

## Supplementary material

**Table S1.** The list of sample informaton of mitchondrial genomes of 26 published species of Scolytidae.

Subfamily	Tribe	Category	Species	Accession no.
Hylesininae	Hylastini	<i>Hylates</i>	<i>Hylates attenuatus</i>	NC_036290.1
Hylesininae	Hylastini	<i>Hylates</i>	<i>Hylates brunneus</i>	NC_036262.1
Ipinae	Ipini	<i>Pityogenes</i>	<i>Pityogenes trepanatus</i>	KX_035225.1
Ipinae	Ipini	<i>Pityogenes</i>	<i>Pityogenes bidentatus</i>	NC_036289.1
Ipinae	Ipini	<i>Ips</i>	<i>Ips calligraphus</i>	MW_589547
Ipinae	Ipini	<i>Ips</i>	<i>Ips acuminatus</i>	MK_988441
Ipinae	Ipini	<i>Ips</i>	<i>Ips sexdentatus</i>	NC_036281.1
Ipinae	Ipini	<i>Orthotomicus</i>	<i>Orthotomicus erosus</i>	MZ_823388
Ipinae	Ipini	<i>Orthotomicus</i>	<i>Orthotomicus laricis</i>	NC_036291.1
Ipinae	Dryocoetini	<i>Dryocoetes</i>	<i>Dryocoetes autographus</i>	NC_036287.1
Ipinae	Dryocoetini	<i>Dryocoetes</i>	<i>Dryocoetes hectographus</i>	MZ_766132
Ipinae	Dryocoetini	<i>Dryocoetes</i>	<i>Dryocoetes villosus</i>	NC_036282.1
Ipinae	Xyleborini	<i>Cyclorhipidion</i>	<i>Cyclorhipidion bodoanus</i>	NC_036295
Ipinae	Xyleborini	<i>Xylosandrus</i>	<i>Xylosandrus saxesenii</i>	KX035203.1
Ipinae	Xyleborini	<i>Anisandrus</i>	<i>Anisandrus dispar</i>	NC_036293.1
Ipinae	Xyleborini	<i>Xylosandrus</i>	<i>Xylosandrus morigerus</i>	NC_036283.1
Ipinae	Xyleborini	<i>Xylosandrus</i>	<i>Xylosandrus germanus</i>	NC_036280.1
Ipinae	Xyleborini	<i>Xylosandrus</i>	<i>Xylosandrus crassiusculus</i>	NC_036284.1
Ipinae	Xyloterini	<i>Trypodendron</i>	<i>Trypodendron signatum</i>	NC_036292.1
Ipinae	Xyloterini	<i>Trypodendron</i>	<i>Trypodendron domesticum</i>	NC_036286.1
Ipinae	Polygraphini	<i>Polygraphus</i>	<i>Polygraphus poligraphus</i>	OK_110248
Ipinae	Tryphphloeini	<i>Trypophloeus</i>	<i>Trypophloeus asperatus</i>	NC_036285.1
Ipinae	Corthylini	<i>Gnathotrachus</i>	<i>Gnathotrachus materiarius</i>	NC_036294.1
Ipinae	Corthylini	<i>Pityophthorus</i>	<i>Pityophthorus pubescens</i>	NC_036288.1
Ipinae	Hyloterini	<i>Dendroctonus</i>	<i>Dendroctonus micans</i>	MZ_768861
		<i>Curculio</i>	<i>Curculio elephas</i>	KX_087269.1

**Table S2.** *Ips* species used in this study.

species	Collection locality,data and collector	Host	Preservation method	Genbank Accession No.
<i>Ips acuminatus</i> (Gyllenhal)	Czech Republic: Moravia, Tulasice V-1995. M. Knizek	Unrecorded	Frozen	AF113325
<i>Ips amitinus</i> 1 (Eichhoff)	Czech Republic: Moravia, Chuchelna V-1995. M. Knizek	<i>Picea abies</i>	Ethanol	AF113326
<i>Ips amitinus</i> 2	Russia: Lenbolovo, St. Petersburg Reg. 8-10-VIII-1998.M. Mandelstan	Spruce	Ethanol	AF113327
<i>Ips apache</i> 1 (Lanier)	AZ: Cochise Co. Coronado National Forest. Rd 42, 10 mi NW of Portal. 6-IX-1996.	<i>Pinus engelmanni</i>	Frozen	AF113328
<i>Ips apache</i> 2	Mexico: Michoacan: Uruapan. Barranca del Cupatitzio 1996. A. Storer	Unrecorded	Ethanol	AF113329
<i>Ips avulsus</i> 1 (Eichhoff)	Louisiana. 1996. G. Lenhard	Unrecorded	Pinned	AF113330
<i>Ips avulsus</i> 2	GA: Cobb Co. Marietta. 19-IX-1997. M. Caterino	<i>Pinus</i>	Frozen	AF113331
<i>Ips bonanseai</i> 1 (Hopkins)	AZ: Graham Co. Coronado National Forest Rd. 366.5-IX-1996.	<i>Pinus</i>	Frozen	AF113332
<i>Ips bonanseai</i>	2 Mexico: Nuevo Leon. XII-1993. S. Seybold	Unrecorded	Frozen	AF113333
<i>Ips borealis Swaine</i>	Canada: Quebec, Gatineau Park nr. Taylor Lake.20-V-1995.	<i>Picea glauca</i>	Frozen	AF113334
<i>Ips calligraphus</i> 1 (Germer)	NY: Suffolk Co. Smithtown 11-IX-1994.	<i>Pinus strobus</i>	Frozen	AF113335
<i>Ips calligraphus</i> 2	AZ: Gila Co. 14 mi. S. Young 26-XI-1985. G. N. Lanier	<i>Pinus ponderosa</i>	Pinned	AF113336
<i>Ips cembrae</i> 1 (Heer)	Czech Republic: Moravia, Resice. 15-V-1997. M. Knizek	<i>Larix decidua</i>	Ethanol	AF113337
<i>Ips cembrae</i> 2	France: Briançon, 16-VI-1996. A. Roques	<i>Larix decidua</i>	Ethanol	AF113338
<i>Ips cembrae</i> 3	China: Heilongjiang, Lo-Shan. 1-VI-1996. A. Roques	<i>Larix gmelini</i>	Ethanol	AF113339
<i>Ips concinnus</i> (Mannerheim)	WA: Clallam Co. Hoh River Rd. 28-VI-1997.	<i>Picea sitchensis</i>	Frozen	AF113340
<i>Ips confusus</i> 1 (LeConte)	AZ: Gila Co. San Carlos Indian Reservation. 11 mi. NE of Point of Pines 26-V-1993. S. Seybold, A. I. Cognato & D. L. Wood	<i>Pinus edulis</i>	Frozen	AF113341
<i>Ips confusus</i> 2	NV: Douglas Co. Gardnerville. II-1994. S. Seybold.	<i>Pinus monophylla</i>	Frozen	AF113342
<i>Ips cribricollis</i> 1 (Eichhoff)	NM: Otero Co. Lincoln National Forest Rt. 82 8.05 km E. Cloudcroft, 11-V-1994.E.	<i>Pinus ponderosa</i>	Frozen	AF113343
<i>Ips cribricollis</i> 2	Mexico: Michoacan: San Juan Nuevo, LaPila Forest,31-V-1998. A. I. Cognato & A. Del Rio-Morea	<i>Pinus leiophylla</i>	Ethanol	AF113344
<i>Ips duplicatus</i> 1 (Sahlberg)	Czech Republic: Moravia, Chuchelna. V-1995. M.Knizek	<i>Picea abies</i>	Ethanol	AF113345
<i>Ips duplicatus</i> 2	Russia: Lenbolovo, St. Petersburg Reg. 8-10-VIII-1998.M. Mandelstan	Spruce	Ethanol	AF113346
<i>Ips emarginatus</i> 1	CA: Lassen Co. Black's Mountain Experimental Forest. VII-1994. S.	<i>Pinus</i>	Frozen	AF113347

(LeConte)	Seybold, A. I. Cognato & D. L. Wood	<i>ponderosa</i>		
<i>Ips emarginatus</i> 2	WA: Kittitas Co. Roslyn. 30-VI-1997.	<i>Pinus ponderosa</i>	Frozen	AF113348
<i>Ips grandicollis</i> 1 (Eichhoff)	NY: Suffolk Co. Brookhaven. 28-VIII-1992	<i>Pinus rigida</i>	Frozen	AF113349
<i>Ips grandicollis</i> 2	Canada: Ontario: Constance Bay, Turbolton Forest.13-V-1995.	<i>Pinus banksiana</i>	Pinned	AF113350
<i>Ips grandicollis</i> 3	FL: Pinellas Co., Harpon Spring, Howard Park.12-V-1995. D. Czokajlo	Unrecorded	Pinned	AF113351
<i>Ips hauseri</i> Reitter	USSR: Kazachstan. Isyk 1767m Zailij. Ala Tau.29-V-1974. A. Pfeffer Igt.	Unrecorded	Pinned	AF113352
<i>Ips hoppingi</i> 1 Lanier	Mexico: Nuevo Leon Mpio. Galeana Rd. Galeana-Dr.Arroyo, Las Crucites 2,470m. X-1993. S. Seybold	<i>Pinus cembroides</i>	Frozen	AF113353
<i>Ips hoppingi</i> 2	AZ: Cochise Co. Coronado N.F. Rd. 42 10mi NW. Portal.7-IX-1996.	<i>Pinus cembroides</i>	Frozen	AF113354
<i>Ips hunteri</i> Swaine	AZ: Greenlee Co. Rd. 191, 3 mi. N. Hannangan's Meadow. 3-IX-1996.	<i>Picea pugnens</i>	Frozen	AF113355
<i>Ips integer</i> (Eichhoff)	AZ: Greenlee Co. Rd. 191, 7 mi. S. Hannangan's Meadow. 1-IX-1996.	<i>Pinus ponderosa</i>	Frozen	AF113356
<i>Ips knausi</i> Swaine	CO: Fairfield nr. Payosa Springs N. Jose. VII-1994. S.Kelley	<i>Pinus ponderosa</i>	Ethanol	AF113357
<i>Ips latidens</i> 1 (Leconte)	CA: Mariposa Co. Fish Camp 15-IV-1996.	<i>Pinus lambertinan</i>	Frozen	AF113358
<i>Ips latidens</i> 2	WA: Roslyn. 30-VI-1997.	<i>Pinus ponderosa</i>	Frozen	AF113359
<i>Ips lecontei</i> 1 Swaine	AZ: Gila Co. San Carlos Indian Reservation. Point of Pines 27-V-1993. S. Seybold, A. I. Cognato & D. L. Wood	<i>Pinus ponderosa</i>	Frozen	AF113360
<i>Ips lecontei</i> 2	AZ: Greenlee Co. Apache National Forest Rd. 191, 20 mi N.Morceani. 4-IX-1996.	<i>Pinus ponderosa</i>	Frozen	AF113361
<i>Ips longifolia</i> (Stebbing)	Bhutan: Autsu Lhuntshi. 1100 m. 9-X-1985. H. Schmutzenhofer	Chir pine	Pinned	AF113362
<i>Ips mannsfeldi</i> (Wachtl)	Austria: Vienna. VI-1989. C. Stauffer	Unrecorded	Ethanol	AF113363
<i>Ips mexicanus</i> (Hopkins)	CA: Marin Co. Olema. 8-III.1994.	<i>Pinus muricata</i>	Frozen	AF113364
<i>Ips montanus</i> (Eichhoff)	CA: Modoc Co. Warner Mountains, T44N, R15E, N1/2, S17.25-VII-1994. S. Seybold, A. I. Cognato, D. L. Wood.	<i>Pinus monticola</i>	Frozen	AF113365
<i>Ips nobilis</i> (Wollaston)	Canary Islands: Tenerife. Villaflor. 12-III-1993. M. Knizek.	Unrecorded	Pinned	AF113366
<i>Ips paraconfusus</i> 1 Lanier	CA: Alameda Co. Berkeley. Wildcat Cayon Rd. 14-X-1995.	<i>Pinus radiata</i>	Frozen	AF113367
<i>Ips paraconfusus</i> 2 Lanier	CA: Mariposa Co. Fish Camp 15-IV-1996.	<i>Pinus lambertinana</i>	Frozen	AF113368
<i>Ips perroti</i> Swaine	Canada: Ontario: Constance Bay, Torbolton Forest. 13-V-1995	<i>Pinus bankisana</i>	Frozen	AF113369

<i>Ips perturbatus</i> 1 (Eichhoff)	Canada: Ontario: Muni. of Ottawa-Carleton, Marlborough Forest, 19-V-1995. D. E. Bright & A. I. Cognato	<i>Picea glauca</i>	Frozen	AF113370
<i>Ips perturbatus</i> 2, 3	Canada: Alberta. nr Manning. VIII-1996. D. Langor	<i>Picea glauca</i>	Ethanol	AF113371
<i>Ips perturbatus</i> 2, 3	Canada: Alberta. nr Manning. VIII-1996. D. Langor	<i>Picea glauca</i>	Ethanol	AF113372
<i>Ips pilifrons</i> 1 Swaine	AZ: Greenlee Co. Rd. 191, 7 mi. S. Hannangan's Meadow. 1-IX-1996	<i>Picea engelmannii</i>	Frozen	AF113373
<i>Ips pilifrons</i> 2	CO: Larimer Co. Roosevelt N.F., Hwy 14 10,000 ft. 18-VI-1997	<i>Picea engelmannii</i>	Frozen	AF113374
<i>Ips pini</i> 1 (Say)	NM: Otero Co. Lincoln N.F. 11-V-1994.	<i>Pinus ponderosa</i>	Frozen	AF113375
<i>Ips pini</i> 2	AZ: Apache Co. Apache N.F. Rd. 56. 3-IX-1996.	<i>Pinus ponderosa</i>	Frozen	AF113376
<i>Ips pini</i> 3	Canada: Calgary 9-X-1990. J. Bordan	<i>Pinus contorta</i>	Ethanol	AF113377
<i>Ips plastographus</i> (LeConte)	CA: Marin Co. Inverness 14-VIII-1995.	<i>Pinus muricata</i>	Frozen	AF113378
<i>Ips schmutzenhoferi</i> Holzschuh	Bhutan: Chelaila, 3100 m. 5-VI-1986. H. Schmutzenhofer	<i>Larix griffithiana</i>	Pinned	AF113379
<i>Ips sexdentatus</i> (Boerner)	Czech Republic: Moravia, Tulasice V-1995. M. Knizek	Unrecorded	Ethanol	AF113380
<i>Ips spinifer</i> (Eichhoff)	CA: Contra Costa Co. Diablo 3-IX-1995.	<i>Pinus sabiniana</i>	Frozen	AF113381
<i>Ips stebbingi</i> 1 Strohmeyer	Pakistan: Swat, Utror. 3-VIII-1987. C. Holzschuh	<i>Pinus gerardiana</i>	Pinned	AF113382
<i>Ips stebbingi</i>	2 Nepal: Dhawalagiri, Kall-Gandaki-Khola, Mustang, D.Kalopani 2500-2800 m 3-VIII-1987. C. Holzschuh	<i>Pinus gerardiana</i>	Pinned	AF113383
<i>Ips tridens</i> (Mannerheim)	WA: Clallam Co. Hoh River Rd. 28-VI-1997.	<i>Picea sitchensis</i>	Frozen	AF113384
<i>Ips typographus</i> 1 (Linnaeus)	Czech Republic: Moravia. V-1995. M. Knizek	Unrecorded	Frozen	AF113385
<i>Ips typographus</i> 2	Russia: Lenbolovo, St. Petersburg Reg. 8-10-VIII-1998. M.Mandelstan	Spruce	Ethanol	AF113386
<i>Ips typographus</i> 3	Russia: St. Khekhcir environs, Khabarovsk 2-IX-1990. M.Mandelstan	<i>Pinus koraiensis</i>	Pinned	AF113387
<i>Ips woodi</i> 1 Thatcher	AZ: Greenlee Co. Rd. 191, 7 mi. S. Hannangan's Meadow. 1-IX-1996.	<i>Pinus strobiformis</i>	Frozen	AF113388
<i>Ips woodi</i> 2	CA: Mono Co. Inyo National Forest Crooked Creek Research Station 21-VIII-1997.	<i>Pinus flexilis</i>	Frozen	AF113389
<i>Ips amitinus</i>	Lower Austria, Gutenbrunn	<i>Picea abies</i>	Ethanol	U82587
<i>Ips cembrae</i>	Styria, Kindberg	<i>Larix decidua</i>	Ethanol	U82588
<i>Ips duplicatus</i>	Moravia, Ostrau	<i>Picea abies</i>	Ethanol	U82586
<i>Ips acuminatus</i>	Lower Austria, Retz	<i>Pinus</i>	Ethanol	U82585

		<i>silvestris</i>		
<i>Ips subelongatus</i>	China: Hebei,Pingquan	<i>Larix</i>	Ethanol	KC411926
		<i>principis</i>		
<i>Ips subelongatus</i>	China: Neimenggu,Aertai,Wuchagou	<i>Larix</i>	Ethanol	KC411927
		<i>gmelinii</i>		
<i>Ips subelongatus</i>	China: Heilongjiang,Menjiagang	<i>Larix</i>	Ethanol	KC411928
		<i>olgensis</i>		
<i>Ips typographus</i>	Belgium Arlon	Spruce	Ethanol	KF846139
<i>Ips typographus</i>	Belgium Beauraing	Spruce	Ethanol	KF846140
<i>Ips typographus</i>	Belgium Bouillon	Spruce	Ethanol	KF846141
<i>Ips hoppingi</i>	Unrecorded	<i>Pinus</i>	Ethanol	EF115516
<i>Ips hunteri</i>	Unrecorded	Spruce	Ethanol	EF115517
<i>Ips amitinus</i>	Unrecorded	Spruce	Ethanol	EF115509
<i>Ips perturbatus</i>	Unrecorded	Spruce	Ethanol	EF115521
<i>Ips pilifrons</i>	Unrecorded	Spruce	Ethanol	EF115523
<i>Ips shangrila</i>	Unrecorded	Spruce	Ethanol	EF115526
<i>Ips tridens</i>	Unrecorded	Spruce	Ethanol	EF115528
<i>Ips cembrae</i>	Unrecorded	<i>Larix</i>	Ethanol	KC514452
<i>Ips cembrae</i>	Unrecorded	<i>Larix</i>	Ethanol	KC514451
<i>Ips nitidus</i>	Unrecorded	Spruce	Ethanol	KF846204
<i>Ips nitidus2</i>	Unrecorded	Spruce	Ethanol	KF846205

**Table S3.** Base composition in the mitochondrial genomes of bark beetles.

Whole genome	Length (bp)	T %	A %	A+T %	AT-skew	C %	G %	C+G %	GC-skew
<i>Dendroctonus micans</i>	14,607	34.15	40.55	74.70	0.09	15.93	9.37	25.30	-0.26
<i>Ips nitidus</i>	15,409	35.16	37.97	73.13	0.04	16.65	10.22	26.87	-0.24
<i>Ips shangrila</i>	15,641	35.15	38.11	73.25	0.04	16.57	10.18	26.75	-0.24
<i>Ips hauseri</i>	15,466	34.83	37.61	72.43	0.04	17.42	10.15	27.57	-0.26
<i>Ips duplicatus</i>	15,572	34.59	37.30	71.89	0.04	17.74	10.36	28.11	-0.26
<i>Ips subelongatus</i>	15,259	35.76	38.76	74.52	0.04	15.73	9.75	25.48	-0.23
<i>Ips typographus</i>	15,384	35.22	38.22	73.44	0.04	16.63	9.93	26.56	-0.25
Average( <i>Ips</i> )		35.12	37.99	73.11	0.04	16.79	10.10	26.89	-0.25
Protein coding genes(PCGs)									
<i>Dendroctonus micans</i>	11,126	41.77	31.57	73.34	-0.14	14.38	12.28	26.66	-0.08
<i>Ips nitidus</i>	11,190	41.39	29.71	71.09	-0.16	15.40	13.51	28.91	-0.07
<i>Ips shangrila</i>	11,160	41.47	30.07	71.54	-0.16	15.16	13.29	28.46	-0.07
<i>Ips hauseri</i>	11,177	41.07	29.13	70.20	-0.17	15.96	13.84	29.80	-0.07
<i>Ips duplicatus</i>	11,137	40.59	29.20	69.79	-0.16	16.38	13.83	30.21	-0.08
<i>Ips subelongatus</i>	11,196	42.42	30.46	72.88	-0.16	14.19	12.92	27.12	-0.05
<i>Ips typographus</i>	11,196	41.44	30.01	71.45	-0.16	15.26	13.28	28.55	-0.07
Average( <i>Ips</i> )		41.40	29.76	71.16	-0.16	15.39	13.45	28.84	-0.07
rRNA									
<i>Dendroctonus micans</i>	2,137	43.61	36.17	79.78	-0.09	6.69	13.52	20.22	0.34
<i>Ips nitidus</i>	2,181	40.15	38.23	78.38	-0.02	7.07	14.55	21.62	0.35
<i>Ips shangrila</i>	2,201	40.80	37.30	78.10	-0.04	6.93	14.97	21.90	0.37
<i>Ips hauseri</i>	2,159	40.10	38.61	78.71	-0.02	6.69	14.60	21.29	0.37
<i>Ips duplicatus</i>	2,203	39.96	38.75	78.71	-0.02	6.64	14.65	21.29	0.38
<i>Ips subelongatus</i>	2,177	40.57	38.37	78.94	-0.03	6.50	14.55	21.06	0.38
<i>Ips typographus</i>	2,177	40.43	37.86	78.29	-0.03	6.88	14.83	21.71	0.37
Average( <i>Ips</i> )		40.34	38.18	78.52	-0.03	6.79	14.69	21.48	0.37
tRNA									
<i>Dendroctonus micans</i>	1,358	37.78	39.54	77.32	0.02	10.31	12.37	22.68	0.09
<i>Ips nitidus</i>	1,444	36.23	40.35	76.58	0.05	10.24	13.18	23.42	0.13
<i>Ips shangrila</i>	1,444	36.52	40.21	76.73	0.05	10.82	12.44	23.27	0.07
<i>Ips hauseri</i>	1,438	36.89	38.95	75.85	0.03	10.16	13.99	24.15	0.16
<i>Ips duplicatus</i>	1,429	36.52	39.40	75.92	0.04	10.38	13.70	24.08	0.14
<i>Ips subelongatus</i>	1,431	37.26	40.43	77.69	0.04	9.94	12.37	22.31	0.11
<i>Ips typographus</i>	1,439	35.57	40.43	75.99	0.06	10.90	13.11	24.01	0.09
Average( <i>Ips</i> )		36.50	39.96	76.46	0.05	10.41	13.13	23.54	0.12

**Table S4.** Organization of the mitochondrial genome of *I. typographus*.

Gene	Direction	Start position	Stop position	Length	Anticodon	Start codon	Stop codon	IGS
<i>trnQ</i>	R	1	71	71	CAT			
<i>trnM</i>	F	86	157	72	TTG			14
<i>ND2</i>	F	161	1168	1008		ATA	TAA	3
<i>trnW</i>	F	1169	1236	68	TCA			0
<i>trnC</i>	R	1266	1332	67	GCA			29
<i>trnY</i>	R	1338	1404	67	GTA			5
<i>COI</i>	F	1429	2997	1569		ATT	TAA	24
<i>trnL2</i>	F	3021	3089	69	TAA			23
<i>COII</i>	F	3090	3770	681		ATC	TAA	0
<i>trnK</i>	F	3805	3876	72	CTT			34
<i>trnD</i>	F	3893	3960	68	GTC			16
<i>ATP8</i>	F	3961	4125	165		ATC	TAG	0
<i>ATP6</i>	F	4122	4799	678		ATA	TAA	-4
<i>COIII</i>	F	4805	5587	783		ATG	TAA	5
<i>trnG</i>	F	5614	5679	66	TCC			26
<i>ND3</i>	F	5683	6033	351		ATT	TAA	3
<i>trnA</i>	F	6046	6114	69	TGC			12
<i>trnR</i>	F	6136	6205	70	TCG			21
<i>trnN</i>	F	6238	6303	66	GTT			32
<i>trnS1</i>	F	6304	6371	68	GCT			0
<i>trnE</i>	F	6373	6443	71	TTC			1
<i>trnF</i>	R	6448	6518	71	GAA			4
<i>ND5</i>	R	6552	8297	1746		ATT	TAA	33
<i>trnH</i>	R	8298	8363	66	GTG			0
<i>ND4</i>	R	8398	9735	1338		ATG	TAA	34
<i>ND4L</i>	R	9742	10029	288		ATT	TAA	6
<i>trnT</i>	F	10055	10121	67	TGT			25
<i>trnP</i>	R	10122	10188	67	TGG			0
<i>ND6</i>	F	10200	10697	498		ATT	TAA	11
<i>CytB</i>	F	10783	11925	1143		ATA	TAA	85
<i>trnS2</i>	F	12028	12097	70	TGA			102
<i>ND1</i>	R	12117	13064	948		TTG	TAA	19
<i>trnL1</i>	R	13066	13134	69	TAG			1
<i>rrnL</i>	R	13152	14516	1365				17
<i>trnV</i>	R	14510	14574	65	TAC			-7
<i>rrnS</i>	R	14573	15384	812				-2

**Table S5.** Organization of the mitochondrial genome of *I. subelongatus*.

Gene	Direction	Start position	Stop position	Length	Anticodon	Start codon	Stop codon	IGS
<i>trnQ</i>	R	1	71	71	TTG			
<i>trnM</i>	F	140	210	71	CAT			68
<i>ND2</i>	F	214	1221	1008		ATA	TAA	3
<i>trnW</i>	F	1223	1289	67	TCA			1
<i>trnC</i>	R	1296	1359	64	GCA			6
<i>trnY</i>	R	1373	1440	68	GTA			13
<i>COI</i>	F	1452	2999	1548		ATT	TAA	11
<i>trnL2</i>	F	3012	3079	68	TAA			12
<i>COII</i>	F	3080	3760	681		ATC	TAA	0
<i>trnK</i>	F	3804	3874	71	CTT			43
<i>trnD</i>	F	3880	3947	68	GTC			5
<i>ATP8</i>	F	3948	4121	174		ATT	TAG	0
<i>ATP6</i>	F	4115	4795	681		ATG	TAA	-7
<i>COIII</i>	F	4820	5602	783		ATG	TAA	24
<i>trnG</i>	F	5630	5700	71	TCC			27
<i>ND3</i>	F	5704	6054	351		ATC	TAA	3
<i>trnA</i>	F	6064	6128	65	TGC			9
<i>trnR</i>	F	6147	6215	69	TCG			18
<i>trnN</i>	F	6248	6314	67	GTT			32
<i>trnS1</i>	F	6315	6381	67	GCT			0
<i>trnE</i>	F	6384	6448	65	TTC			2
<i>trnF</i>	R	6456	6524	69	GAA			7
<i>ND5</i>	R	6534	8276	1743		ATT	TAA	9
<i>trnH</i>	R	8277	8348	72	GTG			0
<i>ND4</i>	R	8373	9710	1338		ATG	TAA	24
<i>ND4L</i>	R	9726	10019	294		ATA	TAA	15
<i>trnT</i>	F	10067	10133	67	TGT			47
<i>trnP</i>	R	10134	10199	66	TGG			0
<i>ND6</i>	F	10202	10711	510		ATT	TAA	2
<i>CytB</i>	F	10761	11897	1137		ATG	TAA	49
<i>trnS2</i>	F	11912	11981	70	TGA			14
<i>ND1</i>	R	12001	12948	948		TTG	TAA	19
<i>trnL1</i>	R	12950	13018	69	TAG			1
<i>rrnL</i>	R	13004	14367	1364				-15
<i>trnV</i>	R	14383	14448	66	TAC			15
<i>rrnS</i>	R	14447	15259	813				-2



**Table S6.** Organization of the mitochondrial genome of *I. shangrila*.

Gene	Direction	Start position	Stop position	Length	Anticodon	Start codon	Stop codon	IGS
<i>trnQ</i>	R	1	70	70	TTG			
<i>trnM</i>	F	101	170	70	CAT			30
<i>ND2</i>	F	171	1181	1011		ATT	TAA	0
<i>trnW</i>	F	1197	1265	69	TCA			15
<i>trnC</i>	R	1344	1410	67	GCA			78
<i>trnY</i>	R	1463	1528	66	GTA			52
<i>COI</i>	F	1595	3139	1545		TTA	TAA	66
<i>trnL2</i>	F	3150	3216	67	TAA			10
<i>COII</i>	F	3217	3897	681		ATC	TAA	0
<i>trnK</i>	F	3929	4000	72	CTT			31
<i>trnD</i>	F	4012	4080	69	GTC			11
<i>ATP8</i>	F	4081	4248	168		ATT	TAG	0
<i>ATP6</i>	F	4245	4922	678		ATA	TAA	-4
<i>COIII</i>	F	4933	5715	783		ATG	TAA	10
<i>trnG</i>	F	5740	5813	74	TCC			24
<i>ND3</i>	F	5817	6167	351		ATT	TAA	3
<i>trnA</i>	F	6173	6241	69	TGC			5
<i>trnR</i>	F	6303	6372	70	TCG			61
<i>trnN</i>	F	6413	6478	66	GTT			40
<i>trnS1</i>	F	6479	6548	70	GCT			0
<i>trnE</i>	F	6551	6618	68	TTC			2
<i>trnF</i>	R	6623	6687	65	GAA			4
<i>ND5</i>	R	6704	8440	1737		ATT	TAA	16
<i>trnH</i>	R	8441	8509	69	GTG			0
<i>ND4</i>	R	8543	9880	1338		ATG	TAA	33
<i>ND4L</i>	R	9899	10192	294		ATA	TAA	18
<i>trnT</i>	F	10253	10320	68	TGT			60
<i>trnP</i>	R	10321	10387	67	TGG			0
<i>ND6</i>	F	10402	10896	495		ATT	TAA	14
<i>CytB</i>	F	11062	12195	1134		ATG	TAA	165
<i>trnS2</i>	F	12288	12360	73	TGA			92
<i>ND1</i>	R	12382	13326	945		ATT	TAA	21
<i>trnL1</i>	R	13331	13397	67	TAG			4
<i>rrnL</i>	R	13383	14766	1384				-15
<i>trnV</i>	R	14760	14827	68	TAC			-7
<i>rrnS</i>	R	14825	15641	817				-3

**Table S7.** Organization of the mitochondrial genome of *I. duplicatus*.

Gene	Direction	Start position	Stop position	Length	Anticodon	Start codon	Stop codon	IGS
<i>trnQ</i>	R	1	69	69	TTG			
<i>trnM</i>	F	135	203	69	CAT			65
<i>ND2</i>	F	204	1214	1011		ATA	TAA	0
<i>trnW</i>	F	1240	1306	67	TCA			25
<i>trnC</i>	R	1324	1387	64	GCA			17
<i>trnY</i>	R	1477	1547	71	GTA			89
<i>COI</i>	F	1562	3106	1545		ATC	TAA	14
<i>trnL2</i>	F	3102	3169	68	TAA			-5
<i>COII</i>	F	3170	3850	681		ATT	TAA	0
<i>trnK</i>	F	3902	3972	71	CTT			51
<i>trnD</i>	F	4026	4094	69	GTC			53
<i>ATP8</i>	F	4095	4268	174		ATT	TAG	0
<i>ATP6</i>	F	4262	4942	681		ATG	TAA	-7
<i>COIII</i>	F	4952	5734	783		ATG	TAA	9
<i>trnG</i>	F	5816	5886	71	TCC			81
<i>ND3</i>	F	5887	6240	354		ATT	TAA	0
<i>trnA</i>	F	6251	6316	66	TGC			10
<i>trnR</i>	F	6331	6399	69	TCG			14
<i>trnN</i>	F	6434	6499	66	GTT			34
<i>trnS1</i>	F	6500	6567	68	GCT			0
<i>trnE</i>	F	6570	6635	66	TTC			2
<i>trnF</i>	R	6711	6779	69	GAA			75
<i>ND5</i>	R	6834	8541	1708		ATC	T-	54
<i>trnH</i>	R	8542	8611	70	GTG			0
<i>ND4</i>	R	8624	9961	1338		ATG	TAG	12
<i>ND4L</i>	R	9974	10267	294		ATA	TAG	12
<i>trnT</i>	F	10285	10351	67	TGT			17
<i>trnP</i>	R	10352	10418	67	TGG			0
<i>ND6</i>	F	10442	10927	486		ATC	TAA	23
<i>CytB</i>	F	10983	12122	1140		ATG	TAA	55
<i>trnS2</i>	F	12231	12299	69	TGA			108
<i>ND1</i>	R	12327	13268	942		ATT	TAA	27
<i>trnL1</i>	R	13273	13341	69	TAG			4
<i>rrnL</i>	R	13317	14717	1401				-25
<i>trnV</i>	R	14706	14772	67	TAC			-12
<i>rrnS</i>	R	14771	15572	802				-2

**Table S8.** Organization of the mitochondrial genome of *I. hauseri*.

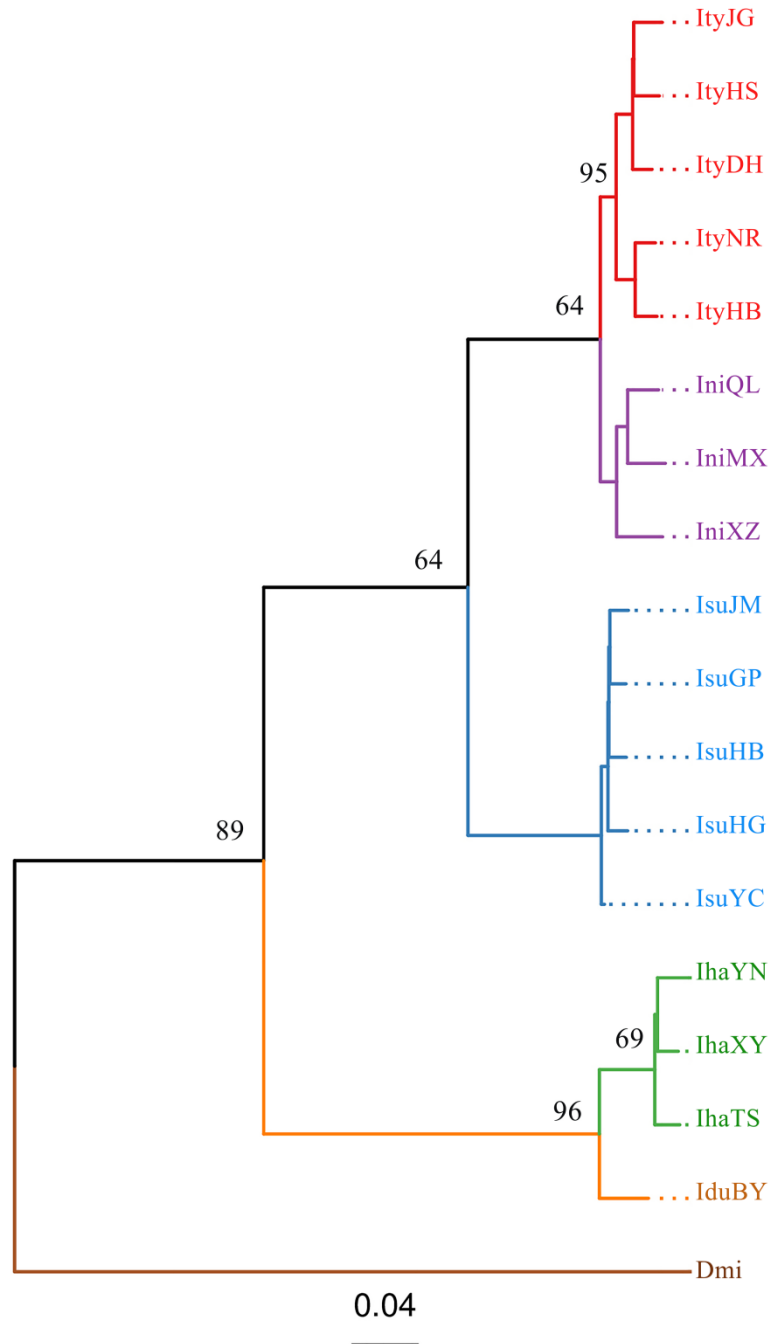
Gene	Direction	Start position	Stop position	Length	Anticodon	Start codon	Stop codon	IGS
<i>trnQ</i>	R	1	70	70	TTG			
<i>trnM</i>	F	123	193	71	CAT			52
<i>ND2</i>	F	194	1204	1011		ATA	TAA	0
<i>trnW</i>	F	1226	1292	67	TCA			21
<i>trnC</i>	R	1309	1373	65	GCA			16
<i>trnY</i>	R	1439	1506	68	GTA			65
<i>COI</i>	F	1470	3050	1581		ATT	TAA	-37
<i>trnL2</i>	F	3046	3113	68	TAA			-5
<i>COII</i>	F	3114	3794	681		ATT	TAA	0
<i>trnK</i>	F	3835	3905	71	CTT			40
<i>trnD</i>	F	3951	4019	69	GTC			45
<i>ATP8</i>	F	4020	4190	171		ATC	TAG	0
<i>ATP6</i>	F	4184	4864	681		ATG	TAA	-7
<i>COIII</i>	F	4876	5658	783		ATG	TAA	11
<i>trnG</i>	F	5714	5783	70	TCC			55
<i>ND3</i>	F	5784	6137	354		ATT	TAA	0
<i>trnA</i>	F	6150	6218	69	TGC			12
<i>trnR</i>	F	6317	6386	70	TCG			98
<i>trnN</i>	F	6418	6483	66	GTT			31
<i>trnS1</i>	F	6484	6551	6	GCT			0
<i>trnE</i>	F	6554	6621	68	TTC			2
<i>trnF</i>	R	6656	6723	68	GAA			34
<i>ND5</i>	R	6781	8488	1708		ATC	T-	57
<i>trnH</i>	R	8489	8557	69	GTG			0
<i>ND4</i>	R	8570	9907	1338		ATG	TAA	12
<i>ND4L</i>	R	9921	10214	294		ATA	TAG	13
<i>trnT</i>	F	10231	10297	67	TGT			16
<i>trnP</i>	R	10298	10365	68	TGG			0
<i>ND6</i>	F	10377	10874	498		ATT	TAA	11
<i>CytB</i>	F	10924	12063	1140		ATG	TAA	49
<i>trnS2</i>	F	12172	12240	69	TGA			108
<i>ND1</i>	R	12276	13212	937		TTG	T	35
<i>trnL1</i>	R	13214	13283	70	TAG			1
<i>rrnL</i>	R	13300	14660	1361				16
<i>trnV</i>	R	14654	14720	67	TAC			-7
<i>rrnS</i>	R	14719	15516	798				-2

**Table S9.** Organization of the mitochondrial genome of *I. nitidus*.

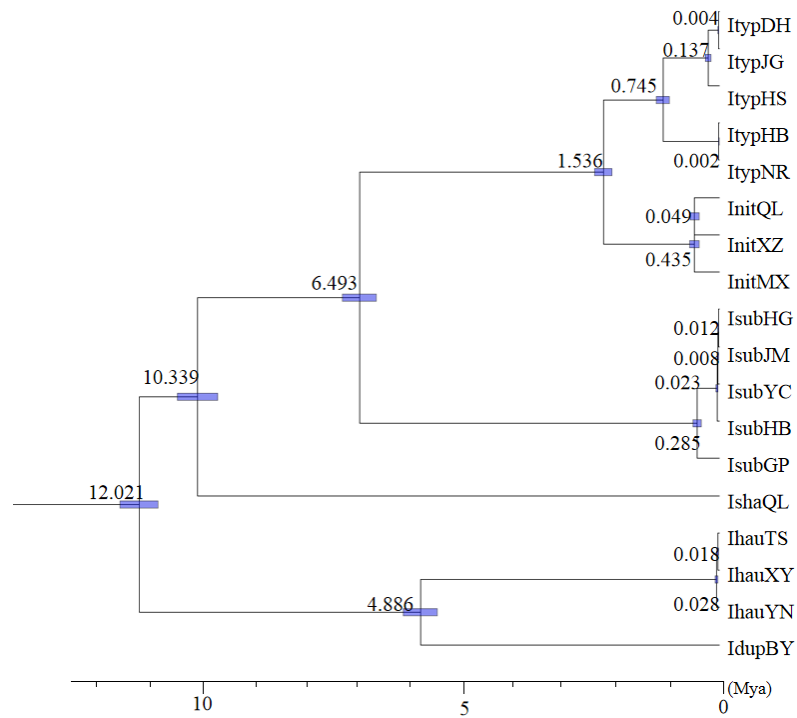
Gene	Direction	Start position	Stop position	Length	Anticodon	Start codon	Stop codon	IGS
<i>trnQ</i>	R	1	71	71	TTG			
<i>trnM</i>	F	87	159	73	CAT			15
<i>ND2</i>	F	163	1170	1008		ATA	TAA	3
<i>trnW</i>	F	1171	1238	68	TCA			0
<i>trnC</i>	R	1264	1333	70	GCA			25
<i>trnY</i>	R	1340	1406	67	GTA			6
<i>COI</i>	F	1444	3003	1560		ATC	TAA	37
<i>trnL2</i>	F	3023	3091	69	TAA			19
<i>COII</i>	F	3092	3772	681		ATC	TAA	0
<i>trnK</i>	F	3803	3874	72	CTT			30
<i>trnD</i>	F	3891	3958	68	GTC			16
<i>ATP8</i>	F	3959	4123	165		ATT	TAG	0
<i>ATP6</i>	F	4120	4797	678		ATA	TAA	-4
<i>COIII</i>	F	4803	5585	783		ATG	TAA	5
<i>trnG</i>	F	5611	5676	66	TCC			25
<i>ND3</i>	F	5677	6030	354		ATT	TAA	0
<i>trnA</i>	F	6042	6110	69	TGC			11
<i>trnR</i>	F	6132	6201	70	TCG			21
<i>trnN</i>	F	6234	6299	66	GTT			32
<i>trnS1</i>	F	6300	6367	68	GCT			0
<i>trnE</i>	F	6369	6440	72	TTC			1
<i>trnF</i>	R	6445	6516	72	GAA			4
<i>ND5</i>	R	6542	8287	1746		ATT	TAA	25
<i>trnH</i>	R	8288	8353	66	GTG			0
<i>ND4</i>	R	8393	9730	1338		ATG	TAA	39
<i>ND4L</i>	R	9737	10024	288		ATT	TAA	6
<i>trnT</i>	F	10051	10117	67	TGT			26
<i>trnP</i>	R	10118	10184	67	TGG			0
<i>ND6</i>	F	10196	10693	498		ATT	TAA	11
<i>CytB</i>	F	10784	11926	1143		ATA	TAA	90
<i>trnS2</i>	F	12049	12118	70	TGA			122
<i>ND1</i>	R	12138	13085	948		TTG	TAA	19
<i>trnL1</i>	R	13087	13155	69	TAG			1
<i>rrnL</i>	R	13173	14536	1364				17
<i>trnV</i>	R	14530	14594	65	TAC			-7
<i>rrnS</i>	R	14593	15409	817				-2

**Table S10.** Organization of the mitochondrial genome of *D. micans*.

Gene	Direction	Start position	Stop position	Length	Anticodon	Start codon	Stop codon	IGS
<i>trnQ</i>	R	1	70	70	TTG			
<i>trnM</i>	F	81	150	70	CAT			10
<i>ND2</i>	F	151	1150	1000		ATT	T	0
<i>trnW</i>	F	1172	1235	64	TCA			21
<i>trnC</i>	R	1235	1296	62	GCA			-1
<i>trnY</i>	R	1300	1362	63	GTA			3
<i>COI</i>	F	1355	2899	1545		ATT	TAA	-8
<i>trnL2</i>	F	2895	2959	65	TAA			-5
<i>COII</i>	F	2960	3643	684		ATT	TAA	0
<i>trnK</i>	F	3645	3715	71	CTT			1
<i>trnD</i>	F	3716	3779	64	GTC			0
<i>ATP8</i>	F	3780	3935	156		ATA	TAG	0
<i>ATP6</i>	F	3982	4600	619		ATA	TAA	46
<i>COIII</i>	F	4606	5388	783		ATG	TAA	5
<i>trnG</i>	F	5395	5458	64	TCC			6
<i>ND3</i>	F	5459	5812	354		ATT	TAG	0
<i>trnA</i>	F	5811	5871	61	TGC			-2
<i>trnR</i>	F	5870	5936	67	TCG			-2
<i>trnN</i>	F	5935	6000	66	GTT			-2
<i>trnS1</i>	F	6001	6065	65	GCT			0
<i>trnE</i>	F	6065	6127	63	TTC			-1
<i>trnF</i>	R	6126	6188	63	GAA			-2
<i>ND5</i>	R	6192	7896	1705		ATT	T	3
<i>trnH</i>	R	7897	7957	61	GTG			0
<i>ND4</i>	R	7941	9284	1344		ATA	TAA	-17
<i>ND4L</i>	R	9281	9577	297		ATG	TAA	-4
<i>trnT</i>	F	9581	9643	63	TGT			3
<i>trnP</i>	R	9644	9706	63	TGG			0
<i>ND6</i>	F	9709	10212	504		ATT	TAA	2
<i>CytB</i>	F	10215	11351	1137		ATA	TAA	2
<i>trnS2</i>	F	11354	11418	65	TGA			2
<i>ND1</i>	R	11436	12383	948		TTG	TAG	17
<i>trnL1</i>	R	12385	12446	62	TAG			1
<i>rrnL</i>	R	12409	13742	1334				-38
<i>trnV</i>	R	13741	13806	66	TAC			-2
<i>rrnS</i>	R	13804	14607	804				-3

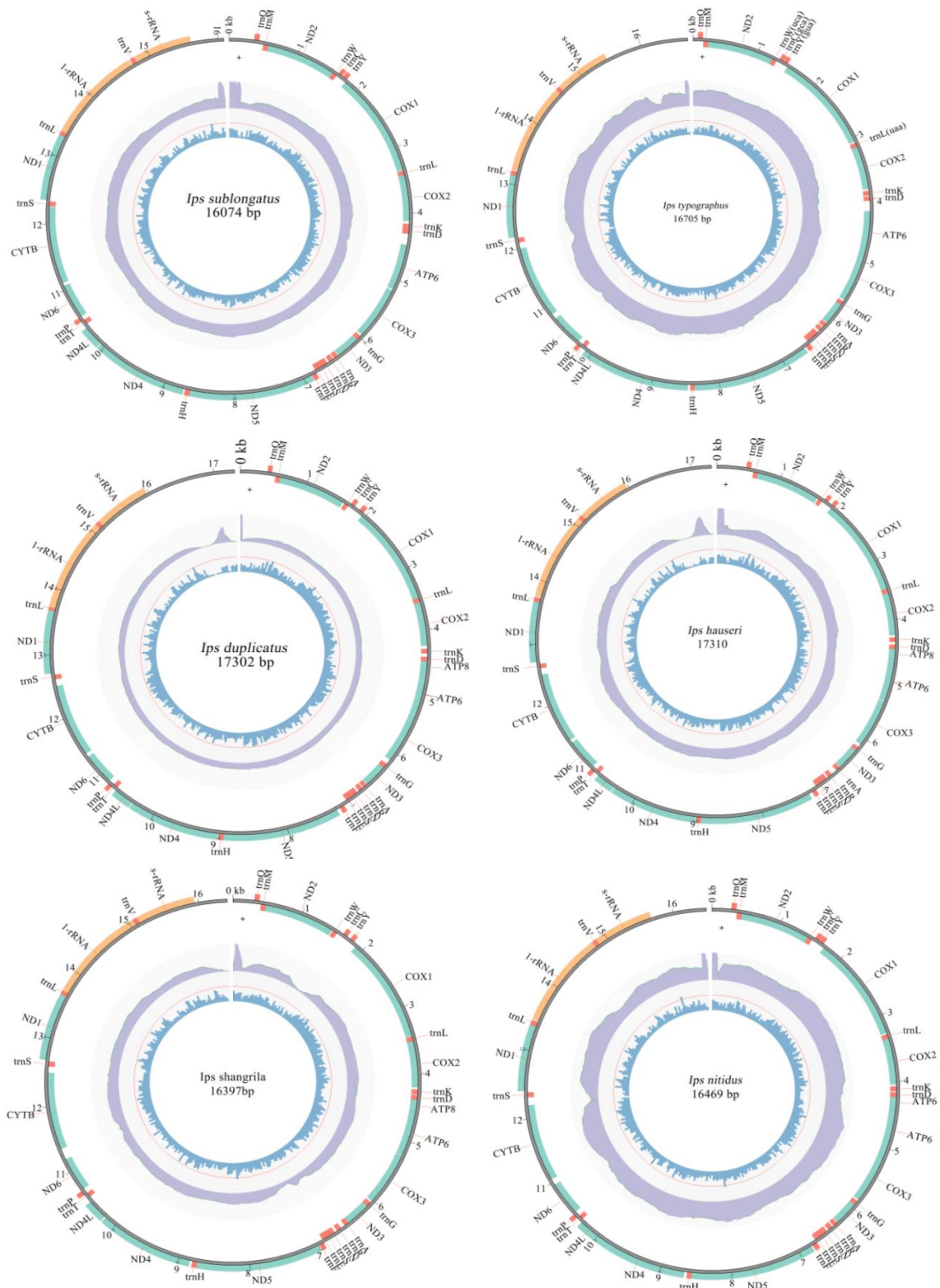


**Figure S1.** Phylogenetic tree (ML) of *Ips* geographic populations based on SNP. Numbers above or below branches indicate bootstrap values.



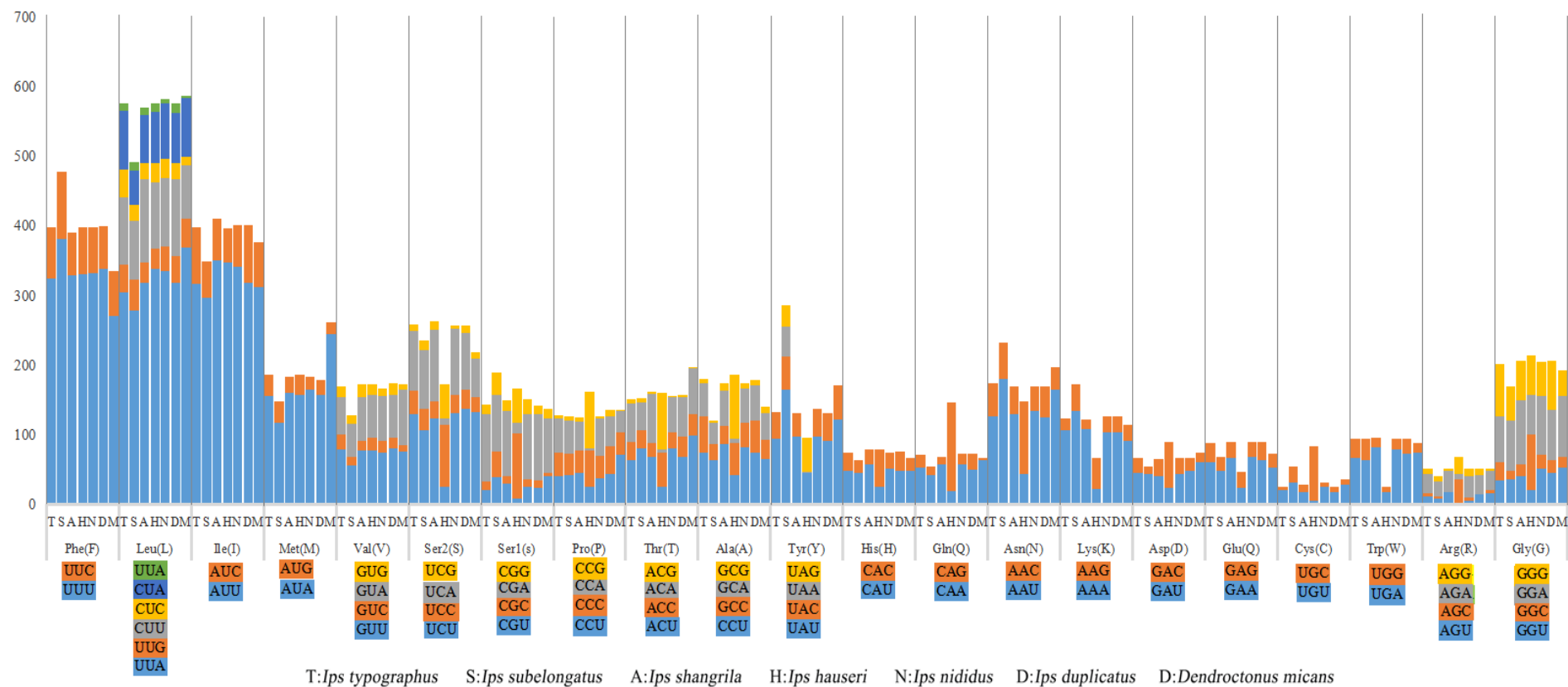
**Figure S2.** Tree of divergence times tree of the *Ips* species/populations.

Numbers above branches indicate the divergence time (in million years) of the branches. The middle solid line indicates the mean population size, and the gray area below and above the solid line indicates the 95% confidence interval.



**Figure S3.** Circular maps of six newly sequenced bark beetles. The genes that were transcribed clockwise are shown outside the circle, while genes that were transcribed counterclockwise are shown inside the circle.





**Figure S4.** Amino acid usage of protein-coding genes of the mitochondrial genome in the genus *Ips*.