

Magpies, *Pica pica*, at the southern limit of their range actively select their thermal environment at high ambient temperatures

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Abstract. The effect of high ambient temperatures on the behaviour of Magpies (*Pica pica*) was assessed in northern Cyprus, which marks the southern limit of their European range. Magpies actively selected their thermal environment when temperatures rose above 31°C, by retreating to shaded areas. On days when the temperature was higher, Magpies appeared to spend more time perched in the shade and less time foraging. Flying and foraging activities were generally restricted to cooler parts of the day. Magpies were rarely seen panting or drinking and gular fluttering was not observed. We suggest that utilisation of shade is important for Magpies to regulate their body temperature, allowing them to remain common at the southern limit of their range despite experiencing high temperatures.

Kurzfassung. Bei der Elster (*Pica pica*) wurde im nördlichen Zypern, dem südlichsten europäischen Vorkommen der Art, der Effekt hoher Umgebungstemperaturen auf das Verhalten untersucht. Wenn die Umgebungstemperaturen über 31°C ansteigen, wählen Elstern aktiv ihre thermische Umwelt aus, indem sie sich an schattige Plätze zurückziehen. An Tagen mit hohen Umgebungstemperaturen verbringen Elstern mehr Zeit im Schatten mit Ruheverhalten, und dafür weniger für Nahrungssuche. Fliegen und Nahrungssuche sind dann normalerweise auf die kühleren Tagesstunden beschränkt. Erhöhte Atemfrequenz und Trinken wurde nur selten bemerkt, Hecheln gar nicht. Wir vermuten, dass die Ausnutzung von Schatten für die Thermoregulation der Elster von großer Bedeutung ist, und das Vorhandensein schattiger Plätze die Voraussetzung für das häufige Vorkommen an der Südgrenze ihres Brutareals trotz der hohen Umgebungstemperaturen ist.

Key words. Behavioural thermoregulation, Magpie, geographical distribution, northern Cyprus, Mediterranean, heat stress.

Introduction

Abiotic factors, such as climate, have long been thought to be the primary driving force that determines the distribution and abundance of species (ANDREWARTHA & BIRCH 1954). However, remarkably little is known of the factors that limit the broad geographical ranges occupied by avian species. While the winter range limits of birds in relation to cold stress has been investigated (ROOT 1988), the effect of heat stress in shaping avian distributions has received little attention. The extent to which temperature restricts the distribution of avian species may be investigated by the study of widely distributed resident species such as the Magpie (*Pica pica*), a non-migratory bird which is found throughout most of the northern hemisphere (BIRKHEAD 1991). In the Palaearctic its distribution ranges from Britain and Ireland in the west, to the Kamchatka Peninsula in eastern Russia. In Europe it extends from