

Plant Timetree

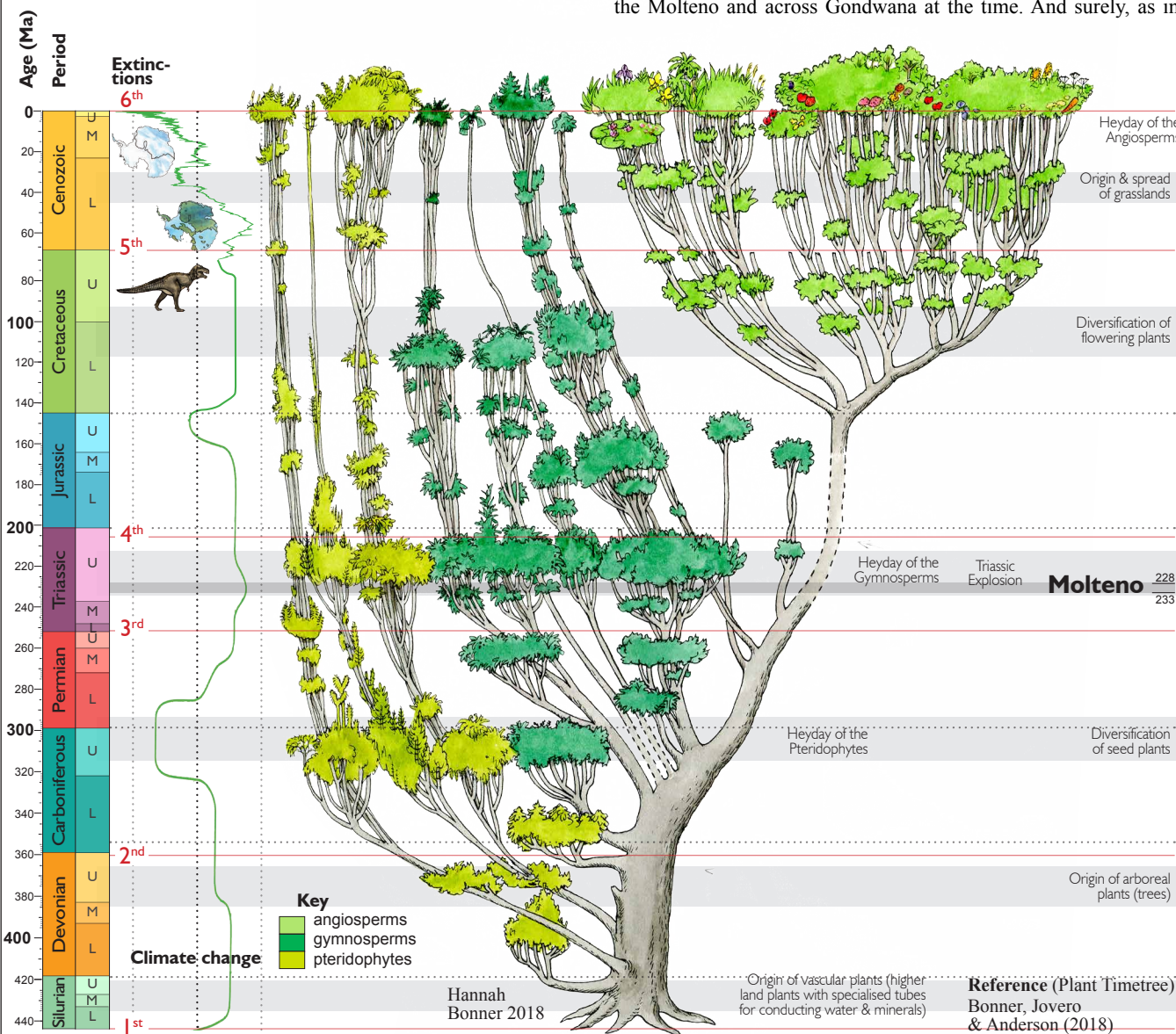
Co-evolution of plants & insects

The plants and insects share a close co-evolutionary history from around 440 million years back in the early to middle Silurian. Particularly clear, for instance, is the parallel radiation of the angiosperms (flowering plants) and of the 'Big Four' orders of pollinating insects, the Coleoptera (beetles), Diptera (flies), Lepidoptera (butterflies & moths), and the Hymenoptera (Ants, wasps & bees), from the early Cretaceous at around 140 million year ago.

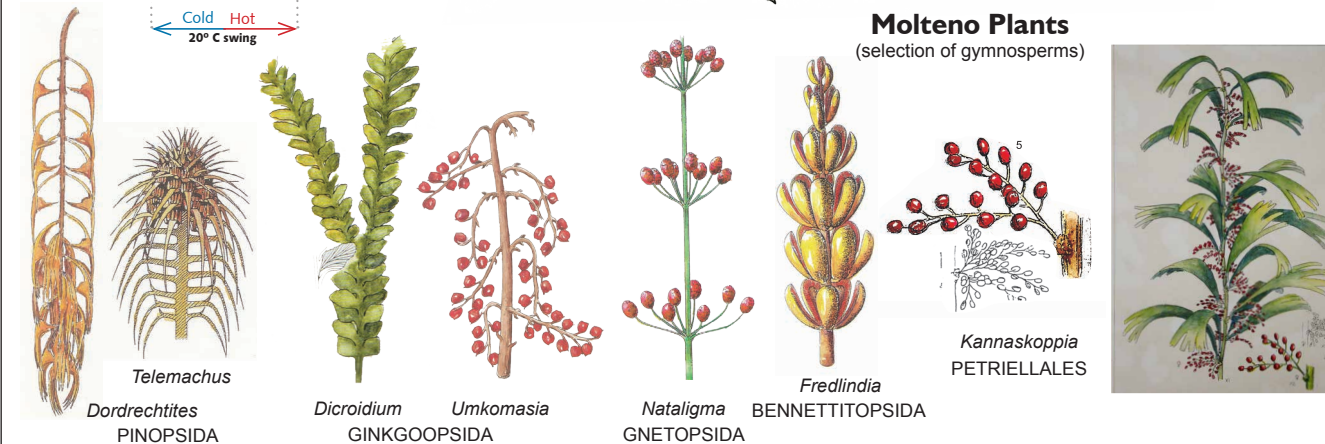
Molteno window onto co-radiation of gymnosperms & beetles

In the Triassic explosion of life we see the 'heyday of the gymnosperms' and the first great diversification of the beetles. For the first time we see the beetles taking up around half the total diversity of the insects as they do in today's world.

The evidence for the close interdependence of the beetles and gymnosperms in the Molteno is overwhelming. The beetles were surely the primary pollinators of the diversity of gymnosperms in the Molteno and across Gondwana at the time. And surely, as in



Molteno Plants (selection of gymnosperms)



INTRODUCTION

Insect Timetree

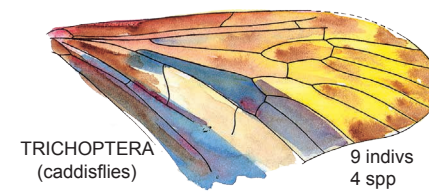
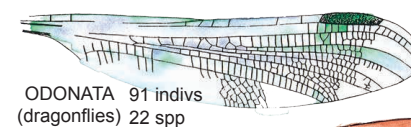
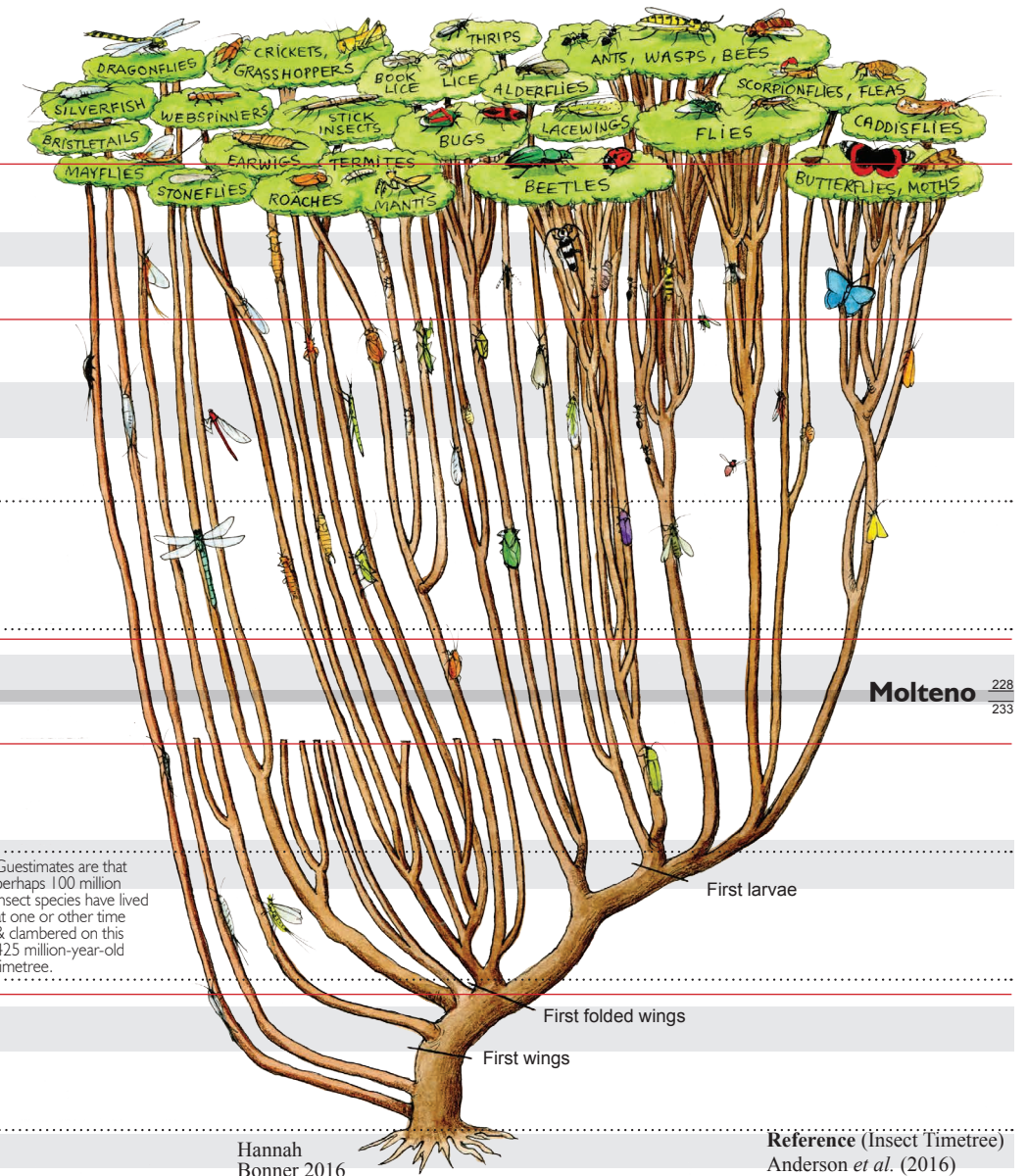
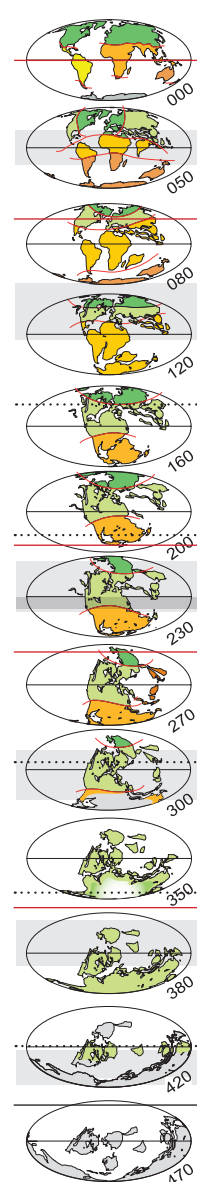
today's world, **colour** must have played a significant part in the interaction. We hypothesise that for the first moment in Earth-time, we see the full rainbow of colours expressed in both the plant and animal world. The early dinosaurs—as in the avian world of today—one speculates joined this new world of colour.

Interesting to note that the earliest known direct evidence of insect pollination amongst the angiosperms is of a pollen-covered beetle in amber at c100myrs—very recent Indian find (Imbler, 2019).

Molteno insects

c2300 specimens from 43 of the 100 TCs
Based on our preliminary sorting of the full collection in the late 1990s:
43 TCs, 2056 indivs, 18 orders, 117 genera, 333 species
Beetles—'make up almost half the total diversity, much as today's insect world'
Cockroaches—'make up almost half the total abundance, but show little diversity' (And. et al., 1996, 1998, 1999)

Continental Drift



Molteno Insects (selection of orders)

2056 individuals
117 genera
335 species

INTRODUCTION