

### ARCHEOBOTANY

## High times

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Credit: Davidxgreen / Alamy Stock Photo

While the use of substances to alter or expand consciousness may be as old as human life itself, gaps remain in our understanding of how such substances were developed and used, especially in environments that were not typically conducive to their local production.

Melanie Miller, at the University of Otago, and colleagues recovered a 'ritual bundle' in a rock shelter some 3,900 metres up in the Andes Mountains of southwestern Bolivia, dating back to approximately AD 1000. The bundle consisted of a leather bag, two ornate snuffing tablets and a pouch with multiple snouts, a snuffing tube, spatulas and dried plant materials. Testing samples from the pouch showed the presence of five compounds, including cocaine, benzoylecgonine and bufotenine, which are not found together in modern

plants, thus suggesting that multiple plants were used in these rituals (in fact, this is the largest combination of psychoactive specimens recovered from a single artifact on the continent). Another notable find is the presence of harmine, which, due to the plants involved, could indicate the development of ayahuasca, a substance whose use has been speculated about in pre-Columbian South America. The plants used to create these substances were foreign to this area of the Andean highlands and would have to have been gathered either through trade or by religious figures, specifically.

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