

## ***GONDWANA 14 – “East Meets West”***

### **Field Trip DurGo-4 – The Paleogene magmatism and associated structures of the Arraial do Cabo area, Brazil**

The Pontal do Atalaia-Cabo Frio Island in Arraial do Cabo are located at the Cabo Frio Structural High adjoining the border of the Campos (northwards) and Santos (southwards) offshore sedimentary basins. Over 80% of the oil and gas reserves of Brazil are found within these two basins, including most of the so-called *Pré-Sal* reserves. As such, the outcropping continental area is an ideal place to study magmatic and structural processes that extend towards the offshore basins. Magmatic processes are mostly represented by Paleogene alkaline intrusive (plutons and dykes) rocks and structural features include foliations, lineations, folds and ductile shear faults of the Paleoproterozoic basement as well as faults and joints of the Mesozoic and Cenozoic. Alkaline dykes include dolerites, lamprophyres, trachytes and minor phonolites that cut both the Paleoproterozoic orthogneisses and the Cabo Frio Island syenites and associated plutonic alkaline rocks. Outcrops are considered exceptional for a tropical area and reveal cross-cutting relationships between mafic and/or felsic dykes and faults. In addition to the fine geology of the area there is also a dramatic scenery marked by steep hills that meet the sea of the Blue Coast of Rio.

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**Day:** September 28<sup>th</sup>, 2011

**Participants:** 10 (minimum), 20 (maximum)

**Registration deadline:** May 31<sup>st</sup>, 2011

**Registration Fee:** US\$ 150 (Búzios-Arraial-Búzios by bus + sailing boat + lunch).

### **SCHEDULE**

08:00 h - bus departing from the hotel.

08:30 h - arrive in Pontal do Atalaia.

08:45 h - 09:30 h:

**1<sup>st</sup> stop:** walking down the hill side to see the Paleoproterozoic basement rocks and dyke-dyke cross-cutting relationships.

09:30 h - 10:15 h:

**2<sup>nd</sup> stop:** walking along the hill side to see dyke-fault cross-cutting relationships.

10:15 h - back to bus.

10:20 h - 11:00 h:

**3<sup>rd</sup> stop:** walking down and along the hill side to see subhorizontal trachyte dykes and cross-cutting relationships with subvertical mafic dykes.

11:00 h - back to bus.

11:05 h - 11:45 h:

**4<sup>th</sup> stop:** walking down and along the hill side to see drusy-bearing trachytes and trachyte breccia.

11:45 h - back to bus.

11:45 h - 12:00 h:

**5<sup>th</sup> stop:** photo of the group.

12:00 h - back to bus.

12:05 h - 12:30 h:

**6<sup>th</sup> stop:** walking down and along the hill side to see cross-cutting relationships between mafic and felsic dykes as well as faults. Best examples of ductile structures in the Paleoproterozoic gneisses and amphibolites.

12:30 h - back to bus.

**7<sup>th</sup> stop:** walking along the road to see the alkaline intrusive rocks of the Cabo Frio Island.

12:50 h - back to bus.

13:00 h - embarking the sailing boat.

13:15 h - 14:30 h - lunch at the floating restaurant.

14:30 h - 17:00 h - sailing around the Cabo Frio Island with a **8th stop** (around 45 minutes) at the beach to see the dunes and beach rock.

17:00 h - back to bus.

17:30 h - arriving at the hotel.

**Photos:**



Folded Paleoproterozoic orthogneisses at the Pontal do Atalaia, Arraial do Cabo, Brazil  
(3<sup>rd</sup> stop).



Folded Paleoproterozoic amphibolite and gneiss cut by thin lamprophyre dykes at the Pontal do Atalaia, Arraial do Cabo, Brazil (6<sup>th</sup> stop).



Cross-cutting relationship between trachyte and lamprophyre dykes (6<sup>th</sup> stop).





Sailing around the Cabo Frio Island, Arraial do Cabo, Brazil (8<sup>th</sup> stop).



Thick diabase dyke cut by thin trachyte dyke at the Pontal do Atalaia, Arraial do Cabo, Brazil (8<sup>th</sup> stop).



Fault breccia in gneiss in the Pontal do Atalaia, Arraial do Cabo, Brazil.



Fault breccia in syenite in the Pontal do Atalaia, Arraial do Cabo, Brazil (7<sup>th</sup> stop).





Beach rock (light green) in the Cabo Frio Island, Arraial do Cabo, Brazil (8<sup>th</sup> stop).



Sunset at the Pontal do Atalaia, Arraial do Cabo, Brazil (3<sup>rd</sup> stop).

**Images and maps:**





