

Article

Update on Distribution and Conservation Status of Amphibians in the Democratic People's Republic of Korea: Conclusions Based on Field Surveys, Environmental Modelling, Molecular Analyses and Call Properties

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Citation: Borzée, A.; Litvinchuk, S.N.; Ri, K.; Andersen, D.; Nam, T.Y.; Jon, G.H.; Man, H.S.; Choe, J.S.; Kwon, S.; Othman, S.N.; et al. Update on Distribution and Conservation Status of Amphibians in the Democratic People's Republic of Korea: Conclusions Based on Field Surveys, Environmental Modelling, Molecular Analyses and Call Properties. *Animals* **2021**, *11*, 2057. <https://doi.org/10.3390/ani11072057>

Academic Editor: Jesse Grismer and Andreas Maletzky

Received: 26 April 2021

Accepted: 1 July 2021

Published: 9 July 2021

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1. Supplementary files

1.1. Supplementary tables

1.1.1. Supplementary Table S1

Dataset containing GPS coordinates. Dataset for all associated with species for all the datapoints used in the models in this study. This table contains 24193 datapoints.

1.1.2. Supplementary Table S2

GPS coordinates for all geolocalised amphibian presence in DPR Korea. Dataset provided in this study and extracted from the literature. Please see methods for species specific references.

[illegible]

<i>Pelophylax nigromaculatus</i>	42.441898	129.744003	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.441898	129.744003	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.441898	129.744003	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.441898	129.744003	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana dybowskii</i>	42.419899	129.699997	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana dybowskii</i>	42.345001	130.371994	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana uenoi-dybowskii</i>	42.419899	129.699997	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana uenoi-dybowskii</i>	42.345001	130.371994	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bombina orientalis</i>	42.3251	130.453003	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bombina orientalis</i>	42.2812	129.225006	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bombina orientalis</i>	42.222599	129.214996	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bombina orientalis</i>	42.286598	130.304993	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bombina orientalis</i>	42.325298	130.451004	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bombina orientalis</i>	42.3256	130.451004	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bombina orientalis</i>	42.240501	130.358993	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bombina orientalis</i>	42.222599	129.214996	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bufo gargarizans</i>	42.273701	130.294998	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bufo gargarizans</i>	42.2742	130.296005	<i>Onychodactylus</i>	39.147499	127.445999
<i>Dryophytes japonicus</i>	42.304199	130.389999	<i>Onychodactylus</i>	39.147499	127.445999
<i>Dryophytes japonicus</i>	42.2659	129.223007	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.304001	130.389999	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.2328	129.225006	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.331799	130.576996	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.287102	130.242996	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.325901	130.584	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.312302	130.227997	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.292	130.207993	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.237202	130.248993	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.253502	130.225006	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.330101	130.218002	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.244999	130.281006	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.330799	130.375	<i>Onychodactylus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	42.289799	130.257004	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana dybowskii</i>	42.286499	130.307007	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana dybowskii</i>	42.2757	129.227005	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana dybowskii</i>	42.277199	130.298004	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana dybowskii</i>	42.282299	130.315002	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana dybowskii</i>	42.280102	130.300995	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana uenoi-dybowskii</i>	42.286499	130.307007	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana uenoi-dybowskii</i>	42.2757	129.227005	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana uenoi-dybowskii</i>	42.277199	130.298004	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana uenoi-dybowskii</i>	42.282299	130.315002	<i>Onychodactylus</i>	39.147499	127.445999

[illegible]

Glandirana rugosa	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Glandirana rugosa	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Onychodactylus	41.749401	128.350006	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.786301	129.791	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.785301	129.768997	Onychodactylus	39.147499	127.445999
Rana dybowskii	41.788399	129.785004	Onychodactylus	39.147499	127.445999
Rana dybowskii	41.803101	128.320007	Onychodactylus	39.147499	127.445999
Rana uenoi-dybowskii	41.788399	129.785004	Onychodactylus	39.147499	127.445999
Rana uenoi-dybowskii	41.803101	128.320007	Onychodactylus	39.147499	127.445999
Salamandrella tridactyla	41.766899	129.106003	Onychodactylus	39.147499	127.445999
Dryophytes japonicus	41.548726	128.486679	Onychodactylus	39.147499	127.445999
Rana dybowskii	41.558201	128.384995	Onychodactylus	39.147499	127.445999
Rana uenoi-dybowskii	41.558201	128.384995	Onychodactylus	39.147499	127.445999
Salamandrella tridactyla	41.62439	128.851861	Onychodactylus	39.147499	127.445999
Bombina orientalis	41.408901	129.654007	Onychodactylus	39.147499	127.445999
Pelophylax nigromaculatus	41.4161	129.699997	Onychodactylus	39.147499	127.445999
Bombina orientalis	41.387402	128.173996	Onychodactylus	39.147499	127.445999
Bufo gargarizans	41.3862	129.630005	Onychodactylus	39.147499	127.445999

[illegible]

<i>Kaloula borealis</i>	40.722	129.234	<i>Onychodactylus</i>	39.147499	127.445999
<i>Dryophytes japonicus</i>	40.454148	127.033393	<i>Onychodactylus</i>	39.147499	127.445999
<i>Hynobius leechii</i>	40.378399	125.119003	<i>Onychodactylus</i>	39.147499	127.445999
<i>Onychodactylus</i>	40.447701	127.570999	<i>Onychodactylus</i>	39.147499	127.445999
<i>Onychodactylus</i>	40.446999	127.341003	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana dybowskii</i>	40.415199	127.262001	<i>Onychodactylus</i>	39.147499	127.445999
<i>Rana uenoi-dybowskii</i>	40.415199	127.262001	<i>Onychodactylus</i>	39.147499	127.445999
<i>Bombina orientalis</i>	40.309101	125.969002	<i>Onychodactylus</i>	39.147499	127.445999
<i>Hynobius leechii</i>	40.231201	125.495003	<i>Onychodactylus</i>	39.147499	127.445999
<i>Strauchbufo raddei</i>	40.22	124.568	<i>Onychodactylus</i>	39.147499	127.445999
<i>Strauchbufo raddei</i>	40.2687	124.810997	<i>Onychodactylus</i>	39.147499	127.445999
<i>Dryophytes japonicus</i>	40.176794	127.931244	<i>Pelophylax chosenicus</i>	39.196112	125.604961
<i>Dryophytes japonicus</i>	40.176794	127.931244	<i>Pelophylax chosenicus</i>	39.204263	125.595751
<i>Dryophytes japonicus</i>	40.176794	127.931244	<i>Pelophylax chosenicus</i>	39.152199	125.762001
<i>Dryophytes japonicus</i>	40.176794	127.931244	<i>Pelophylax nigromaculatus</i>	39.197044	125.60599
<i>Dryophytes japonicus</i>	40.176794	127.931244	<i>Pelophylax nigromaculatus</i>	39.203341	125.596781
<i>Dryophytes japonicus</i>	40.176794	127.931244	<i>Pelophylax nigromaculatus</i>	39.215199	126.864998
<i>Kaloula borealis</i>	40.079601	124.899002	<i>Pelophylax nigromaculatus</i>	39.254501	125.918999
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Pelophylax nigromaculatus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Pelophylax nigromaculatus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Pelophylax nigromaculatus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Pelophylax nigromaculatus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Pelophylax nigromaculatus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Pelophylax nigromaculatus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Pelophylax nigromaculatus</i>	39.147499	127.445999
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Rana coreana</i>	39.245471	125.685587
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Rana coreana</i>	39.195599	125.606003
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Rana coreana</i>	39.186501	125.521004
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Rana dybowskii</i>	39.203899	125.842003
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Rana uenoi-dybowskii</i>	39.203899	125.842003
<i>Pelophylax nigromaculatus</i>	40.1768	127.931	<i>Rana uenoi-dybowskii</i>	39.1475	127.445833
<i>Strauchbufo raddei</i>	40.072	124.383	<i>Bufo gargarizans</i>	39.007999	125.736999
<i>Strauchbufo raddei</i>	40.144299	124.449997	<i>Bufo gargarizans</i>	39.078899	127.459
<i>Strauchbufo raddei</i>	40.131802	124.685997	<i>Bufo gargarizans</i>	39.004902	125.736999
<i>Rana amurensis</i>	40.1768	127.931	<i>Dryophytes japonicus</i>	39.020661	125.717334
<i>Rana amurensis</i>	40.1768	127.931	<i>Dryophytes japonicus</i>	39.079601	127.447998
<i>Rana amurensis</i>	40.1768	127.931	<i>Dryophytes japonicus</i>	39.004501	125.734001
<i>Rana amurensis</i>	40.1768	127.931	<i>Dryophytes japonicus</i>	39.078899	125.850998
<i>Rana amurensis</i>	40.1768	127.931	<i>Dryophytes japonicus</i>	39.07485	127.416658
<i>Rana amurensis</i>	40.1768	127.931	<i>Dryophytes suweonensis</i>	39.125534	125.726775
<i>Rana amurensis</i>	40.1768	127.931	<i>Glandirana rugosa</i>	39.098301	127.514
<i>Rana amurensis</i>	40.1768	127.931	<i>Hynobius leechii</i>	39.0896	127.449997

<i>Rana amurensis</i>	40.1768	127.931	<i>Hynobius leechii</i>	39.0644	127.632004
<i>Rana amurensis</i>	40.1768	127.931	<i>Hynobius leechii</i>	39.079601	127.134003
<i>Rana amurensis</i>	40.1768	127.931	<i>Hynobius leechii</i>	39.1077	126.124
<i>Rana amurensis</i>	40.1768	127.931	<i>Hynobius leechii</i>	39.0742	126.788002
<i>Rana amurensis</i>	40.1768	127.931	<i>Hynobius leechii</i>	39.104099	125.834
<i>Rana amurensis</i>	40.1768	127.931	<i>Kaloula borealis</i>	39.003799	125.716003
<i>Rana coreana</i>	40.1768	127.931	<i>Onychodactylus</i>	39.089802	127.452004
<i>Rana dybowskii</i>	40.188099	126.433998	<i>Pelophylax chosonicus</i>	39.0741	125.513001
<i>Rana dybowskii</i>	40.073502	127.426002	<i>Pelophylax nigromaculatus</i>	39.020708	125.717619
<i>Rana uenoi-dybowskii</i>	40.188099	126.433998	<i>Pelophylax nigromaculatus</i>	39.0877	127.456001
<i>Rana uenoi-dybowskii</i>	40.073502	127.426002	<i>Rana dybowskii</i>	39.0746	127.459
<i>Bombina orientalis</i>	40.0186	126.333	<i>Rana uenoi</i>	39.044201	125.732002
<i>Bombina orientalis</i>	40.062801	125.485001	<i>Rana uenoi-dybowskii</i>	39.0746	127.459
<i>Bombina orientalis</i>	40.054901	127.421997	<i>Rana uenoi-dybowskii</i>	39.044201	125.732002
<i>Bufo gargarizans</i>	40.031601	126.170998	<i>Bufo gargarizans</i>	38.985199	125.767998
<i>Glandirana rugosa</i>	40.0467	125.073998	<i>Bufo gargarizans</i>	38.9468	126.431999
<i>Glandirana rugosa</i>	39.9953	126.124	<i>Dryophytes japonicus</i>	38.905721	125.565476
<i>Glandirana rugosa</i>	40.014801	127.464996	<i>Dryophytes japonicus</i>	38.995261	125.540474
<i>Hynobius leechii</i>	40.048901	125.238998	<i>Dryophytes suweonensis</i>	39.001301	125.718002
<i>Pelophylax nigromaculatus</i>	40.021198	127.418999	<i>Hynobius leechii</i>	38.886902	127.647003
<i>Pelophylax nigromaculatus</i>	40.057201	126.182999	<i>Pelophylax nigromaculatus</i>	38.908298	125.467003
<i>Pelophylax nigromaculatus</i>	39.968201	124.333	<i>Pelophylax nigromaculatus</i>	39.0023	125.724998
<i>Rana dybowskii</i>	40.044498	124.874	<i>Rana coreana</i>	38.921171	125.553358
<i>Rana dybowskii</i>	39.978901	126.153999	<i>Rana coreana</i>	38.998402	125.824997
<i>Rana dybowskii</i>	40.0186	126.333	<i>Dryophytes japonicus</i>	38.866251	125.401032
<i>Rana uenoi-dybowskii</i>	40.044498	124.874	<i>Dryophytes japonicus</i>	38.852217	125.412945
<i>Rana uenoi-dybowskii</i>	39.978901	126.153999	<i>Dryophytes japonicus</i>	38.850886	125.309697
<i>Rana uenoi-dybowskii</i>	40.0186	126.333	<i>Dryophytes japonicus</i>	38.827432	125.874754
<i>Bombina orientalis</i>	39.8643	126.072998	<i>Dryophytes japonicus</i>	38.807193	125.636677
<i>Bufo gargarizans</i>	39.878502	127.360001	<i>Hynobius leechii</i>	38.787102	127.641998
<i>Bufo gargarizans</i>	39.930698	124.745003	<i>Hynobius leechii</i>	38.776402	127.029999
<i>Bufo gargarizans</i>	39.9095	124.882004	<i>Kaloula borealis</i>	38.855999	126.133003
<i>Dryophytes japonicus</i>	39.842701	127.556	<i>Pelophylax chosonicus</i>	38.865101	125.278818
<i>Kaloula borealis</i>	39.8549	127.417	<i>Pelophylax chosonicus</i>	38.866808	125.274351
<i>Pelophylax chosonicus</i>	39.901	124.452	<i>Pelophylax chosonicus</i>	38.863121	125.240562
<i>Pelophylax nigromaculatus</i>	39.8717	127.542999	<i>Pelophylax chosonicus</i>	38.8367	125.221001
<i>Pelophylax nigromaculatus</i>	39.8106	125.932999	<i>Pelophylax nigromaculatus</i>	38.850873	125.309738
<i>Pelophylax nigromaculatus</i>	39.882099	124.264999	<i>Pelophylax nigromaculatus</i>	38.864153	125.240826
<i>Pelophylax nigromaculatus</i>	39.842098	124.255997	<i>Pelophylax nigromaculatus</i>	38.797401	125.276001
<i>Strauchbufo raddei</i>	39.830399	124.478996	<i>Bombina orientalis</i>	38.6567	128.104996
<i>Strauchbufo raddei</i>	39.853901	124.468002	<i>Bombina orientalis</i>	38.6222	128.115997
<i>Rana amurensis</i>	39.8312	127.615997	<i>Bombina orientalis</i>	38.612	126.035004

<i>Rana amurensis</i>	39.8312	127.615997	<i>Bombina orientalis</i>	38.616901	126.581001
<i>Rana amurensis</i>	39.8312	127.615997	<i>Bufo gargarizans</i>	38.6441	125.424004
<i>Rana coreana</i>	39.858898	127.538002	<i>Bufo gargarizans</i>	38.613098	125.942001
<i>Rana coreana</i>	39.831799	127.611999	<i>Bufo stejnegeri</i>	38.633301	128.104996
<i>Dryophytes japonicus</i>	39.782865	125.069206	<i>Dryophytes japonicus</i>	38.660099	127.988998
<i>Glandirana rugosa</i>	39.7248	125.869003	<i>Dryophytes japonicus</i>	38.685101	128.304993
<i>Hynobius leechii</i>	39.7738	124.907997	<i>Dryophytes japonicus</i>	38.653801	126.577004
<i>Pelophylax chosenicus</i>	39.743	124.861	<i>Dryophytes japonicus</i>	38.6642	126.042
<i>Pelophylax chosenicus</i>	39.7094	124.922996	<i>Glandirana emeljanovi</i>	38.659801	127.989998
<i>Pelophylax nigromaculatus</i>	39.689899	127.345001	<i>Glandirana emeljanovi</i>	38.685101	128.304993
<i>Strauchbufo raddei</i>	39.694199	125.820999	<i>Glandirana rugosa</i>	38.652199	126.608002
<i>Strauchbufo raddei</i>	39.686401	124.969002	<i>Glandirana rugosa</i>	38.619999	126.168999
<i>Bombina orientalis</i>	39.5448	125.475998	<i>Hynobius leechii</i>	38.616199	128.108993
<i>Bufo gargarizans</i>	39.607101	127.490997	<i>Hynobius leechii</i>	38.645901	128.119995
<i>Bufo gargarizans</i>	39.583599	125.389	<i>Hynobius leechii</i>	38.614201	127.369003
<i>Bufo gargarizans</i>	39.540501	125.622002	<i>Hynobius leechii</i>	38.723	126.181
<i>Dryophytes japonicus</i>	39.542099	125.431999	<i>Kaloula borealis</i>	38.609001	125.401001
<i>Dryophytes japonicus</i>	39.608145	125.558697	<i>Onychodactylus</i>	38.636398	127.376999
<i>Dryophytes suweonensis</i>	39.539902	125.457001	<i>Onychodactylus</i>	38.6287	128.110992
<i>Glandirana rugosa</i>	39.6544	127.483002	<i>Onychodactylus</i>	38.638	128.117004
<i>Hynobius leechii</i>	39.567299	125.834999	<i>Pelophylax nigromaculatus</i>	38.657101	127.988998
<i>Hynobius leechii</i>	39.669498	125.403999	<i>Pelophylax nigromaculatus</i>	38.685101	128.304993
<i>Pelophylax chosenicus</i>	39.546902	125.457001	<i>Pelophylax nigromaculatus</i>	38.637001	126.060997
<i>Pelophylax chosenicus</i>	39.5452	125.449997	<i>Rana uenoi</i>	38.6926	126.054001
<i>Pelophylax nigromaculatus</i>	39.6297	127.497002	<i>Rana uenoi</i>	38.694698	126.637001
<i>Pelophylax nigromaculatus</i>	39.645302	125.297996	<i>Rana uenoi</i>	38.627998	128.108993
<i>Rana coreana</i>	39.594501	125.856003	<i>Rana uenoi</i>	38.687401	128.197006
<i>Rana dybowskii</i>	39.6273	127.462997	<i>Rana uenoi</i>	38.685101	128.304993
<i>Rana uenoi-dybowskii</i>	39.6273	127.462997	<i>Rana uenoi-dybowskii</i>	38.6926	126.054001
<i>Dryophytes japonicus</i>	39.48281	125.479278	<i>Rana uenoi-dybowskii</i>	38.694698	126.637001
<i>Dryophytes japonicus</i>	39.471472	125.376714	<i>Rana uenoi-dybowskii</i>	38.627998	128.108993
<i>Dryophytes japonicus</i>	39.51183	125.609088	<i>Rana uenoi-dybowskii</i>	38.687401	128.197006
<i>Dryophytes japonicus</i>	39.493227	125.56594	<i>Rana uenoi-dybowskii</i>	38.685101	128.304993
<i>Dryophytes japonicus</i>	39.528801	127.226997	<i>Bombina orientalis</i>	38.495701	125.221001
<i>Dryophytes suweonensis</i>	39.471183	125.376548	<i>Glandirana rugosa</i>	38.512501	125.751
<i>Dryophytes suweonensis</i>	39.500306	125.402548	<i>Hynobius leechii</i>	38.506802	127.833
<i>Dryophytes suweonensis</i>	39.487254	125.387098	<i>Hynobius leechii</i>	38.488899	126.872002
<i>Dryophytes suweonensis</i>	39.492161	125.432633	<i>Hynobius leechii</i>	38.5541	125.889999
<i>Dryophytes suweonensis</i>	39.485831	125.47828	<i>Kaloula borealis</i>	38.562901	126.108002
<i>Dryophytes suweonensis</i>	39.486587	125.525196	<i>Pelophylax nigromaculatus</i>	38.568001	127.674004
<i>Dryophytes suweonensis</i>	39.492596	125.566042	<i>Rana coreana</i>	38.486599	125.224998
<i>Dryophytes suweonensis</i>	39.532902	125.466003	<i>Rana uenoi</i>	38.494598	125.213997

<i>Dryophytes suweonensis</i>	39.450901	125.481003	<i>Rana uenoi</i>	38.549999	127.658997
<i>Hynobius leechii</i>	39.417099	126.360001	<i>Rana uenoi-dybowskii</i>	38.494598	125.213997
<i>Hynobius leechii</i>	39.449699	126.152	<i>Rana uenoi-dybowskii</i>	38.549999	127.658997
<i>Onychodactylus</i>	39.411499	126.027	<i>Glandirana emeljanovi</i>	38.452702	126.176002
<i>Pelophylax chosenicus</i>	39.492637	125.432289	<i>Hynobius leechii</i>	38.4575	127.225998
<i>Pelophylax chosenicus</i>	39.471472	125.376714	<i>Hynobius leechii</i>	38.369999	127.110001
<i>Pelophylax chosenicus</i>	39.493005	125.563685	<i>Hynobius leechii</i>	38.343601	126.584999
<i>Pelophylax chosenicus</i>	39.502701	125.513001	<i>Hynobius leechii</i>	38.434299	125.271004
<i>Pelophylax chosenicus</i>	39.452202	125.528	<i>Hynobius leechii</i>	38.378502	126.093002
<i>Pelophylax nigromaculatus</i>	39.486585	125.52582	<i>Kaloula borealis</i>	38.3605	125.794998
<i>Pelophylax nigromaculatus</i>	39.471992	125.377844	<i>Pelophylax chosenicus</i>	38.4454	125.614998
<i>Pelophylax nigromaculatus</i>	39.493045	125.564729	<i>Rana coreana</i>	38.440203	125.845677
<i>Pelophylax nigromaculatus</i>	39.480527	125.47816	<i>Rana coreana</i>	38.409	125.172
<i>Pelophylax nigromaculatus</i>	39.511915	125.608786	<i>Rana coreana</i>	38.387	125.107
<i>Pelophylax nigromaculatus</i>	39.534302	125.442001	<i>Rana coreana</i>	38.434	125.322
<i>Pelophylax nigromaculatus</i>	39.528801	127.226997	<i>Rana coreana</i>	38.4076	125.68
<i>Pelophylax nigromaculatus</i>	39.530602	127.236999	<i>Bombina orientalis</i>	38.3214	127.514
<i>Bufo gargarizans</i>	39.2747	125.999	<i>Bufo gargarizans</i>	38.241199	126.753998
<i>Hynobius leechii</i>	39.304699	127.167	<i>Dryophytes japonicus</i>	38.2528	126.611999
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Glandirana emeljanovi</i>	38.3186	127.514
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Glandirana rugosa</i>	38.242802	126.792
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Hynobius leechii</i>	38.2798	126.906998
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Hynobius leechii</i>	38.226501	126.658997
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Hynobius leechii</i>	38.334202	126.453003
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Hynobius leechii</i>	38.213501	125.575996
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Hynobius leechii</i>	38.310398	125.396004
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Kaloula borealis</i>	38.2262	126.917999
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Kaloula borealis</i>	38.2262	126.917999
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	38.322601	127.508003
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	38.239399	126.598
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Rana coreana</i>	38.213006	126.268705
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Rana coreana</i>	38.2048	125.193001
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Rana uenoi</i>	38.2229	125.214996
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Rana uenoi-dybowskii</i>	38.2229	125.214996
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Dryophytes japonicus</i>	38.0807	126.488998
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Dryophytes japonicus</i>	38.196671	126.278151
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Hynobius leechii</i>	38.183701	126.228996
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Hynobius leechii</i>	38.129101	126.019997
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Hynobius leechii</i>	38.077801	125.827004
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Hynobius leechii</i>	38.1367	125.050003
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Rana coreana</i>	38.158201	126.435326
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Bombina orientalis</i>	37.944901	126.606003

<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Bombina orientalis</i>	38.025398	126.454002
<i>Bufo gargarizans</i>	39.147499	127.445999	<i>Bombina orientalis</i>	38.028301	125.722
<i>Dryophytes japonicus</i>	39.203612	125.594033	<i>Bombina orientalis</i>	37.970798	126.554001
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Bombina orientalis</i>	37.970798	126.554001
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Bufo gargarizans</i>	38.019699	126.478996
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Bufo stejnegeri</i>	38.033828	126.115341
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Dryophytes japonicus</i>	38.00941	126.632972
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Glandirana emeljanovi</i>	37.942902	126.603996
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Glandirana rugosa</i>	38.035801	125.313003
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Hynobius leechii</i>	37.993999	126.600998
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Hynobius leechii</i>	38.040901	125.473999
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Kaloula borealis</i>	38.043098	125.653999
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Onychodactylus</i>	38.055698	125.716003
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Pelophylax chosonicus</i>	37.9534	126.671997
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Pelophylax nigromaculatus</i>	37.950901	126.491997
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Rana coreana</i>	37.966398	126.375816
<i>Dryophytes japonicus</i>	39.1475	127.445833	<i>Rana coreana</i>	38.068699	126.480003
<i>Dryophytes japonicus</i>	39.244044	125.808749	<i>Rana coreana</i>	37.955101	126.632004
<i>Dryophytes japonicus</i>	39.188361	125.730404	<i>Bombina orientalis</i>	37.816799	126.57
<i>Dryophytes japonicus</i>	39.234749	125.903276	<i>Bufo gargarizans</i>	37.9342	126.622002
<i>Glandirana rugosa</i>	39.147499	127.445999	<i>Dryophytes japonicus</i>	37.932598	126.5
<i>Glandirana rugosa</i>	39.147499	127.445999	<i>Dryophytes suweonensis</i>	37.909	126.66
<i>Glandirana rugosa</i>	39.147499	127.445999	<i>Kaloula borealis</i>	37.924099	126.529999
<i>Glandirana rugosa</i>	39.147499	127.445999	<i>Dryophytes japonicus</i>	42.236401	130.360001
<i>Glandirana rugosa</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.236401	130.360001
<i>Glandirana rugosa</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.223	130.488007
<i>Glandirana rugosa</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.2281	130.556
<i>Hynobius leechii</i>	39.251701	126.831001	<i>Pelophylax nigromaculatus</i>	42.303001	130.483993
<i>Hynobius leechii</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.2999	130.457993
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.261501	130.401001
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.246201	130.468002
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.273399	130.544998
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.3223	130.470001
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.242199	130.403
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.257999	130.380005
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.3302	130.404999
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.204498	130.417007
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.219601	130.427994
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.2896	130.578995
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.265598	130.526993
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.3167	130.417007
<i>Onychodactylus</i>	39.147499	127.445999	<i>Pelophylax nigromaculatus</i>	42.211102	130.559998

<i>Onychodactylus</i>	39.147499	127.445999	<i>Strauchbufo raddei</i>	42.2365	130.360001
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1.1.3. Supplementary Table S3

Percent contribution of bioclimate variables. Dataset used for all amphibian species found in the DPR Korea. Species name are abbreviated such as: *Bombina orientalis* Bo, *Bufo gargarizans* Bg, *Bufo stejnegeri* Bs, *Dryophytes japonicus* Dj, *Dryophytes suweonensis* Ds, *Glandirana emeljanovi* Ge, *Hynobius leechii* Hl, *Kaloula borealis* Kl, *Onychodactylus* sp. O sp., *Onychodactylus koreanus* Ok, *Pelophylax chosenicus* Pc, *Pelophylax nigromaculatus* Pn, *Strauchbufo raddei* Sr, *Rana amurensis* Ra, *Rana coreana* Rc, *Rana dybowskii* Rd, *Rana huanrenensis* Rh, *Rana uenoi* Ru, *Salamandrella tridactyla* St

Sp.	Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	Bio9	Bio10	Bio11	Bio12	Bio13	Bio14	Bio15	Bio16	Bio17	Bio18	Bio19
Bo	1.7526	19.9029	2.0648	1.8516	8.0358	1.7483	2.445	2.6646	0.939	12.4349	0.1393	17.7179	9.2413	3.238	10.365	3.0275	1.3429	0.4805	0.6079
Bg	1.0306	12.3662	2.6233	4.7437	36.7349	1.5603	3.8289	5.6767	0.3711	1.6603	0.7356	3.9974	9.4722	2.6515	3.7139	4.7265	1.9366	1.88	0.2903
Bs	2.9821	2.7952	1.18	0.5745	5.9469	2.0642	1.213	25.9101	0.6504	4.038	0.1575	6.3062	8.1608	0.3343	5.6414	30.2855	0.6676	1.0664	0.0259
Dj	1.1574	13.4523	16.7478	7.8944	16.0711	0.4197	0.4177	2.8381	0.3889	3.5911	0.5038	20.934	2.9234	5.7191	2.2202	2.8302	0.9372	0.6128	0.3408
Ds	0.632	7.8953	23.6776	22.5545	25.6349	0.0338	1.6945	0.9566	0.0614	1.5539	0.0001	1.7251	6.9483	0.276	1.3878	2.4533	0.0221	2.153	0.3399
Ge	8.946	8.3482	1.1846	2.9992	8.7736	8.497	1.215	6.9685	0.3575	11.351	0.2972	15.0352	3.7282	9.2983	7.4354	3.7112	0.5399	0.7008	0.613
Hl	1.6282	6.4155	0.8409	2.6241	13.4705	9.5226	2.0772	2.0115	1.9221	8.8864	0.3148	5.1248	25.6126	9.1193	3.5824	1.6972	3.0912	2.0093	0.0495
Kb	3.2721	5.8536	13.929	2.0218	7.4075	1.0594	3.188	7.5763	4.0471	16.817	1.1961	12.7096	9.1109	0.4836	4.6713	0.647	1.7029	1.0556	3.251
O sp.	3.32	4.9919	5.127	3.387	4.8923	0.3229	0.3008	7.8304	0.2829	21.9487	2.9819	4.2873	3.7051	18.5929	0.6294	9.2007	0.207	7.4323	0.5593
Ok	0	7.3609	5.3783	0.5283	4.6322	0.7651	0.5841	4.3468	0.7331	11.2881	1.919	10.8218	17.6297	25.3695	0.1026	3.7919	0.6695	0.4508	3.6282
Pc	4.5261	19.8148	3.0277	24.1502	7.947	0.0445	0.5723	4.4519	0.1328	14.0539	0.1029	8.2611	8.7441	0.8341	0.5273	1.2815	0.4326	0.0675	1.0276
Pn	0.2726	13.501	9.4034	10.8918	6.6315	6.041	2.7174	1.7658	0.6686	1.8424	0.2252	6.8792	9.039	18.4781	3.7859	1.7289	4.5288	0.7529	0.8464
Sr	0.0298	2.192	31.6799	0.4753	0	0	0	0	0	2.1819	0.0675	0.5334	0	0.9083	37.3047	0.3613	23.7226	0.0258	0.5174
Ra	3.3548	4.9455	0.7302	2.0383	0.7873	0.5758	0.4822	1.1333	25.4582	28.1177	0.9479	0.9744	1.9002	2.4756	4.9274	1.9973	0.173	12.4402	6.541
Rc	0.0449	27.0921	4.1694	0.9465	2.186	0.2267	3.6346	32.1756	0.5657	2.4824	0.4579	4.3802	5.1538	2.425	1.1697	5.2782	3.2093	2.3322	2.0699
Rd	1.2097	1.0562	0.0963	0.4489	3.2118	2.4132	0.4981	1.765	0.19	3.4206	1.669	16.0668	2.7043	3.0119	1.1421	4.1216	33.6126	2.318	21.0441
Rh	1.5791	5.3738	0.0388	0.3861	0.4217	0.1008	1.8107	1.5472	17.0882	3.2543	0.2896	0.3852	32.4522	15.2775	3.2527	0.0017	2.1493	14.5188	0.0724
Ru	2.0497	3.2202	1.5823	0.9487	5.6562	8.8322	4.9909	7.5451	0.3633	12.4509	0.1928	4.4719	3.7138	33.5799	4.829	4.7531	0.4453	0.1705	0.2046
St	0.7935	0.1514	0.2259	0	5.202	0.3326	0.1548	0.9715	2.007	59.5349	0.8688	1.5673	24.6413	0.2267	0.0606	2.099	0.0875	1.0747	0.0005

1.1.4. Supplementary Table S4

Permutation importance of bioclimate variables. Dataset used for all amphibian species found in the DPR Korea. Species name are abbreviated such as: *Bombina orientalis* Bo, *Bufo gargarizans* Bg, *Bufo stejnegeri* Bs, *Dryophytes japonicus* Dj, *Dryophytes suweonensis* Ds, *Glandirana emeljanovi* Ge, *Hynobius leechii* Hl, *Kaloula borealis* Kl, *Onychodactylus* sp. O sp., *Onychodactylus koreanus* Ok, *Pelophylax chosenicus* Pc, *Pelophylax nigromaculatus* Pn, *Strauchbufo raddei* Sr, *Rana amurensis* Ra, *Rana coreana* Rc, *Rana dybowskii* Rd, *Rana huanrenensis* Rh, *Rana uenoi* Ru, *Salamandrella tridactyla* St

Species	Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	Bio9	Bio10	Bio11	Bio12	Bio13	Bio14	Bio15	Bio16	Bio17	Bio18	Bio19
Bo	2.85	14.7158	4.5579	3.0885	3.1353	11.9531	13.2741	1.1917	1.6448	9.4556	1.1973	6.5718	2.8653	8.7523	4.5347	7.5461	1.3629	0.3352	0.9677
Bg	1.2477	3.1467	1.1513	1.7336	19.0202	9.6164	0.6872	5.2053	2.2573	2.4401	2.0901	4.362	9.5699	15.3862	2.9483	12.4667	3.6551	2.7693	0.2464
Bs	0.2986	7.0237	5.8612	0.4884	8.8917	0.4864	2.248	13.3704	8.9093	1.3471	2.4774	2.3402	11.879	4.063	5.6962	22.5699	0.2895	1.7598	0
Dj	0.902	12.605	2.8145	1.9891	36.9267	1.8023	1.1299	0.5214	0.7754	1.9043	1.7916	4.9005	2.5919	20.5802	3.3332	2.2435	1.3682	1.5634	0.2568
Ds	36.1895	5.2499	8.229	6.0868	8.3731	0.1376	8.3663	3.8759	0	6.0095	0.0142	4.2301	6.6314	0.7784	0.1571	5.0153	0.2555	0.3565	0.0439
Ge	2.4796	4.6247	1.026	0.1706	3.2872	25.1378	3.6687	2.7263	0.617	3.1345	0.9439	7.6899	1.6131	20.3085	10.5525	8.4619	1.3661	0.8151	1.3767
Hl	2.8442	10.0295	4.8227	1.7194	6.7252	13.357	0.4717	1.5065	2.0331	6.7468	0.0235	1.476	9.5179	22.4719	5.1943	3.2752	4.7245	1.8881	1.1728
Kb	0.6457	5.6183	4.1049	1.008	15.8436	0.1548	5.1048	3.4451	13.148	26.3626	1.8792	4.5449	3.62	5.4976	0.6463	0	1.8249	3.0755	3.4758
O sp.	0.0133	2.8932	10.6565	1.2252	2.6837	0.8028	1.278	16.5557	1.1994	10.9376	4.4455	3.7031	3.7133	21.6705	0.3851	5.9869	0.8855	8.1295	2.835
Ok	0	4.4102	4.2165	0.795	1.0171	4.4615	0.0255	8.4975	3.8025	2.9344	0.9503	5.1829	19.3566	12.0794	0.0349	2.8934	8.2481	0.3024	20.7918
Pc	1.2225	23.6313	5.1717	17.3211	1.2606	1.0354	1.4146	28.3271	0.0052	1.7471	0.0009	0.4526	6.3404	7.2635	1.407	1.7174	0.904	0.7776	0
Pn	0.5025	4.7	3.7815	4.9088	1.7275	28.8389	9.4798	0.7349	0.6613	2.2686	0.4425	1.5768	9.1416	11.0475	5.6498	7.4907	4.0732	2.6035	0.3706
Sr	0.0013	7.6887	0.0211	3.5215	0	0	0	0	0	15.2122	0	0	0	0	2.6222	2.2668	68.6662	0	0
Ra	0.6161	1.9403	2.1359	3.7905	3.6251	1.0468	0.2052	1.748	10.408	25.3432	1.1316	3.1601	5.9633	3.2036	4.7688	4.6783	0.272	12.6493	13.314
Rc	0.1857	3.2616	0.1546	0.4712	14.3479	0.5633	2.8371	22.1106	16.2803	0.0637	3.097	6.2455	5.4601	9.009	2.5059	3.4233	0.1104	9.8447	0.0282
Rd	2.7784	1.5536	0.7397	5.3571	1.2727	0.6728	0.7515	0.309	0.009	8.767	1.626	0.1565	10.4532	2.5309	0.9742	8.5982	45.1827	2.3729	5.8947
Rh	20.0873	1.4752	0.1117	0.6036	1.4354	0	0	20.6259	23.6666	2.9077	0.2935	1.8147	4.9718	3.2958	0.3821	0	7.5981	10.6257	0.105
Ru	2.4947	3.4869	2.0072	3.6388	3.9589	12.3051	8.5728	4.4205	0.4264	10.1242	0.0504	1.5221	9.5817	25.3042	3.4849	2.5747	3.651	1.3447	1.0505
St	12.4742	0.2441	0.1548	0	26.8806	0	1.2667	0	0.1966	10.2277	4.7205	0	35.6494	5.069	2.8854	0	0	0	0.231

1.1.5. Supplementary Table S5

Training gain with individual bioclimate variables. Dataset used for all amphibian species found in the DPR Korea. Species name are abbreviated such as: *Bombina orientalis* Bo, *Bufo gargarizans* Bg, *Bufo stejnegeri* Bs, *Dryophytes japonicus* Dj, *Dryophytes suweonensis* Ds, *Glandirana emeljanovi* Ge, *Hynobius leechii* Hl, *Kaloula borealis* Kl, *Onychodactylus* sp. O sp., *Onychodactylus koreanus* Ok, *Pelophylax chosenicus* Pc, *Pelophylax nigromaculatus* Pn, *Strauchbufo raddei* Sr, *Rana amurensis* Ra, *Rana coreana* Rc, *Rana dybowskii* Rd, *Rana huanrenensis* Rh, *Rana uenoi* Ru, *Salamandrella tridactyla* St

Species	Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	Bio9	Bio10	Bio11	Bio12	Bio13	Bio14	Bio15	Bio16	Bio17	Bio18	Bio19
Bo	0.1375	0.1463	0.0754	0.1289	0.1397	0.1069	0.1385	0.1548	0.1242	0.1563	0.1147	0.1838	0.1406	0.0419	0.156	0.147	0.0578	0.1169	0.0551
Bg	0.1573	0.1047	0.0148	0.0769	0.2148	0.1375	0.0891	0.2019	0.1299	0.1961	0.1356	0.0791	0.1069	0.0407	0.053	0.1168	0.0661	0.0898	0.0556
Bs	0.5341	0.148	0.245	0.215	0.4453	0.5442	0.1707	0.5228	0.5333	0.4554	0.5818	0.3752	0.5712	0.0893	0.1597	0.6854	0.0805	0.5671	0.0793
Dj	0.1132	0.1091	0.1337	0.0684	0.126	0.0599	0.0402	0.1351	0.0916	0.1337	0.0722	0.1612	0.0316	0.0699	0.0443	0.0983	0.082	0.0617	0.0759
Ds	0.4739	0.3483	0.4179	0.456	0.5462	0.3104	0.3541	0.4797	0.3417	0.55	0.3622	0.479	0.3144	0.0924	0.2648	0.3798	0.1947	0.3675	0.193
Ge	0.2447	0.0889	0.0242	0.156	0.1657	0.2167	0.1437	0.2081	0.2183	0.2209	0.2109	0.1856	0.0681	0.0841	0.0842	0.0868	0.0719	0.0538	0.0677
Hl	0.1978	0.0599	0.0079	0.1624	0.1859	0.1908	0.1456	0.1843	0.1943	0.2043	0.1877	0.1366	0.1501	0.1071	0.0741	0.1097	0.1132	0.1186	0.1087
Kb	0.219	0.0977	0.1272	0.0965	0.2254	0.1283	0.0618	0.3198	0.1543	0.2589	0.158	0.1525	0.0823	0.0496	0.0446	0.0906	0.1316	0.0817	0.1341
O sp.	0.1978	0.0931	0.1192	0.1276	0.1868	0.1668	0.1053	0.1755	0.1568	0.2271	0.1779	0.1527	0.1678	0.0991	0.0819	0.1921	0.06	0.1849	0.0595
Ok	0.246	0.2083	0.3101	0.284	0.1751	0.2933	0.23	0.1721	0.2974	0.2407	0.3081	0.4383	0.3808	0.3802	0.1606	0.3774	0.3112	0.3866	0.3127
Pc	0.4701	0.2708	0.1723	0.329	0.3943	0.348	0.2858	0.3872	0.3265	0.4414	0.355	0.3235	0.2669	0.0716	0.1831	0.2551	0.1604	0.1829	0.1472
Pn	0.0807	0.1024	0.0989	0.1245	0.0792	0.0805	0.0899	0.0683	0.0998	0.074	0.1002	0.1127	0.0558	0.1602	0.0625	0.1136	0.1905	0.092	0.1829
Sr	0.1378	0.1015	1.8745	1.1102	0.0024	0.3184	0.5765	0.0066	0.4039	0.0002	0.3906	0.7444	0.0077	1.8996	2.3714	0.0629	2.2396	0.0828	2.2403
Ra	0.4565	0.0635	0.4138	0.2818	0.7166	0.2726	0.2117	0.5794	0.3795	0.7374	0.3297	0.4173	0.4712	0.2125	0.1584	0.4807	0.172	0.4672	0.1535
Rc	0.1829	0.2102	0.109	0.0356	0.2261	0.1603	0.0813	0.2865	0.1355	0.2686	0.1429	0.0699	0.1068	0.0427	0.0201	0.1074	0.0511	0.12	0.0444
Rd	0.9652	0.2297	0.308	0.5675	0.7899	0.8517	0.5546	0.8417	0.8381	0.8491	0.909	1.5192	1.0054	1.6795	0.3838	1.2133	1.7986	1.1776	1.7926
Rh	1.2586	0.8927	0.3926	0.9908	0.5659	1.3524	1.0792	0.724	1.3681	0.8607	1.3768	1.3625	1.8631	1.2243	0.3607	1.5069	1.2399	1.8614	1.3379
Ru	0.1494	0.0708	0.0181	0.1921	0.1522	0.1813	0.1698	0.1656	0.1824	0.1665	0.175	0.1711	0.0722	0.2104	0.0719	0.1149	0.1908	0.0884	0.1826
St	1.9987	0.1471	0.0561	0.4434	2.1913	1.3743	0.341	2.2054	1.5464	2.2521	1.6229	1.2907	1.3599	0.8094	0.0205	1.0761	0.8532	1.0095	0.8394

1.1.6. Supplementary Table S6

List of samples and matching sequences used in this study. All sequences are fragments of the 12S ribosomal small sub-unit, with primers from [1] for *Dryophytes* sp. and priors from [2] for *Rana* sp. Ext. stands for extraction round based on the lysis buffer (see methods) and Ta stands for PCR annealing temperature compared to the one recommended. All sequences presented here have unresolved calls in sequencing, that do not prevent species identification, but would not be adequate for submission to GenBank.

ID	Ext	Ta	Sequence	Species
ZISP.140 02	1	Ta+2	TTGTTACTTAACCTTATACATGCAAGTCTCAGCACCCCTGTGAGAACGCCCTCAATCTTCTTATTGAAACGAGGAGCTGGTATCAGGCACAATTATTAGCCCAAGA CACCTAGCCACGCCACATCCACAAGGAAATTCAGCAGTAATTAACATTGAGTATAAGCGTCAGCTTGACTCAGTTAAAGTAAAGAGAGCCGGCAAATATGGTG CCAGCCGCCGCGGTTACACCACGAGGCTCAAATTGATTACTTTCGGCGTAAAGCGTGATTAAAGTTACCCATTAAGTATAGTTGTATTTAACTAAGCTGTGACA CGCTTGTTCTTAAGAACTCAAAAACGAAAGTTACT	<i>Dryophytes</i> <i>japonicus</i>
ZISP.140 04	1	Ta+2	TTGTTACTTAACCTTATACATGCAAGTCTCAGCACCCCTGTGAGAACGCCCTCAATCTTCTTATTGAAACGAGGAGCTGGTATCAGGCACAATTATTAGCCCAAGA CACCTAGCCACGCCACATCCACAAGGAAATTCAGCAGTAATTAACATTGAGTATAAGCGTCAGCTTGACTCAGTTAAAGTAAAGAGAGCCGGCAAATATGGTG CCAGCCGCCGCGGTTACACCACGAGGCTCAAATTGATTACTTTCGGCGTAAAGCGTGATTAAAGTTACCCATTAAGTATAGTTGTATTTAACTAAGCTGTGACA CGCTTGTTCTTAAGAACTCAAAAACGAAAGTTACT	<i>Dryophytes</i> <i>japonicus</i>
ZISP.139 79	1	Ta+2	CTTCACCAGGTAAAGGAGCTGGTATCAGGCACAGATTCTTGCCCAACAACCTAGTCTCACCACACCCCCAAGGGTACTCAGCAGTGATTAACCTTTGCGCATA AGCGACAGCTTGACTCAGTTAGGAAAAACAGGGCCGGCTAACACGGTGCCAGCCGCCGCGGCTACACCGTGACCCAAGTTGATAATCACCAGCGTTAAGCGT GATTAAAGTTCTATAAAAATTAGGGCCAAATTAACACTTAGTAGTATTATGCTTGTGTTAAGAAGAACACAAAACGAAGTTGC	<i>Rana uenoi</i>
ZISP.139 69	1	Ta+4	CTTCACCAGGTAAAGGAGCTGGTATCAGGCACAGATTCTTGCCCAACAACCTAGTCTCACCACACCCCCAAGGGTACTCAGCAGTGATTAACCTTTGCGCATA AGCGACAGCTTGACTCAGTTAGGAAAAACAGGGCCGGCTAACACGGTGCCAGCCGCCGCGGCTACACCGTGACCCAAGTTGATAATCACCAGCGTTAAGCGT GATTAAAGTTCTATAAAAATTAGGGCCAAATTAACACTTAGTAGTATTATGCTTGTGTTAAGAAGAACACAAAACGAAGTTGC	<i>Rana uenoi</i>
ZISP.139 71	2	Ta+4	CTTCACCAGGTAAAGGAGCTGGTATCAGGCACAGATTCTTGCCCAACAACCTAGTCTCACCACACCCCCAAGGGTACTCAGCAGTGATTAACCTTTGCGCATA AGCGACAGCTTGACTCAGTTAGGAAAAACAGGGCCGGCTAACACGGTGCCAGCCGCCGCGGCTACACCGTGACCCAAGTTGATAATCACCAGCGTTAAGCGT GATTAAAGTTCTATAAAAATTAGGGCCAAATTAACACTTAGTAGTATTATGCTTGTGTTAAGAAGAACACAAAACGAAGTTGC	<i>Rana uenoi</i>
ZISP.139 73	2	Ta+4	CTTCACCAGGTAAAGGAGCTGGTATCAGGCACAGATTCTTGCCCAACAACCTAGTCTCACCACACCCCCAAGGGTACTCAGCAGTGATTAACCTTTGCGCATA AGCGACAGCTTGACTCAGTTAGGAAAAACAGGGCCGGCTAACACGGTGCCAGCCGCCGCGGCTACACCGTGACCCAAGTTGATAATCACCAGCGTTAAGCGT GATTAAAGTTCTATAAAAATTAGGGCCAAATTAACACTTAGTAGTATTATGCTTGTGTTAAGAAGAACACAAAACGAAGTTGC	<i>Rana uenoi</i>

ZISP.139 76	1	Ta+2	CTTCACCAGGTAAAGGAGCTGGTATCAGGCACAGATTCTTGCCCAACAACCTAGTCTCACCACACCCCAAGGGTACTCAGCAGTGATTAACCTTTGCGCATA AGCGACAGCTTGACTCAGTTAGGGAAAACAGGGCCGGCTAACACGGTGCCAGCCGCCGGCTACACCGTGGACCCAAGTTGATAATCACCGGCGTTAAGCGT GATTAAAGTTCTATAAAATTAGGGCCAAATTAACACTTAGTAGTATTATGCTTGTTGTTAAGAAGAACAACAAACGAAAGTTGC	<i>Rana uenoi</i>
ZISP.139 78	1	Ta	CTTCACCAGGTAAAGGAGCTGGTATCAGGCACAGATTCTTGCCCAACAACCTAGTCTCACCACACCCCAAGGGTACTCAGCAGTGATTAACCTTTGCGCATA AGCGACAGCTTGACTCAGTTAGGGAAAACAGGGCCGGCTAACACGGTGCCAGCCGCCGGCTACACCGTGGACCCAAGTTGATAATCACCGGCGTTAAGCGT GATTAAAGTTCTATAAAATTAGGGCCAAATTAACACTTAGTAGTATTATGCTTGTTGTTAAGAAGAACAACAAACGAAAGTTGC	<i>Rana uenoi</i>
ZISP.139 72	1	Ta+2	CTTCACCAGGTAAAGGAGCTGGTATCAGGCACAGATTCTTGCCCAACAACCTAGTCTCACCACACCCCAAGGGTACTCAGCAGTGATTAACCTTTGCGCATA AGCGACAGCTTGACTCAGTTAGGGAAAACAGGGCCGGCTAACACGGTGCCAGCCGCCGGCTACACCGTGGACCCAAGTTGATAATCACCGGCGTTAAGCGT GATTAAAGTTCTATAAAATTAGGGCCAAATTAACACTTAGTAGTATTATGCTTGTTGTTAAGAAGAACAACAAACGAAAGTTGC	<i>Rana uenoi</i>
ZISP.139 74	2	Ta+4	CTTCACCAGGTAAAGGAGCTGGTATCAGGCACAGATTCTTGCCCAACAACCTAGTCTCACCACACCCCAAGGGTACTCAGCAGTGATTAACCTTTGCGCATA AGCGACAGCTTGACTCAGTTAGGGAAAACAGGGCCGGCTAACACGGTGCCAGCCGCCGGCTACACCGTGGACCCAAGTTGATAATCACCGGCGTTAAGCGT GATTAAAGTTCTATAAAATTAGGGCCAAATTAACACTTAGTAGTATTATGCTTGTTGTTAAGAAGAACAACAAACGAAAGTTGC	<i>Rana uenoi</i>

1. Hua, X.; Fu, C.; Li, J.; Oca, A.N.M.d.; Wiens, J.J. A revised phylogeny of holarctic treefrogs (genus *Hyla*) based on nuclear and mitochondrial DNA sequences. *Herpetologica* **2009**, *65*, 246-259.
2. Yang, B.-T. *et al.* Diversity and phylogeography of Northeast Asian brown frogs allied to *Rana dybowskii* (Anura, Ranidae). *Molecular phylogenetics and evolution* **2017**, *112*, 148-157.