Geochronological constraints from the Coompana Province, with implications for geological relationships with the Gawler Craton and Musgrave Province

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Guinewarra Bore, granite

The problem with dating chips

206730
1488 Ma
metagranite
Undawidgi
Supersuite

213838
1189 Ma
granite vein
Moodini
Supersuite

Forrest Zone; Wingate et al., 2015
Potoroo 1 – petroleum exploration hole (Shell, 1975)

- 220 km offshore
- Coompana Prov. on continental shelf?
- drill-chips from base of hole

![Image showing biotite cooling age and Pb/Pb isochron diagram]
Madura
No rocks >1650 Ma
Major Grenvillian mag. & meta
Ar cooling ages all Grenvillian

West Coompana
Haig Cave Supersuite
1415–1389 Ma
Burkin gneiss
1487 Ma

East Coompana
Undawidgi Supersuite
c. 1490 Ma
Toolgana Supersuite
c. 1610 Ma

Gawler
Most rocks >1690 Ma (incl. Archean)
No Grenvillian overprint
Ar cooling ages pre ~1500 Ma
Shearing ~1440 Ma

Spaggiari et al., 2015
Mallabie 1: Officer Basin?

Sandstone ~2162 feet

Arkose ~4019 feet

Basalts

1500 Ma

Coompana source?

Coompana + Gawler source?
Conclusions

Expanded evidence-base for age and event-history of Coompana Province

- (although still scanty)

Coompana Province distinct from Gawler Craton: protolith ages, magmatic & metamorphic ages, cooling ages

No geochron evidence for any difference between Forrest Zone (ie western Coompana) and eastern Coompana

For geochronology, drill-chips are a poor second compared with diamond core. We can measure ages from chips, but without the context and confidence of core, the meaning and value of those ages is ambiguous.