

## Oral presentation

### Tibetan alpine ethnobotany and climate change

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**Introduction.** Globally, alpine vegetation is among the most susceptible to global climate change, with elevational up-migration of plants displacing the highest floral elements - figuratively pushing them off mountain tops. A world-wide monitoring network [GLORIA ([www.GLORIA.ac.at](http://www.GLORIA.ac.at))] tracks these vegetation changes, including our contribution in the eastern Himalayas. In Tibet, alpine vegetation contributes significantly to Tibetan livelihoods, medicine, and cosmology, and so our group additionally monitors human impacts of global climate change.

**Objectives.** To monitor and analyze patterns in alpine vegetation and Tibetan plant use in the eastern Himalayas; and to understand Tibetan perceptions of climate change.

**Methods.** To the standardized GLORIA monitoring procedures ([www.GLORIA.ac.at](http://www.GLORIA.ac.at)) we add ethnobotanical inventories with Tibetan doctors, detailing alpine plant use. Analyses are by NMS and CCA ordination. Additionally, we interviewed Tibetan villagers (15 in each of 6 villages, N=90) about their perceptions of climate change and causes.

**Results.** Alpine vegetation is influenced by site, precipitation, and elevation, with highest elevations being most uniform among sites (i.e., arctic-alpine associations), as well as most threatened by global climate change. Tibetan medicine depends heavily on herbs found throughout the alpine vegetation, including these highest elevations (e.g., *Saussurea* spp.), which in turn are most threatened by global climate change. Tibetan people recognize much climate change (glacial retreat, higher temperatures, variable rainfall, less snow, etc.) but often attribute it to spiritual causes (lack of prayer, presence of foreign unbelievers, etc.).

**Conclusion.** Global climate change may have serious impacts on both alpine vegetation and Tibetan medicine, land use, and cosmology in the eastern Himalayas. Some Tibetan medicinal plants (e.g., *Saussurea laniceps*) are already threatened by overharvest, so that global climate change exacerbates the risk of extinction of these high elevation endemics. Tibetan alpine pastures are threatened by advancing treeline, as are Tibetan concepts of sacred space. Tibetan perceptions of climate change are detailed, while their interpretation of it is influenced by cosmology and lack of outside information.

Keywords: alpine ecology, Himalayas, Tibetan medicine, Tibetan sacred space, perceptions of climate change

#### Selected References

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