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POLLEN AND SPORES FROM A POSSIBLE PREHISTORIC
GARDEN SITE IN WAIPOUA FOREST, NORTHLAND

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The following investigation was funded by the New Zealand Forest Service, as part of the Waipoua Archaeological Project. Although the results were inconclusive, they are reported as an example of the type of investigation in which palynology has a role.

An archaeological investigation was carried out in December 1985 in Compartment 5 of the Waipoua State Forest to document surface and subsurface evidence prior to proposed forest clearance. A determination of functions and ages of sites recorded was required.

Site N18/186, covering c. 12 ha on a moderately steep, north-facing hillside 60-80 m above the Waipoua River, comprises several different surface features which are suggestive of prehistoric garden plots. These surface features range from small stone-free plots of little-tilled soil to stone-and-earth-mound "gardens" as well as drained wetland "gardens".

Approximately two thirds of the site is beneath mature *Pinus patula* and *P. taeda* forest. The remainder is under native bush. Archaeological investigations were confined to the former area. The major surface features of this part of the site are stone structures, predominantly heaps or mounds which lie partially or completely buried beneath a dense duff layer (pine needles), up to 250 mm in depth.

Two mounds were sectioned revealing an admixture of soil and small pebbles at their core, suggesting that they were constructed for horticultural purposes (Smith 1986). It was hoped that palynological analysis of a soil sample taken from one mound would indicate whether the site had previously been used by prehistoric Polynesians to grow crops such as kumara (*Ipomoea batatas*), yams (*Dioscorea* sp.), taro (*Colocasia antiquorum*) and particularly gourds (*Lagenaria vulgaris*) (Bulmer 1983:6). A soil sample (#38) was taken from near the middle of an earth-and-pebble fill, c. 300 mm below the surface of the mound, and submitted to the author by Ian Smith.

Nine microscope pollen slides were prepared with pollen extracted from the sample using the standard pollen laboratory procedures used at N.Z. Geological Survey, D.S.I.R., Lower Hutt. The steps taken were soaking in hydrofluoric acid for 24 hours, treating with hot hydrochloric acid, separating with the

heavy liquid zinc bromide, oxidizing, acetolysing, then filtering. The slides were not stained. All slides were scanned, using X10 objective, for pollen of Polynesian cultigens. One slide was then chosen at random and a total of 200 pollen and spores were counted using a X40 objective. A list of the pollen and spore types found is given below:

TABLE: Pollen and spore count (slide PC1)

Pollen and spore type	Count
PTEROPHYTA	
<i>Cyathea</i>	3
Pteridaceae	1
Monolete spores	3
Smooth trilete spores, not <i>Pteridium</i>	138
LYCOPHYTA	
<i>Lycopodium volubile</i>	1
HEPATOPHYTA	
<i>Anthoceros</i>	1
CONIFEROPHYTA	
<i>Dacrydium cupressinum</i>	3
<i>Pinus</i>	25
ANTHOPHYTA	
Gramineae	2
<i>Metrosideros</i>	2
<i>Leptospermum</i>	1
Unidentifiable angiospermae	4
Unidentifiable pollen and spores	16

Total count	200

Pollen and spore recovery from the soil sample was good, although preservation of palynomorphs was generally poor and the flora was poor in species. Abundant charcoal fragments and woody fragments were present.

The sample was dominated by trilete spores, 69% of the total count. *Pinus* was the dominant pollen type represented, although only 12.5% of the total count. Apart from trilete spores and *Pinus* pollen very few other pollen or spore types were recorded and then with only a few grains of each type.

This assemblage derives from a pine forest and is of recent origin, that is, post-European occupation in age. Because of the state of preservation of the *Pinus* pollen grains they appear to be *in situ* rather than laboratory contaminants (which sometimes appear in fossil samples).

Charcoal fragments suggest periodic burning (perhaps of the undergrowth of the pine forest).

No pollen or spores of Polynesian cultigens were observed.

Some possible explanations of the formation of this pollen and spore assemblage include:

- (1) Contamination of barren or near-barren sample by pollen and spores from pine litter;
- (2) Downwash or biological (e.g. earthworm) carrying down of pollen and spores; and
- (3) Young soil fill of the stone mound (i.e. post pine-forest maturity).

Without further investigation, choice between these alternatives is not possible, although (1) is unlikely (Smith pers. comm.).

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References

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