



Optimization of cultural conditions for *in vitro* regeneration of wild potato species

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The wild tuberous *Solanum* species growing in the countries of South America are a valuable donor material for cultivated potato breeding. A number of experimental approaches in wild potato biotechnology require the step of *in vitro* regeneration.

The aim of this study was to evaluate the *in vitro* regeneration process of wild potato species on various culture media.

Materials and methods

The work involved 5 different protocols for callus induction (CIM) and regeneration (RM) nutrient media, and 14 wild potato samples belonging to different species from VIR Genebank collection (table 1).

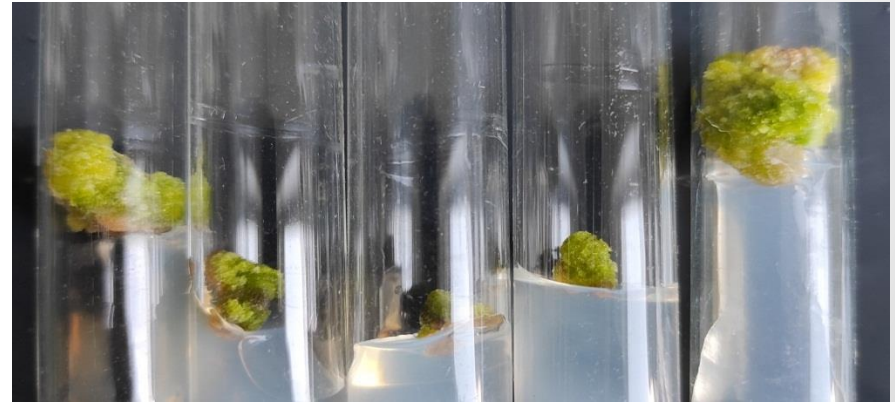
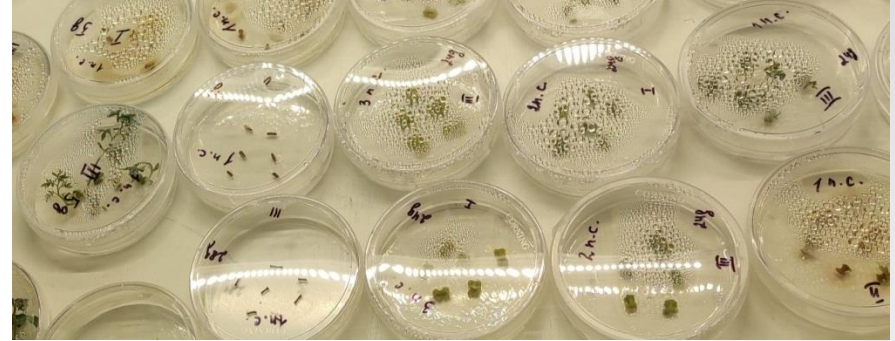
The explants were planted in triplicate. Used stem explants of the upper 3-4 internodes in vitro plants. Stem parts 6–8 mm long, without an axillary bud, were placed on a nutrient media in Petri dishes. The stem explants were incubated at CIM until callus were formed, and then transferred to RM. The number of explants producing regenerated plants was counted.

Table 1
List of in vitro samples of wild potato species

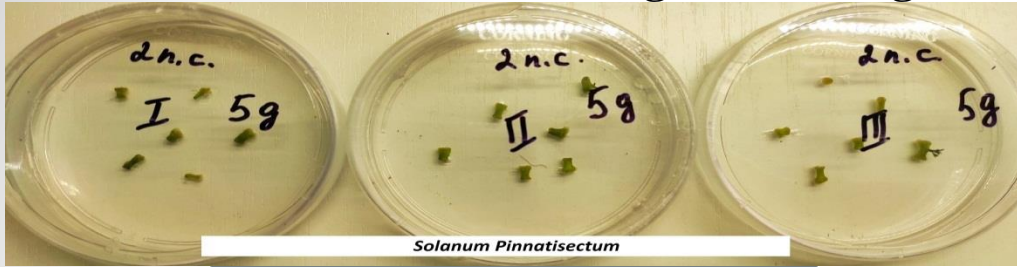
№	Species	№ VIR catalog
1	<i>S. verrucosum</i>	23015
2	<i>S. demissum</i>	15176
3	<i>S. stoloniferum</i>	23652
4	<i>S. polyadenium</i>	24957
5	<i>S. pinnatisectum</i>	24239
6	<i>S. stoloniferum</i>	3326
7	<i>S. jamesii</i>	24923
8	<i>S. tarijense</i>	12637
9	<i>S. pinnatisectum</i>	23569
10	<i>S. dolichostigma</i>	7613
11	<i>S. commersonii</i>	21355
12	<i>S. chacoense</i>	19759
13	<i>S. chacoense</i>	22687
14	<i>S. demissum</i>	19997

Results

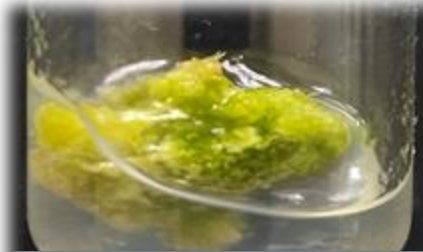
Callus formation was observed in 13 species, among them formation of regenerated plants was noted in 11 species (table 2). The samples that formed the largest number of regenerating plants belong to *S. pinnatisectum*, *S. chacoense* and *S. polyadenium* species. One of the experimental media was found to be suitable for the regeneration of all 11 species. This media can further be used for different biotechnological methods, for example, for genetically modified plants regeneration after genetic transformation of potato cells.



Stages of the regeneration process



Planting stem explants



Callus formation



Solanum Polyadenium



Solanum Chacoense

Formation of regenerating plants



Solanum Pinnatisectum

Table 2
Regeneration of wild potato species

№	Species	Callus formation	Regeneration, nutrient media				
			№1	№2	№3	№4	№5
1	<i>S. verrucosum</i>	+	-	-	-	-	-
2	<i>S. demissum</i>	+	+	+	+	-	+
3	<i>S. stoloniferum</i>	+	-	-	-	-	-
4	<i>S. polyadenium</i>	+	-	+	+	-	+
5	<i>S. pinnatisectum</i>	+	-	-	+	+	+
6	<i>S. stoloniferum</i>	+	-	-	-	+	-
7	<i>S. jamesii</i>	-	-	-	-	-	-
8	<i>S. tarijense</i>	+	-	-	-	+	+
9	<i>S. pinnatisectum</i>	+	-	-	+	+	+
10	<i>S. dolichostigma</i>	+	+	+	+	+	+
11	<i>S. commersonii</i>	+	-	-	+	+	+
12	<i>S. chacoense</i>	+	-	+	-	+	+
13	<i>S. chacoense</i>	+	+	-	+	+	+
14	<i>S. demissum</i>	+	+	-	+	+	+

+ - the formation of callus and regenerating plants was observed.

Conclusion

The process of regeneration of wild potato species on various nutrient media was characterized and the optimal nutrient media for the regeneration process was identified.

Acknowledgments

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