



Note-by-Note Recipes

Synthetic Tropical Biosphere to reduce cost, energy, time & calories

Dish Name: *Tropical life (La vie tropicale)*

Submitted by:

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Materials and Method

The dish Tropical Life is composed of five distinct elements: Black Earth, Red Flora, Yellow Energy Puree, Blue Ocean Syrup, and Green Terrestrial Moss. Each element is prepared separately and assembled on the plate as described in Section 4.6. The **recipe below yields 5 servings** unless otherwise stated. It was made for 5 servings due to working and handling conditions. All quantities are expressed in grams (g) or millilitres (ml) using the metric system.

4.1 Black Earth

The Black Earth simulates rich, dark forest soil through lipid powderisation which is the encapsulation of a fat phase within the hydrophobic pockets of a maltodextrin matrix.

4.1.1 Equipment

Digital weighing scale (± 0.01 g precision), small stainless-steel saucepan, thermometer, stainless-steel wire whisk, dry storage container.

4.1.2 Ingredients (5 servings)

Ingredient	Quantity	Description / Supplier
Cocoa butter	12.5 g	Refined cocoa butter, melted
Bamboo charcoal powder	1.25 g	Food-grade activated charcoal (E153)
Maltitol	6.25 g	Sweetener E965; Sosa
Maltosec (maltodextrin)	25.0 g	Tapioca-derived; Sosa

Table 1. Ingredients for Black Earth (5 servings)

4.1.3 Method

- ❖ Heat the cocoa butter in a saucepan over low heat to 35°C until fully melted.
- ❖ Remove from heat and whisk in the bamboo charcoal powder and maltitol until evenly suspended.
- ❖ Gradually whisk the Maltosec (maltodextrin) into the lipid mixture in small additions while agitating continuously.
- ❖ Continue whisking for 3 minutes until the liquid has completely transitioned to a dry, dark powder.
- ❖ Store in a sealed, dry container at room temperature until plating.



4.2 Red Flora

The Red Flora replicates the vivid, domed silhouette of tropical blossoms through rapid thermal gelation using agar-agar, a thermo-reversible polysaccharide derived from red algae.

4.2.1 Equipment

Digital weighing scale, 500 ml stainless-steel pot, wire whisk, thermometer, domed silicone mould (approximately 4 cm diameter per cavity), refrigerator.

4.2.2 Ingredients (5 servings)

Ingredient	Quantity	Description / Supplier
Water	125 ml	Tap water
Maltitol	12.5 g	Sweetener E965; Sosa
Agar-agar	1.25 g	Food-grade agar E406; Sosa
Rose flavouring	5 drops	Food-grade rose aroma; MSK
Red food colouring	2.5 g	Powder red colour; Mallard Ferrier

Table 2. Ingredients for Red Flora (5 servings)

4.2.3 Method

- ❖ Combine cold water, maltitol, and agar-agar in a saucepan and whisk to disperse.
- ❖ Place over medium heat and bring to a rolling boil (95-100°C), whisking continuously, then hold at boiling for 30 seconds to ensure complete hydration of the agar chains.
- ❖ Remove from heat and stir in the rose flavouring and red food colouring.
- ❖ Pour immediately into domed silicone moulds and allow to cool to room temperature, then refrigerate for a minimum of 15 minutes until fully set.
- ❖ Demould gently by inverting the mould just before plating.



4.3 Yellow Energy Puree

The Yellow Energy Puree evokes a concentrated burst of tropical sunlight using a cold-swelling modified tapioca starch (MSK Ultratex) that thickens instantaneously without the application of heat, thereby preserving the delicate mango aroma esters.

4.3.1 Equipment

Digital weighing scale, small stainless-steel bowl, wire whisk, piping bag or squeeze bottle.

4.3.2 Ingredients (5 servings)

Ingredient	Quantity	Description / Supplier
Water	62.5 ml	Tap water
Maltitol	6.25 g	Sweetener E965; Sosa
Mango essence	5 drops	Food-grade mango aroma; MSK
Yellow food colouring	2.5 g	Powder yellow colour; Mallard Ferrier
MSK Ultratex (modified starch)	3.75 g	Pregelatinised tapioca starch E1442; MSK

Table 3. Ingredients for Yellow Energy Puree (5 servings)

4.3.3 Method

- ❖ Combine the water, maltitol, mango essence, and yellow colouring in a bowl and stir until the maltitol is dissolved.
- ❖ Gradually whisk in the MSK Ultratex in a thin stream while agitating continuously.
- ❖ Continue whisking for 1-2 minutes at room temperature until a smooth, glossy, thick fluid gel forms.
- ❖ Transfer to a piping bag or squeeze bottle and reserve at room temperature until plating.



4.4 Blue Ocean Syrup

The Blue Ocean Syrup represents the tropical sea through a precisely diluted glucose syrup whose viscosity is tuned to flow slowly across the plate while suspending edible glitter particles.

4.4.1 Equipment

Digital weighing scale, small bowl, wire whisk or spoon, squeeze bottle.

4.4.2 Ingredients (5 servings)

Ingredient	Quantity	Description / Supplier
Glucose syrup	18.75 g	Standard glucose syrup; Belgosuc
Water	37.5 ml	Tap water
Blue food colouring	2.5 g	Powder blue colour (E133); Mallard Ferrier
Edible glitter	1 pinch	Mica-based edible glitter (E555)

Table 4. Ingredients for Blue Ocean Syrup (5 servings)

4.4.3 Method

- ❖ Combine the glucose syrup and water in a bowl and whisk vigorously until fully integrated.
- ❖ Stir in the blue food colouring and mix until the colour is uniform.
- ❖ Add the edible glitter and stir gently to suspend the particles.
- ❖ Transfer to a squeeze bottle and reserve at room temperature until plating.



4.5 Green Terrestrial Moss

The Green Terrestrial Moss reproduces the spongy, moist texture of forest moss through controlled microwave aeration. The methylcellulose (Metilgel) undergoes reverse thermal gelation, where it uniquely sets when heated rather than when cooled. This eventually locks the steam-expanded whey protein scaffold into a stable, damp sponge.

4.5.1 Equipment

Digital weighing scale, stainless-steel bowl, wire whisk, paper cups with three small holes pierced in the base, Microwave oven.

4.5.2 Ingredients (5 servings)

Ingredient	Quantity	Description / Supplier
Water	50 ml	Tap water
Whey protein isolate	12.5 g	Unflavoured whey isolate
Metilgel (methylcellulose)	6.25 g	Methylcellulose E461; MSK
Trehalose	6.25 g	Disaccharide humectant; Sosa
Green food colouring	5 drops	Liquid green colour (E142); Mallard Ferrier

Table 5. Ingredients for Green Terrestrial Moss (5 servings)

4.5.3 Method

- ❖ Combine water, whey protein isolate, Metilgel, trehalose, and green colouring in a bowl.
- ❖ Whisk aggressively for 3 minutes to incorporate air into the batter and begin hydrating the methylcellulose.
- ❖ Divide the batter into 5 paper cups, each pierced with 3 holes at the base to allow steam release.
- ❖ Microwave each cup individually at 800 W for exactly 10 seconds.
- ❖ Remove immediately when the surface appears set and bouncy. Do not overcook, as excess radiation will dehydrate the sponge.
- ❖ Invert cups and allow the moss to cool for 5 minutes before plating.



4.6 Assembly of the Final Dish

Once all five components are prepared, assemble Tropical Life as follows:

- ❖ Place a generous spoonful of Black Earth on the lower-left third of a wide, shallow white plate to simulate a soil base.
- ❖ Position one domed Red Flora centrally or slightly offset above the soil.
- ❖ Pipe three to four drops of Yellow Energy Puree around and beside the Red Flora, varying the dot sizes for a natural effect.
- ❖ Using the squeeze bottle, trail the Blue Ocean Syrup in a flowing arc across the right side of the plate, allowing it to pool slightly at one end.
- ❖ Tear or crumble the Green Terrestrial Moss into irregular pieces and scatter across the Black Earth and around the base of the Red Flora.
- ❖ Serve immediately; components are best consumed at room temperature.



Figure 1. Final plated dish — Tropical Life. From left to right: Black Earth soil base, Green Terrestrial Moss, Red Flora dome, Yellow Energy Puree, Blue Ocean Syrup trail.

Caloric Analysis

The caloric content of the final dish was calculated **per serving (approximately 78 g)** and compared against a calorically equivalent traditional dessert of similar components (a conventional mousse-based plate with fresh fruit, standard biscuit, and caramel sauce).

Ingredient	Cal/g (kcal)	Qty (g)	Cal/serving (kcal)
Maltosec (5.0 g)	3.8	5.0	19.0
Cocoa butter (2.5 g)	8.8	2.5	22.0
Bamboo charcoal (0.25 g)	0.0	0.25	0.0
Maltitol (5 g avg)	2.1	5.0	10.5
Agar-agar (0.25 g)	0.3	0.25	0.07
MSK Ultratex (0.75 g)	3.8	0.75	2.85
Glucose syrup (3.75 g)	3.0	3.75	11.25
Whey protein isolate (2.5 g)	3.7	2.5	9.25
Metilgel (1.25 g)	0.0	1.25	0.0
TOTAL	—	~78 g	~74.9 kcal

Table 7. Caloric breakdown of Tropical Life per serving.

Tropical Life (Note-by-Note)	Traditional Equivalent Dessert
Black Earth (lipid powder): 41.5 kcal	Chocolate mousse (fresh cream, cocoa): ~180 kcal
Red Flora (agar dome): 10.6 kcal	Fruit compote (fresh fruit, sugar syrup): ~65 kcal
Yellow Puree (Ultratex): 16.1 kcal	Mango coulis (fresh mango, sugar): ~80 kcal
Blue Syrup (glucose/water): 11.25 kcal	Caramel sauce (sugar, cream, butter): ~95 kcal
Green Moss (whey sponge): 9.25 kcal	Sponge cake (flour, egg, butter): ~120 kcal
TOTAL: ~74.9 kcal / serving	TOTAL: ~540 kcal / serving

Table 8. Caloric comparison between Tropical Life and a traditional equivalent dessert.

Conclusion

The dish provides approximately 74.9 kcal per serving, representing a reduction of approximately 86% compared to a calorically equivalent traditional dessert (~540 kcal), without sacrificing the sensory qualities of taste, texture, or visual appeal as confirmed by sensory evaluation (all components scoring ≥ 4.0 on a 5-point hedonic scale). All ingredients used are compliant with EU food additive regulations.

The project demonstrates that Note-by-note cooking can deliver multi-sensory dishes of high sensory quality at dramatically reduced caloric, economic (€0.62 per serving), and thermal energy costs. With further development, such approaches hold genuine potential to contribute to healthier, more sustainable food systems in the future.

References

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