



GONDWANA 14 – “East Meets West”

Field Trip PostGo-3 – Paraná II- Juro-Cretaceous Sequence

The purpose of this field trip is to present the geology, stratigraphy, sedimentary and volcanological aspects of the Juro-Cretaceous sequence in Paraná basin (Rio Grande do Sul state). At the central portion of Rio Grande do Sul state we will see aeolian dune deposits of the Botucatu Formation and good expositions of the contact of the first Serra Geral lava flows with aeolian dunes. In Soledade-Pouso and Rota do Sol profiles we will see the lava flows types that constitute the Serra Geral Formation and several volcanic structures. To finish we will visit the Aparados da Serra National Park, with its huge canyons opened in the lava flows.

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Period of the field trip: October 1st – 5th, 2011

Participants: 15 (minimum), 20 (maximum)

Registration deadline: August 15th, 2011

Registration fee: US\$ 900 (it includes transportation by bus or minibus with on board service, accommodation in double rooms, breakfast, lunch and dinner).

SCHEDULE

DAY 0 - October 1st, 2011

Time: 7:00 p.m.

Pre-field trip meeting at “Bar do Beto” - <http://www.bardobeto.com.br> -, 811 Sarmiento Leite Street, Cidade Baixa, Porto Alegre, Rio Grande do Sul, Brazil.

Hotels in Porto Alegre: Master Express Perimetral and/or Master Express Cidade Baixa - <http://www.master-hoteis.com.br> -

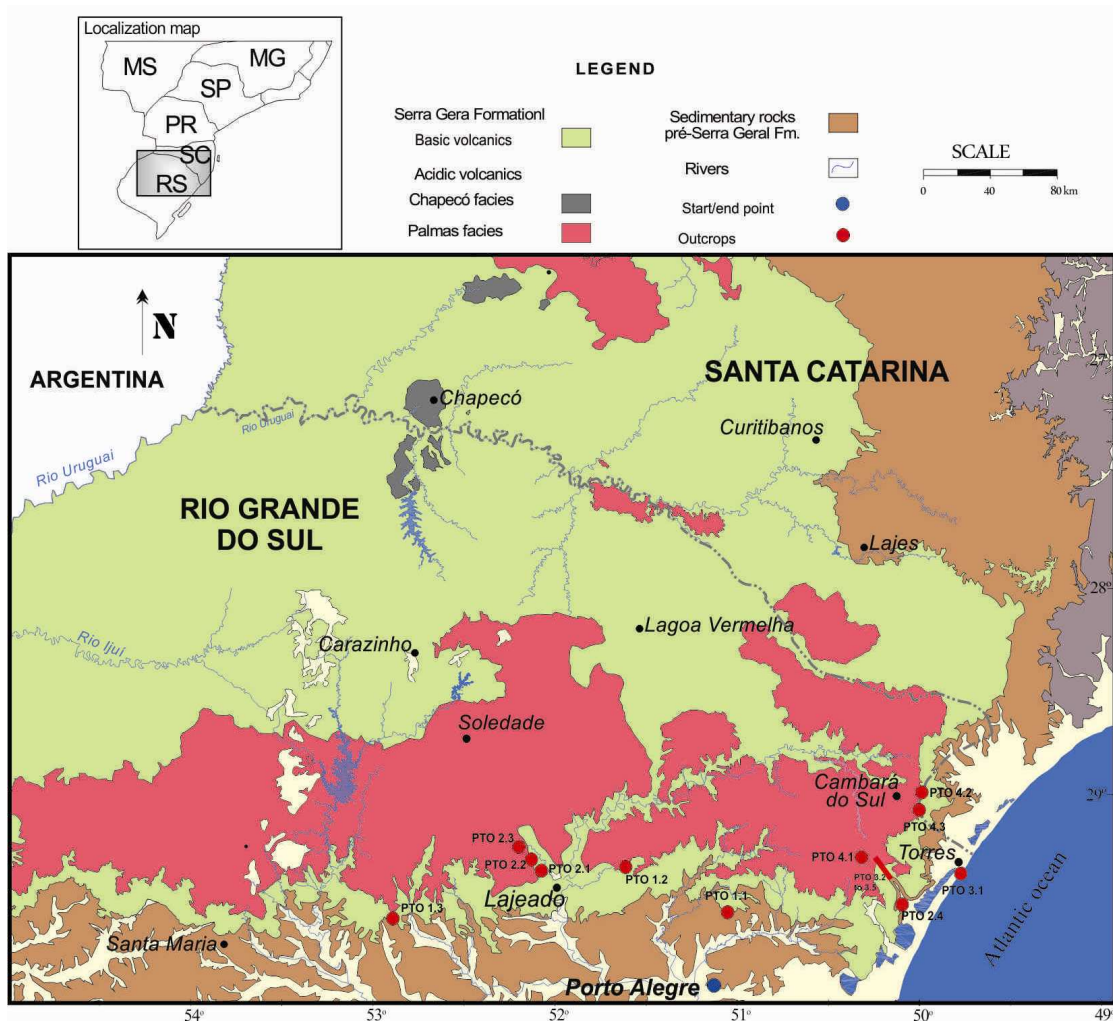
DAY 1 - October 2nd, 2011

Time: 8:00 a.m.

Meeting point at **Hotel Master Express Perimetral**.



FIELD TRIP OUTCROPS



Location map of the outcrops visited in field trip Parana II.



OUTCROP 1.1

First Serra Geral lava flow and contact with Botucatu sandstone, Dois Irmãos, RS

This stop is located in Rio Bonito Quarry near BR-116 road at Dois Irmãos town. At this quarry a linear dune is covered by lava flows and the contact can be observed in longitudinal and transverse sections. The contacts between the lava and sediments are sharp, and mixtures of lava and sand, such as breccia-like rocks, are generally absent.

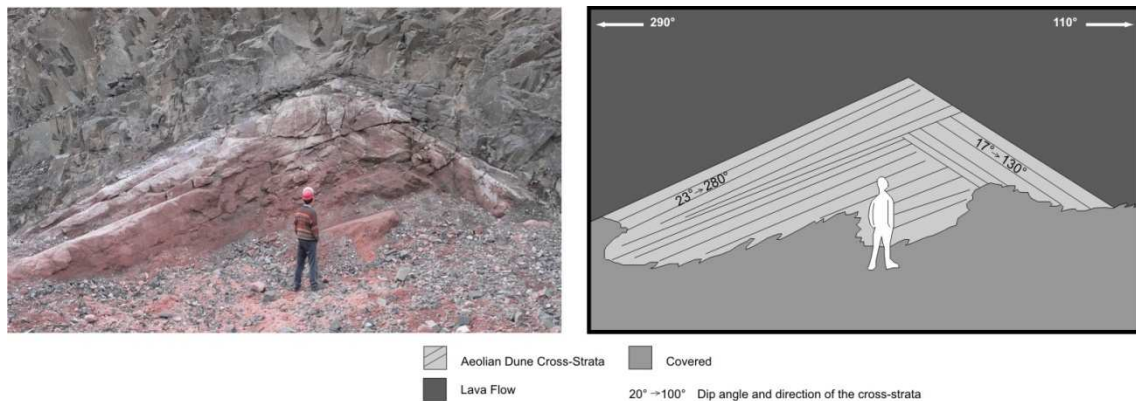


Figure 2- Transverse section of a linear dune from Rio Bonito Quarry (Stop 1.1).

OUTCROP 1.2

Basic dikes cutting dunes, Feliz, RS

At this stop we can see two basic dikes cutting the dune. The dikes are up to 1m thick and contacts are irregular. Near occur a lava flow covering the dune, probably related to dikes, but the relations between dikes and flow are not exposed.

OUTCROP 1.3

Santa Cruz Park, Santa Cruz do Sul, RS

In Santa Cruz Park occurs a large dune covered by the first's flows of Serra Geral Formation. Like the old quarry is inactive and transformed in a municipal park many structures related to lava-sediment interactions are preserved at the dune surface.



Figure 3- Features type crescentic ridges formed by advance of lava lobes on the dune face.

Night: Weiland Hotel, Santa Cruz do Sul - www.weiandhotel.com.br -

DAY 2 - October 3rd, 2011

OUTCROP 2.1

Compound pahoehoe flows

The stop point is located along the BR-386 road, 14 km after Lajeado. This is a beautiful and long outcrop along the road, but the traffic is intense and the stop is dangerous.

The outcrop consists of a set of pahoehoe flows. The basal pahoehoe flow is partially exposed, it is composed of multiple lava lobes and diverse structures are observed. At the basal portion of lobes pipe vesicles are common and ropes can be observed at the surfaces. Locally, moulds of ropy surface occur in near vertical positions, and probably are formed by slabby pahoehoe.

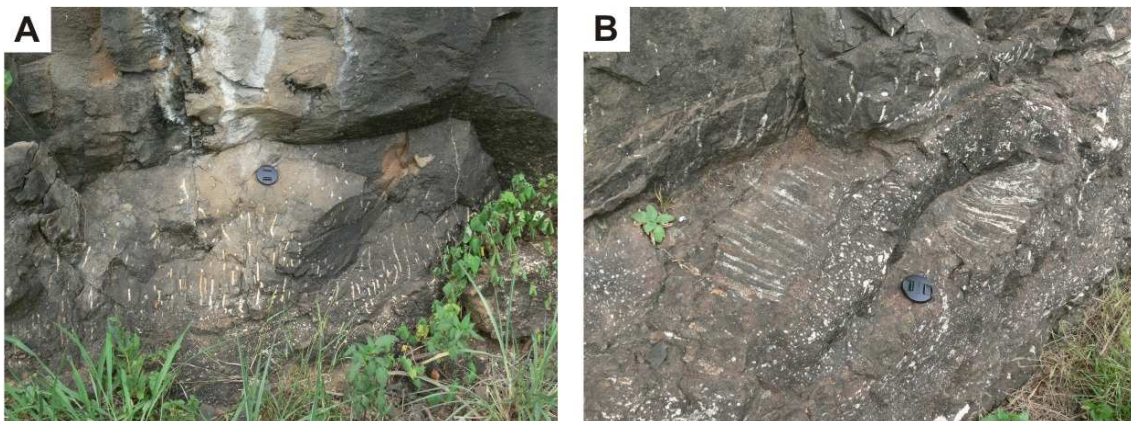


Figure 4- A) Pipe vesicles at the base of pahoehoe lobe, B) ropy surfaces. Stop 2.1.



OUTCROP 2.2

Sedimentary layer between pahoehoe flows

Sedimentary layers composed by sandstone occur interlayered with the basic flows at the basal portion of Serra Geral Formation. Along the BR-386 road we will observe one of these deposits.

OUTCROP 2.3

An inactive quarry along the BR-386 exhibits acid rocks from Palmas member. The acid rocks are massive and have a pronounced inclined jointing typical of lava domes and salt and pepper texture.

OUTCROP 2.4

Pahoehoe flows

Along the BR-101 road we will observe many outcrops with the alternance of pahoehoe flows and dunes. At an inactive quarry near Três Forquilhas have a beautiful exposure of the first basic lava flows of Serra Geral Formation in this region.

Night: Dunas Hotel, Torres - www.dunashoteis.com.br -

DAY 3 - October 4th, 2011

OUTCROP 3.1

Guarita State Park, Torres, RS

The Guaritas State Park is a very beautiful place constituted by two big outcrops of lava flows and sandstone located at the Guaritas beach. This outcrop is the eastmost exposure of jurassic-cretaceous sequence in South America. The relations between lava flows and dunes are very well exposed along the *falesias*. Locally can be observed dry peperites formed by interactions of lava and unconsolidated sand.



Figure 5- View of Guaritas State Park.

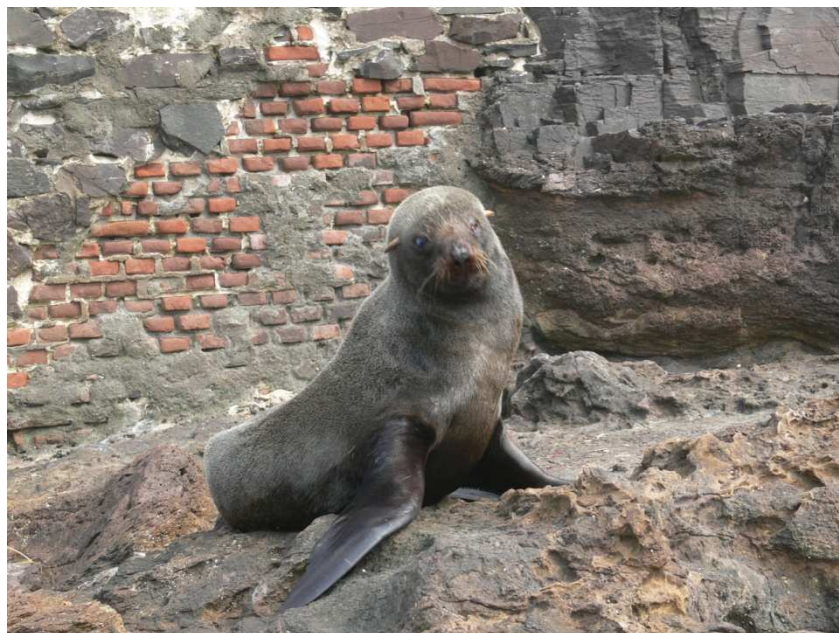


Figure 6- Seal relaxing over the peperite at the Guaritas Park, note the contact between peperite and basaltic flow at the right upside.



OUTCROPS 3.2 to 3.5

Rota do Sol profile

The outcrops 3.2 to 3.5 are located along the Rota do Sol Road where about 1.000 m of the volcanic sequence is exposed. Along the profile we will observe rocks formed by four volcanic episodes. The sequence begins with pahoehoe lavas that are covered by acidic rocks. Over these acidic rocks occur a sequence of 'a'a lavas that are covered by a second acidic episode.

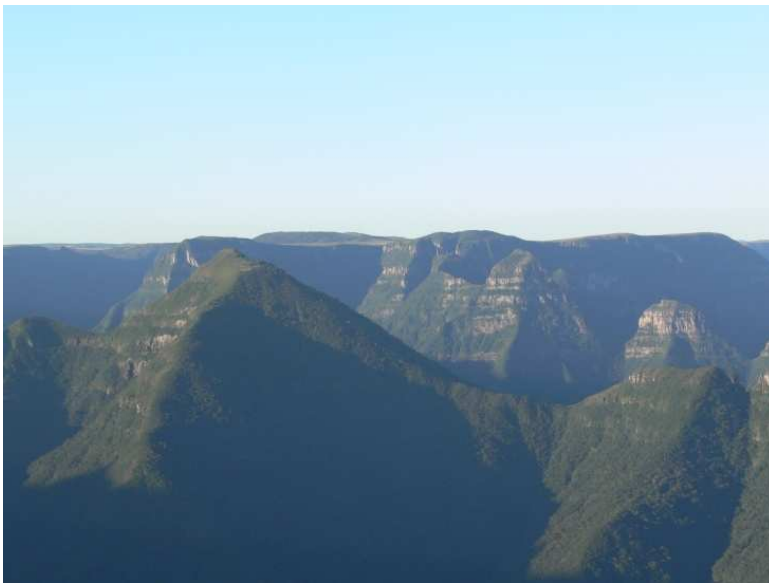


Figure 7- View of the volcanic sequence at Rota do Sol profile.

Night: Hotel Cavalinho Branco, São Francisco de Paula, RS - www.hotelcavalinhobranco.com.br -

DAY 4 - October 5th, 2011

OUTCROP 4.1

Vitrophiric acidic rocks

In both sides of the road RS 453 there are outcrops of a vitrophiric poorly vesiculated rock, with conchoidal surface fractures and glassy to resinous lustre. These acid flows are of the Palmas facies, and represent the top of the volcanic sequence in this region.



OUTCROP 4.2

Fortaleza Canyon, Cambará do Sul, RS

The Fortaleza Canyon is 7.5 km long and the rock walls are about 800 m high. It's a beautiful local to observe the sequence of acidic volcanic rocks.



Figure 8- View of the Fortaleza canyon
(http://www.cprm.gov.br/Aparados/ponto_14.htm).

OUTCROP 4.3

Aparados da Serra National Park, RS

The Aparados da Serra National Park is on the border of Rio Grande do Sul (RS) and Santa Catarina (SC) States. With an area of 10.250 ha, it has several canyons like Fortaleza, Faxinalzinho, Malacara, Itaimbezinho and others, originated from deep fractures opened in a sequence of lava flows.

We will visit the Itaimbezinho canyon (Fig. 9), the most famous of the park, which name is from Tupi-Guarani origin (aborigenes people that lived in this region) and means "sharp stone". Itaimbezinho is a huge canyon of 5800 m of length, up to 2000 m wide and about 720 m of maximum deep. There are belvederes in special positions to see the interior of the canyon, with its several waterfalls, the luxuriant vegetation and the sequence of lava flows.



Figure 9- Itaimbezinho canyon, stop 4.3 (Photo by Vinicius Matté)

Finish: 6:00 p.m at Hotel Master Express Perimetral, Porto Alegre.