

2 ***Aridibacter famidurans* and *Aridibacter kavangonensis*, 2 novel species of *Acidobacteria***  
3 **subdivision 4 isolated from semiarid savanna soil**

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10 **Running title:** *Aridibacter famidurans* gen. nov., sp. nov. and *A. kavangonensis*, sp. nov.

11 **Subject category:** New Taxa, subsection *Other Bacteria*

12 **Footnote**

13 The GenBank/EMBL/DDBJ accession numbers for the 16S rRNA gene sequence of *Aridibacter*  
14 *famidurans* A22\_HD\_4H<sup>T</sup> and *Aridibacter kavangonensis* Ac\_23\_E3<sup>T</sup> are KF245634 and  
15 KF245633, respectively.

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21 **Supplementary Table 1.**

22 Full cellular fatty acid profile of the strains A22\_HD\_4H<sup>T</sup> and Ac\_23\_E3<sup>T</sup>.

23 Percentages of total fatty acids are outlined in the table. Summed features are two or more  
 24 fatty acids which were not separated by MIDI chromatograph.

<u>Fatty acid</u>	<u>A22 HD 4H<sup>T</sup></u>	<u>Ac 23 E3<sup>T</sup></u>
<b>Saturated</b>		
12:0	0.35	0.24
14:0	0.47	0.67
16:0	<b>3.63</b>	<b>4.96</b>
18:0	0.23	-
20:0	1.05	0.48
<b>Unsaturated</b>		
14:1 ω5c	1.85	0.77
18:3 ω6c	-	0.46
<b>Methyl-branched</b>		
11:0 iso	0.39	0.79
13:0 iso	<b>4.14</b>	<b>3.45</b>
14:0 iso	0.24	-
15:0 iso	<b>35.14</b>	<b>38.01</b>
15:1 anteiso A	0.70	0.33
16:0 iso	0.86	1.90
16:0 anteiso	0.47	0.61
16:1 iso G	0.33	-
17:0 iso	0.61	1.67
17:0 anteiso	<b>6.19</b>	<b>10.85</b>
17:1 iso ω9c	0.66	2.30
17:1 anteiso A	3.01	<b>4.11</b>
<b>Hydroxy</b>		
12:0 3-OH	0.36	-
13:0 iso 3-OH	0.29	-
17:0 iso 3-OH	1.80	1.47
<b>Summed Feature</b>		
1 (15:1 iso H/13:0 3-OH)	<b>17.15</b>	<b>11.65</b>
3 (16:1 ω7c/16:1 ω6c)	<b>20.05</b>	<b>15.27</b>

26 **Supplementary Table 2.** Single substrate concentration used for determination of substrate  
 27 range of the strains A22\_HD\_4H<sup>T</sup> and Ac\_23\_E3<sup>T</sup> in liquid culture.

<b>Substrate</b>	<b>Concentration [mM]</b>
Arabinose	5
Cellobiose	5
Erythrose	5
Erythrulose	5
Fructose	5
Fucose	5
Galactose	5
Glucose	5
Lactose	5
Lyxose	5
Maltose	5
Mannose	5
Melzitose	5
Raffinose	5
Rhamnose	5
Sorbose	5
Sucrose	5
Trehalose	5
Xylose	5
Glucosamine	5
N-acetylglucosamine	5
N-acetylgalactosamine	5
Acetoin	5
Adonitol	5
Arabitol	10
Dulcitol	5
Lyxitol	5
Mannitol	5
Myo-Inositol	5
Sorbitol	5
Xylitol	5
Alanine	5
Arginine	5
Asparagine	2
Aspartate	2
Cysteine	2
Glutamate	2

Glutamine	2
Glycine	5
Histidine	5
Hydroxy-Proline	5
Isoleucine	2
Leucine	5
Lysine	5
Methionine	5
Ornithine	2
Phenylalanine	5
Proline	2
Threonine	5
Tryptophan	1.25
Tyrosine	5
Valine	5
Adipate	5
Acetate	5
Ascorbate	5
Benzoate	5
Trimethoxybenzoate	5
Butyrate	2.5
$\alpha$ -Hydroxybutyrate	2.5
$\beta$ -Hydroxybutyrate	2.5
$\gamma$ -Hydroxybutyrate	2.5
Isobutyrate	2.5
Caproate	5
Caprylate	5
Citrate	2
Isocitrate	5
Crotonate	5
Formate	2.5
Fumarate	5
Gluconate	5
2-Oxogluconate	5
Glucuronate	5
2-Oxoglutarate	5
Glycolate	5
Glyoxylate	5
Heptanoic acid	5
Isovalerate	0.5
Laevulinate	5

Lactate	2
Malate	5
Maleic acid	5
Malonate	5
Nicotinic acid	2
Oxaloacetate	5
Propionate	5
Protocatechuate	5
Pyruvate	10
Shikimate	5
Succinate	10
Tartrate	2
2-Oxovalerate	5
Butanol	5
1,2-Butandiol	5
2,3-Butandiol	5
Ethanol	5
Ethylene glycol	5
Glycerol	5
Methanol	2
Propanol	5
1,2-Propandiol	5
Fermented rumen extract	5
<b>Substrate</b>	<b>Concentration [% w/v]</b>
Laminarin	0.05
Tween 80	0.001
Casamino acids	0.05
Casein hydrolysate	0.05
Peptone	0.05
Yeast extract	0.05
<b>Substrate</b>	<b>Concentration [mg l<sup>-1</sup>]</b>
Starch	500
Cellulose	500
Chitin	500
Avicel	500

29 **Supplementary Table 3.** Enzyme activities of A22\_HD\_4H<sup>T</sup> and Ac\_23\_E3<sup>T</sup>.

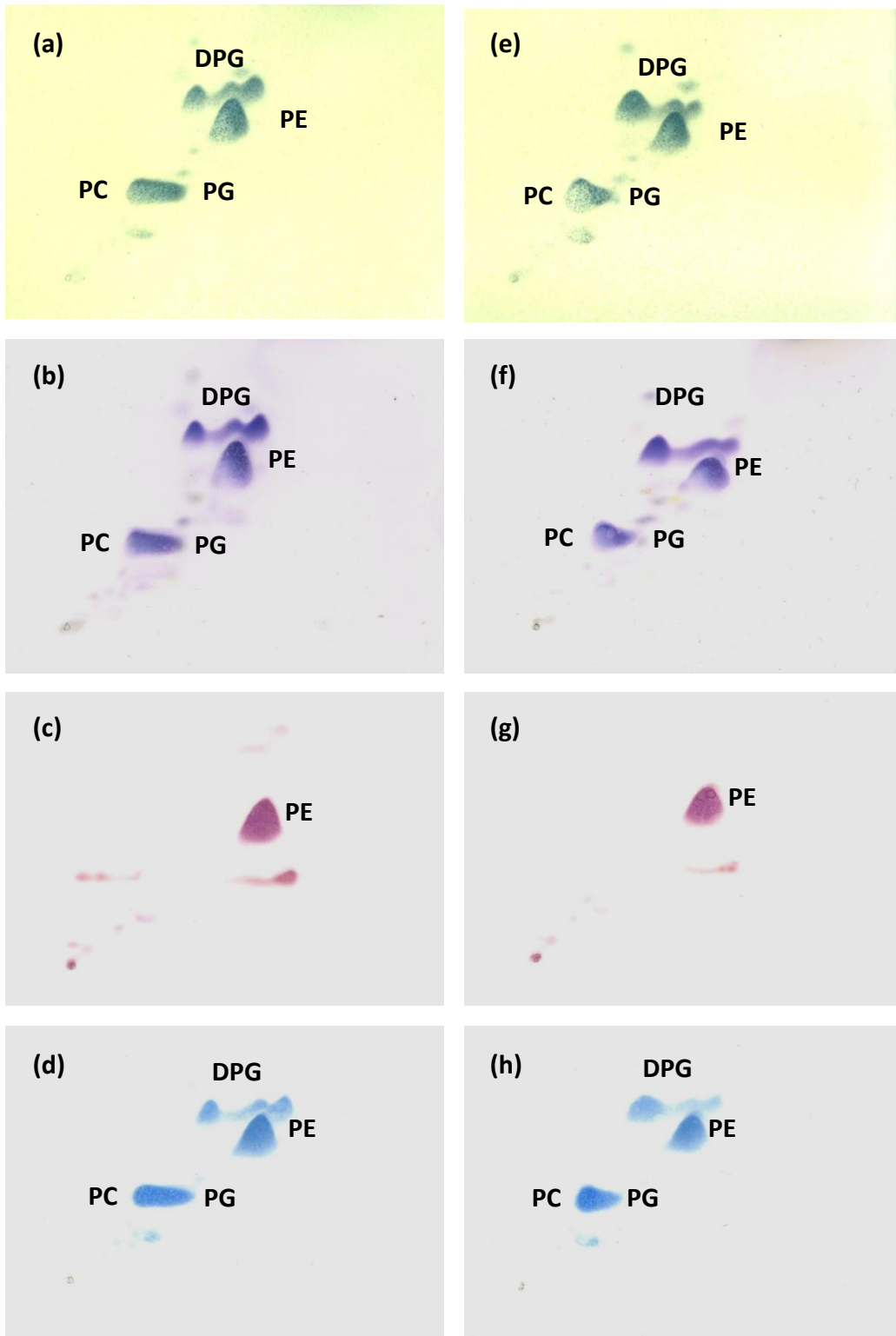
30 +, positive; -, negative; (+), weak enzyme activity detected.

<u>Enzyme</u>	<u>A22 HD 4H<sup>T</sup></u>	<u>Ac 23 E3<sup>T</sup></u>
Alkaline phosphatase	+	+
Acid phosphatase	+	+
Naphtol-AS-BI-phosphohydrolase	(+)	+
Leucine arylamidase	+	+
Valine arylamidase	+	+
Cysteine arylamidase	-	-
Arginine dihydrolase	-	-
Indol production	-	-
Esterase lipase C8	(+)	(+)
Lipase C14	(+)	(+)
Esterase C4	-	-
Trypsin	+	+
α-Chymotrypsin	(+)	+
Urease	-	-
Gelatinase	(+)	-
α-glucosidase	(+)	-
β-glucosidase	+	+
α-mannosidase	-	-
α-galactosidase	-	-
β-galactosidase (API ZYM)	-	-
β-galactosidase (API 20 NE)	+	+
α-fucosidase	-	-
β-glucuronidase	-	-
N-acetyl-β-glucosaminidase	+	+

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Supplementary Fig. S1

34 FIGURE LEGENDS

35 **Supplementary Fig. S1.** Polar lipids composition of the strains A22\_HD\_4H<sup>T</sup> (a-d) and  
36 Ac\_23\_E3<sup>T</sup> (e-h) on thin layer chromatography. Staining for determination of the polar lipids  
37 with dodecamolydophosphoric acid (a, e), ninhydrin (b, f), anisaldehyd sulfuric acid (c, g),  
38 Zinzadze reagent (d, h). For lipid separation chloroform:methanol:water (65:25:4, v/v/v) was  
39 used in the first direction and chloroform:methanol:acetic acid:water (80:12:15:4, v/v/v/v) in  
40 the second direction. PE: phosphatidylethanolamine, PC: phosphatidylcholine, DPG:  
41 diphosphatidylcholine, PG: phosphatidylglycerol.