

10th March 2016
edition

Quaternary Entomology Dispatch



Editorial

Dear colleagues,

It is with great pleasure that I present the new edition of the Quaternary Entomology Dispatch, our newsletter where you can share news about your palaeoentomology/archaeoentomology projects, publications, dissertations and meetings. The newsletter was initiated and produced from 1988 to 2006 by Professor Scott Elias, who kindly agreed to pass on the task of gathering and distributing news on Quaternary Entomology research to me. Thus, after 10 years, Quaternary Entomology Dispatch is back!

In this edition, you will be able to learn more about research currently being conducted by some of our colleagues in Russia and the Yukon (Canada) and to find out about recently completed student dissertations in palaeoentomology/archaeoentomology. The newsletter also includes a list of recent publications that have not yet been included in the Bibliography of Quaternary Entomology (Qbib, which you can find at <http://www.bugscep.com/qbib.html>). I would like to thank all those of you who sent me their contributions and I encourage you to keep participating in the following editions!

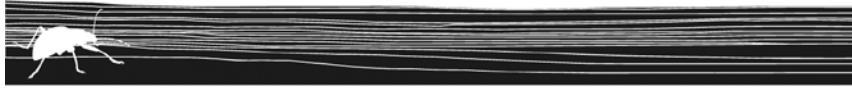
I hope that you will enjoy the content and format of the newsletter. Please do get in touch with me if you have any comments or suggestions, at veroforbes@gmail.com.

Please enjoy!

Véronique Forbes

Contents

News from our Russian colleagues	2
Recently completed dissertations	3
Recent publications	5
About the Quaternary Entomology mailing list	8



News from our Russian colleagues

By **Svetlana Kuzmina:**

S. Kuzmina started to study Quaternary insects in 1984, when, as a student, she met Sergei Kiselev (the first Russian Quaternary entomologist) at Moscow University. Sergei worked on several projects and needed somebody to continue his study in the Kolyma Lowland. A long summer field season on Alazea River resulted in an already huge collection of northern fossil beetles to become even larger. The next season (on both Alazea and Keremesit Rivers) added another several hundred specimens and the collection continues to grow every year.

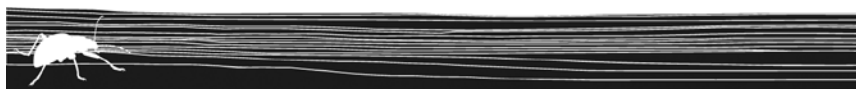
Important insect fossil datasets were generated by this work, several of which have been published (see publications by S. Kuzmina). However, many, some of them dating from the mid-1990s, still await publication. In order to ensure that this data would not be lost, S. Kuzmina decided to create a large database to include all her published and unpublished insect data. The database, called 'The West Beringia database (QINSIB)', includes fossil insect data from Late Neogene and Quaternary deposits from northeastern Siberia and Chukotka. It was originally developed in a Microsoft Access format by S. Kuzmina's former teacher Andrei Sher, but it has now been converted into Excel tables and support images to make it more accessible and easy to query. The database includes datasets both from S. Kuzmina and Sergei Kiselev. A monograph about the West Beringian Quaternary insects has also been published (Kuzmina 2015). The next step in the development of QINSIB will be the implementation of datasets from East Beringia and the finding of a website where to host it.

S. Kuzmina is also working, with a group of Russian scientists, on the Quaternary invertebrate isotope project. In this project, several core species (*Morychus viridis*, *Curtonotus alpinus*, *Pterostichus brevicornis*, amongst others) have been selected from different ages and regions of West Beringia for isotope analysis. Fossil *Daphnia* were also tested. The first results are scheduled to come out next year.

Besides insects, S. Kuzmina has also begun to write popular science. Popular articles about Quaternary paleontology (which are currently in Russian but will eventually be translated to English) are presented on the web site of the Moscow Ice Age Museum (<http://www.science.iceage.ru>). Thanks to opportunities provided by the museum, S. Kuzmina has also been able to visit the Old Crow area in the Yukon (Canada) this summer. The goal of this fieldwork was to collect additional samples from the section Ch'ijee's Bluff at Porcupine River, which yielded well developed Last Interglacial beds and insect assemblages that were studied by J. Matthews. Several additional samples were collected during the 2008 expedition, including one from the lower Neogene and three from the Last Interglacial unit. Two of these three assemblages are typical of interglaciation assemblages in the region; the third, unexpectedly, reflects dry and cold climatic conditions.

By **Evgeniy Zinovyev:**

Zinovyev E.V. is currently finalizing work on entomological material from the Yana-RHS site (Siberia), dated to the end of the Late Pleistocene, jointly with Drs. V. Pitulko (Institute for Material Culture History, RAS, St Petersburg, Russia) and E. Pavlova (Arctic & Antarctic Research Institute, St Petersburg, Russia). This project integrates the results of long-term studies that were undertaken in collaboration with Drs. Pitulko and Pavlova, as well as Dr. S.A. Kuzmina (Pitulko et al., 2007). This work produced more than 20,000 fragments attributed to 7656 individual beetles. Preliminary results of this work suggest that there were significant changes in insect population dynamics from the end of the Late Pleistocene (between 27,540 ±180 yrs. BP (Beta-271405; CL level) to 9,790 ±110 yrs. BP (LE-8915). For example, the pill beetle *Morychus viridis*, which accounts for 90.7-91.9% of all individuals in samples collected at the bottom of this section (dated to 27.6 to



18.6 kya BP), decreases to only 0.8% of individuals in the uppermost samples (dated to 9.7 kya BP). These insect assemblages are typical for the Late Pleistocene period in northeastern Siberia.

Zinovyev E.V. is also continuing joint work with Drs. A. Legalov and R. Dudko (Institute of Systematics and Ecology of Animals, Novosibirsk, Russia), which focuses on paleontological material from the southern part of Western Siberia. In the Ob river valley and its tributaries – Suzun, Chumysh, Aley, Chik and Orda rivers – rich subfossil insect assemblages were collected. At the Rogalevo site (Ordariver, Novosibirsk area), a rich insect fauna was collected alongside a large amount of rodents' (Rodentia, Arvicolinae) bone remains. This research is conducted in parallel with a study of modern beetle faunas from this area, under the direction of Dr. Legalov.

In 2015, Zinovyev E.V. and colleagues from the Institute of Ecology of Plants and Animals began, in collaboration with Dr. V.S. Sheinkman (Ben Gurion University, Mitspe Ramon, Israel), a study of the Late Pleistocene site 'Belaya Gora', located in the Vakh river (West Siberia, Nizhnevartiovsk area, Russia; 61°27'N, 82°28' E). Insect assemblages were collected from layers dated to MIS 5a - MIS 3, as part of a multidisciplinary investigation of the site, which also includes detailed paleobotanical, stratigraphic and paleosol analyses.

At present, Zinovyev E.V. is finalizing the preparation of a joint publication of paleontological material (including subfossil insect data) from the Late Pleistocene to the Early Holocene site 'Zeleniy Ostrov' (West Siberia, Nizhnevartiovsk area, Russia; 62°29'N, 81°51'E) located in the Glubokiy Sabun river. This work is done in collaboration with Drs. V.S. Sheinkman, S. Sedov (Instituto de Geología, UNAM, México), Shumilovskikh L. (Tomsk State University, Russia), Korkina E., Korkin S. (Nizhnevartovsk State University, Russia) and Golyeva A. (Institute of Geography, RAS, Russia). The insect assemblages of the upper part of this section (dated to 10.7 kya BP) are typical of the northern taiga, whereas in the bottom of the same section (22.1 kya BP), assemblages reflect a more arctic environment. The insect data are consistent with the paleobotanical, paleopedological and sedimentary records.

Recently completed dissertations

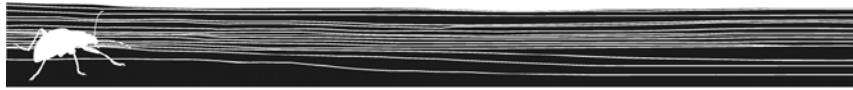
Evaluation of Archaeoentomology for Reconstructing Rural Life-Ways and the Process of Modernisation in 19th- and Early 20th-Century Iceland

PhD thesis (2013, University of Aberdeen) by: **Véronique Forbes**

Supervised by Dr. Karen Milek (University of Aberdeen) and Prof. Andrew J. Dugmore (University of Edinburgh)

This thesis addresses the potential of archaeoentomology for reconstructing rural life-ways, the processes of modernisation and the implementation of 'improvement' ideas in 19th- and early 20th-century Iceland. The first half of this thesis presents modern and ethnoarchaeological fossil insect data that investigate the potential of archaeoentomology in the Icelandic context. These studies provide an analytical framework for the reconstruction of rural life-ways and living conditions on two 19th- and early 20th-century Icelandic sites, presented in the second half of the thesis.

The modern analogues study refines our understanding of the ecological preferences and tolerances of synanthropic beetles exploiting stable manure and stored hay and identifies duck fleas as indicators of eiderdown harvesting. The ethnoarchaeological study reveals variations between synanthropic communities and ectoparasites in human living areas, byres and storage buildings and helps to clarify some of the taphonomic processes involved in the formation of archaeological floors. When applied to the interpretation of past activities and living conditions at two 19th- and early 20th-century farmhouses in northern Iceland, this data provides insights into floor maintenance and manuring practices, participation in international trade and local resource exploitation. It also highlights the potential of insect remains to clarify the processes by which Icelandic rural life-ways came to be modernised.



The preservation and postglacial history of Ice Age Holarctic beetles, as inferred from museum and ancient DNA

PhD thesis (2012, Royal Holloway University of London) by: **Peter D. Heintzman**

Supervised by Dr. Ian Barnes (Royal Holloway University of London) and Prof. Scott Elias (Royal Holloway University of London)

Degraded DNA can be recovered from specimens that are preserved in museums and the natural environment. Data generated from such DNA have provided valuable evidence for the assessment of a suite of biologically important questions. However, research of this nature is limited for invertebrate taxa, despite their diversity and ecological necessity. Using DNA data from dry-stored museum and permafrost preserved ancient specimens, this thesis greatly extends the study of degraded DNA from invertebrates. The thesis focuses on two arctic ground beetle species (*Amara alpina*, *Pterostichus brevicornis*), which are abundant in museum collections and permafrost deposits.

A lack of data that characterises the preservation and potential of degraded beetle DNA, and thereby assessment of future possibilities for this emerging field, provided the impetus for the first three results chapters. Using two different sequencing approaches, the preservation of DNA in museum and ancient specimens was investigated. In addition, the taxonomic utility of DNA extracted from these specimens was assessed. These chapters demonstrate that DNA could be routinely recovered from museum specimens. DNA from ancient specimens could be recovered from *A. alpina* but not *P. brevicornis*. In most cases therefore, degraded DNA from these beetles could be used to address further questions.

The final two results chapters focus on the response of the two study species to a past period of climatically driven change, using DNA data from museum and ancient specimens. In these chapters, the mode of postglacial colonisation of Canada at the end of the last ice age was investigated. It was found that existing models of this process were broadly, but not wholly, correct. This may have implications for models of how beetles will respond to future climatic change.

Although some challenges lie ahead, this thesis demonstrates the potential for museum and ancient permafrost-preserved beetle specimens in future, DNA-based, large-scale investigations.

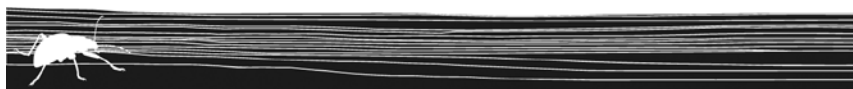
Reconstructing Holocene landscape cover using sub-fossil Coleoptera

PhD thesis (2016, Queens University Belfast) by **Geoff Hill**

Supervised by Dr. Nicki Whitehouse (Plymouth University), Dr. Helen Roe (Queens University Belfast) and Dr. David Smith (University of Birmingham)

This thesis utilised a Coleopteran based modern analogue technique to reconstruct land cover via a novel multi-tiered functional group approach. Results from 19 modern sites with varying forest cover / 'openness' were sampled, analyzed and individually mapped. Modern analogue datasets indicate that there is a quantifiable relationship between these functional group proportions and local landscape cover (within 1000m). This is especially strong along a gradient of increasing forest cover for the sites studied. The multi-tiered functional group analysis has provided a set of criteria to reconstruct surrounding vegetation cover in both woodland, open and wetland contexts. The inclusion of a synanthropic "score" to these taxa has further aided the recognition of anthropogenic land use. Although more modern analogue sites are required, this thesis has demonstrated that Coleoptera have great potential within quantitative landscape reconstruction studies.

This thesis further included a Late Mesolithic study from Lough Kinale, Ireland. Higher than expected levels of human impact within these assemblages made its use in landscape reconstructions unsound. Results from fossil beetle, including the presence of 'house fauna', and dung fungal spore analyses suggest the presence of hut structures maintained at least over two phases of the site's usage.



Here, There, and Everywhere: An Archaeoentomological Assessment of Outbuildings at the Viking Age site of Vatnsfjörður, Iceland

MSc dissertation (2014) by: **Nika Shilobod**

Supervised by Dr. Karen Milek (Department of Archaeology, University of Aberdeen) and Dr. Véronique Forbes (Department of Archaeology, University of Aberdeen)

Although archaeoentomological samples are often taken from house floors, there have previously been few outbuildings and outdoor features, such as wells and outhouses, used for microfossil analysis in Viking Age and Medieval Iceland. House floors do not paint a complete picture of the settlement as they are inherently limited by the activities performed in the home and its immediate surroundings. This MSc dissertation seeks to improve methodology by focusing on archaeoentomological samples from a range of outbuildings. This study was conducted on the 10th-century outbuildings at the site of Vatnsfjörður, a wealthy chieftain farmstead in the Westfjords of Iceland. Excavations from 2005-2013 uncovered a 10th century farm including a long house (*skáli*), a smithy, possible storage buildings, a possible animal building, workshop, and boat house, and various outdoor cooking pits, middens, pathways, and hearths. Samples for archaeoentomological analysis were obtained from most of the Viking Age buildings within the site. The archaeoentomological assemblage contains the potential evidence to shed light on the use of space within these outer structures.

Recent publications

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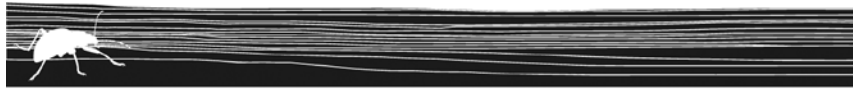
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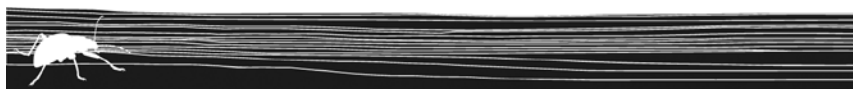
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edition

Quaternary Entomology Dispatch



About the Quaternary Entomology mailing list

Back in 2011, myself and Prof. Scott Elias set up a mailing list to facilitate communication amongst researchers in Quaternary Entomology. The list allows subscribers, including experienced workers in the field but also students, to exchange news and ideas and to query their colleagues about any questions, problems or requests they may have. Our mailing list is hosted by Jiscmail, a national academic service based in the UK. **To subscribe to the mailing list, please visit: <https://www.jiscmail.ac.uk/cgi-bin/webadmin?Ao=QUATERNARYENTOMOLOGY>**

The mailing list will be used from now on to distribute new editions of the Quaternary Entomology Dispatch. **The new edition of the newsletter is scheduled for September 2016**, and a call for contribution will be sent to the mailing list during the previous month.

