

CUPRESSACEAE

TETRACLINIS ARTICULATA, A HITHERTO UNRECORDED NATURALISED ALIEN CONIFER IN SOUTH AFRICA

INTRODUCTION

Tetraclinis articulata, a monotypic Mediterranean genus of the Cupressaceae allied to *Widdringtonia* and *Callitris*, is a native of Morocco, Algeria and Malta with a small outlying population near Cartagena in south-east Spain (Dallimore & Jackson 1974; Krüssman 1972). While inspecting various exotic trees in the historic naval cemetery at Simonstown with the late Prof. E. A. Schelpe in 1984, several randomly planted mature specimens as well as naturalised saplings were observed which were later positively identified by us as *Tetraclinis articulata*. Subsequently, two additional groups were found further up Simonstown Mountain flanking Runciman Drive, above the cemetery. The latter groups consisted of approximately 18 mature specimens planted at regular intervals in rows and measuring between 10 and 12 metres in height with

the trunk diameter at chest height ranging from 250 to 400 mm. (Figure 9). Moreover, saplings as well as young seedlings in various stages of development were also noted on adjacent undeveloped plots and on the surrounding mountainside above Simonstown, competing with other alien trees such as various *Eucalyptus* and *Acacia* species. It appears that *Tetraclinis* is in the process of becoming naturalised locally in the environs of Simonstown, especially in disturbed areas, although at this stage it shows no indication of becoming a rampant arborescent pest plant in fynbos. In late summer (February, March) the cones open spontaneously releasing their seeds, which have two laterally placed wings to assist in their dispersal (Figure 10). Under windy conditions *Tetraclinis* seeds are probably distributed several hundred metres from the parent plants. When felled or injured the trees coppice extensively.

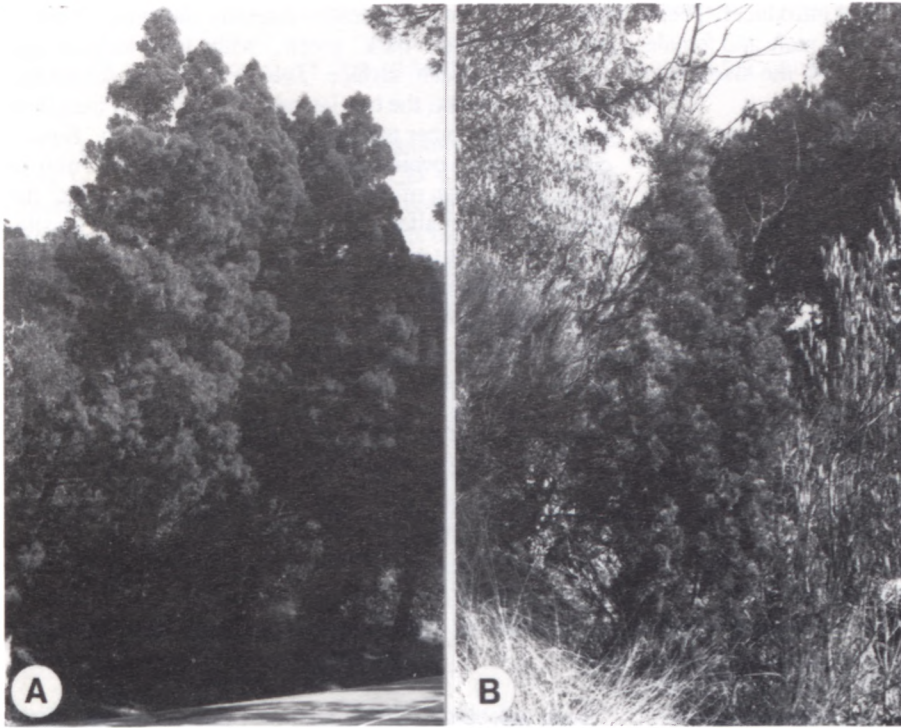


FIGURE 9.—A, mature group of *Tetraclinis articulata* on Runciman Drive, Simonstown; B, naturalised *T. articulata* seedling on Simonstown Mountain in association with *Elytropappus rhinocerotis* and *Acacia cyclops*.

ESTABLISHMENT AND DATE OF INTRODUCTION TO SOUTH AFRICA

With the exception of a single record of a specimen cultivated at The Wilds, Johannesburg in the 1950's, the presence of *Tetraclinis articulata* has not been noted in South Africa as an ornamental, a commercial forest species, or as an alien adventive either in local herbaria, or in publications listing conifers cultivated in this country (Poynton 1984; Poynton pers. comm.; Wells *et al.* 1986). The Simonstown plantings and adjacent naturalised occurrences of this species have apparently hitherto been overlooked and may well be the only major occurrence of the species in our region. Since the Royal Navy formerly maintained important naval bases at Simonstown and on Malta, and as *Tetraclinis* is indigenous to Malta, it seems plausible to assume that the Simonstown plantings were

introduced either as seed or seedlings from Malta by Royal Navy personnel at some stage in the past. All the mature *Tetraclinis* trees at Simonstown are of comparable age. Judging from their size they appear to be fully mature. A photograph in the Simonstown Museum depicts a formal Empire Day (May 24th) tree-planting ceremony at which the *Tetraclinis* trees on Runciman Drive were planted out as half metre seedlings from paraffin-tin containers. Museum staff have dated this photograph as having been taken between 1904 and 1910. Additional confirmation of the date of this event appears in a brochure entitled 'Souvenir of Simonstown 1910' (Anon. 1910) which also records that the town council had spent £795 over the previous five years (i.e. 1905–1910) planting trees in the Simonstown Municipal area. How and why the seed or seedlings of *T. articulata* were brought to South Africa is unclear but it appears to have been a single isolated

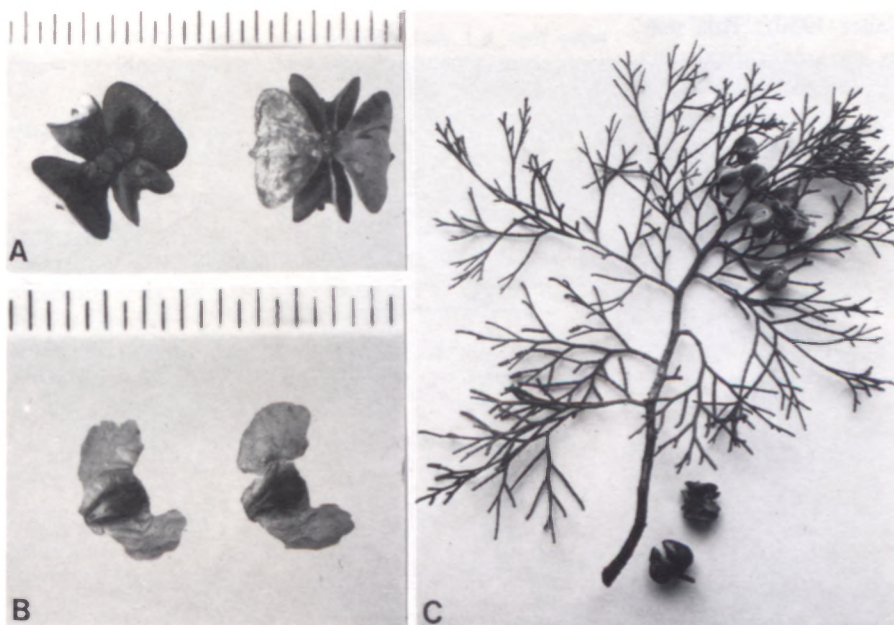


FIGURE 10.—A, dehiscent female cones of *Tetraclinis articulata*, dorsal & ventral views; B, seeds showing prominent lateral wings; C, fruiting branch bearing immature female cones. Each scale division = 2 mm.

event instigated by an enthusiastic plant introducer. These trees have evidently been producing both male and female cones for several decades as indicated by the size (3–4 m tall) of the largest self-sown saplings.

NATURAL OCCURRENCE AND USES

Extensive forests of *Tetraclinis* cover some 350 000 ha in Morocco, where this species is an important source of a dark, fragrant timber (Howes 1949). It is among the ecologically dominant tree species of Mediterranean woodland in North Africa. White (1983) recognises *Tetraclinis articulata* forest as a distinct plant community within the broader classification of Mediterranean sclerophyllous forest occurring from southern Morocco to Tunisia in the oceanic and maritime semi-arid zones (rainfall 500–700 mm per year), between sea level and 1500 metres, on both calcareous and siliceous soils. Well-grown *Tetraclinis* forest is from 12 m to 15 m tall (White 1983). The hard, short-grained timber has been esteemed since Roman times and may be finely figured like birds-eye maple (Dallimore & Jackson 1974). Apart from producing a commercially valuable timber, this species is also the source of a resin which exudes from the trunk known as African or Mogador Sandarac and was used in the manufacture of clear varnishes (Howes 1949).

POTENTIAL USES IN SOUTH AFRICA

Tetraclinis articulata is clearly a very suitable tree for semi-arid Mediterranean-type climatic conditions, having an ability to withstand considerable periods of drought (Dallimore & Jackson 1974).

It would probably be worth cultivating in the more arid western areas of the winter rainfall region as a street tree or an ornamental and might also possibly serve as a commercial source of timber. However, in the moister regions of the western Cape, e.g. the Cape Peninsula, there are indications that this species could invade natural fynbos on a limited scale.

No mention of *Tetraclinis* was made in the *Flora of the Cape Peninsula* (Adamson & Salter 1950). This may indicate that the spread of seedlings into areas surrounding the original plantings has only become noticeable in the last 40 years and that prior to 1950, seedling spread was not especially evident due perhaps to the fact that the original plantings had only recently reached sexual maturity. The group at Simonstown now produces an abundant seed crop annually, the cones dehiscing mainly in February and March.

DESCRIPTION

***Tetraclinis articulata* (Vahl) Masters** in *Journal of the Royal Horticultural Society*: 250 (1892); Masters: 14 (1893); Tutin: 38 (1964); Dallimore & Jackson: 602 (1974); Krüssmann: 318 (1972).

Thuja articulata Vahl: 96 (1794).

A monoecious, broadly conical evergreen tree 12–15 m tall; trunk up to 0.5 m in diam. *Bark* reticulately fissured

scaly, grey-brown. *Branchlets* laterally flattened, dichotomous, glabrous, dark green, with two longitudinal striations on each surface. *Leaves* in fours, scale-like, adnate-decurrent, the two laterals slightly larger than, and enclosing, the other pair. *Cones* terminal, solitary. *Female cones* stalked, ovoid, 4-valved, glaucous, 10–15 mm in diam., one pair of cone scales cordate-triangular, the opposite pair smaller, ovate-truncate. *Male cones* sessile, 8–10 × 3 mm, sporophylls opposite and decussate, papyraceous. *Seeds* conic, 15–18 mm across with two prominent, upwardly deflected lateral wings.

Specimens examined

CAPE. — 3418 (Simonstown): Simonstown, mountainside above town (–AB), Jan., *Rourke 1824* (NBG, PRE, PRF).

TRANSVAAL. — 2628 (Johannesburg): The Wilds, cultivated, Sept. 1952, *H. Friede 3* (PRE).

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