

## Wing geometric morphometrics and microsatellite analysis provide similar discrimination of honey bee subspecies

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### Electronic supplementary material

**Table 1.** Classification functions for discrimination between pure *A. m. mellifera*, pure *A. m. carnica* and hybrids. The landmarks used for the discrimination were numbered as in Gerula et al. (2009).

subspecies	1x	1y	2x	2y	3x	3y	4x	5y	6x	6y
pure <i>A. m. mellifera</i>	-143365.9	7176.1	-152144.4	-66638.6	-95535.6	-25670.1	-112478.8	-44227.0	-94001.7	57427.6
pure <i>A. m. carnica</i>	-142999.8	7640.9	-152327.5	-67154.6	-95208.3	-26016.5	-112199.0	-44499.1	-94185.2	58385.7
hybrids	-143201.5	7467.5	-152246.6	-67004.5	-95416.1	-25820.3	-112383.4	-44357.0	-94114.2	57825.3

Table 1. (continued)

subspecies	7x	8y	9x	9y	10x	10y	12x	12y	13x	13y
pure <i>A. m. mellifera</i>	-52655.3	767.7	-54549.6	99479.3	-61997.1	-26420.2	-20828.8	-62294.3	-39472.8	-63505.5
pure <i>A. m. carnica</i>	-52539.2	476.2	-54742.3	99702.6	-61880.7	-27007.6	-20350.2	-61798.9	-39868.6	-63630.9
hybrids	-52620.2	760.6	-54590.2	99479.3	-62006.1	-26645.6	-20576.7	-62093.6	-39636.3	-63508.5

Table 1. (continued)

subspecies	15x	16y	17y	18x	19x	constant
pure <i>A. m. mellifera</i>	34886.6	-36730.1	7199.2	122406.6	-200176.3	-146328.3
pure <i>A. m. carnica</i>	35044.4	-37295.6	7422.6	122516.6	-200007.7	-146178.2
hybrids	34916.7	-36869.8	7236.4	122426.3	-200172.7	-146303.2

**Table 2.** Mean values of aligned landmarks coordinates describing forewing. The landmarks were numbered as in Gerula et al. (2009).

subspecies	1x	1y	2x	2y	3x	3y	4x	4y	5x	5y
pure <i>A. m. mellifera</i>	-0.288138	-0.055095	-0.247724	-0.054449	-0.195368	0.060703	-0.183011	-0.013575	-0.163436	-0.133246
pure <i>A. m. carnica</i>	-0.284708	-0.055597	-0.252373	-0.057638	-0.183364	0.062992	-0.178185	-0.013723	-0.168178	-0.139036
hybrids	-0.286195	-0.055370	-0.249723	-0.056219	-0.190159	0.062038	-0.180933	-0.014013	-0.165009	-0.136436
all (reference)	-0.287141	-0.055238	-0.248885	-0.055366	-0.192355	0.061380	-0.181805	-0.013725	-0.164481	-0.134903

Table 2. (continued)

subspecies	6x	6y	7x	7y	8x	8y	9x	9y	10x	10y
pure <i>A. m. mellifera</i>	-0.071519	0.070673	0.006392	0.116259	-0.010284	0.089323	0.053307	0.041179	0.011207	0.013150
pure <i>A. m. carnica</i>	-0.071806	0.073746	0.004130	0.119303	-0.012549	0.091163	0.049782	0.041481	0.006603	0.010152
hybrids	-0.072178	0.072148	0.004772	0.117659	-0.010864	0.090701	0.052594	0.041341	0.008803	0.011330
all (reference)	-0.071751	0.071487	0.005633	0.117047	-0.010732	0.089959	0.052668	0.041264	0.009930	0.012241

Table 2. (continued)

subspecies	11x	11y	12x	12y	13x	13y	14x	14y	15x	15y
pure <i>A. m. mellifera</i>	0.070366	-0.036244	0.074175	-0.100703	0.101159	-0.146202	0.126171	0.103265	0.174366	0.059836
pure <i>A. m. carnica</i>	0.067825	-0.038568	0.075300	-0.101015	0.099621	-0.149650	0.125991	0.105890	0.174935	0.061106
hybrids	0.069929	-0.037859	0.075903	-0.100961	0.101904	-0.147457	0.125686	0.104312	0.174034	0.060684
all (reference)	0.069928	-0.037009	0.074830	-0.100818	0.101197	-0.146995	0.126004	0.103896	0.174335	0.060244

Table 2. (continued)

subspecies	16x	16y	17x	17y	18x	18y	19x	19y
pure <i>A. m. mellifera</i>	0.297293	0.000612	0.355199	-0.005041	0.366061	-0.047696	-0.476215	0.0372514
pure <i>A. m. carnica</i>	0.298738	0.000610	0.355035	-0.004261	0.367203	-0.046387	-0.473999	0.0394298
hybrids	0.297617	0.000627	0.354227	-0.005012	0.365755	-0.047137	-0.476163	0.0396246
all (reference)	0.297565	0.000617	0.354887	-0.004938	0.366107	-0.047370	-0.475932	0.0382269