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Short communication

Chromosome number of New Zealand specimens of *Atriplex billardierei*, Chenopodiaceae

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Abstract Meiotic chromosome counts of $n = 9$ ($2n = 9II$) have been determined from wild plants of *Atriplex* (subgenus *Theleophyton*) *billardierei* gathered in New Zealand and on Chatham Island. *Atriplex billardierei* is an endangered species within New Zealand but remains abundant on Chatham Island.

Keywords chromosome numbers; Chenopodiaceae; *Atriplex billardierei*; *Theleophyton billardierei*; New Zealand flora

INTRODUCTION

Atriplex billardierei (Moq.) Hook.f. (Chenopodiaceae) is an annual herb of coastal sandy

beaches and was formerly widespread in Australasia (Wilson 1984; P. J. de Lange unpubl. data). Although it was treated by Allan (1961) as the sole member of the monotypic genus *Theleophyton*, Wilson (1984) presented evidence for retaining this species within *Atriplex* (albeit within its own subgenus, *Theleophyton*) and his taxonomy is followed here.

Atriplex billardierei was once widespread throughout New Zealand (Cheeseman 1925; Allan 1961), but is now an endangered species (Cameron et al. 1995). Current records suggest that *A. billardierei* is now extinct in the South Island and Stewart Island (Wilson 1987; Wilson & Given 1989), and almost extinct in the North Island with only two small populations known from Whareana and Waikuku Beaches near North Cape (P. J. de Lange unpubl. data). Fortunately, the species remains abundant on the main island of the Chathams group, Chatham (Rekohu) Island (Wilson & Given 1989; P. J. de Lange & G. M. Crowcroft unpubl. data). Herbarium and field evidence suggests that *A. billardierei* may now be extinct (cf. Wilson 1984) in continental Australia (P. O'Callaghan pers. comm.; P. J. de Lange unpubl. data), but small populations persist on some of the more remote beaches of Tasmania where this species may at times be seasonally abundant (A. Buchanan and A. Rozefelds pers. comm.).

Possibly because of its present scarcity and annual habit, the chromosome number of *A. billardierei* has not been counted. This paper reports the chromosome number of *A. billardierei* from two New Zealand botanical locations for the species, Waikuku Beach (North Cape) and Chatham Island. Material of Australian origin has yet to be studied.

MATERIALS AND METHODS

The origin of the plant material studied is given in Table 1. Young flower buds and root tips were sampled from not less than 10 plants from each population studied. Voucher specimens taken from the

plants counted are lodged in the Herbarium of the Auckland Institute and Museum (AK). Chromosome numbers were obtained from developing staminate flowers sampled from the wild. The flowers were fixed in ethanol:chloroform:acetic acid, 6:3:1 for 12 hours at room temperature and then transferred to 70% ethanol for storage. Meiosis was observed in pollen mother cells that were squashed on a slide in a drop of FLP orcein (Jackson 1973). Attempts were also made to sample root tips from the field and from cultivated material. These proved unsuitable for counting because of their small size and the difficulty of obtaining undamaged actively growing material. Since the collection of root tips involved removing whole plants, not an appropriate option for a rare plant, only a small number of collections was made.

RESULTS AND DISCUSSION

Clear and unambiguous chromosome counts were obtained from plants from both sites (Table 1). In both cases metaphase I and anaphase I/telophase I cells had either $2n = 9\text{II}$ or $n = 9$. The chromosomes were small (Fig. 1) and even if mitotic cells were available they would probably be too small for karyotype analysis.

Chromosome counts have not been obtained from the only other indisputably indigenous New Zealand *Atriplex* species, *A. buchananii* (Webb et al. 1988; Druce 1993); however, $2n = 9\text{II}$ has been found in 26 species recorded from California (Nobs 1975) and 27 species endemic to Australia (Nobs 1979). Nobs (1975) considered that $x = 9$ is the base number for *Atriplex*, as is also the case for the majority of the Chenopodiaceae.

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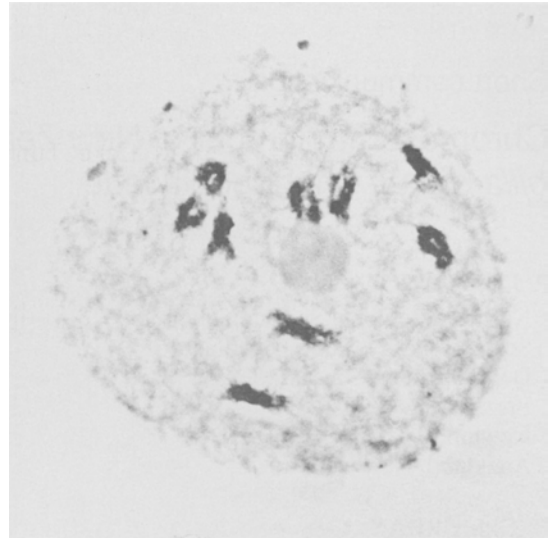


Fig. 1 Chromosomes at diakinesis of *Atriplex billardierei* from Chatham Island (AK 227267). Scale bar — = 1 μm .

Amanda Baird, Chatham Island Field Centre, Canterbury Conservancy, Department of Conservation for assistance with access to Chatham Island populations of *A. billardierei*. Alex Buchanan, Andrew Rozefelds (HO), Paul Wilson (PERTH), and Patrick O'Callaghan (Victoria Institute of Marine Sciences) commented on the present-day continental Australian and Tasmanian distribution of *A. billardierei*. Paul Wilson and Murray Dawson kindly reviewed a draft of this paper.

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Table 1 Chromosome numbers and place of origin for the plants studied

Species	n	Collection details	Herbarium voucher
<i>Atriplex billardierei</i>	9	New Zealand, North Cape, Waikuku Flats, Waikuku Beach, near outlet of Te Kanakana Stream.	AK 225314, 225956
<i>Atriplex billardierei</i>	9	New Zealand, Chatham (Rekohu) Island, Kaingaroa Beach	AK 227267–9

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