Report on the INTAV international tephra conference "Crossing New Frontiers: Tephra Hunt in Transylvania", 24 June–1 July, 2018, Moieciu de Sus, Romania

The International Focus Group on Tephrochronology and Volcanism (INTAV) held a tephra conference, "Crossing New Frontiers: Tephra Hunt in Transylvania", at Moieciu de Sus, near Braşov in the southern Carpathian Mountains of Transylvania, Romania, from 24 June to 1 July, 2018. INTAV is a long-standing (from 1961) global tephra research group active within the Stratigraphy and Chronology Commission (SACCOM) of INQUA. It organises specialist tephra meetings every four years or so on average, although the most recent meeting (before this one in Romania) was in 2010 in Kirishima, Japan. The Romanian tephra meeting was convened by Daniel Veres (Romania) and Ulrich Hambach (Germany), together with support from the INTAV executive committee of Britta Jensen (Canada), Peter Abbott (UK/Switzerland), Takehiko Suzuki (Japan), Siwan Davies (UK), and David Lowe (New Zealand). By all measures, the conference must be judged a tremendous success, helping to advance the seven objectives of INTAV's underpinning EXTRAS project (EXTending tephRAS as a global geoscientific research tool stratigraphically, spatially, analytically, and temporally), allowing insight into much of the excellent research being undertaken in Romania and nearby countries, and, in part because of the special venue and the conference programme construction, providing great opportunities for discussion, networking, and interactions between the wide range of participating researchers, and also, not least, because of the warmth, friendliness, and helpfulness of the hosts at the venue and during the field trips. No stone was left unturned by Daniel Veres and Ulrich Hambach, and their friendly student and postdoctoral helpers, to ensure that all participants felt very welcome and were well looked after for their entire stay in Romania.

The conference also featured, notably, strong contributions in volcanology as well as many papers representing the explosion of research on cryptotephras in a range of environmental settings, and on new methods for detecting and analysing them including the use of X-ray fluorescence core scanners (such as ITRAX) and computed tomography (CT) imaging, new methods for analysis including trace element mapping of small glass shards using multiple line scans with LA-ICP-MS, new dating applications, and a number of novel applications of tephra deposits that are best described as 'beyond isochrons'.

Held at the spectacular mountain resort 'Cheile Gradistei' Fundata (see photo above), the meeting involved 92 participants (Fig. 1) – a record number for an INTAV meeting – from 20 countries. The greatest numbers were from the UK (24), Germany (14), Romania (7) and the USA (5) with up to four representatives from each of Denmark, Russia, Norway, Sweden, Canada, Italy, Switzerland, Turkey, Japan, China, Poland, Serbia, Hungary, Singapore, Iceland, and New Zealand. The total included 22 students, with 17 of these undertaking PhDs.

Fig. 1. Participants at the tephra conference awaiting the opening talk. Photo: David Lowe.

Participants were treated to 94 stimulating papers, including 41 oral papers in seven sessions and 53 poster papers presented in three sessions. All the poster papers remained on display for the entire conference. Seven outstanding (invited) keynote presentations were made, one in each oral session, by Sabine Wulf (UK), Michael Sigl (Switzerland), David Karátson (Hungary), Caroline Bouvet de la Maisonneuve (Singapore), Maarten Blaauw (UK), John Westgate (Canada), and Vera Ponomareva (Russia). A special evening lecture was given by Ioan ('Nino') Seghedi (Romania) entitled "Geological and volcanological outline of the Carpathian-Pannonian region with emphasis on the Romanian territory", which summarised the complex regional geological setting and very active tectonism as well as local volcanism in the southern Carpathians. The presentation helped to set the scene for the one-day mid-conference field excursion in the region (and the later post-conference excursion). The mid-conference trip was led by Ioan Seghedi, Daniel Veres, and Ulrich Hambach (Seghedi et al., 2018) and included a visit to the basaltic Perşani volcanic field (Fig. 2) and a very popular viewing of Dracula's castle in Bran at the end of the day (Fig. 3).

Fig. 2. Participants in front of columnar basalt in the Perșani volcanic field (active from 1.2-0.6 Ma) in the southern Carpathians during the mid-conference field trip. Photo: Pierre Oesterle.

Fig. 3. Bran (Dracula) Castle, Transylvania, visited during the mid-conference excursion. Not far from the conference venue at Moieciu de Sus, the castle in Bran was completed in 1388 AD. Photo: David Lowe.

The conference abstract volume is available at the conference website (Hambach and Ulrich, 2018). Papers arising from the conference are to be assembled into a special tephrochronology volume of *Quaternary International* (in preparation).

The conference was supported financially and in kind by a number of sponsors (all listed in the programme and abstracts volume and on the conference website) and an INQUA grant (1710P) of €4600 obtained by INTAV through SACCOM (supported by commission president, Mauro Coltorti). The generous INQUA grant was used to help 18 early career researchers (ECRs) and students to travel to the meeting (Fig. 4). Most were from within Europe (14) but four travelled from beyond Europe including several from as far away as New Zealand.

Fig. 4. Ten of the 18 happy ECR and student recipients of the INQUA travel grants. Photo: David Lowe.

Another feature of the conference was an excellent Bayesian-based age modelling workshop (Fig. 5) led by Maarten Blaauw (UK) following his insightful keynote paper, "More dates and use Bayes – recommendations for robust age-depth models". Maarten's presentation is available on the conference website. Steve Kuehn (USA) reported on progress on the development of the INTAV global database project and provided new updated protocol sheets for evaluation by tephra community in the next few months.

Fig. 5. Maarten Blaauw (right) leading the age-modelling workshop for around 25 participants. Photo: David Lowe.

Four students were awarded certificates and cash prizes (sponsored by the University of Waikato, New Zealand) for first and second places in poster and oral presentations (Fig. 6). As noted by the judges, the standards of presentation were uniformly high throughout the conference and so their job was a difficult one.

Fig. 6. The winners and runners-up for best student oral and poster papers. From left, Jayde Hirniak, Jennifer Saxby, Hannah Buckland, and Ali Monteath. Photo: David Lowe.

A number of awards were presented at the conference dinner, which also featured traditional Romanian dancing and music. Two INTAV Honorary Life Memberships were awarded to Gudrun Larsen (Iceland) (the award was received on Gudrun's behalf by her colleague Esther Ruth Gudmunsdottir; Fig. 7) and to (a surprised) David Lowe (New Zealand). Their achievements in tephrochronology were described in brief by Andrew Dugmore (UK) and Peter Abbott, respectively. Only 14 such awards have been made internationally since they were instigated formally about 20 years ago by INTAV.

Fig. 7. Esther Ruth Gudmunsdottir (Iceland) receiving the INTAV Honorary Life Member certificate on behalf of Gudrun Larsen (Iceland) from INTAV president Takehiko Suzuki. Photo: David Lowe.

John Westgate (Canada) was awarded, to universal acclaim, a special framed certificate to mark the 50th anniversary of the publication of his pathfinding paper (with the late D.G.W. Smith) in 1969 on the use of the electron probe to characterise glass shards in tephras to enable them to be correlated over long distances (Figs. 8 and 9) (Smith and Westgate, 1969). The venue hosts also baked a commemorative chocolate layer-cake to mark the occasion (Fig. 8).

On the last day of the conference, a business meeting was held by the executive of INTAV at which the future of INTAV as a global tephra community was discussed, including possible roles in INQUA and IAVCEI or as a stand-alone organisation (see Lowe et al., 2018, pp.3-4). The forthcoming INQUA congress in Dublin (2019) was also noted, in which four sessions relating to tephrochronology are currently open for abstracts.

Fig. 8. Certificate and special chocolate (layer) cake prepared to commemorate the 50th anniversary of the publication of John Westgate's pioneering paper (with D.G.W. Smith) in 1969. From left, Takehiko Suzuki, Cora and John Westgate, Britta Jensen, Peter Abbott, and David Lowe.

Fig. 9. The special commemorative certificate presented to John Westgate (to learn more about John's exemplary contributions to tephrochronology, see Froese et al., 2008). The SEM images of glass shards (provided by Britta Jensen) represent the North American tephras that John analysed in undertaking his seminal research. Photo: David Lowe.

The conference was followed by a compelling three-day post-conference field trip involving 32 participants. It was led by David Karátson, Daniel Veres, and Ulrich Hambach (Karátson et al., 2018) along with student/ECR helpers. The excursion, which ended in Bucharest, included a visit to a huge and impressive underground salt mine at Slănic; proximal rhyolitic and dacitic tephra deposits, domes, and craters; the mountainous impacts of dynamic and complex tectonism; beautiful monasteries, churches, walls and castles and other buildings from Romania's rich history; loess encompassing distal tephras and paleosols on the Wallachian plains (Figs. 10 and 11); landsliding landscapes; and spectacular mud volcanoes (Fig. 12).

Fig. 10. Loess section supporting Mollisols on the Wallachian plains in southeast Romania alongside the Buzău River. At the base is a thick distal tephra (~0.5 m), the Y5 tephra (Fig. 11) associated with the Campanion Ignimbrite eruption c. 39-40 ka in the Campi Flegrei field, Italy. Photo: David Lowe.

Fig. 11. The darker-tinted Y5 tephra, about 0.6 m thick, alongside Dan Veres. Photo: David Lowe.

Fig. 12. Top of a mud volcano in a natural reserve at Berca belching mainly methane derived from deposits ~3 km below. In the background are hills that have been subject to very fast rates of mass movement (landsliding). Photo: David Lowe.

References

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