

Themadag "Holenbroeders: invloeden van de verscheidenheid van de habitat op de broedbiologie van mezen"

Op zaterdag 24 oktober 1993 organiseerde de NOU in het gebouw van het IAC een themadag in Wageningen. Hieronder volgen samenvattingen van de lezingen die op deze dag gehouden werden.

Habitat diversity and breeding, the Van Balen approach

JOOST TINBERGEN

De conclusie van het proefschrift van Van Balen luidde als volgt: "De Koolmees vertoont in zijn broedseizoen en zijn legselgrootte een aantal aanpassingen die hem geschikt maken voor het broeden in eikenbossen en biotopen met een soortgelijke voedselsituatie. Populaties in dennenbossen kunnen hun broedseizoen niet aanpassen aan de lokale omstandigheden, met de hierboven beschreven consequentie."

In deze lezing is uiteengezet wat de basis van deze conclusie was aan de hand van gegevens die door Van Balen en zijn medewerkers zijn verzameld. Vervolgens is nagegaan in hoeverre er andere hypothesen zijn om de waarnemingen te verklaren. Meer en meer wordt gedacht dat individuele dieren hun legselgrootte en hun legdatum kunnen aanpassen aan hun individuele omstandigheden. Waarom vinden wij dan niet meer verschillen tussen de broedbiologie van Koolmezen in afhankelijkheid van hun broedbiotoop? Deze lezing gaf een indruk van het werk en de ideëenwereld van Van Balen en was tevens bedoeld als opstapje voor het werk dat door anderen op deze themadag zal worden besproken.

The effect of habitat diversity on clutch size in tits

ANDRÉ A. DHONDT

One of the many exciting findings of Kluyver in his classical 1951 paper was that in Great Tits the average clutch size decreased with population density. In 1970 Klomp reviewed clutch size in birds and emphasized that it remained unclear how density dependence in clutch size came about.

A recent review by Sinclair on density dependence shows that clutch size is found to be density dependent in some studies but not in others. Data from recent research support a new hypothesis that density independent clutch sizes are the result of habitat heterogeneity.

The brain teaser of the Mediterranean tits, or how to cope with environmental uncertainty

JACQUES BLONDEL

Surveys of breeding traits of tits in the Mediterranean region have shown a huge variation in such important traits as laying date and clutch size. Some populations may start to breed much earlier than British or Dutch tits, as expected from broad generalizations on geographical trends, whereas others may start to breed even later than Finnish ones. Why such a variation? The summer invasion of Mediterranean beaches by so many North European people gives the impression that living in this region is a sinecure. This is misleading, however, at least for land birds. Mediterranean landscapes are habitat mosaics characterized by 1) an overall low abundance of food with a large between-habitat variation, 2) a dry and hot summer that makes this season much more hard than winter for birds, especially because they have to recover after breeding and moult.



Koolmees met jong (links)
Flevoland, 8-7-'92, A. C.
Zwage

Long term studies in progress in five habitats characterized by their dominant tree species (summergreen or evergreen), and their degree of isolation, will give an insight in some basic mechanisms which determine the variation of breeding traits. Some issues on the genetical and environmental components of the decision-making concerning laying date and clutch size were discussed. Connected with this, some results on habitat selection and consequences of between-habitat dispersal on adaptedness/maladaptedness to local habitats were discussed.

Factors affecting the timing of laying in Great Tits

CHRIS M. PERRINS

Many female birds require large amounts of food to form their eggs. Small birds like Great Tits lay a clutch of eggs which weighs as much as the bird. Almost all the nutrients in these eggs are collected during the laying period. This means that they have to (approximately) gather sufficient food each day to make an egg.

Not surprisingly therefore, the birds need abundant food in order to be able to breed. Some of the variations in breeding behaviour have been explained in terms of weather or competition affecting the food supply; if food supplies are limited in the laying period, what can the birds do?

1) They can delay until the feeding conditions have improved. Evidence for this comes from the fact that the birds delay breeding in cold springs. Also, birds artificially fed extra food lay earlier. Surprisingly, however, there is no evidence that their timing is affected by variations in natural food supplies.

2) They could also lay a smaller clutch. There is some evidence that they do this: clutch size decreases with increasing density of breeding pairs. But, given that (presumably) food supply is increasing as the laying period progresses, the birds should not run out of resources for egg-laying, so that once they have started laying, shortage of food should not cause them to stop laying. Fitting with this suggestion that the birds are not limited from laying extra eggs by food shortage, artificial feeding does not lead to an increase in the number of eggs laid, though, in contrast to laying date, clutch size is modified by variations in natural food supplies. So are most of the variations in clutch size not the result of varying food supply for the laying female, but rather adaptations for matching the brood size to the expected food supply during the nesting period? Variations in their caterpillar food supply will be critical at nestling period and their variations in clutch size may reflect this.

3) If food is scarce during laying, a large clutch size could still be laid by extending the interval between eggs; some species do lay at 36 or 48-hour intervals. However, most small birds lay soon after dawn, perhaps because this minimises the number of daylight hours for which the birds are carrying eggs. If this is the reason,

possibly the choice is between laying at one or two day intervals; the latter would be disadvantageous for the Great Tit since it would greatly delay the completion of the clutch and hence the date at which the eggs hatch; this would lead to a marked reduction in the number of young that survive.

4) They could lay smaller eggs. Laying smaller eggs has many disadvantages. Hatching success and fledging are lower from smaller eggs and chick weight at fifteen days is also slightly lower for chicks from smaller eggs. Since lighter chicks survive less well than heavy ones, this means that, compared with parents laying large eggs, parents laying smaller eggs are slightly less likely to produce young which survive to become breeders. Do these disadvantages outweigh the advantages of laying earlier?

Lokale aanpassing en fenotypische plasticiteit: de centrale rol van 'gene flow'

ARIE VAN NOORDWIJK

Van Balen heeft laten zien dat Koolmezen slechts matig aangepast zijn aan het broeden in dennenbossen. In het algemeen zijn er twee oplossingen voor het probleem dat in verschillende habitats verschillende selectiedrukken heersen: specialisatie of flexibiliteit. Specialisatie kan zich alleen ontwikkelen in geïsoleerde populaties. Isolatie in kleine habitatfragmenten heeft echter vergaande consequenties voor de populatiedynamica en er moet ook met de effecten van inteelt rekening worden gehouden. Flexibiliteit vereist echter een ingewikkeld programma, waarin de omgeving goed gemeten en voorspeld kan worden.

Aan de hand van gegevens en analyses wordt duidelijk dat bij Koolmezen zowel een zekere specialisatie als een zekere flexibiliteit kan worden aangetoond. In deze lezing is vooral nagegaan waar de grootste hiaten in onze kennis zitten. Twee van de belangrijkste elementen waarvan wij nog weinig weten zijn dispersie (waar zijn individuen geboren en waar broeden ze) en de fysiologische mechanismen waardoor mezen hun reproductie aanpassen aan de lokale omstandigheden.

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