

Nepalese *Berberis aristata*

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**Introduction**

Nepal has approximately 800 forest products that are not timber, that are used by the Nepalese people (Kwaschik, 2011). One of these non-timber forest products is *Berberis aristata*, locally known as Chutro, or Chitra, a fruit shrub grown in Nepal (Kwaschik, 2011). *Berberis aristata* has been well documented as a useful medicinal plant using its stem and roots (Gilani et al., 1999; Komal, Ranjan, Neelam, Birendra & Kumar, 2011). However, the Chutro plant produces a fruit that can be eaten by humans (Komal et al., 2011), and has other uses including producing a unique Nepalese red wine (Shakya, 2002).

### **Product Description**

*B. aristata* is not unique to Nepal and grows along the Himalayas, at an elevation between 2000 and 2500 meters (Komal et al., 2011; Shakya, 2002). Chutro is a shrub between 2 and 3 metres tall, with dark green leaves, multiple yellow flowers, and produces purple fruits which have a weight of approximately 227 mg (Komal et al., 2011). Chutro is a dicot fruit shrub (Humagain & Shrestha, 2009), which begins to flower in March through April (Parmar & Kaushal, 1982). The fruits of the Chutro plant have a both sweet and sour taste and are high in vitamins (Bhattarai, Chaudhary & Taylor, 2009). The fruit is ripe in the months of May and June (Shakya, 2002) and can stay on the plant ripe until it begins to rain (Parmar & Kaushal, 1982). In one season a plant can be picked four times and produce 657 g of the purple fruit in total (Parmar & Kaushal, 1982). Chutro is a shrub with many historical uses in Nepal, and a potential to be promoted internationally.

### **History, Local Biodiversity and Culture**

Chutro has a long history of being a medicinal product in Nepal and other South Asian countries (Gilani et al., 1999). Podar et al. looked into patents concerning chutro and found 48 medicinal patents covering use such as for diabetes, heart problems, liver troubles, for healing wounds, fever (Potdar, Hirwani & Dhulap, 2012) and as a solution for diarrhea (Joshi, Shirkhedkar, Prakash & Maheshwari, 2011). Due to these many properties Ali et al. consider chutro to be in endangerment of overuse in India (Ali, Malik & Sharma, 2008). Thus, protection of the shrub needs to also occur in Nepal for its international sale to be a reality.

### **Agronomic Issues**

Chutro remains a wild plant and is collected by the Nepalese people from the wild forests (Ray, Gururaja & Ramchandra, 2010). Chutro is not domesticated, but researchers found that vegetatively propagating Indian chutro is successful, instead of only growing the plant from seeds (Ali et al., 2008). The authors argue this is a way to improve the production of Chutro in India (Ali et al., 2008), and it may be possible to follow this technique in Nepal. Moreover, The barberry species generally will grow in all soils, except when “waterlogged” (Simmons, 1972, p.36). However, further research needs to be done in the hindrances to the growth of chutro to understand the possibility of it being domesticated.

### **Environmental Sustainability**

Uprety, Poudel, Asselin, Boon, and Shrestha in their study of the Rasuwa District in Nepal noted that medicinal plants play an important for income generation of the population (2011). However, medicinal plants are potentially being overused, and thus sustainability is a key factor in their continued used (Uprety et al., 2011). The medicinal parts of the chutro are the bark, roots and leaves (Joshi et al., 2011), while wine is produced from the fruits (Shakya, 2002). In 1997 to 1998, medicinal fruit trade between Nepal and India was worth 16 million, but chutro

was not listed as a major medicinal traded plant (Olsen, 2005). Additionally, Uprety et al., note that the sale of medicinal plants has failed to help a large portion of the population due to illegal trade and other extenuating factors (2011). Therefore another way to promote chutro is wine, while still leaving the other parts of the shrub for the medicinal products, thus allowing one shrub to have multiple uses.

### **Economic Benefits and Business Opportunities**

Agriculture is a key economic sector in Nepal, but only about 17 percent of land is available for farming (CIA, 2013), but 42 percent is woodland (CIA, 2013). A program by The World Agroforestry Centre in Cameroon to domesticate fruits has had a tremendous impact on the ability of farmers to have a higher income and be able to send their children to school (Pye-Smith, 2010). Thus, fruits are a good option to expand the economy as the annual profit made from fruits is higher than that of other agricultural products (Shakya, 2002). Dr. Deva Bhakta Shakya identifies Chutro as one of the many underutilized fruits in Nepal (2002). However, the profitability of the fruit depends on the accessibility of transportation available to the farmer (Shakya, 2002). Those in the hilly or mountainous regions of Nepal have trouble with transportation (Shakya, 2002). Wine trade in Nepal may meet with trouble of transportation costs due to the lack of proper roads (CIA, 2013).

One of the only existing industries in Nepal using the indigenous, wild fruit is the production of wine (Shakya, 2002). Hinwa is a company that produces wine using both chutro and aiselu in Nepal (Hinwa Wine, n.d). In an article in a Nepali newspaper the owner of Hinwa claimed the problem is the inability to produce enough to meet demand (Dahal, 2010). According to the company's Google+ account they can be reached at 977 26 402089 (Hinwa Winery, n.d).

Ainselu, a yellow raspberry, *Rhubus ellipticus*, (Shakya, 2002), must also be studied to make a wine out of the two products possible. To promote the use of both of these underutilized fruit in production of Nepalese wine, studies of the genetics and different landraces in Nepal must be studied (Shakya, 2002). Ray et al. in the study of Indian chutro suggested pinpointing an area with the most accessibility and beginning the production in that region (2010). This could also be a key point for the production of the wine in Nepal.

### **Export Potential**

If wine is going to be a successful export from Nepal to Canada, there must be a market available in Canada. Imported wine was consistently over 60 percent of the consumed in Canada between 1996 and 2007, and had a total value of 1.6 billion in 2007 (AAFC, 2013). According to Agriculture and Agri-Food Canada Canadians are continuing to drink more wine (2014). To import wine into Canada, the wine must meet all conditions of the Food and Drug Act, and labeling regulations under the Consumer Packaging and Labelling Act (AAFC, 2014). Liquor is highly regulated in Canada and selling liquor in any province requires approval of a liquor control board, and is subject to import taxes by the federal government (AFFC, 2014). The province of Ontario, with a large population, including the multicultural city of Toronto, seems like a plausible area to start in Canada. The Liquor Board of Ontario controls all alcohol in Ontario, and on their website provides information for interested sellers (LCBO, 2014). Yearly the LCBO sends out a list of products that they are interested in buying, and in 2014 they listed red wines from Europe, Asia or Africa including “indigenous and traditional varieties/blends from outside the major established sources,” for between 13 and 25 dollars (Cannon, 2014). Therefore, there may be a place in the Canadian wine market for Nepalese wine, but improvements in the collection of the fruits, production of the wine will need to occur first.

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