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### Data Article

# Data set useful for the micropropagation and the assessment of *post-vitro* genetic fidelity of veteran trees of *P. orientalis* L.



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#### ABSTRACT

The data presented in this article are related to the research article titled “Conservation of veteran trees within historical gardens (COVE): a case study applied to *Platanus orientalis* L. in central Italy” (Ciaffi et al., 2018) [1]. This article reports data on the composition of the substrates used in the different steps of *Platanus orientalis* micropropagation: establishment of *in vitro* culture, multiplication, elongation and rooting. Moreover, molecular data were used to assess the genetic fidelity of the micropropagated plants respect mother plants after three year of *in vitro* cultivation. Fifteen ISSR markers, used in “Determination of genetic stability of long-term micropropagated plantlets of *Platanus acerifolia* using ISSR markers” (Huang et al., 2009) [2] on *P. acerifolia* and in “Variant identification in *Platanus occidentalis* L. using SNP and ISSR markers” (Lee et al., 2012) [3] on *P. occidentalis*, were successfully employed in the present study on *P. orientalis*. The plant material was collected from the Renaissance garden of Villa Lante in Viterbo, Italy. It is envisioned that these data set will provide useful information for the conservation of veteran oriental plane trees of historical gardens.

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## Specifications table

Subject area	Plant Biotechnology; Genetics
More specific subject area	Micropropagation and Molecular Markers analysis
Type of data	Table, figure
How data was acquired	An <i>in vitro</i> experiment was set up to test the effect of the composition of different culture media on multiplication, elongation and rooting ability of <i>P. orientalis</i> explants. A thermocycler equipment and an electrophoretic chamber were employed to amplify ISSR molecular markers and separate PCR products, visualized under UV radiation after staining with ethidium bromide. The UVITEC Essential V6 Gel Imaging and Documentation System was used to acquire the images.
Data format	Raw and analyzed data
Experimental factors	The effect of different nitrogen, calcium and sulfur concentrations was monitored to obtain vigorous <i>in vitro</i> material in the different steps of micropropagation protocol.
Experimental features	The ability of veteran plane tree to be cloned by micropropagation was determined by using different substrates. The assessment of the genetic fidelity of micropropagated plants respect the donor plant was analyzed by using ISSR markers after 3 years of <i>in vitro</i> culture.
Data source location	Viterbo, Italy, lat 42° 25' 32", long, 12° 09' 18"
Data accessibility	Data is available within this article
Related research article	[1] M. Ciaffi, E. Alicandri, A.M. Vettrai, A.R. Paolacci, M. Tamantini, A. Tomao, M. Agrimi, E. Kuzminsky, Conservation of veteran trees within historical gardens (COVE): a case study applied to <i>Platanus orientalis</i> L. in central Italy, Urban For. Urban Green. 34 (2018) 336–347. <a href="https://doi.org/10.1016/j.ufug.2018.07.022">10.1016/j.ufug.2018.07.022</a>

## Value of the data

- Data on the composition of the substrates used in the present paper can be used from the scientific community to overcome the difficulties registered till now to set up a successful *in vitro* cloning for *P. orientalis*.
- Data set of ISSR markers demonstrated that these markers can be transferred from *P. acerifolia* and *P. occidentalis* to *P. orientalis* for the assessment of the genetic fidelity respect to the mother plant.
- Data set presented in this paper could be useful for the propagation of veteran plane trees from Renaissance gardens for the conservation of this unique historical germplasm.

## 1. Data

Plane trees are fast growing plants commonly used in urban and peri-urban areas for the establishment of gardens and tree-lined avenues. Cloning protocols of plane trees with trait of interest (i.e. pest resistance) were described in several scientific papers with a particular emphasis on *P. acerifolia*, a hybrid species (*Platanus orientalis* x *Platanus occidentalis*). The first dataset here reported consists on the detailed composition of six media, of which three reported in the literature for plane trees cloning and three developed for the micropropagation of *P. orientalis* (Table 1) as described in the related research article [1]. In particular, the MS [4] and GD [5] substrates, and WPM medium [6] were respectively reported for the regeneration/micropropagation of *P. acerifolia* [7–10] and *P. orientalis* [11]. In addition, Kuzminsky Poplar (KP), Kuzminsky Oriental Plane (KOP), and Kuzminsky Rooting Oriental Plane (KROP) media were developed in [1] for the establishment of *in vitro* culture,

**Table 1**

Inorganic and organic composition of the substrates used in the multiplication stage of *in vitro* micropropagation of *P. orientalis* (mg L<sup>-1</sup>).

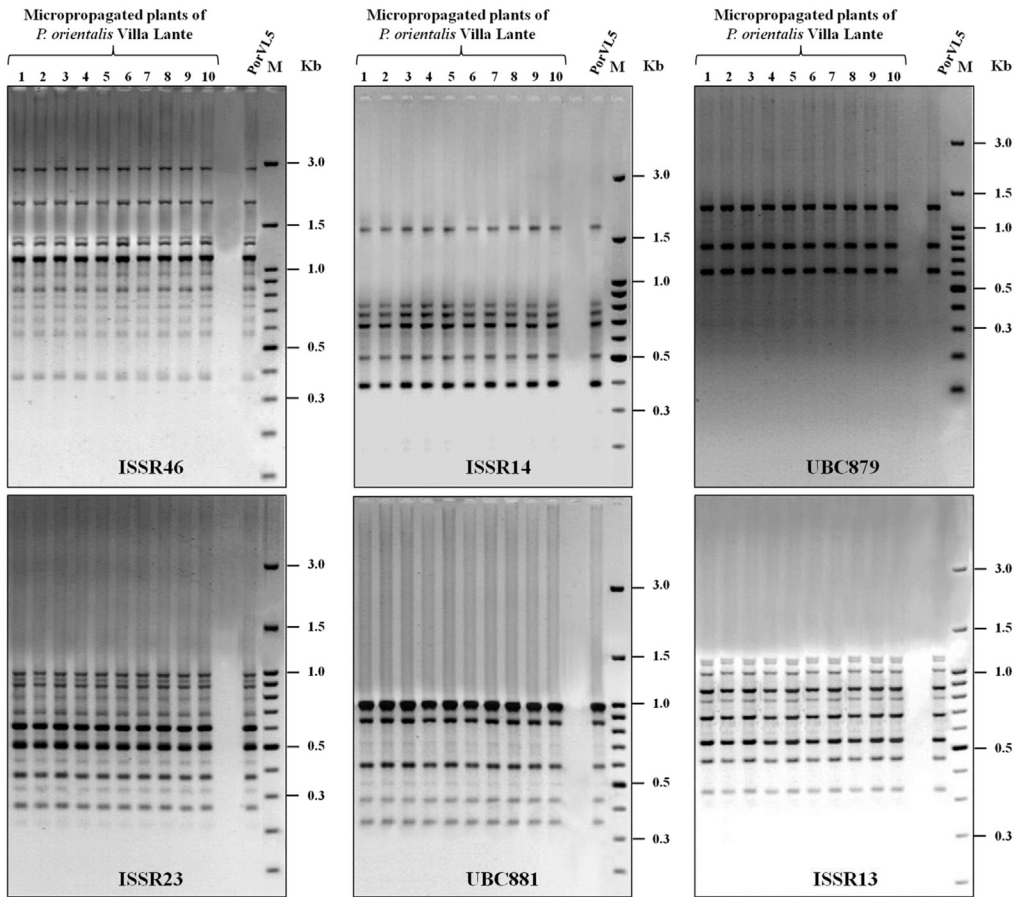
Ingredients	MS	GD	WPM	KP	KOP	KROP
KNO <sub>3</sub>	1,900	1,000	–	1,900	950	–
NH <sub>4</sub> NO <sub>3</sub>	1,650	1,000	400	1,650	–	400
CaCl <sub>2</sub> 2H <sub>2</sub> O	440	–	96	440	440	96
Ca(NO <sub>3</sub> ) <sub>2</sub> 4H <sub>2</sub> O	–	246	556	–	1,000	556
K <sub>2</sub> SO <sub>4</sub>	–	–	990	–	–	990
KCl	–	65	–	–	–	–
MgSO <sub>4</sub> 7H <sub>2</sub> O	370	35	370	370	370	370
KH <sub>2</sub> PO <sub>4</sub>	170	300	170	170	170	170
KI	0.83	0.80	–	0.83	0.83	–
H <sub>3</sub> BO <sub>3</sub>	6.20	0.30	6.20	6.20	6.20	6.20
MnSO <sub>4</sub> H <sub>2</sub> O	16.98	1.00	16.98	16.98	16.98	16.98
ZnSO <sub>4</sub> 7H <sub>2</sub> O	8.60	0.30	8.60	8.60	8.60	8.60
Na <sub>2</sub> MoO <sub>4</sub> 2H <sub>2</sub> O	0.25	0.03	0.25	0.25	0.25	0.25
CuSO <sub>4</sub> 5H <sub>2</sub> O	0.03	0.03	0.25	0.03	0.03	0.03
CoCl <sub>2</sub> 6H <sub>2</sub> O	0.03	0.03	–	–	–	–
AlCl <sub>3</sub>	–	–	–	0.03	0.03	0.03
Na <sub>2</sub> EDTA	37.30	–	37.30	74.50	74.50	74.50
FeNaEDTA	–	36.70	–	–	–	–
FeSO <sub>4</sub> 7H <sub>2</sub> O	27.80	–	27.80	55.75	55.75	55.75
Thiamine HCl	0.10	10.00	1.00	0.40	0.40	0.40
Nicotinic acid	0.50	1.00	0.50	–	–	–
PyridoxineHCl	0.50	1.00	0.50	–	–	–
Glicine	2.00	4.00	2.00	–	–	–
Myo-inositol	100	100	100	100	100	100
Activated charcoal	–	–	3,000	–	–	–
Sucrose	30,000	30,000	30,000	30,000	30,000	30,000

the development of axillary shoots (multiplication) and the elongement and rooting phase for veteran plants of *P. orientalis*. The second dataset (Fig. 1) illustrates the electrophoretic patterns of six of the 15 ISSR markers developed by [2,3] (Table 2) and here utilized for the assessment of the genetic fidelity of 10 micropropagated plants of *P. orientalis* respect to the veteran mother plant (Por VL5) after three years of *in vitro* culture.

## 2. Experimental design, materials and methods

In the related research article [1] an experimental programme to obtain *in vitro* cloned material of veteran trees of *P. orientalis* collected in the Renaissance garden of Villa Lante delle Rovere in Viterbo (Italy) was carried out in the period 2015–2017. A detailed description of the collection and handling procedures was described in [1]. The experimental design consists in the comparison of the six substrates here described (Table 1) for the induction of axillary shoots (multiplication stage) adding 0.5 mg L<sup>-1</sup> of the BAP cytokinin, after 1 month in KP for the establishment of the *in vitro* culture without hormones. The multiplication stage was carried out by using 5 explants per substrate. After one month the more elongated microshoot (> 1.5 cm) were cut with a part of the basal callus and put in KROP medium where for elongation and rooting the content of sucrose was reduced to 20 g L<sup>-1</sup> and the medium was added with the auxin Indole-3-butyric acid (IBA 0.02 mg L<sup>-1</sup>).

Genomic DNA was extracted from leaves of ten micropropagated plants as described in [1]. PCR reactions by the 15 ISSR primers (Table 2) were performed in a total volume of 25 µl containing approximately 20 ng of genomic DNA, 0.5 µM of each primer and 12.5 µl of Hot Start PCR Master Mix, 2 × (Biotech rabbit, Hennigsdorf, Germany). All reactions were carried out in a Eppendorf Thermal Cycler (Mastercycler Gradient) with the following parameters: initial denaturation at 95 °C for 4 min, 35 cycles of amplification, each at 94 °C for 1 min, 50–59 °C for 1 min (depending on the optimal



**Fig. 1.** Agarose gel electrophoresis of PCR products by six of the 15 ISSR primers used to assess the genetic stability of the 10 micropropagated plants from PorVL5.

**Table 2**

Characteristics of the 15 ISSR primers used to assess the genetic fidelity of micropropagated plants.

Primer code	Primer sequence (5'-3')	Annealing temperature (°C)
ISSR12	(AG) <sub>8</sub> YG	55
ISSR13	(AG) <sub>8</sub> YT	53
ISSR14	(AG) <sub>8</sub> RA	53
ISSR20	(GA) <sub>8</sub> YG	55
ISSR23	(GA) <sub>8</sub> YT	53
ISSR24	(GT) <sub>8</sub> YC	55
ISSR25	(GT) <sub>8</sub> YG	55
ISSR28	(GT) <sub>8</sub> RA	53
ISSR36	(AC) <sub>8</sub> YG	55
ISSR38	(AC) <sub>8</sub> YA	53
ISSR43	(GTG) <sub>5</sub>	54
ISSR44	(GAC) <sub>5</sub>	54
ISSR46	(GGGGT) <sub>3</sub>	59
UBC879	(CTCA) <sub>3</sub>	50
UBC881	(GGTG) <sub>3</sub>	59

Y=T/C; R=G/A.

annealing temperature of the different primer employed), 72 °C for 2 min, and a final extension at 72 °C for 7 min. Amplification products were separated on 1.5% (w/v) agarose gels and visualized under UV radiation after staining with ethidium bromide (0.001%) and analyzed using the UVITEC Essential V6 Gel Imaging and Documentation System (Clever Scientific, Rugby, United Kingdom).

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## Transparency document. Supplementary material

Transparency document associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.dib.2018.09.009>.

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