A NEW EQUISETUM SPEICES ADVENTIVE IN NEW ZEALAND

P.J. de Lange

INTRODUCTION

One species of horsetail, Equisetum arvense L. is recorded as adventive in this country (Brownsey 1980) and it is thought to be spreading (Brownsey et al. 1985). Recently workers in the Aquatic Plants Division of MAF(Tech.) Ruakura discovered an unidentified Equisetum species growing in a small pond at Eskdale, Napier.

EQUISETUM IN NEW ZEALAND

Equisetum are of ancient lineage, represented in the fossil record as far back as the late Devonian - early Carboniferous (359-345 m.y. absolute ages after Whittow 1984) see Raven & Curtis (1982). For this reason they are of especial academic interest. Unfortunately Equisetum are also considered dangerous agricultural weeds (Brownsey et al. 1985) and they are poisonous to livestock; although no recorded cases of poisoning have occurred in New Zealand (Connor 1977).

Equisetum are almost cosmopolitan in their distribution, although they are absent from Australia (Clapham et al. 1962, Brownsey et al. 1985a). This absence is unusual, since Sphenophytes are present in late Devonian fossils of Australia (White 1986) as the now extinct tree horsetails, Calamites. This genus appeared less successful in the southern hemisphere than in the northern hemisphere (White 1986) so possibly conditions in Devonian Australasia were not suitable for this group of plants and with their extinction no further indigenous Sphenophytes survived. Today the only extant genus, Equisetum, is adventive in Australasia.

Equisetum arvense L., the field horsetail was first recognised as an adventive species in this country in 1922 (Brownsey et al. 1985) and its distribution appears to be expanding (Brownsey 1980 & Brownsey et al. 1985). Other Equisetum species are grown in controlled conditions for teaching purposes by Universities and other learning institutions, but none of these have been found in a wild state.

A NEW ADVENTIVE SPECIES?

Recently, a population of another Equisetum species was discovered in a small dam at Eskdale, Napier. The author became aware of this colony when he was shown herbarium and living material grown in the experimental gardens of the Aquatic Plants Division of MAF(Tech.), Ruakura, Hamilton (see Fig. 1).

The plants originated from a deliberate planting made by the owner of the land who once sold aquatic plants for ornamental purposes. This planting had spread, although it was still confined to the pond.

Later, a further two sites were discovered on farmland at Hoe-o-Tainui, one from a planting in a fish pond and the other within vicinity of this and probably introduced there. This adventive colony was destroyed, although specimens are in cultivation for further study. A specimen from the original Eskdale gathering was sent to WELT and

material was collected and lodged in the University of Waikato Herbarium (WAIK see Fig. 2).

Unlike the Eskdale plants which bear cones, neither the Hoe-o-Tainui or MAF(Tech.) plants have produced cones. Although it is too early to be certain, the slower growth rate and seemingly poor production of cones may suggest the species is not a potential noxious plant like E. arvense, however Equisetum are well known for erratic cone setting (Brownsey et al. 1985), so it is too early to be sure of the plant's status.

From my observations it is quite likely this Equisetum is present in other fish ponds and wetland sites in the country. The material seen at Hoe-o-Tainui was reputedly sold by nurseries in the Auckland area (Wright pers. comm. 1988) and if this were so the species must be present elsewhere in the region. The author and Dr Brownsey of the National Museum Herbarium, Wellington would be delighted to hear of further discoveries of any Equisetum species.

A NEW ADVENTIVE EQUISETUM?

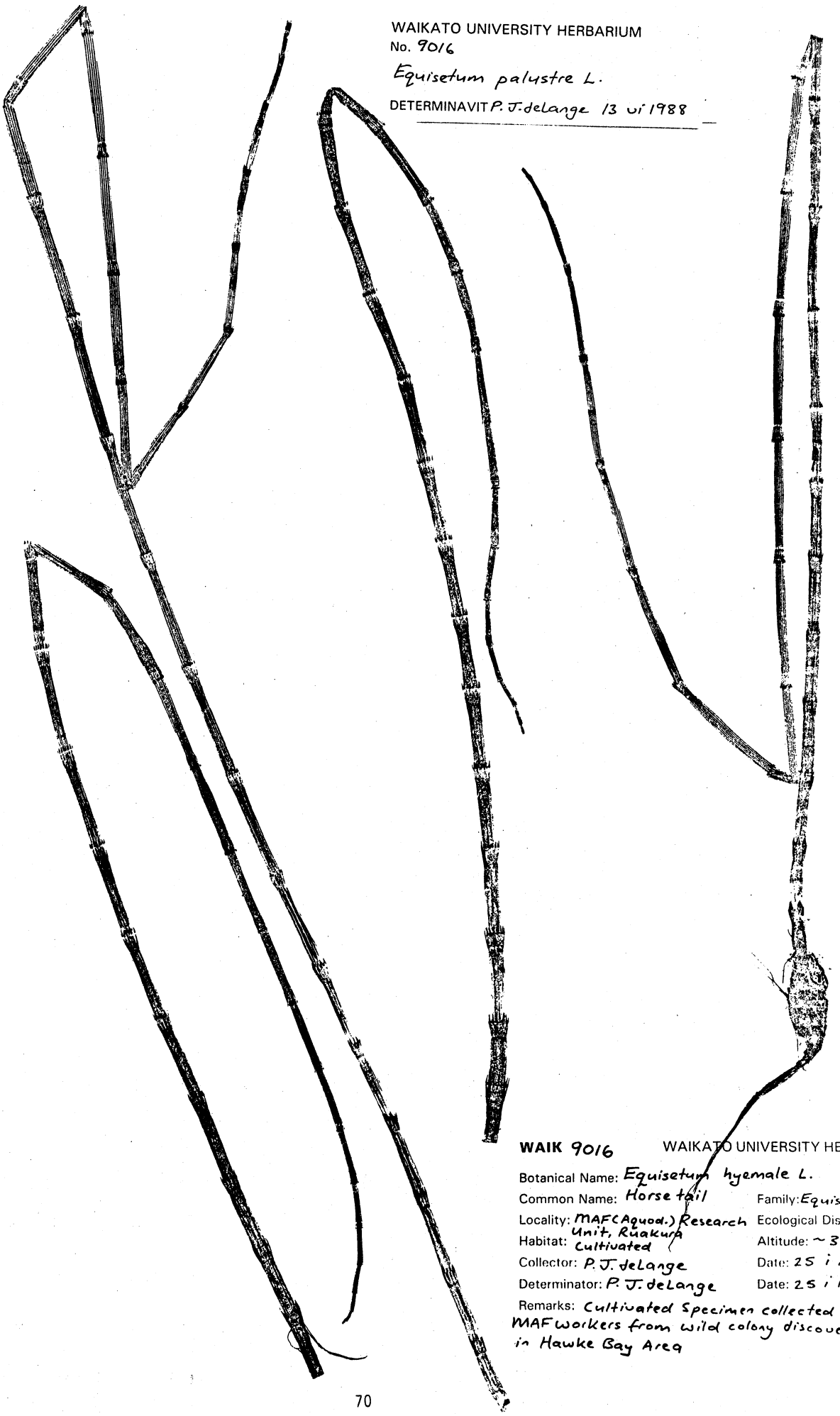
The taller size range of the plants, their decidious branching habit, coloration and growth form are quite unlike the only adventive species recorded for the country E. arvense (Brownsey 1980), so an attempt was made to identify the species from the limited material available at WAK (see Table 1).

Species	Sheaths	Internode Grooving	Branching	Sheath Ribbing
E.arvense	Brown	(3) - 4	Typical	1 - Ribbed
E.fluviatile	Green/Black	10 - 30	Occasional	10 - 30
E.hyemale	Black/White	10 - 30	None	10 - 30
E.palustre	Green/Black	4 - 8	Occasional	1 - Ribbed
E.sp. ?	Green/Black	4 - (6) - 8	Occasional	1 - Ribbed

Table 1. Four *Equisetum* Sterile stem characters compared with the new *Equisetum* (After Clapham et al. 1962)

The species was tentatively identified as E. hyemale L. - a common species grown in the University Glasshouses for study in Botany courses - mainly because of the obvious differences from E. arvense. Examination of material suggested the plant was not this species but another entity. Whilst similar to E. hyemale, the plants lacked the inflated internodes and the black/white sheath banding typical of this species (Clapham et al. 1962). Fertile specimens had been collected at Eskdale but I have been unable to compare these with E. hyemale cones, since University of Waikato specimens have never been fertile.

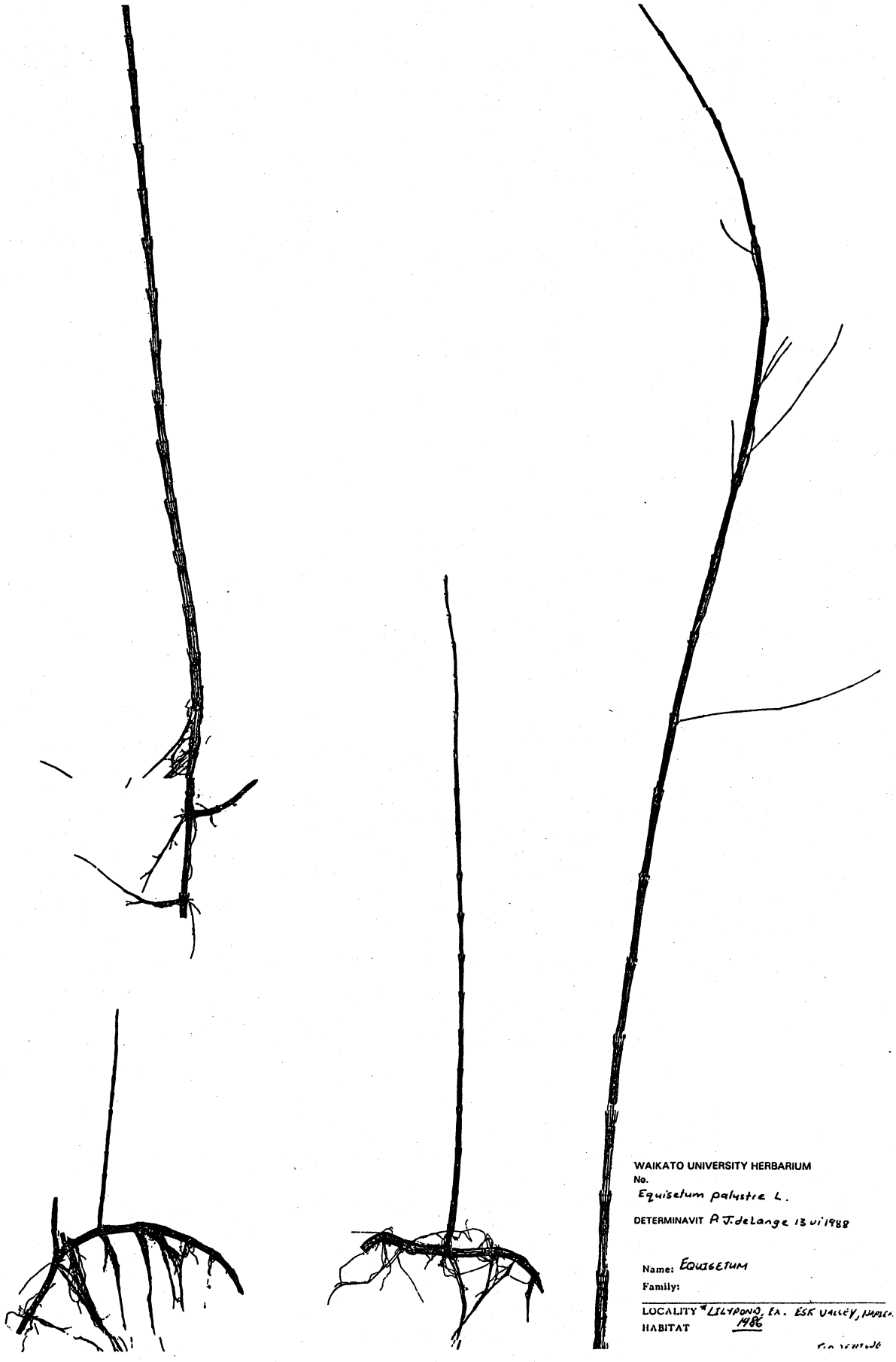
The new horsetail is similar to E. fluviatile L., the water horsetail (see Clapham et al. 1962, Toman and Felix 1974). Supporting features being; the yellowish green emergent and maroon coloured submerged stems, more or less hollow stems, and black or green tipped black sheaths



WAIKATO UNIVERSITY HERBARIUM
No. 9016
Equisetum palustre L.
DETERMINAVIT *P. J. deLange 13 vi 1988*

WAIK 9016 WAIKATO UNIVERSITY HERBARI

Botanical Name: *Equisetum hyemale L.*
Common Name: *Horse tail* Family: *Equisetace*
Locality: *MAF (Aquod.) Research Unit, Ruakura* Ecological District No
Habitat: *Cultivated* Altitude: *~30m*
Collector: *P. J. deLange* Date: *25 i 1988*
Determinator: *P. J. deLange* Date: *25 i 1988*
Remarks: *Cultivated Specimen collected by MAF workers from wild colony discovered in Hawke Bay Area*



WAIKATO UNIVERSITY HERBARIUM
No.
Equisetum palustre L.
DETERMINAVIT A J. deLange 13 vi 1988

Name: EQUISETUM
Family:

LOCALITY *LILYPOND, EA. ESK VALLEY, HAWKE'S*
HABITAT *1986*

(Clapham et al. 1962). Material is closest to E. palustre L., the marsh horsetail (Clapham et al. 1962). Features it shares with this species are the scarious, white margins of the sheaths, single sheath rib, and 6-8 grooves (not 14-30 as in E. fluviatile). For these reasons material in WAIK and MAF have been determined as E. palustre. This identification awaits official confirmation, so live material and further specimens have been forwarded to WELT for further investigation by Dr Brownsey.

ACKNOWLEDGEMENTS

I would like to thank Paul Champion MAF(Quol) for obtaining further information on the Equisetum colony at Eskdale and permitting use of the MAF(Tech) herbarium and experimental gardens. Sydney Wright on whose land the Hoe-o-Tainui colony was found provided information as to the possible origins of the plants. Lastly, I would like to thank Dr Brownsey of the National Museum for providing access to the herbarium collections of Equisetum.

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MY ADVENTURES WITH THE TWO LUCYS - PART TWO
THE POOR KNIGHTS

Katie Reynolds

As a young child I used to hear my parents discussing trips that they had had out to the Hen and Chickens. They always made it sound as though they had been to Heaven! Sometimes they took me with them. On the occasion which I shall now descibe I was not yet four years old; yet