

INTERNATIONAL GEOSCIENCE PROGRAMME (IGCP)



Annual Report* of IGCP Project No. 510

IGCP project short title: **A-type Granites and Related Rocks through Time**

Duration: **2005-2009 (on-extended-term-status requested for 2010)**

Project leader(s):

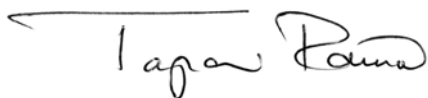
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Date of submission of report: 22 December 2009

Signature of project leader:



O. Tapani Rämö [on behalf of Roberto Dall'Agnol, Carol D. Frost, and Laurence J. Robb]

1. Website address related to the project

<http://www.igcp-510.org>

2. Summary of major past achievements of the project

During the first four years (2005-2008), the project arranged five meetings with technical scientific sessions (Moscow, Idaho, USA; Belém, Brazil; Stellenbosch, South Africa; Québec City, Canada; Oslo, Norway) and eight field conferences (Yellowstone-Snake River Plain; southern and central Finland; Pitinga, Amazonas State, Brazil; Carajás, Pará State, Brazil; Bushveld Igneous Province, South Africa; southern Nevada and southeastern California, USA; Oslo Rift, southeastern Norway; Corsica, France). The proceedings of the first Annual Meeting (Moscow, Idaho, 2005) were published as a special issue of *Lithos* (vol. 97, 1-2, 2007) and those of the second (Belém, Brazil, 2006) as a special issue of *The Canadian Mineralogist* (vol. 47, Part 6, 2009). An active international consortium of researchers from more than 40 countries working in the field of A-type granites and related rocks has been established, involvement of mining companies in the project has been enhanced, and scientific breakthroughs regarding the petrogenesis of A-type associations as well as their typology and metallogeny have been realized. The project is in full speed now – pursuing its goals on a global scale – and will complete its mission in 2010.

3. Achievements of the project this year only

3.1. List of countries involved in the project (*countries active this year)

Argentina*, Australia*, Austria, Belgium*, Brazil*, Cameroon, Canada*, Colombia, Czech Republic, Egypt, Estonia*, Finland*, France*, Germany*, India*, Iran*, Ireland*, Israel*, Italy*, Japan, Namibia, the Netherlands, Norway*, People's Republic of China, Poland, Portugal*, Republic of Korea, Romania, Russia*, Slovakia*, South Africa, Spain, Sweden, Switzerland*, Taiwan, Turkey*, Ukraine, the United Kingdom*, the United States of America*, Uruguay, Venezuela, Yugoslavia.

3.2. General scientific achievements and social benefits

In to its fifth year now, the project has continued to pursue the main goals (petrogenesis and metallogenic significance of A-type granites, granite typology and lithospheric evolution). The highlights of the year 2009 are:

- Petrogenesis of A-type granites and alkaline complexes (silicate rocks and carbonatites) were thoroughly discussed as the project examined the classic Kola alkaline province this summer.
- Scientists from Russia, the Far East, and Latin America have been recruited to the project and they have actively participated in the activities of IGCP-510 and contributed to the proceedings volumes realized/in preparation thus far.
- New in-depth understanding of the metallogeny of rare metal (Nb, Ta, Y, REE, Li etc.) deposits associated with the A-type granites was documented in the proceedings volume of

the second Annual Meeting (August 2006; Belém, Brazil) that was published as a special issue of *The Canadian Mineralogist*.

- Papers from the May 2008 Ronald F. Emslie symposium (the fourth technical meeting of the project) have been brought to the revision stage and they will be published in a further special issue of *The Canadian Mineralogist* (M.A. Hamilton, J.S. Scoates, and O.T. Rämö, Guest Editors). This volume will focus on the petrogenesis of the anorthositic rocks that are found in A-type granite complexes.

3.3. *List of meetings with approximate attendance and number of countries*

August 14-22, 2009: The ninth scientific field trip of IGCP-510, joint venture with the Eurogranites network. The trip was arranged by Prof. O. Tapani Rämö (University of Helsinki), Dr. Jaana Halla (Geological Museum, University of Helsinki), and Prof. Yuri Voytekhovskiy (Kola Science Centre, Russian Academy of Sciences). There were two principal targets: the Nattanen-type granites recently identified as post-collisional, oxidized A-type granites, and the classic Khibiny alkaline complex of the Devonian Kola alkaline province in the heart of the Kola Peninsula. The trip was attended by 24 individuals from 14 countries (*Belgium, Estonia, Finland, France, Germany, Ireland, Italia, Norway, Portugal, Russia, Slovakia, Switzerland, the United Kingdom, and the United States*). Four keynote presentations were given on various aspects of the A-type granites (and undersaturated rocks).

September 26-29, 2009: The tenth scientific field trip of IGCP-510. The trip was led by Dr. Vedat Toprak (Middle East Technical University, Turkey) and it focused on the ignimbrites and calc-alkalic volcanic centers of the Neogene Quaternary Cappadocian volcanic province. The trip was attended by 12 individuals from 8 countries (*Argentina, Brazil, Canada, France, India, Russia, Turkey, and the United States*).

September 29-30, 2009: The fifth Annual (sixth technical) meeting of IGCP-510. The meeting was held at Tunceli University, eastern Turkey and it was convened by Prof. Durmus Boztug (President of the Tunceli University) and Prof. Carol Frost (University of Wyoming). The meeting gathered 26 researchers from 9 countries (*Argentina, Australia, Brazil, Canada, France, India, Russia, Turkey, and the United States*). 14 oral presentations were given.

October 1-3, 2009: The eleventh scientific field trip of IGCP-510. Led by Drs. Ilkay Kuscu, Durmus Boztug, and Gonca Kusku, it focused on the alkaline rock associations at Keban and Hasancelebi and related iron-oxide, gold, and copper mineralizations. The trip was attended by 16 individuals from 8 countries (*Argentina, Australia, Brazil, Canada, India, Russia, Turkey, and the United States*).

3.4. *Educational, training or capacity building activities*

In the four 2009 meetings of the project, doctoral and post-doctoral students from several participating countries have been actively involved. We will continue to promote the educational aspect of the project by recruiting further students especially from the less developed countries.

3.5. *Participation of scientists from developing countries, and in particular young and women scientists*

A substantial fraction of the occurrences of A-type granites are located in the less developed countries (*Africa, Asia, Latin America* etc.) and the project will continue recruiting new delegates from these regions, young and women scientists in particular.

3.6. *List of most important publications (including maps)*

In 2009, 24 peer-reviewed and 4 other scientific publications were released (since the beginning of the project, 65 and 12, respectively). For details, please log on to www.igcp-510.org.

3.7. *Activities involving other IGCP projects, UNESCO, IUGS or others*

The project joined forces with the Eurogranites network (B. Bonin, coordinator) to arrange the Finnish Lapland – Kola Peninsula, Russia (August 2009) field conference.

4. Activities planned (pending on-extended-term-status)

4.1. *General goals*

In its final year, 2010, the project will target on the four main goals (petrogenesis, metallogeny, typology, evolution of the lithosphere) of the project and assess the outcome of the six years of work by soliciting papers from all aspects of the agenda for a final memoir.

4.2. *Tentative list of specific meetings and field trips (please list the participating countries)*

August 14-18, 2010: Four-day pre-conference field trip will examine new targets in the Wiborg rapakivi granite batholith area, both off-shore and on mainland Finland. These include mixed (wiborgitic) fayalite-hastingsite granites and quartz monzonites in the southern part of the batholith (Gulf of Finland); anorthosites, leucogabbroids, ferrodiorites, and granites of the Ahvenisto complex (northern flank of the batholith); a supracrustal (quartzite-basalt-rhyolite) sequence in a megaxenolith embedded in rapakivi granite (northwestern part of the batholith); iridescent labradorite rapakivi granites in Ylämaa (east-central part of the batholith), and topaz granites in the west-central part of the batholith.

August 18-20, 2010: final Annual Meeting at the University of Helsinki. Papers will be solicited to cover all the main fields of IGCP-510: (1) Petrogenesis of the A-type granites; (2) Metallogenic significance of the A-type granites; (3) Granite typology; and (4) Relation to lithospheric evolution.

Participating countries: any number of those listed in section 3.1 plus countries to be enrolled in 2010.

5. Project funding requested

Pending on-extended-term-status (cf. Section 6) and in order to support the maximum number of delegates from the less developed countries in the 2010 meeting in Finland, we request for maximum possible project funding for 2010.

6. Request for extension, on-extended-term-status, or intention to propose successor project

2009 was the fifth year of IGCP-510. To carry the project plan to completion, the project leadership is committed to organize a final conference and field trip in Finland (University of Helsinki) in August 2010 (cf. Section 4.2). We thus request an on-extended-term-status for 2010.

7. Financial statement (\$ USD only)

The IUGS/UNESCO funds allocated to IGCP-510 in 2009 (\$US 5000) were used to support the following individuals to attend the project meetings in Turkey: Márcia BARROS, Brazil (\$US 1200); Naresh KOCHHAR, India (\$US 1200); Dmitri KONOPELKO, Russia (\$US 1200); Daniel RUBIOLO, Argentina (\$US 1200). The remainder of the funds (\$US 200) was used for administrative expenses.

8. Attach any information you may consider relevant

N/A