Territory and mate choice in relation to food availability in the Dusky Warbler (*Phylloscopus fuscatus*)

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Abstract
The Dusky Warbler (*Phylloscopus fuscatus*) is a species, in which polygyny occurs at a high rate. Female choice appears to be based on the selection of a territory rather than on the selection of a male, as will be shown elsewhere. Aim of this study was to determine the role of food availability as a measure of territory quality.
Territories, which were the most rich in insects during the breeding period, showed a much higher rate of polygyny than poor territories. At the same time, these rich places were occupied by the earliest arriving males and also the first clutches were found there. Surprisingly it was found, that these territories with highest food abundance during the period of raising nestlings, had very low insect densities in spring during the arrival of males and females, as compared to other territories. Therefore it is argued, that Dusky warblers, early in spring, are able to predict which territories will be the richest, based on vegetation characteristics and not based on a direct estimate of actual prey density.

Introduction

Males of most warbler species arrive earlier in the breeding area than females (Lack, 1954). The optimal arrival time depends on the costs and benefits of arriving at a particular time. Early arriving males have a higher reproductive success than later arriving males, as is illustrated for butterflies in (Fagerström & Wiklund, 1982). In several studies has been shown that females, after their arrival, visit several territorial males, and has been found evidence for a active female mate choice (Bensch & Hasselquist, 1992; Dale et al., 1990). In the study of Bensch & Hasselquist, 1992, on Great Reed warblers, females visited on average 6 males before settling in a territory. In the study of Dale et al. ,1990, on Pied Flycatchers, females visited up to 9 males. It was argued that females are able to remember these males and choose the best one. It was not known on what basis the females selected their mates.

There are numerous studies on different bird species, to find out what cues a female uses to chose a mate. Most of these studies concentrate on bird species in which polygyny occurs. These polygynous males, in some respect, must be more attractive than other males to females. On the other hand, settling in a territory with an already mated male may entail costs, for example in the loss of parental care, competition with other females and perhaps by increasing the attractiveness of a territory to a predator due to higher nest density (Wittenberg 1980). However to explain polygyny these costs of sharing a male must be compensated with benefits through the increased quality of the breeding situation as is postulated in the 'pol ygyny threshold theory' (Orians 1969). A female can benefit by choosing a high quality male (Arvidsson & Neergaard, 1991; Yasukawa, 1981; Møller, 1994) or by choosing for a high quality territory the male owns. This territory can be attractive because it provides more suitable nesting sites (Hoi & Ille, 1996; Aebischer et al. 1996, Evans & Burn, 1996; Savalli, 1994) or it provides more abundant food resources (Wittenberger, 1980). However most of the times these two factors are related with each other; the males of highest quality are occupying the best territories (Yasukawa, 1981). Males of high quality are more likely to arrive early as is illustrated in the Barn swallow (Møller, 1994). Males with long tails arrived earlier than short tailed males. The tail length was an honest signal for quality. The early arriving males thus had access to the best territories.

These two factors are often hard to disentangle. Although is some studie this is tried (Arvidsson & Neergaard, 1991).

To find out which cues are used by a female to select a mate this study was carried out on the Dusky warbler, a species in which monogamy and polygyny occurs.

In Forstmeier 1999 (in preparation) is illustrated that female Dusky warblers do not select for any male trait but select for a territory. The question still needs to be answered is: what makes a territory attractive for a Dusky warbler? In the present paper is looked at the role of food availability in the territory choice of the Dusky warbler.

Study area

The study was carried out in a coastal-tundra area in Eastern Siberia. The study area was situated 200 kilometres north east of Magadan. The area of interest is the transition between tundra-like habitat dominated by Carex species and taiga forest dominated by Larch (*Larix cajandri*). Most of the Dusky Warblers territories were found in the transition between these habitats. The study area consisted of three locations (see appendix, for map of the area). The first is the "Floodplain". This area is situated close to the river "Malcachan". In spring when the snow melts large parts of this area are flooded by this river. The second area is the "Slope", it is the transition between the Floodplain and the higher and drier tundra area. The third area is the "Pinus hill". This is situated approximately 20 metres above sea level, and is the furthest away from the river. In these areas two vegetation types can be distinguished. One is characterised by a mosaic of dense 1 to 2 meter high pinus bushes (*Pinus pumila*), short grassy patches and low Birch bushes (*Betula middendorffii* and some *Betula exilis*) with a average height of 50 cm and, especially on the Pinus hill, *Alnus fruticosa* bushes can be found. The second vegetation type can be found along streams in the floodplain and is dominated by *Alnus hirsuta*, *Betula middendorfii*,and *Salix spec.*

Biology of the Dusky warbler

The Dusky Warbler (*Phylloscopus fuscatus*) is a small passerine (9-10g), which breeds throughout southern Siberia from the Ob river in the west to the Pacific coast in the east. It winters in south east Asia (Dementiev & Gladkov 1968). At the end of May the first males arrive from their winter areas to their breeding areas in Siberia. Males occupy territories and defend them against intruders. There is a high intensity of singing behaviour in this period. Approximately two weeks later the females arrive. They choose a male and settle in his territory. In our population of Dusky warblers the number of females settling in one territory varied between 0 and 5. Few males apparently stayed unmated, most males were monogamous and some were polygynous (18%, 9 polygynous males and 40 monogamous males). Only the female is involved in nest building and hatching of the eggs. During feeding of the nestlings the male will only help his primary female (females 60% and males 40% of the feedings) , secondary females rear their chicks alone. The chicks fledge at an age of 12 days. The females leave the territories with their broods within one or two weeks and disperse over the area. Males will stay and defend their territories until autumn (Forstmeier, 1997). Dusky warblers experience a high rate of nest predation. In the study year 1998 66% of the nests were predated. The main predators are the Ground Squirrel (*Tamias sibiricus*), Red Fox (*Vulpes vulpes*) and Stoat (*Mustela erminea*). In addition nests regularly are parasitised by the Horsefield Cuckoo (*Cuculus horsfieldii*, formerly *Cuculus saturatus*)

Method

Trapping and banding

To identify birds individually almost all birds were caught with mist nets and each given an individually different colour ring combination. When caught morphological measurements were taken from each individual. Mass, tarsus, bill height, bill breadth, wing length and wing formula were measured. The morphological measurements are analysed in Forstmeier ,1998 (in preparation).

Throughout the whole season intensive observations were made to find out arrival dates of males and females. Males were easily detected because the occupation of territories coincides with an intensive singing behaviour. Dusky warbler males have to distinct song types, high variable long song and a monotonous short song (Forstmeier & Bergman, 1997). Each male had a individually recognisable short song, so the could be monitored even without reading the rings. By plotting all the observations of each singing male on a map, territory boundaries were established by the polygon method. The arrival of females is much harder to determine because females have a very secretive behaviour. Therefore the first observation date of a female in a territory doesn't tell much about the actual settling date. Much time was put in finding nests, which are very well hidden in the undergrowth of the vegetation. Nests were found by observing and following nest building females. However most nests were found after hatching of the eggs when parents were feeding their nestlings intensively, and nests could be found more easily

Insect sampling

To quantify the abundance of insects, insect samples were taken in three different periods. The first, in spring, is during the arrival of females (8-6/23-6), the second during feeding of nestlings (9-7/6-8), in the summer and the third period in autumn when the males still defend their territories and females and juveniles already are leaving the area (18-8/24-8).

During each sample period five samples were taken in every territory (on the "Pinus hill" only three samples were taken). Every sample consisted of 10 sub-samples. When a territory was sampled, ten branches (the ten sub-samples) of different bush species were shaken above an umbrella, held upside down. The sub-samples were taken from the different bush species. The 10 sub samples taken per territory were divided over the bush species according to the coverage of every species in that particular territory. After shaking, all insects were counted, classified in orders, and their length and breadth was estimated to the nearest 0,1 mm. Later, the total insect volume per territory was calculated by multiplying the length times the square of the breadth of each insect and adding all these values per territory. Insects with a volume of more than 1 cm^3 were skipped in the analyses because they didn't seemed to be interesting for Dusky warblers as food items as is illustrated in the results. All insect data have been tested by non parametric tests because there were severe deviations from a normal distribution (Kolmogorov Smirnov $Z=5.184$, $P<0.000$).

To get insight in the preferred food by the Dusky Warbler, observations of nestling feeding females were made. A hide was put up close to a nest, with nestling feeding parents. Most of the time, the prey items could be identified in insect orders, by means of a telescope (20-60 magnification). The size of these insects was estimated relative to the size of the bill of the food carrying bird.

Results

Food of Duskies

The arthropods that were found with the highest numbers in the insect samples belong to the orders of homoptera, arachnida and diptera. The homoptera that were sampled were very small cicads (with a volume of 4*2*2mm). Comparing the insects found in the samples with the insects observed to be fed by nestling feeding parents, it is found that Dusky warblers show a preference for diptera and especially caterpillars, as these are found in a higher percentage in the food than in the samples, (see table 1).

When comparing the sizes of the sampled and fed insects it is found that the frequency distributions completely overlap and show the same distribution. However the only difference is that there are more insects with a very big size found in the samples. Because these categories of insects are apparently not interesting for feeding they are skipped in the analyses (these are the insects with a volume bigger or equalling $1cm^3$). So the samples only contain insects that are suitable as food items.

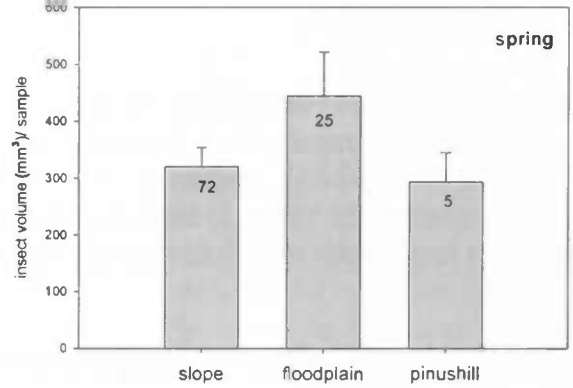
Although the insects that are fed by the Dusky warblers to their offspring is only roughly known, the three most important items found in the food, are among the five most sampled items. Although there is a considerable selection on some prey items, there is a large overlap in both size and species of the samples with the food. So the insects that were found by this way off sampling are relevant for the Dusky warblers as food for their offspring.

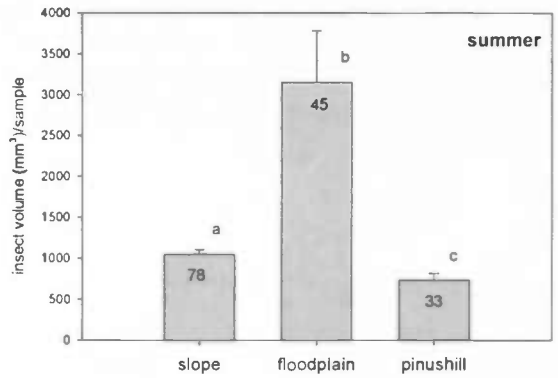
Tabel (1): Frequency distribution of arthropods found in samples, and insects that are fed by parents to nestlings. Numbers are percentages of total number of sampled insects or total number of determined insects, during observations of nestling feeding parents.

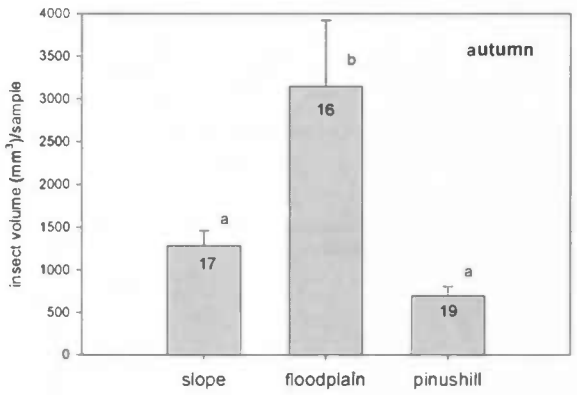
Arthropod species	**% in samples**	**% in food**
Homoptera	51.4	-
Arachnida	20.2	13.7
Diptera	10.1	23.0
Heteroptera	7.4	-
Lepidoptera (caterpillars)	4.0	40.4
Colembola	2.5	-
Trigoptera	1.6	2.7
Hymenoptera	1.2	1.1
Lepidoptera (adult)	0.8	1.1
Larve	0.5	-
Ephemeroptera	0.2	0.5
Odonata	0.01	
Orthoptera (grasshoppers)	0.01	
Total number	**16616**	**183**

The different areas

First the three areas were compared in insect abundance in the three sample periods. No significant differences were found in the spring sample period (Kruskal-Wallis, χ^2 =2.282, P=0.320). In the summer all the three areas are significantly different (Kruskal-Wallis, χ^2=27.58, P<0.00, non parametric multiple comparison P<0.05).







Figure(1): Insect volumes in the three areas (slope, floodplain and pinushill) in the three sample periods.. The volumes are the average of the samples taken on these areas. The numbers in the bars represent the total number of samples on which the average is based, the a, b and c represent significant differences (Kruskal-Wallis for spring; χ^2 =2.28, P=0.32, for summer; χ^2 =27.585, P<0.00, for autumn; χ^2 =22.38, P<0.00 Non parametric multiple comparison P<0.05.

The flood plain is the most food rich place and the pinushill is the poorest. In autumn only the floodplain is richer in insects than the slope and pinushill (Kruskal-Wallis, χ^2 =22.38, P<0.00, non parametric multiple comparison P<0.05)

Because all the areas are significantly different during the summer period, the three areas are treated separately during most analyses. In the most food rich habitat the incidence of polygyny is highest 29% (4 out of 10 territories) on the Slope 13% of the territories were polygynous (2 out of 15 territories). On the pinus hill, the poorest habitat more polygynous territories were found then expected 16% (3 out of 16)

Difference between polygynous and monogamous territories

The monogamous territories are richer in insect abundance early in spring, however this difference is not statistically significant (Slope: Mann-Whitney Z=-0.118, n_1=57, n_2=15, P=0.906, Flood plain: Z=-0.291, n_1=20, n_2=5, P=0.197). See figure (2). In summer the polygynous territories are richer in insects in both areas (Slope: Mann-Whitney Z=-2.171, n_1=58, n_2=15, P=0.030, Flood plain Z=-2.604, n_1=25, n_2=20, P=0.009).

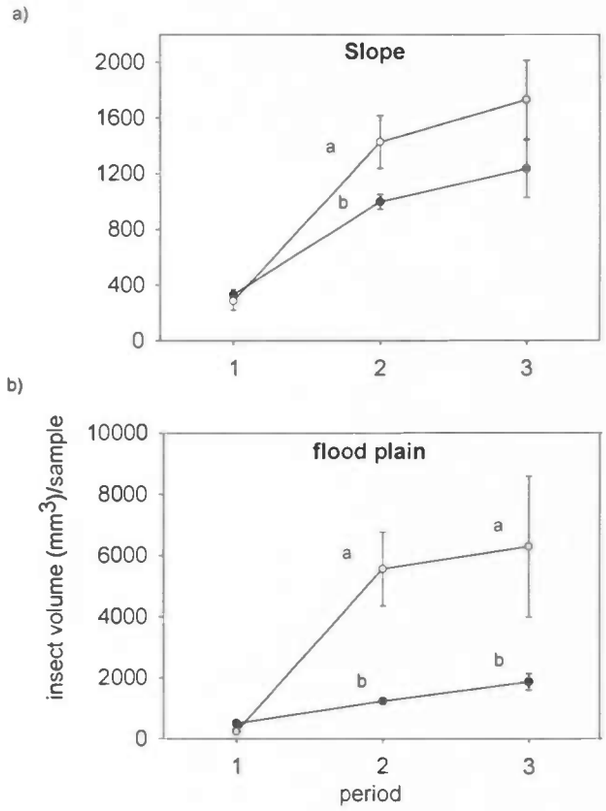


Figure (2a): Insect volume on the Slope over the three sample periods in monogamous territories (●) *and polygynous territories* (○). *The averages of all the samples taken are depicted (± S.E). The a and b's represent significant differences tested with Mann Whitney test.(2b): the same as for 2a with the difference that there is looked at the flood plain.*

In autumn (period 3) the polygynous territories in both areas are on average insect richer however no significant differences are found (Slope: Mann Whitney P=0.248, Flood plain P=0.192). The data of the pinus hill are not depicted because

although the polygynous territories were insect richer in period 2 and 3 this difference is not significant (in period 2 P=0.518, in period 3 P=0.264).

Territory choice

Which territories are preferred by the Dusky Wablers? To analyse this, the territories were divided into three groups. Territories that were occupied early by males (0-6 days after the first male), middle (7-11 days after first male) and late occupied territories (12-16 days after first male). The males that occupy a territory are not necessarily the males that will breed in that territory.

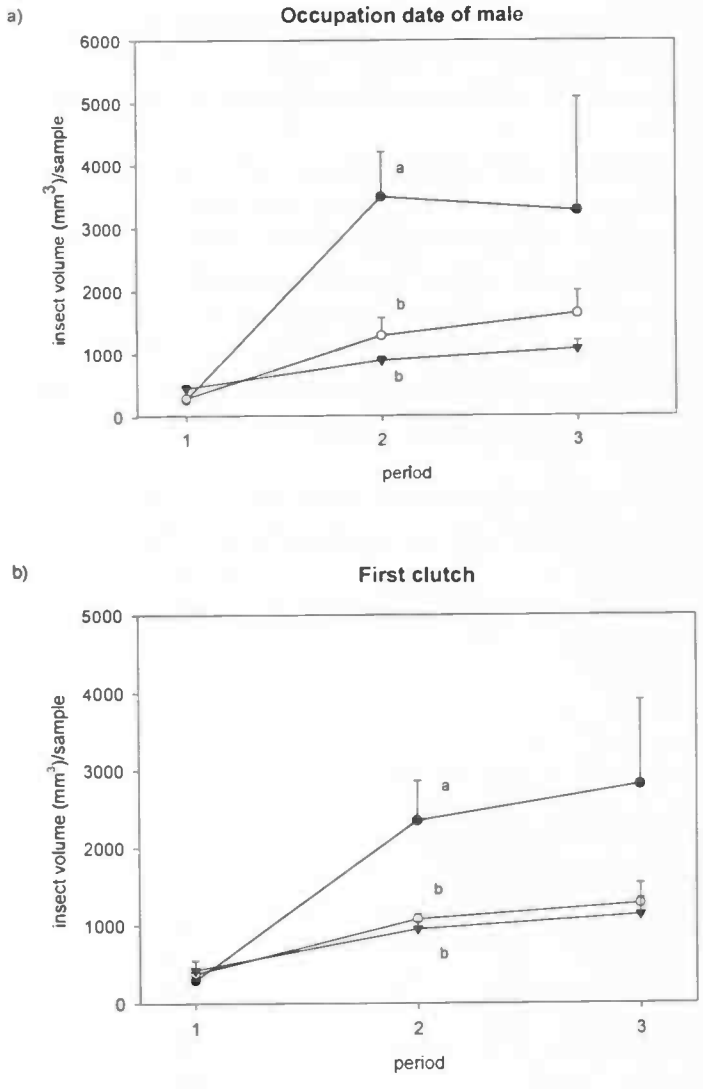


Figure 3 (a): The insect abundance in territories that are early occupied by males (●), compared to middle (○) and late (▼) male occupied territories. Averages ± S.E. have been depicted. The a and b's depict significant differences tested by Kruskal- Wallis followed by a non parametric multiple comparison. (b): same as figure 3 (a) with the difference that there is looked at territories with an early (●), middle (○) and late first clutch(▼). See text for further details.

Because later arriving males were observed removing settled males out of their territories, after a period of intensive chasing. If males base their territory choice on

insect availability, the competition should be greatest for the most food rich places. These territories are expected to be occupied as the first ones.

Early in the season males have a free choice where to settle. However, as shown in figure (3) the territories that have the lowest amount of insects were first occupied by males (this difference is nearly significant: Kruskal-Wallis χ^2=5.865, df=2, P=0.053).

Only in period 2 (summer) the territories that are occupied early by a male are significantly insect richer (Kruskal-Wallis χ^2=26.778, df=2, P<0.00). In period 3 again the early and late occupied territories show no difference (Kruskal-Wallis P=0.339).

The date at which females settle in territories is hard to determine. They are rather cryptic, so the first observation of a female is not a reliable measure of arrival date. That is the reason why the date of the first clutch of a female in a territory is used, attractive territories are expected to have earlier clutches than less attractive ones.

To look at female preferences for a territory, territories were divided into three groups. Territories with an early clutch (0-3 days after first egg of the season), middle (4-7 days after first egg) and territories with a late clutch (8-12 days after first egg).The picture is the same as with the occupation of males. The first clutches were found in the territories with the lowest insect abundance (however this is not significant: Kruskal-Wallis χ^2=1.205, df=2, P=0.547). The territories with an early clutch show again the sharpest increase in insects and are significantly richer only in period 2 (Kruskal-Wallis χ^2=6.287, df=2, P=0.043). In period 3 this difference is no longer significant (P=0.052).

So both the males and the females select for territories that are the most insect rich during the period of nestling feeding. How are they able to predict which territories will be good during that period?

There are big differences in the abundance of insects between different plant species. See figure (4).

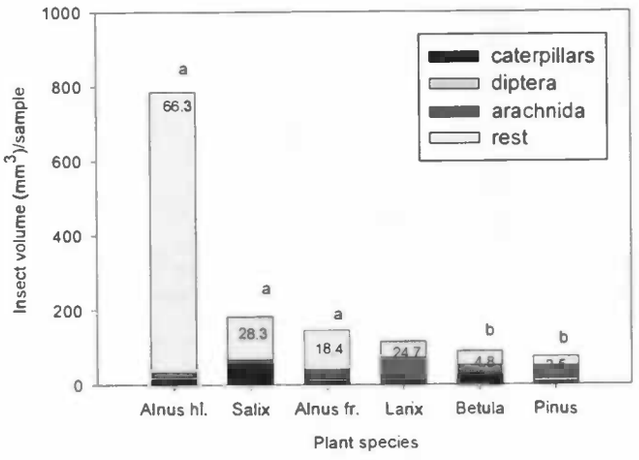


Figure 4): Average insect volumes, divided in the three most important food items and a rest group, of subsamples taken during whole season of different plant species. The plant species are: Alnus hirsuta, Salix spec., Alnus fruticosa, Larix cajandri, Betula middendorffii and Pinus pumila. (SE of total volume are written in the bars, significant differences of totals are indicated by the a's and b's, Kruskal-Wallis P<0.05)

There are significantly more insects (total volume) on *Alnus hirsuta, Salix* and *Alnus fruticosa* than on *Betula* and *Pinus* (Kruskal-Wallis χ^2=153.821, df=5, P<0.000, non parametric multiple comparison P<0.05).

During the season Alnus hirsuta shows the sharpest increase in total insect volume. In the beginning of the season there are hardly any insects found. This increases tremendously to more than 1000mm^3 per sample. This increase is largely due to a spectacular increase in the number of a homoptera species, *Cicada spec.*, during summer especially on *Alnus hirsuta*. This also explains the big rest group in figure 4) on *Alnus hirsuta*. It is known that this last prey item is being used as food for nestlings, but it is not known how important it is. However these cicades have a big impact on the data.

When there is looked the prey items of which is known that are important in nestling feeding, a somewhat different picture emerges. There is found that Birch and Willow are the richest in caterpillars (total caterpillar volume), the most selected food item. Larch and Pinus are richest in total volume of diptera and arachnida.

When Dusky warblers use the vegetation as a cue to select a territory that will be insect rich in summer, a different cover of plant species is expected in the most attractive (polygynous) territories.

The vegetation of polygynous and monogamous territories is indeed different as is illustrated in figure (5).

The data were first arcsinus transformed to account for the deviations from normality because of the percentages. Then the cover of every plant species were pair wise compared and tested with a T-test. The bachelor territories were kept outside the analysis because of two small sample size. The polygynous territories contained significantly more *Alnus hirsuta* (t=-3.438 df=47 p=0.001) and *Salix* (t=-3.128 df=47 p=0.003) than monogamous territories.

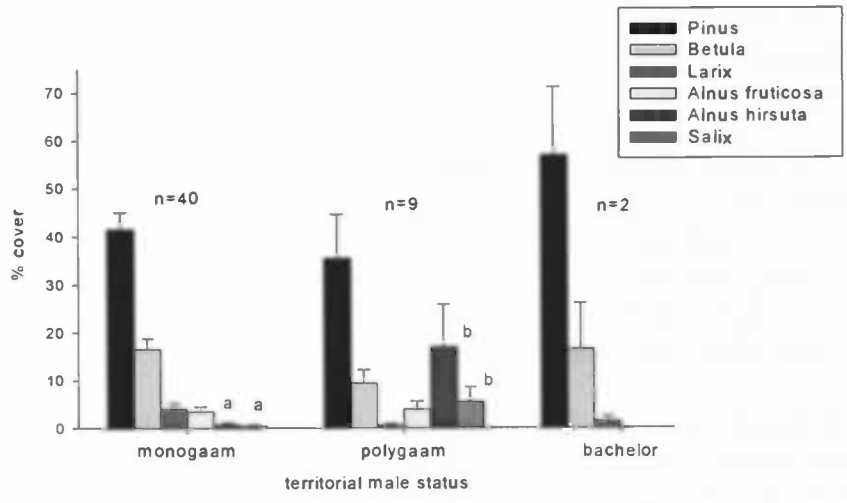


Figure (5): average cover of bush species (±SE) for monogamous, polygynous and territories occupied by only one male without females. The number of territories is indicated by 'n', a's en b's represent significant differences (t-test, P<0.05).

So it looks like a selection is made by the Dusky warblers for the territories that are richest in total insect volume.

Discussion

Territory choice

The first males that arrive in the area have a free choice were to settle. They should select for the best territories high in insect availability if this is the cue for territory choice. For a female it would be even more advantageous, than for a male, to select for a place rich in insects. Because Dusky Warbler females have to put a lot of effort in raising their chicks. In monogamous pairs females feed their nestlings more than their mates . A polygynous male only assists his primary female in feeding, the secondary females feeds her nestlings alone. So for a female it pays quite a lot to settle in a rich habitat.

In contrast to this, the places were the first males settle and were the first clutches are found are lowest in insect abundance. So both males and females select for the places with the poorest food conditions. This looks like a sub optimal choice. However these places show the sharpest increase in insects during the season and will peak in insect availability in the time the first eggs hatch and nestlings have to be fed. So they turn out to be the most food rich places in the time of highest food requirements.

How can they predict insect availability

It looks like the Dusky warbler is well able to predict which places will be the most insect rich in the time that they need it the most. How can they do this?

They can not do it by looking at the insects available at the time when they select there territories. Because the territories poorest in food in spring will be the best in summer.

When you look at the change in insect abundance between the most important bush species that occur in the habitats where the Dusky warblers are found, you find that there are marked differences. On *Alnus hirsuta* the total amount of insects shows an enormous increase. This is largely due to small homoptera (Cicada spec.). This is a insect with a size of 4*2*2 mm^3 which occurs in very large numbers during summer only on *Alnus hirsuta*. From the observations that were done on nest feeding parents could not be concluded that they were feeding these items. However one female that was feeding her nestlings was caught in a mist net and she was still holding her food in her bill which consisted of a caterpillar and three of these Cicades. There is a strong bias in these observations towards big easy recognizable prey items (like spiders, caterpillars and flies). Very small preys could never be determined with any agree of accurracy. So at least it is known that cicades are feed to nestlings, but to what extend could not be determined. They look like a suitable and attractive prey because they are very easy to gather (they can be pecked of the branches very easily) and occur in very large numbers.

If there is looked at the most important food items ,according to the obserations of nest feeding parents, like lepidoptera, arachnida and diptera than you find that the highest abundance is found on Betula middendorfii and Salix species. If there is looked only at caterpillars, which was the food most selected by the Dusky warbler, than again Betula and Salix are the most rich bush species. Interesting to see is that the insect availability is very low on Pinus bushes. It is the lowest when there is looked at all insect orders or only at caterpillars, and it is intermediair when there is looked at Arachnida and diptera. So Pinus looks like a marginal plant species for food. However this bush is found in most territories with the highest coverage. On average more than 40%, however it is totally lacking on two polygynous territories.

So the bush species that occur in a given territory can give information about insect availability. When Dusky warblers select for places high in *Alnus hirsuta*, Birch and Willow they will on average select the most food rich places. So they should select for territories which are rich in decidiuous bushes. However other features (as stated below) can also be important like if whether the vegetation offers suitable nesting places or whether it gives enough protection against predation.

How can polygyny be explained

Polygynous males must be attractive in some respect for females. A female can choose a male based on different cues.

First she can select for a high quality male. Females can select a male on basis of a special male trait. This trait can be a signal for the quality of the male. In this way the female selects for good genes for her offspring (as is illustrated in Arvidsson & Neergaard, 1991; Yasukawa, 1981). However when monogamous and polygynous males are compared no difference in a morphological trait could be detected (see Forstmeier 1999, in preparation). However females did seem to select for males with longer tails and longer and more pointed wings, these are the older males. This is probably the by-product of these males arriving earlier in the area and occupying the best territories. In Forstmeier 1999 (in preparation) is shown that females don't choose a mate on a male trait but they select a territory.

The question is what makes a territory attractive?

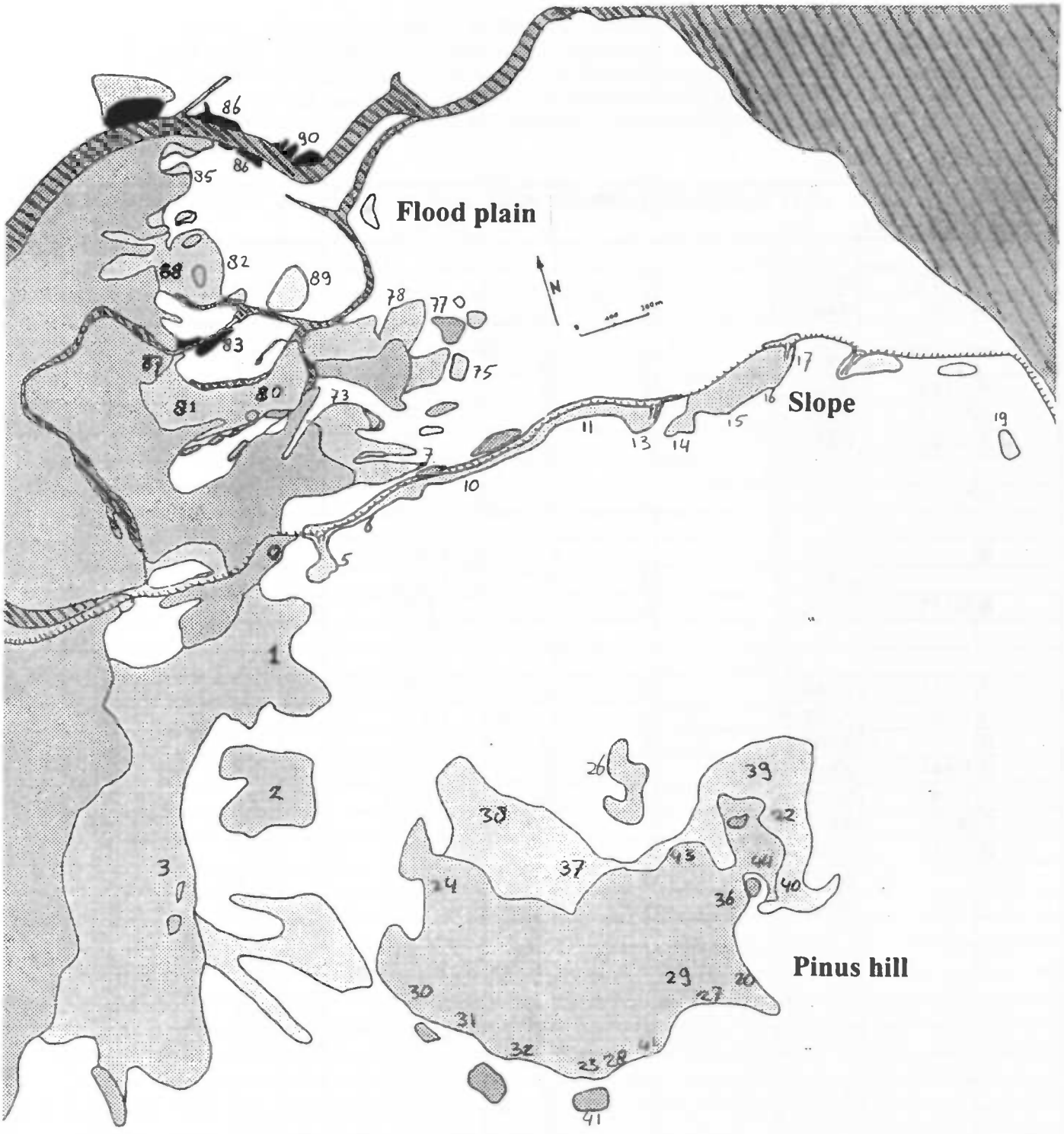
In this study is shown that males and females select territories wich are most food rich during nestling feeding. Also the polygynous territories have (on average) a higher insect availability in summer. If these territories are selected by means of vegetation characteristics there should be differences between monogamous and polygynous territories. Indeed is found that polygynous territories have a higher cover of *Alnus hirsuta* and Salix.

However when there is looked at each polygynous territory seperately, not all cases can be explained by food. Of the 9 polygynous territories in the whole study area, 4 are the richest in total insect volume of all territories that are occurring in that part of the study area (territories 10, 27, 83, 86). To find an explanation for the other 5, there is looked at insect groups seperately. One of these 5 (territory 90) unexplained territories was highest in total volume of Arachnida, diptera and lepidoptera, which are the food items most preferred by the Dusky warbler. It was also highest in lepidoptera volume, the prey most selected by the Dusky. That means that 4 territories in which polygyny occurs cannot be explained by food. Three of them are rich in food but not richer than most monogamous territories, and one (territorium 40) is almost the poorest territory of the study area. So in these places other factors must be responsible to explain polygyny.

There are two possibilities. First these territories can provide more suitable nesting sites. As is shown in a study by Savalli (1994) on widow birds. In this study is shown that breeding success of a male is depended on the number of cock nests and the average grass height. Another study of Evans and Burns (1996) showed that polygynous territories of Wrens had a higher number of available nest sites.

Another cue might be predation risk. In Hoi and Ille (1996), is shown that Marsh warblers select territories with the highest vegetation density which had the lowest predation risk. This last oppurtunity seems less likely in our study because the predation pressure was just as high in polygynous as in monogamous territories.

Appendix



Map of the study area.
The three areas are indicated (Slope, Pinus hill and Floodplain). The white areas are vegetation types dominated by Graminoids or Carex species. The light gray areas are characterised by a low cover of small *Pinus pumilla* bushes. The intermediate gray areas are dominated by a high cover of high Pinus. The darkest gray areas are taiga areas dominated by Larch. The black areas are dominated by Salix and Alnus hirsuta. The hatched areas are water, the river "The Malcachan" which flows into the sea of Ochotsk. All territories are indicated by the numbers.

Tabel (1): all territories divided in the three areas (S=slope, F=floodplain, P=pinushill). Occupation date of each territory of first male, number of females in the territory, number of nests (including replacement clutches) have been depicted. Per female breeding in the territory the number off eggs, number of nestlings, number of fledglings have been noted. Date of the first egg in every territory and date of predation, and type of predator have been noted. Predators are; F=fox, B=burunduk, C=crow, S=sorex).

Area	Terr	Occupationof ♂	# ♀	# nest	Individuel (♀)	eggs	Nestling	Fledglings	1.Ei	Predation date	Predator
S	0	7/06	1	1				0			
S	1	6/06	1	1	f1.2	6	6	0	23/06	21/07	F
S	2	4/06	1	1	f2.1	4	4	0	23/06	19/07	F
S	3	11/06	0	0							
S	4	7/06	1	1	f4.2	6	6	6	21/06		
S	5	8/06	1	1	f5.2	6	6	0	19/06	18/07	F
S	6	5/06	1	2	f6.1	6	6	0	18/06	11/07	B
S	6				f6.1	4	4	0	17/07	09/08	B
S	10	28/05	3	5	f10.2			0			
S	10				f10.2	5	0	0	07/07	17/07	B
S	10				f10.4			0			
S	10				f10.4			0			B
S	10				f13.1	6	6	6	17/06		
S	11	7/06	1	2	f8.1	>1	0	0	20/06	21/06	B
S	11				f8.1			0			
S	13	5/06	2	4	f13.2			0			
S	13				f13.2	4	4	0	04/07	31/07	F
S	13				f14.1	>4	0	0	16/06	19/06	C
S	13				f14.1	5	5	2	26/06	?	B
S	14	8/06	1	1	f14.2	5	5	0	22/06	14/07	B
S	15	2/06	1	1	f15.2	6	6	0	20/06	14/07	
S	16	7/06	1	1	f17.1	7		0	15/06	17/06	C
S	17	9/06	1	1	f17.3	5	4	2	18/06	14/07	B
S	19	11/06	1	1	f19.1	5	5	5	19/06		
P	20	27/05	1	1	f20.1	5	4	4	23/06		
P	22	3/06	1	1				0			
P	23	8/06									
P	24	4/06	1	1				0			
P	26	5/06	0	0							
P	27	4/06	3	4	f27.1			5	26/06		
P	27				f27.2			0			
P	27				f27.2	5	5	5	28/06		
P	27	6/06			f27.3	5	5	5	29/06		
P	28	8/06	1	1	f28.1	6	6	6	18/06		
P	29	8/06	1	1	f29.1	6	6	6	21/06		
P	30	9/06	1	1				0			
P	31	7/06	1	1	f31.1	6	6	6	21/06		
P	32		1	1	f32.1	5	5	5	22/06		
P	36	8/06									
P	37	8/06	2	3	f37.1	5		0	16/06	08/07	B
P	37				f37.2			0			
P	37				f37.2	5	0	0	03/07	21/07	B
P	38	8/06	1	1	f38.1	4	4	4	23/06		

P	39	8/06	1	1	f39.1	5	5	5	25/06			
P	40	8/06	2	4	f40.1	4		0				
P	40				f40.1		2	2	02/07			
P	40				f40.2			0				
P	40				f40.2	3	3	0	07/07	01/08	B	
P	41	10/06	1	1	f41.1	5	5	5	23/06			
P	42	12/06	1	1				0				
F	7	3/06	2	4	f7.1			0				
F	7				f7.1	5	5	5	04/07			
F	7				f7.2			0				
F	7				f7.2	>1	0	0	12/07	13/07	C	
F	73	11/06	1	1				0				
F	75	8/06	1	1	f75.1	4	0	0	21/06	04/07	B	
F	77	9/06	1	1	f77.1	5	0	0	23/06	06/07	B	
F	78	1/06	1	2	f78.1			0				
F	78				f78.1	>3	0	0	19/06	23/06	B	
F	80	7/06	1	1	f80.1	4	4	0	23/06	16/07	B	
F	81	10/06	1	1				0				
F	82	2/06	1	1	f82.1	5	5	5	20/06			
F	83	31/05	2	4	f83.1	>3	0	0	15/06	20/06	F	
F	83				f83.1	4	4	4	28/06			
F	83				f83.2		0	0		?	F	
F	83				f83.2	5	4	4	06/07			
F	84	4/06	1	1	f84.1	5	0	0	27/06	29/06	C	
F	86	5/06	3	5	f86.1	>2	0	0	09/07	11/07	C	
F	86				f86.1		0	0		02/07	B	
F	86				f86.2	4	4	4	27/06			
F	86				f86.3	4	4	0	05/07	01/08	S	
F	86				f86.3	5	0	0		?	S	
F	87	7/06	1	2	f87.1			0				
F	87				f87.1	4	0	0	11/07	13/07	C	
F	88	12/06	1	1				0				
F	89	12/06	1	1	f89.1	6	4	4	27/06			
F	90		5	7	f90.1	6	6	6	19/06			
F	90				f90.2	5	5	5	22/06			
F	90				f90.3	6	6	6	21/06			
F	90				f90.4			0				
F	90				f90.4	4	4	4	04/07			
F	90				f90.5			0				
F	90				f90.5			3	18/07			

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