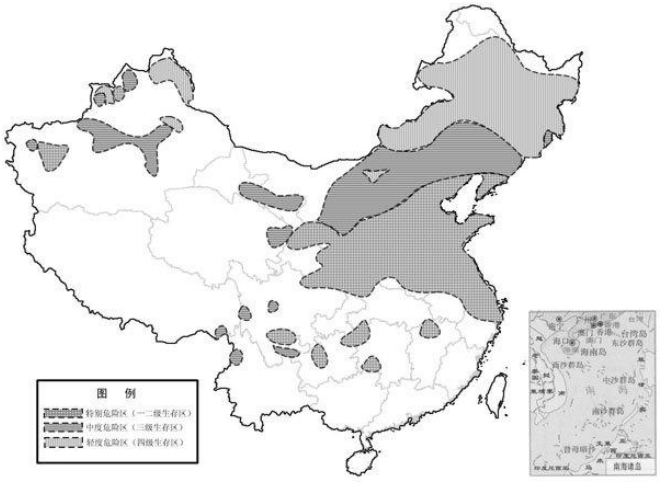
Bizarro-World You Ain't From Around Here! Fall Webworm and Staghorn Sumac (*two species native to the U.S. which are invasive in China*).

By: Yujuan Chen, Virginia Tech.

Editor's note: When we think about exotic invasive species, we often only think about those that were introduced to the U.S. from other countries (and often from China). However, other countries have invasive species problems as well. In fact, of the world's 100 worst invasive species, 50 can be found in China. These cause the Chinese economy to lose over $29.3 billion a year. This article takes a look at two species which are (or may be) invasive in China thanks to an introduction from the U.S.

China is a vast country with rich biodiversity, making it especially vulnerable to invasions of non-native species. In fact, there is a long history of non-native species introduction. Alien species occur in each of China's 34 provinces, municipalities and autonomous regions. They occur widely in both urban and rural landscapes, and in protected areas. Alien plants have been reported everywhere, except in a few remote reserves in the Qinghai-Tibet Plateau, Hengduan Mountain, Xinjiang and Inner Mongolia (Yan et al., 2001).

By the middle of the 1990's, there were about 58 invasive plant species reported; by the late 1990's, 108; by 2003, 283 alien invasive species have been identified in China. The number of species of alien invasive microorganisms, aquatic plants, terrestrial plants, aquatic invertebrates, terrestrial invertebrates, amphibians and reptiles, fish, and mammals were 19, 18, 170, 25, 33, 3, 10, and 5, respectively. The proportion of alien invasive species originating from America, Europe, Asia, Africa and Oceania were 55, 22, 10, 8 and 0.6%, respectively (HaiGen et al., 2004). The fall webworm (*Hyphantria cunea*) and



The fall webworm regional distribution in China (www.dglyj.gov.cn) (Darker regions show areas under severe invasive conditions and lighter regions show areas under a warning for an invasive situation).

staghorn sumac (*Rhus typhina*) are two invasive species introduced to China from the U.S.

The fall webworm (*Hyphantria cunea*), which is native to North America, was introduced to Dandong and Xinjin in Liaoning Province in 1979. Since then, it has spread to Shandong and Shanxi, where it has caused serious damage in orchards, forests, and croplands. Fall webworm has been reported to infest more than 100 plant species in China. Within its introduced range, the species totally defoliates trees in orchards, in parks and recreation areas, and in horticultural plantings along boulevards, causing significant mortality of trees in both urban and rural areas (Yan et al., 2001; ZhongQi and YongAn, 2007).

Damage caused by fall webworm on trees in China.

An integrated biological control technique was developed which controls 2 generations of the fall webworm successively. Effective and sustainable control results were reached and the fall webworm was suppressed for 6 years in Shanghai, Dalian, Yantai and Qingdao cities in China.

Fall webworm control strategies in China include both herbicideapplications and biological control techniques.

Staghorn sumac (*Rhus typhina*) is a native of the eastern United States. It grows very fast and has brightly colored foliage during fall. Because of its ecological benefits and horticultural uses,

R. typhina has been introduced from its native North America to many other countries, including China. Recently, the fast vegetative and reproductive growth of this nonnative species, however, has led some to believe that it may become invasive and out of control if cultivated in large numbers (Zhang et al., 2009).

The foliage of staghorn sumac.

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Yujuan Chen is a PhD student in the Department of Forest Resources & Environmental Conservation; cyj0727@vt.edu.

Editor's note: China is not the only country which is experiencing loss of biodiversity as a result of the introduction of invasive species. In response, a number of international working groups have formed to develop strategies for reducing biodiversity losses. I will be revisiting this topic in future newsletters. For those interested, there is a wealth of information available on this global problem from these organizations.

- *National Invasive Species Information Center* http://www.invasivespeciesinfo.gov/international/main.shtml
- *2010 Biodiversity Indicators* http://www.bipindicators.net/
- *Convention on Biological Diversity* http://www.cbd.int/invasive/