

quarries in the region have also showed cavansite.

326-11 Poster Carmo, Isabela

NEOGENE CONTINENTAL WEATHERING RATES FROM 40Ar/39Ar GEOCHRONOLOGY, MINAS GERAIS, BRAZIL

CARMO Isabela¹, VASCONCELOS Paulo²
1 - UFRJ, UQ
2 - UQ

Keywords: 40Ar/39Ar geochronology; weathering rates; Neogene; SE Brazil
Since precipitation of Mn-oxides within a weathering profile records the interaction between descending oxygenated meteoric waters and the reduced Mn-bearing primary lithology, the ages of Mn-oxides yield the time at which the meteoric oxidation front reached a certain depth in the profile. To test the hypothesis that deeply stratified weathering profiles evolve through the downward propagation of weathering fronts through time and that supergene minerals precipitated at the weathering front may persist metastably in weathering profiles, recording the history of weathering front propagation, we sampled Mn-oxides from four different depths in a 60 m deep profile exposed by the Cachoeira Mn-mining operations in SE Brazil. Laser incremental heating 40Ar/39Ar geochronology of 21 grains of Mn-oxides (cryptomelane) extracted from 7 samples, together with the sampling depth control, permit calculating the rate of downward propagation of oxidation fronts through time, yielding long-term (> 10 Ma) continental weathering rates for the area. The results yield middle Miocene to early Pliocene ages, decreasing from the top to the bottom of the profile, as expected from a downward propagating oxidation front. The oldest results (12.74-12.22 Ma) are obtained from duricrust samples at surface, while the youngest results (6.55-5.18 Ma) correspond to samples collected at 60 m below the present surface. Intermediate depths (42 and 45 m) yield intermediate ages (7.64-7.24 and 7.12-6.80 Ma, respectively). A linear fit through the distribution of weathering ages with depth yields a curve whose slope is 8.8 m * Ma⁻¹, the estimated rate of propagation of the weathering front. Given that the Mn-rich metamorphic rock (gondite) are surrounded by weathered schists and granulitoides, it is reasonable to assume that the average rate of the weathering front propagation, measured on supergene minerals precipitated on weathering profiles overlying the gondite, also applies to the adjacent lithologies. Thus, the results provide information on the saproclitization rate of the lithological units in the area surrounding the Cachoeira Mine (CM). The rate measured for the CM profile is compatible to the rates (4-8 m * My⁻¹) estimated from argon geochronology of surface samples at several distinct sites in SE Brazil (Carmo & Vasconcelos, Earth Surf. Proc. Land., in press).

326-12 Poster Bedini, Enton

LOW-GRADE NICKEL LATERITES OF ALBANIA

ARKAXHIU Fethi¹, BEDINI Enton²

1 - Albanian Geological Survey, Tirana, ALBANIA
2 - Geological Research Institute, Tirana, ALBANIA

Keywords: nickel laterites; Albania; ore reserves

Low-grade nickel laterites (Iron-nickel and nickel-silicate ores) spreading in the Mirdita zone of Albanides are the products of the lateritization of ultramafic igneous rocks of Mirdita eastern ophiolite belt during the Cretaceous period. They occur in three regions of Albania: 1. Northeastern (Kukesi); 2. Central-eastern (Librazhd-Pogradec) and 3. Southeastern (Bilishti). 1. Nickel-silicate and iron-nickel ore deposits such as Trull, Surroji and Arren are discovered in the Kukesi region. All the ore deposits have been formed by the lateritization of the ultrabasic mantle rocks during the lower Cretaceous. They consist of the nickel-silicate ores situated in the lower part of the laterite profile and iron-nickel ores in the upper part. 2. Iron nickel ore deposits situated in northeastern and southwestern flanks of the Shkumbini river syncline occur in the Librazhd-Pogradec region. In the northeastern flank they are located between the Middle-Upper Jurassic ultrabasic rocks at the bottom and Late Cretaceous limestones (Santonian-Early Campanian) at the top (in situ laterites), whereas in the contrary a great accumulation of the iron-nickel ore situated between two carbonate facies (Early Cretaceous at the bottom and Late Cretaceous at the top) occur in the southwestern flank (sedimentary type). 3. The Bitincka and Kapshtica ore deposits consisting of nickel-silicate and iron-nickel in situ laterites have been discovered in the region of Bilishti. They have been formed by the end of the Late Cretaceous representing the youngest iron-nickel and nickel-silicate lateritic products of Albania. They are situated on the serpentinized ultrabasic rocks and are covered by Paleogene formations. The northeastern and southeastern regions present a fuller lateritic profile having both nickel-silicate and iron-nickel ores, whereas in the central region the iron-nickel ore is predominant. Fe, Ni, Co, SiO₂, Cr₂O₃, MgO are the main component elements. Ni content ranges between 1-1.1 wt%. The overall ore reserves of the three mineralized areas are estimated to hundred of millions of tons, Bitincka deposit being the most attractive with one hundred million tons, having also a slightly higher ore grade due to consistent development of the nickel silicate horizon. The development of new technologies, lowering the cut-off grade, has opened new perspectives to the mining activity in this sector.

326-13 Poster Bruno, Delia Evelina

LANDSCAPE EVOLUTION AT LUZZI (CALABRIA, SOUTHERN ITALY)

BRUNO Delia Evelina¹, CALCATERRA Domenico¹, CRITELLI Salvatore², LE PERA Emilia³, PARISE Mario⁴

1 - Federico II University of Naples, Italy
2 - University of Calabria, Arcavacata di Rende, Italy
3 - National Research Council - IRPI, Section of Cosenza, Italy
4 - National Research Council - IRPI, Section of Bari, Italy

Keywords: weathering; landslides; Calabria

The town of Luzzi is located on the western side of the Sila Massif (Calabria, southern Italy), at the top of a hill bounded by narrow valleys, where Palaeozoic high-grade metamorphic rocks are deeply weathered. These rocks are gneiss and biotite schist, locally overlain by sedimentary sequences of Plio-Pleistocene to the east. In this study we examine the causes and some effects of rock weathering at the macro and micro-scale. We have analysed the morphological evolution of an area close to the town of Luzzi. Field surveying of the weathering features was carried out using both qualitative (colour, sound and entrance into of hammer; presence of fractures, breaking of samples) and quantitative (Schmidt's Hammer test) criteria to classify rock strength. In this area we observed the presence of classes III to VI (according to the Hong Kong Geotechnical Control Office classification), with prevailing V and VI classes. Within the terrains classified as V and VI class, a great variability in the characteristics of weathered materials was in turn observed. Consequently, two sub-classes were defined for V and VI terrains. The intense chemical and physical weathering of outcropping rocks strongly controls the morphological setting. Actually, several landslides occurred in the area, the most important being a complex mass movement that caused serious damage to main-built infrastructures and houses since the 16th century. Within the slope affected by

this phenomenon, most of the observed scarps are oriented toward the west or WNW, as shown by the landslide activity maps, which highlight the evolutionary trend of the area from 1954 to 1996. The morphological features in this area are greatly dependent on grade of weathering, tectonic activity, anthropogenic interventions, and rainfall. This latter induced a reactivation of the landslide in 1996, when new scarps developed in the study area.

326-14 Poster Chernikov, Andrei Andreevich

NEAR-SURFACE AND DEEP-SEATED WEATHERING PRODUCTS

CHERNIKOV Andrei Andreevich¹

1 - Fersman Mineralogical Museum RAS

Keywords: hypergenesis; near-surface; deep-seated; deposits

As a result of water-rock interaction near the earth surface the weathering crusts and coherent with them mineral association and mineral deposits, sometimes very grand, developed on the top of the fresh rocks or ore deposit bodies during the long-term interval and other favourable factors. Some meteoric waters may circulate to the depths of thousands of meters in areas where the permeability of the rocks is sufficiently high and differences in hydrodynamic pressure exist. Physical and chemical characteristics of groundwaters, penetrating to this depths, change rapidly. In consequence of water-rock interactions the porosity of rocks changes, the different mineral associations and mineral deposits are formed in deep parts of host rocks. Author examined it in book "Deep-seated hypergenesis, mineral and oreformation" (in Russian). Many factors, such as the original rock types, climate, geological history etc. affect the evolution and the type of physical, chemical and mineralogical states of weathering crust and deep-seated hypergene zone. Three principal types of rocks according to the natural processes which conduct to the forming of the weathering crust and deep-seated hypergene zone are 1) silicate rocks; 2) carbonates, sulfates and halides; 3) rocks enriched in sulfide and organic substances. The greater proportion of gold, vanadium, uranium and other deposits were formed over a long period of geological time as their ores composed of polygenetic mineral associations of different ages. Apart from several hydrothermal mineral stages no less than three hypergene stages were established, including deep-seated hypergene stage, on the giant gold-uranium Aldan Shield deposits (Russia). The contribution of the hypergene mineralisation in the formation of the base-metal-oregenetic deposit Big Kanimsur (Tadjikistan), the unique complex (V, U, Pd, Pt, Au, Ag) deposits of the Omega type (Karelia, Russia), pyrites and base metal deposits of the Ural, Altai and other regions in Russia and other countries. The polymorphic mineral associations and polymorphic peculiarity of mineral for hydrothermal, near-surface cementation and deep-seated hypergene zones are distinguished. Formation of porous media in the hypergene zone is the decisive factor for the accumulation of oil and gas.

326-15 Poster Motta, José Francisco Marciano

KAOLINITIC CLAY DEPOSITS FROM WEATHERING OF SEDIMENTS OF RECONCÁVO BASIN, BAHIA STATE, BRAZIL

CONCEIÇÃO FILHO Valter Mônica¹, MOTTA José Francisco Marciano², MOREIRA Marcos Donadello³, SILVA Raymundo Wilson Santos³, CABRAL JUNIOR Marsis³, TANNÓ Luiz Carlos³, CUCHIERATO Gláucia²
1 - CBPM - Bahia State Company for Mineral Researches - BA - Brazil
2 - IPT - Institute for Technological Researches - SP - Brazil

Keywords: Weathering products; kaolinitic clays; plastic clay; Reconcavo Basin; Erosion cycle

Several and important plastic clay and kaolin deposits for ceramic have been recently measured by State-owned CBPM mineral exploration company in the Bahia State of Brazil. These occurrences are placed on the flat terraces alongside the coastal areas, such as the Reconcavo Baiano and in the south of Bahia regions. This paper focuses the former area, which comprises the Reconcavo Basin, a Lower Cretaceous intracontinental rift, filled up by syn-rift megasequence, including sandstones, shales and limestone, and a post-rifting cover, with conglomerates and sandstones with occasional shales and limestone. The main assembly of clayminerals in the clayey fresh rocks is made up by illite (Ill) and smectite (sm) groups and additionally by ill-sm mixed layer and kaolinite. These clayminerals were originated by detritic heritage as well as by diagenesis. After deposition, the region was submitted to tectonic and isostatic movements and regional erosion cycles, including weathering under warm and humid conditions. As result, a significative a kaolinitic-rich weathered covering can be observed in the area, throughout a set of outcrops, which draw the following weathered profile: a) in the top - fragments of iron crust; b) top to medium level - up to 50m-thick sandy deposits, white in color, with kaolinitic-rich matrix layer, extensively exploited for construction; c) medium level - 5-10m thick white laminated clayey rock, formed by kaolinitic clay, corresponding the kaolinitic clay ore deposits; d) medium to bottom level - colored clayey rock; normally reddish; and e) bottom level - green to gray fresh clayey rocks, composed by illitic to illitic-smectitic clays. The kaolinitic clay layer is mainly formed by kaolinite, followed by quartz, and other phyllosilicates. The kaolinite shows euhedric and hexagonal plates, well defined, with diameter varying between 0.1 to 3 µm. Analyzing these aspects of the mineralogy and its relationship with the fresh rocks and the regional lateritic profile, it's indicate that most of kaolinite content is formed in situ by weathering of Reconcavo Basin sediments. Detail studies for determine the origin and the age of weathering event and to qualifying and to measure these deposits for ceramic use is still going on. Previous studies carried out point out more than 30 million tons of kaolinitic clays for whiteware ceramics. The main characteristics of these clays are the low iron content and white firing color.

326-16 Poster Oliveira, Sonia Maria Barros De

DEGRADATION OF A LATERITIC IRON CRUST IN THE BRAZILIAN AMAZON

LARIZZATTI Joao Henrique¹, OLIVEIRA Sonia Maria Barros De²

1 - Serviço Geológico do Brasil
2 - University of São Paulo

Keywords: Ferricrete; Laterite; Brazilian Amazon

At Tapajós Province, situated in the south-central part of the Amazon craton, the landscape consists of an undulating relief which resulted from the incision of the Velhas Surface. During the Velhas geomorphological cycle (Oligocene to Lower Pleistocene), under contrasted tropical climate, lateritic iron crust profiles developed from Proterozoic igneous rocks. Subsequent more humid climatic conditions led to the degradation of the duricrust into latosols. A geochemical balance of the laterization process was estimated on the basis of detailed mineralogical and geochemical data from the weathering mantle in the Fazenda Pison area. In a fully preserved profile (20-30 m deep), five main units can be recognized, from the base: (1) a saprolite, (2) a mottled clay layer, (3) a discontinuous ferricrete, (4) a red latosol horizon, and (5) a yellow latosol horizon. The latosols have nodules and pisoliths derived from the duricrust within a clay-rich matrix. Factor analysis carried out on chemical data (26 samples, 24 variables) reveals 3 groups of elements with contrasting behavior.

The first, Si-Ca-Na-Mg-K-Mn-Ba-Cu-Zn-Rb, is characteristic of the saprolite, representing the residual primary minerals and the manganeseiferous concretions which are common at the base of the profile. The second, Fe-V-Cr-S-Ga, represents the geochemical signature of the iron crust, and the third, Al-Ce-La-Nb-Zr-Sr-Ti-Pb, is related to the presence of kaolinite, either in the mottled clay layer and in the latosols. Mass balance has been performed assuming the immobility of Ti, resulting in a volumetric change of approximately -50% for the mottled clay layer and the overlying horizons compared to the saprolite. There is a strong depletion of Ca, Na, K and Mg (-80 to -100%), and a moderate depletion of Si (-65 to -80%) and Al (-45 to -65%) across the profile. Iron is moderately enriched in the mottled clay layer (+50 to +60%), and strongly enriched in the ferricrete (+330 to +700%). In the latosols Fe is slightly depleted (-20 to -38%). The absolute accumulation of iron in the ferricrete is due to the geochemical vertical transport of this element from a previous overlying profile which underwent aggressive weathering. On the other hand, an important amount of Fe has been leached out from the profile during the geochemical degradation of the ancient ferricrete into red and yellow latosols.

326-17 Poster Cho, Sang Ho

EXPERIMENTAL AND NUMERICAL ESTIMATION OF DYNAMIC FRACTURE PROPERTIES OF ROCK

CHO Sang Ho¹, OGATA Yuji², KANEKO Katsuhiko¹
 1 - Hokkaido University
 2 - AIIST

Keywords: dynamic fracture properties of rock; dynamic tension test; dynamic fracture process analysis

Information regarding the dynamic fracture properties of rock material is of considerable importance in assessing the stability of rock structures under dynamic conditions. This study suggest a new approach based on Hopkinson's effect combined with spalling phenomena to investigate the dynamic fracture properties of rock, e.g., the fracture energy and coefficient of uniformity of rock subjected to dynamic loads. The approach combined the dynamic tension test and dynamic fracture process analysis. In the tensile test, the free surface displacement velocity at the free end of a rock specimen is measured with a laser vibration meter and the fractured planes are observed using a high-speed camera. The measured displacement velocities are used to evaluate the ratio of initial and final flying velocities. In the dynamic fracture process analysis, the increment displacement form of a dynamic finite element method is used to explain large displacement behavior. The analysis incorporates rock inhomogeneity and the fracture process zone (FPZ), and uses the tensile softening curve, which is an approximate function of the crack opening displacement (COD), h , and the cohesion, S , to model the FPZ in rock. The COD values from 0 to W_1 correspond to the microcrack zone and values from W_1 to W_2 correspond to the bridging zone. The COD values, W_1 and W_2 , are defined as the fracture energy, G_f , and the tensile strength S_t . The fracture processes are simulated using specimen models with different fracture energies and microscopic strength spatial distributions. The calculated displacement velocities for the specimens are used to evaluate the ratio of initial and final flying velocities, and compare with that from the measured displacement velocities. From these analyses, the fracture energies of the rock specimens are determined and used to evaluate the coefficient of homogeneity for the rock involved in dynamic tensile fracture and strength. In addition, this study shows that the dynamic fracture properties of rock are of importance to determine rock breakage and fragmentation in blasting.

326-18 Poster Quinta Ferreira, Mário Oliveira

WEATHERING OF THE GRANITE OF GUARDA (PORTUGAL) AND CORRELATIONS BETWEEN GEOCHEMICAL INDICES

QUINTA FERREIRA Mário Oliveira¹, ANTÃO Ana M.C.²
 1 - Dep. Ciências da Terra, Universidade de Coimbra, Portugal
 2 - Dep. Engenharia Civil, Instituto Politécnico da Guarda, Portugal

Keywords: granite; weathering; geochemical indices; Guarda-Portugal

The influence of weathering on the petrographic and chemical characteristics of the granitic rocks of Guarda, central Portugal, was studied. These granites were formed during the Hercynian orogeny. They are monzogranites and their mineralogy is constituted by quartz, microcline, oligoclase-albite, biotite and muscovite. As accessory minerals apatite, zircon and magnetite are found. As secondary minerals kaolinite, sericite and chlorite are the most abundant minerals. The texture is porphyritic, with an average dimension of 7mm, having large mega crystals of feldspar with an average dimension of 45mm. The thin sections study revealed that in grades of weathering I and II, following the ISRM classification, the presence of fissures is rare and they are closed. With the increase of weathering increases the number of fissures, the porosity, the content of chlorite and dark minerals and decreases the content of anorthite of the plagioclase. In weathering grade I the molecular ratios

$Al_2O_3/(Na_2O+K_2O+CaO)$ between 1.04 e 1.09 and the $Al_2O_3/(Na_2O+K_2O)$

between 1.29 e 1.36 being classified as peraluminous to calc-alkaline granites. The area is located in the "Estrela" mountain, at level 1000m, having an annual average temperature of 9°C, with cold winters and dry hot summers, with an average annual rainfall of 1094mm. The region has large granite blocks on top of the hills, and the regional rock massif is fractured and eroded. Four main joint sets were identified. After the field description and collection of representative samples, the rock material was characterised in the laboratory by optical microscopy, X-ray diffraction and chemical analyses. Tests were also undertaken to determine the physical characteristics of the material of the different grades of weathering. Several chemical weathering indices were computed and the statistical correlations between them and the weathering grade have been evaluated. Only the indexes WPI (Reiche, 1943), Miura (Miura, 1973), CWI (Sueoka, 1988) and β (Rocha-Filho et al, 1985) showed good statistical correlations. The ratio $2Fe_2O_3/(2Fe_2O_3+FeO)$ shows the two stages of weathering, as presented by Miranda (1984). The index B, the ratio R_2O_3 (Coiman, 1982) and the index (Imob) (Irfan, 1996) showed reasonable correlations with the weathering grade. Acknowledgements: To "Centro de Geociências da Universidade de Coimbra" and to PRODEP III (4/5.3/Prodep/2000, ref.182.004/00) from "Fundo Social Europeu".

326-19 Poster Sayyed, Mohammed Rafi

LITHOLOGICAL CONTROL ON THE GEOCHEMICAL MOBILITY OF ELEMENTS DURING WEATHERING

SAYYED Mohammed Rafi¹

1 - GEOLOGY DEPARTMENT, POONA COLLEGE, CAMP, PUNE 411 001, INDIA

Keywords: Weathering; Elemental mobility; Geochemistry; Lithological control
 Rock weathering is controlled by variety of factors. The lithological control on the chemical weathering has been investigated with special reference to the mobility of major elements. The various rock types occurring in the Vasal-Virar

area, north of Mumbai (India) have been studied for their chemical weathering under all other controlling factors remaining essentially constant. In order to evaluate the mobility of major elements, the chemical analyses of samples of weathered and fresh rocks were carried out. Binary and ternary plots, by considering the behavior of single element oxide or a group of elemental oxides during progressive weathering, give interesting information. These chemical studies revealed that crystallinity of rocks, intensity of fracturing and jointing in the rocks and their depth of exposure to various weathering processes, to great extent, have controlled the chemical composition of the weathered products. Irrespective of the type of rock, the compositions of weathered products seem to have been governed by the mobility of elements during weathering. The rocks during weathering, despite their different mineral and chemical composition, have shown a general depletion of alkalies (K and Na) & alkaline earths (Ca and Mg), Fe^{2+} and Si on one hand and enrichment of Al, Fe^{3+} and H_2O^+ on other hand. The magnitude of depletion or enrichment of these elements however has been different chiefly due to their chemical composition.

326-20 Poster Di Figlia, Maria Grazia

SOIL SOLUTION GEOCHEMISTRY IN THE PANTELLERIA ISLAND: IMPLICATIONS FOR WEATHERING ON VOLCANICS

DI FIGLIA Maria Grazia¹, BELLANCA Adriana¹, NERI Rodolfo¹, ANGELONE Massimo²

1 - Dipartimento C.F.T.A. Università di Palermo
 2 - Sezione PROT-CHIM, ENEA Casaccia-ROMA

Keywords: Soil solutions; saturation index; weathering

Major, minor, and trace metal contents were determined in soils and soil solutions of Pantelleria Island, Sicily, in order to evaluate the extent of weathering and the contribution of aqueous transport to groundwater. Based on thermodynamic modeling of the soil solution data, the clay minerals recognized in the soils result over-saturated, kaolinite being the stable phase. Soil solutions are significantly under-saturated with respect to the more alterable phases, such as olivine, pyroxenes and glass, with the latter near to the saturation state. High Na concentrations of soil solutions, ascribed to sea salt addition and volcanic glass alteration, probably favour the stability of sodium-rich feldspars. Super-saturation of minerals rich in Fe and Al, like gibbsite, goethite, hematite and smectite-like clays account for moderate mobile Al and Fe. The depletion of Ca and Mg, related to neoformation of clay minerals, makes the solutions undersaturated with respect to the alterable primary minerals. Soil solutions are strongly super-saturated with respect to the principal Fe-Ti oxides recognized in the soils and inherited from bedrock, suggesting their stability during weathering. The chemical composition of soil solutions appears to be very similar to those of isothermal groundwaters in the island.

326-21 Poster Dani, Norberto

BAUXITE EVOLVED FROM ALKALINE ROCKS OF LAGES, SC - BRAZIL

DANI Norberto¹, FORMOSO Milton L. L.¹, MEXIAS Andre S.¹, GOMES Marcia E. B.¹
 1 - Universidade Federal do Rio Grande do Sul

Keywords: bauxite; Brazil; nordstrandite; halloysite; allophanes

The specific objective of this work is to investigate the weathering process and genesis of bauxite deposits associated with alkaline rocks that outcrop in the region of Lages, Santa Catarina, South of Brazil. The chemical and petrographic revision allowed to rearrange the feldspathic alkaline rocks group in south type and north type phonolites. In the north type is recognized and described the presence of a differentiated process of postmagmatic alteration. In this environment, the intensity of the endogenetic alteration was decisive in the formation of the deposits and this is one of the main causes of the concentrated distribution of bauxite in the north type phonolite. It is proposed a review of the available data on regional and local geomorphology, as well as on the geological events responsible for the current landform modelization. This analysis, associated with a set of data obtained by the application of geochronology techniques, based in fission tracks of apatites, demonstrate the difficulties of accept bauxite generation during the Early Tertiary. The data converge to a Late Tertiary age. The products of meteoric alteration evolve to a paragenesis formed by a restricted group of secondary minerals, especially halloysite, aluminum iron and titanium hydroxides and oxihydroxides. Using detailed X-ray diffraction combined with Infra Red spectrometry and partial chemical attacks turn available the identification of low crystalline phases as Si-Al allophanes. Following up in the weathering profile by detailed mineralogical studies, associated to experimental laboratory syntheses turn possible not only to speculate about the allophane transformation to halloysite or gibbsite, but also to describe the increase transformation of halloysite to kaolinite. For the first time in Brazil is described the natural occurrence of the aluminum hydroxide polymorph, identified as nordstrandite. The reasons for speciation of aluminum compounds (nordstrandite, gibbsite and boehmite) on this particular weathering profile are inferred. In the same way, the early nucleation of boehmite is in disagreement with the current models that explain the distribution of this phase in laterites around the world. At the same time, it is investigated the reasons of the halloysite nucleation in these rocks, as well as the influence of the solution composition in the crystallinity and morphology of this phase.

326-22 Poster Ietto, Fabio

CONTINENTALITY AND WEATHERING AGE OF GRANITOIDES IN SOUTHERN CALABRIA

IETTO Fabio¹, IETTO Antonino¹

1 - Università della Calabria, Dipartimento di Scienze della Terra, Via Pietro Bucci - Cubo 12/b - Rende (CS) 87036 Italy ITALY

Keywords: Weathering; southern Calabria; erosion

The main outcrops of granitoid rock in the Italian peninsula are to be found in Calabria or, to be more precise, in southern Calabria. The literature that, up to now, has studied the weathering processes of these rocks, even though limited to the Serre mountains (MORESI 1987; CALCATERRA et al. 1993; MONGELLI & MORISI, 1990; MONGELLI, 1993; MONGELLI et al., 1998; LE PIRA et al, 2000), has always implicitly or explicitly stated that these alterations occurred in an environment with a "Mediterranean climate" and, consequently, during the Pleistocene time, even considering that time's climatic variations. This assumption is the basis from which the various stages of maturity of these processes have been looked for and studied area by area, adopting the classical methods of analysis or proposing some new ones. Our recent studies allow us to state that the beginning of the weathering processes in Calabrian granitoids dates back at least to the pre-Tortonian time and that the present outcrops of granitic alterites are the erosive residual of more ancient mantles. Consequently, the degree of maturity that can now be observed in different outcrops depends essentially on the profundity that the superficial erosive processes have reached. The stratigraphic columns do not show the degree of maturity that the weathering reached but the immaturity of the deepest levels of the more ancient mantles that progressively emerge. The areas with more mature alterite outcrops are, though, those which are more protected from the erosion