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Contemporary chorology of the spadefoot toads (*Pelobates* spp.) in the Balkan Peninsula

GEORG DŽUKIĆ[1], VLADIMIR BEŠKOV[2], VESNA SIDOROVSKA[3], DAN COGĂLNICEANU[4] & MILOŠ L. KALEZIĆ[1,5]

[1]Institute for Biological Research »Siniša Stanković«, Bulevar Despota Stefana 142, 11000 Beograd, Serbia, [2]Institute of Zoology, Bulgarian Academy of Sciences (BAN), Tzar Osvoboditel 1, 1000 Sofia, Bulgaria, [3]Society for the Investigation and Conservation of Biodiversity and the Sustainable Development of Natural Ecosystems – BIOECO, Briselska 12, 1000 Skopje 45, FYR Macedonia, [4]University Ovidius Constanța, Faculty of Natural Sciences, Bvd. Mamaia 124, Constanța, Romania, [5]Institute of Zoology, Faculty of Biology, Studentski trg 16, 11000 Beograd, Serbia
Corresponding author: MILOŠ L. KALEZIĆ, mkalezic@ibiss.bg.ac.yu

Heutige Verbreitung der Knoblauchkröten (*Pelobates* spp.) auf der Balkanhalbinsel

Auf der Grundlage eigener Untersuchungen und anderer bekannter Verbreitungsangabe, präsentieren wir Fundpunkte (Ortsname, Höhe, Quelle) der Knoblauchkröten (*Pelobates fuscus* und *P. syriacus*) von der Balkanhalbinsel und aus angrenzenden Gebieten. Es ist ein Versuch, eine erste Datenbank zu aktuellen und historischen Funden der Knoblauchkröten aus diesem Teil Europas zu erstellen. Wir analysieren darüber hinaus die Höhenverbreitungsmuster. Knoblauchkröten haben eine wesentlich größere Höhenverbeitung auf dem Balkan als bisher bekannt. Im allgemeinen sind Koblauchkröten auf dem Balkan Flachlandbewohner, mit einer signifikanten gegenläufigen Korrelation für beide Arten in Bezug auf Anwesenheit und zunehmender Höhe, obwohl in einigen Bereichen Knoblauchkröten in relativ großer Höhe angetroffen werden können.

Schlüsselbegriffe: Amphibia, Anura, Pelobatidae, *Pelobates fuscus*, *P. syriacus*, Balkan, räumliche Verbreitung, Höhenverbreitung, Paläo-Chorologie, Sympatrie.

Abstract

Based upon data from our own investigations and known chorological data sources, we present locality data (toponymy, elevation and source) of spadefoot toads (*Pelobates fuscus* and *P. syriacus*) distribution from the Balkan Peninsula region and adjacent areas. It is an attempt to develop the first accessible database on the present and historical records of spadefoot toads distributions in this part of Europe. We also analysed patterns of their elevation data. Spadefoot toads have much larger altitudinal ranges in the Balkans than was previously thought. The spadefoot toads are generally lowland amphibians in the Balkans, with a significant inverse correlation between presence and increasing altitude for both species, though in some parts these toads can be encountered in relatively high altitude habitats.

Key words: Amphibia, Anura, Pelobatidae, *Pelobates fuscus*, *P. syriacus*, Balkan, spatial and altitudinal distribution, paleochorology, sympatry.

Introduction

Two spadefoot toad species that belong to two different phylogenetic lineages within the genus *Pelobates* (MAGLIA 1998) inhabit the Balkans. The common spadefoot toad (*P. fuscus*) has an extensive range, which covers most of the plains and hilly regions of Central, Eastern and Southeastern Europe (NÖLLERT 1997). This toad occurs from sea level to an elevation of 810 m (ZAVADIL et al. 1995, KUZMIN 1999, BEŠKOV & NANEV 2002). The present range of the eastern spadefoot toad (*P. syriacus*) includes most of Macedonia, Bulgaria, Greece, Turkey, Israel and Syria and the southeastern part of Romania (e. g. SOFIANIDOU 1977, 1997) and is bounded by the Pannonian plain and the Danube River on the north, the Morava River valley on the west, the Mediterranean shoreline on the south, and Transcaucasia on the east (NÖLLERT 1997). The vertical distribution of this species ranges from sea level to 1 935 m (KUZMIN 1999).

No other amphibian species in Europe leads such a secretive life, as the spadefoot toads (*Pelobates* spp.). During the day and during dry and/or windy periods, they hide in deep burrows. When above ground, in the course of migrations and when seeking food, they are strictly nocturnal. It was therefore particularly difficult to find reliable indications of its presence. Not surprisingly, spadefoot toads were described quite late from the Balkans. Thus, *P. syriacus* was described from Macedonia only in 1928 (KARAMAN 1928), in Bulgaria in 1932 (MÜLLER 1932), in Romania in 1954 (BĂCESCU 1954) and in Greece in 1975 (BÖHME 1975).

These amphibians are highly specialized and have a narrow ecological niche. Since they are obligatory burrowing species landscape features have a strong influence on population spread and/or abundance (e. g. NÖLLERT 1990). Typical terrestrial habitats include sandy areas, heath lands and deciduous woodlands with loamy soils. The spawning biotopes include a variety of permanent or semi-permanent ponds. The larval stage of spadefoot toads is of very long duration (2 to 4 months), with larvae being much larger than in other European anurans (e. g. NÖLLERT 1997, KUZMIN 1999).

The Balkan Peninsula is of crucial importance for understanding phylogeography, taxonomy-diversity, chorology and conservation issues of spadefoot toads in Europe. First, the southernmost portion of the range of *P. fuscus* and the northernmost portion of the range of *P. syriacus* are in the Balkans. This peninsula is also the only region where these species occur in sympatry. In addition, the last post-glacial invasion into central Europe took place from this area of Southern Europe, a long-standing refugial centre (EGGERT et al. 2006).

In a previous paper (DŽUKIĆ et al. 2005) we outlined the historical and contemporary ranges of the two spadefoot toad species (*Pelobates fuscus* and *P. syriacus*) in the Balkan Peninsula, including the adjacent area based upon published data and our own investigations, as well as from indirect paleogeographical and paleoecological data. The aim of this paper is to establish the first accessible database on the present and historical records of spadefoot toads distribution in the Balkans and adjacent areas, excluding Hungary as the up-to-date survey of the spadefoot toad distribution in this country was recently published (SCHÄFFER & PURGER 2005). This database will serve for scientific studies and support protection and conservation matters.

Materials and methods

The dataset of the present study (names of locations where spadefoot toads have been recorded and their elevation) made use of our unpublished original records (32.1 % in *P. fuscus* and 25.3 % in *P. syriacus*), as well as of previously published data on spadefoot toad distribution in the Balkans. Most records came from the inventory of larvae, juveniles and especially adults in aquatic or terrestrial habitats. There were also distributional data based on the presence of dead specimens due to road kills. In a few cases records came from findings of the osteological remains in the owls' regurgitations or in the nests of bird of prey.

Breeding sites more than 500 m apart were considered as independent entrances for establishing distributional pattern. Our locality elevation was recorded from topographic maps (1 : 50 000 and 1 : 25 000 scales). In order to establish vertical distributional patterns of the spadefoot toads on the Balkan Peninsula as precise as possible, we considered as independent entries toad incidences on different altitudes even within the same localities. Thus, the number of entries for the elevation pattern study is larger than for the distributional pattern analysis (483 vs. 441 of *P. fuscus*, and 171 vs. 165 of *P. syriacus*). On the other hand, we did not have elevations for locations that came from some published papers, dealing with spadefoot toad distributions in Greece and Turkish Thrace, but without scoring site altitudes.

Spadefoot toads preference for the altitudinal distribution was analysed using the Spearmann non-parametric correlation coefficient of species incidence on increasing altitude intervals of 20 m. The analysis was carried out using the Statistica (StatSoft, Inc. 1997) program package.

Results and Discussion

Present-day chorology. We recorded a total of 441 sites of the common spadefoot toad on the Balkans and adjacent parts of the species' range. (Appendix, fig. 1). The vast majority of these locations belong to the Pannonian plain where the common spadefoot toad is widely distributed (e. g. SCHREIBER 1912, NÖLLERT 1997). In the Peripannonian area of the Western and Central Balkans, the common spadefoot toad is usually thought to be confined only to the narrow lowland zone south of the Save and Danube Rivers. However, during fieldwork we recorded several additional locations in the lowland area of central and Eastern Serbia (fig. 1). Southward along the Great Morava River valley, we observed the common spadefoot toad in the village, Staro Lanište (near Jagodina), as well as in the valley of South Morava (Ćićina village, near Aleksinac). We failed to find *P. fuscus* populations along the West Morava River in spite of intensive searches over the last three years. Another *P. fuscus* penetration into the central Balkans is along the Timok River, in the western part of the Vlaško-Pontic basin. In Bulgaria, the distributional records are mostly confined to the area along the Danube River and the western bank of the Black Sea, with only significant penetration into the Balkans continental mass along the Jantra river valley up to the Veliko Trnovo region (fig. 1). Contemporary connection of Panonian and Dacian parts of the species ranges in Romania could be a remanent one since the Neogene.

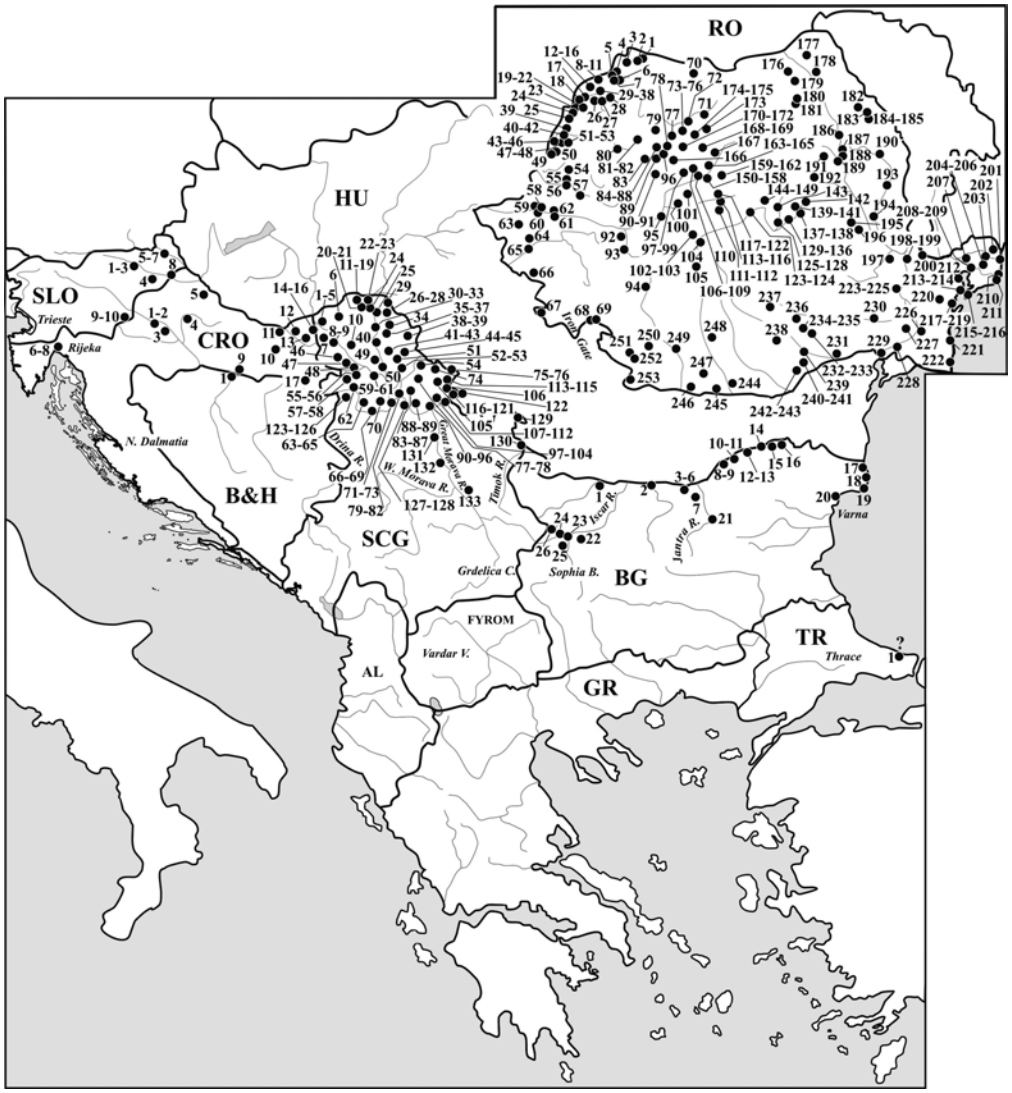

Fig. 1: Location sites of the common spadefoot toad (*Pelobates fuscus*) on the Balkan Penisula and adjacent areas. Romania is displaced for clarity.
Fundpunkte der Knoblauchkröte (*Pelobates fuscus*) auf dem Balkan und in angrenzenden Gebieten. Rumänien ist aus Darstellungsgründen hervorgehoben worden.

Of a special biogeographical importance for the present and recent past common spadefoot toad distribution patterns are three isolates. On the West Balkan there is a historical refugium in the Rijeka town surroundings, in three localities (see Appendix for location data). The last records from this area dated a hundred years ago. Due to considerable habitat alteration, especially breeding site destructions, this part of the species range can be considered as a historical one (DŽUKIĆ et al. 2005). As a contemporary *P. fuscus* isolate, as now stands, in Turkish Thrace, near the Bosphorus Strait, isolated population has been found (EISELT 1988, BARAN & ATATUR 1997). This is by

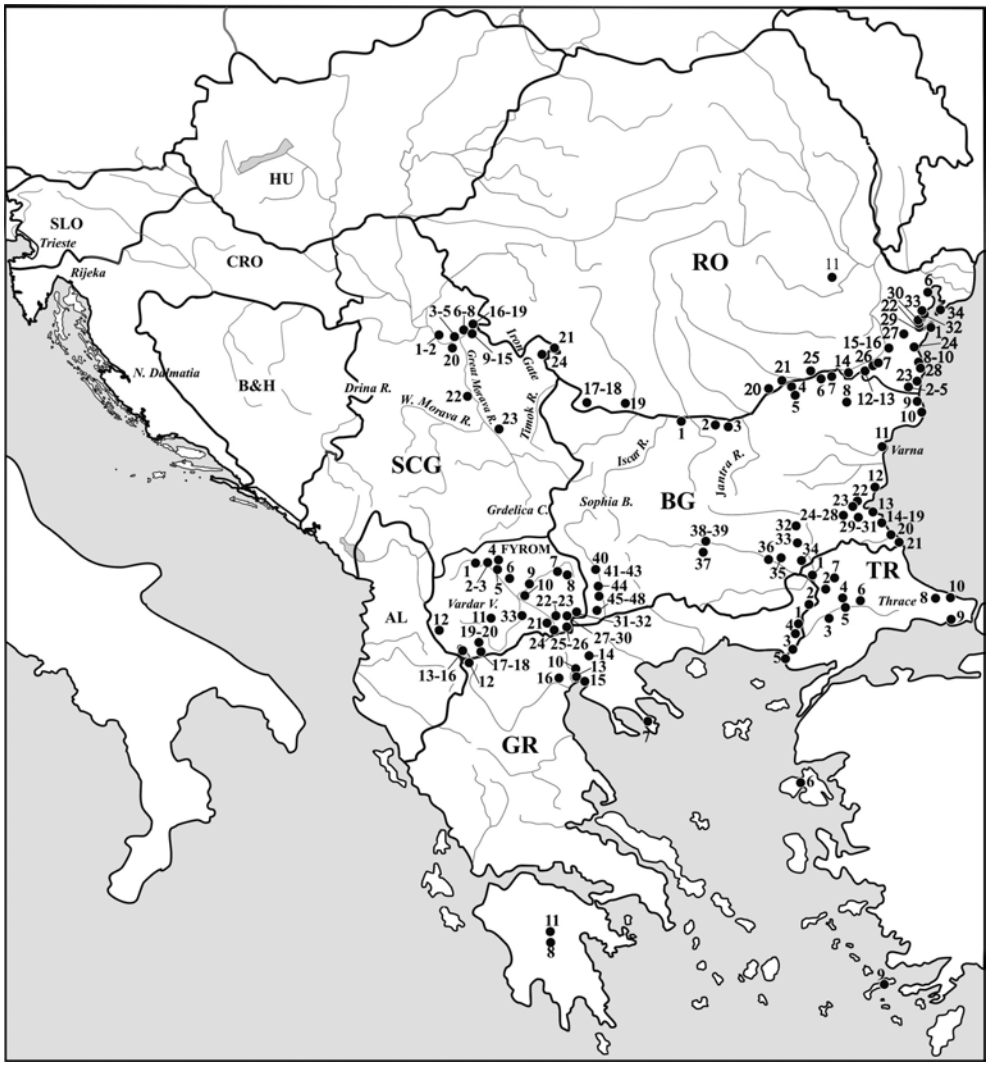

Fig. 2: Location sites of the eastern spadefoot toad (*Pelobates syriacus*) on the Balkan Penisula and adjacent areas.
Fundpunkte der Syrischen Schaufelkröte (*Pelobates syriacus*) auf dem Balkan und in angrenzenden Gebieten.

far the southernmost site in the species' range (fig. 1). However, confounding the issue is that this site is 400 km apart from the nearest *P. fuscus* populations which might be the results of inefficiently search efforts along the coastal Black Sea area south of Varna. An additional notable isolated Balkan populations, occurs in the Sophia Ravine (506–680 m a. s. l) (BEŠKOV & BERON 1964, BEŠKOV & NANEV 2002). Three localities were confined to the bottom area of previous lake, while two locations were recorded on the higher terraces within the Sofia Ravine.

A total of 165 confirmed eastern spadefoot toad's localities on the Balkans and adjacent areas were recorded (Appendix, fig. 2). According to available data, the range of

P. syriacus in the Balkans is disjunctive. The larger part of the range includes Greece, FYR Macedonia, eastern and Southern Bulgaria, Turkish Thrace and Romania (Dobrugea and along the Danube River). To these areas we can add the lowlands of the North-Eastern portions of Serbia (post-Iron Gate area), and the Timok River valley, presumably up to Knjaževac. *P. syriacus* is more common in Greece than apparent from our list (see Appendix). According to T. SOFIANIDOU (personal communication), the eastern spadefoot toad is known from at least 150 aquatic habitats within 40 regions all over the Greek mainland. Altitude of most of these localities ranges from sea level to 150 m, while some are on the plateaus up to 500–600 m. The smaller areas of occurrence for *P. syriacus* in the Balkans are confined to the south easternmost portion of the Pannonian plain, the narrow sandy lowland of the right Danube River bank and the Great Morava valley (at Staro Lanište), including the lower zones of the Western Morava and Southern Morava drainages. Most likely, Grdelica Canyon on the south and the Iron Gates on the east demarcate the border between these two parts of the eastern spadefoot toad range within the Balkans.

Regarding the spadefoot toads altitudinal distribution on the Balkans, the lowest recorded elevation of both species was at the sea level (Bulgarian and Romanian coast of the Black See). *P. syriacus* has a broader altitudinal range (up to 920 m, FYR Macedonia) than *P. fuscus* (maximum elevation 680 m, Sofia Ravine, Bulgaria). The average elevation (median ± standard error) of the *P. fuscus* incidence on the Balkan appeared to be 104.9 ± 7.2 m, and of *P. syriacus* 69.0 ± 15.3 m. Most records of both spadefoot toads are within the range of the sea level up to 100 m, with decreasing frequencies towards higher elevations (fig. 3). There is a highly significant inverse correlation between *P. fuscus* and *P. syriacus* presence and increasing altitude. Spearmann non-parametric correlation coefficient of species incidence and increasing altitude intervals of 20 m was $Rs = -0.78$ ($P < 0.001$) for *P. fuscus*, and $Rs = -0.66$ ($P < 0.001$) for *P. syriacus*. This is due to a decline in area with elevation (KÖRNER 2004) and also favourable habitats with soft erosional soils are mostly located at lower altitudes.

Regarding habitat elevation, the two disjunctive parts of the eastern spadefoot toad distribution on the Balkans differ considerably. The Serbian part of the species' range appears to be low; with a median value of 77.5 ± 4.3 m (range 41 to 155 m). The larger part (Greece, FYR Macedonia, Bulgaria, Turkey and Romania) is characterised by much more variation in habitat elevations (from sea level to 920 m), with median value of 60.0 ± 17.7 m.

Paleochorology. Three species of the spadefoot toad genus *Pelobates* occur in Europe (*P. cultripes*, *P. fuscus* and *P. syriacus*) and a fourth in Northwestern Africa (*P. varaldii*). Based on available data the genus *Pelobates* most probably originated from North America, while its first European fossil record is from the early Oligocene (DUFFAUD 2000). Only two valid fossil members within the genus are known, *P. decheni* (BÖHME et al 1982) and *P. sanchizi* (VENCZEL 2004).

Fossils of *P. fuscus* are presently known from the Middle and Late Miocene in Hungary (VENCZEL 1999, GAL et al. 2000), and Western Czechoslovakia (SPINAR 1976), the Pliocene and Early Pleistocene in Poland (MLYNARSKI 1962), and the Pleistocene in

Romania (VENCZEL 1989) and Czechoslovakia (ROČEK 1981). It might be that spadefoot toads were relatively constant inhabitants of Central and Eastern Europe, even during

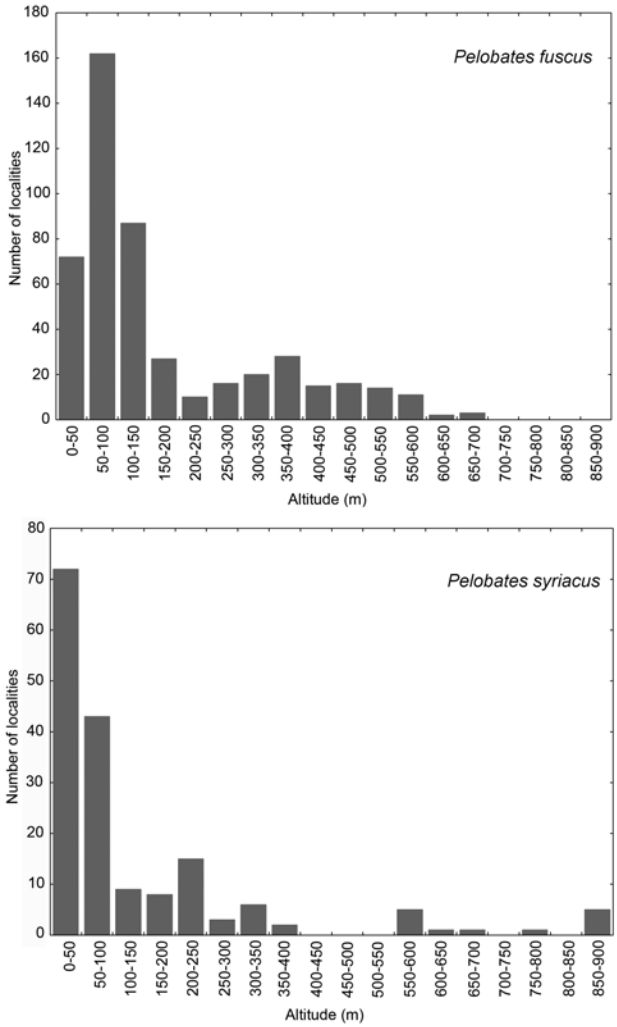

Fig. 3: Altitudinal distribution patterns of *P. fuscus* and *P. syriacus* on the Balkans and adjacent areas.
Höhenverbreitung von *P. fuscus* und *P. syriacus* auf dem Balkan und in angrenzenden Gebieten.

and/or between glaciations. Undoubtedly, this was so in the Balkans as this peninsula is widely considered to be one of the major European long-term refugia for many taxa (e. g. TABERLET et al. 1998, HEWITT 1999), including amphibians (e. g. ARNTZEN 1978, COGĂLNICEANU & VENCZEL 1992, DŽUKIĆ & KALEZIĆ 2004). If so, populations of the common spadefoot toad from central Serbia, i.e. in the valleys of the Great and Southern Morava rivers, probably have a genetic continuity with the ancestor of the current conspecific counterparts in Central and North Europe. The Morava Valleys was an important refugial centre due to its morphology, characterized by a system of connected ravines and canyons, and geologic history (MATVEJEV 1975).

The contemporary northern and western range of distribution of *P. syriacus* seems to be much smaller. The fossil record shows that, during the Pliocene, the range of this

spadefoot toad extended much further north into central Europe (e. g. MLYNARSKI 1962, 1977, ROČEK 1981).

Spadefoot toads sympatry. The ranges of the two spadefoot toad species overlap on the Balkan Peninsula (e. g. FUHN 1960, DŽUKIĆ 1974a, b). Species co-occur along the lower course of the Danube, along the western coast of the Black Sea, and further to the south, in the vicinity of the Bosporus Strait (DŽUKIĆ & PASULJEVIĆ 1983, EISELT 1988, COGĂLNICEANU 1991). Our recent findings enlarge the zone of sympatry to encompass the Great Morava valley area, including South Morava, as well as the North-Eastern part of Serbia (Kladovo, Negotin areas). It is possible that an even larger sympatric zone expanding into the Nišava River valley and the Leskovac ravine could be established.

Of special note is that these two species live syntopically, at least in terrestrial habitats (e. g. ROT-NIKČEVIĆ et al. 2001). The problem of interspecific competition appears to be likely, but this remains to be studied further. Both species of spadefoot toads are in decline over large parts of their area. A thorough knowledge of their present distribution range and its dynamic in time is of crucial importance for their successful conservation.

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Appendix

Locality data (cite names, elevations, sources); pc – personal communications, ts – this study, unp.– unpublished.

Pelobates fuscus

Slovenia: 1. Slivnica pri Mariboru, 264 m, GREGORI 1990; 2. Rače: »Turn«, 251 m, VOGRIN 1997a; 3. Rački ribnik, 251 m, VOGRIN 1999; 4. Medvedce: reservoir, 255 m, VOGRIN & VOGRIN 1997; 5. Turjanci: Hrastje Mota, 190 m, ts; 6. Prekmurje: Rakičan, 186 m, DŽUKIĆ & PASULJEVIĆ 1983; 7. Turjanci: Rihtarovci, 190 m, ts; 8. Ormož, 192 m, VOGRIN 1997b; 9. Dolenjska: Sajovce, 152 m, VOGRIN 1999; 10. Doljenska: Gorjanci, 250 m, FREYER 1842.

Croatia: 1. Zagreb, 100, 135 m, PAVLETIĆ 1964; 2. Zagreb: vicinity, 100, 135 m, PAVLETIĆ 1964; 3. Turopolje: Orle, 99 m, DŽUKIĆ et al. 1981; 4. Čazma, 144 m, DŽUKIĆ & PASULJEVIĆ 1983; 5. Koprivnica: Peteranec, 133 m. ts; 6. Rijeka: small lakes around Škurinja, 345 m, MATISZ 1896; 7. Rijeka: Grobničko polje, 281 m, DEPOLI 1898; 8. Rijeka: Grobnik, 466 m, DEPOLI 1898; 9. Nova Gradiška: Vrbova, 125 m, ts; 10. Našice, 157 m, KARAMAN 1921; 11. Donji Miholjac, 97 m, ts; 12. Baranja: Petlovac, 93 m, MIKUŠKA & VUKOVIĆ 1980; 13. Belje, 95 m, MOJSISOVICS 1897; 14. East Baranja: Batina, 85, 89, 105 m, MOJSISOVICS 1897; 15. Baranja: Suza, 97 m, ts; 16. Baranja: Kazuk: Siga, 84 m, DŽUKIĆ & PASULJEVIĆ 1983; 17. Slavonija: Bošnjaci, 85 m, POZZI 1966.

Bosnia: 1. Srbac: Brajinci: Bardača, 91 m, OBRATIL 1981;

Serbia: 1. Bački Monoštor: Opaljenik, 85, 86 m, VUKOV & PANTELIĆ 1997; 2. Bački Monoštor: Češki most, 86 m, VUKOV & PANTELIĆ 1997; 3. Bački Monoštor: Štrbac, 86 m, VUKOV & PANTELIĆ 1997; 4. Bački Monoštor: Vučićev salaš, 88 m, VUKOV & PANTELIĆ 1997; 5. Bački Monoštor: Jaroši, 88 m, VUKOV & PANTELIĆ 1997; 6. Svetozar Miletić: Bela bara, 89 m, ts; 7. Apatin, 86 m, DŽUKIĆ & PASULJEVIĆ 1983; 8. Doroslovo, 87, 91 m, ts; 9. Bački Brestovac, 88 m, ts; 10. Novi Vrbas, 85 m, PAVLETIĆ 1964; 11. Hrastovača: »Naftagas«, 126, 128 m, ts; 12. Hrastovača: Pačarnik, 126 m, ts;

13. Hrastovača: border marker No. 351, 123 m, ts; 14. Hrastovača: Jasenovac, 117 m, ts; 15. Hrastovača: Mali Jasenovac, 117 m, ts; 16. Hrastovača: Cirkuzantska bara, 115 m, ts; 17. Hrastovača: school »Kraljević Marko«, 117 m, ts; 18. Hrastovača: Radanovačka šuma, 120 m, ts; 19. Hrastovača: Čavolj, 126 m, ts; 20. Palić: northern lake bank, 105 m, PRŠA 1954; 21. Palić: Mens beach, 107 m, AGARDI 1977; 22. Hajdukovo, 118 m, DŽUKIĆ & PASULJEVIĆ 1983; 23. Ludaško jezero, 104 m, PAUNOVIĆ 1997; 24. Selevenj, 98 m, ts; 25. Kanjiža: Kapetanski rit, 84 m, ts; 26. Novi Kneževac: Fish-pond, 82 m, ts; 27. Firiđ, 82, 92 m, ts; 28. Banatsko Aranđelovo, 82 m, DŽUKIĆ & PASULJEVIĆ 1983; 29. Rabe, 82 m, DŽUKIĆ & PASULJEVIĆ 1983; 30. Senta, 85 m, ts; 31. Senta-vicinity: terrace I, 80 m, GUELMINO 1991; 32. Senta-vicinity: terrace II, 95 m, GUELMINO 1991; 33. Trešnjevac, 84, 102 m, ts; 34. Čoka, 84 m, DŽUKIĆ & PASULJEVIĆ 1983; 35. Ostojićevo-Padej, 85 m, ts; 36. Jazovo, 81 m, ts; 37. Jazovo: zone of the Zlatice river, 82, 84 m, KRIZMANIĆ 1999; 38. Kikinda, 83 m, ts; 39. Banatska Topola, 78m, ts; 40. Mol, 82 m, VASVARY 1939; 41. Slano Kopovo, 79 m, DŽUKIĆ & PASULJEVIĆ 1983; 42. Novi Bečej - Bašaid, 80 m, ts; 43. Arača, 82 m, DŽUKIĆ & PASULJEVIĆ 1983; 44. Torda, 83 m, ts; 45. Torda – vicinity, 85 m, ts; 46. Silbaš - Parage, 85, 86 m, ts; 47. Bački Petrovac, 85 m, RADOVANOVIĆ 1957; 48. Novi Sad: left the Danube river bank, 75, 80 m, PRŠA 1954; 49. Žabalj, 82 m, ts; 50. Titelski breg: Veudvar, 127 m, DŽUKIĆ & PASULJEVIĆ 1983; 51. Melenci, 82 m, ts; 52. Zrenjanin: swimming-pool, 83 m, ts; 53. Ečka: fish-pond, 75, 81 m, ts; 54. Sutjeska, 78, 81 m, ts; 55. Sremska Kamenica, 80 m, PRŠA 1959; 56. Šuljam: Mutalj, 229, 250 m, DŽUKIĆ & PASULJEVIĆ 1983; 57. Novi Ledinci - Ledinci, 81 m, KRIZMANIĆ 1999; 58. Ledinci, 66 m, KRIZMANIĆ 1999; 59. Karlovački Vinogradi, 80 m, ts; 60. Čortanovci: the Danube river bank, 80 m, DŽUKIĆ & PASULJEVIĆ 1983; 61. Čortanovci, 147 m, ts; 62. Sremska Mitrovica: Commemorative cemetery, 80, 84 m, ts; 63. Klenak: Grabovci (section 81), 78 m, ts; 64. Klenak: Grabovci (section 85), 80 m, ts; 65. Klenak: Grabovci (section 97), 78 m, ts; 66. Obedska bara, 74, 78, 79 m, KRIZMANIĆ 1999; 67. Obrež: hotel »Obedska bara«, 79 m, PANTELIĆ 1995a,b; 68. Obrež: Revenica, 79, 81 m, ts; 69. Obrež: Matijevica, 79 m, PANTELIĆ 1995a, b; 70. Dobanovci: Slatina, 78 m, ts; 71. Bežanija, 80, 90 m, DŽUKIĆ & PASULJEVIĆ 1983; 72. Novi Beograd, 72, 80 m, DŽUKIĆ & PASULJEVIĆ 1983; 73. Zemun: Gornji Grad, 96, 103 m, DŽUKIĆ & PASULJEVIĆ 1983, ts; 74. Šurjan, 79 m, ts; 75. Miletićevo: Raroš, 79 m, ts; 76. Veliki Gaj: fish-pond, 83 m, ts; 77. Samoš - Dobrica: Vasinska bara, 79 m, ts; 78. Crepaja: Jama pond, 82 m, ts; 79. Borča Greda: Mali Zbeg, 72, 73, 77 m, ts; 80. Krnjača, 71, 74 m, DŽUKIĆ & PASULJEVIĆ 1983, ts; 81. Krnjača: river-embankment toward Pančevo (II ramp), 71 m, ts; 82. Krnjača: river-embankment toward Pančevo (I ramp), 74 m, ts; 83. Pančevo: Town forest, 71, 74 m, ts; 84. Pančevo, 77 m, SPEVAK 1951; 85. Pančevo: vicinity, 75 m, RADOVANOVIĆ 1957; 86. Ada Forkontumac, 72 m, ts; 87. Vojlovica: Oil refinery, 73, 76 m, ts; 88. Ivanovo, 69 m, DŽUKIĆ & PASULJEVIĆ 1983; 89. Ivanovo: river-embankment, 75 m, ts; 90. Kovin: Ponjavica, 69 m, ts; 91. Kovin, 79 m, DŽUKIĆ & PASULJEVIĆ 1983; 92. Kovin: Crna bara, 77 m, ts; 93. Kovin: Crvenka, 92 m, ts; 94. Gaj: Zvezdana, 87 m, ts; 95. Gaj: Dojčinac, 86 m, ts; 96. Deliblato: Kraljevac, 86 m; 97. Deliblatska peščara: Majur bara, 82 m, DŽUKIĆ & PASULJEVIĆ 1983; 98. Deliblatska peščara: Hatarice, 86 m, ts; 99. Deliblatska peščara: Ružino polje, 96 m, ts; 100. Deliblatska peščara: Šumarak: Lovačka kuća, 114 m, ts; 101. Deliblatska peščara: »Tenkovski put«, 127, 135 m, ts; 102. Dubovac: Mali Lap, 77 m, ts; 103. Deliblatska peščara: line No. H31/H30, 89 m, ts; 104. Deliblatska peščara: Zamfir bara, 80 m, ts; 105. Vlajkovac, 82 m, ts; 106. Orešac: Židovar, 144 m, ts; 107. Deliblatska peščara: Preke njive, 76 m, ts; 108. Deliblatska peščara: Utrine, 70 m, ROT-NIKČEVIĆ et al. 2001; 109. Deliblatska peščara: Zubanov salaš, 72 m, ROT-NIKČEVIĆ et al. 2001; 110. Deliblatska peščara: Đabin salaš, 73 m, ROT-NIKČEVIĆ et al., 2001; 111. Deliblatska peščara: Knjažev salaš, 74 m, ts; 112. Deliblatska peščara: Salaš Vlaških, 72 m, ROT-NIKČEVIĆ et al.; 2001; 113. Vršac: Veliki rit, 84 m, ts; 114. Vršački breg: Vinogradi, 126 m, DOBAN 1959; 115. Vršački breg; Široko bilo, 360 m, ts; 116. Jasenovo: mill, 76 m; ts; 117. Jasenovo: meadow, 77 m, ts; 118. Mali pesak: Vagane, 71 m, ts; 119. Mali pesak: Kremzerov salaš, 108 m, ts; 120. Mali pesak: Orlova umka, 114 m, ts; 121. Deliblatska peščara: Devil bridge, 69 m, ts; 122. Bela Crkva: Jaruga, 83 m, ts; 123. Zasavica: Valjevac, 80 m, ts; 124.

Zasavica: »Jezero«, 79 m, STANKOVIĆ, 2006; 125. Zasavica: Vrbovac, 79 m, STANKOVIĆ, 2006; 126. Vrbovac - Radenković, 79, 81 m, STANKOVIĆ, 2006; 127. Beograd: Topčider, 100, 160 m, KARAMAN 1921; 128. Višnjica, 84, 90, 150 m, SPEVAK 1951, RADOVANOVIĆ 1957; 129. Kladovo: Lolića rit, 41 m, EGGERT 2000; 130. Radujevac, 52, 59 m, ts; 131. Markovac: river Rača, 106, 109 m, GRUJOVIĆ 1961; 132. Staro Lanište: Nova bara, 99, 100 m, ts; 133. Aleksinac: Ćićina, 153, 155 m, ts.

Bulgaria: 1. Orjahovo, 30 m, ts; 2. Nikopol, 25 m, ts; 3. Belena: Persina island, 25 m, UNDŽIJAN 2000; 4. Belensko blato, 20, 25 m, BUREŠ & CONKOV 1942; 5. Svištovsko blato, 20, 25 m, UNDŽIJAN 2000; 6. Svištov, 20, 60 m, BUREŠ & CONKOV 1942; 7. Svištovsko: Kozlovec, 30, 40 m, BUREŠ & CONKOV 1942; 8. Ruse: mouth of the river Rusenski Lom, 15, 20 m, UNDŽIJAN 2000; 9. Ruse, 20, 25 m, KOVAČEV 1912; 10. Rusensko: Marten, 30 m, BEŠKOV 1972; 11. Topčijska river, 50 m, UNDŽIJAN 2000; 12. Tutrakansko: Nova Černa, 20 m, ts; 13. Tutrakansko: Biological station »Kalimok«, 20 m, BEŠKOV & NANEV 2002; 14. Tutrakan, 20, 50 m, UNDŽIJAN 2000; 15. Garvan, 20, 30 m, UNDŽIJAN 2000; 16. Srebarna: Silistrensko jezero, 20, 40 m, BEŠKOV 1972; 17. Durankulak, 0.5, 10 m, BĂCESCU 1935; 18. Šabla: Šablensko jezero, 0.5, 10 m, BEŠKOV 1972; 19. Busalka: Tauk liman, 1. 5 m, ts; 20. Batova reka: valley, 2, 30 m, BĂCESCU 1935; 21. Velikotarnovsko: Saševo, 70 m, ts; 22. Dolni Bogrov, 540 m, BEŠKOV 1972; 23. Sofija: kvart Birimirci, 530 m, ts; 24. Sofijsko: Katina, 520 m, ts; 25. Sofija: Bojansko blato, 680 m, BEŠKOV, 1972; 26. Slivnica, 580, 600 m, ts.

Romania: 1. Bixad, 204 m, GYONGYVER et al. 1999; 2. Turt, 331 m, ts; 3. Băbeşti, 143 m, ARNTZEN, J. W. pc; 4. Decebal, 89 m, GHIRA et al. 2002; 5. Boghiş, 97 m, GHIRA et al. 2002; 6. Traian, 97 m, GHIRA et al. 2002; 7. Paulian, 104 m, GHIRA et al. 2002; 8. Lucăceni, 110 m, GHIRA et al. 2002; 9. Capleni, 108m, GHIRA et al. 2002; 10. Doba, 97m, GHIRA et al. 2002; 11. Domăneşti, 111 m, GHIRA et al. 2002; 12. Carei, 130 m, GHIRA et al. 2002; 13. Sanislău, 155 m, Poliş, Oradea Museum, 1979; 14. Foieni, 118 m, GHIRA et al. 2002; 15. Ianculeşti, 142 m, GHIRA et al. 2002; 16. Marna Noua, 155 m, GHIRA et al. 2002; 17. Piscolţ, 125 m, COVACIU-MARCOV 2002; 18. Văsad, 110 m, COVACIU-MARCOV 2002; 19. Pir, 130 m, GHIRA et al. 2002; 20. Galoşpetreu, 111 m, GHIRA et al. 2002; 21. Tarcea, 110 m, COVACIU-MARCOV, 2002; 22. Otomani, 141 m, COVACIU-MARCOV 2002; 23. Cherechiu, 145 m, COVACIU-MARCOV 2002; 24. Cadea, 145 m, GHIRA et al. 2002; 25. Diosig, 111 m, COVACIU-MARCOV 2002; 26. Andrid, 107 m, ARNTZEN, J. W., 1994 pc; 27. Tăşnad, 167 m, GHIRA et al. 2002; 28. Ady Endre, 121 m, GHIRA et al. 2002; 29. Căuaş, 123 m, GHIRA et al. 2002; 30. Sînmiclăuş, 141 m, GHIRA et al. 2002; 31. Raduleşti, 116 m, GHIRA et al. 2002; 32. Eriu-Sîncrai, 143 m, GHIRA et al. 2002; 33. Ghenci, 121 m, GHIRA et al. 2002; 34. Ghilvaci, 117 m, GHIRA et al. 2002; 35. Chirolt, 119 m, GHIRA et al. 2002; 36. Moftinu Mic, 118 m, GHIRA et al. 2002; 37. Ţeghea, 121 m, GHIRA et al. 2002; 38. Terebeşti, 116 m, GHIRA et al. 2002; 39. Biharia, 125 m, GHIRA et al. 2002; 40. Girişu de Criş, 113 m, GHIRA et al. 2002; 41. Palota, 118 m, GHIRA et al. 2002; 42. Oradea, 145 m, FUHN 1960; 43. Cheresig, 99 m, GHIRA et al. 2002; 44. Toboliu, 101m, GHIRA et al. 2002; 45. Cefa, 105 m, GHIRA et al. 2002; 46. Sîntandrei, 118 m, GHIRA et al. 2002; 47. Livada de Bihor, 153 m, GHIRA et al. 2002; 48. Nojorid, 167 m, GHIRA et al. 2002; 49. Inand, 104 m, GHIRA et al. 2002; 50. Bicaciu, 115 m, GHIRA et al. 2002; 51. Cihei, 173 m, GHIRA et al. 2002; 52. Felcheriu, 300 m, GHIRA et al. 2002; 53. Fughiu, 164 m, GHIRA 1997; 54. Tăuţ, 105 m, GHIRA et al. 2002; 55. Beliu, 130 m, GHIRA et al. 2002; 56. Bocsig, 123 m, ARNTZEN, J.W. 1994, pc; 57. Dieci, 168 m, GHIRA et al. 2002; 58. Ghioroc, 133 m, GHIRA et al. 2002; 59. Arad, 109 m, FUHN 1960; 60. Fîntînele, 123 m, GHIRA et al. 2002; 61. Lipova, 192 m, FUHN 1960; 62. Cladova, 228 m, GHIRA et al. 2002; 63. Satchinez, 100 m, STUGREN 1966; 64. Timişoara, 91 m, FUHN 1960; 65. Pădureni, 87 m, FUHN, I. unp; 66. Percosova, 78 m, STOIAN, F., University of Bucharest, Faculty of Biology, Vertebrate collection, 1979; 67. Baziaş, 211 m, FUHN 1960; 68. Ieşelniţa, 55 m, FUHN 1970; 69. Orşova, 55 m FUHN 1970; 70. Repedea, 536 m, CRĂCIUN, N. 1988, pc; 71. Ilva Mică, 465 m, GHIRA et al. 2002; 72. Beclean, 276 TÖRÖK, Z. 1992, pc; 73. Nuseni, 356 m, GHIRA et al. 2002; 74. Bozieş, 461 m, GHIRA et al. 2002; 75. Manic, 423 m, GHIRA et al. 2002; 76. Orheiu Bistriţei, 375 m, GHIRA et al. 2002; 77. Gherla, 257 m, FUHN 1960; 78. Iclozel, 337 m, GHIRA et al. 2002; 79. Osorhel, 333 m, GHIRA et al. 2002; 80. Gepiu, 115 m, GHIRA et al. 2002; 81. Aschileu Mare, 338 m, GHIRA et al. 2002; 82. Aschileu Mic, 370 m,

GHIRA et al. 2002; 83. Leghia, 576 m, GHIRA et al. 2002; 84. Deuşu, 454 m, GHIRA et al. 2002; 85. Chinteni, 514 m, GHIRA et al. 2002; 86. Corneşti, 466 m, FUHN 1960; 87. Catalina, 446 m, GYONGYVER et al. 1999; 88. Fodora, 366 m, GHIRA et al. 2002; 89. Cluj Napoca, 354 m, SZEKELY & NEMES 2002; 90. Filea de Jos, 571 m, GHIRA et al. 2002; 91. Iara, 426 m, GHIRA et al. 2002; 92. Hunedoara, 287 m, FUHN 1960; 93. Sîntămaria Orlea, 330 m, GHIRA et al. 2002; 94. Bumbeşti-Jiu, 477 m, ARNTZEN, J.W. pc; 95. Alba lulia, 187 m, ARNTZEN, P. & ZUIDERWIJK, A. 1983, pc; 96. Câmpeneşti, 354 m, GHIRA et al. 2002; 97. Tăureni, 269 m, GHIRA et al. 2002; 98. Luduş, 322 m, GHIRA et al. 2002; 99. Zau de Câmpie, 381 m, GHIRA et al. 2002; 100. Blaj, 256 m, GHIRA et al. 2002; 101. Crăieşti, 240 m, GHIRA et al. 2002; 102. Sibiu, 401 m, BĂNĂDUC 2004; 103. Dealul Guşteriţei, 379 m, BĂNĂDUC 2004; 104. Turnu Roşu, 618 m, GHIRA et al. 2002; 105. Cornetu, 497 m, FUHN, I. unp.; 106. Deleni, 337 m, GHIRA et al. 2002; 107. Mogoaia, 308 m, GHIRA et al. 2002; 108. Band, 343 m, GHIRA et al. 2002; 109. Grebenişu de Câmpie, 395 m, GHIRA et al. 2002; 110. Cipău, 262 m, GHIRA et al. 2002; 111. Şaeş, 412 m, GHIRA et al. 2002; 112. Apold, 470 m, GHIRA et. al. 2002; 113. Daneş, 354 m, GHIRA et al. 2002; 114. Viilor, 412 m, GHIRA et al. 2002; 115. Sighişoara, 412 m, FUHN 1960; 116. Albeşti, 376 m, GHIRA et al. 2002; 117. Cund, 416 m, GHIRA et al. 2002; 118. Gogan, 481 m, GHIRA et al. 2002; 119. Pipea, 417 m, GHIRA et al. 2002; 120. Veţca, 378 m, GHIRA et al. 2002; 121. Hetiur, 419 m, GHIRA et al. 2002; 122. Ţopa, 366 m, GHIRA et al. 2002; 123. Rupea, 471 m, GHIRA et al. 2002; 124. Hoghiz, 490 m, GHIRA et al. 2002; 125. Ozun, 509 m, GYONGYVER et al. 1999; 126. Sântionlunca, 509 m, CSATA & CSATA 1996; 127. Chilieni, 524 m, GHIRA et al. 2002; 128. Zălan, 565 m, GYONGYVER et al. 1999; 129. Sântionlunca, 509 m, GHIRA et al. 2002; 130. Bita, 522 m, GHIRA et al. 2002; 131. Boroşneu Mare, 542m, GYONGYVER et al. 1999; 132. Moacşa, 553 m, GYONGYVER et al. 1999; 133. Reci, 574 m, FUHN 1960; 134. Telechia, 533 m, CSATA & CSATA 1996; 135. Brateş, 536 m, GHIRA et al. 2002; 136. Surcea, 539 m, GHIRA et al. 2002; 137. Covasna, 656 m, GHIRA et al. 2002; 138. Ghelinţa, 614 m, GYONGYVER et al. 1999; 139. Târgu Secuiesc, 557 m, CSATA & CSATA 1996; 140. Sînzieni, 593 m, GHIRA et al. 2002; 141. Târgu Secuiesc, 557 m, GHIRA et al. 2002; 142. Lemnia, 592 m, GHIRA et al. 2002; 143. Bicsad, 695 m, GHIRA et al. 2002; 144. Vârghiş, 500 m, GYONGYVER et al. 1999; 145. Baraolt, 464 m, GYONGYVER et al. 1999; 146. Augustin, 442 m, GYONGYVER et al. 1999; 147. Micloşoara, 472 m, GYONGYVER et al. 1999; 148. Ormeniş, 460 m, GHIRA et al. 2002; 149. Racoş, 468 m, GYONGYVER et al. 1999; 150. Chinciuş, 372 m, GHIRA et al. 2002; 151. Târnaveni, 267 m, GHIRA et al. 2002; 152. Bichiş, 364 m, GHIRA et al. 2002; 153. Suplac, 369 m, GHIRA et al. 2002; 154. Dumitreni, 397 m, GHIRA et al. 2002; 155. Corunca, 413 m, GHIRA et al. 2002; 156. Păsăreni, 334 m, GHIRA et al. 2002; 157. Leordeni, 302 m, GHIRA et al. 2002; 158. Sînpaul, 296 m, GHIRA et al. 2002; 159. Bălăuşeri, 324 m, GHIRA et al. 2002; 160. Sîngeorgiu de Pădure, 351 m, GHIRA et al. 2002; 161. Eremieni, 412 m, GHIRA et al. 2002; 162. Miercurea Nirajului, 352 m, GHIRA et al. 2002; 163. Sîntana de Mureş, 293 m, GHIRA et al. 2002; 164. Tîrgu Mureş, 368 m, GHIRA et al. 2002; 165. Dumbrăvioara, 329 m, GHIRA et al. 2002; 167. Reghin, 355 m, FUHN 1960; 166. Suatu, 329 m, GHIRA et al. 2002; 168. Sînmihaiu de Cîmpie, 370 m, GHIRA et al. 2002; 169. Miceştii de Cîmpie, 412 m, GHIRA et al. 2002; 170. Ţaga, 359 m, GHIRA et al. 2002; 171. Geaca, 376 m, FUHN 1960; 172. Nimigea de Jos, 315 m, STUGREN & POPOVICI 1961; 173. Petriş, 418 m, GHIRA et al. 2002; 174. Lechinţa, 346 m, GHIRA et al. 2002; 175. Sîniacob, 330 m, GHIRA et al. 2002; 176. Zamostea, 322 m, Museum of Natural History, Iaşi; 177. Cordăreni, 126 m, Museum of Natural History, Iaşi; 178. Botoşani, 163 m, FUHN 1960; 179. Suceava, 385 m FUHN 1960; 180. Baia, 351 m, FUHN 1960; 181. Bogdăneşti, 341 m, FUHN 1960; 182. Larga-Jijia, 90 m, Museum of Natural History, Iaşi; 183. Iasi, 77 m, FUHN 1960; 184. Valea lui David, 147 m, CRĂCIUN, N. 1988, pc; 185. Bârnova, 147 m, CRĂCIUN, N. 1988, pc; 186. Roman, 181 m, FUHN 1960; 187. Lunca Siretului, 213 m, FUHN, I. unp.; 188. Prundu Costei, 151 m, ŞOVA 1972; 189. Bacău, 163 m, ts; 190. Vaslui, 80 m, FUHN 1960; 191. Luncani, 295 m, GHIRA et al. 2002; 192. Brătuleşti, 356 m, ŞOVA 1972; 193. Bârlad, 69 m, FUHN 1960; 194. Tecuci, 28 m, FUHN 1960; 195. Odobeşti, 155 m, ts; 196. Focşani, 40 m, FUHN 1960; 197. Ariciu, 14 m, ts; 198. Măcin, 27 m, FUHN 1960; 199. Ostrovul Hogioaia, 4 m, COGĂLNICEANU et al. 1998; 200. Luncaviţa, 9 m, TÖRÖK 1999;

201. Sulina, 2 m, FUHN 1971; 202. C.A. Rosetti, 1 m, FUHN 1971; 203. Mila 23, 2.5 m, FUHN 1971; 204. Caraorman, 2 m, OȚEL 1992; 205. Perivolovca, 1 m, OȚEL 1992; 206. Uzlina, 7 m, OȚEL 1992; 207. Maliuc, 5 m, OȚEL 1992; 208. Murighiol, 36 m, ts; 209. Beştepe, 63 m, ts; 210. Sfântu Gheorghe, 1 m, OȚEL 1992; 212. Enisala, 59 m, OȚEL 1992; 211. Grindul Sărături, 1 m, STUGREN & POPOVICI 1961; 213. 6 Martie, 18 m, OȚEL 1992; 214. Capul Dolojman, 25 m, ts; 215. Gura Portiței, 1 m, TÖRÖK 1997; 216. Periteaşca, 1 m, TÖRÖK 1997; 217. Histria, 6 m, OȚEL 1992; 218. Cetatea Histria, 6 m, ts; 219. Grindul Săele, 1 m, TÖRÖK 1997; 220. Sarighiol de Deal, 215 m, ts; 221. Agigea, 14 m, ts; 222. Mangalia, 1 m, FUHN 1960; 223. Gura Gârluței, 16 m, ts; 224. Insula Mică a Brăilei 10 m, ts; 225. Lacul lui Traian, 10 m, ts; 226. Cernavodă, 45 m, FUHN 1960; 227. Feteşti, 30 m, ts; 228. Oltina, 62 m, FUHN 1960; 229. Bugeac, 3 m, FUHN 1960; 230. Slobozia, 35m, FUHN 1960; 231. Olteniţa, 5 m, FUHN 1960; 232. Cernica, 31 m, FUHN 1960; 233. Brăneşti, 57 m, ts; 234. Râioasa Forest, 82 m, ts; 235. Mogoşoaia, 95 m, ts; 236. Scroviştea, 111 m, ts; 237. Nucet, 190 m, FUHN 1960; 238. Naipu 103 m, ts; 239. Comana, 65 m, FUHN 1960; 240. Băneasa, 81 m, ts; 241. Greaca, 66 m, ts; 242. Frăţeşti-Frasinu, 11 m, ts; 243. Giurgiu, 11 m, FUHN 1960; 244. Lunca 14 m, ts; 245. Corabia, 54 m, FUHN 1960; 246. Dăbuleni, 46 m, ts; 247. Amărăştii de Jos, 118 m, ts; 248. Turia, 194 m, GHIRA et al. 2002; 249. Craiova, 108 m, FUHN 1960; 250. Seaca de Pădure, 216 m, ts; 251. Măgurele, 81 m, ts; 252. Pleniţa, 141 m, ts; 253. Ciuperceni, 38 m, FUHN 1960.

Turkey (Thrace): 1. Karaburun, 1 m, EISELT 1988.

Pelobates syriacus

Serbia: 1. Ivanovo, 69 m, DŽUKIĆ & PASULJEVIĆ 1983; 2. Ivanovo: river-embankment, 75 m, ts; 3. Kovin: Ponjavica, 69 m, ts; 4. Kovin: Grad, 79 m, ts; 5. Kovin: Dunav: Bogdanova putanja, 68 m, DŽUKIĆ 1972; 6. Deliblatska peščara: Majur bara, 82 m, DŽUKIĆ 1972; 7. Deliblatska peščara: Hatarice, 86 m, ts; 8. Deliblatska peščara: Ružino polje, 96 m, ts; 9. Deliblatska peščara: Dragićev hat, 79 m, DŽUKIĆ 1994; 10. Deliblatska peščara: Ludvig polje, 81 m, DŽUKIĆ 1994; 11. Deliblatska peščara: Preke njive – Dolnice, 76 m, ts; 12. Deliblatska peščara: Zubanov salaš, 70 m, ts; 13. Deliblatska peščara: Đabin salaš, 72 m, ts; 14. Deliblatska peščara: Knjažev salaš, 74 m, ts; 15. Deliblatska peščara: Salaš Vlaških, 72 m, ts; 16. Deliblatska peščara: Devil bridge, 69 m, ts; 17. Deliblatska peščara: Devojačko brdo, 100 m, ts; 18. Mali pesak, 105 m, ts; 19. Banatska Palanka: Kukuruzara, 82 m, ts; 20. Smederevo: Jezava, 72 m, KARAMAN 1948; 21. Kladovo: Lolića rit, 41 m, EGGERT 2000; 22. Staro Lanište: Nova bara, 99, 100 m, ts; 23. Bobovište: Ciganske livade, 155 m, DŽUKIĆ & PASULJEVIĆ 1983; 24. Rečica: Balta Lakuri, 54 m, ts.

Macedonia: 1. Lepenac: above the Skoplje town, 301 m, KARAMAN 1931; 2. Skopje, 262 m, KARAMAN 1928; 3. Skopsko polje, 222, 236 m, KARAMAN 1931; 4. Ajvatovc – marsh, 369 m, KARAMAN 1931; 5. Petrovec, 224 m, DŽUKIĆ & PASULJEVIĆ 1983; 6. Saramzalino, 230, 309 m, ROT-NIKČEVIĆ et al. 2001; 7. Kočani: Pribačevo, 330, 332 m, ts; 8. Vinica - Berovo: bridge on the Pekljan river, 780 m, DŽUKIĆ & PASULJEVIĆ 1983; 9. Štip, 300 m, KARAMAN 1928; 10. Dubrava (Negotino), 112 m, ts; 11. Prilepsko Golemo Konjari, 608 m, ts; 12. Struga, 695 m, POZZI 1966; 13. Prespa: Novo Perovo, 854 m, KARAMAN 1928; 14. Prespa: Ezerani, 853, UGURTAS et al. 2002; 15. Prespa: Asamati, 855 m, POZZI 1966; 16. Prespa: Nakolec, 853 m, ts; 17. Bitolsko: Žabjani: Bel Kamen, 581, 583 m, ts; 18. Bitolsko: Kremenica: Bukri, 581 m, ts; 19. Bitolsko: Novaci, 580 m, HRISTOVSKI 1979; 20. Mariovo: Skočivir, 580 m; 21. Prdejci, 53 m, ROT-NIKČEVIĆ et al. 2001; 22. Đavato, 52 m, ts; 23. Đavato: Tumba, 60 m, ts; 24. High-way Đevđelija – Bogorodica, 55 m, DŽUKIĆ & PASULJEVIĆ 1983; 25. Stari Dojran, 148, 160 m, KARAMAN 1928; 26. Stari Dojran: Sretenovo, 148 m, ts; 27. Bansko, 207 m, DŽUKIĆ & PASULJEVIĆ 1983; 28. Murtino, 208 m, DŽUKIĆ & PASULJEVIĆ 1983; 29. Turnovo, 208 m, DŽUKIĆ & PASULJEVIĆ 1983; 30. Sekirnik, 210 m, ROT-NIKČEVIĆ et al. 2001; 31. Monospitovo, 205 m, DŽUKIĆ & PASULJEVIĆ 1983; 32. Monospitovsko blato, 205 m, UGURTAS et al. 2002; 33. Mariovo: Bešište, 920 m, ts.

Bulgaria: 1. Nikopol, 25 m, ts; 2. Belene (vicinity of the Balensko blato), 20, 25 m, BUREŠ & CONKOV 1942; 3. Sviščov, 20, 40 m, BUREŠ & CONKOV, 1942; 4. Nova Černa: Biological station »Kalimok«, 20 m, UNDŽIJAN 2000; 5. Nova Černa (Tutrakansko), 20 m, UNDŽIJAN 2000; 6. Garvan (Silistrensko), 20 m, UNDŽIJAN 2000; 7. Srebarna (Silistrensko), 20, 30 m, BEŠKOV 1998; 8. Bezmer - Čestimensko (Tervel), 40 m, UNDŽIJAN 2000; 9. Durankulaško blato, 0, 10 m, STOJANOV 1997; 10. Šablensko blato, 0, 10 m, STOJANOV 1997; 11. Asparuhovo (Varna), 30 m, UNDŽIJAN 2000; 12. Nesebar, 5, 15 m, BUREŠ & CONKOV 1942; 13. Park Rosenec (ex. Otmanli), 0, 15 m, ts; 14. Blato Alepu, 6 m, ts; 15. Blato Arkutino, 1, 10 m, BEŠKOV 1972; 16. Mouth of the river Ropotamo, 1, 10 m, BEŠKOV 1961; 17. Hondros Bay: Perla - Maslen Nos, 20 m, ts; 18. Primorsko: North Beach, 2 m, BEŠKOV 1985; 19. Primorsko, 10 m, BEŠKOV 1985; 20. Đavolsko blato (Primorsko), 2, 10 m, ts; 21. Carevo, 1, 15 m, ts; 22. Sinemorec, 15 m, ts; 23. Trojanovo, 60, 70 m, MILČEV unp.; 24. Blgarovo, 50 m, ts; 25. Prvenec, 60, 70 m, MILČEV unp., 26. Zornica, 60, 70 m, MILČEV unp., 27. Malina – Pravdino, 60, 70 m, MILČEV unp.; 28. Asparuhovo, 0, 30 m, MILČEV unp.; 29. Rusokastro, 30, 40 m, MILČEV unp.; 30. Debelt, 50 m, MILČEV unp.; 31. Vrli Brjag, 3 m, BEŠKOV 1961; 32. Zidarovo, 20, 30 m, MILČEV unp.; 33. Tenevo, 120 m, MILČEV unp.; 34. Elhovo, 80 m, BUREŠ & CONKOV 1942; 35. Lesovo: the Tundža river, 50 m, STOEV 2000; 36. Čerepovo (Sakar Mont.), 360 m, STOJANOV 1997; 37. Harmanli, 40 m, OBST 1973; 38. Markovo (Plovdivsko), 220, 230 m, MÜLLER 1932; 39. Island on the Marica River (Plovdiv), 195 m, ANGELOV & KALČEV 1961; 40. Fish-pond (North Plovdiv), 210, 220 m, ts; 41. Simitli, 300, 330 m, OBUCH & BENDA 1996; 42. Kresna, 175, 190 m, BEŠKOV 1985; 43. Gradešnica, 160 m, ts; 44. Gradeška banja, 310 m, ts; 45. Mikrevo (Sandansko), 160 m, BEŠKOV 1961; 46. Spatovo (Sandansko), 130 m, BEŠKOV 1961; 47. Rupite, 120 m, ts; 48. Novo Konomladi (Sandansko), 160 m, ts.

Romania: 1. Grindul Chituc-Sinoe, 1 m, FUHN 1960; 2. Hagieni Forest, 72 m, FUHN 1960; 3. Hagieni Forest, 72 m, FUHN, pc; 4. Padurea Hagieni, 72 m, FUHN, I.; 5. Padurea Hagieni, 72m, FUHN, pc.; 6. Portița, Lacul Razelm, 1m, ts; 7. Valea Baciului, 65 m, IANA 1970; 8. Agigea 14 m, FUHN 1960; 9. Agigea 14 m, Museum of Natural History, Iaşi, ts.; 10. Agigea, 14 m, Vancea, S., Muzeul Iasi, 1964; 11. Balta Albă, 34 m, ts; 12. Băneasa, Canaraua Fetii, 83 m, SĂLĂGEAN et al., 1978; 13. Baneasa, Canaraua Fetii, 83 m, SALAGEAN et al., 1978; 14. Bugeac, 3 m, FUHN 1960; 15. Cernavodă, 50 m, ts; 16. Cernavoda, 1m, FUHN, pc.; 17. Ciupercenii Noi, 44 m, FUHN 1960; 18. Ciupercenii Noi, 44 m, FUHN, pc.; 19. Dunăreni, 1 m, IANA 1970; 20. Giurgiu, 11 m, FUHN 1960; 21. Greaca, 66 m, FUHN 1960; 22. Histria, 6 m, OȚEL 1992; 23. Mangalia, 1 m, FUHN 1960; 24. Năvodari, 33 m, FUHN 1960; 25. Oltenița, 5m, FUHN 1960; 26. Oltina, 62 m, FUHN 1960; 27. Piatra 8 m, ts; 28. Techirghiol, 1 m, FUHN 1960; 29. Chituc, 1 m, TÖRÖK 1997; 30. Grindul Chituc, 1 m, TÖRÖK 1997; 31. Grindul Lupilor, 1 m, TÖRÖK 1997; 32. Grindul Săele, 1 m, TÖRÖK 1997; 33. Movila Sinoe, 9 m, ts; 34. Periteaşca, 1 m, TÖRÖK 1997.

Turkey (Thrace): 1. Edrine, 120 m, UGURTAS et al. 2002; 2. Gulbaba, EISELT 1988; 3. Swamp near Buyuk Dolluk and Uzunkopru, EISELT 1988; 4. Babaeski, EISELT 1988; 5. Babaeski: Sofuhalil Göleti, 130 m, UGURTAS, pc; 6. Luleburgaz, EISELT 1988; 7. Inece Vil., EISELT 1988; 8. Altinsehir near Mahmutby, EISELT 1988; 9. Karaburun, EISELT 1988; Yassýören, 50 m, UGURTAS pc; 10. Terkos (Durusu) Lake, 10 m, UGURTAS pc.

Greece: 1. Mandra (Thrace), EISELT 1988; 2. Didymotichon (Thrace), EISELT 1988; 3. Evros' Altwasser, EISELT 1988; 4. Evros: Soufli-Dadia-Lefkimmi, CORBETT 1989; 5. Delta Evors, CORBETT 1989; 6. Island Lesbos: Filia, 230 m, EISELT 1988; 7. Tristuika (Sithonia: Penisula Chalkidike), EISELT 1988; 8. Lake Taka (Tripolis, Peloponnes), EISELT 1988; 9. Island Kos (Mactichai - Marmaris), EISELT 1988; 10. Vicinity of Thessaloniki: Sindos, SOFIANIDOU 1977; 11. Levidion – Tripolis, BÖHME 1975; 12. Prespa National Park, 853 m, BOUSBOURDAS & IOANNIDIS 2000; 13. Pirgos (Halastro, Thessaloniki); 14. Galikos (Thessaloniki); 15. Kalohori (Thessaloniki); 16. Kato (Koufalia).