Monks et al.: Comment on Section 2.13, Biogenic Emissions and Chemistry

This section omits any mention of the pioneering work of the Georgian Guivi Sanadze, who was the first to identify the emission of isoprene from plants (Sanadze, 1957). Unaware of Sanadze's work in the USSR, Rasmussen and Went independently discovered isoprene emissions shortly after (Rasmussen and Went, 1965). Sanadze was also the first to show that isoprene emission rates are temperature dependent (Sanadze and Kursanov, 1966). I think the first three paragraphs require revision to reflect Sanadze's contribution and the subsequent evolution of bVOC research and atmospheric chemistry.

I therefore suggest that **Section 2.13 Paragraphs 1, 2 and 3** now read:

The first report that plants emit volatile organic compounds into the atmosphere was made in 1957 by the Georgian scientist Guivi Sanadze (Sanadze, 1957). Unaware of Sanadze's work in the USSR, Rasmussen and Went independently discovered isoprene emissions in 1965 (Rasmussen and Went, 1965). Sanadze was also the first to show that isoprene emission rates are temperature dependent (Sanadze and Kursanov, 1966). However, the relevance of biogenic VOC for atmospheric chemical processes was not immediately recognized. Although Tingey at the USEPA did note the potential for isoprene to play a role in regional air quality in 1978, this was not formalised until the ground-breaking work of Chameides and colleagues in 1988 (Chameides et al., 1988) and MacKenzie and colleagues in 1991 (MacKenzie et al., 1991).

In 1992 the seminal review of Fehsenfeld et al. (1992) brought the importance of isoprene and a very wide range of other VOCs of biological origin to the attention of the atmospheric chemistry community, opening up an entirely new branch of atmospheric chemistry. Over time, this became pivotal for major policy formulations to abate ozone pollution.

Underpinning the atmospheric chemistry research that Fehsenfeld et al. promoted, plant physiologists began working on understanding the biological and environmental controls on biogenic VOC emission rates. This allowed the development of relatively simple functions to predict the emissions of biogenic VOCs which resulted in the first spatially and temporally resolved global model of global emissions (Guenther et al., 1993). This soon evolved into more sophisticated high resolution global models (Guenther et al., 2000;Guenther et al., 1995), allowing for the emissions of biogenic compounds to be included in atmospheric chemistry models across all scales. Eventually, this work took the form of the widely used MEGAN (Model of Emissions of Gases and Aerosols from Nature) model (Guenther et al., 2006) which is still used in modern Earth system models today (Table 2 and Figure 14).

New references

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