

New data on taxonomy and systematics of the genus *Diamesa* Meigen (Diptera: Chironomidae: Diamesinae) from Tien Shan and Pamir Mountains, with description of two new species

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Tab. S1. PCR primers and length of aligned sequences for three mitochondrial (COI, COII, 16S rRNA) and two nuclear (18S rRNA, EF-1a) markers.

Locus	Forward primer	Reverse primer	Reference	Length of aligned sequences used in analyses (bp)
COI	COIF-ALT: ACAAATCAYAARGAYATYGG	COIR-ALT TTCAGGRTGNCCRAARAAYCA	Mikkelsen <i>et al.</i> , 2006	658
COII	Mtd13-mod: AATATGGCAGAATAGTGCAA	Mtd20-mod TGGTTAAGAGACCATTACTTG	Ekrem <i>et al.</i> , 2010	754
16S rRNA	LR-J-12887: CCGGTTTGAACCTCAGATCATGT	LR-N-13398 CACCTGTTTATCAAAAACAT	Simon <i>et al.</i> , 1994	510
18S rRNA	18S_Fw1_O: CTTGTCTCAAAGATTAAGCCAT	18S_Rw1_917 CGAGRTCCTATTCCATTATTCC	Own production	798
EF-1a	Efs_149_Cardio: AAGGAAGCACAAAGAAATGG	Efa_1043_Cardio: CCGTTTGAAATTTGTCCTGG	Ekrem <i>et al.</i> , 2010 with modifications	978

Tab. S2. The best models for the partitions used in Bayesian Inference.

Partition names	Best Model	Combined Length, bp	Reference
COI_pos3, COII_pos3	GTR+G	448	Tavaré, 1986
COI_pos1, COII_pos1	GTR+I	447	
EF-1a_pos3	GTR+G	300	
COI_pos2	F81+I	219	Felsenstein, 1981
COII_pos2,	F81	228	
EF-1a_pos1	F81	300	
EF-1a_pos2	F81+I	299	
16S_rRNA	HKY+I	511	Hasegawa <i>et al.</i> , 1985)
18S_rRNA	HKY+I	799	

Tab. S3. List of taxa, samples ID and GenBank accessions.

Taxa	Sample ID:	COI	COII	16S rRNA	18S rRNA	EF-1a
1. <i>Diamesa planistyla</i>	DIA-ADI1D10-3_183	MG913444	MG913460	MG913390	MG913417	MG913487
2. <i>D. planistyla</i>	DIA-ADI2E1-3_184	MG913445	MG913461	MG913391	MG913418	MG913488
3. <i>D. planistyla</i>	DIA-ADI3E2-3_185	MG913446	MG913462	MG913392	MG913419	MG913489
4. <i>D. planistyla</i>	DIA-ADI4E3-3_186	MG913447	MG913463	MG913393	MG913420	MG913490
5. <i>D. hamaticornis</i>	DIA-CHI1E5-3_188	KY640389	MG913464	MG913394	MG913421	MG913491
6. <i>D. hamaticornis</i>	DIA-CHI2E6-3_189	KY640387	MG913465	MG913395	MG913422	MG913492
7. <i>D. alibaevae</i>	DIA-CHI3E7-3_190	MG913448	MG913466	MG913396	MG913423	MG913493
8. <i>D. hamaticornis</i>	DIA-SUU1G2-3_205	KY640388	MG913467	MG913397	MG913424	MG913494
9. <i>D. cinerella</i>	DIA-DER1A1-4_220	KY640394	MG913468	MG913398	MG913425	MG913495
10. <i>D. cinerella</i>	DIA-DER2A2-4_221	KY640390	MG913469	MG913399	MG913426	MG913496
11. <i>D. cinerella</i>	DIA-DER3A3-4_222	KY640395	MG913470	MG913400	MG913427	MG913497
12. <i>D. cinerella</i>	DIA-DER4A4-4_223	KY640391	MG913471	MG913401	MG913428	MG913498
13. <i>D. alibaevae</i>	DIA-DER6A6-4_225	MG913449	MG913472	MG913402	MG913429	MG913499
14. <i>D. cinerella</i>	DIA-DAR1C2-4_241	KY640392	MG913473	MG913403	MG913430	MG913500
15. <i>D. cinerella</i>	DIA-DAR2C3-4_242	KY640393	MG913474	MG913404	MG913431	MG913501
16. <i>D. steinboecki</i>	DIA-MAI1C4-4_243	KY640397	MG913475	MG913405	MG913432	MG913502
17. <i>D. steinboecki</i>	DIA-MAI2C5-4_244	KY640398	MG913476	MG913406	MG913433	MG913503
18. <i>D. akhrorovi</i>	DIA-MAI1C6-4_245	MG913450	MG913477	MG913407	MG913434	MG913504
19. <i>D. alibaevae</i>	DIA-MAI2C7-4_246	MG913451	MG913478	MG913408	MG913435	MG913505
20. <i>D. akhrorovi</i>	DIA-MAI3C8-4_247	MG913452	MG913479	MG913409	MG913436	MG913506
21. <i>D. planistyla</i>	DIA-ALA1E2-4_261	MG913453	MG913480	MG913410	MG913437	MG913507
22. <i>D. planistyla</i>	DIA-ALA2E3-4_262	MG913454	MG913481	MG913411	MG913438	MG913508
23. <i>D. alibaevae</i>	DIA-ALA3E4-4_263	MG913455	MG913482	MG913412	MG913439	MG913509
24. <i>D. planistyla</i>	DIA-ADI1E6-4_265	MG913456	MG913483	MG913413	MG913440	MG913510
25. <i>D. alibaevae</i>	DIA-CHI1E7-4_266	MG913457	MG913484	MG913414	MG913441	MG913511
26. <i>D. alibaevae</i>	DIA-CHI2E7-4_267	MG913458	MG913485	MG913415	MG913442	MG913512
27. <i>D. alibaevae</i>	DIA-CHI3E9-4_268	MG913459	MG913486	MG913416	MG913443	MG913513

Tab. S4. Between Kimura 2 parameter nucleotides mean distances (under the diagonal) and standard error estimates (above the diagonal) of *Diamesa* obtained in this study (bold) and from GenBank.

<i>Diamesa</i> species	1	2	3	4	5	6	7	8	9	10
1. akhrorovi		0.011	0.011	0.011	0.014	0.012	0.014	0.012	0.014	0.013
2. alibaevae	0.102		0.010	0.010	0.012	0.011	0.011	0.012	0.011	0.011
3. <i>bertrami</i>	0.106	0.084		0.009	0.012	0.010	0.011	0.010	0.011	0.009
4. cinerella	0.100	0.072	0.091		0.011	0.005	0.012	0.013	0.010	0.006
5. <i>latitarsis</i>	0.119	0.087	0.098	0.087		0.011	0.014	0.013	0.011	0.011
6. hamaticornis	0.103	0.079	0.094	0.020	0.088		0.012	0.013	0.011	0.004
7. planistyla	0.115	0.078	0.087	0.097	0.106	0.098		0.014	0.013	0.012
8. <i>simplex</i>	0.108	0.100	0.088	0.101	0.118	0.106	0.116		0.012	0.012
9. <i>steinboeckii</i>	0.103	0.099	0.091	0.084	0.092	0.085	0.104	0.107		0.011
10. <i>tonsa</i>	0.105	0.083	0.093	0.027	0.092	0.013	0.098	0.106	0.089	

REFERENCES

- Felsenstein J, 1981. Evolutionary trees from DNA sequences: a maximum likelihood approach. *J. Mol. Evol.* 17:368-376.
- Ekrem T, Willassen E, Stur E, 2010. Phylogenetic utility of five genes for dipteran phylogeny: a test case in the Chironomidae leads to generic synonymies. *Mol. Phylogenet. Evol.* 57:561-571.
- Hasegawa M, Kishino H, Yano T, 1985. Dating of human-ape splitting by a molecular clock of mitochondrial DNA. *J. Mol. Evol.* 22:160-174.
- Mikkelsen PM, Bieler R, Kappner I, Rawlings TA, 2006. Phylogeny of Veneroidea (Mollusca: Bivalvia) based on morphology and molecules. *Zool. J. Linn. Soc. Lond.* 148:439-521.
- Simon C, Frati F, Beckenbach A, Crespi B, Liu H, Flook P, 1994. Evolution, weighting and phylogenetic utility of mitochondrial gene sequences and a compilation of conserved polymerase chain reaction primers. *Ann. Entomol. Soc. Am.* 87:651-701.
- Tavaré S, 1986. Some probabilistic and statistical problems in the analysis of DNA sequences. *Lectures on mathematics in the life sciences. Am. Math. Soc.* 17:57-86.