

Geographical Variation in Size of White-browed Babblers in Western Australia

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Introduction

Australian babblers are mainly birds of dry country habitats, such as acacia scrub although they may also occupy eucalypt woodland (Blakers *et al.* 1984). In Western Australia, the White-browed Babbler *Pomatostomus superciliosus* (Vigors and Horsfield) occurs north to the Tropic of Capricorn but is not found on the Swan coastal sandplain or in the dry sclerophyll forest of the South-West (Ford 1971). However, populations of White-browed Babblers are found in the wet sclerophyll forest of the South-West, especially where the understorey contains thickets of *Acacia* or *Trymalium*.

Results and Discussion

White-browed Babblers caught in the Karri forest understorey, near Pemberton (34°S) were substantially heavier than those caught towards the northern extremity of the species distribution, near Shark Bay (26°S) (Table 1). Birds from intermediate latitudes, near Kalgoorlie and at the Eyre Bird Observatory on the Great Australian Bight, were intermediate in size. Short-billed or other obviously immature birds were not included in these samples. Repeated captures of individually marked birds at Eyre revealed that seasonal and annual variation in weight was small compared to differences between locations. Two separate collections each at Shark Bay and Pemberton confirmed that the differences observed were not due to local anomalies.

Although some authors (Cowles 1964; Macdonald 1973) have suggested that the Gascoyne area of Western Australia contains a smaller race of White-browed Babblers, Ford (1971) concluded that there was a south-north cline of decreasing size in Western Australia and that no such subspecies existed. Ford (1971) divided the museum specimens he measured into northern and southern groups, the northern group corresponding closely to our Shark Bay sample. His measurements agree closely with ours for live birds from this area (Table 1). Specimens comprising his southern group came from areas to the east of the sclerophyll forests and were relatively large.

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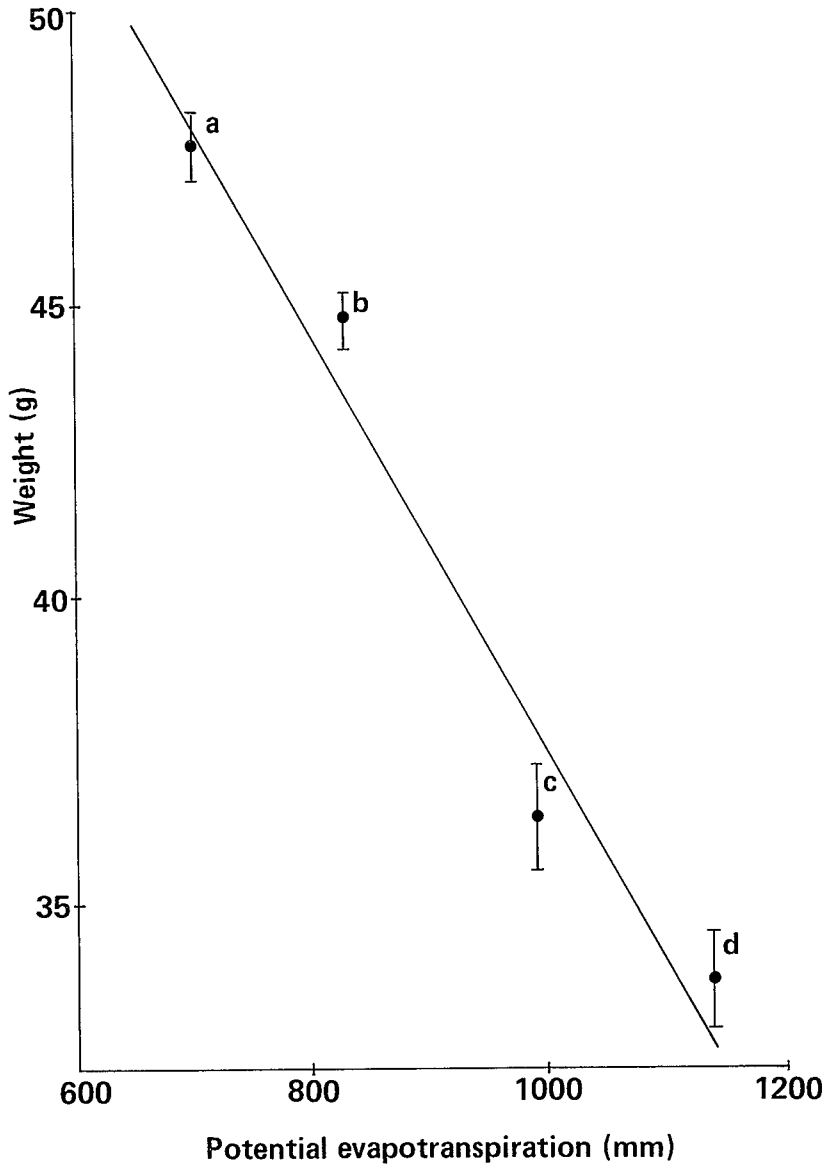


Figure 1 Relationship between mean weights (\pm S. E.) of White-browed Babblers from four areas of Western Australia, and the average potential evapotranspirations in those areas (from Mather 1963). The areas are Pemberton (a), Eyre (b), Kalgoorlie (c) and Shark Bay (d). The equation for the regression line is: Mean weight (g) = $73.1 - 0.0358$ potential evapotranspiration (mm).

Table 1: The mean (\pm S.E.) weights, wing lengths and bill lengths of White-browed Babblers from different regions of Western Australia. Numbers measured shown in parentheses.

Location	Latitude	Weight (g)	Wing Length (mm)	Bill Length (mm)
Shark Bay (10)	26°S	33.4 \pm 0.8	77.2 \pm 0.6	26.4 \pm 0.6
Shark Bay (14) (Ford 1971: North)	26-28°S	—	77.3 \pm 0.7	26.1 \pm 0.3
Kalgoorlie (8)	31°S	36.2 \pm 0.9	80.1 \pm 0.9	26.2 \pm 0.8
Eyre (61)	32°S	44.7 \pm 0.5	84.6 \pm 0.4	—
Wheatbelt (29) (Ford 1971: South)	31-34°S	—	84.9 \pm 0.7	28.1 \pm 0.3
Pemberton (31)	34°S	47.7 \pm 0.6	82.2 \pm 0.7	30.3 \pm 0.5

Weight is probably the best general measure of body size (Amadon 1944), to which it is proportional, whereas appendages may vary independently of each other or of body size (Grant 1965). In the babblers examined weight decreased northwards, as noted by Ford (1971), but not simply with latitude. There was, however, a clear relationship (Figure 1) between the mean weight of babblers at a location and its potential evapotranspiration (Mather 1963), a measure which combines the effects of both temperature and rainfall ($r_2 = +0.98$; $P < 0.05$). Several studies of geographical variation in birds have found size to be related more to the combined effects of temperature and humidity than to either factor alone (James 1970; Niles 1973; Wooller *et al.* 1985).

Singing Honeyeaters *Meliphaga virescens* (Vieillot) throughout Australia show similar clinal variation in weight, apparently related to climatic factors, in accord with Bergmann's rule (Wooller *et al.* 1985). In Western Australia, Golden Whistlers *Pachycephala pectoralis* (Latham) also show a clinal increase in size southwards (Ford 1971). Other standard measurements of White-browed Babblers, such as wing length and bill length, also showed similar trends but with occasional anomalies. For instance, babblers from Pemberton had comparatively short wings, which may be related to the much greater density of the vegetation in wet sclerophyll than elsewhere.

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