In vitro biochemical features in calli derived from winter wheat anthers and their possible influences on a secondary embriogenesis

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There are a lot of difficulties in practice of double haploid technologies, especial in the area of winter crops using. In winter wheat, along with embryo-like structures in the culture of isolated anthers, a significant number of rhizogenic calluses are formed.

1a

The donor plants were grown at the artificial climate station and under natural conditions at the experimental site of the Zalarinsky agroecological station.

donor plants in the laboratory

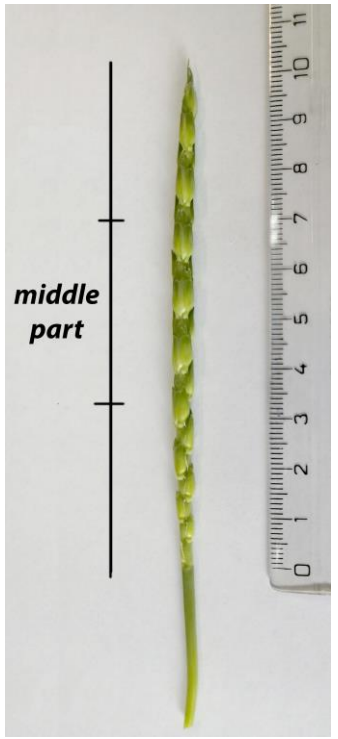
1b

Zalarinsky agroecological station

2

The plant material was selected at the boot stage.

3



Anthers were isolated from 6-10 spikelets of the middle part of the spike.

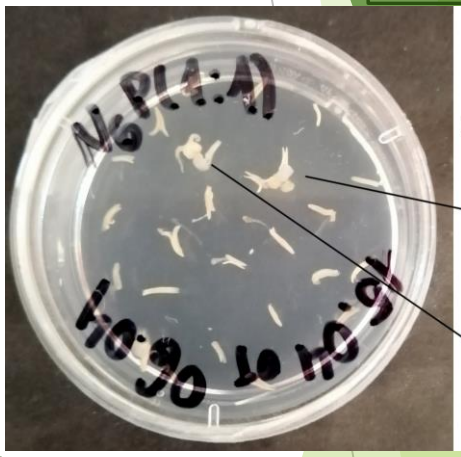
Androclinic structures were treated with low positive temperature and replanted in 190-2Cu medium for 4-6 weeks (Pauk et al., 2003

4

isolated anthers

Anthers were planted on a modified N6 medium containing glycine (2 mg / L), ascorbic acid (1 mg/L), 2,4-D (1 mg/L) and NAA (1 mg/L) (Anapiyaev, 2001).

5



non-morphogenic calli

embrioid

6

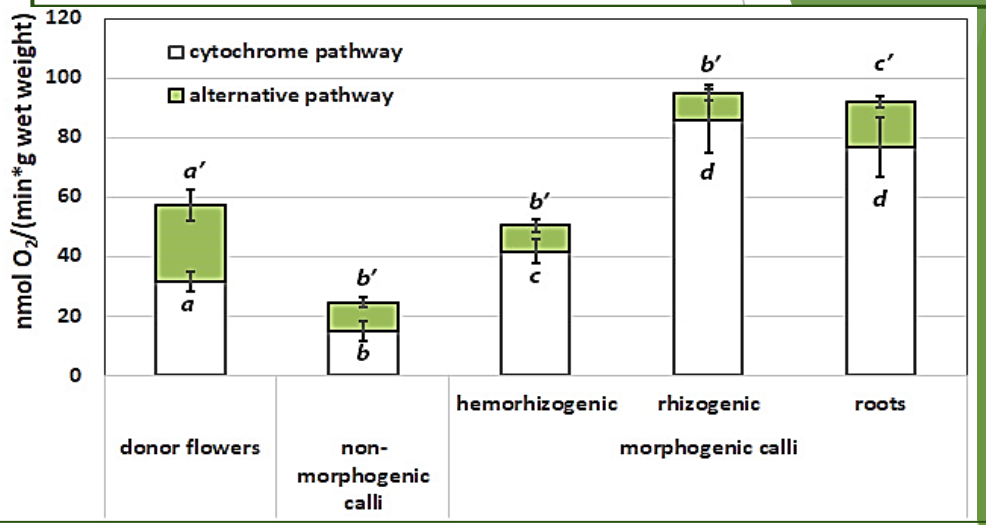
green regenerant plants

rhizogenic callus

Features of respiration and fatty acid composition in the rhizogenic calli, derived from isolated anthers of winter wheat variety Irkutskaya

	Donor flowers	Rhizogenic calli
C14:0	**0,43±0,06***	**0,91±0,26***
C15:0	**0,04±0,08***	**0,79±0,16***
C16:0	26,90±2,61	33,72±5,06
C17:0	**0,14±0,03***	**0,36±0,13***
C18:0	6,71±1,55	11,37±5,30
C20:0	0,34±0,03	0,75±0,29
C22:0	0,37±0,11	1,24±0,63
Saturated acids	***34,93±5,15****	***49,14±3,28****
C16:1	0,69±0,14	0,83±0,34
C18:1ω9	**9,77±0,47***	**3,49±0,96***
C18:1ω7	**2,93±0,15***	**1,80±0,35***
C20:1ω9	0,46±0,01	no
C18:2ω6	**18,47±1,85***	**28,23±6,03***
C18:3ω3	**32,71±1,85***	**17,17±3,86***
Unsaturated acids	***65,03±7,18****	***51,52±3,92****

The fatty acid composition of rhizogenic calli was distinguished by an increased content of saturated fatty acids, including pentadecanoic and heptadecanoic acids performed regulatory functions, and a low content of unsaturated fatty acids, especially the content of linolenic acid.



M±S.D. n = 5. Significant differences in M at $p < 0.05$ are marked in different letters on the diagram and * in the table.

The maximum respiration rate was in rhizogenic calli and was about 100 nmol O_2/(min * g of fresh weight), while the alternative pathway contribution to respiration was no more than 10%.
This respiration rate was mainly due to the high respiratory activity of the roots formed in these calli. Non-morphogenic calli were characterized by a minimum respiration rate, with the alternative pathway contribution reaching 40%.

The studied features of the rhizogenic calli metabolism indicate an insufficient supply of cells with the energy necessary to maintain the processes of morphogenesis.

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THANK YOU FOR ATTENTION!