

## Nepal: Viticultural extremes and the steepest vineyards of the world

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When thinking about Nepal and the breathtaking snow-covered mountain range of the Himalaya, one does not usually bear lush grapes and sweeping vista of vineyard terraces in mind. However, this is exactly what you'll find when visiting the area around Pataleban, about 1.5h west of Katmandu, 26° north of the equator.



Figure 1: Pataleban Resort in Nepal.

Figure 2: View from the visitor terrace towards the Himalaya.  
(Source:www.patalebanresort.com)

Mr. Kumar Karki, Mr. Janapal Thapa and Mr. Dhruba Kumar Khatri are the local founders of Nepal's first and only winery "Pataleban Vineyard Winery", which puts Nepal right there on the list of international wine producing countries. The innovative Mr. Karki brought the idea of viticulture – and some cuttings of *Yama Sauvignon* and *Kai Noir* - back with him from a long-term stay in Japan. He wanted to tap into the potential of winemaking to create jobs in his rural region, attract visitors, and develop unique local agro-souvenirs like wine, juice and tea. The vines grew well enough, and soon European varieties like *Chardonnay*, *Merlot*, *Pinot Noir* and *Cabernet Sauvignon* found their way for testing to Nepal, too. Japanese and Swiss wine makers provided early consultancy. Apart from the winery, the estate evolved into a small, popular tourist resort, offering vineyard and trekking tours to the surrounding Pataleban forests.

But the real break-through came with the cultivation of recent German breeds of fungus resistant grape varieties (PIWI = Pilz widerstandsfähig = German for 'fungus resistant'). Today, some ten hectares are planted with PIWIs from over six decades of breeding – ranging from the early *Muscat Bailey* and *Muscat Blue*, to the PIWIs of the 1960s like *Regent*, *Orion*, *Phoenix*, and finally to the latest generation like *Monarch*, *Cabernet Cortis*, *Cabernet Cantor*, *Sauvignier Gris* and the white *Muscaris* and *Solaris*.

### Difficulties of viticulture in Nepal

The grapes in Nepal are grown at heights ranging from 860 to 1,500m above sea level. In this region, bud break at 1,000m.a.s.l is at the beginning of April. Already mid-June, however, sees the onset of the monsoon season, bringing precipitation of 240mm in the second half of June and even up to 370mm in July. These aren't exactly ideal conditions for the production of fully ripe grapes! It is therefore necessary to come up with a few innovations to shorten the fruit-bearing cycle of the vines.

### Early budding

To accelerate the growth of vines at altitudes and latitudes such as under Nepalese conditions, one should make use of the bud breaking agent hydrogen cyanamide, better known as “Dormex”. If applied at the right time, this well-established growth regulator for the tropics can lead to budding of vines at the beginning of March, and ensuing on-set of flowers at a time when vines without treatment are just concluding their natural dormancy period. “Dormex” has been successfully tested in 2019 and shows very promising results at the Pataleban vineyards.



Figure 3: Vines in the background and to the left (purple marking) with „Dormex“ treatment, vine in the front (yellow marking) without. (Own photo)

### Early ripening cultivars and soil warming

The very early ripening of some of the latest PIWI varieties such as *Muscaris* and *Solaris* – as early as August – is seen as problematic in many northern (50° N) grape growing regions. But at high altitudes, and to avoid monsoonal phases such as in Nepal, these cultivars are virtually ideal.

To enhance soil warming and thus further accelerate bud break in spring, some terraces have been partially or completely covered with thick, local slate and schist rocks. This so-called “rock-mulching” has been successfully applied by the author in northern India, and as a side-effect reduces weed growth and evaporation.



Figure 4: „Rock-mulching“ applied in single vine pits and Figure 5: in vine rows. (Own photos)

Thus the combination of early ripening cultivars, the application of “Dormex”, and rock-mulching of the terraces proves to be a promising approach for quality grape production in Pataleban. Upon implementation of these measures in 2019, ripe and healthy grapes – e.g. *Solaris* with 83° Oechsle – have been recorded already by June 8<sup>th</sup>, a huge quality improvement compared to the previous years.

### Vineyard terraces and soils

Due to the extreme topography of Nepal, virtually all vines are grown on manually built terraces of 1.5 to 50m width. The long, westwards oriented valley at Pataleban features four grape growing areas, i.e. Pataleban, Kaule, Kewalpur, and Khani Kola.

Since these vineyard terraces are located in the same valley, starting from 860 and reaching up to 1,500m.a.s.l, once can safely call them the steepest vineyards of the world. The spectacular terraces of Wisperterminen in the Wallis, Switzerland “only” have an altitudinal difference of 500m.



**Figure 6: View towards the valley from Kewalpur vineyard. (Own photo)**

The title “highest vineyard of the world” is, however, not applicable to Nepal: the relatively far distance to the equator in addition to the high elevation restricts the vegetation period too much. The highest vineyards are found at 8°N in the tropical highlands of Ethiopia, where grapes have been successfully grown at 2000m.a.s.l for 70 years near the town of Guder.

The soils in the region vary widely, from red, heavy clay soils (pH: 6.7) to grey, stony, shallow schist soils (pH: 7.0). This diversity is due to the fact that the area now known as Nepal was once covered by the huge Tethys ocean. Thus sedimentary rocks were mingled with various layers when the Indian tectonic plate collided with the Eurasian plate, leading to the folding up of the Himalaya mountain range with its famous highest peak, Mount Everest (8848m.a.s.l).

### Winery and wines

The winery is located at some distance from the resort, with a spectacular view but as of yet limited infrastructure.



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The yearly harvest of app. 20t of grapes is processed with technically simple resources such as entrapper/crusher and hydro-press. The wine is matured in 1,000-2,000l stainless steel tanks in an air-conditioned facility. Last years musts were de-acidified and chaptalized to 12% alcohol, but due to not fully ripe grapes, as well as limited winery resources and oenological know-how, the resulting wines are currently rather basic, but unique.

**Figure 7: Vista across the vineyard at Kaule, with the Himalaya range in the background. (Source:www.patalebanresort.com)**

There is, however, a huge potential for Nepalese wine. Imagine currently one single wine estate in relation to a population of 30 million Nepali, plus 1.2 million tourists visiting the country per year. With proper expertise and the selection of cultivars, altitude and soil conditions, it should be possible to produce a wide range from fruity white wines to well-bodied red wines.

The estate accordingly invests heavily in professional training of their staff and future wine-makers (e.g. internships and studies abroad in Geisenheim), as well as in new winery facilities, improved road access, and enhanced touristic services.



Figure 8: Label (left) and advertising (right) for Pataleban Vineyard Winery wines. (Own Photo)

### Membership at PIWI International

Pleased about the positive results of the 2019 field trials and new wine making techniques, which greatly enhance the prospects for successful wine production in Nepal, the Pataleban Vineyard Winery management decided spontaneously to become a member of PIWI International. Nepal is now the 19<sup>th</sup> country among the over 350 affiliated estates worldwide.

### About the author:

Wolfgang W. Schaefer holds a M. Sc. in Viticulture and Oenology and has been involved with viticultural extremes relating to grape production in the tropics and sub-tropics for over 40 years. He is the founder and, together with M.Sc. Hans-Peter Hoehnen, managing director of the consulting firm Tropical Viticulture Consultants (TVC, [www.tropical-viticulture.com](http://www.tropical-viticulture.com)).