

A short-term defence of fruit-bearing plants by the blackcap (*Sylvia atricapilla*)

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The defence of trophic resources by small fruit-eating passeriformes has been the subject of numerous studies concerned with the species involved, the types of defended resources (the different species of plants in the period of fruit ripening), the activity of defence, and the coevolutionary implications of the relationship between the plants producing fruits and the agents of seed dispersion, the birds (Zahavi 1971; Tye 1986; Snow & Snow 1986; Moore 1988).

The defence of food sources obviously leads to an advantage over conspecifics, which are forced to search for other suitable fruit-bearing plants. However, it does involve a certain expenditure of energy to chase away possible competitors, which are not only conspecific.

This behaviour is performed in particular by the Mistle Thrush *Turdus viscivorus*, although the Blackbird *Turdus merula* and the Fieldfare *Turdus pilaris* practise it frequently. It has been observed mainly during the winter in Central and Northern Europe. Within this context, there are also aspects of intergeneric coevolution connected with the competition for food among the Turdidae; in this regard, the large size of the Mistle Thrush would be related to a more effective defence against competitors (Snow & Snow 1984). Holly *Ilex aquifolium* is by far the species of plant most actively defended by the Mistle Thrush, followed by Hawthorn *Crataegus* ssp., while even some other plants are defended, such as Ivy *Hedera helix* or Yew *Taxus baccata* (Snow & Snow 1988).

The aim of this communication is to show the modality of defence of a temporary pantry by Blackcap and to put in evidence cases of short-term defence in a Mediterranean area.

The study area is an urban courtyard with a small garden, of about 2000 m² in the city of Pesaro, which I am able to monitor each winter. In addition to some

Japanese Persimmon *Diospyros kaki*, the area includes isolated trees of a few, mainly domestic, fruit-bearing species: *Prunus domestica*, *Prunus avium*, *Prunus armeniaca*, *Pirus communis*, *Ficus carica*, *Eriobotrya japonica*, *Ligustrum japonica*. Since none of these plants has fruit in winter (except the *Ligustrum* until December-January), only the persimmon, which have some fruit on their branches until January-February, are utilized by the wintering birds during this period. The birds normally feeding on persimmon were: Blackcap *Sylvia atricapilla*, Blackbird *Turdus merula*, Great Tit *Parus major*, Robin *Erithacus rubecula*, Italian Sparrow *Passer italiae* and, occasionally according to the migratory situation, also Goldcrest *Regulus regulus* and Firecrest *Regulus ignicapillus*.

This period of defence of trophic resources was observed in the first few days of February 1993 and in December 1994. In 1993 following repeated frost, there remained a single fruit among the branches of three adjacent persimmon trees, habitually frequented, also contemporaneously, by different species of small passeriformes without evident manifestations of reciprocal aggression. During the winter 1993-94 there were no other occurrences of defence, but in December 1994 another case was observed.

The area around the persimmon trees also represented a nesting territory since a pair of Blackcaps had nested there during the preceding season, the nest being located in a domestic rose bush.

The area was observed for 3 hours on February 5 1993 (7:30-9:30 and 15:30-16:30) and for 1 hour in the morning on the following days until February 15. The number of hours of observation in 1994 was 13, between December 9 and the following days.

The 1993 case is described in detail because it shows the main behaviours of the defending bird.

On the morning of February 5, a male Blackcap continuously patrolled the foliage and engaged in a

series of attacks, mainly against a female Blackcap. The defensive behaviour could be classified into the following categories:

- 1) - patrolling: the male continued to move among the branches around the fruit;
- 2) - chasing attacks: he moved toward the other birds in small flights and jumps from branch to branch and chased them from their perches. The species attacked were Blackcap (males and females), Italian Sparrow, Robin and Goldcrest.
- 3) - physical attack: Physical attacks were made only against other Blackcaps, on the whole, the most severe aggression was manifested against a female Blackcap who tried to approach the food source. The aggressor flew toward the female, drove her away from her perches and engaged in an aerial duel, with vocalizations, during which the two contenders clashed continuously, the male Blackcap made dives at the female, and they struck each other with wing beats and contacts of their claws. During the physical clashes, there were brief falls of a few meters by the two entwined contenders who sometimes finished on the ground where they continued to fight for a few seconds. After the series of attacks the female moved away to other trees.

In the period in which the male was alone, he patrolled continuously and sometimes approached the fruit, giving it a few pecks. On February 6, the male Blackcap continued to patrol the tree but during the night the last persimmon fruit fell to the ground.

A further observation is that the Blackcaps, which before had never utilized persimmons that had fallen to the ground, now did begin to use them; in addition to the defending male, a Sparrow and a Robin were observed to peck at the fallen fruit.

In subsequent observations until February 15, the male Blackcap was seen to patrol his own persimmon tree and still to show aggressive behaviour toward other small passeriformes though less overt and without physical contact; however, the same species were attacked even if they perched on the other persimmon trees. In this period, the area was frequented much less, the female no longer appeared and only a few times were there interactions with the Sparrow, the Warblers and, rarely, the Robin. The male Blackcap stayed in the region and defended the area until February 20 after which he moved away.

The 1994 case was observed on the 9th of December and the last persimmon fruit was defended by a female. The female defended the fruit with the same modalities as the male, mainly against two other Blackcaps (a male and a female), with patrolling, chasing attacks and, against the male, physical attacks.

On the same day, at 13.30 the persimmon fruit fall to the ground. The female patrolled the area, but not all the time, and the next day she abandoned the area.

During her absence two other Blackcaps arrived, both males, and they pecked the part of the persimmon fruit remaining on the branch, but without manifestations of aggressiveness.

The behaviour of the Blackcap in this area is very similar to that studied experimentally in the White Wagtail *Motacilla alba* by Zahavi (1971) and the Fieldfare by Type (1986). In those studies, it was found that, in conditions of widely-distributed and abundant resources, feeding by the Wagtail and Fieldfare occurred without intraspecific aggressive behaviour. However, when the resources were artificially reduced and limited, aggressive behaviours and defence of food resources began to appear. As a matter of fact, also in the present case, when food was well scattered, the Blackcaps fed on the numerous fruits of the persimmon trees without either inter- or intraspecific aggression. However, when the food became really scarce, the observed Blackcaps started to defend in a rather aggressive manner the only fruit left on the tree.

Our Blackcaps showed also that both males and females carry out this defensive behaviour and that the resource is really chosen by a single animal. If the resources are not considered as a personal pantry, feeding Blackcaps are not aggressive toward each other. We may further observe that the intraspecific defence was strongest because physical attacks were made only against other Blackcaps.

Short-term defence of fruit-bearing plants over periods of a few days was observed also by Pratt (1988) in a tropical environment with an abundance of fruit. The behaviour of the Blackcaps in Italy would appear to be a short-term defence of a fruit resource in an environment with good availability, in contrast to the long-term defence found further North in environments that are poorer in quantity and types of fruit.

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Riassunto - La difesa di piante con frutti che costituiscono una risorsa alimentare in situazioni di carenza di cibo risulta un comportamento abbastanza comune in diverse specie di turdidi in Nord Europa. Nel presente lavoro sono stati analizzati casi di difesa a breve termine di risorse alimentari di Capinera su frutti di *Diospyros kaki*. La difesa è stata osservata nel 1993 e nel 1994 ed effettuata sia da un maschio che da una femmina contro diverse altre specie di passeriformi anche se in maniera più accentuata con conspecifici, con diverse modalità: pattugliamento, attacco con picchiate, attacco con scontro fisico. Questo

comportamento è attuato da un singolo animale che difende un albero-dispensa. Questa modalità di difesa, proprio perchè temporanea, risulta meno accentuata in ambiente mediterraneo, meno estremo e con maggiori risorse invernali disponibili, che non nel Nord dell'Europa.

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