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Genes encoding an agmatine deiminase pathway in *Lactobacillus brevis* are located immediately downstream of the tyrosine decarboxylation operon in a locus proposed to be involved in acid resistance

Patrick M. Lucas, Victor S. Blancato, Olivier Claisse, Christian Magni, Juke S. Lolkema and Aline Lonvaud-Funel

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Table S1. Distribution of AgDI and TDC gene clusters in LAB

PCRs were carried out using genomic DNA of the indicated bacteria as template and three sets of primers matching the *tyrDC* gene (column TDC), the *aguA1* and *arcC* genes (column AgDI) and the *nhaC* and *ptcA* genes (column Link). Plus and minus symbols denote the presence and the absence of amplification products, respectively.

Species*	Strain†	Origin‡	AgDI	TDC	Link
<i>Lb. brevis</i>	ATCC 367	U	+	+	+
<i>Lb. brevis</i>	IOEB 7702	W	–	–	–
<i>Lb. brevis</i>	IOEB 8404	W	–	–	–
<i>Lb. brevis</i>	IOEB 8407	W	+	+	+
<i>Lb. brevis</i>	IOEB 8511	W	+	+	+
<i>Lb. brevis</i>	IOEB 8907	W	+	+	+
<i>Lb. brevis</i>	IOEB 9112	W	+	+	+
<i>Lb. brevis</i>	IOEB 9301	A	–	–	–
<i>Lb. brevis</i>	IOEB 9809	W	+	+	+
<i>Lb. brevis</i>	IOEB 9901	W	+	+	+
<i>Lb. brevis</i>	IOEB 9906	S	+	–	–
<i>Lb. brevis</i>	IOEB 9907	S	+	–	–
<i>Lb. brevis</i>	IOEB 9908	S	+	+	+
<i>Lb. brevis</i>	IOEB 9910	S	+	–	–
<i>Lb. brevis</i>	IOEB 9925	S	+	+	+
<i>Lb. brevis</i>	IOEB 0019	W	+	+	+
<i>Lb. brevis</i>	IOEB 0402	W	+	+	+
<i>Lb. buchneri</i>	LTH 2515	C	–	–	–
<i>Lb. buchneri</i>	LTH 1388	C	–	–	–
<i>Lb. buchneri</i>	DSMZ 5987	C	–	–	–
<i>Lb. buchneri</i>	ATCC 11305	B	–	–	–
<i>Lb. casei</i>	ATCC 334	C	–	–	–
<i>Lb. casei</i>	IOEB 8102	W	–	–	–
<i>Lb. casei</i>	IOEB 8606	W	–	–	–
<i>Lb. casei</i>	IOEB 9104	W	–	–	–
<i>Lb. casei</i>	IOEB 9105	W	–	–	–
<i>Lb. casei</i>	IOEB 9645	W	–	–	–
<i>Lb. casei</i>	IOEB 9914	S	+	+	+
<i>Lb. casei</i>	IOEB 9915	S	–	–	–
<i>Lb. casei</i>	IOEB 9916	S	–	–	–
<i>Lb. casei</i>	IOEB 9919	S	+	+	+
<i>Lb. casei</i>	IOEB 9920	S	–	–	–
<i>Lb. collinoides</i>	ATCC 27612	A	–	–	–
<i>Lb. collinoides</i>	IOEB 9206	A	–	–	–
<i>Lb. collinoides</i>	IOEB 9207	A	–	–	–
<i>Lb. collinoides</i>	IOEB 9208	A	–	–	–
<i>Lb. collinoides</i>	IOEB 9526	A	–	–	–

<i>Lb. collinoides</i>	IOEB 9527	A	-	-	-
<i>Lb. collinoides</i>	IOEB 9528	A	-	-	-
<i>Lb. collinoides</i>	IOEB 9529	A	-	-	-
<i>Lb. collinoides</i>	IOEB 0203	A	-	-	-
<i>Lb. diolivorans</i>	IOEB 0004	W	-	-	-
<i>Lb. diolivorans</i>	IOEB 0005	W	-	-	-
<i>Lb. fermentum</i>	ATCC 9338	U	-	-	-
<i>Lb. fermentum</i>	IOEB 9912	S	-	-	-
<i>Lb. fructivorans</i>	IOEB 865	W	-	-	-
<i>Lb. fructivorans</i>	IOEB 9107	W	+	+	+
<i>Lb. fructivorans</i>	IOEB 9305	W	-	-	-
<i>Lb. fructivorans</i>	IOEB 9501	W	-	-	-
<i>Lb. hilgardii</i>	ATCC 8290	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 720	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 7701	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 7902	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 7903	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 8408	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 8510	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9101	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9102	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9103	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9109	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9110	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9111	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9202	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9515	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9519	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9522	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9544	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9545	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9546	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9547	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9548	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9549	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9550	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9601	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9602	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9603	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9604	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9606	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9607	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9620	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9621	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9622	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9623	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9644	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 9647	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9648	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 9649	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 0001	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0002	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0003	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0006	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0007	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0008	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 0009	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0010	W	-	-	-

<i>Lb. hilgardii</i>	IOEB 0011	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0012	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0013	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0014	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0015	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0016	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0017	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0018	W	+	+	+
<i>Lb. hilgardii</i>	IOEB 0021	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0022	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0023	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0029	W	-	-	-
<i>Lb. hilgardii</i>	IOEB 0204	A	-	-	-
<i>Lb. mali</i>	ATCC 27304	W	-	-	-
<i>Lb. mali</i>	IOEB 0028	A	-	-	-
<i>Lb. paracasei</i>	IOEB 0020	W	-	-	-
<i>Lb. plantarum</i>	ATCC 8014	U	-	-	-
<i>Lb. plantarum</i>	IOEB 8402	W	-	-	-
<i>Lb. plantarum</i>	IOEB 8512	W	-	-	-
<i>Lb. plantarum</i>	IOEB 8603	W	-	-	-
<i>Lb. plantarum</i>	IOEB 8605	W	-	-	-
<i>Lb. plantarum</i>	IOEB 8904	W	-	-	-
<i>Lb. plantarum</i>	IOEB 9106	W	-	-	-
<i>Lb. plantarum</i>	IOEB 9113	W	-	-	-
<i>Lb. plantarum</i>	IOEB 9201	W	-	-	-
<i>Lb. plantarum</i>	IOEB 9532	W	-	-	-
<i>Lb. plantarum</i>	IOEB 9608	W	-	-	-
<i>Lb. plantarum</i>	IOEB 0401	W	-	-	-
<i>Lb. sakei</i>	LTH 2076	K	-	-	-
<i>Lb. sakei</i>	ATCC 15521	R	-	-	-
<i>Lb. sanfranciscensis</i>	ATCC 27651	C	+	+	+
<i>Lactobacillus 30A</i>	ATCC 33222	I	-	-	-
<i>Lb. mesenteroides</i>	ATCC 8293	O	-	-	-
<i>Lb. mesenteroides</i>	IOEB 8607	W	-	-	-
<i>Lb. mesenteroides</i>	IOEB 8902	W	-	-	-
<i>Lb. mesenteroides</i>	IOEB 9642	W	-	-	-
<i>O. oeni</i>	IOEB 8403	W	-	-	-
<i>O. oeni</i>	IOEB 8406	W	-	-	-
<i>O. oeni</i>	IOEB 8413	W	-	-	-
<i>O. oeni</i>	IOEB 8417	W	-	-	-
<i>O. oeni</i>	IOEB 8419	W	-	-	-
<i>O. oeni</i>	IOEB 8802	W	-	-	-
<i>O. oeni</i>	IOEB 8905	W	-	-	-
<i>O. oeni</i>	IOEB 8908	W	-	-	-
<i>O. oeni</i>	IOEB 9115	W	-	-	-
<i>O. oeni</i>	IOEB 9204	W	-	-	-
<i>O. oeni</i>	IOEB 9220	W	-	-	-
<i>O. oeni</i>	IOEB 9221	W	-	-	-
<i>O. oeni</i>	IOEB 9304	A	-	-	-
<i>O. oeni</i>	IOEB 9517	W	-	-	-
<i>O. oeni</i>	IOEB 9523	W	-	-	-
<i>O. oeni</i>	IOEB 9613	W	-	-	-
<i>O. oeni</i>	IOEB 9614	W	-	-	-
<i>O. oeni</i>	IOEB 9624	W	-	-	-
<i>O. oeni</i>	IOEB 9628	W	-	-	-
<i>O. oeni</i>	IOEB 9701	W	-	-	-

<i>O. oeni</i>	IOEB 9801	W	-	-	-
<i>O. oeni</i>	IOEB 9803	W	-	-	-
<i>O. oeni</i>	IOEB 9806	W	-	-	-
<i>O. oeni</i>	IOEB 9808	W	-	-	-
<i>O. oeni</i>	IOEB 0025	W	-	-	-
<i>O. oeni</i>	IOEB 0026	W	-	-	-
<i>O. oeni</i>	IOEB 0027	W	-	-	-
<i>O. oeni</i>	IOEB 0501	W	-	-	-
<i>O. oeni</i>	IOEB 0502	W	-	-	-
<i>O. oeni</i>	IOEB 0503	W	-	-	-
<i>P. acidilactici</i>	ATCC 8042	U	-	-	-
<i>P. damnosus</i>	ATCC 25248	B	-	-	-
<i>P. damnosus</i>	IOEB 0301	W	-	-	-
<i>P. dextrinicus</i>	ATCC 33087	H	-	-	-
<i>P. parvulus</i>	ATCC 19371	H	-	-	-
<i>P. parvulus</i>	IOEB 8415	W	-	-	-
<i>P. parvulus</i>	IOEB 8501	W	-	-	-
<i>P. parvulus</i>	IOEB 8508	W	-	-	-
<i>P. parvulus</i>	IOEB 8514	W	-	-	-
<i>P. parvulus</i>	IOEB 8515	W	-	-	-
<i>P. parvulus</i>	IOEB 8608	W	-	-	-
<i>P. parvulus</i>	IOEB 8801f	W	-	-	-
<i>P. parvulus</i>	IOEB 9114	W	+	+	+
<i>P. parvulus</i>	IOEB 9615	W	-	-	-
<i>P. pentosaceus</i>	ATCC 33316	B	-	-	-
<i>P. pentosaceus</i>	IOEB 7901	W	-	-	-
<i>P. pentosaceus</i>	IOEB 8906	W	-	-	-
<i>P. pentosaceus</i>	IOEB 9904	S	-	-	-
<i>T. muriaticus</i>	LMG 18498	F	-	-	-

**Lb.*, *Lactobacillus*; *Ln.*, *Leuconostoc*; *O.*, *Oenococcus*; *P.*, *Pediococcus*; *T.*, *Tetragenococcus*.

†ATCC, American Type Culture Collection; DSMZ, Deutsche Sammlung von Mikroorganismen und Zellkulturen; IOEB, Faculty of Oenology, University Victor Segalen Bordeaux 2; LMG, Belgian Coordinate Cultures of Micro-organisms; LTH, Institut für Lebensmittelechnologie, Universität Hohenheim.

‡Origins of the bacteria: A, apple juice or cider; B, beer; C, cheese; F, squid liver sauce; H, silage; I, intestinal tract; K, sauerkraut; O, olive; R, fermented rice; S, sugar cane; U, undetermined; W, wine, grape berries or grape juice.