

**EUROPEAN
CURRICULUM VITAE
FORMAT**



PERSONAL INFORMATION

Name

FERENC LÁZÁR FORRAY

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ferenc.forray@ubbcluj.ro

Nationality

Hungarian

Date of birth

29 MARCH 1969

WORK EXPERIENCE

a) scientific research

- Dates

- Name and address of employer

- Type of business or sector
- Occupation or position held

- Main activities and responsibilities

- Dates (from – to)

- Name and address of employer

- Type of business or sector
- Occupation or position held

- Main activities and responsibilities

- Dates (from – to)

- Name and address of employer

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- Main activities and responsibilities

- Dates (from – to)

- Name and address of employer

- Type of business or sector
- Occupation or position held

- Main activities and responsibilities

2003- 2006

University of California at Davis, NEAT ORU/THERMO CHEM FACILITY, One Shields Ave 1, Davis, CA, USA

Scientific research

• Postdoctoral researcher

- Thermochemistry of acid mine drainage related minerals (jarosite, beudantite, beaverite, lead jarosite, alunite and yavapaiite)
- Thermochemistry of nanomaterials (sulfides)
- Thermochemistry of arsenic minerals
- Computer network administrator
- Lab instrument supervisor

2000-2001

"Eötvös Loránd" University, Budapest, Múzeum Körút no. 6, Budapest, Hungary

Scientific research

• Scientific researcher

- Geochemistry of heavy metals and the fate and transport of them in the environment

1998 – 1999

Ifu.GmbH, Flöha, Germany, Heinrich-Heine Str 5, D-09557, Flöha, Germany

Scientific research

• Scientific researcher

- Study of the river water polluted by mining industry using UV-VIS spectroscopy and AOS spectroscopy

1997

University of Stellenbosch, South Africa, Private Bag X1, Matieland 7602, South Africa

Scientific researcher

• Scientific researcher

- Study of heavy metal pollution in vicinity of cooper mines (Namaqualand, South Africa)
- Study of rock-water interactions using capillary electrophoresis
- Geochemical study of fluid inclusions in minerals using capillary electrophoresis
- Capillary electrophoresis training

<ul style="list-style-type: none"> • Dates (from – to) • Name and address of employer <ul style="list-style-type: none"> • Type of business or sector • Occupation or position held • Main activities and responsibilities 	<p>1994 “Eötvös Loránd” University, Budapest, Múzeum Körút no. 6, Budapest, Hungary Scientific researcher</p> <ul style="list-style-type: none"> • Scientific researcher • Paleoecology of actaeonella fauna from Cherges (Hunedoara County, Romania)
<p>b) University instruction</p> <ul style="list-style-type: none"> • Dates • Type of business or sector • Occupation or position held <p>• Main activities and responsibilities</p>	<p>1995 - present Didactic activity in university instruction, Babes-Bolyai University</p> <ul style="list-style-type: none"> • Scientific researcher (1995-1996) at the “Babeş-Bolyai” University, Biology and Geology Faculty • Geology engineer (1996-1997) at the “Babeş-Bolyai” University, Biology and Geology Faculty, Electron microscopy laboratory • Teaching assistant (1997-2002) at the “Babeş-Bolyai” University, Biology and Geology Faculty • Lecturer (2002-present) at the “Babeş-Bolyai” University, Biology and Geology Faculty, Department of Geology, Chair of Mineralogy • Vice dean (2008 – 2012) at the “Babeş-Bolyai” University, Biology and Geology Faculty <p>• Practical works:</p> <ul style="list-style-type: none"> – Geology (“Babeş-Bolyai” University, Geography Faculty) <p>• Courses of lectures for students and trainers for a master's degree:</p> <ul style="list-style-type: none"> – Geochemistry (“Babeş-Bolyai” University, Biology and Geology Faculty) – Environmental Geology (“Babeş-Bolyai” University, Environmental Science Faculty) – Crystallography (“Babeş-Bolyai” University, Biology and Geology Faculty) – Analytical methods (“Babeş-Bolyai” University, Biology and Geology Faculty) – Geological hazards (“Babeş-Bolyai” University, Environmental Science Faculty) – Applied informatics in geology (“Babeş-Bolyai” University, Biology and Geology Faculty) – Geological data interpretation (“Babeş-Bolyai” University, Biology and Geology Faculty) – Applied statistics (“Babeş-Bolyai” University, Biology and Geology Faculty) – Geology (“Babeş-Bolyai” University, Geography Faculty)

EDUCATION AND TRAINING

<ul style="list-style-type: none"> • Dates • Name and type of organization providing education and training • Principal subjects/occupational skills covered • Title of qualification awarded • Level in national classification (if appropriate) 	<p>1995-2002 “Babeş-Bolyai” University, Biology and Geology Faculty</p> <p>Training for a doctor's degree in geology</p> <p>Doctor in geology (Magna cum laude)</p> <p>Post-university</p>
<ul style="list-style-type: none"> • Dates • Name and type of organization providing education and training • Principal subjects/occupational skills covered • Title of qualification awarded • Level in national classification (if appropriate) 	<p>1994-1995 “Babeş-Bolyai” University, Biology and Geology Faculty</p> <p>Training for a master degree in geology</p> <p>Master degree in petrometallurgy</p> <p>Post-university</p>
<ul style="list-style-type: none"> • Dates • Name and type of organization providing education and training 	<p>1989-1994 “Babeş-Bolyai” University, Biology, Geography and Geology Faculty</p>

<ul style="list-style-type: none"> • Principal subjects/occupational skills covered • Title of qualification awarded 	Training for a geology and geophysical engineer degree
• Level in national classification (if appropriate)	Geology and geophysical engineer
• Dates	University
• Name and type of organization providing education and training	1984-1988
• Title of qualification awarded	Energetic High school no. 2, (classes 9-12), Deva, Hunedoara County
• Level in national classification (if appropriate)	Graduation diploma, Electro technique
• Dates (from – to)	High school
• Name and type of organization providing education and training	1976-1984
• Title of qualification awarded	School no. 3, Deva, Hunedoara County
• Level in national classification (if appropriate)	School graduate
	Elementary and gymnasium

PERSONAL SKILLS AND COMPETENCES

Acquired in the course of life and career but not necessarily covered by formal certificates and diplomas.

MOTHER TONGUE

OTHER LANGUAGES

- Reading skills
- Writing skills
- Verbal skills

- Reading skills
- Writing skills
- Verbal skills

ORGANIZATIONAL SKILLS AND COMPETENCES

Coordination and administration of people, projects and budgets; at work, in voluntary work (for example culture and sports) and at home, etc.

AWARDS

TECHNICAL SKILLS AND COMPETENCES

With computers, specific kinds of equipment, machinery, etc.

HUNGARIAN

ROMANIAN

- VERY GOOD
VERY GOOD
VERY GOOD

ENGLISH

- VERY GOOD
GOOD
GOOD

- Director/member in many research grants
- Secretary general, 16th Meeting of the Association of European Geological Societies (MAEGS-16), 9 - 13 July 2009, Babeş-Bolyai University, Cluj-Napoca, Romania

- 2001 – AWARD FOR ACADEMIC MANAGEMENT (Nr. 20.373/19.12.2011)

ADVANCED COMPUTER SKILLS

- WINDOWS
- SOFTWARE PROGRAMMING (DATABASES, SMALL UTILITY PROGRAMS)
- WEB DESIGN
- ADOBE PHOTOSHOP AND ILLUSTRATOR

GEOLOGY RELATED SOFTWARE

- ROCKWORKS
- SURFER
- SPSS

	<ul style="list-style-type: none"> - SURFER - SPSS - MATERIALS STUDIO - CRYSTAL SHAPER - JADE - MATCH! - DIFRACEVA - PHREEQC - MINTEQA2 - GLOBAL MAPPER <p>ADVANCED ELECTRONICS</p> <p>ADVANCED MECHANICS</p> <p>ANALYTICAL EQUIPMENTS (USE / MAINTENANCE)</p> <ul style="list-style-type: none"> - XRD (CERTIFICATE FROM UNIVERSITY OF CALIFORNIA, DAVIS, USA) + MAINTENANCE - XRF - CAVITY RING DOWN SPECTROSCOPY + MAINTENANCE - ELECTRON MICROPROBE + MAINTENANCE - TG/DSC - FTIR - CALORIMETRIC MEASUREMENTS - SEM - TEM - CAPILLARY ION ELECTROPHORESIS
ARTISTIC SKILLS AND COMPETENCES <i>Music, writing, design, etc.</i>	Professional photographer Art photography
OTHER SKILLS AND COMPETENCES <i>Competencies not mentioned above.</i>	Mountaineering Cave exploration
DRIVING LICENCE(S)	Yes, B category (EU) and C category (California, USA)
ADDITIONAL INFORMATION	<ul style="list-style-type: none"> • Web page http://pages.ubbcluj.ro/forray • Research gate (Impact score: 20.13): https://www.researchgate.net/profile/Ferenc_Forray • Member in scientific societies: <ul style="list-style-type: none"> – Geochemical Society – American Geophysical Union (AGU) • Scientific review member at National Authorities for Scientific Research (ANCS) • Reviewer for the following ISI publications: <ul style="list-style-type: none"> • Geochimica et Cosmochimica Acta (Impact Factor: 4.331) • Review in Mineralogy and Geochemistry (Impact Factor: 3.565) • Quaternary Research (Impact Factor: 2.544) • American Mineralogist (Impact Factor: 2.28) • Neues Jahrbuch für Mineralogie (Impact Factor: 0.875) • Reviewer for the following journals: <ul style="list-style-type: none"> • Studia UBB, Geologia • Journal of Lithic Studies

ADDITIONAL INFORMATION

- Author of 10 ISI articles, 5 as first author
- Author of 1 book and 2 chapters (published in Romania)
- Director of 3 research grants
- Member in more than 23 research grants and contracts

ANNEXES:

Annex 1: List of the research grants/projects/contracts

Annex 2: List of publications

Annex 3: List of presentation at conferences

ANNEX 1

LIST OF THE RESEARCH GRANTS/PROJECTS/CONTRACTS

PI for grants

1. **Forray F. L.** Grant A11/2001 ANSTI (2001-2002), Monitorizarea complexă a mediului în Munții Apuseni. Implementarea strategiei de monitorizare. Colectiv: Cristina Dobrotă, Forray E., Tămaș Tudor și Jozsa S. Valoare grant: 25.000.000 lei.
2. **Forray, F.L.**, 2002. Bioaccumulation of heavy metals in gastropods shells as tool for environmental pollution monitoring, Sapientia, Cluj-Napoca. Valoare grant: \$1000.
3. **Forray, F.L.**, 2003. Research on the possibilities of stopping the heavy metal pollution in the Rosia Montana mining region Sapientia, Cluj-Napoca. Valoare grant: \$1000.

Member in research grant and contracts

1. **PI: Forray Ferenc Lazar**, Contract ISER, filial București 2015, Analize izotopice $\delta^{13}\text{C}$ pe probe de sol. Project value: 4000 lei.
2. **PI: Forray Ferenc Lazar**, Contract ISER, filial Cluj, Contract nr. 18565/5.11.2014, Analize izotopice pe probe de apa. Project value: 7432 lei.
3. **PI: Ionescu Maria-Irina-Corina**, (2009) *STUDIUL GEOCHIMIC SI MINERALOGIC AL ANDEZITELOR DIN MUNTII OAS-GUTAI*, altele nationale, GEOCHIMIE SI RESURSE , *Precup Carmen Natalia / membru echipa , Nagy Istvan / membru echipa , Balica Constantin / membru echipa , Forray Ferenc-Lazar / membru echipa*. Project value: 14998 RON.
4. **PI: Filipescu Sorin**, *Studiu geologic, evaluare regionala si posibilitati de valorificare a argilelor gazeifere din Romania (o resursa neconventionala) – etapa I*, altele nationale, PALEONTOLOGIE-STRATIGRAFIE , *Haitonic Raluca - Emilia / membru echipa, Silye Lorand / membru echipa, Bucur Ioan / membru echipa, Benea Ion-Marcel / membru echipa, Bedelean Horia-Stefan / membru echipa, Chira Carmen-Mariana / membru echipa, Forray Ferenc-Lazar / membru echipa, Har Nicolae / membru echipa, Onac Petroniu-Bogdan-Lucian / membru echipa, Popa Mirela-Violetta / membru echipa, Sasaran Emanoil-Florin / membru echipa, Tantau Ioan / membru echipa, Szabo Botond / membru echipa, SZEKELY Szabolcs-Flavius / membru echipa, Miclea Andreea Ionela / membru echipa, Beldean Claudia-Mariana / membru echipa, Reszeg Voichita / membru echipa, Andreica Dumitru / membru echipa , Facultatea de Geologie si geofizica/UNIVERSITATEA BUCURESTI/ partener*. Project value: **69254 RON**.
5. **PI: Alexandra Navrotsky**, Grant U.S. Department of Energy Grant DEFG0397SF14749 (2003-2015): Thermodynamics of Minerals Stable Near the Earth's Surface. Membru: **Forray Ferenc Lazar**. Project value: > **\$1.000.000**.
6. **PI: Peter Uhlík**, Advanced Environmental Geology (ADVANCEG 1) – Mineral resources suitable for environmental application ERASMUS IP: 11203-1655/BRATISL02 (2011/12), Coordonator pentru Romania: Dana Pop, **Forray Ferenc Lazar**. Project value: **33 947 EUR**.
7. **PI: Peter Uhlík**, Advanced Environmental Geology (ADVANCEG 2) – The impact of mining activities on the environment. ERASMUS IP: 11203-0899/BRATISL02 (2012/13), Coordonator pentru Romania: **Forray Ferenc Lazar**. Project value: **35 518 EUR**.

8. PI: Peter Uhlík, Advanced Environmental Geology (ADVANCEG 3) – The environmental technologies in mining and waste management. ERASMUS IP: 13203-1044/BRATISL02 (2013-2014), Coordonator pentru Romania: **Forray Ferenc Lazar**. Project value: **32 794 EUR.**
9. PI: Onac Petroniu-Bogdan-Lucian, Stable isotope signature in bat guano cave as archives of past environments, UEFISCDI, GEOCHIMIE SI RESURSE, PN II- ID -PCE-2011-3-0588/2013-2016, GEANTA Anca-Daniela / membru echipa , GIURGIU Alexandra - Mihaela / membru echipa , **Forray Ferenc-Lazar / membru echipa** . Project value: **1429657 RON.**
10. PI: Paul Serban Agachi, (2007–2013, (PN II) Nr.6PM/I/ 20.10.2008) R.I.C.I. Retea Integrata de Cercetari Interdisciplinare. Contract de finantare pentru executie proiecte . Plan National De Dezvoltare a Cercetarii. Dezvoltarea și modernizarea infrastructurii de cercetare existente prin includerea Centrelor și Laboratoarelor vizate într-o Rețea Integrată pentru Cercetări Interdisciplinare (RICI). Membrii: Colectiv mare din Univ. Babeș-Bolyai, **Forray Ferenc-Lazar / membru echipa**. Project value: **54.043.558,41 lei.**
11. PI: Onac Petroniu-Bogdan-Lucian, Grant B.M. 24351, cod proiect 9 (1999-2001); Studiul compoziției, vârstei și gradului de poluare a solurilor fosile și actuale din Transilvania. Membrii: Lucreția Ghergari, Tămaș Tudor, **Forray Ferenc-Lazar, Bodnariuc Antoniu**. Project value: **\$50.000.**
12. PI: Filipescu Sorin, Grant 218 Banca Mondiala (2001-2002), Dezvoltarea metodelor de predare, asimilare si evaluare in domeniul stiintelor natural cu ajutorul modulelor multimedia. Colectiv: Forray Ferenc-Lazar / membru echipa. Project value: **\$40.000.**
13. PI: Dana Pop, Grant Nr. 32575/1999, 38/1-2, CNCSU Nr. 32575/1999, Tema nr. 107/38- CNCSU. Baze de date multimedia pentru colectii mineralogice (Multimedia database for mineralogical collections). Membrii: **Forray Ferenc-Lazar**, Marcel Benea, Ioan Bedelean, Bodnariuc Anton. Project value: unknown.
14. PI: Lucreția Ghergarii. Grant CNCSIS 46/51 (1999): Cercetări privind microstructura, microtextura si compozitia fazală aproduselor de ceramică fină procesate prin tratamente termice rapide. Membrii: Teofil Farcas, Forray Ferenc-Lazar. Project value: unknown.
15. PI: Ioan Bucur, Grant CNCSU si Banca Mondiala (1997-2000): Dezvoltarea studiilor aprofundate si a doctoratelor in domeniul Petrometalogeniei, tectonicii, sedimentologiei si biostratigrafiei in terenurile proterozoice si fanerozoice din Romania. Valoare 125 000 USD). Membrii echipei: Barbu Ovidiu, Bedelean Horea, Benea Marcel, Chira Carmen, Codrea Vlad, Duca Voicu, Filipescu Sorin, Forray Ferenc-Lazar, Har Nicolae, Ionescu Corina, Onac Bogdan, Popa Mirela, Săsăran Emanoil, Tanțău Ioan, Tămaș Călin, Tămaș Tudor. Project value: **\$125.000.**
16. PI: Lucreția Ghergari, Grant CNCSIS 13/439(1997), 4/93(1998): I. Studiul influenței materilor prime asupra microstructurii, microtexturii și compoziției fazale ale unor produse ceramice. II. Studiu paleontologic asupra charophytelor din formațiunile paleogene de pe bordura nord-vestică a Bazinului Transilvaniei. Membrii: **Forray Ferenc, Teofil Farcas.** Project value: 9000 lei.
17. PI: Lucreția Ghergari, Proiect de cercetare Mina Cacica (1996) Petrography and mineralogy of some rock salt from Cacica mine. Membrii: Teofil Farcas, Forray Ferenc, Albu Octavian, Simona Popa. Project value: 3560 lei.
18. PI: Lucreția Ghergari, 1996 Grant no.1018 CNCSU, 13/439 1997). I. Studiul caracteristicilor microstructurale și de compoziție fazală pentru unele produse ceramic de diferite proveniențe.

- II. Studii morfostructurale asupra unor organism fosile mezozoice și neozoice cu importanță stratigrafică. Ioan Mârza, Ioan Bedelean, Sorin Filipescu, Charmen Chira, Teofil Fărcaș, Forray Ferenc. Project value: unknown.
19. **PI: Militon Frentiu and Grigor Moldovan** (1993-1997) Elaboration of models and algorithms for applications from different domains. New performant algorithms concerning problems of classification, simulation and reorganization of data. Contract 1087B/1993, 3010/1994, B10/Grant 244/1995, Grant 943/1996, Grant 309/1997, Contract between the Babes-Bolyai University, Cluj-Napoca and the Ministry of Education and Science Research grant coordinated by Prof. Militon Frentiu and Grigor Moldovan. Members: Forray Ferenc. Project value: unknown.
20. **PI: Lucreția Ghergari**, Contract SANEX (1995) Determinări mineralogice și microstructurale pe materii prime și produse ceramic (Mineralogical and micro structural determination of some ceramic product). Members: Teofil Farcas, Forray Ferenc, Albu Octavian, Silvia Moraru, Simona Popa, Ciceu Marius. Project value: unknown.
21. **PI: Ioan Mârza**, no.1015 CNCSU, B43-57/1 ,CNCSIS(1995-1997) Petrographical, metalogenetical and micro tectonic comparison between Laramic and Neogene's volcanism from Apuseni mountains and Banat (Romania). Members: Lucreția Gherghari, Har Nicolae, Forray Ferenc, Călin Tămaș. Project value: unknown.
22. **PI: Lucreția Ghergari**, 1995, Grant B47-33/CNCSU 1.1 Studii mineralogice complexe asupra ocurențelor și zăcămintelor de bentonite din Transilvania; recoltarea de probe pregătirea probelor. 1.2. Studii mineralogice complexe asupra ocurențelor și zăcămintelor de bentonite din Transilvania; studii mineralogice și petrografice. Ioan Mârza, Ioan Bedelean, Teofil Fărcaș, Forray Ferenc. Project value: unknown.
23. **PI: Lucreția Ghergari**, 1995, Grant A16-34/1.2 CNCSIS Studii morfostructurale ale mineralelor argiloase (smectite) de diferite proveniențe. Ioan Mârza, Ioan Bedelean, Sorin Filipescu, Carmen Chira, Teofil Fărcaș, Forray Ferenc. Project value: unknown.

ANNEX 2

LIST OF THE PUBLICATIONS

1. Forray, F.L., Onac, B.P., Tanțău, I., Wynn, J.G., Tămaș, T., Coroiu, I., Giurgiu, A., 2015. A Late Holocene environmental history of a bat guano deposit from Romania: an isotopic, pollen and microcharcoal study. *Quaternary Science Reviews*. doi: 10.1016/j.quascirev.2015.05.022.
2. Onac, B.P., Hutchinson, S.M., Geantă, A., Forray, F.L., Wynn, J.G., Giurgiu, A.M., Coroiu, I., 2015. A 2500-year Late Holocene multi-proxy record of vegetation and hydrologic changes from a cave guano-clay sequence in SW Romania. *Quaternary Research* 83, 437-448. doi: 10.1016/j.yqres.2015.01.007.
3. Ponta, G.M., Nam, N.X., Forray, F.L., 2015. A comparative study between the karst of Hoa Quang, Cao Bang province, Vietnam and Tuscumbia Alabama, U.S.A. *NCKRI SYMPOSIUM* 5, 1-13.
4. Onac, B.P., Forray, F.L., Wynn, J.G. & Giurgiu, A.M. 2014, Guano-derived $\delta^{13}\text{C}$ -based paleo-hydroclimate record from Gaura cu Musca Cave, SW Romania. *Environmental Earth Sciences*, 71 (9): 4061-4069. DOI 10.1007/s12665-013-2789-x.
5. Forray, F.L., Smith, A.M.L., Navrotzky, A., Wright, K., Hudson-Edwards, K.A. & Dubbin, W.E. 2014, Synthesis, characterization and thermochemistry of synthetic Pb-As, Pb-Cu and Pb-Zn jarosites. *Geochimica et Cosmochimica Acta*, 127: 107-119.
6. Servida, D., Comero, S., Dal Santo, M., De Capitani, L., Grieco, G., Marescotti, P., Porro, S., Forray, F.L., Gál, Á. & Szakács, A. 2013, Waste rock dump investigation at Roșia Montană gold mine (Romania): a geostatistical approach. *Environmental Earth Sciences*, 70 (1): 13-31.
7. Pop, D., Ionescu, C., Forray, F., Tămaș, C.G. & Benea, M. 2011, "Transylvanian gold" of hydrothermal origin: an EMPA study in an archaeological provenancing perspective. *European Journal of Mineralogy*, 23 (6): 911-923.
8. Forray, F.L., Smith, A.M.L., Drouet, C., Navrotzky, A., Wright, K., Hudson-Edwards, K.A. & Dubbin, W.E. 2010, Synthesis, characterization and thermochemistry of a Pb-jarosite. *Geochimica et Cosmochimica Acta*, 74 (1): 215-224.
9. Forray, F.L., Drouet, C. & Navrotzky, A. 2005, Thermochemistry of yavapaiite $\text{KFe}(\text{SO}_4)_2$: Formation and decomposition. *Geochimica et Cosmochimica Acta*, 69 (8): 2133-2140.
10. Navrotzky, A., Forray, F.L. & Drouet, C. 2005, Jarosite stability on Mars. *Icarus*, 176 (1): 250-253.
11. Lane, M.D., Bishop, J.L., Dyar, M.D., Cloutis, E., Forray, F.L., Hiroi, T., 2005. Integrated spectroscopic studies of anhydrous sulfate minerals. *Lunar and Planetary Science XXXVI*, #1442.
12. Forray, F.L. & Hallbauer, D.K. 2000, A study of the pollution of the Aries River (Romania) using capillary electrophoresis as analytical technique. *Environmental Geology*, 39 (12): 1372-1384.
13. Mărza, I., Hallbauer, D.K., Forray, F., 2004. Hollow, non - fixed hydrothermal concretions - a mineralogical curiosity from the Herja - (Baia Mare) ore deposit. *Romanian Journal of Mineral Deposits* 81, 130-134.
14. Forray, F., 2002. Environmental pollution in the Aries river catchment basin. Case study: Rosia Montana mining exploitation. *Studia UBB, Geologia* Special Issue 1, 189-198.
15. Forray, F.L., 2001a. Application of factor analysis in study of pollution of the Aries River (Apuseni Mountains, Romania). *Studia UBB, Geologia* XLVI, 47-58. Romanian.

16. **Forray, F.L.**, 2001b. Using pollution index to establish the contamination level of Aries River (Apuseni Mountains, Romania). *Studia UBB, Geologia* XLVI, 153-159. Romanian.
17. Onac, B.P., **Forray, F.L.**, 2000. Camiro 1.0 - The Romanian cave minerals database program. *Romanian Journal of Mineralogy* 80, 1, 57-62.
18. **Forray, F.L.**, 1999. Application of UV-VIS spectrophotometry in study of mine water. *Studia UBB, Geologia* XLIV, 75-84.
19. **Forray, F.**, Andreica, A., 1997. Telur 1.0 - Identification system for minerals. *Studia UBB, Geologia* XLII, 13-21.
20. Ghergari, L., Tămaş, T., Damm, P., **Forray, F.**, 1997. Hydrothermal paleokarst in Pestera din Valea Rea (Bihor Mountains, Romania). *Theoretical and Applied Karstology* 10, 115-125.
21. Ghergari, L., **Forray, F.**, Andrei, V., 1996. Contributions to the petrographic and mineralogical study of the rock salt from Cacica (Suceava county). *Studia UBB, Geologia* XLI, 165-180.
22. **Forray, F.**, Bucur, I.I., 1995. Some new data concerning the upper Cretaceous deposits from Chergheş (Hunedoara country). *Studia UBB, Geologia* XL, 29-38.
23. Mârza, I., Ghergari, L., **Forray, F.**, Tămaş, C.G., 1995. The glauch - glamm formation associated to the hydrothermal deposits from the Apuseni Mountains: Genetic and metallogenetic mechanism. *Studia UBB, Geologia* XL, 185-194.
24. Ghergari, L., **Forray, F.**, Gál, Á., Fărcaş, T., 1994. Arsenic minerals from Săcărâmb ore deposit: arsenic, arsenolite, villyaelenite and krautite (Transylvania, Romania). *Studia UBB, Geologia* XXXIX, 127-140.

Books and book chapters

1. Bucur I., Balica C., Bedelean H., Benea M., Chira C., Codrea V., Filipescu S., **Forray F.**, Gal A., Popa M., Săsăran E., Tanțău, I., 2008. Repere geologice în Apuseni și sud-vestul Carpaților Meridionali. Ed. Presa Universitară Clujeană, Cluj-Napoca, 225 p.
2. **Forray, F.L.**, 2003, A nehézfém-szennyezés megállításának vizsgálata a verespatakban bányavidéken (Research on the possibilities of stopping the heavy metal pollution in the Rosia Montana mining region). In Tanulmányok a természettudományok tárgyköréből. (Ujvárosi, L. (Ed.), Editura Scientia, Cluj-Napoca, 247-273 p.
3. **Forray, F.L.**, 2002, A nehézfémek csigavázba történő bioakkumulációjának használata környezetszennyezési felmérésekben (Bioaccumulation of heavy metals in gastropods shells as tool for environmental pollution monitoring). In Tanulmányok a természettudományok tárgyköréből. (Nagy, L. (Ed.), Editura Scientia, Cluj-Napoca, 203-227 p.

ANNEX 3

LIST OF PRESENTATION AT CONFERENCES (after 2004)

1. **Forray, F.**, Cleary, D., Onac, B.P., Wynn, J.G. (2015) Stable carbon and nitrogen isotopes in bat guano as proxies for paleoenvironmental reconstruction: Case studies from Romania. 23rd International Karstological School "Classical Karst", Postojna, Slovenia, June 15-20, 2015. Poster.
2. Onac, B.P., Hutchinson, S.M., Geanta, A., **Forray, F.L.**, Wynn, J.G., Giurgiu, A.M., Coroiu, I. (2014) 2500-year Late Holocene vegetation and hydrologic changes from a cave guano-clay sequence in the Danube Gorge, SW Romania (ID# 29474). American Geophysical Union Fall Meeting, San Francisco. December 15-19, 2014. Poster.
3. Daniel Veres, Joël Savarino, Bruno Jourdain, **Ferenc FORRAY**, Mihaly MOLNAR, BEGY Robert, Patrick GINOT (2014) Assessing the suitability of Scarisoara cave ice for glaciochemical research: a coupled chemical and water isotopic approach. Late Pleistocene and Holocene climatic variability in the Carpathian-Balkan region. GEOREVIEW 170-171.
4. **Forray, F.L.**, Onac, B.P., Giurgiu, A., Tamas, T., Geanta, A., Dumitru, O.A. (2014) Guano as proxy for paleoclimate studies: examples from Romania. Goldschmidt Conference, Sacramento (USA), June 8-13, 2014, Abstract Volume, p. 723, Poster.
5. **Forray, F.L.**, Giurgiu, A., Onac, B.P., Tamas, T. (2014) Paleoclimate record from Zidita Cave (Romania) using guano-derived $\delta^{13}\text{C}$ isotopic data. Geophysical Research Abstracts, vol. 16, EGU2014-14313-1. European Geosciences Union, Vienna (Austria), April 27-May 2, 2014. Poster.
6. Bogdan P. ONAC, **Ferenc L. FORRAY**, Jonathan G. WYNN, Alexandra M. GIURGIU, Anca GEANTA (2013) A Medieval warm period $\delta^{13}\text{C}$ record from the Gaura cu Musca cave, SW ROMANIA. 10th Applied Isotope Geochemistry Conference, Budapest, September 22-27, 2013, Poster.
7. W Cherry, **FL Forray**, L Lefticariu (2013) Connectivity of the Tisza River System: trace element and isotopic constraints. AGU Fall Meeting. P. 1195. Abstracts
8. E Mosonyi, **FL Forray** (2010) Remnant mineral assemblages in the garnet porphyroblasts from the Rebra Group micaschist used for establish metamorphic PT path (Rodna Mountains, east Carpathians). Congress of the Carpathian - Balkan Geological Association (19th : Sept. 23-36, 2010 : Thessaloniki, Greece. Oral presentation.
9. Luttge-Pop Dana, Balc Ramona, Iancu Ioana, **Forray Ferenc-Lazar**, *The "Night of Museums" at the Museum of Mineralogy, Babes-Bolyai University Cluj-Napoca*, 16th Meeting of the Association of European Geological Societies (MAEGS-16), Cluj University Press, Studia Universitatis Babes-Bolyai, Geologia, Special Issue – MAEGS-16, Editor: C. Ionescu, H. Bedelean, V. Hoeck, ISSN 1221-0803, Directory of Open Access Journals, Geoscience e-Journals, 2009, P. 43-45
10. Luttge-Pop Dana, Ionescu Maria-Irina-Corina, Benea Ion-Marcel, Tamas Calin-Gabriel, **Forray Ferenc-Lazar**, *Electron Microprobe Data on Rosia Montana (Apuseni Mountains) Gold: Towards a Database for Identifying Ancient Artefacts*, MinPet2009 & MSCC2009, Mitt. Österr. Miner. Ges., 155 (2008). MinPet2009 – MSCC2009 – Abstracts. ISSN 1609-0144., 2009, P. 131-131
11. Luttge-Pop Dana, **Forray Ferenc-Lazar**, *Nevoie de conservare a mineralelor – nevoie de interdisciplinaritate*, International Conference Directions in Preventive Conservation, Sibiu, Romania 26-29 September 2007, CD ROM, ISBN 978-973-88607-1-1, Editor: Bernath, A. , 2007, P.1-15

12. **Forray, F.L.**, Navrotsky, A., 2005. Thermochemistry of arsenic minerals. *Geochim. Cosmochim. Acta* 69, A773. doi: 10.1016/j.gca.2005.03.037.
13. **Forray, F.L.**, Navrotsky, A., Drouet, C., 2004. Jarosite stability on Mars, Second Conference on Early Mars: Geologic, Hydrologic, and Climatic Evolution and the Implications for Life. Abstract #8009. Lunar and Planetary Institute, Houston (CD-ROM), Jackson Hole, WY.

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