

Distribution patterns of Hermann's Tortoise *Testudo hermanni* GMELIN, 1789, in the region of former Yugoslavia (Testudines: Testudinidae)

Verbreitungsmuster der Griechischen Landschildkröte
Testudo hermanni GMELIN, 1789
im Gebiet des ehemaligen Staates Jugoslawien
(Testudines: Testudinidae)

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KURZFASSUNG

Die Verbreitung der Griechischen Landschildkröte *Testudo hermanni* GMELIN, 1789 auf dem Territorium des ehemaligen Staates Jugoslawien wird anhand der publizierten Nachweise aus dem Zeitraum vom Ende des 19. Jahrhunderts bis zur Gegenwart und der Aufzeichnungen der Autoren beschrieben.

Auch wenn offensichtlich anthropogene Verbringungen von Schildkröten entlang der Adriatischen Meeresküste erfolgten, so können doch einige Populationen im Bereich der nördlichen Adria Restvorkommen einer ursprünglich kontinuierlichen Verbreitung darstellen.

ABSTRACT

The distribution of Hermann's Tortoise *Testudo hermanni* GMELIN, 1789, in the territory of former Yugoslavia was reviewed based on the records published since the end of the 19th century and the authors' observations.

Although anthropogenic translocation of tortoises evidently occurred along the Adriatic coast, some populations in the northern parts of the Adriatic could be relicts of an originally continuous distribution.

KEY WORDS

Reptilia: Testudines: Testudinidae, *Testudo hermanni*, Land tortoises, distribution records, range area, ecology, former Yugoslavia, Balkan Peninsula

INTRODUCTION

Hermann's Tortoise *Testudo hermanni* GMELIN, 1789, is patchily distributed in the northern Mediterranean area (BOUR 1997). Isolated populations occur in west Mediterranean states (Spain, France, Italy) and their islands (Balearic Islands, Corsica, Sardinia and Sicily), while a more continuous distribution is found over most of the Balkan Peninsula (BOUR 1997). The territory of former Yugoslavia, i. e., the current states of Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia (including Kosovo and Metohija) and the Former Yugoslav Republic of Macedonia cover the western and central parts of the Balkan

Peninsula. Over the years, this region emerged as an important research area for many aspects of Hermann's Tortoise biology, such as complex pattern of diversification (FRITZ et al. 2006), ecology (MEEK & INSKEEP 1980; MEEK 1985, 1989; GOLUBOVIĆ et al. 2013), sexual dimorphism and morphological variation (ĐORĐEVIĆ et al. 2011, 2013; LJUBISAVLJEVIĆ et al. 2012), and commercial overharvesting and its consequences on wild populations (LJUBISAVLJEVIĆ et al. 2011). However, comprehensive distribution data that could serve for describing the detailed distribution pattern are still lacking. According to the synoptic

literature of the region (BOUR 1997; CHEYLAN 2001), Hermann's Tortoise occurs along a narrow Adriatic coastal strip, sporadically entering inland regions in Bosnia and Herzegovina and Montenegro, whereas in Serbia and Macedonia it is generally widely distributed. However, it remained unclear whether distribution gaps and scattered distribution pattern presented in the maps mirror data deficiency, absence due to specific ecological demands of the species, or due to long-term overharvesting (LJUBISAVLJEVIĆ et al. 2011).

In this paper the authors depict in detail the distribution of Hermann's Tortoise in the region of former Yugoslavia based upon unpublished, and a number of published distributional data, and elucidate possible ecological and human deleterious effects on the distribution pattern.

The systematic status of Hermann's Tortoise and its populations in the study area is still under debate. *Testudo hermanni* was placed into the genus *Eurotestudo* by some authors (LAPPARENT DE BROIN et al. 2006a, 2006b) while others elevated its west Mediterranean (*T. hermanni hermanni*) and Balkan (*T. hermanni boettgeri* MOJSISOVICS, 1889) forms to species level and recognized Dalmatian populations as a third species, *T. hercegovinensis* WERNER, 1899 (PERÁLA 2002, 2004; BOUR 2004). Since these changes were not widely accepted (FRITZ et al. 2006; PARHAM et al. 2006; FRITZ & BININDA EDMONDS 2007; FRITZ & HAVAŠ 2007), the authors of the present paper refer to the view by the latter authorities in retaining the generic name *Testudo* and the classic two subspecies model.

MATERIALS AND METHODS

The dataset of locations where *T. hermanni* were recorded consists of the authors' unpublished records and the available previously published data from within the territory of former Yugoslavia. A database was created which included locality data: site names, coordinates and elevations (where available) and sources. Moreover, locations were denoted where the presence of Hermann's Tortoises were assumed to be the

result of introduction (i.e., where specimens were spotted only once, without subsequent confirmation or when data were provided by competent persons but remained unsupported by any form of physical evidence such as specimens, shells, fragments, photographs, etc.). Reevaluation of old distribution records was essential to identify possible disappearance from previously occupied areas.

RESULTS

In total, 551 locations of occurrence of Hermann's Tortoise in the region of Former Yugoslavia were recorded. The smallest numbers of localities were found in Slovenia (at the border region to Italy) and in Bosnia and Herzegovina (9 and 15, respectively). There were only 39 localities in Croatia, while the largest number (258 locations) was recorded in Macedonia. In Montenegro and Serbia the record localities numbered 86 and 144, respectively. According to the information presented (Fig. 1), *T. hermanni* is widely distributed in Serbia and FYR Macedonia. The range area in Serbia is

largely outlined by the rivers Sava and Danube in the north and the 20th meridian in the west. In Montenegro and Bosnia and Herzegovina, the tortoise is common to the south of the countries where it is found from the Adriatic coast to the borders of the sub-Mediterranean region in the north-east. In Montenegro, the species is also known to occur on small near-shore islands of the Skadar Lake Archipelago. Within the Central Balkans, *T. hermanni* prefers open hilly terrains, and mountainous areas up to 1200 m (in Serbia) and about 1300 m above sea level (in Macedonia), avoiding the moist

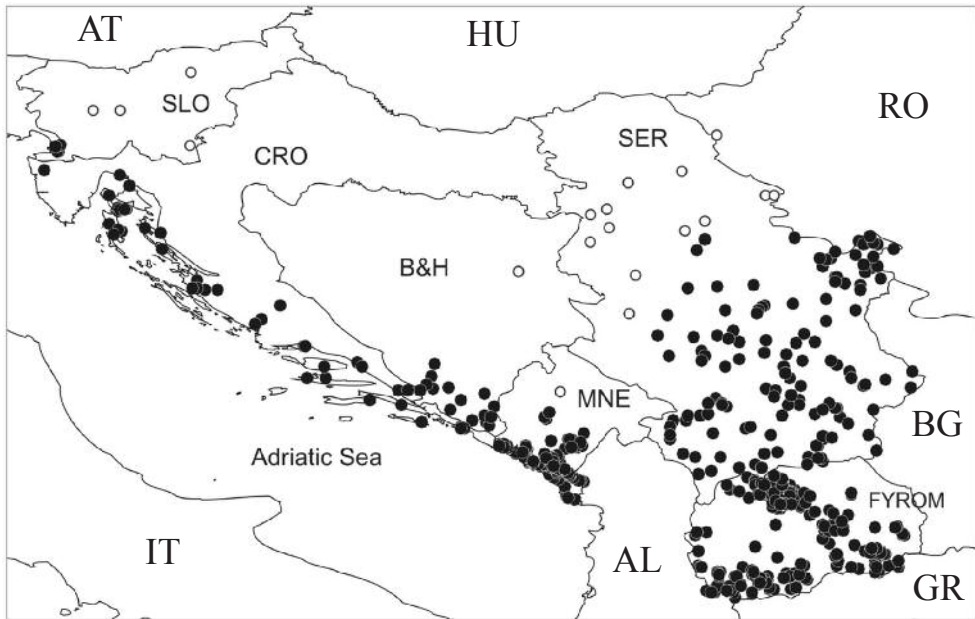


Fig. 1: Distribution of *Testudo hermanni* GMELIN, 1789, in the territory of former Yugoslavia, according to literature data and the authors' unpublished field records. Solid circles – record locations ascribed to natural distribution; empty circles – locations ascribed to anthropogenic introduction. SLO – Slovenia, CRO – Croatia, B&H – Bosnia and Herzegovina, SER – Serbia, MNE – Montenegro, FYROM – Former Yugoslav Republic of Macedonia. Neighboring countries identified by their ISO country codes.

Abb. 1: Verbreitung von *Testudo hermanni* GMELIN, 1789 auf dem Territorium des ehemaligen Jugoslawiens nach den publizierten Nachweisen und den unpublizierten Felddaten der Autoren. Volle Kreise bezeichnen natürliche Vorkommen; leere Kreise bezeichnen vermutete anthropogene Freisetzen. SLO – Slowenien, CRO – Kroatien, B&H – Bosnien and Herzegowina, SER – Serbien, MNE – Montenegro, FYROM – Ehemalige Jugoslawische Republik Mazedonien. Nachbarländer sind mit ihren ISO-Landeskennungen bezeichnet.

flat lowlands in the Pannonian Plain, as well as in the valleys of big rivers, the Velika Morava for example. In many aspects, the vertical distribution of *T. hermanni* in Montenegro corresponds to the pattern in Serbia and Macedonia, however records are restricted to somewhat lower altitudes up to 830 m a.s.l. The northernmost localities were recorded in the border region of north-eastern Italy. In Croatia and Slovenia, *T. hermanni* occurs along the Adriatic coast area, including some islands. There the species reveals a patchy distribution, mainly bound to shrub-covered slopes with scattered clearings at lower elevations (up to 320 m). Hermann's Tortoise is also present on the larger Croatian islands such as the

Kvarner island group (Cres, Krk, Rab, Pag, Plavnik), and on the islands in southern Dalmatia (Brač, Hvar, Korčula, Mljet). Locations where the tortoise was introduced were determined in northern and western Serbia, eastern Bosnia and Herzegovina, northern Montenegro and inland regions of Slovenia. Due to a gap in the north Adriatic region, locations of potential introduction may be those of northern Istria (Srbanj in Croatia, Ankaran in Slovenia and the north-east Italian records). The authors of this paper however, adhere to the view that these coastal populations are likely to be of autochthonous origin and marked them (in Fig. 1) as records of natural distribution (see Discussion).

DISCUSSION

The present study identified a larger range area of *T. hermanni* in more detail than previously recorded in the region of former Yugoslavia (see BOUR 1997; CHEYLAN 2001). This is particularly true for Serbia. The western boundary of the range of *T. hermanni* in Serbia and its association with the 20th meridian is significantly determined by orographic parameters, climatic conditions and vegetation characteristics (JANKOVIĆ 1984; TOMIĆ 1992). This boundary overlaps with the transitional area of Illyrian (western) and Moesian (eastern) floristic Provinces (JANKOVIĆ 1984). According to this demarcation, the range of *T. hermanni* in Serbia undoubtedly belongs to the Moesian (eastern) floristic Province, characterized by a higher proportion of xerothermophilic floristic elements, a more continental climate and different geological foundation (larger silicate areas) in relation to the Illyrian Province. Thus, in inland regions of the species' distribution (Serbia and FYR Macedonia), the presence of habitats connected to the close vicinity of deciduous broad-leaved thermophilous oak forests of the alliances *Quercion frainetto* and *Ostryo-Carpinion orientalis* appeared to be crucial for the distribution of Hermann's Tortoise, as also found for Romanian populations (ROZYŁOWICZ & DOBRE 2010). The maximum abundance of the species was associated with bright thermophilic oak forests and their degradation stages. However, in some parts of Eastern Serbia and along the Ibar River Valley, the species occurs in lilac shrubs on rocky steep limestone slopes, and in Metohia and Macedonia in chestnut forests. In central Italy a few plant species were recently found to determine the distribution pattern of *T. hermanni* at microscale level (DEL VECCHIO et al. 2011). It might well be that similar determinants additionally shape the peculiar distribution patterns in Serbia and other parts of former Yugoslavia.

Surface characteristics of the terrain had more influence on the occurrence of *T. hermanni* than the geological foundation, especially those prevailing on heat-exposed plateaus and diversely sloped surfaces up to 1300 m above sea level. These are primari-

ly shallow, skeletal and dry soils on silicate and limestone foundations. Furthermore, tortoises often occurred on anthropogenically altered grounds and terrains exposed to erosion, as well as in extensively damaged habitats.

Along the Adriatic coast, the tortoises were found in degraded habitats of Mediterranean evergreen oak forests of the *Quercion ilicis* alliance, such as evergreen shrublands of macchia and garrigues, but was also present in grasslands and cultivated fields. As Hermann's Tortoise prefers lower elevations (CHEYLAN 2001; FRITZ et al. 2006; this study), it is largely confined to the coastal region by the adjoining mountain ranges. The inland extension of the species into Herzegovina and Montenegro was accomplished by spreading along the main river valleys of Mediterranean climate.

The distributional gap between Adriatic and Serbian populations corresponds to the zone of high mountains between Serbia and Montenegro, which represent major barriers in spreading of *T. hermanni* (FRITZ et al. 2006). The disjunction between continental and coastal populations continues in northern Albania, coinciding with the Prokletije Mountain Massif, but is not obvious in central and south Albania (HAXHIU 1998). Although the populations of Hermann's Tortoise from the two range areas (Adriatic coast and Balkan inland) differ in some morphological characteristics (LJUBISAVLJEVIĆ et al. 2012), the molecular differentiation caused by limited gene flow through geographical barriers seems to represent an initial stage (FRITZ et al. 2006). Thus, it would be premature to treat them as different subspecies or even species.

So far, the demarcation of the distribution in north-western part appeared particularly intriguing and not well understood. Although some authors proposed the autochthonous origin of the north-eastern Adriatic populations of *T. hermanni* (CHEYLAN 2001 and references therein), the prevailing view was that they were introduced (SAJOVIĆ 1913; TOME 1996; DOVČ et al. 2005; KROFEL et al. 2009; TÓTH et al. 2009; TVRIKOVIĆ et al. 2009; HENKENS et al. 2010), supposing that the populations in

north-eastern Italy, Istria and some Croatian islands probably stem from specimens translocated from southern parts of the Adriatic coast by Catholic monks and gentry who occasionally used them for alimention (SAJOVIĆ 1913; BRUNO & MAUGERI 1977; TOME 1996; FILIPPI et al. 2010).

Although first findings in Slovenia date back to the middle of the 19th century (FREYER 1842), subsequent authors did not include *T. hermanni* in the Slovenian herpetofauna (SAJOVIĆ 1914; ZEI 1958; MRŠIĆ 1997), even delimiting the natural distribution of the species clearly south of the Istrian Peninsula (SIEBENROCK 1906; POZZI 1966; MRŠIĆ 1997). FRITZ et al. (2006) revealed the genetic similarity of Istrian and other populations along the east Adriatic coast. This finding favors neither allochthonous origin of north Adriatic populations nor the hypothesis that they could be the remnants from an originally continuous distribution during the last glaciation period (CHEYLAN 2001). During the Würm glaciation, the level of the Adriatic Sea was about 100 m lower than today, with its northernmost extent at what is now the vicinity of the Monte Gargano-Pelješac section (BOGNAR 1987). Present day islands that run parallel to the coast were part of the mainland throughout the Würm glaciation and formed

only after the climatic amelioration (STEVANOVIĆ et al. 1992). In support of the hypothesis of autochthonous origin of north Adriatic populations there are Pleistocene archaeological records of *T. hermanni* in Istria (vicinity of Pula), northern Dalmatia (vicinity of Karlobag) and central Dalmatia (Vicinity of Split) (PAUNOVIĆ 1983a, 1983b), and the finding that the individuals of a native population in the residual Holm oak forest of Mesola in north-eastern Italy show molecular characteristics typical of the Balkan and Greek *T. h. boettgeri* (MIRIMIN et al. 2004).

The plot of records (Fig. 1) reveals not fully explained gaps in the current distribution of *T. hermanni* and, although there are no natural barriers, the turtle's rather sporadic occurrence in flat or less mountainous areas that, according to their habitat characteristics, appear suitable for tortoises. This probably reflects local extinctions due to post-isolation destruction of habitats on islands (KRYŠTUFEK & KLETEČKI 2007), habitat alteration through urban and agricultural development, especially along the north Adriatic coast (MAZZOTI 2004), and tortoise overharvesting for commercial purposes during the 20th century in the whole study area (LJUBISAVLJEVIĆ et al. 2011).

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APPENDIX 1

Locality data the present study and map (Fig. 1) are based upon (information, if available, in the order: locality name, geographic latitude, longitude, elevation a.s.l., sources); in – introduction, pers. com. – personal communication, unpubl. – unpublished, s.a. – without year, o – ostrvo (island), s – selo (village).

Angaben zu den Fundorten, auf denen die vorliegende Untersuchung und Karte (Abb. 1) basieren (Angaben wenn vorhanden in der Reihenfolge: Name der Lokalität, geogr. Länge, geogr. Breite, Höhe ü. M., Datenquelle); in – Freisetzung, pers. com. – persönliche Mitteilung, unpubl. – unpubliziert, s.a. – ohne Jahr, o – ostrvo (Insel), s – selo (Dorf).

Bosnia and Herzegovina.- 1. Tuzla: s. Stupari, 44°19', 18°42', 399 m, in, Džukić unpubl.; 2. Trebinje, 42°43', 18°21', Werner 1899, Schweiger 2006; 3. Trebinje: Golo Brdo, 42°41', 18°23', Werner 1898; 4. Fatnica, 43°1', 18°20', Tomasini 1894, Werner 1898; 5. Mostar, 43°20', 17°48', Mölendorf 1873, Bolkay 1924; 6. Bileća, 42°53', 18°26', Werner 1898, Bolkay 1924, Radovanović 1951, Veith 1991; 7. Mostar: Blizanci, 43°12', 17°46', Werner 1898; 8. Hutovo blato, 43°4', 17°47', Bolkay 1924; 9. Čapljina, 43°7', 17°43', Radovanović 1951; 10. Zavala, 42°51', 17°58', Radovanović 1951; 11. Hu m, 42°44', 18°12', Radovanović 1951; 12. Stolac, 43°5', 17°57', Veith 1991; 13. Ljubinja, 42°57', 18°5', Veith 1991; 14. Ljubomir, 42°47', 18°20', Veith 1991; 15. Mosko, 42°46', 18°24', Veith 1991.

Croatia.- 1. Cres ostrvo: Rt Meli, 44°44', 14°29', 15 m, Bruno 1980; 2. Dubrovnik: Lapad: Lazaret, 42°40', 18°5', 45 m, Radovanović 1951; 3. Hvar ostrvo: Vrboska, 43°11', 16°39', 18 m, Radovanović 1951; 4. Krk ostrvo: Omišalj, 45°13', 14°34', 85 m, Bruno 1980; 5. Makarska: Bast, 43°21', 16°59', 312 m, Mršić 1987, Schmidler 1999; 6. Plavnik ostrvo, 44°58', 14°32', 10 m, Bruno 1980; 7. Pag ostrvo: Caska, 44°33', 14°55', 12 m, Pavletić 1964; 8. Split: Marjan: Tolovica, 43°31', 16°25', 65 m, Radovanović 1951; 9. Senj: Jablanici, 44°43', 14°54', 40 m, Mršić 1987; 10. Zadar, 44°8', 15°17', Schweiger 2006; 11. o. Rab, 44°46', 14°44', Schweiger 2006; 12. Ploče, 43°3', 17°25', Schweiger 2006; 13. Krka, 43°48', 15°58', Schweiger 2006; 14. Dubrovnik, 42°39', 18°7', Schweiger 2006; 15. Metković, 43°3', 17°39', Veith 1991; 16. Istra: Srbanj, 45°23', 13°40', Fritz et al. 2006; 17. Dalmacija: Lozovac, 43°48', 15°58', Fritz et al. 2006; 18. Dalmacija: Šibenik, 43°45', 15°54', Fritz et al. 2006; 19. Dalmacija: Pelješac, 42°54', 17°27', Fritz et al. 2006; 20. Kvarner: o. Cres, 44°45', 14°26', Sehnal & Schuster 1999, Toth et al. 2006; 21. Kvarner:

o. Cres, 44°57', 14°27', Sehnal & Schuster 1999, Toth et al. 2006; 22. Kvarner: o. Cres, 44°49', 14°21', Sehnal & Schuster 1999, Toth et al. 2006; 23. Kvarner: o. Cres, 44°45', 14°27', Rathbauer 2002, Toth et al. 2006; 24. Kvarner: o. Cres, 45°7', 14°21', Rathbauer 2002, Toth et al. 2006; 25. Kvarner: o. Cres, 44°42', 14°24', Rathbauer 2002, Toth et al. 2006; 26. Kvarner: o. Cres, 44°59', 14°27', Toth et al. 2006; 27. Kvarner: o. Cres, 44°58', 14°28', Toth et al. 2006; 28. Kvarner: o. Plavnik, 44°58', 14°31', Cheylan 2001, Toth et al. 2006; 29. Rijeka, 45°20', 14°28', Depoli 1898, Bruno & Maugeri 1976; 30. pl. Promina, 43°57', 16°10', Kolombatović 1882, 1886; 31. Split, 43°31', 16°26', Kolombatović 1882, 1886; 32. Neretve, 43°3', 17°31', Kolombatović 1882; 33. Zadar, 44°8', 15°14', Rössler 1904; 34. Makarska, 43°18', 17°2', Mršić 1987; 35. Dalmacija: o. Hvar, 43°11', 16°27', Werner 1902, Werner 1908; 36. Dalmacija: o. Korčula, 42°57', 17°7', Germar 1817; 37. Dalmacija: Dubrovnik, 42°39', 18°5', Germar 1817; 38. Dalmacija: ostrvo Mljet, 42°43', 17°40', Werner 1908; 39. Dalmacija: ostrvo Brač, 43°18', 16°38', Werner 1908.

Former Yugoslav Republic of Macedonia.- 1. Ohrid, 41°8', 20°50', 734 m, Karaman 1928; 2. Prespa, 41°4', 20°59', 912 m, Karaman 1922; 3. Resen, 41°5', 20°59', 947 m, Karaman 1928; 4. Skopje, 42°1', 21°25', 274 m, Karaman 1928; 5. Gevgelija, 41°8', 22°29', 98 m, Buresch & Zonkow 1933; 6. Tetovo: Liseč, 42°0', 20°56', 1210 m, Džukić 1972; 7. pl. Bistra: s. Rosoki, 41°33', 20°41', 801 m, Sterijovski et al. 2003a; 8. Bitola: D Staravina, 41°7', 21°32', 660 m, Džukić unpubl.; 9. Rapeš: Dmakovo, 41°7', 21°37', 695 m, Džukić unpubl.; 10. Staravina: Drapeš, 41°5', 21°42', 760 m, Džukić unpubl.; 11. Kruševo: s. Arilevo, 41°24', 21°12', 926 m, Džukić unpubl.; 12. s. Brod: Lokva, 40°57', 21°35', 580 m, Džukić unpubl.; 13. Rapeš-Staravina, 41°5', 21°40', 450 m, Džukić unpubl.; 14. Gevgelija-Skopje, 41°25', 22°15', 118 m,

- Džukić unpubl.; 15. Veselčani-Borotino, 41°17', 21°26', 599 m, Džukić unpubl.; 16. Kavadarci-Vozarci, 41°26', 21°59', 340 m, Džukić unpubl.; 17. Medžitlija-Skočivir, 40°58', 21°38', 576 m, Džukić unpubl.; 18. Bitola-Staravina, 41°5', 21°34', 800 m, Džukić unpubl.; 19. Budimirci-Gradešnica, 41°3', 21°45', 930 m, Džukić unpubl.; 20. Budimirci-Staravina, 41°4', 21°44', 847 m, Džukić unpubl.; 21. Prilep-Gradsko, 41°29', 21°55', 152 m, Džukić unpubl.; 22. Mala Reka, 41°48', 21°28', 940 m, Džukić unpubl.; 23. Rasimbegov most, 41°12', 21°43', 389 m, Džukić unpubl.; 24. Crvena Voda, 41°51', 21°28', 919 m, Džukić unpubl.; 25. Rapeš-Staravina, 41°6', 21°40', 550 m, Džukić unpubl.; 26. Prespansko jezero, 41°1', 20°59', 852 m, Radovanović 1951; 27. Ohrid: Tumba, 41°8', 20°48', 700 m, Radovanović 1951; 28. Skoplja: Trndol, 41°59', 21°24', 352 m, Radovanović 1951; 29. Štavica-Vitolšte, 41°13', 21°41', 562 m, Džukić unpubl.; 30. Skopje: Zajčev Rid, 42°1', 21°24', 312 m, Pavletić 1964, Kopstein & Wettstein 1920; 31. Jablanica-Debr, 41°21', 20°36', 598 m, Kopstein & Wettstein 1920; 32. Kitka, 41°51', 21°30', 1100 m, Dimovski 1966; 33. Štip-Krivolak, 41°35', 21°57', 190 m, Dimovski 1971; 34. Štip-Krivolak, 41°38', 22°1', 308 m, Dimovski 1971; 35. Štip-Krivolak, 41°34', 22°8', 500 m, Dimovski 1971; 36. Štip-Krivolak, 41°36', 22°8', 465 m, Dimovski 1971; 37. Gradsko: Gorna Laka, 41°35', 21°57', 141 m, Fritz et al. 2006; 38. Gradsko: Vardarski Rid, 41°34', 21°56', 205 m, Fritz et al. 2006; 39. Skopje: Vardarište, 41°59', 21°28', 243 m, Cyren 1941; 40. Galičica: s. Olšani, 41°1', 20°49', 880 m, Dimovski 1981; 41. Galičica: s. Peštani, 41°1', 20°49', 757 m, Dimovski 1981; 42. Galičica: s. Trpejca, 40°58', 20°47', 727 m, Dimovski 1981; 43. Galičica: s. Ljubaništa, 40°55', 20°46', 740 m, Dimovski 1981; 44. Galičica: man. Sv. Nau m, 40°55', 20°45', 730 m, Dimovski 1981; 45. Prespansko jezero: Carino, 40°58', 20°54', 875 m, Dimovski 1981; 46. Prespansko jezero: s. Stenje, 40°56', 20°55', 853 m, Dimovski 1981; 47. Prespansko jezero: Oteševo, 40°59', 20°55', 890 m, Dimovski 1981; 48. Ohrid: Labino, 41°7', 20°48', 732 m, Radovanović 1941; 49. Prespansko jezero: Rajca, 41°0', 21°3', 872 m, Radovanović 1941; 50. Dojransko jezero, 41°11', 22°43', 196 m, Radovanović 1941; 51. Gevgelija: Vir, 41°8', 22°31', 49 m, Radovanović 1941; 52. Ohridsko jezero, 41°6', 20°49', 695 m, Radovanović 1941; 53. Ohridsko jezero: Šum vrelo, 41°11', 21°4', 713 m, Radovanović 1941; 54. Ohridsko jezero: St. Nau m, 40°56', 20°41', 714 m, Radovanović 1941; 55. Šar planina: s. Brodec, 42°3', 20°54', 890 m, Grubač 2000; 56. Skopje: Rid, 41°59', 21°25', 406 m, Cyren 1941; 57. Pelagonija: s. Raštani, 41°3', 21°19', 781 m, Nikolovski 1960; 58. Pelagonija: s. Barešani, 40°57', 21°21', 653 m, Nikolovski 1960; 59. Pelagonija: Strčina, 41°1', 21°19', 670 m, Nikolovski 1960; 60. Prespansko jezero: o. Golem Grad, 40°52', 20°59', 870 m, Origanska et al. 1998; 61. Bitola: s. Žabeni, 40°57', 21°24', 585 m, Džukić unpubl.; 62. Bitola: s. Nižepole, 41°0', 21°14', 1200 m, Džukić unpubl.; 63. pl. Pelister, 41°4', 21°15', 840 m, Džukić unpubl.; 64. pl. Pelister, 41°4', 21°14', 874 m, Džukić unpubl.; 65. Bitola: Resen: Prevalec, 41°4', 21°13', 900 m, Džukić unpubl.; 66. Bitola: s. Srpci Gorno, 41°5', 21°13', 927 m, Džukić unpubl.; 67. Prespansko: s. Brajčino, 40°54', 21°10', 1028 m, Džukić unpubl.; 68. Pelagonija: s. Lera, 41°6', 21°10', 720 m, Mikes et al. 1981, Džukić unpubl.; 69. Pelagonija: s. Svinjišta, 41°8', 21°10', 699 m, Mikes et al. 1981, Džukić unpubl.; 70. Pelagonija: s. Streževo, 41°8', 21°11', 702 m, Mikes et al. 1981, Džukić unpubl.; 71. Pelagonija: s. Suvodol, 41°4', 21°30', 630 m, Džukić unpubl.; 72. Pelagonija: Bitola, 41°7', 21°10', 720 m, Džukić unpubl.; 73. Skopska Kotlina: Dračevo, 41°56', 21°32', 240 m, Dimovski 1960; 74. Skopska Kotlina: Dolno Lisičje, 41°57', 21°32', 231 m, Dimovski 1960; 75. Skopska Kotlina: Gorno Lisičje, 41°58', 21°29', 237 m, Dimovski 1960; 76. Skopska Kotlina: Orešani, 41°54', 21°36', 232 m, Dimovski 1960; 77. Skopska Kotlina: Zelenikovo, 41°53', 21°35', 220 m, Dimovski 1960; 78. Skopska Kotlina: Gorno Količani, 41°53', 21°28', 620 m, Dimovski 1960; 79. Skopska Kotlina: Dolno Količani, 41°53', 21°29', 527 m, Dimovski 1960; 80. Skopska Kotlina: Viteka, 41°53', 21°31', 565 m, Dimovski 1960; 81. Skopska Kotlina: Sindjeličevo, 42°1', 21°31', 238 m, Dimovski 1960; 82. Skopska Kotlina: Aračinovo, 42°1', 21°34', 260 m, Dimovski 1960; 83. Skopska Kotlina: Brnjarci, 42°2', 21°33', 295 m, Dimovski 1960; 84. Skopska Kotlina: Ajvatovac, 42°0', 21°37', 315 m, Dimovski 1960; 85. Skopska Kotlina: Mojanci, 42°3', 21°34', 570 m, Dimovski 1960; 86. Skopska Kotlina: Belimbegovo, 41°59', 21°34', 230 m, Dimovski 1960; 87. Skopska Kotlina: Mažari, 41°59', 21°30', 233 m, Dimovski 1960; 88. Skopska Kotlina: Trubarevo, 41°59', 21°32', 232 m, Dimovski 1960; 89. Skopska Kotlina: Petrovac, 41°56', 21°37', 225 m, Dimovski 1960; 90. Skopska Kotlina: Kadino Selo, 41°58', 21°36', 227 m, Dimovski 1960; 91. Skopska Kotlina: Mralino, 41°57', 21°36', 228 m, Dimovski 1960; 92. Skopska Kotlina: Ržaničani, 41°56', 21°38', 230 m, Dimovski 1960; 93. Skopska Kotlina: Ognjanci, 41°55', 21°35', 228 m, Dimovski 1960; 94. Skopska Kotlina: Taor, 41°54', 21°37', 249 m, Dimovski 1960; 95. Skopska kotlina: Rakotinci, 41°56', 21°25', 525 m, Dimovski 1960; 96. Skopska Kotlina: Dobri Dol, 41°56', 21°24', 440 m, Dimovski 1960; 97. Skopska Kotlina: Varvara, 41°55', 21°26', 315 m, Dimovski 1960; 98. Skopska Kotlina: Crvena Voda, 41°51', 21°28', 660 m, Dimovski 1960; 99. Skopska Kotlina: Aldinci, 41°48', 21°26', 1195 m, Dimovski 1960; 100. Skopska Kotlina: Pagaruša, 41°53', 21°30', 570 m, Dimovski 1960; 101. Skopska Kotlina: Malčište, 41°53', 21°23', 460 m, Dimovski 1960; 102. Skopska Kotlina: Crni Vrv, 41°49', 21°23', 1080 m, Dimovski 1960; 103. Skopska Kotlina: Govrlevo, 41°56', 21°21', 590 m, Dimovski 1960; 104. Skopska Kotlina: Gorno Solnje, 41°57', 21°23', 730 m, Dimovski 1960; 105. Skopska Kotlina: Dolno Solnje, 41°57', 21°23', 630 m, Dimovski 1960; 106. Skopska Kotlina: Gorno Nerezi, 41°59', 21°23', 589 m, Dimovski 1960; 107. Skopska Kotlina: Dolno Nerezi, 41°59', 21°22', 303 m, Dimovski 1960; 108. Skopska Kotlina: Glumovo, 41°59', 21°18', 355 m, Dimovski 1960; 109. Skopska Kotlina: Šiševo, 41°58', 21°19', 285 m, Dimovski 1960; 110. Skopska Kotlina: Krušopek, 41°59', 21°21', 490 m, Dimovski 1960; 111. Skopska Kotlina: Matka, 41°58', 21°17', 462 m, Dimovski 1960; 112. Skopska Kotlina: Saraj, 41°59', 21°20', 266 m, Dimovski 1960; 113. Skopska Kotlina: Kondovo, 42°1', 21°19', 295 m, Dimovski 1960; 114. Skopska Kotlina: Kučovo, 42°4', 21°19', 545 m, Dimovski 1960; 115. Skopska Kotlina: Dolno Svilare, 42°2', 21°17', 328 m, Dimovski 1960; 116. Skopska Kotlina: Gorno Svilare, 42°3', 21°17', 388 m,

- Dimovski 1960; 117. Skopska Kotlina: Rašče, 42°1', 21°15', 362 m, Dimovski 1960; 118. Skopska Kotlina: Volkovo, 42°3', 21°22', 276 m, Dimovski 1960; 119. Skopska Kotlina: Novo Selo, 42°2', 21°21', 265 m, Dimovski 1960; 120. Skopska Kotlina: Gjorče Petrov, 42°1', 21°21', 293 m, Dimovski 1960; 121. Skopska Kotlina: Gornjane, 42°7', 21°23', 610 m, Dimovski 1960; 122. Skopska Kotlina: Banjane, 42°6', 21°23', 512 m, Dimovski 1960; 123. Skopska Kotlina: Brazda, 42°5', 21°24', 390 m, Dimovski 1960; 124. Skopska Kotlina: Raduša, 42°5', 21°13', 321 m, Dimovski 1960; 125. Skopska Kotlina: Čučer, 42°6', 21°23', 505 m, Dimovski 1960; 126. Skopska Kotlina: Pobožje, 42°7', 21°26', 577 m, Dimovski 1960; 127. Skopska Kotlina: Kučevište, 42°7', 21°25', 560 m, Dimovski 1960; 128. Skopska Kotlina: Brodec, 42°8', 21°26', 890 m, Dimovski 1960; 129. Skopska Kotlina: Mirkovci, 42°6', 21°24', 475 m, Dimovski 1960; 130. Skopska Kotlina: Ljubanci, 42°6', 21°27', 587 m, Dimovski 1960; 131. Skopska Kotlina: Ljuboten, 42°6', 21°28', 667 m, Dimovski 1960; 132. Skopska Kotlina: Raštak, 42°5', 21°29', 621 m, Dimovski 1960; 133. Skopska Kotlina: Radišani, 42°4', 21°27', 370 m, Dimovski 1960; 134. Skopska Kotlina: Butelj, 42°2', 21°27', 309 m, Dimovski 1960; 135. Skopska Kotlina: Vizibegovo, 42°2', 21°25', 297 m, Dimovski 1960; 136. Skopska Kotlina: Saraj, 42°0', 21°20', 270 m, Dimovski 1960; 137. Skopska Kotlina: Usje, 41°57', 21°28', 315 m, Dimovski 1960; 138. Skopska Kotlina: Kisela Voda, 42°3', 21°15', 321 m, Dimovski 1960; 139. Skopska Kotlina: Gorno Konjare, 41°58', 21°43', 256 m, Dimovski 1960; 140. Skopska Kotlina: Batinci, 41°55', 21°29', 285 m, Dimovski 1960; 141. Skopska Kotlina: Bardovci, 42°2', 21°23', 294 m, Dimovski 1960; 142. Skopska Kotlina: r. Lepenac, 42°2', 21°22', 270 m, Dimovski 1960; 143. Skopska Kotlina: Jurumuleri, 41°58', 21°34', 230 m, Dimovski 1960; 144. Skopska Kotlina: Karabakluk, 41°56', 21°34', 228 m, Dimovski 1960; 145. Skopska Kotlina: Pudarnica, 42°8', 21°7', 668 m, Dimovski 1960; 146. Skopska Kotlina: Goli Rid, 42°6', 21°12', 589 m, Dimovski 1960; 147. Skopska Kotlina: Veternik, 42°1', 21°19', 434 m, Dimovski 1960; 148. Skopska Kotlina: Golema Rudina, 42°4', 21°18', 706 m, Dimovski 1960; 149. Skopska Kotlina: Kale, 42°2', 21°15', 513 m, Dimovski 1960; 150. Skopska Kotlina: Dugački Rid, 42°5', 21°12', 430 m, Dimovski 1960; 151. Skopska Kotlina: Žeden, 42°3', 21°12', 1090 m, Dimovski 1960; 152. Skopska Kotlina: Radiški Rid, 42°4', 21°26', 447 m, Dimovski 1960; 153. Skopska Kotlina: Poliševina, 42°6', 21°23', 590 m, Dimovski 1960; 154. Skopska Kotlina: Osojnica, 41°52', 21°23', 720 m, Dimovski 1960; 155. Skopska Kotlina: Orljak, 42°4', 21°16', 801 m, Dimovski 1960; 156. Skopska Kotlina: Karljajak, 41°58', 21°21', 952 m, Dimovski 1960; 157. Skopska Kotlina: Vrteška, 41°57', 21°14', 660 m, Dimovski 1960; 158. Skopska Kotlina: Kalja, 41°54', 21°27', 454 m, Dimovski 1960; 159. Skopska Kotlina: Suva Gora, 41°55', 21°8', 1141 m, Dimovski 1960; 160. Skopska Kotlina: Pinar, 41°49', 21°41', 293 m, Dimovski 1960; 161. Skopska Kotlina: Korija, 41°50', 21°41', 489 m, Dimovski 1960; 162. Skopska Kotlina: Osoj, 41°57', 21°15', 900 m, Dimovski 1960; 163. Skopska Kotlina: Kitka, 41°51', 21°29', 1150 m, Dimovski 1960; 164. Skopska Kotlina: Koritinje, 41°51', 21°32', 1070 m, Dimovski 1960; 165. Skopska Kotlina: Crni Vrv, 41°52', 21°44', 758 m, Dimovski 1960; 166. Skopska Kotlina: Vodno, 41°58', 21°24', 895 m, Dimovski 1960; 167. Skopska Kotlina: Bulačani, 42°3', 21°29', 395 m, Dimovski 1960; 168. Skopska Kotlina: Ljubanci, 42°7', 21°29', 897 m, Dimovski 1960; 169. Skopska Kotlina: Venac, 41°56', 21°47', 853 m, Dimovski 1960; 170. Skopska Kotlina: Stojkovo Trlo, 41°53', 21°25', 720 m, Dimovski 1960; 171. Skopska Kotlina: Ploča, 42°3', 21°18', 670 m, Dimovski 1960; 172. Skopska Kotlina: Grnčarnica, 41°51', 21°35', 560 m, Dimovski 1960; 173. Skopska Kotlina: Senokos, 42°9', 21°24', 1060 m, Dimovski 1960; 174. Bitolsko: s. Bratin Dol, 41°4', 21°15', 842 m, Džukić unpubl.; 175. Bitolsko, 41°3', 21°14', 950 m, Džukić unpubl.; 176. Gevgelija: Vardarski rid, 41°9', 22°31', 69 m, Džukić unpubl.; 177. pl. Bistra: Rososčka reka, 41°33', 20°41', 858 m, Sterijovski et al. 2004; 178. Skopska kotlina: Crvena Voda-Mala Reka, 41°51', 21°28', 919 m, Džukić unpubl.; 179. Prespa: Stenje-Konjsko, 40°55', 20°58', 970 m, Džukić unpubl.; 180. pl. Galičica: Oteševo, 40°58', 20°53', 1100 m, Džukić unpubl.; 181. Trepeja-Ohrid, 40°59', 20°48', 722 m, Džukić unpubl.; 182. pl. Jakupica: s.Oreš, 41°38', 21°25', 1000 m, Sterijovski et al. 2003a; 183. pl. Ogražden, 41°31', 22°46', 550 m, Sterijovski & Stamatovski 2003b; 184. pl. Ogražden, 41°31', 22°47', 611 m, Sterijovski & Stamatovski 2003b; 185. pl. Ogražden, 41°32', 22°46', 850 m, Sterijovski & Stamatovski 2003b; 186. pl. Ogražden, 41°37', 22°42', 700 m, Sterijovski & Stamatovski 2003b; 187. pl. Ogražden, 41°36', 22°41', 850 m, Sterijovski & Stamatovski 2003b; 188. pl. Jablanica: Gradišta, 41°12', 20°36', 882 m, Sterijovski et al. 2010a; 189. pl. Jablanica: Mala Krasta, 41°11', 20°37', 850 m, Sterijovski et al. 2010a; 190. pl. Kožuf: Nužde, 41°10', 22°18', 750 m, Sterijovski et al. 2010b; 191. pl. Kožuf: Alčak, 41°11', 22°13', 1750 m, Sterijovski et al. 2010b; 192. pl. Kožuf: Mihajlovo, 41°12', 22°4', 1200 m, Sterijovski et al. 2010b; 193. pl. Kožuf: s. Konopište, 41°15', 22°5', 900 m, Sterijovski et al. 2010b; 194. Kosovrasti-Debar, 41°31', 20°34', 633 m, Džukić unpubl.; 195. Kosovrasti: Kosovraška Banja, 41°33', 20°35', 580 m, Džukić unpubl.; 196. Prespa, 40°59', 20°56', 861 m, Džukić unpubl.; 197. Bitolsko: Bitola, 41°2', 21°15', 1006 m, Nikolovski 1960; 198. Prespa, 41°5', 21°0', 907 m, Radovanović 1951; 199. Prespa, 40°56', 20°56', 858 m, Radovanović 1941; 200. Prespa, 41°1', 21°19', 678 m, Radovanović 1951; 201. s. Srpci, 41°5', 21°12', 891 m, Džukić unpubl.; 202. Bitolsko: s. Rotino, 41°4', 21°15', 821 m, Džukić unpubl.; 203. Bitolsko: s. Nižepole, 41°1', 21°14', 1292 m, Džukić unpubl.; 204. Prespa: s. Brajčino, 40°55', 21°10', 1077 m, Džukić unpubl.; 205. Bitolsko: Streževo, 41°9', 21°10', 821 m, Džukić unpubl.; 206. Bitolsko: s. Svinšte, 41°8', 21°11', 739 m, Džukić unpubl.; 207. Ohridsko jezero, 41°5', 20°49', 773 m, Radovanović 1941; 208. Prespa: s. Asamati, 40°59', 21°3', 862 m, Radovanović 1941; 209. Dojran, 41°12', 22°42', 165 m, Radovanović 1941; 210. Prespa, 40°56', 20°54', 898 m, Radovanović 1941; 211. Gevgelisko: Djevdjelija, 41°8', 22°28', 99 m, Radovanović 1941; 212. Ohridsko: Ohrid, 41°6', 20°49', 695 m, Radovanović 1941; 213. Ohridsko: Šu m, 41°11', 20°38', 712 m, Radovanović 1941; 214. Ohridsko: Sv. Nauma, 40°55', 20°44', 701 m, Radovanović 1941; 215. Dolni Polog: Tetovo, 41°59', 21°2', 417 m, Radovanović 1951; 216. Veleško: Veles, 41°44', 21°47', 248 m, Džukić unpubl.;

217. Bogdanci, 41°12', 22°37', 115 m, Džukić unpubl.; 218. Dojransko jezero, 41°15', 22°43', 176 m, Džukić unpubl.; 219. Dojransko jezero, 41°19', 22°35', 131 m, Džukić unpubl.; 220. Strumica: s. Voislavci, 41°36', 22°28', 342 m, Džukić unpubl.; 221. Štip: Kezovica, 41°44', 22°11', 267 m, Džukić unpubl.; 222. Marijanska pl. Nikola Tal, 41°21', 22°22', 239 m, Doflein 1921; 227. Veles: s. Nogaevci, 41°38', 21°55', 167 m, Dimovski 1971; 228. Veles: s. Ulanici, 41°35', 21°57', 143 m, Dimovski 1971; 229. Veles: s. Enešovo, 41°37', 22°11', 223 m, Dimovski 1971; 230. Veles: s. Mušanci, 41°34', 21°59', 150 m, Dimovski 1971; 231. Veles: s. Nogaevci, 41°37', 21°56', 209 m, Dimovski 1971; 232. Veles: s. Džidimirci, 41°34', 22°3', 270 m, Dimovski 1971; 233. Veles: s. Delisinc, 41°47', 21°59', Dimovski 1971; 234. Veles: Bogoslovec, 41°45', 22°2', 490 m, Dimovski 1971; 235. Veles: Orlovo Brdo, 41°34', 22°8', 519 m, Dimovski 1971; 236. Veles: Serta, 41°40', 22°7', 460 m, Dimovski 1971; 237. Zletovo: s. Ratavica, 41°57', 22°13', 429 m, Džukić unpubl.; 238. Zletovo: s. Ratavica, 41°58', 22°13', 474 m, Džukić unpubl.; 239. s. Kaluckova, 41°21', 22°29', 111 m, Doflein 1921; 240. s. Ahranli, 41°21', 22°32', 281 m, Doflein 1921; 241. s. Terzeli, 41°21', 22°31', 278 m, Doflein 1921; 242. s. Kalkova, 41°21', 22°30', 178 m, Doflein 1921; 243. s. Piravo, 41°19', 22°32', 144 m, Doflein 1921; 244. s. Udovo, 41°21', 22°27', 104 m, Doflein 1921; 245. Valandovo, 41°19', 22°34', 191 m, Doflein 1921; 246. s. Mravinca, 41°17', 22°30', 63 m, Doflein 1921; 247. Udovo-Mravinca, 41°18', 22°30', 61 m, Doflein 1921; 248. s. Smokvica, 41°15', 22°28', 98 m, Doflein 1921; 249. s. Negorci, 41°12', 22°28', 118 m, Doflein 1921; 250. s. Negorci, 41°11', 22°29', 77 m, Doflein 1921; 251. s. Veseli, 41°20', 22°32', 254 m, Doflein 1921; 252. Dolno Povardarje, 41°23', 22°29', 250 m, Doflein 1921; 253. Dolno Povardarje, 41°20', 22°25', 145 m, Doflein 1921; 254. Dolno Povardarje, 41°23', 22°26', 242 m, Doflein 1921; 255. Ovcē pole: s. Karatmanovo, 41°46', 21°50', 348 m, Doflein 1921; 256. pl. Pelister: Nižepole, 41°1', 21°15', 960 m, Hristovski 1979; 257. Tikveš: Vitačevo, 41°18', 22°3', 824 m, Džukić unpubl.; 258. Tikveš: Vitačevo, 41°19', 22°4', 850 m, Džukić unpubl.

Montenegro. - 1. Durmitor: Gornja Bukovica, 43°2', 19°8', 1350 m, in, Čupić pers. com.; 2. Ulcinj: Velika plaža, 41°54', 19°17', 22 m, Džukić unpubl.; 3. Ulcinj: Pristan, 41°55', 19°13', 40 m, Džukić unpubl.; 4. Ulcinj: Maslinada, 41°56', 19°12', 161 m, Radovanović 1951; 5. Pečurice, 42°2', 19°11', 140 m, Bolkay 1924; 6. Skadarsko jezero: o. Široka gorica, 42°5', 19°23', 16 m, Džukić unpubl.; 7. Skadarsko jezero: o. Bisage, 42°6', 19°21', 15 m, Džukić unpubl.; 8. Skadarsko jezero: o. Tophana, 42°6', 19°20', 45 m, Džukić unpubl.; 9. Bar: s. Tudemili, 42°7', 19°7', 75 m, Luštrik & Vinko 2006; 10. Skadarsko jezero: o. Moračnik, 42°8', 19°16', 10 m, Džukić & Kalezić unpubl.; 11. Sutomore, 42°8', 19°4', 65 m, Džukić & Kalezić unpubl.; 12. Skadarsko jezero: Malo Beško, 42°9', 19°14', 23 m, Džukić unpubl.; 13. Petrovac: s. Mišići, 42°10', 19°1', 160 m, Luštrik & Vinko 2006; 14. Skadarsko jezero: s. Murići, 42°10', 19°13', 20 m, Džukić unpubl.; 15. Skadarsko jezero: o. Beška, 42°10', 19°14', 15 m, Džukić & Kalezić unpubl.; 16. Skadarsko jezero: o. Golubovo, 42°10', 19°14', 25 m, Džukić & Kalezić unpubl.; 17.

Virpazar: Limljani: Gornji Kraj, 42°11', 19°6', 260 m, Džukić & Kalezić unpubl.; 18. Skadarsko jezero: o. Starčevo, 42°11', 19°13', 15m Ljubisavljević et al. 2011; 19. Virpazar: s. Limljani, 42°12', 19°6', 156 m, Ljubisavljević et al. 2011; 20. Skadarsko jezero: s. Godinje, 42°13', 19°7', 40 m, Biasoletto 1841; 21. Skadarsko jezero: Virpazar, 42°14', 19°6', 25 m, Džukić unpubl.; 22. Crmnica: Brčela: Gornji Brčeli, 42°15', 19°1', 370 m, Ebel 1842; 23. Brčeli: Sv. Nikola, 42°15', 19°1', 305 m, Džukić unpubl.; 24. Sveti Stefan: Djenaši, 42°15', 18°55', 290 m, Anonimous in litt. 1972; 25. Crmnica: s. Utrg, 42°16', 18°59', 430 m, Ebel 1842; 26. Budva: ostrvo Sveti Nikola, 42°16', 18°52', 80 m, Džukić unpubl.; 27. Sv. Stefan: Miločer, 42°16', 18°54', 50 m, Luštrik & Vinko 2008; 28. Budva: ostrvo Sveti Nikola, 42°16', 18°51', 70 m, Radovanović 1956, Džukić unpubl.; 29. Crmnica: Velika Trojica, 42°16', 18°57', 1100 m, Ebel 1842; 30. Skadarsko jezero: o. Vranjina: pećina, 42°16', 19°8', 110 m, Džukić unpubl.; 31. Sv. Stefan: Pržno, 42°16', 18°54', 25 m, Luštrik & Vinko 2006; 32. Budva: Jaz, 42°17', 18°48', 10 m, Meek 1984; 33. Budva: Komosevina, 42°17', 18°50', 300 m, Radovanović 1951; 34. Crmnica: s. Trnovo, 42°17', 19°2', 530 m, Ebel 1842; 35. Budva: Bijeli do, 42°17', 18°50', 35 m, Džukić unpubl.; 36. Budva: Babilonija, 42°17', 18°51', 60 m, Meek 1984; 37. Budva: Dubovica, 42°18', 18°50', 140 m, Džukić unpubl.; 38. Lastva Grbaljska, 42°19', 18°49', 190 m, Džukić unpubl.; 39. Grbaljsko polje: Brda, 42°21', 18°46', 130 m, Meek 1984; 40. Tivat: Radovići, 42°23', 18°40', 110 m, Luštrik & Vinko 2006; 41. Tivat: Radovići, 42°24', 18°40', 112 m, Luštrik & Vinko 2006; 42. Kotor: Trojice, 42°24', 18°46', 220 m, Džukić unpubl.; 43. Tivat: Krašići, 42°24', 18°40', 8 m, Luštrik & Vinko 2006; 44. Dobrota, 42°26', 18°47', 62 m, Džukić unpubl.; 45. Boka Kotorska: Dobrota, 42°26', 18°46', 12 m, Džukić unpubl.; 46. Podgorica: Beri, 42°26', 19°11', 30 m, Džukić unpubl.; 47. Kotor: Dobrota, 42°27', 18°46', 20 m, Radovanović 1951; 48. Podgorica: Doljani, 42°27', 19°19', 80 m, Džukić unpubl.; 49. Zelenika: Dragomir, 42°27', 18°35', 121 m, Radovanović 1941; 50. Podgorica: Zlatica, 42°28', 19°18', 62 m, Bolkay 1924; 51. Dobrota: Tripkovići, 42°28', 18°46', 10 m, Džukić unpubl.; 52. Doljani: bliže Morači, 42°28', 19°17', 56 m, Erdeljanović 1907; 53. Medun, 42°28', 19°22', 476 m, Džukić unpubl.; 54. Doljani: Zlatica, 42°28', 19°18', 65 m, Džukić unpubl.; 55. Herceg Novi: s. Mojdež, 42°29', 18°29', 248 m, Džukić unpubl.; 56. Zagarač: Miogost, 42°31', 19°2', 589 m, Džukić & Kalezić unpubl.; 57. Piperi: Crnci, 42°32', 19°15', 435 m, Džukić unpubl.; 58. Piperi: Crnci Donji, 42°32', 19°13', 112 m, Džukić unpubl.; 59. Piperi: Crnci Gornji, 42°32', 19°14', 493 m, Džukić unpubl.; 60. kanjon Morače: Dromira, 42°36', 19°23', 151 m, Džukić unpubl.; 61. Nikšić: s. Ozrinici, 42°45', 18°59', 630 m, Džukić unpubl.; 62. Nikšić: Trebjesa, 42°46', 18°58', 700 m, Radovanović 1951; 63. Nikšić: s. Lukovo, 42°49', 19°1', 830 m, Ebel 1842; 64. s. Bioče, 42°30', 19°21', Džukić et al. unpubl.; 65. Zelenika: Sasovići, 42°28', 18°34', Džukić unpubl.; 66. Budva: Soliotsko polje, 42°23', 18°45', Džukić unpubl.; 67. Mrčevo polje: Grbalj, 42°21', 18°45', 1 m, Džukić unpubl.; 68. pl. Sutorman, 42°16', 19°8', 520 m, Džukić unpubl.; 69. Skadarsko jezero: o. Vranjina, 42°17', 19°8', Džukić unpubl.; 70. Skadarsko jezero: Karuč, 42°21', 19°7', Džukić

unpubl.; 71. Skadarsko jezero: Rvaši, 42°22', 19°6', Džukić unpubl.; 72. Skadarsko jezero: Šindjon, 42°21', 19°2', Džukić unpubl.; 73. Skadarsko jezero: Riječani, 42°20', 19°3', Džukić unpubl.; 74. Skadarsko jezero: Donje Selo, 42°18', 19°3', Džukić unpubl.; 75. Meterizi: Ivanovo Polje, 42°23', 18°58', Džukić & Kalezić unpubl.; 76. Skadarsko jezero: s. Gornje Krnjice, 42°13', 19°11', 350 m, Džukić & Kalezić unpubl.; 77. Herceg Novi: Kameno, 42°29', 18°32', 436 m, Džukić unpubl.; 78. Gornji Brčeli: Mužovići, 42°20', 18°59', 450 m, Džukić unpubl.; 79. Ulcinj: Velika plaža, 41°55', 19°13', Džukić unpubl.; 80. Virpazar: Orahovačko polje, 42°15', 19°4', Džukić unpubl.; 81. Kotor: Dobrota, 42°27', 18°46', Džukić unpubl.; 82. Budva, 42°18', 18°51', Werner 1898, Schweiger 2006; 83. Herceg Novi, 42°27', 18°32', Schweiger 2006; 84. Tivat, 42°24', 18°44', Schweiger 2006; 85. Sutorina, 42°28', 18°29', Bolkay 1924; 86. Podgorica, 42°27', 19°15', Bolkay 1924, Kopstein & Wettstein 1921.

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Džukić unpubl.; 38. Golija: Golijska reka, 43°25', 20°17', 1430 m, Džukić unpubl.; 39. Grabovac: Crkvice, 43°38', 20°10', 290 m, Džukić unpubl.; 40. Gledičke planine: s. Planinica, 43°41', 20°58', 275 m, Džukić unpubl.; 41. Goč: s. Otroci, 43°38', 20°48', 379 m, Džukić unpubl.; 42. Ibar: grad Maglič, 43°37', 20°33', 255 m, Džukić unpubl.; 43. Ibar: Ušće, 43°28', 20°38', 336 m, Džukić unpubl.; 44. Ibar: s. Biljanovac, 43°25', 20°40', 376 m, Džukić unpubl.; 45. Ibar: s. Donja Brvenica, 43°22', 20°38', 160 m, Džukić unpubl.; 46. Istok: vrelo Istok, 42°47', 20°29', 520 m, Džukić unpubl.; 47. Jabukovac: Balta Ursuluj, 44°21', 22°26', 110 m, Džukić unpubl.; 48. Jastrebac: s. Vitanovac, 43°27', 21°18', 388 m, Džukić 1972; 49. Jagodina: s. Bresje, 43°56', 21°16', 150 m, Džukić unpubl.; 50. Kukavica: s. Mihalovac, 42°52', 22°3', 610 m, Džukić & Kalezić unpubl.; 51. Kačanik, 42°14', 21°16', 520 m, Pasuljević 1968; 52. Kijev: Cerovik, 42°36', 20°45', 595 m, Pasuljević 1968; 53. Kladovo: Podvrška, 44°36', 22°30', 170 m, Džukić & Kalezić unpubl.; 54. Kolare: Odžinac, 43°54', 21°14', 160 m, Ljubisavljević et al. 2011; 55. Kopaonik: Brzeće, 43°18', 20°53', 983 m, Crnobrnja & Rohalj 1988; 56. Kosovo Polje, 42°39', 21°6', 551 m, Fejérváry 1923; 57. Kosovska Mitrovica, 42°53', 20°54', 590 m, Fejérváry 1923; 58. Kruševac, 43°35', 21°19', 205 m, Radovanović 1941; 59. Kragujevac: s. Adžine Livade, 43°54', 20°53', 463 m, Džukić unpubl.; 60. Kuršumlja: s. Rudare, 43°4', 21°19', 460 m, Džukić unpubl.; 61. Kosmaj: Ropočevo, 44°32', 20°35', 195 m, Kalezić unpubl.; 62. Kozjak: Kitka, 42°18', 21°55', 1211 m, Džukić unpubl.; 63. Kruševica: s. Davidovac, 42°32', 21°55', 398 m, Džukić & Kalezić unpubl.; 64. Labljane-Novo Brda: s. Izvor, 42°35', 21°22', 827 m, Džukić unpubl.; 65. Lazareva reka: Kovej, 44°1', 21°57', 350 m, Džukić unpubl.; 66. Lebane: s. Svinjarica, 42°57', 21°40', 397 m, Džukić unpubl.; 67. Lebane: s. Rujkovac, 42°54', 21°40', 510 m, Džukić unpubl.; 68. Leskovac: Crcavac, 42°48', 21°50', 420 m, Džukić unpubl.; 69. Leskovac: s. Zaguzane, 42°55', 21°59', 272 m, Džukić unpubl.; 70. Majdanpek: Debeli Lug, 44°22', 21°55', 320 m, Džukić unpubl.; 71. Majdanpek, 44°26', 21°57', 485 m, Radovanović 1941; 72. Majdanpečke planine, 44°27', 21°53', 599 m, Djordjević 1900; 73. manastir Ivković, 43°52', 21°13', 218 m, Ljubisavljević et al. 2011; 74. Mali Jastrebac: s. Azbresnica, 43°22', 21°42', 420 m, Džukić unpubl.; 75. Mali Požarevac, 44°39', 20°40', 175 m, Džukić unpubl.; 76. Miroč, 44°36', 22°21', 425 m, Djordjević 1900; 77. Miroč, 44°29', 22°16', 495 m, Džukić unpubl.; 78. Medvedja: s. Lece, 42°54', 21°33', 530 m, Džukić unpubl.; 79. Negotin: Mihajlovac, 44°22', 22°30', 60 m, Džukić unpubl.; 80. Negotin, 44°14', 22°32', 42 m, Radovanović 1941; 81. Novo Selo, 44°44', 20°20', 501 m, Fejérváry 1923; 82. Niška Banja: s. Prosek, 43°19', 22°4', 250 m, Džukić unpubl.; 83. Niš: Knez Selo, 43°22', 22°0', 422 m, Džukić unpubl.; 84. Ozren: Lipovac, 43°34', 21°50', 394 m, Džukić unpubl.; 85. Pasjača: s. Dobrotić, 43°11', 21°34', 549 m, Džukić unpubl.; 86. Petrovo Selo: Dobra voda, 44°37', 22°27', 435 m, Ljubisavljević et al. 2011; 87. Prizren: s. Zrze, 42°21', 20°34', 317 m, Džukić unpubl.; 88. Prizren, 42°12', 20°44', 398 m, Fejérváry 1923, Pasuljević 1968; 89. Peć: Jerinjak, 42°40', 20°18', 550 m, Fejérváry 1923, Pasuljević 1968; 90. Priština, 42°40', 21°9', 651 m,

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