Food habits of sika deer at Otome Highland, Yamanashi, with reference to *Sasa nipponica*

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For the last two decades, sika deer in Japan have expanded their range. The Otome Highland in Yamanashi Prefecture, central Japan, is no exception, as the abundance of sika deer has increased in this region, particularly over the last decade. Because many populations of sika deer inhabiting the central or northern Pacific region of Japan are dependent on *Sasa nipponica*, a dwarf bamboo growing in the understory of deciduous broad-leaved forests, as a food plant (Takatsuki 1983, 1986; Ueda et al. 2002; Kobayashi and Takatsuki 2012), the deer population of Otome Highland, which belongs to the same climatic zone, is also expected to depend on this species. The forest of Otome Highland was once a montane forest of *Fagus crenata*, but was logged to become a secondary oak forest, which is common to other places. A unique point of this highland is that it was logged for skiing in 1951, and subsequently, a grassland composed of grasses and various forbs developed. Thus, sika deer would utilize both forest and grassland.

In many habitats of sika deer, *Sasa nipponica* is an important food for the deer during the winter because other forbs and grasses senesce and trees and shrubs lose their leaves; thus, *S. nipponica* is the almost only evergreen forage plant. Therefore, documenting the extent of deer grazing on *S. nipponica* during winter is important. Thus, the objectives of this study were to quantitatively analyze the food habits of sika deer in the Otome Highland and to determine their grazing intensity on *S. nipponica*.

**Study area and methods**

Otome Highland is situated in the northern part of Yamanashi Prefecture (Fig. 1) along a south-facing slope at 1,700 m elevation. The area was used as a ski run from 1952 to 2000. The grassland has been continually mown to arrest forest succession. Since the ski run closed in 2000, mowing has been maintained by local people. The grassland is 5.5 ha in size and is dominated by *M. sinensis* along with various forbs. The highland is surrounded by forest composed of *Quercus crispula, Betula ermanii*, and *Larix kaempferi*.

We collected 20 fecal pellets of sika deer from 10 fresh pellet groups almost every month from May 2011 to April 2012. We were unable to find feces in July and August 2011 and February 2012. During the summer, we were unable to locate feces, despite intensive searching, because pellets were quickly decomposed by dung beetles. Therefore, additional summer samples were collected in July 2012. In February 2012, we could not access the highland because the road was blocked by snow. Fecal samples were analyzed using the method of Stewart (1967). Pellets were washed over a 0.5-mm mesh. Plant fragments were then spread over a glass

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