

Table S1. Plant growth regulator (PGR) treatments (BAP and NAA in combination) for callus induction in Experiment 3. CS: Carbon source.

Experiment 3	
Previously selected conditions	BAP-NAA (mg/L - mg/L)
	3.0- 0.05
(Experiment 1)	1.25-0.05
Explant – Light	0.5-0.05
	3.0-0.225
+	1.25-0.225
x	0.5-0.225
(Experiment 2)	3.0-0.5
CS type - CS	1.25-0.5
concentration	0.5-0.5
	0-0

Table S2. Plant growth regulator (PGR) treatments (BAP and NAA in combination) for callus maintenance.

Treatment	BAP – NAA (mg/L – mg/L)
1	0-0
2	0.05-0.05
3	0.1-0.1
4	0.23-0.23
5	0.5-0.5
6	1.0-1.0
7	2.0-2.0
8	3.0-3.0
9	5.0-5.0
10	7.0-7.0
11	10.0-10.0

Table S3. Parameters evaluated on callus induction and maintenance from *T. officinale* explants.

Parameter	Description	Classification on scale
Callus induction		
Callogenesis (%)	The percentage of explants with callus regarding the total explants sowed.	---
Degree of callus formation (% scale)	Callus formation regarding surface of the explant. Measured using a millimetric grid.	-: No calli, +: Minor calli <33%, ++: Moderate calli 34-66%, +++: Profuse calli 67-100%
Induction time (d)	The time when callus induction was initiated.	---
Color	Main coloration of the callus masses (Y) Yellow, (PY) Pale yellow. (DY) Dark yellow. (PG) Pale green. (G) Green, (DG) Dark green, (B) Brown	---
Friability (% scale)	The percentage of the friable cell mass considering the total callus mass in weight. Determined by mechanical disruption.	-: null 0% (compact 100%) +: low <33%, ++: medium 34-66%, +++: high 67-100%
Organogenesis (%)	The percentage of callus that develops shoots or roots with respect to the total number of calli.	---
Viability (%)	The percentage of the explants that died survived without contamination during the experimental period.	---
Final callus weight (fresh and dry weight, FW and DW respectively) (g)	Cell mass before (FW) and after (DW) dryness.	---
Humidity	Considered as the cell weight loss after dryness at 105°C overnight.	---
Growth index (GI)*	The ratio between the fresh weight at time <i>t</i> , and the initial fresh weight of the inoculum.	---
Organogenic ratio*	The proportion of the callus that develops shoots or roots with respect to the total mass of the callus.	+: low <33%, ++: medium 34-66%, +++: high 67-100%

* Only during callus maintenance.

Table S4. Statistical results (Wilks' Lambda Test) on callus induction from different *T. officinale* explants under the conditions proposed in this work. CS: Carbon source. DF - Degrees of Freedom.

Experiment 1	Value	F	Hypothesis DF	Error DF	Sig.	Partial Eta Squared
Intercept	0.000	1.7 E34	6.000	195.0	0.000	1.000
Explant	0.610	18.716	14.000	86.000	0.000	0.753
Light	0.163	31.504	7.000	43.000	0.000	0.837
Explant × Light	0.272	16.461	7.000	43.000	0.000	0.728
Experiment 2						
CS type	0.058	132.2	8.000	65.0	0.000	0.942
CS concentration	0.000	176.6	24.000	189.1	0.000	0.953
CS type × CS concentration	0.060	12.9	24.000	189.1	0.000	0.608
Experiment 3						
PGR	0.000	47.0	63.000	535.5	0.000	0.779

Table S5. Statistical results (p-value) for explant type, light, carbon source type and concentration, and PGR concentration on callus induction from *T. officinale* explants.

Dependent variable	Experiment 1			Experiment 2		Experiment 3	
	Explant	Explant ×		CS type	CS conc.	CS conc. × CS type	PGR
		Light	Light				
Callogenesis	0.000	0.282	0.282	0.000	0.000	0.000	0.000
Induction time	0.000	0.000	0.002	0.540	0.992	0.814	0.000
Degree of callus formation	0.000	0.000	0.000	NM*	NM*	NM*	NM*
Fresh callus weight	0.000	0.282	0.282	0.000	0.000	0.000	0.000
Dry callus weight	0.000	0.282	0.282	0.442	0.000	0.017	0.000
Organogenesis	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Viability	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Color	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Friability	0.000	0.000	0.000	0.000	0.000	0.241	0.000
Humidity	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NM: Not measured. *Not measured for hypocotyls, this parameter was not applied because callus grew strictly from only one side of the explant covering it completely.