

Table S1. List of gene regions, PCR amplification conditions, and their references as followed in this study.

Region (Primers)	PCR conditions	Reference
16S RNA gene with 16S–23S ITS region (8F/ BS23SR)	Initial denaturation at 95 °C for 5 minutes, followed by 35 cycles of denaturation at 94 °C for 1 min, annealing at 58 °C for 45 s, extension at 72 °C for 1 min 40 s, and a final extension at 72 °C for 10 min.	[13]
16S rRNA gene (27F/1492R)	Initial denaturation at 94 °C for 5 min, 35 cycles at 94 °C for 30 s, 52 °C for 30 s, 72 °C for 30 s, and a final extension at 72 °C for 10 min.	[35]
16S–23S ITS region (322F/340R)	Initial cycle consisting of 3 min at 95 °C, 2 min at 55 °C and 30 s at 72 °C, followed by 30 cycles of amplification (1.5 min at 95 °C, 2.5 min at 55 °C and 3 min at 72 °C, and a final extension at 72 °C for 7 min	[34,36]
<i>rbcl</i> gene (<i>rbclf/rbclr</i>)	Initial denaturation at 94 °C for 5 min, followed by 30 cycles of denaturation at 92 °C for 1 min, annealing at 55 °C for 1 min, and extension at 72 °C for 2 min, and a final extension at 72 °C for 6 min.	[37]

Table S2. A partial similarity matrix (%) generated using the 16S rRNA gene sequence of *Stenomitos nagquensis* sp. nov. and its closely related species.

Strain	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 <i>Stenomitos nagquensis</i> CSML-F035																	
2 <i>Stenomitos rutilans</i> HA7619-LM2	98.2																
3 <i>Stenomitos hiloensis</i> HA6792-KK3	98.9	89.7															
4 <i>Stenomitos kolaensis</i> Pasv RS28	98.7	93.6	92.5														
5 <i>Stenomitos pantisii</i> TAUMAC 4318	90.8	89.1	89.6	90.1													
6 <i>Stenomitos tremulus</i> CPCC 471	99.2	98.3	99.2	98.9	91.1												
7 <i>Stenomitos tenuis</i> PCM304.07	99.1	98.5	98.9	99.0	91.6	98.6											
8 <i>Stenomitos frigidus</i> BEA 0966B	99.3	98.5	99.2	98.9	90.9	99.3	98.7										
9 <i>Stenomitos frigidus</i> ANT. L52B.3	98.4	97.8	98.5	98.3	90.7	98.2	97.9	98.8									
10 <i>Stenomitos frigidus</i> ANT.L8.1	98.7	98.0	98.3	98.0	88.8	98.3	98.3	98.8	98.2								
11 <i>Stenomitos frigidus</i> ANT.L53B.1	98.6	97.9	98.2	97.9	88.7	98.2	98.2	98.7	98.1	99.7							
12 <i>Stenomitos frigidus</i> ANT. L64B.1	98.7	98.2	98.8	98.5	90.2	98.6	98.6	98.6	98.3	98.7	98.7						
13 <i>Stenomitos frigidus</i> ANT.L52.3	98.7	98.0	98.3	98.0	88.7	98.3	98.3	98.8	98.2	99.6	99.6	98.7					
14 <i>Stenomitos frigidus</i> AR3-EA3	98.2	97.4	98.2	97.9	90.8	98.1	97.9	98.5	99.8	98.0	98.0	98.0	98.0				
15 <i>Stenomitos</i> cf. <i>frigidus</i> 3CIP	98.2	97.5	98.7	98.3	89.2	98.0	98.3	98.6	98.1	97.8	97.8	98.2	97.8	97.8			
16 <i>Stenomitos frigidus</i> ACSSI_171	98.0	97.7	98.6	98.2	90.1	98.3	98.0	98.4	99.2	98.1	98.1	98	98.1	99.1	98.1		
17 <i>Stenomitos frigidus</i> CANT10	97.7	97.7	98.3	98.3	90.2	97.9	97.7	98.1	98.9	97.9	97.9	97.7	97.9	98.8	97.8	99.3	
18 <i>Stenomitos frigidus</i> CAU11	97.8	97.6	97.6	98.1	90.3	98.1	97.9	98.3	99.1	98.0	98.0	97.7	98.0	98.9	98.0	99.4	99.1
19 <i>Stenomitos frigidus</i> BEA 1253B	97.2	97.1	97.7	97.1	90	97.4	97.6	97.6	98.1	98.2	98.2	96.9	98.2	97.9	97.3	97.9	97.6
20 <i>Stenomitos</i> sp. BACA0708	98.1	90.3	97.2	92.6	91.2	99.1	99.1	98.5	98.4	98.7	98.7	97.9	98.7	98.1	98.6	97.6	97.5
21 <i>Stenomitos</i> sp. BACA0054	98.4	89.7	89.7	90.9	91.2	99.3	98.6	98.6	98.5	98.5	98.5	98.0	98.5	98.3	98.5	97.7	97.6
22 <i>Stenomitos</i> sp. BACA0618	97.9	89.6	89.6	91.0	91.2	98.9	99.1	98.1	98.2	98.4	98.4	97.8	98.4	97.9	98.5	97.3	97.3
23 <i>Stenomitos</i> sp. WJT24NPBG20	97.3	87.7	87.7	87.8	88.7	97.1	97.2	97.3	98.2	96.8	96.8	97.1	96.8	98	96.6	98.4	98.1
24 <i>Stenomitos</i> sp. SAG 37.90	98.9	98.4	98.4	99.1	91.2	99	99.1	98.6	98.6	98.7	98.7	98.2	98.7	98.3	98.6	97.6	97.3
25 <i>Stenomitos</i> sp. KPABG 610003	99.2	87.4	87.4	90.2	89.5	98.6	99.3	98.8	98.7	98.6	98.6	99.0	98.5	98.4	98.7	98.5	98.3
26 <i>Stenomitos</i> sp. KPABG 610004	99.3	86.9	91.6	89.6	88.9	99.9	98.5	99.2	98.4	98.4	98.4	98.6	98.4	98.1	98.1	98.4	98.1