



# Style: HAZY IPA (19L/5GAL)

Source: Biotransformation series

Fermented with: LalBrew Pomona™

WE BREW WITH YOU.™

Beer name and/or description: **Pacific Rim Hazy IPA (Terpene-driven IPA)**

In this recipe, we explore the ability of LalBrew Pomona™ to biotransform other terpenes into the highly citrusy citronellol with Escarpment Lab. The intention is to maximise the soft floral, citrusy, and fruity notes that can be gained from terpene-driven beer. See notes page for more details. [Read more](#)

IBU: 25 | Color (SRM): 4.6 | % ABV: 6.5

## Water

Mash Water	Temp.	76	°C	169	°F
			20	L	5.3
Sparge Water	Temp.	78	°C	172	°F
			8.4	L	2.2

## Malt

Malt/adjuncts	Weight		%
	Kg	Lbs	
Pale Ale Malt	1.9	4.1	36
Pilsner Malt	1.9	4.1	36
Flaked Wheat	0.85	1.85	14
Flaked Oats	0.85	1.85	14
<b>Total</b>	<b>5.5</b>	<b>11.9</b>	<b>100</b>

## Mash & Sparge

	Temperature		Time (min)
	°C	°F	
Mash Step 1	69	156	
Mash Step 2			
Mash Step 3			
Mash Step 4			

## NOTES

Other ingredients	Quantity	Units (L, g, etc)	Addition Point
ABV Aromazyme (optional)	1	g	With day 1 DH

## Boil

Wort	SG	L	gal	pH
Pre-boil	1.055	24.3	6.4	
Post-boil	1.063	21.2	5.6	
<b>Total Boil Time</b>	<b>60</b>	<b>minutes</b>		

## Hops

Hop Variety	%AA	Weight		Kettle addition	Dry hopping
		g	oz		
Motueka	7.0	20	0.7	20	
Motueka	7.0	40	1.4	5	
Amarillo	8.6	33	1.2	5	
Bravo	15.5	57	2.0	WP	
Motueka	7.0	57	2.0	WP	
Amarillo	8.6	57	2.0	WP	
Amarillo	8.6	38	1.4		1
Motueka	7.0	76	2.7		At FG
Mosaic	12.5	76	2.7		At FG
Ekuanot	14.2	76	2.7		At FG
<b>Total</b>	<b>96</b>	<b>530</b>	<b>18.8</b>		

## Fermentation

Yeast Strain	LalBrew Pomona™			
Pitch Rate	0.58	g/L	1x 11g sachet	
Temperature	19	°C	66	°F
	SG		Plato	
OG	1.063		15.4	
FG	1.013		3.3	
Attenuation	79	%		

Whirlpool additions for 30 min at 82°C.

Raise temp to 23°C for diacetyl rest at 35-45% attenuation.



WE BREW  
WITH YOU.™

## LalBrew Pomona™ Biotransformation Recipe Series

### Lallemant/Escarpments Labs Collab 1: Pacific Rim Hazy IPA (Terpene-driven IPA)

In this recipe, we explore the ability of LalBrew Pomona™ to biotransform other terpenes into the highly citrusy citronellol. The intention is to maximise the soft floral, citrusy, and fruity notes that can be gained from terpene-driven beer.

We will achieve this by a combination of methods:

- › **Use hop varieties known to have high quantities of free and bound terpene geraniol** (Motueka, Bravo) for late kettle and whirlpool additions. Free geraniol will be transformed by LalBrew Pomona™ into citronellol. By adding these hops to the kettle and whirlpool, the yeast is able to convert geraniol into citronellol during active fermentation.
- › **Use hop varieties high in bound terpenes** (Amarillo) for early dry hopping to allow yeast-derived beta-glucosidase enzymes to release free-aromatic terpenes and provide more free geraniol substrate for biotransformation. Optionally, a purified beta-glucosidase enzyme such as ABV Aromazyme can be used to boost the release of free terpenes.
- › **Late dry hop with varieties known for high free terpenes** (Motueka) and hop esters for added complexity.

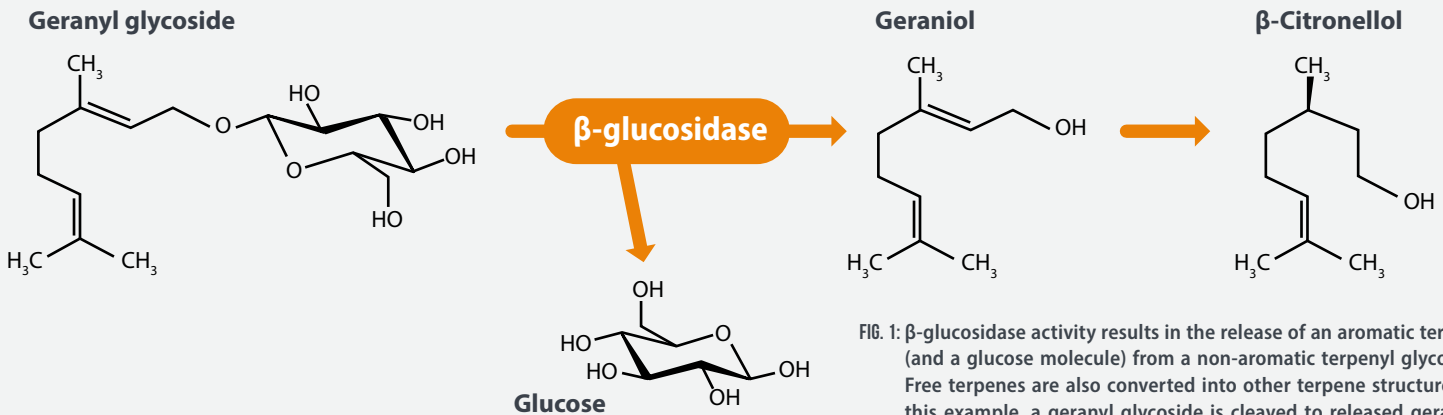


FIG. 1:  $\beta$ -glucosidase activity results in the release of an aromatic terpene (and a glucose molecule) from a non-aromatic terpenyl glycoside. Free terpenes are also converted into other terpene structures. In this example, a geranyl glycoside is cleaved to released geraniol, which is then converted into  $\beta$ -citronellol.

## TERPENE TYPE

### Whirlpool /Early Dry Hop

High in **free Geraniol**

### Fermentation

Maximize terpene **conversion**

### Late Dry Hopping

High in **free terpene**



### $\beta$ -Citronellol

Created through biotransformation of Geraniol

Lemon/lime, floral

**Hops:** Motueka, Bravo, US Cascade, Mosaic®, Sorachi Ace, Citra®

**Yeast:** LalBrew Pomona™

Motueka