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Distribution of the Stag Beetle *Lucanus cervus* (Linnaeus, 1758) (Coleoptera, Scarabaeoidea, Lucanidae) within Romania, Europe

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***Lucanus cervus*, Distribution, Regions, Natura 2000 sites, Romania, Europe**

ABSTRACT

The paper summarises the distribution of *Lucanus cervus* (stag beetle) in Romania over the period 1891–2020 based onliterature reviews, museum specimens and occurrence data (the latter especially from within Natura 2000 sites). The main data sources are reports published in specialized literature; data preserved at the" Ion Borcea" Museum of Natural Sciences in Bacău; on-site observations and collections by Cristina Stancă Moise between the years 2000-2020; as well as the previous work and personal communications of Cornelia Chimişliu (2010-2019), Mihaela Arinton (2003) and N. Olenici (2018). After collation of all data sources, 225 locations for the species were identified in 37 counties (each containing Natura 2000 sites) along with Bucharest City. Based on these data we have drawn a map of the distribution of this species in Romania's nine regions, also considering the collecting period. Considering the gaps in studying the distribution of this protected species in Romania, our paper forms a new baseline for future surveys and studies on *Lucanus cervus.*

INTRODUCTION

Lucanus cervus (Linnaeus, 1758), known as the stag beetle, is a large *Coleoptera* species found all over Europe. Due to habitat loss and/or fragmentation, IUCN (International Union for Conservation of Nature) considers it to be "Near Threatened" (NT) (Nieto and Alexander, 2010) and in need of monitoring (Harvey *et al*., 2011). As a consequence, at a European level it. the species is protected by the European Convention on the Conservation of European Wildlife and Natural Habitats which was adopted at Bern in 1979 and by the Council Directive no. 92/43/CEE (https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm), known as the Habitats Directive (Animal and plant species of community interest whose conservation requires the designation of special areas of conservation). The situation in Romania is better, the species being protected here by the Government Emergency Order no. 57 of 2007 (http://legislatie.just.ro/Public/DetaliiDocument/83289). During the period 2013-2018, the species was therefore considered as having a Favorable Conservation Status (https://liferosalia.ro/lucanus-cervus), now its status being assessed as Low Risk (Tatole *et al*., 2009).

The importance of the species is reflected by ample research on its distribution, habitat, monitoring and conservation that contains severaldistribution maps (Bardiani *et al*., 2017; Campanaro and Bardiani, 2012; Davies *et al*., 2008; Fremlin and Fremlin, 2010; Halil *et al*., 2013; Hawes, 2008; Kuźmiński *et al*., 2020; Méndez *et al*., 2017; Pérez-Bote *et al*., 2006; Pratt, 2000; Rink and Sinsch, 2006; Thomaes *et al*., 2008, 2017; Thomaes, 2009).

One of the best-known maps of *L. cervus'* distribution in Europe (Fig. 1) is based on the data received from specialists of several European countries (both from countries with comprehensive and incomplete data bases, examples of the latter being Albania, Bosnia-Herzegovina, Croatia, France, Romania, Serbia, and Ukraine) (Harvey *et al*., 2011).

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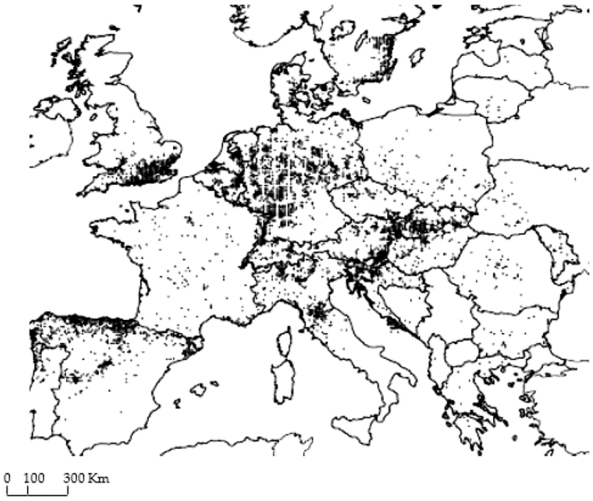

Fig. 1. Distribution of *L. cervus* across Europe. Each dot represents at least one record in a 10 x 10 km^2 area (Harvey *et al*., 2011).

In Romania, the focus of survey efforts on the presence of *L. cervus* since 2007 has been on Natura 2000 sites and the results of this researchhave been reported in specialized papers (Arinton and Ciornei, 2015; Bărbuceanu *et al*., 2015; Bărbuceanu, 2017; Bobîrnac *et al*., 1973; Bucşe and Tăuşan, 2010; Bussler *et al*., 2005; Chimişliu, 2006, 2007a, b, 2014, 2017; Cuzepan and Tăuşan, 2013; Fleck, 1905; Fusu *et al*., 2015; Ieniştea, 1975; Istrate, 2016; Manu *et al*., 2017; Marcu, 1928; Montandon, 1906; Negru and Roşca, 1967; Niculescu and Mitrea, 2016; Nițu, 2007; Ochs, 1921; Petri, 1912; Procheş, 1997; Prunar *et al*., 2013; Roşca, 1976; Ruicănescu, 1992; Stan, 2013; Stan and Nițu, 2013; Stan *et al*., 2016). This research resulted in three historical distribution maps of *L. cervus*. Firstly, 48 Sites of Community Importance (SCIs) were identified in 25 counties (Fig. 2) in 2009 (Tatole *et al*., 2009).

Secondly, a finer-scale distribution map of 10x10 km^2 (Fig. 3) resolution was produced based on data provided by Petru Istrate and Otto Merkl of the Hungarian Natural History Museum (Harvey *et al*., 2011). The authors concluded that the species is in decline in Romania, though this assessment can be questioned given the limited data they used. The majority of Istrate's and Merkl's data was collected in Transylvania and Banat as well as Romania's neighbor, the Republic of Moldova, and therefore incomplete for seven of Romania's nine regions.

In 2013, Stan published a third map (Fig. 4) based on the data kept in the collections of the "Grigore Antipa" Natural History Museum in Bucharest and on specimens photographed by the authors on several Romanian sites (Stan, 2013).

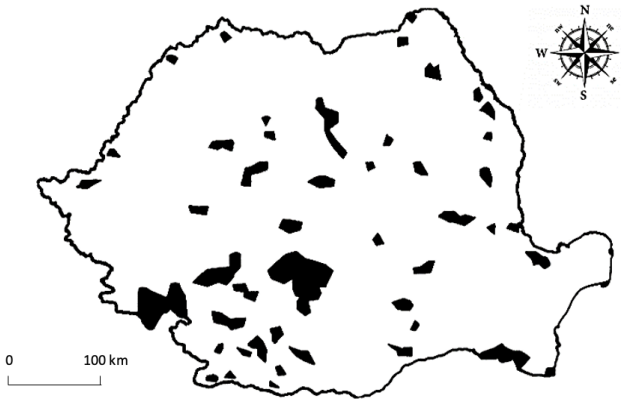

Fig. 2. Distribution map of *L. cervus* in Romania (Tatole *et al*., 2009).

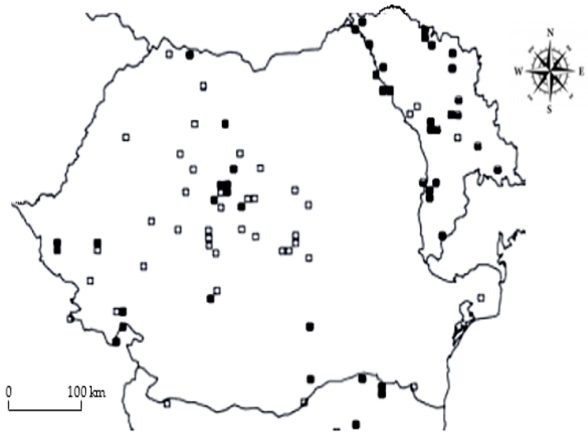

Fig. 3. Distribution map of the stag beetle in Romania and the Republic of Moldova (Harvey *et al*., 2011).

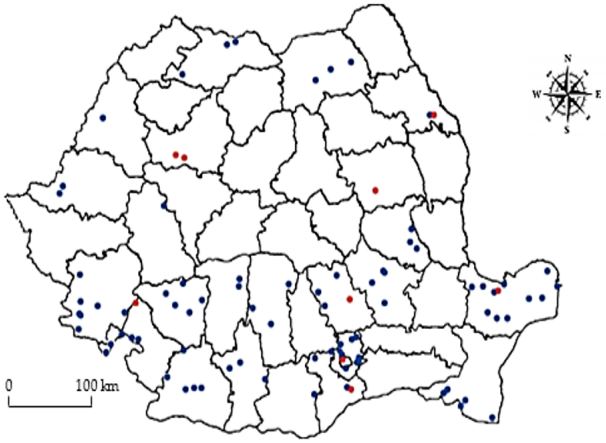

Fig. 4. *Lucanus cervus cervus* distribution in Romania based on examined material (blue bullets) and observed/ photographed specimens (red bullets) (Stan, 2013).

The Natura 2000 programme of surveys reflected by these maps has shown that *L. cervus* is, generally speaking, the most frequently recorded Coleoptera, a frequency that suggests its good conservation status (Bucşe and Tăuşan, 2010; Prunar *et al*., 2013; Stan and Nițu, 2013; Bărbuceanu, 2017; Istrate, 2016; Manu *et al*., 2017; Niculescu and Mitrea, 2016; Stan *et al*., 2016).

The aim of this paper is to provide an updated and wider-ranging description and distribution map of the past and current distribution of *L. cervus* in Romania's nine regions, comprising 41 counties and the Capital City–Bucharest based on data collected between 1891 (first record) and 2020. We hope that our results will encourage further surveys and ecological studies on *L. cervus* in Romania and Europe.

MATERIALS AND METHODS

This paper is based on the following materials: Reports published in specialized literature, unpublished data preserved in the collection of "Ion Borcea" Museum of Natural Sciences in Bacau that was extracted by Mihaela Arinton, data originating from field observations and specimens collected by Cristina Stancă Moise in the period 2000–2020 and personal communication with Cornelia Chimişliu (2010-2019), Mihaela Arinton (2003) and N. Olenici (2018). The previously published reports pertain to specimens preserved in the collections of the Museum of Oltenia in Craiova (Chimişliu, 2007), the Museum of Natural History in Sibiu (Cuzepan and Tăuşan, 2013) and the "Grigore Antipa" Natural History Museum in Bucharest (Stan, 2013). In the following, the data gathered from literature will be identified as previous reports. We reference this data by collecting location (with geographical coordinates) and year of report, followed by the name of the authors of the paper and the publication year. The unpublished data are identified as original data. Here, we indicate the number and sex of the insects, collecting location (with geographic coordinates), collection year and collector's name (legit). For a more encompassing overview of the *Lucanus cervus* distribution, we also present the Sites of Community Importance where the species have been identified in the Order No. 2387 of September 29, 2011 (https://biodiversity.europa.eu/countries/romania) for the modification of the Ministry of Environment and Sustainable Development Order No. 1964 (https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm), regarding the establishment in Romania of the nature protected area status for the Sites of Community Importance, as integrant part of the European ecological network Natura 2000 (http://legislatie.just.ro/Public/DetaliiDocumentAfis/31211).

Romanian is placed in the south-east of trhe Europe, at the boundary between Continental Europe and Balkan Peninsula, at the crossing of 45° North Parallel with 25° East Meridian. On the area of Romania are nine distinct regions: Banat, Bucovina, Crișana, Dobrogea, Maramureș, Moldova, Muntenia, Oltenia and Transylvania.

Abbreviations: Col. NSMC Bacău–Collections of the Ion Borcea Natural Sciences Museums Complex, Bacău; pers. com.–personal communication, SCI-Site of Community Importance.

RESULTS

After compiling and synthesizing the data, we have identified 225 locations where *L. cervus* has been collected in Romania from 1891 to 2020. The insect is widespread in all nine regions (34 counties and Bucharest City, i.e., 83% of the total territory) and no doubt still under-recorded (Table I). From these 225 locations, 187 have been previously mentioned and 53 are original findings by the authors. Of the original findings (Table II), 38 are newly identified and 15 have been previously mentioned, but we have not found them in the data we have found/researched on site. The distribution on provinces and counties is given in Table I.

Based on this data we have designed a map that reflects the species' distribution in the nine historical regions with their respective counties during the following collecting periods: (a) 1891–1950, nine sites; (b) 1951-2000, 34 sites; (c) after 2000, 22 sites. The map also includes the 67 Natura 2000 sites where the species has been identified (Fig. 5).

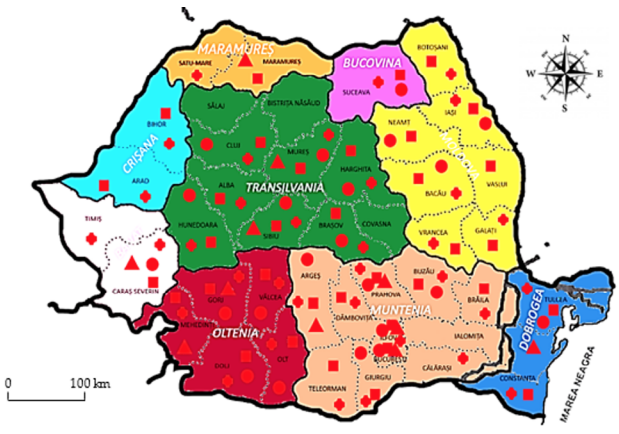

Fig. 5. Distribution map of *Lucanus cervus* in the nine Romanian historical regions (including 34 counties and Buchrest City) during the collecting periods (a) 1891-1950 (■), (b) 1951-2000 (●), (c) after 2000 (✦), (d) Natura 2000 Sites (▲).

Table I. Collecting locations reported in Romania 1891–2020, presented in alphabetical order by regions, counties and sites.

Region	County	Collection site	No. of sites	Collection period
Banat	Caraş-Severin	Bozovici, Băile herculane, Domogled mountains, Gârlişte, Miniş, Moldova nouă, Nera gorges (Lindini clearing), Oraviţa, Sasca montană-damian forest, Stancilova	10	1927-2012
Bucovina	Suceava	Burdujeni, Cacica, Gura humorului, Râşca-slătioara forest, Suceava	5	1961-2018
Crișana	Arad	Arad, Sântana, Utviniş Forest	3	1954-1977
	Bihor	Sânmartin	1	1961-1997
Dobrogea	Constanţa	Başpunar, Canaraua fetii, Cernavodă, Hagieni forest, Negureni, Iortmac Valley	6	1921-1993
	Tulcea	Babadag forest, Caraorman, Celic dere, Ciucurova, Greci, Letea forest, Letea, Măcinului mountains-suluc Valley, Murighiol, Niculiţel (Cocoş monastery), Slava rusă, Sulina, Tulcea	13	1962-2006
Maramureș	Maramureș	Bistra (Bistra valley), Bârsana, Mireşu mare	3	1916-1998
Moldova	Bacău	Bacău, Dospineşti, Gherăieşti, Gioseni, Holt, Livezi, Mănăstirea caşin, Orbeni, Pârâul boghii, Poiana sărată, Prăjeşti, Racova, Sascut, Sănduleni, Scorţeni, Slănic Moldova, Tociloasa, Urecheşti, Budului valley	19	1971-2012
	Botoșani	Botoşani, Gorovei	2	1968-1997
	Galați	Gârboavele forest	1	1968
	Iași	Bivolari, Bârnova, Bârnova forest, Bârnova-repedea forest, Iaşi, Pietrosul-reserve forest, Repedea hill, Slobozia-beech forest	8	1968-2012
	Neamț	Stan hill, Târgu neamţ, Vânători	3	1973- 2003
	Vaslui	Băbuşa	1	1996
	Vrancea	Focşani, Mărăşeşti, Răstoaca, Urecheşti, Vidra	5	1962-1983
Muntenia	Argeș	Broşteni, Ludeşti, Morăreşti, Piteşti, Stoeneşti	5	1906- 2014
	Brăila	Brăila	1	1965 - 1997
	București	Băneasa forest, Broşteni, Bucharest, Bucharest (Museum park), Filaret	5	1905-2009
	Buzău	Arbănaşi-beceni forest, Costeşti-spătaru forest, Izvorul dulce-beceni, Măgura-beech forest	4	1987-2005
	Dâmbovița	Gulia-tărtăşeşti	1	1983-1993
	Giurgiu	Crevedia mare, Comana forest	2	1954-2013
	Ilfov	Brăneşti forest, Căldăruşani, Căldăruşani forest, Cernica forest, Corbeanca, Mogoşoaia, Pasărea forest, Snagov	8	1905-2009
	Prahova	Azuga, Breaza, Prahova riverside (Măgureni), Masivul ciucaş, Mehedinţa (Podenii Noi)	5	1905-2011
	Teleorman	Drăgăneşti-vlaşca	1	1979-1980
Oltenia	Dolj	Amăraşti de Jos, Argentoaia, Bratovoieşti, Bucovăţ, Castrele traiane (Pleniţa forest), Cârligei, Cobia, Craiova, Craiova (Depot), Filiaşi, Negoi, Perişor, Poiana mare, Preajba, Radovan, Radovan (Panaghia forest), Secui, Şimnicu de Sus, Teasc	19	1951-2019
	Gorj	Baia de fier-galbenului valley, Barcului forest, Bengeşti, Bîrseşti, Călugăreasa, Cărbuneşti, Cărpiniş-plaiului valley, Cerna valley, Cheile sohodol, Cloşani, Crasna, Defileul Jiului-"Cârligul Întors, Drăgoieşti forest, Dobrana, Lainici, Lainici monastery Lăzăresti forest, Lăzăresti-prislop point, Locurele hermitage, Novaci forest, pietrele albe, Radoşi-aninisului valley, Radoşi-ciocăzeaua valley, Stănceşti-amaradia valley, Târgu cărbuneşti, Târgu jiu, Olteţului valley, Târgul logreşti, Tismana, Transalpina, Ţiganca valley, Valea haracu, Vişina monastery, Zorleşti	34	1928-2015
	Mehedinți	Eşelniţa, Gura motrului, Gura văii, Mraconia valley, Orşova, Strehaia, Şviniţa, Turnu severin	8	1928-1983
	Olt	Balş, Palanca forest (Nicolae titulescu), Sarului forest, Strehareţ forest (Slatina)	4	1980-2015

Table continued on next page.....

Region	County	Collection site	No. of sites	Collection period
	Vâlcea	Câineni, Călimăneşti, Cozia mountains, Gatejeşti-buneşti forest, Obârşia lotrului, Păuşeşti-otăsău, Stânişoara monastery	7	1956-2016
Transylvania	Alba	Bistra-bistrei valley	1	1998
	Braşov	Braşov-station area, Cincu, Ciucaş mountains, Hărman	4	1963-2014
	Cluj	Cluj, Cheile turzii, Frăsinet, Rece mountain, Sic-păstrăraia	5	1990-2016
	Harghita	Sf. Ana lake, Topliţa-Mărşineţului forest, Uzului valley	3	1960-2007
	Hunedoara	Deva, Geoagiu, Orăştie, Poiana	4	1980-2020
	Mureş	Breite plateau, Buneşti-bircheni forest, Chindra hill, Praid, Roadeş, Sighişoara, Târgu mureş	7	1900-2013
	Sibiu	Apoldul de sus, Biertan, Brad, Bungard, Cisnădioara, Dealul cu Pini, Dumbrava sibiului forest, Guşteriţa hill, Hamba, Ocna sibiului, Paltinului valley, Păuca, Racoviţa, Sibiel, Sibiu, Şura mare, Şuvara saşilor	17	1889-2020

We present below the obtained data, in the alphabetical order of regions name, counties and collecting sites.

Banat region

Caraş-severin county

Previous reports: Bozovici (45°00′04″N 21°57′13″E)-1962 (Cuzepan and Tăuşan, 2013); Băile Herculane (44°52′43″N 22°24′51″E)-1927, 1954, 1968, 1970, 1970, 1978 (Cuzepan and Tăuşan, 2013); 1950, 1952, 1962, 1964, 1971, 1976, 1977, 1978, 1983, 1984, (Stan, 2013); Domogled Mountain (45.09306°N 22.62417°E)-1964, 1965 (Cuzepan and Tăuşan, 2013); 1965, 1984 (Stan, 2013); Gârliste (45°10′39″N 21°48′48″E)-2001 (Stan, 2013); Miniş (46°8′6″N 21°36′16″E)-2012 (Prunar *et al*., 2013); Moldova Nouă (44°43′4″N 21°39′50″E)-1971, 1972, 1973 (Stan, 2013); Nera Gorges (Lindini Clearing) (4.925°N 21.802°E)-2002 (Stan, 2013); Oraviţa (45°2′25″N 21°41′7″E)-1975 (Stan, 2013); Sasca Montană (Damian forestry range) (44°53′49″N 21°41′42″E)-2005 (Stan, 2013); Stancilova (44°48′58″N 21°48′46″E)-2012 (Prunar *et al*., 2013). Original data: Băile Herculane (44°52′43″N 22°24′51″E)-2♂♂, June 1, 1978 legit A. Dima; 1♂ şi 1♀, June 9 1978 legit A. Dima (col. NSMC Bacău). Col. NSMC

Bucovina region

Suceava county

Previous reports: Gura Humorului (47°33′14″N 25°53′21″E)-1986 (Stan, 2013); Râşca-Slătioara Forest (7°21′25″N 26°14′4″E)-1983 (Stan, 2013); Suceava (47°39′5″N 26°15′20″E)-1975 (Stan, 2013). *Original data*: Burdujeni (47°40′33”N 26°16′22”E)-1♂, July 30, 1969, Răileanu (Col. NSMC Bacău); Cacica (47°38′17″N 25°54′00″E)-1♂, July 11, 2018 legit N. Olenici (com. pers. N. Olenici, 2018); Suceava (47°39′5″N 26°15′20″E)-1♂, July 21, 1961 legit G. Răileanu; 1♀, July 15, 1962, legit G. Răileanu; 1♀, July 20, 1962, legit G. Răileanu; 1♂, July 16, 1965, legit G. Răileanu; 1♂, June 15, 1967, legit G. Răileanu (Col. NSMC Bacău).

Crişana region

Arad county

Previous reports: Arad (46°10′36″N 21°18′4″E)-1954 (Stan, 2013); Sântana (46°35′N 21°50′E)-1959 (Cuzepan and Tăuşan, 2013); Utviniş Forest (46°16′51″N 21°24′0″E)-1977 (Stan, 2013).

Bihor county

Sânmartin (47°00′24″N 21°58′29″E)-1961, 1966, 1968, 1980, 1984, 1997 (Stan, 2013).

Dobrogea region

Constanta county

Previous reports: Baş Punar (Fântâna Mare) (45.09306°N 22.62417°E)-1967 [26], 1967); 1955, 1959 (Stan, 2013); Canaraua Fetii (44.05333°N 27.67417°E)-1964; 1966 (Stan, 2013); Cernavodă (44°20′17″N 28°2′1″E)-1921 (Negru and Roşca, 1967); Dumbrăveni forest (forestry range Furnica)-1996, Hagieni Forest (43°47′2″N 28°28′48″E)-1973 (Stan, 2013); Negureni (47°36′04″N 28°30′36″E)-1990, 1993 (Stan, 2013); Iortmac Valley (44.22556°N 27.76167°E)-1972 (Cuzepan and Tăuşan, 2013).

Tulcea county

Previous reports: Babadag Forest (44°53′36″N 28°42′43″E)-1972 (Cuzepan and Tăuşan, 2013; Stan, 2013); Caraorman (45°4′44″N 29°23′35″E)-1991 (Stan, 2013); Celic Dere (45°07′26″N 28°38′07″E)-1992, 2006 (Stan, 2013); Ciucurova (44°55′01″N 28°28′40″E)- 1981 (Stan, 2013); Greci (45°10′02″N 28°15′03″E)-1962, 2005 (Stan, 2013); Letea Forest (45.34028°N 29.52556°E)-1962

Table II. Number of collecting sites within the regions and counties.

Region	County	Previously mentioned sites	Original data		Total no. of sites
			Previously mentioned sites and retrieved	Newly mentioned sites	
1	2	3	4	5	3+5
Banat	Caraş severin	10	1		10
Bucovin	Suceava	3	1	2	5
Crişana	Arad	3			3
	Bihor	1			1
Dobrogea	Constanţa	6			6
	Tulcea	13	2		13
Maramureş	Maramureş	3			3
Moldova	Bacău	2		17	19
	Botoşani	1		1	2
	Galaţi			1	1
	Iaşi	7		1	8
	Neamţ			3	3
	Vaslui			1	1
	Vrancea	4		1	5
Muntenia	Argeş	5			5
	Brăila	1	1		1
	Bucharest	5	1		5
	Buzău	4			4
	Dâmboviţa	1			1
	Giurgiu	2			2
	Ilfov	8			8
	Prahova	5			5
	Teleorman	1			1
Oltenia	Dolj	19	6		19
	Gorj	34			34
	Mehedinţi	8			8
	Olt	4			4
	Vâlcea	6		1	7
Transylvania	Alba	1			1
	Braşov	3		1	4
	Cluj	4		1	5
	Harghita	1		2	3
	Hunedoara	2		2	4
	Mureş	7			7
	Sibiu	13	3	4	17

(Stan, 2013); Letea (45°17′2″N 29°31′27″E)-1968 (Negru, 1968; Procheş, 1997); Măcinului Mountains-Suluc Valley (5°10′22″N 28°18′22″E)-2006 (Stan, 2013); Niculiţel (Mănăstirea Cocoş) (45°12′42.59″N28°24′56.80″E)-1975 (Roşca, 1976); 1972, 1975 (Stan, 2013); Murighiol (44°58′17″N 29°09′05″E)-1978 (Stan, 2013); Slava Rusă (44°51′1″N 28°36′20″E)-1962, 1991, 1993 (Stan, 2013); Sulina (45°9′34″N 29°39′10″E)-1973 (Stan, 2013); Tulcea (45°11′24″N 28°48′0″E)-1975 (Roşca, 1976). *Original data*: Babadag (44°53′53″N 28°44′31″E)-2♂♂,1♀, June 13, 1973 legit A. Dima; 2♂♂, June 28, 1973 legit A. Dima (Col. NSMC Bacău); Niculiţel (Cocoş Monastery)-3♂♂,1♀, July 15, 1968 legit G. Răileanu (Col. NSMC Bacău).

Maramureș region

Maramureș county

Previous reports: Bârsana (47°49′0″N 24°3′32″E)-1995 (Stan, 2013); Bistra (Bistra valley) (47°52′08″N 24°16′47″E)-1998 (Stan, 2013); Mireșu Mare (47°30′11″N 23°20′7″E)-1916 (Stan, 2013).

Moldova region

Bacău county

Previous reports: Caşin Monastery (46°9′11″N 26°41′17″E)-2012 (Stan, 2013); Pârâul Boghii (46°15′42″N 26°38′40″E)- 2011 (Stan, 2013). Original data: Bacău (46°35′0″N 26°55′0″E)-1♂, July 10, 1971 legit A. Dima; 1♀, June 21, 1974 legit A. Dima; 1♂, June 15, 1975 legit A. Dima; 1♀, June 10, 1976 legit A. Dima; 10♂♂, July 10, 1976 legit A. Dima; 2♂♂, June 20, 1978 legit A. Dima; 3♂♂, June 23, 1978 legit A. Dima; 2♂♂, June 28, 1978 legit A. Dima; 1♂, July 11, 1978 legit A. Dima; 1♀, July 11, 1978 legit A. Dima; 3♀♀, July 17, 1978 legit A. Dima; 9♀♀, July 27, 1978 legit A. Dima; 2♂♂, June 13, 1979 legit A. Dima; 1♂, June 4, 1981 legit A. Dima; 5♂♂, June 24, 1983 legit A. Dima; 3♀♀, 2♂♂, June 28, 1990 legit A. Dima; 2♀♀, July 3, 1990 legit A. Dima; 6♂♂, 1♀, June 23, 1992 legit G. Codreanu; 1♀, July 13, 1992 legit G. Codreanu; 1♀, July 15, 1992 legit M. Hongu; 2♂♂, July 22, 1992 legit M. Ciubotaru; 1♂♂, July 27, 1992 legit M. Ciubotaru; 3♂♂, June 16, 1993 legit G. Codreanu; 2♂♂, June 18, 1993 legit G. Codreanu; 1♀, June 18, 1993 legit M. Hongu; 1♂, June 20, 1993 legit M. Codreanu; 1♀, July 4, 1993 legit M. Codreanu; 2♀♀, July 20, 1993 legit M. Hongu; 1♀, August 1, 1993 legit E. Păsălău; 1♂, June 19, 1995 legit E. Păsălău; 2♂♂, July 5, 1996 legit L. Doroftei; 1♂, June 3, 1996 legit E. Păsălău; 1♂, June 6, 1996 legit L. Doroftei; 1♂, June 10, 1996 legit C. Chirilă; 2♂♂, June 10, 1996 legit E. Păsălău; 5♂♂, June 13, 1996 legit E. Păsălău; 1♀, June 13, 1996 legit E. Păsălău; 1♂, June 17, 1996 legit C. Chirilă; 1♂, June 25, 1996 legit M. Hongu; 2♂♂, June 27, 1996 legit M. Hongu; 2♀♀, June 28, 1996 legit L. Doroftei; 2♀♀, June 29, 1996 legit M. Hongu; 1♀, July 11, 2004 legit O. Pavel; 1♀, July 8, 2005 legit L. Doroftei; 1♀, August 3, 2005 legit M. Arinton; 1♂, July 8, 2008 legit C. Puşcaşu (Col. NSMC Bacău); Dospinești (46°34′55″N 26°59′16″E)-13♂♂, 1♀, June 23, 1992 legit E. Păsălău; 7♂♂, June 24, 1992 legit E. Păsălău; 5♀♀, June 23, 1993 legit E. Păsălău; 3♂♂, June 12, 1995 legit E. Păsălău (Col. NSMC Bacău); Gherăieşti (47°1′27″N 26°49′20″E) - 1♀, June 1, 1973 legit G. Răileanu (Col. NSMC Bacău), Gioseni (46°25′45″N 26°59′32″E)- 1♂, July 15, 1992, legit M. Ciubotaru; 1♂, July 9, 1995, legit M. Ciubotaru; (Col. NSMC Bacău); Holt (46°34′42″N 26°58′29″E)-1♀, June 25, 2003, legit M. Arinton; 1♀, July 9, 2006 legit M. Arinton; 2♂♂, 1♀, June 22, 2011 legit M. Arinton; 1♂, July 5, 2011 legit M. Arinton; 5♂♂, July 7, 2011 legit M. Arinton (Col. NSMC Bacău); Livezi (Bacău) (46°24′23″N 26°44′10″E)-2 ♀♀, July 28, 2003, legit M. Arinton (M. Arinton, com. pers. 2003); Orbeni (46°16′38″N 27°1′19″E)-1♂, July 24, 1992, legit M. Hongu); Poiana Sărată (46°8′33″N 26°27′23″E)-1♀, June 24, 2004 legit M. Hongu (Col. NSMC Bacău); Prăjești (46°39′16″N 26°58′34″E)-2♂♂, June 11, 1985, legit E. Păsălău (Col. NSMC Bacău); Racova (46°42′31″N 26°45′11″E)-1♀, July 5, 1977 legit A. Dima; 1♂, June 23, 1983 legit E. Păsălău; 1♂, July 23, 1985 legit A. Dima; 1♀, August 08, 1986 legit A. Dima; 1♀, August 22, 1990 legit A. Dima; 2♀♀, August 4, 1995 legit C. Ursachi (Col. NSMC Bacău); Sănduleni (46°26′25″N 26°44′18″E) -1♂, July 30, 2011 legit D. Paraschiv (Col. NSMC Bacău); Săscut (46°12′26″N 27°6′37″E)-1♂, June 27, 1996 legit M. Hongu; (Col. NSMC Bacău); Scorțeni (46°33′8″N 26°39′47″E)-1♂, August 4, 2011 legit O. Jigău; 1♀, August 4, 2011 legit O. Jigău (Col. NSMC Bacău); Slănic Moldova (46°12′24″N 26°26′18″E)- 1♂, August 14, 2006 legit O. Goagă; Tociloasa (46°31'0" N. 27°4'60" E) -1♀, Mai 24, 1996 legit C. Chirilă (col. NSMC Bacău); Urecheşti (46°7′57″N 27°5′9″E) -1♂, July 13, 1983, legit A. Dima; Budului Valley (46°35′46″N 26°49′8″E) -1♂, May 28, 1996 legit L. Doroftei; 1♀, June 23, 2005 legit L. Doroftei (Col. NSMC Bacău).

Botoșani county

Previous reports: Botoşani (47°44′N 26°41′E)-1997 (Procheș, 1997) . Original data: Gorovei (47°52′36″N 26°20′41″E)-1♀, July 6, 1968 legit G. Răileanu (col. NSMC Bacău).

Galați county

Original data: Gârboavele Forest (27°59′56″E45.57667°N)-1♂, July 6, 1968 legit G. (Col. NSMC Bacău).

Iaşi county

Previous reports: Bivolari (47°33′46″N 27°24′29″E)-2010 (Arinton and Ciornei, 2015) ; Bârnova (47°05′32″N 27°38′14″E)-1968 (Stan, 2013); Bârnova Forest (47°01'30"N 27°33'95"E)-2012 (Stan, 2013); Bârnova-Repedea Forest (47°05′32″N 27°38′14″E)-1968, 2012 (Stan, 2013); Pietrosul-Reserve Forest (46°59.366' N 27°41.268'E, 235 m)–2012 (Stan and Nițu, 2013); Repedea Hill (47°5'12.56"N 27°38'43.7"E)-2012; (Stan and Nițu, 2013); Slobozia-Beech Forest (697829.901767991X, 615604.079740532 Y)-2012 (Stan and Nițu, 2013). Original data: Iaşi (47°9′44″N 27°35′20″E)-1♂, June 5, 1990, legit Voicu (Col. NSMC Bacău).

Neamț county

Original data: Stan Hill (46.9771611°N 26.5324222°E)-3♂♂; 2♀♀, August 13, 2003, legit M. Arinton (Arinton, com. pers. 2003); Târgu Neamț (7°12′9″N 26°21′31″E)-2♀♀, July 5, 1996 legit E. Păsălău (Col. NSMC Bacău); Vânători (47°12′40″N 26°19′30″E) -1♀, July 27, 2000 legit G. Gurău (Col. NSMC Bacău).

Vaslui county

Original data: Băbuşa (46°48′31″N 27°13′38″E) -2♂♂,1♀, June 22, 1996 legit C. Chirilă (Col. NSMC Bacău).

Vrancea county

Previous reports: Focşani (45°41′49″N 27°11′12″E)-1978 (Stan, 2013); Mărăşeşti (45°52′48″N 27°13′48″E)-1970 (Stan, 2013); Răstoaca (45°39′45″N 27°16′54″E)-1972 (Stan, 2013); Vidra (45°54′33″N 26°53′42″E)-1962 (Stan, 2013). *Original data*: Urecheşti (45°35′59″N 27°03′57″E)-1♂, July 13, 1983 legit A. Dima (Col. NSMC Bacău).

Muntenia region

Argeş county

Previous reports: Broşteni (44°42′59″N 24°52′1″E)-1906 (Stan, 2013); Ludeşti (44°52′24″N 25°14′40″E)–2014 (Bărbuceanu *et al*., 2015); Morăreşti (45°00′28″N 24°33′48″E)-1970 (Stan, 2013); Piteşti (44°51′38″N 24°52′4″E)-1990 (Stan, 2013); Stoeneşti (45°15′46″N 25°10′27″E)-1990 (Stan, 2013).

Brăila county

Previous reports: Brăila (45°16′9″N 27°57′27″E)-1997 (Procheş, 1997) . *Original data*: Brăila (45°16′9″N 27°57′27″E)-1 ♂, July 12, 1965, legit V. Apetri; 2 ♀♀, July 12, 1965, legit V. Apetri (Col. NSMC Bacău).

Bucharest

Previous reports: Băneasa Forest (44° 31′ 2″ N 26° 36′ 0″ E)-1979, 1991, 1998 (Stan, 2013); 1997 (Procheş, 1997); Broşteni (47°14′39″N 25°41′53″E)-1906 (Montandon, 1906); Bucureşti-1906 (Montandon, 1906); 1961, 1966, 1968, 1980, 1984, 1991, 1998, 2006, 2007, 2009 (Stan, 2013); Bucharest (Museum park) (44.4532 N-26.0849 E -2006, 2007, 2009 (Stan, 2013); Filaret-1905 (Fleck, 1905); Original data: Băneasa Forest (44° 31′ 2″ N 26° 36′ 0″ E)-1♀, August 22, 1991 legit E. Păsălău (Col. NSMC Bacău).

Buzău county

Previous reports: Arbănaşi (Beceni, school camp): (5°23′56″N 26°44′12″E)-2005 (Stan, 2013); Costeşti-Spătaru Forest (45°3′N 26°46′E)-1987 Izvorul Dulce-Beceni (45°6′41″N 26°37′55″E)-1999, 2000, 2005 (Stan, 2013); Măgura (45°16′44″N 26°34′52″E)- 2004 (Stan, 2013).

Dâmbovița county

Previous reports: Gulia-Tărtăşeşti (44°32′48″N 25°52′17″E)-1993 (Stan, 2013).

Giurgiu county

Previous reports: Crevedia Mare (44°26′23″N 25°36′55″)-1976 (Stan, 2013); Comana forest (44.14056°N 26.11194°E)-1954, 1955, 1958, 1963, 1974, 1976, 1977, 1979, 1981, 1989, 2013 (Stan, 2013).

Ilfov county

Previous reports: Brăneşti Forest (44°27′25″N 26°20′1″E)-1962, 1963 (Stan, 2013); Căldăruşani (44°44′11″N 26°13′14″E)-1905 (Fleck, 1905); Căldăruşani Forest (44°44′11″N 26°13′14″E)-1959, 1962 (Stan, 2013); Cernica Forest (44.44333°N 26.29556°E)-1960, 2009 (Stan, 2013); Corbeanca (44°35′52.6″N 26°2′43.1″E)-1996 (Stan, 2013); Mogoşoaia (44°31′34″N 26°0′12″E)-1961, 1967 (Stan, 2013); Pasărea Forest (44°28′34″N 26°18′33″E)-1951, 1959, 1960, 1962, 1963, 1970, 1984, 1992 (Stan, 2013); Snagov (44°42′2″N 26°9′47″E)-1962, 1975, 1976, 1979, 1991 (Stan, 2013).

Prahova county

Previous reports: Azuga (45°26′42″N 25°33′19″E)-1905 (Fleck, 1905); Breaza (5°11′14″N 25°39′44″E)-1985 (Stan, 2013); Lunca Prahovei (Măgureni) (45°02′38″N 25°45′06″E)-1964 (Stan, 2013); Ciucaş Mts. (45.50389°N 25.95278°E)-2009 (Stan, 2013); Mehedința (Podenii Noi) (45°5′42″N 26°11′13″E)-2011 (Stan, 2013).

Teleorman county

Previous reports: Drăgăneşti-Vlaşca (44°6′7″N 25°35′46″E)-1979, 1980 (Stan, 2013).

Oltenia region

Dolj county

Previous reports: Amăraşti de Jos (43°57′2″N 24°9′46″E)-1969 (Chimişliu, 2007); Argentoaia (44°31′00″N 23°22′00″E)-1995 (Chimişliu, 2007); Bratovoeşti (44°7′40″N 23°54′13″E)–2015 (Chimişliu, 2007); Bucovăț (44°16′53″N 23°42′27″E)-1967, 1996, 1997, 1998, 1999, 2000, 2001, 2003 (Chimişliu, 2007); Castrele Traiane (Plenița Forest) 44°13’34.7”N 23°09’06.8”E-1981 (Stan, 2013); Cârligei (44°17′1″N 23°44′49″E)–2014 (Manu *et al*., 2017); Cobia (44°47′42″N 25°19′53″E)-1983 (Stan, 2013); Craiova

(44°20′N 23°49′E)-1982, 1991, 1993, 1994, 1996, 1997 (Chimişliu, 2007); Craiova (Depou) (44°20′N 23°49′E)-1984 (Chimişliu, 2007); Filiaşi (44°24′0″N 23°31′12″E)-1990, 1992, 1994 (Chimişliu, 2007); Negoi (43°54′11″N 23°21′46″E)-1992, 1993 (Chimişliu, 2007); Radovan (Panaghia Forest) (44°11′02″N 23°34′39″E)-1984 (Stan, 2013); Perişor (44°08′46″N 23°29′07″E)-1982 (Stan, 2013); Pleniţa Forest (44.24694°N 23.15917°E)-1951, 1959 (Chimişliu, 2007); Poiana Mare (43°55′15″N 23°03′31″E)-1980, 1990, 1994 (Chimişliu, 2007); Preajba (44°15′54″N 23°51′0″E)-1973 (Chimişliu, 2007); Radovan-2003 (Chimişliu, 2007); Secui (44°11′36″N 23°51′39″E)-2011, 2014, 2017 (Chimişliu, 2017); Şimnicu de Sus (44°24′23″N 23°48′09″E)-1998, 2000 (Chimişliu, 2007); Slatina-Strehareţ Forest (44°26′13″N 24°22′12″E)-1980 (Stan, 2013); Teasc (44°10′41″N 23°52′08″E)-1996 (Chimişliu, 2007).

Original data: (C. Chimişliu com. pers., 2010-2019): Bratovoieşti (44°7′40″N 23°54′13″E)-1♂♂, 3♀♀ July 15, 2013; 2♂♂, 5 ♀♀ July 9, 2016; 2♂♂, 2♀♀ July 14, 2018; Bucovăţ (44°16′53″N 23°42′27″E) - 3♂♂, 4 ♀♀, June 28, 2010; 1♂, 2♀♀, June 28, 2019); Craiova (44°20′N 23°49′E)-2♂♂, 3♀♀ July 15, 2012; 1 ♀ July 5, 2015; 1♂, 2♀♀ July 25, 2019; Filiaşi (44°24′0″N 23°31′12″E)-2♂♂, 1♀ July 20, 2018; Preajba (44°15′54″N 23°51′0″E)-3♀♀ July 2, 2016; Secui (44°11′36″N 23°51′39″E)-1♂, 2♀♀ July 26, 2011; 2♀♀ July 25, 2014; 1♀ July 12, 2016; 1♂, 1♀ July 5, 2018; 3♀♀ August 2, 2019.

Gorj county

Previous reports: Baia de Fier-Galbenului Valley (45°15′51″N 23°44′37″E)-2005 (Chimişliu, 2014); Barcului Forest-2015 (Bărbuceanu, 2017); Bengeşti (45°4′17″N 23°35′20″E)-2014 (Manu *et al*., 2017); Bîrseşti (45°3′12″N 23°14′7″E)-1953 (Chimişliu, 2006); Călugăreasa (45°2′29″N 23°38′29″E)–2014 (Manu *et al*., 2017); Cărbuneşti (44°58′11″N 23°31′11″E)-2003 (Chimişliu, 2007); Valea Bistriţei (45°6′42″N 23°2′23″E)-2005 (Chimişliu, 2006); Cărpiniş-Plaiului Valley (45°11′N 23°33′E)-2015 (Bărbuceanu, 2017); Cerna Valley (45°05′35″N 22°37′27″E)-2015 (Bărbuceanu, 2017); Cheile Sohodol (45.14500°N 23.13889°E)-1979, 1987 (Chimişliu, 2006); 1992 (Stan, 2013); Cloşani (45°04′08″N 22°48′8″E)-1928 (Marcu, 1928); Crasna (45°12′52″N 23°33′48″E)-2015 (Bărbuceanu, 2017); Defileul Jiului "Cârligul Întors", fire scar at railway bridge, 11,5 km N i.b.f. of B.-J. (N 45°16.42 - EO 23°23.28), 475 m a.s.l.)-2004 (Bussler *et al*., 2005); Drăgoieşti forest (45°10′43″N 23°30′17″E)-2014 (Bărbuceanu, 2017); Dobrana (45°3′15″N 23°40′2″E)–2014 (Manu *et al*., 2017); Lainici (45°15′50.75″N 23°23′32.90″E)-1967 (Chimişliu, 2006); Lainici Monastery (N 45°13.30 - EO 23°23.02)-2004 (Bussler *et al*., 2005); Lăzăresti Forest (45°8′0″N 23°24′46″E)-2015 (Bărbuceanu, 2017); Lăzăresti-Prislop Point (45°8′0″N 23°24′46″E)-2015 (Bărbuceanu, 2017); Locurele Hermitage (45°3′2″N 22°56′56″E-2004 (Stan, 2013); Novaci Forest (45°10′48″N 23°40′12″E)-2015 (Bărbuceanu, 2017); Olteţului Valley (44°16′50″N 24°10′40″E)-2015 (Bărbuceanu, 2017); Pietrele Albe–1999 (Chimişliu, 2006); Radoşi-Aninisului Valley (45°11′18″N 23°35′46″E)-2015 (Bărbuceanu, 2017); Radoşi-Ciocăzeaua Valley (45°11′18″N 23°35′46″E)-2015 (Bărbuceanu, 2017); Stănceşti-Amaradia Valley (45°10′34″N 23°28′0″E)-2015 (Bărbuceanu, 2017); Târgu Cărbuneşti (44°58′11″N 23°31′11″E)-1984 (Stan, 2013); Târgu Jiu (45°02′02″N 23°16′29″E)-1969 (Stan, 2013); Târgul Logreşti (44°52′19″N 23°42′50″E)-1975 (Chimişliu, 2007); Tismana (45°3′2″N 22°56′56″E)-1928 (Marcu, 1928); 1970 (Chimişliu, 2006); Transalpina Road-2015 (Bărbuceanu, 2017); Ţiganca Valley (45.05583 N 23.64376 326 E)–2014 (Manu *et al*., 2017); Valea Haracu (45.05332N 23.63246 275 E)–2014 (Manu *et al*., 2017); Vişina Monastery (N 45°13.21-EO 23°23.03)-2004 (Bussler *et al*., 2005); Zorleşti (45°05′28″N 23°43′12″E)-1995 (Stan, 2013).

Mehedinţi county

Previous reports: Eşelniţa (44°44′31″N 22°16′11″E)–1964 (Stan, 2013); Gura Motrului (44°33′19″N 23°26′12″E)-1983 Gura Văii (44°40′2″N 22°33′23″E)-1978 (Stan, 2013); Mraconia Valley (44.617°N 22.267°E)-1968 (Stan, 2013); Orşova (44°43′31″N 22°23′46″E)–1968 (Stan, 2013); Strehaia (44°37′20″N 23°11′50″E)-1953 (Chimişliu, 2007); Şviniţa (44°30′00″N 22°06′17″E) 1966-1971 [29]; 1969 (Stan, 2013); Turnu Severin (44°37′24″N 22°40′04″E)-1928 (Marcu, 1928).

Olt county

Previous reports: Balş (44°21′N 24°5′E)-1997 (Chimişliu, 2007); Palanca Forest (Nicolae Titulescu) (44°15′28″N 24°43′14″E)-1980 (Stan, 2013); Sarului Forest (44.44028°N 24.18556°E)-1986 (Marcu, 1928); 1981 (Stan, 2013); Strehareţ Forest (Slatina) (44°26′13″N 24°22′12″E)-1980 (Stan, 2013).

Vâlcea county

Previous reports: Câineni (45°29′43″N 24°18′32″E)-2003 (Chimişliu, 2007); Călimăneşti (45°14′21″N 24°20′36″E)-1969 (Stan, 2013); Cozia Mountains (45.00111°N 24.30056°E)-1956 (Cuzepan and Tăuşan, 2013); Gatejeşti-Buneşti Forest (45°5′46″N 24°12′1″E)-2016 (Niculescu and Mitrea, 2016); Obârşia Lotrului (45°26'5"N 23°37'51"E)-2007 (Stan, 2013); Stânişoara Monastery (45°14′21″N 24°20′36″E) -2002 (Stan, 2013).

Original data: Păuşeşti-Otăsău (45°04′16″N 24°07′49″E)-2♂♂, 1♀, June 17, 2014 legit C. Stancă-Moise.

Transylvania region

Alba county

Previous reports: Bistra-Bistrei Valley (46°04′17″N 23°34′23″E)-1998 (Stan, 2013).

Braşov county

Previous reports: Cincu (45°54′52″N 24°48′13″E)-1963 (Cuzepan and Tăuşan, 2013); Ciucaş Mountains (45°50′95″N25°94′77″E)-2009 (Stan, 2013); Hărman (45°42′24″N 25°41′8″E)-(without further data) legit Deubel (Cuzepan and Tăuşan, 2013).

Original data: Braşov-Station area (45°39′N 25°36′E)-1♂, 1♀, May 30, 2014 legit C. Stancă-Moise.

Cluj county

Previous reports: Cheile Turzii (46°33′56″N 23°40′19″E) 1990-1992 (Ruicănescu, 1992); Frăsinet (46°36′56″N 23°23′06″E)-2012, 2013 (Stan, 2013); Rece Mountain (46°38′04″N 23°14′18″E)-2012 (Stan, 2013); Sic-Păstrăraia (46°55‘54“ N 23°56‘13”E)–2002 (Nițu, 2007).

Original data: Cluj (Neighborhood Câmpului) (46°46′0″N 23°35′0″E)-1♂, 1♀, May 24, 2016, legit C. Stancă-Moise.

Harghita county

Previous reports: St. Ana Lake (46.126385°N 25.88689°E)-1960 (Cuzepan and Tăuşan, 2013), Uzului Valley (46°20′35″N 26°15′10″E)- 2 ♂♂, June 16, 1993, legit M. Hongu (Col. NSMC Bacău); 1♂, July 16, 1995, legit V. Pavel; 1 ♀, July 05, 1997, legit M. Ciubotaru; 1 ♂, July 5, 1997, legit O. Goagă (Col. NSMC Bacău). Original data: Topliţa-Mărşineţului Forest (46°55′25″N 25°20′45″E)-1♂, 1♀, July 1, 2007 legit C. Stancă-Moise.

Hunedoara county

Previous reports: Deva (45°52′N 22°54′E)–1993 [56]; Poiana (46°05′11″N 23°03′19″E)- 1980 (Stan, 2013). Original data: Geoagiu (45°55′12″N 23°12′0″E)-11♂♂, 13♀♀, May 18, 2020 legit C. Stancă-Moise; 1♂, 20 June, 2020 legit C. Stancă-Moise; Orăştie (45°51′N 23°12′E)-2♂♂, 1♀, May 17, 2020 legit C. Stancă-Moise.

Mureş county

Previous reports: Breite Plateau (46°11.033’-46°13.058’N 24°44,877’- 24°46,428’E)– 2006-2009 (Cuzepan and Tăuşan, 2013); Buneşti-Bircheni Forest (46°06′25″N 25°03′26″E) - 2012 (Istrate, 2016); Chindra Hill (46°32′59″N 24°33′35″E)-2012, 2013 (Istrate, 2016); Praid (46°33′09″N 25°07′28″E)–1994 (Szel *et al*., 1995); Roadeş (46°7′40″N 25°6′32″E)-2011 (Istrate, 2016); Sighişoara (46°13′1″N 24°47′28″E)-1900 (Cuzepan and Tăuşan, 2013); 2013 (Istrate, 2016); Târgu Mureş (46°32′59″N 24°33′35″E)-2000 (Istrate, 2016).

Sibiu county

Previous reports: Apoldul de Sus (45°51′2″N 23°49′40″E)-1950, 1958 (Cuzepan and Tăuşan, 2013); Brad (46°07′46″N 22°47′24″E)-1959 (Cuzepan and Tăuşan, 2013); Bungard (45°46′31″N 24°13′23″E)-1956 (Cuzepan and Tăuşan, 2013); Cisnădioara (45°42′16″N 24°6′46″E); (without further data) (Stan, 2013); Dealul cu Pini (45.664011°N, 24.228714°E- 45.665042°N24.2 38093°E)-2014-2015 (Stan *et al*., 2016); Guşteriţa Hill (45°48’4156”N24°11’4783”E)-1889, 1891, 1955, 1956, 1970 (Cuzepan and Tăuşan, 2013); Hamba (45°51′47″N 24°11′49″E)-1956 (Cuzepan and Tăuşan, 2013); Ocna Sibiului (45°52′54″N 24°03′41″E)-1962 (Cuzepan and Tăuşan, 2013); Paltinului Valley (45.545633°N, 24.238817°E)-2014 (Stan *et al*., 2016); Racoviţa (45°40′45″N 24°20′38″E)-1983, 1984, 1989, 1990, 1991, 1992, 1999, 2000 (Chimişliu, 2007); Sibiu (45°47′45″N 24°9′8″E)-1917, 1923, 1929, 1931, 1952, 1954, 1955, 1959, 1958, 1963, 1970, 1974, 1976 (Cuzepan and Tăuşan, 2013); Şura Mare (45°51′9″N 24°10′11″E)-1972 (Cuzepan and Tăuşan, 2013); Şuvara Saşilor (45.672256°N, 24.230792°E-45.66336°N, 24.21624°E)-2014-2015 (Stan *et al*., 2016).

Original data: Biertan (46°08′10″N 24°31′15″E)-1♀, June 12, 2020 legit C. Stancă-Moise; Cisnădioara- 3♂♂, 4♀♀, June 17, 2019 legit C. Stancă-Moise; Guşteriţa Hill-2♂♂, 1♀, May 24, 2018 legit C. Stancă-Moise; Dumbrava Sibiului Forest (45°45’3757”N24°7’3438”E)-1♂, 1♀, June 29, 2000 legit C. Stancă-Moise; 1♀, May 17, 2020 legit C. Stancă-Moise; 1♂, May 18, 2020, legit C. Stancă-Moise; 1♀, June 22, 2020 legit C. Stancă-Moise; Păuca (46°00′37″N 23°53′22″E) - 3♂♂, 5♀♀, May 15, 2017 legit C. Stancă-Moise; Sibiel (Bărcul Roşu Forest, Subpărăţel Forest) (45°45′58″N 23°54′29″E)-1♀, May 27, 2000 legit C. Stancă-Moise; 3♂♂, 2♀♀, June 27, 2002 legit C. Stancă-Moise; 2♂♂, 1♀, May 24, 2018 legit C. Stancă-Moise; 3♂♂, 2♀♀, June 17, 2019 legit C. Stancă-Moise; 3♂♂, 2♀♀, June 2, 2020 legit C. Stancă-Moise; Sibiu-2♂♂, 3♀♀, June 29, 2002 legit C. Stancă-Moise; 1♂, 1♀, May 5, 2006 legit C. Stancă-Moise; 1♂, 1♀, May 18, 2020 legit C. Stancă-Moise.

DISCUSSION

The Annex III of the Order no. 2387, September 2011

identifies 67 SCIs where the presence of *Lucanus cervus* was reported. These sites are spread over all 34 counties of the regions of Romania (Table III). Their location is presented in the Annex No. 1 of the Order no. 2387, September 2011.

Table III. Sites of community importance where *Lucanus cervus* was identified.

No.	Natura 2000 code	Name of the site	County	Regions
1	ROSCI0069	Domogled-Valea Cernei	Caraş-Severin	Banat
			Mehedinţi, Gorj	Oltenia
2	ROSCI0031	Cheile Nerei-Beuşniţa	Caraş-Severin	Banat
3	ROSCI0206	Porţile de Fier	Caraş-Severin Mehedinţi	Banat Oltenia
4	ROSCI0108	Lunca Mureșului inferior	Timiș	Banat
			Arad	Crișana
5	ROSCI0048	Crișul Alb	Arad	Crișana
6	ROSCI0218	Dealul Mocrei-Rovina-Ineu	Arad	
7	ROSCI0407	Zarandul de Vest	Arad	
8	ROSCI0406	Zarandul de Est	Arad	Crișana,
			Hunedoara	Transylvania
9	ROSCI0220	Săcueni-Lacul Cicoş	Bihor	Crișana
10	ROSCI0020	Câmpia Careiului	Satu Mare	Maramureș
			Bihor	Crișana
11	ROSCI0071	Dumbrăveni-Valea Urluia - Lacul Vederoasa	Constanța	Dobrogea
12	ROSCI0149	Pădurea Eseschioi-Lacul Bugeac	Constanța	
13	ROSCI0157	Pădurea Hagieni– Cotul Văii	Constanța	
14	ROSCI0172	Pădurea și Valea, Canaraua Fetii - Iortmac	Constanța	
15	ROSCI0123	Munţii Măcinului	Tulcea	
16	ROSCI0214	Râul Tur	Satu Mare	Maramureș
17	ROSCI0162	Lunca Siretului Inferior	Bacău, Galați Vrancea	Moldova
			Brăila	Muntenia
18	ROSCI0184	Pădurea Zamostea-Lunca	Botoșani	Moldova
			Suceava	Bucovina
19	ROSCI0151	Pădurea Gârboavele	Galați	Moldova
20	ROSCI0135	Pădurea Bârnova-Repedea	Iași	
21	ROSCI0171	Pădurea și pajitile de la Mârzeti	Iași	
22	ROSCI0181	Pădurea Uricani	Iași	
23	ROSCI0026	Cenaru	Vrancea	
24	ROSCI0142	Pădurea Dalhăuți	Vrancea	
25	ROSCI0268	Valea Vâlsanului	Argeș	Muntenia
26	ROSCI0326	Muscelele Argeșului	Argeș	
27	ROSCI0341	Pădurea și Lacul Stolnici	Argeș	
28	ROSCI0354	Platforma Cotmeana	Argeș,	Muntenia,
			Vâlcea	Oltenia

Table continued on next page.....

No.	Natura 2000 code	Name of the site	County	Regions
29	ROSCI0386	Râul Vedea	Olt	Oltenia
			Teleorman, Argeș	Muntenia
30	ROSCI0057	Dealul Istrița	Buzău	Muntenia
31	ROSCI0103	Lunca Buzăului	Buzău	
32	ROSCI0343	Pădurile din Silvostepa Mostiștei	Călărași	
33	ROSCI0344	Pădurile din Sudul Piemontului Cândești	Dâmbovița	
34	ROSCI0043	Comana	Giurgiu	
35	ROSCI0224	Scroviștea	Ilfov	
36	ROSCI0045	Coridorul Jiului	Dolj, Gorj, Olt, Mehedinți	Oltenia
37	ROSCI0202	Silvostepa Olteniei	Dolj	
38	ROSCI0129	Nordul Gorjului de Vest	Gorj	
39	ROSCI0359	Prigoria - Bengeti	Gorj	
40	ROSCI0063	Defileul Jiului	Gorj	Oltenia
			Hunedoara	Transylvania
41	ROSCI0198	Platoul Mehedinți	Gorj, Mehedinți	Oltenia
42	ROSCI0306	Jiana	Mehedinți	
43	ROSCI0140	Pădurea Călugărească	Olt	
44	ROSCI0166	Pădurea Reca Hotărani	Olt	
45	ROSCI0168	Pădurea Sarului	Olt	
46	ROSCI0177	Pădurea Topana	Olt	
47	ROSCI022F	Seaca-Optășani	Olt	
48	ROSCI0046	Cozia	Vâlcea	
49	ROSCI0128	Nordul Gorjului de Est	Vâlcea, Gorj	
50	ROSCI0296	Dealurile Drăgășaniului	Vâlcea, Olt	
51	ROSCI0147	Padurea de stejar pufos de la Mirăslău	Alba	Transylvania
52	ROSCI0004	Băgău	Alba	
53	ROSCI0303	Hârtibaciu Sud-Est	Brașov	
54	ROSCI0352	Perșani	Brașov	
55	ROSCI0013	Bucegi	Brașov	Transylvania,
			Prahova, Dâmbovița	Muntenia
56	ROSCI0099	Lacul Știucilor-Sic-Puini-Bonida	Cluj	Transylvania
57	ROSCI0233	Someșul Rece	Cluj	
58	ROSCI0238 ROSCI0263	Suatu-Cojocna- Crairât Valea Ierii	Cluj	
59	ROSCI0253	Trascău	Cluj, Alba	
60	ROSCI0154	Pădurea Glodeni	Mureș	
61	ROSCI0342	Pădurea Târgu Mureș	Mureș	
62	ROSCI0019	Călimani-Gurghiu	Mureș, Harghita	Transylvania,
			Suceava	Bucovina
63	ROSCI0297	Dealurile Târnavei Mici-Bicheș	Harghita, Mureș	Transylvania
64	ROSCI0357	Porumbeni	Harghita, Mureș	
65	ROSCI0227	Sighișoara-Târnava Mare	Mureș, Sibiu, Brașov	
66	ROSCI0122	Munții Făgăraș	Sibiu, Brașov	
			Argeș	Muntenia
			Vâlcea	Oltenia
67	ROSCI0304	Hârtibaciu Sud-Vest	Sibiu	

L. cervus is a widespread species in Romania, excepting the high alpine areas, yet being present even near the Black Sea, in Caraorman and Letea Forests (Fusu *et al*., 2015). In the *Coleoptera* catalogue of 1912, Perti mentions that *L. cervus* "is a species to be found in the mountain and hilly areas, in oak forests" (Petri, 1912). Our data confirms this claim, since it verifies the presence of the stag beetle in Romania's 34 counties and Bucharest City as follows: Banat–one out of two counties, Bucovina–only one county, Crişana–two out of three, Dobrogea–both counties, Maramureş–one of two, Moldova–all seven counties, Muntenia–nine counties of 11, Oltenia–all five counties and Transylvania–seven of 10, respectively. The largest number of collecting locations are in Oltenia (72 locations), Transylvania (41), Moldova (39), Muntenia (33), followed by Dobrogea; the lowest presence is in Banat (10), Bucovina (5), Crişana (4) and Maramureş (3). The uneven presence of the species is due not only to its inaccurate representation through insufficient research or unpublished results, but also to the differing number of counties in each region as well as the relief and vegetation that determine the presence or absence of favourable habitats for this species. For instance, in our research we have not found reports about the species' presence in the following counties: Timiş (Banat), Satu Mare (Maramureş), Ialomiţa and Călăraşi (Muntenia), Covasna, Bistriţa-Năsăud and Sălaj (Transylvania). Nevertheless, Timiş, Satu Mare and Călăraşi counties are mentioned in the Annex III of the Order No. 2387/2011 (Szel *et al*., 1995), meaning that–until the finalizing of this research in 2021 the presence of *L. cervus* has been confirmed in 37 of 41 Romanian counties. The Natura 2000 sites where the presence of *L. cervus* has been reported are distributed over all 34 counties. The oldest specimen of the *L. cervus* collections analyzed for this paper is a male collected on June 28, 1891 on Gusterita Hill, near Sibiu (Transylvania) and kept in the Transylvania Society Collection, of the Brukenthal Museum in Sibiu (Cuzepan and Tăuşan, 2013). Although the species has not been identified in the SCIs of 7 counties Maramureş (Maramureş), (Muntenia), Neamţ, Vaslui (Moldova), Bistriţa-Năsăud, Covasna, Sălaj (Transylvania), our data confirms its presence in the counties Maramureş, Neamţ and Vaslui. This means that the species has not been reported in four counties: Bistriţa-Năsăud, Covasna, Sălaj and Ialomiţa.

CONCLUSION

While we have by no means exhausted all bibliographic sources where the species may have been reported, this paper is based on substantial published and other research as noted earlier, and therefore brings a systematic, updated, and expanded contribution to knowledge about the distribution and historical evolution of this species in Romania. Our paper the refore serves as a reference point and can become a valuable resource for subsequent research on *L. cervus*. Its results will be complemented in the future by the discovery of still unpublished data at research and academic institutes and museums as well as on-site research in many new locations where the insect may potentially be discovered.

Although at this moment the species appears to have a good conservation status in Romania, its presence needs active measures to avoid the reduction, exhaustion, or fragmentation of its habitats. Moreover, further research is needed to adequately assess whether the species has declined in abundance or distribution on a larger spatial scale. Being a saproxilophagous species, the presence of dead wood is vital for the survival of *L. cervus* (Sprecher-Uebersax, 2003). Preserving old trees and prohibiting the removal of dead wood from forests and parks may positively influence this species' presence in Romania and elsewhere.

Statement of conflict of interest

The authors ahve declared no conflict of interest

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