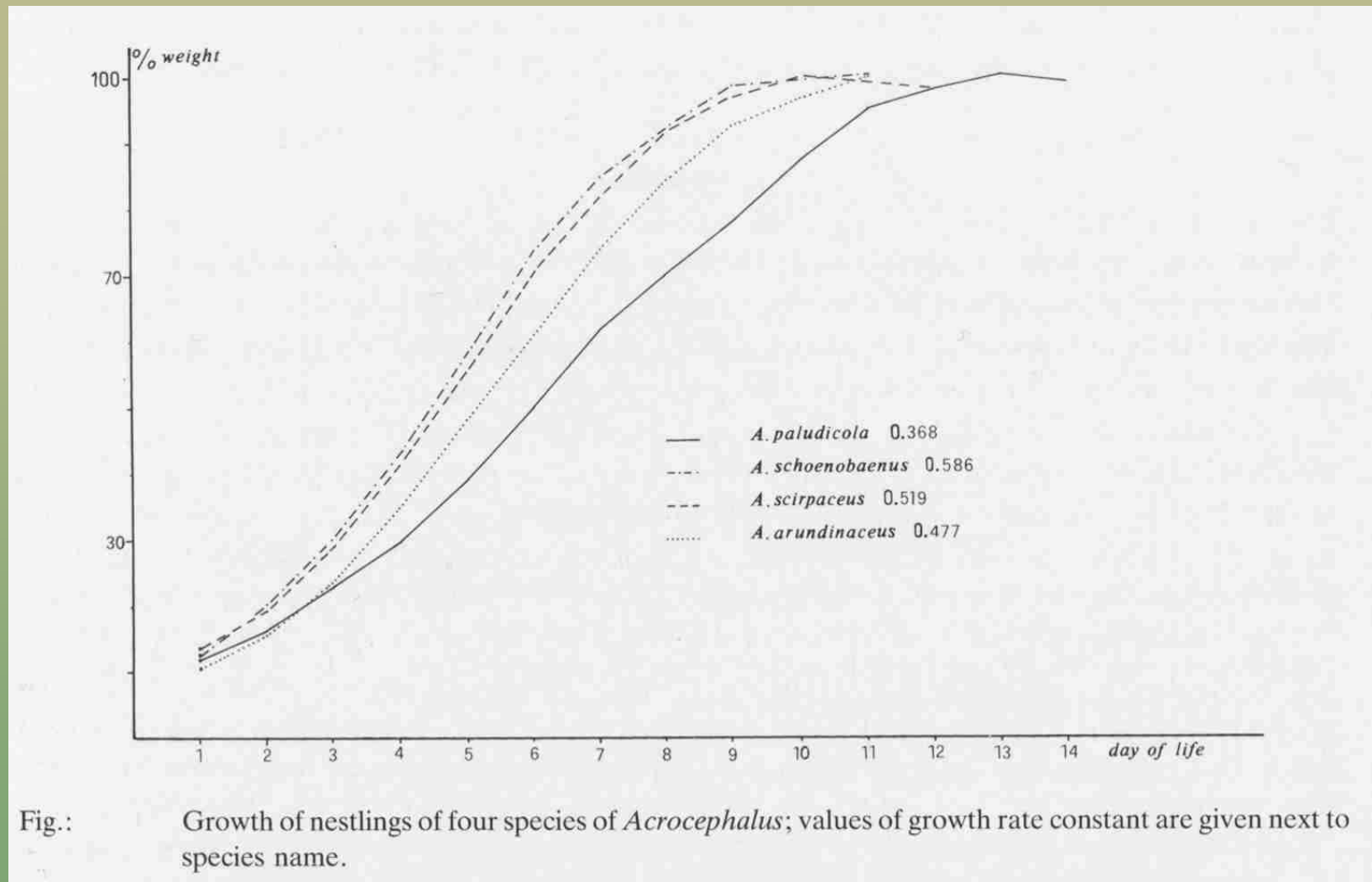
Figure 6. Mutually exclusive foraging areas of female Aquatic Warblers feeding nestlings at Nests 1 and 3. Symbols indicate where birds first landed after leaving the nest. Circles—female of Nest 1; dots—female of Nest 3. Data derive from observations from 0800h to 1200h on 11 June 1988 made simultaneously by two observers. Nest 1 held six 13-day-old nestlings; Nest 3 held four nestlings 10 days old.



Okres pobytu piskląt w gnieździe

Okres pisklęcy (dni)	13	14	15	16
Liczba lęgów	1	3	11	10

Dyrcz 1993



Tab. 1. Nest losses (%) in the Aquatic Warbler calculated with the use of the “traditional” method (number of nests in parentheses).

	1988	1989	1990	1991	\bar{x}
Nest destroyed by predators	10.0	10.2	12.0	12.0	11.1
Flooded nests	—	—	6.7	—	2.6
All nestlings died of starvation	—	6.1	1.3	4.0	2.6
Abandoned nests	2.5	2.0	1.3	—	1.6
Total losses	12.5 (40)	18.3 (49)	21.3 (75)	10.0 (25)	17.9 (189)

Dyrcz i Zdunek 1993b

Tab. 2. Nest losses (%) in Aquatic Warbler calculated with MAYFIELD (1975) method.

	1988	1989	1990	1991	\bar{x}
Nest destroyed by predators	25.8	19.6	21.8	25.7	22.2
Flooded nests	—	—	12.8	—	5.8
All nestlings died of starvation	—	12.3	2.7	9.5	5.8
Abandoned nests	7.2	4.3	2.7	—	3.5
Total losses	33.0	36.2	40.0	35.2	37.3

Dyrcz i Zdunek 1993b

Tab. 4. Clutch size versus fledgling production in some marsh-nesting warblers.

Species	Clutch size	Fledglings per nest	References
<i>Acrocephalus paludicola</i>	4.8	3.2	This study
<i>A. melanopogon</i>	3.9	2.4	LEISLER 1991
<i>A. schoenobaenus</i>	5.0	2.8	BIBBY 1978, KOSKIMIES 1991
<i>A. palustris</i>	4.7	3.2	SCHULZE-HAGEN & MÄDLOW 1986, SCHULZE-HAGEN 1991
<i>A. scirpaceus</i>	3.8	0.6—2.2	DYRCZ 1981, SCHULZE-HAGEN 1991
<i>A. arundinaceus</i>	4.8	2.7	DYRCZ 1981 and 1986
<i>Locustella fluviatilis</i>	4.9	1.8	MACKOWICZ 1989
<i>L. luscinioides</i>	5.0	2.5	PIKULSKI 1980









Cel badań:

Określenie zakresu zmienności sukcesu rozrodczego poszczególnych samców wodniczki i ustalenie czy na ten sukces mają wpływ pasożyty krwi i parametry ciała

Wnioski

Przedstawiona tu analiza wykazała duże indywidualne różnice w sukcesie rozrodczym poszczególnych samców. Stwierdzone korelacje między sukcesem rozrodczym samców a większym otłuszczeniem, wcześniejszym wiosną przystępowaniem do rozrodu i brakiem pasożytów krwi, sugerują że samce w dobrej kondycji mają wyższy sukces rozrodczy.

