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GIPPSLAND BASIN

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**OIL and GAS DIVISION**

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## INTRODUCTION

All of the assemblages are poorly preserved and some are exceedingly poor. The grains are frequently broken or corroded and the finer morphological details may be obliterated. This poor preservation often prevents a reliable specific identification although the objects may be referable to a genus.

Diagnostic species may be limited or absent from an assemblage under these circumstances, the nature of the assemblage as a whole may indicate the zone, although with less confidence than if the determination is based on diagnostic species.

## SPORE POLLEN ZONATION

Spore pollen zonation follows Stover and Partridge (1973). Partridge (1976) modified the ages of the zones somewhat and subdivided some of the zones. The Lower *N. asperus* Zone of Stover and Partridge (1973) is subdivided into an older Lower and younger Middle *N. asperus* Zone, without diagnosis or description (Partridge 1976). A discussion of the Middle *N. asperus* Zone in Stover and Partridge (1982) shows that it is based on the species which first appear in the upper part of the Lower *N. asperus* Zone (in Stover & Partridge 1973), e.g. *Triorites magnificus*. This discussion in Stover and Partridge (1982) is used as a diagnosis of the Middle *N. asperus* Zone.

Partridge (1976) and Stover *et al.* (1979) list subdivisions to the *M. diversus* Zone without diagnosis or description. Under these circumstances, subdivision of the *M. diversus* Zone is not possible.

Spores and pollen identified are listed in Table 1 and the ranges of diagnostic species shown in Fig 1. Three species in Fig 1 (marked with an asterisk) have longer time ranges in the Otway Basin. The ranges for the Gippsland Basin are shown here as these are more appropriate. Nomenclature follows Stover and Partridge (1973).

1. 3387 m. Indeterminate  
Only a few long ranging species have been identified and there are no diagnostic species.
2. 3025-3370 m. *N. senectus* Zone, Campanian  
*Phyllocladidites mawsonii* which first appears at the beginning of the *N. senectus* Zone is present at 3370 m. *Tricolpites gillii* which also first appears at the base of the zone is present at 3315 m. These are very poor assemblages with no other diagnostic species. Reworked Permian and Early Cretaceous species are frequently encountered (see Table 1).
3. 2696-2964 m. *T. longus* Zone, Maastrichtian into Early Palaeocene  
*Latrobosporites crassus* which first appears at the base of the *T. longus* Zone is present at 2964 m. Other diagnostic species, viz *Dilwynites granulatus* and *Proteacidites angulatus* are present also. There is Eocene contamination at 2776 m.
4. 2495-2674 m. *L. balmei* Zone, Palaeocene  
*Haloragacidites harrisii*, *Lygistepollenites ellipticus* and *Myrtacidites* sp. all begin their ranges within the *L. balmei* Zone and are present here. *L. balmei* itself is not common and invariably poorly preserved. Species whose ranges terminate at the top of the *L. longus* Zone are not found here.
5. 2475 m. Indeterminate  
This is a restricted assemblage (which is frequently the case with coals),

with *Myrtacidites* sp. the most common species. There are no diagnostic species.

6. 2460 m. *M. diversus*/*P. asperopolus* Zone. Early/Middle Eocene  
*Itratropopollenites notabilis*, whose range is restricted to these two zones is present here.
7. 2402 m. Indeterminate  
This is a very restricted assemblage with no diagnostic species.  
*Cyatheacidites annulatus*, whose range does not commence until the Early Oligocene *P. tuberculatus* Zone is a contaminant here.
8. 2335-2363 m. Middle *N. asperus* Zone, Late Eocene  
These are poor assemblages with some reworked Palaeocene species.  
*Nothofagidites* spp. are uncommon which is unusual for all of the *N. asperus* Zones. The spore-pollen evidence indicates only Lower-Middle *N. asperus* Zone, but the dinoflagellates (see below) indicate the Middle *N. asperus* Zone.

#### DINOFLAGELLATE ZONATION

Dinoflagellate zonation follows Stover, Helby and Partridge (1979). The zones in this reference are much the same as those in Partridge (1976), with some minor amendments in the former. Neither of these references describe or diagnose the zones. In this report, zone determination relies upon the ranges of a few selected species (see Fig 2). In some assemblages, only long-ranging species are present and it is not possible to place them in a zone.

1. 2776 m. *I. druggii* Zone. Latest Maastrichtian into Earliest Palaeocene  
Preservation is exceedingly poor and diagnostic features are not clear. Specimens are not common, either. The shape of *I. druggii* is similar to *Trithyrodinium evittii* but there is enough of an archaeophyle to suggest *I. druggii* and not *T. evittii*. The shape is also similar to *Eurydinium conoratum*, but most of the specimens look more like *I. druggii* than *E. conoratum*. Consequently, these specimens have been identified as *I. druggii*, with moderate confidence. The ranges of these other two species are shown on Fig 2 also, and it can be seen that their ranges are not very different to that of *I. druggii*.

Some specimens of long ranging species are interpreted as Eocene contaminants because they are better preserved. Definite Eocene pollen contamination is present (see Table 1).

2. 2495-2501 m ?  
Very low concentrations of long ranging species have been found at these depths. They are not considered significant.
3. 2335-2363 m. *C. incompositum* Zone, Late Eocene  
Most specimens are fragmented or poorly preserved and there is some uncertainty about the identification (see Table 1). *A. capricornum*, whose range is restricted to the *C. incompositum* Zone, is present.

#### PALAEOENVIRONMENT

The sequence is non marine up to 2865 m. The assemblage at 2776 m is marginal marine. The sequence is again non marine up to 2402 m. The very low concentrations of dinoflagellates at 2495-2501 m is considered insufficient to indicate a marginal marine environment from 2363 m to 2335 m is marginal marine.

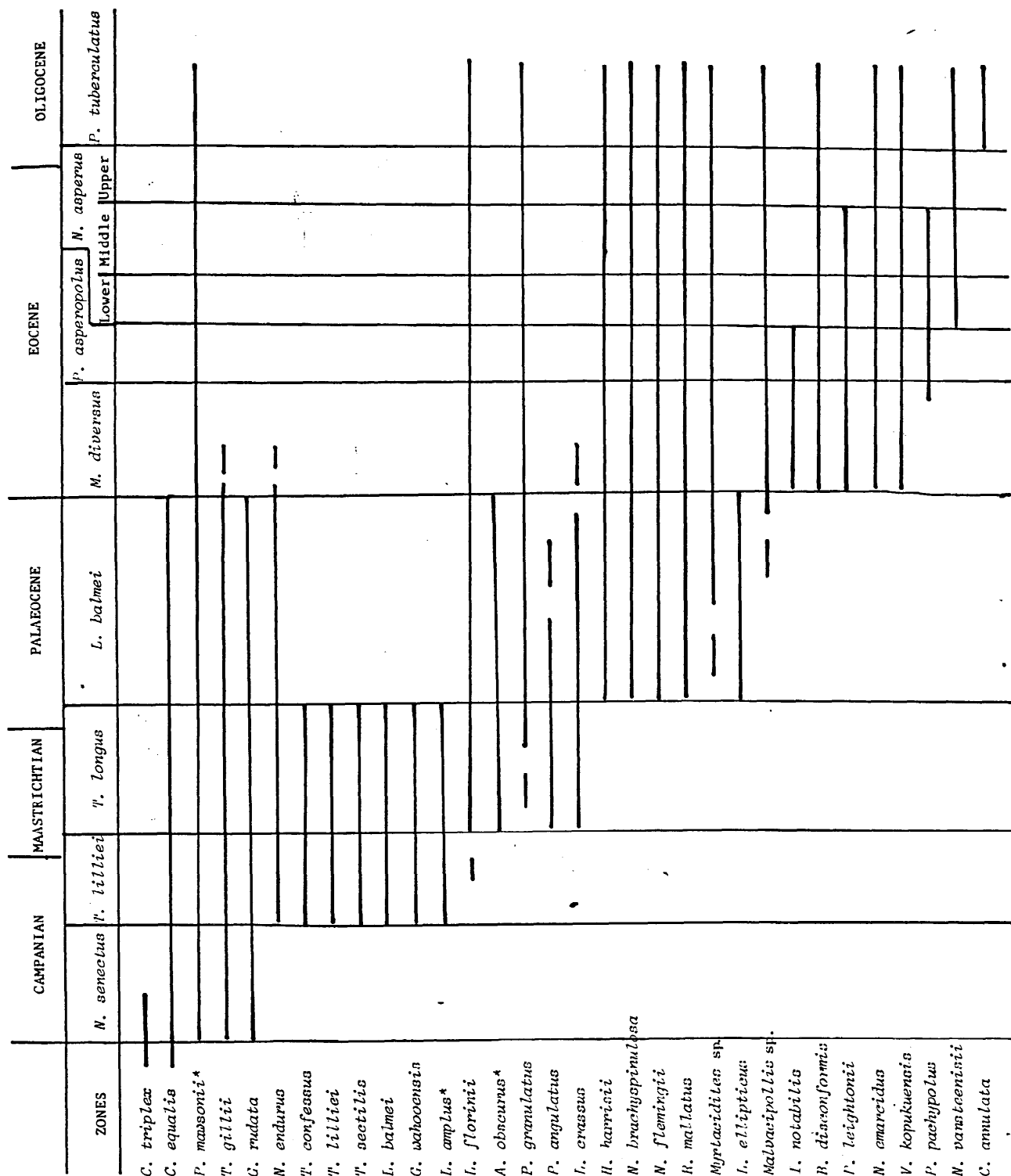


Fig. 1 Spore pollen ranges in Omeo-2. (Ranges from Stover & Partridge 1973). \*Ranges for the Gippsland Basin. See text for further explanation

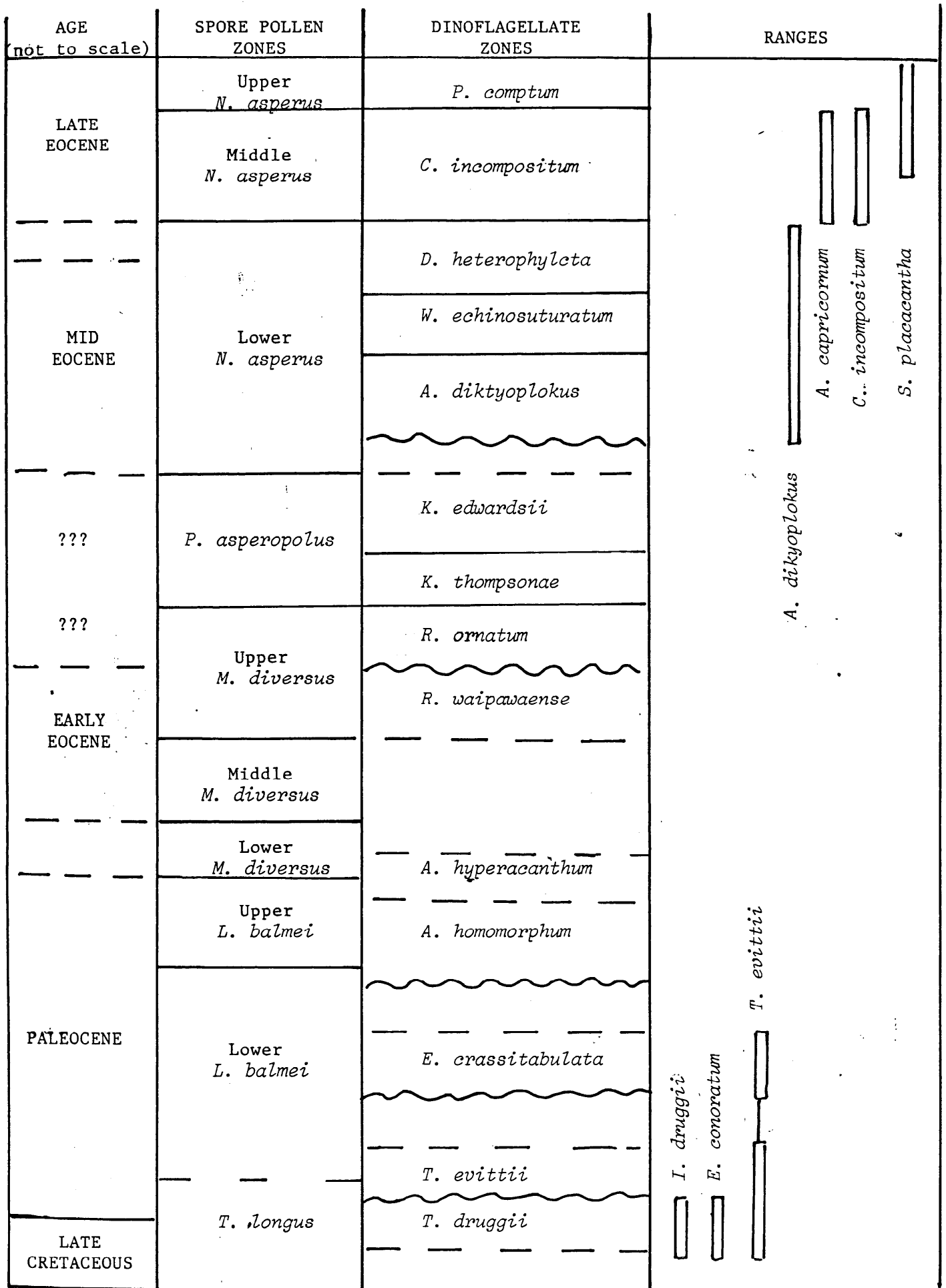


Fig 2. Dinoflagellate ranges in Omeo-2 (Ranges from Stover *et al.* 1979)

Helene A. Martin, August 1985