

ПОЛИХРОННОЕ ВЫВЕТРИВАНИЕ МАССИВНО-КРИСТАЛЛИЧЕСКИХ ПОРОД В ОАЗИСАХ ВОСТОЧНОЙ АНТАРКТИДЫ



**ИНСТИТУТ
ГЕОГРАФИИ**
Российской
академии наук
основан в 1918 году

***Илья Шоркунов,
Андрей Долгих, Никита Мергелов***
Институт географии РАН

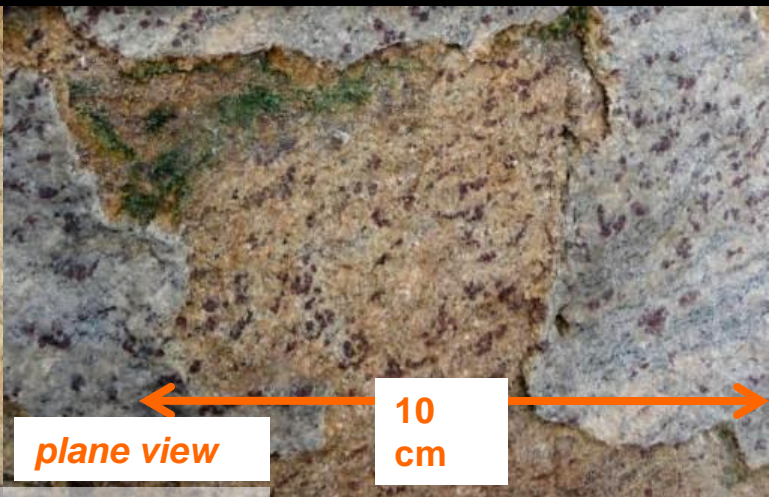


РАЭ РОССИЙСКАЯ
АНТАРКТИЧЕСКАЯ
ЭКСПЕДИЦИЯ





plane view



plane view

10
cm

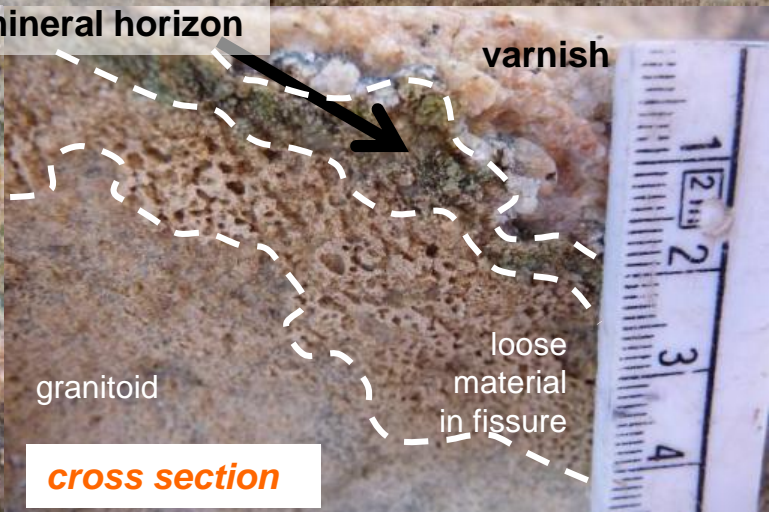


plane view

3 cm

organo-mineral horizon

varnish

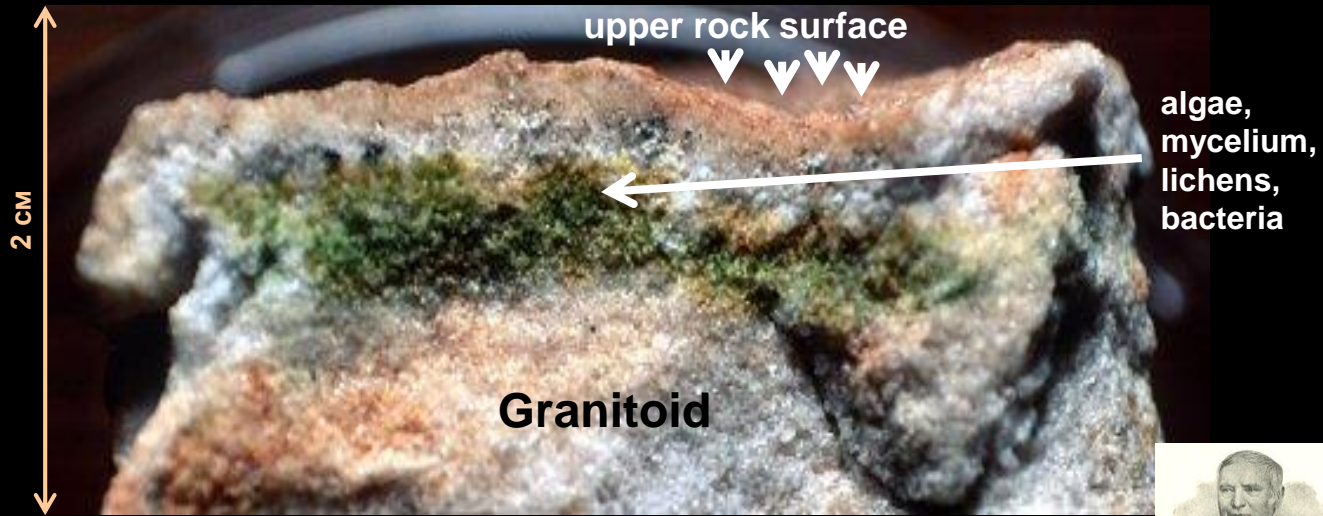


cross section

granitoid

loose
material
in fissure

Endolithic system (endoliths)



First knowledge - XIX century, **Christian Erenberg**, the micropaleontology founder



The first scientific research –1914 г., **L. Daniels**

L. Daniels Die Algen-Vegetation der Südtiroler Dolomitriffe // Ber Dtsch Bot Ges 32. 1914.

The endoliths theory – **Imre Friedman**

1968 – The Negev desert, 1976 – Antarctic Dry Valleys

Friedmann E.I., Ocampo R. Endolithic blue-green algae in the Dry Valleys: primary producers in the Antarctic desert ecosystem // Science. 1976.



SCIENTIFIC REPORTS

OPEN Alteration of rocks by endolithic organisms is one of the pathways for the beginning of soils on Earth

Nikita Mergelov¹, Carsten W. Mueller², Isabel Prater², Ilya Shorkunov¹, Andrey Dolgikh¹, Elya Zazovskaya¹, Vasily Shishkov¹, Victoria Krupskaya³, Konstantin Abrosimov¹, Alexander Cherkinsky⁵ & Sergey Goryachkin²

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3 2 Original Russian Text © N.S. Mergelov, S.V. Goryachkin, I.G. Shorkunov, E.P. Zazovskaya, A.E. Cherkinsky, 2012, published in Pochvovedenie, 2012, No. 10, pp. 1027–1044.

GENESIS AND GEOGRAPHY OF SOILS

Endolithic Pedogenesis and Rock Varnish on Massive Crystalline Rocks in East Antarctica

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SOIL BIOLOGY

Bacterial Communities in the Soils of Cryptogamic Barrens of East Antarctica (the Larsemann Hills and Thala Hills Oases)

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1 Soil-like Patterns Inside the Rocks: 2 Structure, Genesis, and Research 3 Techniques

4 Nikita S. Mergelov, Ilya G. Shorkunov, Victor O. Targulian,
5 Andrey V. Dolgikh, Konstantin N. Abrosimov, Elya P. Zazovskaya
6 and Sergey V. Goryachkin

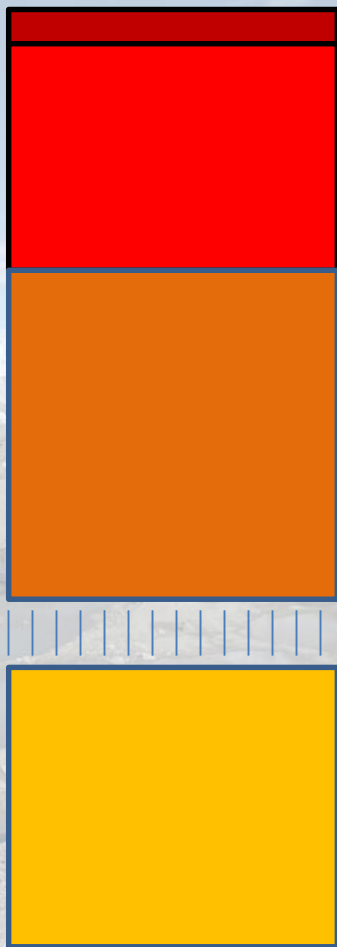




Подкорковый – сапролитизированный горизонт



Выветривание массивно-кристаллических пород



Корковый горизонт

50-2000 мкм

Подкорковый горизонт

3-20 см

Трещинный горизонт

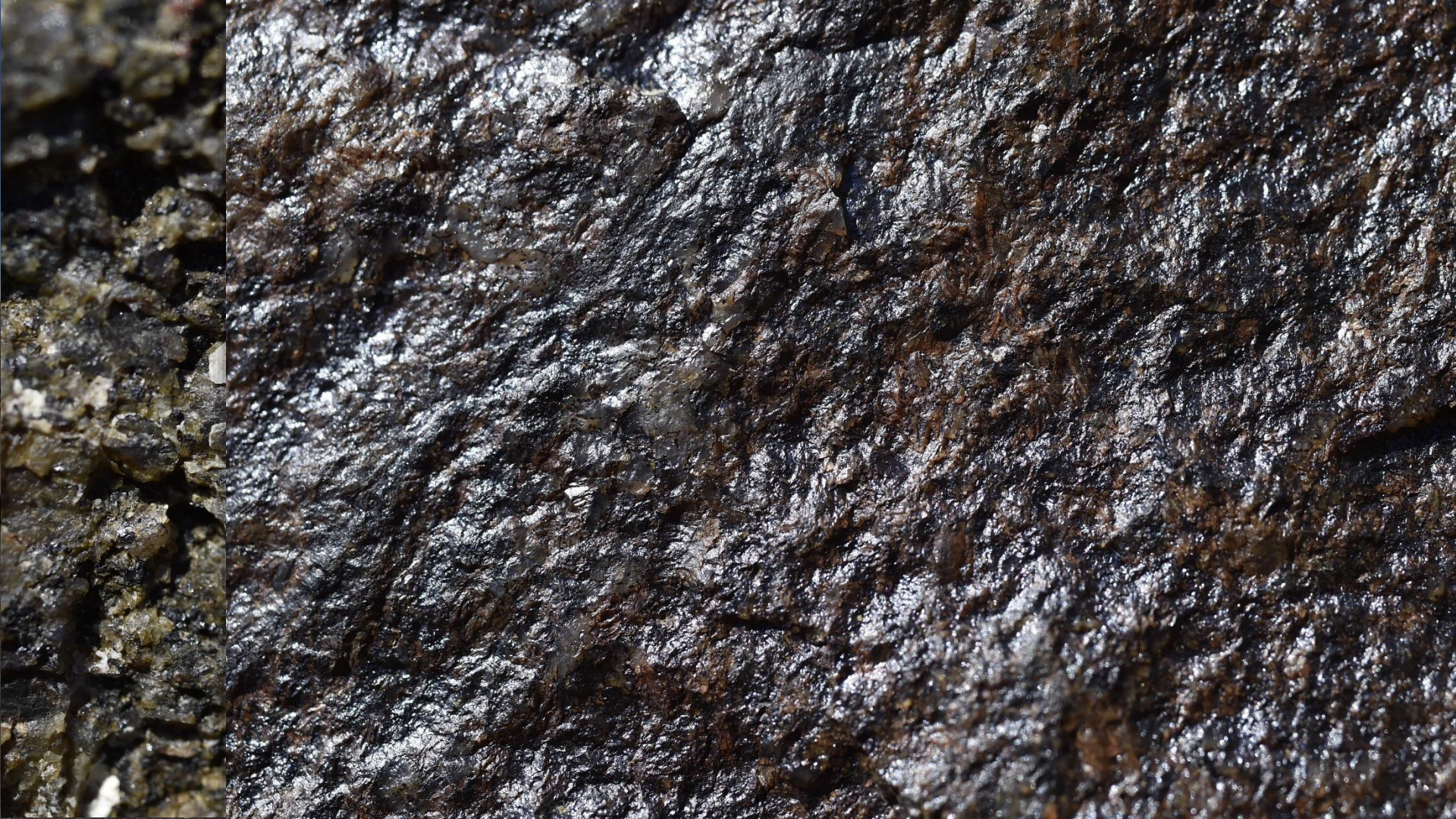
2-25(?) м

**Модель строения
красноцветной «коры выветривания»**





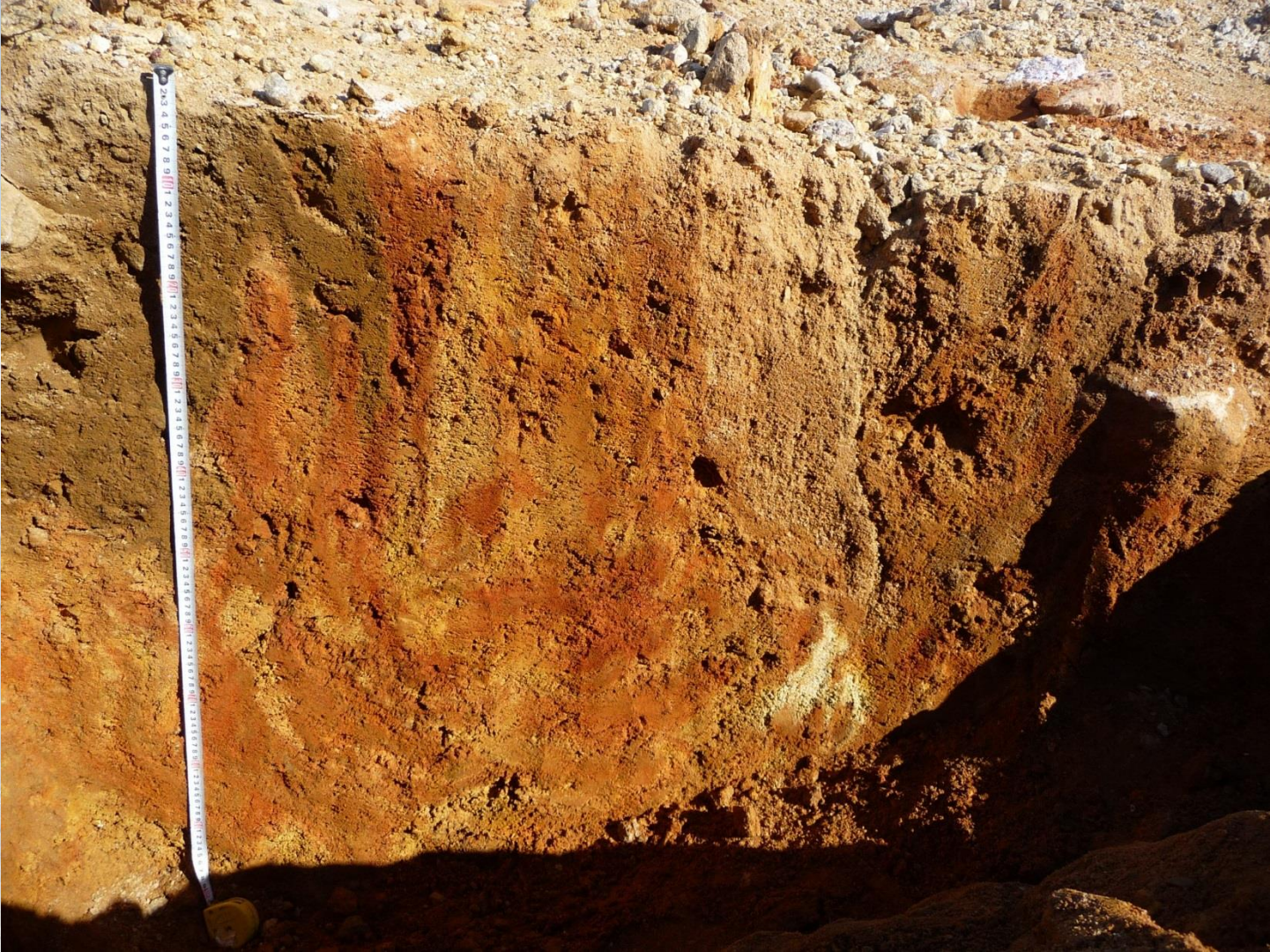






Продукты выветривания и их перераспределение в актуальных ландшафтах









May the Field be with You!

LITHOLOGICAL UNITS

Association 1

Composite mafic-felsic orthogneiss

Association 2

Tonalitic-granitic orthogneiss

Association 3

Interlayered pelite-orthogneiss

Association 4

Migmatitic metapelitic gneiss

Association 5

Pyroxene-bearing quartz monzogabbro

Gabbro

Quartz monzonite-monzodiorite

Hornblende-pyroxene granite

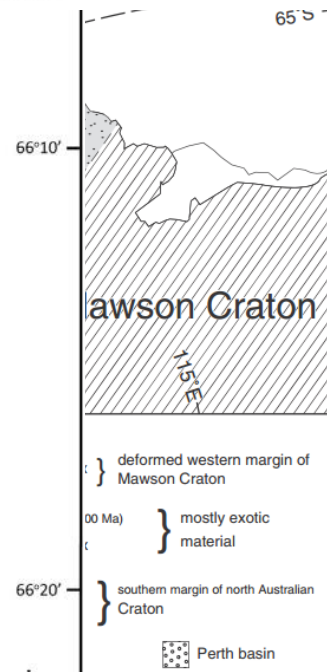
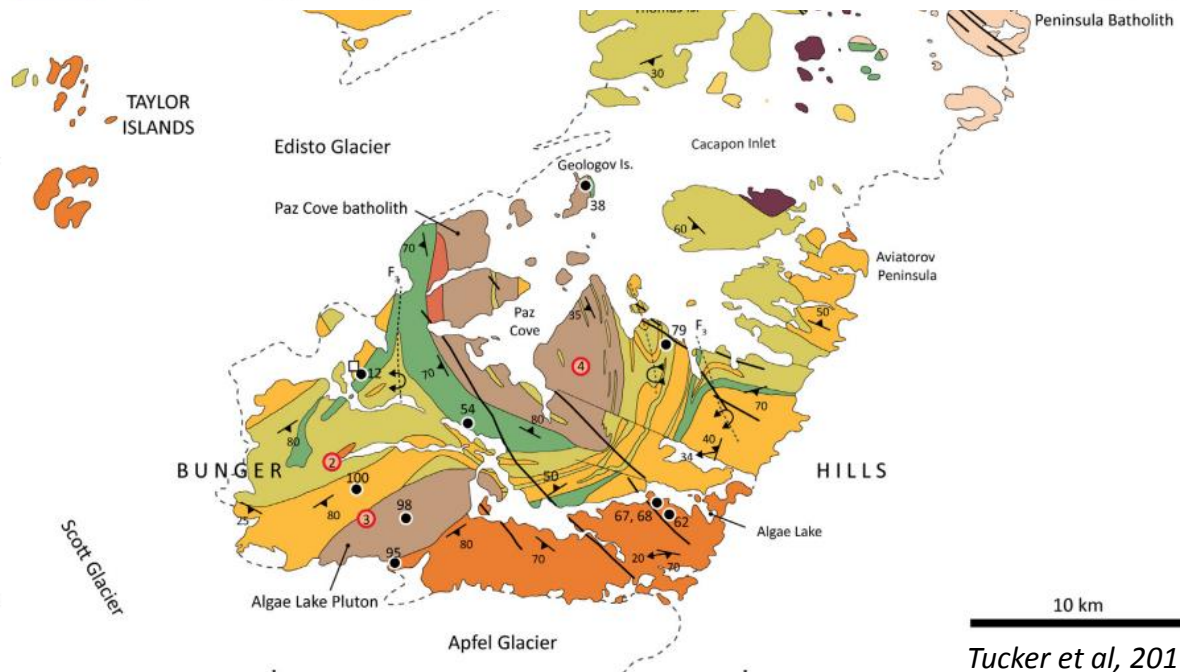
Garnet-pyroxene granite

KEY

- Sample location (this study)
- Sample location (Sheraton et al. 1993)
- Sample location (Tucker et al. 2016)
- Edgeworth David Base (AUS)
- (F_3) Fold axial trace
- Mafic dyke
- ↺↻ Overturned synform/antiform (F_3)
- ▲ Foliation
- Lineation

GEOCHRONOLOGY

1. 1521 ± 29 Ma
2. 1699 ± 15 Ma
3. 1171 ± 3 Ma
4. 1170 ± 4 Ma
5. 1190 ± 15 Ma
6. 1151 ± 4 Ma
7. 1161 ± 18 Ma
8. 1188 ± 12 Ma
9. 1186 ± 11 Ma



Tucker et al., 2017