



Sacred fish

on beliefs, fieldwork, and freshwater food webs in Tibet

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Sacred fish: on beliefs, fieldwork, and freshwater food webs in Tibet

A group of researchers travel to Tibet to study freshwater ecosystems, unaware that their fieldwork techniques will conflict with the religious beliefs and culture of the local villagers.

“If it rains tomorrow, it will be your fault, because you have annoyed Lu by your fishing!”

That was the message we received from the distressed local Tibetans who discovered our research team on the banks of a stream, collecting tissue samples from a fish (*Schizopygopsis younghusbandi*, a cyprinid endemic to Tibet) for stable isotope analysis. *Lu* is the holy spirit of water in the Tibetan Buddhist and Bon religions. The locals were somewhat mollified when our guides managed to convince them that we were sampling a dead fish that had been found floating near the bank. It was probably wise not to mention that we had caught 46 small loaches (*Triplophysa* from the family Balitoridae) using a seine net just half an hour before they showed up. We would soon learn that our first encounter with the villagers was a sign of things to come; field work – and in particular fishing – in Tibet was not going to be as easy as we had thought.

Our Sino–Danish freshwater research expedition to Tibet in August 2011 was a dream come true for most of us (Figure 1). We had traveled to Tibet with little more than guidebook knowledge of what to expect, but were excited about this unique opportunity to explore the community structure, biodiversity, and food webs of freshwater ecosystems at extremely high altitudes, in a region where very few non-Chinese ecologists had worked, and at the same time to experience a proud, mysterious, and fascinating human culture.

Our journey through Tibet took us to numerous lakes and streams where we sampled plankton, benthic algae, macroinvertebrates, and fish. One site that we had planned to sample was an isolated lake 4925 m above sea level, located 120 km east of the city of Lhasa. Upon arrival at the shores of this beautiful lake, we were met by hundreds of Buddhist (or Bon) pilgrims who had gathered for a religious ceremony. Despite a warm welcome by the locals and offers of hot tea (with yak butter and salt; Figure 2), it became clear that we would have to abandon any thoughts of sampling for the time being, as we learned that the lake was regarded as highly sacred by the pilgrims. Even after the ceremony had ended and the pilgrims had departed, our Tibetan guides, who until this point had been very flexible and cooperative, refused to



Figure 1. The authors during their trip to Tibet. From left to right: Tashi (local guide), D Jacobsen, T Tsering, L Hamerlik, K Moltesen Hansen, SK Laursen, and B Zhu.

participate in any sort of activity on the lake, explaining that, “If someone sees us take part, we will be in serious trouble”. So, we had to change our plans and search nearby for another lake to sample.

The reluctance among Tibetans to fish or otherwise disturb lakes reflects their belief that water is sacred and that fish protect the water; thus, eating fish is as abhorrent to most Tibetans as eating pork is to Muslims and eating beef is to Hindus. There are, however, several additional reasons why Tibetans do not eat fish: (1) they wish to take as few lives as possible and thus prefer to eat yak, as one individual can feed many mouths; (2) “water burial”, in which corpses are disposed of in rivers, is common and certain fish feed on the dead bodies; (3) they have a fear of getting fish bones stuck in their throats; and (4) they believe that fish don’t have tongues and therefore cannot gossip (Tibetans detest gossip and reward fish by not eating them).

Only after returning home did it occur to us that these beliefs were likely the reason that Tibetans have had little interest in introducing non-native game fish – such as rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*) – into their lakes and streams. These species have been widely introduced in most regions with suitable habitats, such as in the South American Andes, the African highlands, Australia, and New Zealand (Crawford and Muir 2008); but apart from a single population of

brown trout in Yadong County, close to the Indian border (Hao 2006), such introductions have not occurred in Tibet. The introduction of trout often leads to extirpations of local populations of native fish species (Habit *et al.* [2010] and references therein) as well as amphibians (Finlay and Vredenburg 2007), with possible far-reaching consequences for freshwater food webs. In the tropical Andes, for instance, *Astroblepus* and *Trichomygerus* catfish in high altitude streams are threatened by introduced trout (Jacobsen 2008). The absence of introduced trout in Tibet has most likely saved the widespread, dense, and diverse fauna of native balitorid loaches that we observed from extirpation.

Most ecologists are well aware that field research often presents obstacles that were unforeseen during study planning or when writing a grant application. Our experiences in Tibet provide a good example of how local (or national) beliefs and traditions may impose unexpected constraints on fieldwork and research. Nevertheless, rather than regarding these as frustrating problems, the group dealt with them as memorable challenges and thought-provoking encounters between different cultures. Moreover, it served as a reminder of how stimulating and inspiring ecological fieldwork can be; whenever ecologists are presented with an opportunity to participate in an adventurous field research trip, they should jump at the chance. Traveling to field sites to observe species is indeed crucial for the development of natural history and new theories, because we may just accidentally “stumble onto exciting interactions, behaviors, and ecological mysteries” (Dangles and Casas 2012). Admittedly, organizing such complex research expeditions requires extensive preparation (including time and resources), and there is no guarantee of encountering anything particularly interesting. Furthermore, field surveys are, unfortunately and unjustifiably, accorded less scientific merit than, for example, experiments perfectly designed to support some a priori hypothesis. However, ecologists who are willing to occasionally spend time doing preliminary surveys in extreme environments and sparsely explored regions will likely have fun, and may eventually be scientifically rewarded as well.

Our trip to Tibet was certainly rewarding. Professionally, we were excited to discover what may prove to be fish fauna living at the highest altitudes in the world: an astonishing 5000 m above sea level. We were even more surprised by the abundance, apparent species richness, and herbivorous feeding behavior of these fish (unusual for such high altitudes). Tibet also provided a rare opportunity for us to study natural highland freshwater systems preserved from introduced top predators, such as trout. Still, what gave our experiences an intriguing twist was that the biodiversity and food webs of unique Tibetan aquatic ecosystems were being actively preserved as a



Figure 2. Tibetan pilgrim offering hot yak butter tea upon our arrival at a sacred lake.

result of religious beliefs, a link that we would never have imagined beforehand. Even though the motives of the local Tibetan people and ourselves as naturalists are different, we share the same ultimate goal: the preservation of streams and lakes. We hope, therefore, that our fishing activities in Tibet can, in some way, be justified and forgiven.

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