

Supplementary document I. Genbank accession numbers of the 12s and cytochrome b used in molecular analysis (Codex of the samples between parenthesis).

Cytochrome b

Lacerta agilis garzoni

OR231725 (LA_CN9867), OR231726 (LA_CN9868), OR231727 (LA_CN9876), OR231728 (LA_CN9905), OR231729 (LA_CN9922), OR231730 (LA_CN9923), OR231731 (LA_CN9950), OR231732 (LA_CN9955), OR231733 (LA_CN9957), OR231734 (LA_CN9959), OR231735 (LA_CN9960), OR231736 (LA_CN9961), OR231737 (LA_CN9962), OR231738 (LA_CN9963), OR231739 (LA_CN9966), OR231740 (LA_CN9967), OR231741 (LA_CN9968), OR231742 (LA_CN9969), OR231743 (LA_CN9970), OR231744 (LA_CN9972), OR231745 (LA_CN9976), OR231746 (LA_CN9875), OR231747 (LA_CN9884), OR231748 (LA_CN9951), OR231749 (LA_CN9953), OR231750 (LA_CN9956), OR231751 (LA_CN9958), OR231752 (LA_CN9894), OR231753 (LA_CN9952), OR231754 (LA_CN9954), OR231755 (LA_CN9964), OR231756 (LA_CN9965), OR231757 (LA_CN9971), OR231758 (LA_CN9973), OR231759 (LA_CN10012), AY616419.

Lacerta agilis agilis

AF373032, AY616270, AY616277, SPM002424, SPM003211, AY616280, AY616284, AY616268, EU541211, AY616263, AY616278, AY616281, SPM003359, AY616242, AY616250, EU497990.

Lacerta agilis argus

AY616259, AY616244, EU497989, KC665504, AY616258, EU49786, KC665490, LN835020, KC665491, KC665510, AY616245, AY616260, KC665462, AY616253, DQ097090, EU497983, EU497988, KC665505, KC665507, EU497984, KC665506, CQ142118, LN835019, KC665489, AY616261.

Lacerta agilis Carpathians

AY616426, AY616427, KC665499, AY616433, AY616428, AY616430, AY616431, AY616429, KC665502.

Lacerta agilis chersoniensis

AY616307, AY616330, AY616309, AY616329, KJ940307, AY616319, AY616308, EU497985, KC665508, KC665495, AY616320, KC665494, AY616325, EU497987, KC665487, KC665488, KC665509, AY616310, AY616331, KC665511, AY616332, KC665513, MK165797, AY616311, KC665493, KC665512, AY616312, AY616313, AY616316, MK165798, AY616327, KC665492, KC665486, KC665468, KC665469.

Lacerta agilis boemica

AY616285, AY616286, AY616287, AY616288, AY616289, AY616290, AY616291, AY616241, KC665480.

Lacerta agilis bosnica

KC665479, KC616292, KC616293, KC665471, KC665472, KC665466, KC665473, KC665476, KC665481, KC665477, KC665478, KC940308, KC665467, KC665470, KC665474, KC665475.

Lacerta agilis exigua

AY616295, AY616300, AY616298, KC665483, KC665482, KC665484, AY616302, AY616303, AY616306, AY616340, AY616374, AY616376, AY616351, AY616368, AY616361, AY616386, AY616375, AY616381, AY616359, AY616353, AY616362, AY616350, AY616378, AY616384, AY616407, AY616390, AY616352, AY616370, AY616385, AY616387, AY616355, AY616377, AY616360, AY616367, AY616396, AY616397, AY616399, AY616402, MK165779, MK165795, MK165806, AY616363, AY616391, AY616393, AY616395, AY616341, AY616414, MK165818, MK165769, MK165765, MK165774, MK165803, MK165820, MK165787, MK165783, MK165794, MK165800, MK165812, MK165807, MK165804, AY616364, AY616371, MK165788, MK165772, AY616372, KC665464,

MK165766, KC665465, KC665497, AY616392, MK165801, MK165767, MK165809, MK165785, MK165814, MK165775, MK165811, AY616373, KC665496, EU497991, MK165808, AY616411, AY616400, Y616354, AY616388, AY616369, AY616389, AY616394, KC665503, KC665500, MK165802, MK165793, MK165792, MK165813.

Lacerta agilis tauridica

AY616423, MK165778, MK165761, MK165816, MK165819, MK165762, MK165764, MK165815, MK165817, MK165759, MK165889, MK165829, MK165760, MK165810, MK165831, MK165828, MK165768, MK165790, MK165799, MK165824, MK165784, MK165805, MK165780, AY616424, MK165781, KC665498, MK165777, MK165826, MK165791, MK165771, MK165776, MK165757, MK165825, MK165782, MK165830, AY616425, KC665501, MK165773, MK165786, MK165827, MK165763, MK165823, MK165758, MK165770.

Lacerta bilineata chloronota AM292992.

Lacerta bilineata chlorosecunda AM292991.

Lacerta bilineata fejervaryi AM292990.

Lacerta media ciliciensis KC896968.

Lacerta media israelica KC896975.

Lacerta media media KC897003.

Lacerta media wolterstorffi KC897004.

Lacerta pamphylica LN835022.

Lacerta schreiberi MN015139.

Lacerta strigata LN835024.

Lacerta trilineata cariensis KC897014.

Lacerta trilineata citrovittata KJ940384.

Lacerta trilineata dobrogica KJ940329.

Lacerta trilineata galatiensis KC897021.

Lacerta trilineata hansschweizeri KJ940383.

Lacerta trilineata major KJ940365. *Lacerta trilineata polylepida*

KJ940371. *Lacerta trilineata trilineata* KJ940332. *Lacerta viridis*

guentherpetersi LN834723. *Lacerta viridis meridionalis* LN834737.

Lacerta viridis viridis LN834753. *Timon kurdistanicus* JQ425837.

Timon lepidus MN015137. *Timon nevadensis* JX626250. *Timon*

pater AF378963. *Timon princeps* MN015170. *Timon tangitanus*

DQ902144. *Acanthodactylus erythrurus* MF684936. *Gallotia cae-*

saris MF684936. *Mesalina guttulata* MZ223696.

12sRNA

Lacerta agilis agilis AF149947. *Lacerta agilis exigua* DQ658818.

Lacerta agilis garzoni KX080601. *Lacerta bilineata bilinea-*

ta KX080604. *Lacerta bilineata chloronota* AF149956. *Lacerta*

bilineata chlorosecunda AF149957. *Lacerta media ciliciensis*

KC896854. *Lacerta media israelica* KC896863. *Lacerta media*

media KC896865. *Lacerta media wolterstorffi* KC896892. *Lac-*

erta pamphylica AF149954. *Lacerta schreiberi* KX08059. *Lacerta*

strigata DQ097094. *Lacerta trilineata cariensis* KC896902. *Lac-*

erta trilineata diplochondrodes KC896907. *Lacerta trilineata do-*

brogica AJ238177. *Lacerta trilineata galatiensis* KC896909. *Lac-*

erta trilineata hansschweizeri AF14995. *Lacerta trilineata major*

AF14994. *Lacerta trilineata polylepida* AF14994. *Lacerta tri-*

lineata trilineata AF14995. *Lacerta viridis meridionalis* AF14996.

Lacerta viridis viridis AF14996. *Timon kurdistanicus* JQ425796.

Timon lepidus GQ142071. *Timon nevadensis* AF206595. *Timon*

pater AF378947. *Timon princeps* JQ425804. *Timon tangitanus*

AF378945. *Acanthodactylus erythrurus* AF206607. *Gallotia caesa-*

ris AF439943. *Mesalina guttulata* KX296984.

Supplementary document II. Sources used to compile data on *Lacerta agilis* locations. GBIF, In the case of the database of the French Herpetological Society only locations with a precision less than 10km and for the iNaturalist database, less than 1km.

- ANTIPOV, S. A., I. V. DORONIN & K. D. MILTO, & M. A. SERGEEV (2018): New Records of Amphibians and Reptiles in the Vladimir Region, Russia. – *Current Studies in Herpetology, Saratov, Russia*, **18**: 168–179.
- Atlas de la Société Herpéologique de France.
- BÜLBUL, U., H. KOÇ, H. ÖZCAN, I. ÖZTURK & B. KUTRUO (2019): New locality record of *Lacerta agilis* (Squamata: Lacertidae) in Turkey. – *Turkish Journal of Biodiversity*, **2**: 52–56.
- BURIC, I. & D. JELIĆ (2011): Record of *Lacerta agilis bosnica* (Linnaeus, 1758) erythronotus coloration morph from Zelengora mountain, Bosnia and Herzegovina. – *Haly*, 2011: 23–24.
- CANDAN, K. (2021): Body size and age structure of *Lacerta agilis* Linnaeus, 1758 (Reptilia: Lacertidae) from two different populations in Turkey. – *Biological Diversity and Conservation*, **14**: 505–510.
- ČEIRĀNS, A. (2007): Distribution and habitats of the Sand Lizard (*Lacerta agilis*) in Latvia. – *Acta Universitatis Latviensis*, **723**: 53–59.
- CESAREC, R. & M. ZAD–RAVEC (2018): First record of the erythronotus color morph in *Lacerta agilis bosnica* Schreiber, 1912, from Croatia. – *Herpetozoa Wien*, **31**: 101–102.
- CHIRIKOVA, M. A. & N. N. BEREZOVNIKOV (2015): Materials on the distribution, biotopical and vertical placement of the sand lizard (*Lacerta agilis* Linnaeus, 1758) in its southeast habitat. – *Current Studies in Herpetology, Saratov, Russia*, **15**: 130–145.
- DINCA, P. C., A. STRUGARIU, D. L. STOICA & S. R. ZAMIRESCU (2014): A rapid survey of the herpetofauna of the Taia River Valley (Hunedoara County, Romania). – *Herpetologic Romanica*, **8**: 39–45.
- DORONIN, I. V., M. A. DORONINA & D. BEKOSHVILI (2019): New data on the distribution of lizards in Caucasus. – *Herpetozoa*, **32**: 87–90.
- DORONIN, I. V. & M. A. DORONINA (2020): Review of type specimens of lizards (Sauria: Lacertidae) described by Georgy Fedorovich Sukhov. – *Proceedings of the Zoological Institute of the Russian Academy of Sciences, St. Petersburg*, **324**: 506–524.
- DORONINA, M. A. (2021): Филогения, систематика и распространение ящериц рода *Lacerta*, Linnaeus, 1758 на Кавказе и сопредельных территориях. Institute of Zoology, Russian Academy of Sciences.
- GBIF.
- GISLÉN, T. & H. KAURI (1959): Zoogeography of the Swedish amphibians and reptiles with notes on their growth and ecology. – *Acta Vertebratica, Stockholm*, **1**: 191–391.
- GROZDANOV, A. P. & N. D. TZANKOV (2014): Analysis and comparison of sexual size dimorphism in two lacertid species in Bulgaria. – *Bulgarian Journal of Agricultural Science, Sofia*, **20** (Supplement 1): 139–142.
- GUARINO, F. M., F. CROVETTO, M. MEZZASALMA & S. SALVIDIO (2015): Population size, age structure and life expectancy in a *Lacerta agilis* (Squamata; Lacertidae) population from northwest Italian Alps. – *North–Western Journal of Zoology, Oradea, Romania*, **11**: 241–246.
- GVOŽDÍK, L. & M. BOUKYAL (1998): Sexual dimorphism and intersexual food niche overlap in the sand lizard *Lacerta agilis* (Squamata, Lacertidae). – *Folia Zoologica, Prague*, **47**: 189–195.
- GVOZDIK, L. (2000): Intrapopulation variation in injury frequencies in the sand lizard, *Lacerta agilis* (Squamata, Lacertidae). – *Biologia, Bratislava*, **55**: 557–561.
- IKOVIĆ, V., L. TOMOVIĆ & K. LJUBISAVLJEVIĆ (2016): Contribution to the knowledge of the batracho- and herpetofauna of the Bjelopavlici region (Montenegro). – *Bulletin of the Natural History Museum*, **9**: 113–125.
- iNaturalist
- KALYABINA, S. A., K. D. MILTO, N. B. ANANJEVA, L. LEGAL, U. JOGER & M. WINK (2001): Phylogeography and systematics of *Lacerta agilis* based on mitochondrial cytochrome B gene sequences first results. *Russian – Journal of Herpetology*, **8**: 149–158.
- KUKUSHKIN, O. V., A. G. TROFIMOV, I. S. TURBANOV & V. Y. SLODKEVICH (2019): Herpetofauna of Sevastopol city (southwestern Crimea): species composition, zoogeographic analysis, landscape–zonal distribution, current status and protection. – *Ecosystem Transformation, Cherepovets*, **2**: 4–134.
- KUKUSHKIN, O. V., O. A. ERMAKOV, A. IVANOV, YU. I. V. DORONIN, E. SVIRIDENKO, YU. E. P. SIMONOV, R. A. GORELOV, M. A. KHRAMOVA & I. G. BLOKHIN (2020): Cytochrome b mitochondrial gene analysis–based phylogeography of a sand lizard in the Crimea: ancient refugium at the peninsula, late expansion from the north, and first evidence of *Lacerta agilis tauridica* and *L. a. exigua* (Lacertidae: Sauria) hybridization. – *Proceedings of the Zoological Institute RAS*, **324**: 56–99.
- Félix Amat, field observations.
- LJUBISAVLJEVIĆ, K., M. ANĐELKOVIĆ, A. UROŠEVIĆ & E. S. ROITBERG (2022): Female reproductive characteristics of the Balkan sand lizard *Lacerta agilis bosnica* (Schreiber, 1912). – *Revue suisse de Zoologie*, **129**: 147–153.
- MARCHAND, M. A. (2009): Etude d'une population de Vipère péliade *Vipera berus bosniensis* Boettger, 1889 en Croatie. – *Université de Pau et des Pays de l'Adour*.
- NEKRASOVA, O. D., O. S. OSKYRKO & O. YU. MARUSHCHAK (2018): Color features of sand lizards, *Lacerta agilis* (Sauria, Lacertidae), in Kyiv region (Ukraine). – *Vestnik Zoologii*, **52**: 495–500.
- NETTMANN, H. K., R. DÜLGE, B. HIELEN, U. RAHMEL & C. SCHNAUDER (1992): Vertical distribution pattern of green lizard species (*Lacerta* s. str.) in the Pindos Mountain Chain in central Greece. In *Proceedings of the Sixth Ordinary Meeting of S.E.H. Budapest 1991*, pp 347–350.
- PESKOV, V., E. SVIRIDENKO, A. MALIUK & T. KOTENKO (2010): Sexual dimorphism and sex determination by meristic features of the sand lizard, *Lacerta agilis* Linnaeus, 1758 (Reptilia, Sauria, Lacertidae). – *Scientific Bulletin of the Uzhgorod University (Biology Series)*, **27**: 140–144.
- POPOVA, S., E. VACHEVA, D. ZLATANOVA & N. TZANKOV (2020): Age and sex–related differences determine microhabitat use in *Lacerta agilis bosnica* Schreiber, 1912 (Reptilia: Lacertidae) in Western Bulgaria. – *Acta Zoologica Bulgarica 2020*, 00: 1–9.
- RAMADANOVIC, D. & A. ZIMIC (2019): Record of a *Lacerta agilis* Linnaeus, 1758 with erythronotus colour morph and tail bifurcation. – *Herpetology Notes*, **12**: 779–781.
- SIDOROVSKAYA, V. (2010): Study on assessment and evaluation of amphibians & reptiles within the protected area national park Mavrovo. Technical Report.

- SMOLINSKY, R. (2016): A case of partial melanism in *Lacerta agilis* (Linnaeus, 1758) from the Czech Republic. – Herpetozoa, Wien, **29**: 110–112.
- STERIJOVSKI, B., TOMOVIC, L. & AJTIC, R. (2014): Contribution to the knowledge of the Reptile fauna and diversity in FYR of Macedonia. – North–Western Journal of Zoology, **10**: 83–106.
- VAN NULAND, G. J. & H. STRIJBOSCH (1981): Annual rhythmicity of *Lacerta vivipara* Jacquin and *Lacerta agilis agilis* L. (Sauria, Lacertidae) in the Netherlands. – Amphibia–Reptilia, **2**: 83–95.
- VertNet
- VILAJ, I. & P. DVORSKI (2014): First record of the erythronotus colouration in a female individual *Lacerta agilis* (Laurenti, 1768) in Croatia. – Hyla Herpetological bulletin, Zagreb 2014 (1): 25–26.

Supplementary document III. Best candidate Maxent models. The table shows RM (regularization multipliers), AUC, CBI (Continuous Boyce Index), and AICc (Akaike Index Criterion for finite samples) scores of the model built for each Sand lizard subspecies. FC, feature classes: L, linear; Q, quadratic; H, hinge; P, product; T, threshold.

Subspecies	RM	FC	CBI	AUC	AICc
<i>L. agilis</i>	0.5	LQHPT	1.000	0.865	63743
<i>L. agilis agilis</i>	1	LQHPT	0.988	0.977	12334
<i>L. agilis argus</i>	0.5	LQHP	0.997	0.980	13351
<i>L. agilis boemica</i>	0.5	LQ	0.781	0.989	586
<i>L. agilis bosnica</i>	0.5	LQ	0.571	0.989	781
<i>L. agilis</i> ‘carpathians’	1.5	LQ	0.789	0.994	370
<i>L. agilis chersonensis</i>	1	LQHPT	0.981	0.980	4151
<i>L. agilis exigua</i>	0.5	LQHPT	0.998	0.916	25329
<i>L. agilis garzoni</i>	2	LQ	0.579	0.999	106
<i>L. agilis tauridica</i>	0.5	LQ	0.925	0.999	292