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SPATIAL VARIATIONS IN RARITY IN THE AEGEAN TENEBRIONID BEETLES (Coleoptera, Tenebrionidae)

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Introduction

Tenebrionid beetles (Coleoptera Tenebrionidae) are an important group in the structure and functioning of Mediterranean insular biotas (Cartagena & Galante 2002). The importance of the tenebrionid beetles of the Aegean Islands (Greece) is enhanced by the high conservation concern of the East Mediterranean area (e.g. Médail & Quézel 1999; Troumbis & Dimitrakopoulos 1998; Sfenthourakis & Legakis 2001; Fattorini 2006a). In addition, the Aegean Islands are of high biogeographical and conservation interest because of their location at the crossroad between the Balkan and the Anatolian faunas (Dennis et al. 2000; Fattorini 2002; Fattorini & Fowles 2006). For these reasons, the Aegean tenebrionids represent a faunal group deserving special attention for the conservation of nature in the Mediterranean.

The identification of rare species is an important goal in conservation biology because rare species are more vulnerable and more prone to extinction. Recent attempts to classify rare species have emphasized dichotomies in such characteristics as local population densities, areas of distribution, and degree of ecological specialisation (Dobson & Yu 1993; Manne & Pimm 2001). However, this species-oriented approach, developed for plants and vertebrates, does not directly apply to entire communities. Since islands are considered intrinsically more fragile than mainland areas (e.g. Cartagena & Galante 2003; Cowie & Robinson 2003; Cook & MacDonald 2001; Walter 2004), it is important not only to establish the rarity of the species living on an island, but also to assess how prone to biodiversity loss is an island community as a whole.

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In this paper, I used several measures of species rarity in the Aegean tenebrionids to obtain measures of tenebrionid community rarity on the individual islands and to investigate possible spatial patterns of variation.

Materials and methods

Study area

A total of 32 islands were included in this study (tab. 1). The study area is adequately described by Heller (1976), Sfenthourakis (1996), Dennis et al. (2000), and Fattorini (2002). Phrygana is the dominant vegetation type throughout the islands, while oak forests and maquis habitats occur only in scattered patches on some of the largest islands. Habitat changes wrought by human activities, especially deforestation, are a key feature of the ecology of many islands. Fires play a relevant role in determining the present traits of plant communities (Arianoutsou 1998). Fire and changing grazing pressures create irregular cycles of vegetational change in maquis, so that at one extreme, cover may be less than in most phrygana, while at the other it becomes scrub woodland with a closed canopy. Phrygana is more stable but can be destroyed by burning (Cameron et al. 2000). There is still considerable debate about the nature of the vegetation in the Aegean area before the start of agriculture. Pre-Minoan Crete held significantly more woodland than it does today, but remains of plants typical of phrygana and maquis are found in interstadials of the last glaciation (Cameron et al. 2000). Thus, most of change in faunal composition on the islands after Pleistocene is likely due more to human activities than to natural variation in habitat structure and climate.

Data sources

The tenebrionid fauna of most of the Aegean Islands is well known as a result of intensive surveys from the beginning of the past century to the present (cf. Fattorini & Fowles 2006). On the Aegean Islands, several tenebrionid species are represented by different subspecies endemic to individual islands or groups of islands. These populations can thus be recognized as "evolutionary significant units" (Samways 1998) and I have counted them as different taxa (cf. Fattorini, 2002, 2006b, 2006c, Fattorini in press a). The term 'species' will be used in reference to tenebrionid taxa for simplicity.

Taxonomic treatment and data concerning species distribution are the same as in Fattorini & Fowles (2006). As a whole, 170 taxa (138 species and 32 subspecies) were ascertained to occur as native populations on the study islands. For temporal analyses, I referred to collection dates (from 1870 to 2000: 13 decades) gathered by Fattorini (2006d). Necessarily, these assessments reflect the preferences of the original collectors in terms of collection localities, habitats, and species, but they are the best available data. Data are reported in Appendixes 1 and 2 and are available as Microsoft Excel files on request.

Species rarity and vulnerability

In her seminal papers on plant rarity, Rabinowitz (1981; Rabinowitz et al. 1986) suggested that three aspects of species be examined to assess the degree of rarity: (1) the area of the species distribution (wide/narrow distribution), (2), the number of different kinds of habitats that species occupy (broad/restricted habitat specificity) and (3) local population size (large/small population). In this study, I defined these three dimensions of rarity as follows:

Geographic distribution (ψ). Following Dennis et al. (2000), I estimated the geographic range of a species in the study area as the proportion of islands from which the species is known on the total number of islands. This index, termed ψ after Dennis et al. (2000), allows for an estimation of rarity on the basis of the species distribution within the study area.

Ecological tolerance (ϵ). It is well known that widely distributed species tend to be more eurytopic. Thus, the extent of the area occupied by a species may be considered a rough proxy for its ecological tolerance. For each species, I summed the areas of the islands from which it was known. Each species thus received a value of the 'area of occupancy' which is the sum of the areas of the individual islands inhabited within the archipelago. This value was then divided by the total area of the archipelago (the sum of the individual areas of the islands considered in the study). This final value has been used as an index of species ecological tolerance (here referred to as ϵ).

Local population size (density) (δ). Since no quantitative samplings were available, I estimated local population size by species 'contactability', because encounter rates are proportional to population density (Strayer 1999). To study species contactability, I divided the study period (1870-2000) into decades. Species contactability (termed here as δ) was estimated as the number of decades from which records of a given species were available on the total number of decades until extinction is assumed (last decade with records) for that species.

Vulnerability index (v). Using ψ, δ and ϵ measures of rarity, I calculated an index of species vulnerability (v) applying the method proposed by Kattan (1992).

The aforementioned three indexes are really continuous variables. If species are dichotomized for each of these variables, an eight-celled model is created that reflects different types of rarity and commonness. Kattan (1992) proposed to assign to each cell a number between 1 (species 'rare' in three dimensions) and 8 (species 'common' in three dimensions) to indicate susceptibility to extinction. For each dimension (measure) I dichotomized species into two groups (common and rare) according to whether they were above or below the median and then I assigned each species to a cell as proposed by Kattan. The threshold median values to classify a species as 'rare' were: ≤0.031 for geographic distribution, <0.185 for ecological tolerance, and <0.279 for population density. Note that all these indexes of rarity increase as species became less rare.

The following species were omitted from the aforementioned analyses because of lack of information about decade of occurrence: *Asida fairmairei graeca* Allard, 1869, *Cylindronotus crenatostriatus* Allard, 1876, *Dichillus pertusus* (Kiesenwetter, 1861), *Erodius orientalis orientalis* Brullé, 1832, *Helopelius disgregus* Reitter, 1922, *Leichenum pulchellum* cf. *pumilum* Baudi, 1876, *Probaticus* n. sp., *Stenosis milosana* Koch, 1948.

Community rarity and vulnerability

The aforementioned indexes were used as species parameters to construct analogous indexes at community level.

Distributional rarity (Ψ). Each island was scored according to a rarity index (Ψ) as proposed by Dennis et al. (2000). This index is a measure of mean incidence of species on islands in the archipelago, with high values indicative of increasing mean rarity of an island's fauna and low values of ubiquity of species comprising an island's fauna:

$\Psi = 1 - [(\Sigma_{i\ =\ 1,j}\ \psi_i)/S_j]$

where $\psi_i = n_i/N$, for i…j species, S, and n ≤ N islands; the range in values is bounded theoretically as $\psi \geq 0$ and < 1.

Ecological tolerance (E). For each island, an index of habitat specificity was calculated as follows:

$E = (\Sigma_{i\ =\ 1,j}\ \epsilon_i)/S_j$

where ϵ_i is the index of ecological tolerance discussed above and S is the species richness of an island. This index is a measure of mean habitat selectivity of species on islands in the archipelago, with high values indicative of increasing ecological tolerance of an island's fauna. For the examined archipelago, this index could theoretically vary from 1.867×10^{-4} (when the smallest island is occupied by only one species which does not occur on any other island) to 1 (all species occurring on the island have $\epsilon = 1$). Larger values indicate broader ecological tolerance.

Population densities (Δ). For each island, an index of population size was calculated as follows:

$\Delta = (\Sigma_{i\ =\ 1,j}\ \delta_i)/S_j$

where δ_i is index of species contactability discussed above and S is the species richness of an island. For the examined archipelago, this index could theoretically vary from 0.07 (if an island is occupied by a single species assumed to be present in 13 decades, but recorded from one decade only) to 1 (if all species occurring on the island are recorded in all decades of assumed presence). Larger values indicate higher population densities.

Vulnerability (V). For each island, I calculated a relative index of vulnerability by summing up the value of v of each species. The total value was divided by the maximum theoretical (all species occurring on a given island with v = 8). Thus higher values indicate lower vulnerability.

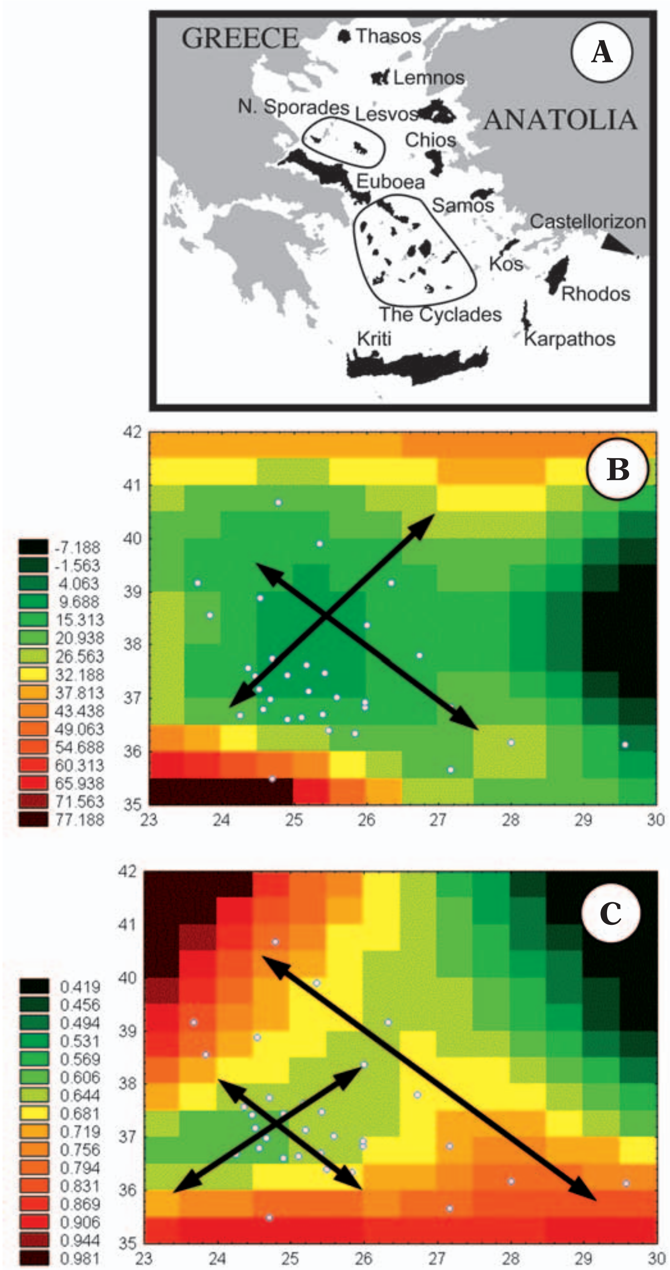
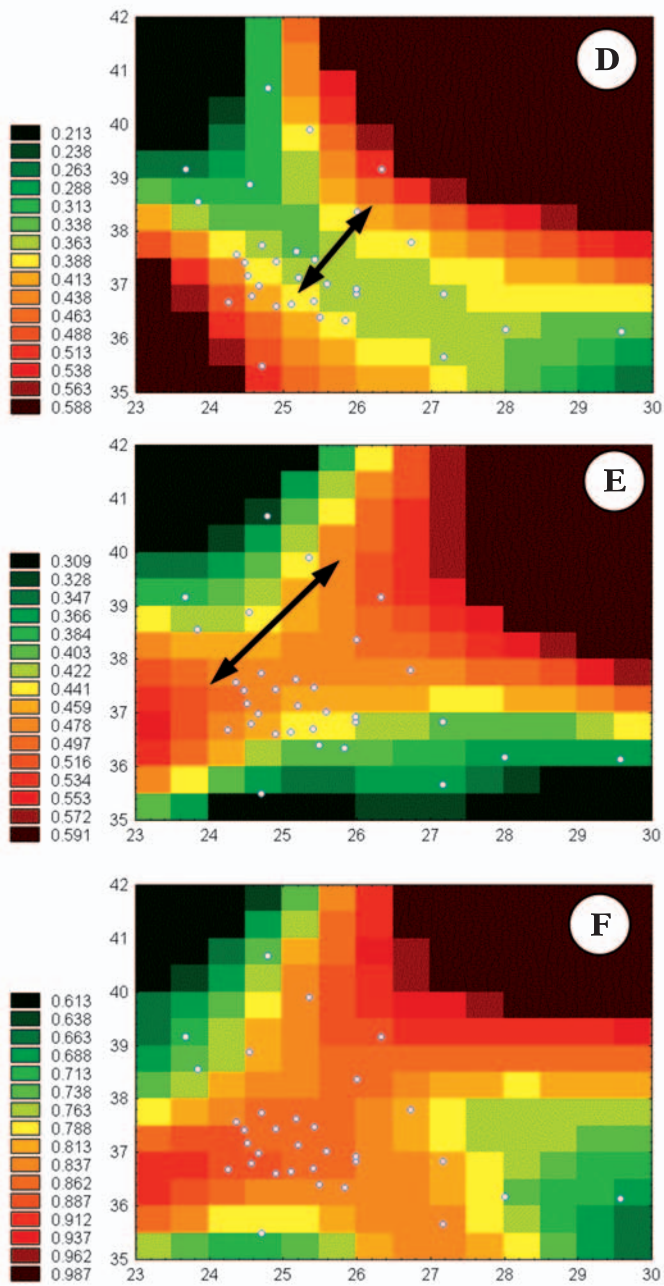


Fig. 1 – Geographic representation of tenebrionid community rarity on the Aegean Islands. A: study area; B: species richness; C: geographic rarity; D: ecological tolerance; E: population density; F: Kattan vulnerability index. Islands are plotted as dots in the longitude-latitude space.


D
0.213
0.238
0.263
0.288
0.313
0.338
0.363
0.388
0.413
0.438
0.463
0.488
0.513
0.538
0.563
0.588
42
41
40
39
38
37
36
35
23
24
25
26
27
28
29
30
E
0.309
0.328
0.347
0.366
0.384
0.403
0.422
0.441
0.459
0.478
0.497
0.516
0.534
0.553
0.572
0.591
F
0.613
0.638
0.663
0.688
0.713
0.738
0.763
0.788
0.813
0.837
0.862
0.887
0.912
0.937
0.962
0.987

Species richness. Since species richness has become one of the most commonly used parameters in conservation biology (cf. Fattorini 2006a), I also considered the total number of species known from each island.

Spatial distributions of all the aforementioned indexes were depicted using contour plots to display surfaces representing a smoothed image of the data. Surfaces were fitted to the X (longitude) Y (latitude) Z (index value) coordinate data (decimal degrees) according to the distance-weighted least squares smoothing procedure (the influence of individual points decreases with the horizontal distance from the respective points on the surface). All the analyses have been carried out with the software utilities of SATISTICA 4.5 (StatSoft Inc. 1993).

Results

Community richness, rarity and vulnerability

Species richness, as well as indexes of community rarity and vulnerability are reported in tab. 1. Correlations between indexes are reported in tab. 2. Geographic rarity was negatively correlated with population density and Kattan's index, thus indicating that islands characterized by species with restricted range are also characterized by species with low population density and low Kattan value. Ecological tolerance and population density were positively correlated with Kattan's index, thus indicating that islands characterized by species with larger population densities and ecological tolerances harbour faunas globally less vulnerable. Finally, species richness was positively correlated with geographic rarity and negatively with population density and Kattan's index. Therefore, geographically rare species are mostly concentrated on the islands with larger species numbers, but the most specious islands are also those characterized by small population density and high vulnerability. This suggests that biodiversity is increased by the presence of vulnerable species represented by small populations.

The geographic distribution of species richness, each rarity index and the vulnerability index are shown in figure 1. Richness decreased in the centre of the archipelago, reaching highest values on peripheral islands (fig. 1B). Geographic rarity increased from the centre of the

Tab. 1 – Rarity indexes at community level.

Island	Island area (km²)	Species richnessa	Geographic distribution	Ecological tolerance	Population density	Kattan index
Amorgos	121.1	7	0.580	0.347	0.440	0.857
Anafi	38.4	12	0.690	0.377	0.423	0.802
Andros	380	12	0.638	0.358	0.460	0.844
Castellorizon	7.3	8	0.769	0.325	0.354	0.688
Chios	842	10	0.662	0.457	0.492	0.925
Euboea	3658	40	0.854	0.355	0.423	0.634
Folegandros	32.1	7	0.576	0.396	0.429	0.821
Ios	107.8	9	0.573	0.314	0.436	0.889
Karpathos	301	14	0.781	0.384	0.381	0.866
Kea	130.6	6	0.651	0.316	0.481	0.833
Kimolos	35.7	3	0.510	0.425	0.538	0.917
Kithnos	99.3	4	0.453	0.427	0.500	0.938
Kos	290.3	26	0.751	0.410	0.396	0.856
Kriti	8260	70	0.885	0.490	0.318	0.716
Lemnos	460	10	0.656	0.443	0.481	0.913
Lesvos	1630	17	0.667	0.508	0.499	0.890
Mikonos	85.5	10	0.631	0.317	0.465	0.850
Milos	150.6	18	0.613	0.479	0.477	0.924
Naxos	428	36	0.721	0.407	0.415	0.882
Pano Koufonissi	3.8	12	0.630	0.390	0.442	0.875
Paros	194.5	8	0.597	0.292	0.423	0.875
Rhodos	1400	40	0.826	0.355	0.321	0.700
Samos	476.2	14	0.708	0.338	0.495	0.723
Santorin	75.8	26	0.726	0.439	0.408	0.885
Serifos	73.2	8	0.613	0.555	0.500	0.938
Sifnos	73.2	9	0.583	0.471	0.496	0.944
Sikinos	41	8	0.625	0.314	0.409	0.859
Siros	83.6	23	0.698	0.360	0.438	0.859
Skiros	209	11	0.679	0.307	0.372	0.784
Skopelos	96	7	0.803	0.244	0.416	0.786
Thasos	379	23	0.799	0.307	0.339	0.717
Tinos	194.3	12	0.664	0.304	0.567	0.771

Tab. 2 – Correlations (Pearson correlation coefficient) between rarity indexes of tab. 1. ** P < 0.01, *** P < 0.001, NS not significant

	Geographic rarity	Ecological tolerance	Population density	Kattan index
Species richness	0.725***	0.221 NS	- 0.556***	- 0.490 **
Geographic rarity		- 0.156 NS	- 0.676****	- 0.733***
Ecological tolerance			0.251NS	0.487**
Population density				0.547***

archipelago to periphery (fig. 1C). Plotting ecological tolerance on island coordinates, produced a map where a definite trend appears: an increase of ecological tolerance from the centre of the archipelago to periphery (fig. 1D). The population density index showed a spatial pattern similar to that of ecological tolerance, thus suggesting a link between density and ecological tolerance (fig. 1E). Finally, a geographical plot of the vulnerability index showed a complex pattern, with high values (i.e. low vulnerability) in the most clumped Cyclades and in some 'Anatolian' islands (fig. 1F).

Discussion

Although the three indexes of community rarity have different information contents, the Kattan index as applied here is a valuable synthetic measure for all of them, and can be usefully applied to rank islands according to their conservation concern in terms of community vulnerability and species richness.

The spatial relationships of different dimensions of rarity with the geographical space are complex. Peripheral islands appear to host the richest faunas, which are also characterized by a high proportion of species geographically restricted. By contrast, ecological tolerance and population density show the following pattern: islands located very close to the Anatolian mainland, as well as those that are clumped, host the most eurytopic and abundant species, while remote southern islands have ecologically specialized faunas with low population density. Vulnerability (i.e. the reverse of Kattan's index applied to communities) decreased in remote islands, which are usually also the smallest. These findings can be interpreted with reference to the relictual character of the Aegean tenebrionids. In equilibrial archipelagos, large islands may act as sources for small and remote islands or can assist species that come from the mainland thus acting as stepping stones. However, the Aegean tenebrionid fauna is mostly relictual (Fattorini 2002, 2005, 2006b, 2006e), and such as mechanism cannot have a relevant role. Most of the Aegean remote islands were connected to each other and to the mainland during Pleistocene falls in sea level. Pleistocene island groupings may be considered as large islands. When these groupings were again fragmented, the resulting islands retained only some of the species which composed the original fauna, a processes known as relaxation after saturation, whilst the islands which were connected to the mainland were less affected by this phenomenon, being able to conserve a more complete fauna (Fattorini 2006b, 2006e, in press b), and thus maintaining more harmonic communities. Islands close to the Anatolian mainland could maintain more 'random' faunas (Fattorini in press b), mostly dominated by more eurytopic species, which are those also more widely distributed and with higher population density. By contrast, remote small islands were strongly affected by extinction and isolation, thus maintaining or evolving ecologically specialized species represented by small populations. This is confirmed by the fact that also endemic species or subspecies restricted to remote small islands actually belong to genera or species groups widely distributed in the archipelago (e.g. *Dendarus*, *Stenosis*, *Colpotus*, etc.). It can be supposed that during Pleistocene regressions their ancestors were largely distributed on the islands as common (and probably eurytopic) species. These ancestors survived to relaxation, but, as a consequence of isolation, evolved in new allopatric taxa presently restricted to remote small islands. This model may explain why the most restricted species/subspecies actually belong to widely distributed taxa.

Such a historical reconstruction clearly shows how much important are relict faunas from a conservation point of view. In equilibrial faunas, locally extinct species can be replaced by new species. By contrast, in non-equilibrial faunas, communities are the result of ancient processes of colonization and speciation, so that extinct species cannot be replaced by new immigrants.

For these reasons, the tenebrionid beetles on the Aegean Islands constitute threatened faunal assemblages of great 'rarity' under several dimensions, and some islands are especially rich in rare species, deserving special attention in conservation efforts.

Appendix 1. Tenebrionid distribution on the Aegean Islands. 1 Amorgos, 2 Anafi, 3 Andros, 4 Castellorizon, 5 Chios, 6 Euboea, 7 Folegandros, 8 Ios, 9 Karpathos, 10 Kea, 11 Kimolos, 12 Kithnos, 13 Kos, 14 Kriti, 15 Lemnos, 16 Lesvos, 17 Mikonos, 18 Milos, 19 Naxos, 20 Pano Koufonissi, 21 Paros, 22 Rhodos, 23 Samos, 24 Santorin, 25 Serifos, 26 Sifnos, 27 Sikinos, 28 Siros, 29 Skiros, 30 Skopelos, 31 Thasos, 32 Tinos. Two species (*Neatus* sp. from Euboea and *Stenosis* sp. from Karpathos) are not included because of taxonomic uncertainty.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Akis elongata Brullé, 1832	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0
Ammobius rufus Lucas, 1849	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	1	0
Anemia sardoa sardoa (Génè, 1839)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Apentanodes globosus globosus (Reiche, 1857)	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apentanodes globosus reductepleuralis Koch, 1935	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Asida fairmairei fairmairei Boieldieu, 1865	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Asida fairmairei graeca Allard, 1869	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blaps abbreviata Mènètriès, 1836	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blaps cretensis Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blaps oertzeni Seidlitz, 1839	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blaps taeniolata Ménétriés, 1832	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Blaps tibialis Reiche, 1857	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Bolitophagus reticulatus (Linné, 1767)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Cabirutus cribricollis (Baudi, 1875)	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Calyptopsis caraboides (Brullé, 1832)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Cataphronetis reitteri Seidlitz, 1898	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Catomus consentaneus (Küster, 1851)	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0
Cephalostenus orbicollis (Ménétriés, 1836)	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	1	0	1	1	0	0	1	0	1	0	1	1	1	0	0	1	0
Cnemeplatia atropos atropos Costa, 1847	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Colpotus byzantinicus (Waltl, 1838)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colpotus pectoralis pectoralis Mulsant & Rey, 1853	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colpotus sulcatus (Ménétriés, 188)	0	0	0	1	1	0	0	0	1	1	0	0	1	1	0	1	0	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0
Colpotus vogti Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Cossyphus tauricus Steven, 1882	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

continued

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Cylindronotus crenatostriatus Allard, 1876	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Cylindronotus cretensis Seidlitz, 1898	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cylindronotus nigropiceus Küster, 1850	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Cylindronotus tuberculiger Reiche, 1857	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Dailognatha cylindritarsis cylindritarsis Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dailognatha cylindritarsis probsti Picka, 1984	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dailognatha hellenica Reitter, 1898	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0	1	1	1	1	0	1	0	0	0
Dailognatha quadricollia anaphiana Koch, 1948	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dailognatha quadricollis carceli Solier, 1835	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Dailognatha quadricollis montana Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dailognatha quadricollis obtusangola Reitter, 1896	1	0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	1	0	0	0	1
Dailognatha quadricollis quadricollis Brullé, 1832	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Dailognatha quadricollis rhodica Koch, 1948	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Dailognatha quadricollis rugata Solier, 1835	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dailognatha quadricollis samosana Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Dailognatha quadricollis sporadica Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dailognatha rugipleuris Reitter, 1896	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus foraminosus Küster, 1851	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus opacus Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus politus Reitter, 1917	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus puncticollis Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus wettsteini Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus graecus Brullé, 1832	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus messenius Brullé, 1832	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1
Dendarus moesiacus (Mulsant & Rey, 1854)	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Dendarus plicatulus paganettii Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Dendarus rhodius Baudi, 1876	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Dendarus anaphianus Koch, 1948	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus angulitibia Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Dendarus dentitibia Koch, 1948	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Dendarus schatzmayri Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Dendarus sinuatus Mulsant, 1854	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Dendarus wernerianus Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
Dendarus stygius oertzeni Koch, 1948	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus stygius stygius Waltl, 1838	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Dendarus tenellus (Mulsant & Rey, 1854)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dendarus werneri Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diaclina fagi (Panzer, 1797)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Diaperis boleti (Linné, 1758)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dichillus carinatus Küster, 1848	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Dichillus obenbergeri Maran, 1935	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dichillus pertusus (Kiesenwetter, 1861)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dichillus subsetulosus Reitter, 1886	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Dichomma dardanum (Steven, 1829)	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	1	1	1	0	0	0	1	1	1	0	1	0	0	0	1
Doliema turcica Reitter, 1877	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eledona hellenica Reitter, 1885	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Erodius orientalis boyeri Solier, 1834	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Erodius orientalis brevicostatus Solier, 1834	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0
Erodius orientalis oblongus Solier, 1834	0	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
Erodius orientalis orientalis Brullé, 1832	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Euboeus mimonti Boieldieu, 1865	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eutagenia minutissima Pic, 1903	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Eutagenia smyrnensis (Solier, 1838)	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	0	0
Gonocephalum affine (Billberg, 1815)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Gonocephalum costatum costatum (Brullé, 1832)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Gonocephalum granulatum nigrum (Küster, 1843)	1	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0
Gonocephalum rusticum (Olivier, 1811)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	1	0	0	1	0	1	0	0	0	1	1	0	0	0
Gonocephalum setulosum setulosum (Faldermann, 1837)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0
Graecopachys quadricollis cretica (Koch, 1948)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Graecopachys quadricollis s.l. (Brullé, 1832)	1	1	1	0	0	1	1	1	0	0	0	1	1	0	0	0	0	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1

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Gunarus kaszabi Grimm, 1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Helopelius aenipennis (Allard, 1876)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Helopelius disgregus Reitter, 1922	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Helops coeruleus (Linné, 1758)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Helops glabriventris glabriventris Reitter, 1885	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Helops glabriventris jelineki Picka, 1984	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Helops rossii Germar, 1817	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Hymatismus villosus Haag-Ruttenberg, 1870	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hypophloeus fasciatus Fabricius, 1790	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hypophloeus fraxini Kugel, 1794	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Hypophloeus pini Panzer, 1799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Idastrandiella allardi (Reitter, 1884)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Idastrandiella graeca (Kraatz, 1877)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Idastrandiella mucorea (Waltl, 1838)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Iphthiminus italicus croaticus (Truqui, 1857)	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laena apfelbecki Schuster, 1915	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laena ferruginea Küster, 1846	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Laena oertzeni Reitter, 1885	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leichenum pulchellum cf. *pumilum* Baudi, 1876	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Menephilus cylindricus cylindricus (Herbst, 1784)	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Micrositus orbicularis Mulsant & Rey, 1854	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	1
Microtelus asiaticus Solier, 1838	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Nalassus plebejus (Küster, 1850)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Oochrotus glaber rhodicus Koch, 1935	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Opatroides punctulatus Brullé, 1832	0	1	0	1	1	0	1	1	1	0	0	0	1	1	1	1	0	1	1	1	0	1	1	1	0	0	0	1	0	0	0	1
Opatrum geminatum s.l. Brullé, 1832	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Opatrum obesum Olivier, 1811	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	1	1	0	0	1	0	1	1	0	0	1	0	0	1	0
Opatrum sabulosum sabulosum (Linné, 1758)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Opatrum verrucosum Germar, 1817	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pachychila frioli Solier, 1835	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Pachyscelis villosa (Drapiez, 1820)	0	0	1	0	1	0	0	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	1	0	0	0	0	1	0	0	0	1
Palorus depressus (Fabricius, 1790)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedinus oblongus Mulsant & Rey, 1853	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Pedinus olivieri Mulsant & Rey, 1853	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedinus quadratus Brullé, 1832	1	1	0	0	1	0	1	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	1	0	0	0	1	1	0	0
Pedinus subdepressus Brullé, 1832	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pentaphyllus chrysomeloides (Rossi, 1792)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Phaleria acuminata s.l. Küster, 1852	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phaleria bimaculata s.l. (Linné, 1767)	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0
Pimelia minos Lucas, 1853	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pimelia subglobosa (Pallas, 1781)	0	1	1	0	0	1	0	1	0	1	0	0	0	0	1	1	1	1	1	0	1	1	1	1	0	0	1	1	0	0	1	1
Platydema europaeum Laporte & Brullé, 1831	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Platynosum paulinae Mulsant & Rey, 1859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Polycoelogastridium sexcostatum (Motschulsky, 1858)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Probaticus euboeicus (Reitter, 1885)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Probaticus graius (Allard, 1885)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Probaticus mori (Brullé, 1832)	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Probaticus n. sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Probaticus obesus (Frivaldski, 1832)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Probaticus tenebricosus (Brullé, 1832)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0
Probaticus tentyrioides (Küster, 1851)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Raiboscelis azureus obliteratus Allard, 1878	0	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	1	1	1	1	0	0
Raiboscelis coelestinus s.l. (Waltl, 1838)	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0
Raiboscelis corvinus brodskyi Picka, 1984	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Raiboscelis corvinus corvinus (Küster, 1850)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Raiboscelis corvinus slamai Picka, 1984	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaurus aegyptiacus aegyptiacus Solier, 1838	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Scleron multistriatum (Forskål, 1775)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0
Stenosis cretica Koch, 1940	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stenosis crivellari Koch, 1935	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

continued

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Stenosis esau Sahlberg, 1907	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Stenosis intermedia dalmatina Reitter, 1916	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stenosis keosana Koch, 1948	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stenosis milosana Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stenosis rhodica Koch, 1935	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Stenosis silvestrii Koch, 1935	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Stenosis syrensis naxica Koch, 1940	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
Stenosis syrensis syrensis Koch, 1936	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Strongylium saracenum (Reiche & Saulci, 1857)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Tentyria grossa grossa Besser, 1832	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tentyria rotundata angulata Brullé, 1832	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Tentyria rotundata mittrei Solier, 1835	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
Tentyria rotundata orbicollis Solier, 1835	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1	0	1	0	0	0	1
Tentyria rotundata paganettii Schuster, 1915	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tentyria rotundata sulcatipennis Schuster, 1936	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Tentyria sporadica sporadica Reitter, 1900	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Trachyderma lima (Petagna, 1819)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0
Trachyderma philistina Reiche, 1857	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Trachyscelis aphodioides Latreille, 1809	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
Uloma culinaris (Linné, 1758)	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uloma cypraea Kraatz, 1873	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Xanthomus ovulus (Seidlitz, 1898)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Xanthomus graecus Dajoz, 1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Xanthomus cypriusGrimm, 1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Zophosis dilatata Deyrolle, 1867	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Zophosis punctata punctata Brullé, 1832	1	0	1	0	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0	1	0
TOTALS	**7**	**12**	**13**	**8**	**10**	**41**	**7**	**9**	**14**	**6**	**3**	**4**	**26**	**71**	**10**	**17**	**10**	**19**	**36**	**12**	**8**	**43**	**14**	**26**	**8**	**9**	**8**	**23**	**11**	**7**	**23**	**13**

Appendix 2. Tenebrionid presence per decade on the Aegean Islands from 1870 to 2000. 1 indicates that at least one record from literature or examined museum materials has been found for a given decade.

	1870-1880	1880-1890	1890-1900	1900-1910	1910-1920	1920-1930	1930-1940	1940-1950	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000
Akis elongata Brullé, 1832	0	0	0	0	0	0	0	0	0	0	1	1	0
Ammobius rufus Lucas, 1849	1	0	0	0	1	0	1	0	0	0	1	1	1
Anemia sardoa sardoa (Génè, 1839)	0	0	0	0	0	0	0	0	0	0	1	0	0
Apentanodes globosus globosus (Reiche, 1857)	0	0	0	0	0	0	1	1	0	0	0	1	0
Apentanodes globosus reductepleuralis Koch, 1935	0	0	0	0	0	0	1	0	0	0	0	0	0
Asida fairmairei fairmairei Boieldieu, 1865	1	1	0	0	0	0	1	0	0	0	1	0	1
Asida fairmairei graeca Allard, 1869	0	0	0	0	0	0	0	0	0	0	0	0	0
Blaps abbreviata Mènètriès, 1836	0	1	0	0	0	0	0	0	0	0	0	0	0
Blaps cretensis Koch, 1948	0	0	0	0	1	0	0	1	0	0	0	1	0
Blaps oertzeni Seidlitz, 1839	0	0	0	0	0	0	0	1	0	0	0	1	0
Blaps taeniolata Ménétriés, 1832	0	0	0	0	0	1	1	0	0	0	0	0	0
Blaps tibialis Reiche, 1857	0	0	0	0	0	0	1	1	0	0	1	0	0
Bolitophagus reticulates (Linné, 1767)	0	0	0	0	0	0	0	0	0	0	0	0	1
Cabirutus cribricollis (Baudi, 1875)	0	0	0	0	0	0	1	0	0	0	0	1	0
Calyptopsis caraboides (Brullé, 1832)	1	0	0	0	0	0	0	0	0	0	1	0	0
Cataphronetis reitteri Seidlitz, 1898	1	0	0	0	1	0	0	0	0	0	0	1	1
Catomus consentaneus (Küster, 1851)	0	1	0	1	0	0	0	0	0	0	1	1	1
Cephalostenus orbicollis (Ménétriés, 1836)	1	1	0	1	0	1	1	1	0	0	1	1	1
Cnemeplatia atropos atropos Costa, 1847	0	1	0	0	1	0	1	0	0	0	0	0	0
Colpotus byzantinicus (Waltl, 1838)	0	0	0	0	0	0	0	0	0	0	1	0	0
Colpotus pectoralis pectoralis Mulsant & Rey, 1853	0	0	1	0	1	0	0	0	0	0	0	1	1
Colpotus sulcatus (Ménétriés, 188)	0	1	0	0	1	1	1	0	0	0	1	1	1
Colpotus vogti Koch, 1948	0	1	0	0	0	0	0	0	0	0	0	1	0
Cossyphus tauricus Steven, 1882	0	0	0	0	1	0	0	0	0	0	1	0	0
Cylindronotus crenatostriatus Allard, 1876	0	0	0	0	0	0	0	0	0	0	0	0	0
Cylindronotus cretensis Seidlitz, 1898	0	0	0	0	0	0	0	1	0	0	0	1	1
Cylindronotus nigropiceus Küster, 1850	0	0	0	0	0	0	0	0	0	0	1	0	1
Cylindronotus tuberculiger Reiche, 1857	1	1	0	0	0	0	0	0	0	0	0	0	0
Dailognatha cylindritarsis cylindritarsis Koch, 1948	0	0	0	0	1	0	1	1	0	0	0	1	0
Dailognatha cylindritarsis probsti Picka, 1984	0	0	0	0	0	0	0	0	0	0	0	1	0
Dailognatha hellenica Reitter, 1898	0	0	0	0	0	0	1	0	0	0	1	1	1
Dailognatha quadricollia anaphiana Koch, 1948	0	0	0	0	0	0	1	1	0	0	0	1	0
Dailognatha quadricollis carceli Solier, 1835	0	1	0	1	0	1	1	1	0	0	1	0	1
Dailognatha quadricollis montana Koch, 1948	0	0	0	0	0	0	0	1	0	0	0	1	1
Dailognatha quadricollis obtusangola Reitter, 1896	1	1	0	0	0	1	1	1	0	0	0	0	1
Dailognatha quadricollis quadricollis Brullé, 1832	0	0	0	0	0	0	0	0	0	0	0	0	1
Dailognatha quadricollis rhodica Koch, 1948	0	0	0	0	0	0	0	0	0	0	1	1	1
Dailognatha quadricollis rugata Solier, 1835	0	1	0	0	0	1	0	1	0	0	1	1	1
Dailognatha quadricollis samosana Koch, 1948	0	1	0	0	0	0	0	0	0	0	0	0	0
Dailognatha quadricollis sporadica Koch, 1948	0	1	0	0	0	0	1	0	0	0	0	1	0
Dailognatha rugipleuris Reitter, 1896	0	0	0	0	0	0	1	0	0	0	0	0	0
Dendarus anaphianus Koch, 1948	0	0	0	0	0	0	1	0	0	0	0	0	1
Dendarus angulitibia Koch, 1948	0	1	0	0	0	0	0	0	0	0	0	0	0
Dendarus dentitibia Koch, 1948	0	1	0	0	0	0	1	0	0	0	0	0	0
Dendarus foraminosus Küster, 1851	1	1	0	0	1	1	0	0	0	0	1	1	1
Dendarus graecus Brullé, 1832	0	0	0	0	0	1	0	1	0	0	1	1	1

continued

	1870-1880	1880-1890	1890-1900	1900-1910	1910-1920	1920-1930	1930-1940	1940-1950	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000
Dendarus messenius Brullé, 1832	1	1	0	0	0	1	1	0	0	0	1	0	1
Dendarus moesiacus (Mulsant & Rey, 1854)	0	1	0	0	0	0	1	1	0	0	1	0	1
Dendarus opacus Koch, 1948	0	0	0	0	0	1	0	1	0	0	1	1	1
Dendarus plicatulus paganettii Koch, 1948	0	0	0	0	0	0	1	0	0	0	0	0	0
Dendarus politus Reitter, 1917	0	0	0	0	0	1	0	1	0	0	1	1	1
Dendarus puncticollis Koch, 1948	0	0	0	0	0	0	0	1	0	0	1	1	0
Dendarus rhodius Baudi, 1876	0	1	0	0	0	0	1	0	0	0	1	1	0
Dendarus schatzmayri Koch, 1948	0	0	0	0	0	0	1	0	0	0	0	0	1
Dendarus sinuatus Mulsant, 1854	0	1	0	0	0	0	1	0	0	0	0	0	1
Dendarus stygius oertzeni Koch, 1948	0	1	0	0	0	0	0	0	0	0	0	0	0
Dendarus stygius stygius Waltl, 1838	1	1	0	0	0	0	0	0	0	0	0	0	0
Dendarus tenellus (Mulsant & Rey, 1854)	0	0	0	0	0	0	0	0	0	0	1	0	0
Dendarus werneri Koch, 1948	0	0	0	0	0	0	1	0	0	0	0	0	0
Dendarus wernerianus Koch, 1948	0	0	0	0	0	0	1	0	0	0	1	0	0
Dendarus wettsteini Koch, 1948	0	0	0	0	0	0	0	1	0	0	0	1	0
Diaclina fagi (Panzer, 1797)	0	0	0	0	0	0	0	0	0	0	0	0	1
Diaperis boleti (Linné, 1758)	0	1	0	0	0	0	0	0	0	0	0	0	0
Dichillus carinatus Küster, 1848	0	0	0	0	0	0	0	0	0	0	0	0	1
Dichillus obenbergeri Maran, 1935	0	0	0	0	0	0	1	0	0	0	1	1	1
Dichillus pertusus (Kiesenwetter, 1861)	0	0	0	0	0	0	0	0	0	0	0	0	0
Dichillus subsetulosus Reitter, 1886	0	0	0	0	0	0	1	0	0	0	0	0	0
Dichomma dardanum (Steven, 1829)	1	0	0	1	0	0	0	1	0	0	1	1	1
Doliema turcica Reitter, 1877	0	0	0	0	0	0	0	0	0	0	0	1	0
Eledona hellenica Reitter, 1885	0	1	0	0	0	0	0	0	0	0	0	0	0
Erodius orientalis boyeri Solier, 1834	0	1	0	0	1	0	0	1	0	0	0	0	0
Erodius orientalis brevicostatus Solier, 1834	1	1	0	0	0	0	1	1	0	0	1	1	1
Erodius orientalis oblongus Solier, 1834	0	1	0	0	0	1	1	0	0	0	1	1	1
Erodius orientalis orientalis Brullé, 1832	0	0	0	0	0	0	0	0	0	0	0	0	0
Euboeus mimonti Boieldieu, 1865	1	0	0	0	0	0	0	0	0	0	1	0	0
Eutagenia minutissima Pic, 1903	0	0	0	0	1	0	0	0	0	0	1	1	0
Eutagenia smyrnensis (Solier, 1838)	1	0	0	0	0	0	1	0	0	0	1	1	1
Gonocephalum affine (Billberg, 1815)	0	0	0	0	0	0	0	0	0	0	0	1	0
Gonocephalum costatum costatum (Brullé, 1832)	0	0	0	0	0	1	1	0	0	0	1	1	0
Gonocephalum granulatum nigrum (Küster, 1843)	1	0	0	0	0	0	1	0	0	0	1	1	1
Gonocephalum rusticum (Olivier, 1811)	1	0	0	0	1	1	1	0	0	0	1	1	0
Gonocephalum setulosum setulosum (Faldermann, 1837)	1	0	0	0	0	0	1	0	0	0	1	1	0
Graecopachys quadricollis cretica (Koch, 1948)	0	1	0	0	1	0	0	0	0	0	1	1	1
Graecopachys quadricollis s.l. (Brullé, 1832)	1	1	0	0	0	0	1	1	0	0	1	0	1
Gunarus kaszabi Grimm, 1981	0	0	0	0	0	0	0	0	0	0	0	1	0
Helopelius aenipennis (Allard, 1876)	0	0	0	0	0	0	1	0	0	0	0	0	0
Helopelius disgregus Reitter, 1922	0	0	0	0	0	0	0	0	0	0	0	0	0
Helops coeruleus (Linné, 1758)	0	0	0	0	0	0	0	0	0	0	0	0	1
Helops glabriventris glabriventris Reitter, 1885	0	1	0	0	0	0	0	0	0	0	0	0	1
Helops glabriventris jelineki Picka, 1984	0	0	0	0	0	0	0	0	0	0	0	1	0
Helops rossii Germar, 1817	0	1	0	0	0	0	0	0	0	0	0	1	1
Hymatismus villosus Haag-Ruttenberg, 1870	0	0	0	0	0	0	1	0	0	0	0	0	0
Hypophloeus fasciatus Fabricius, 1790	0	1	0	0	0	0	0	0	0	0	0	0	0
Hypophloeus fraxini Kugel, 1794	0	1	0	0	0	0	1	0	0	0	0	0	0
Hypophloeus pini Panzer, 1799	1	0	0	1	0	0	0	0	0	0	0	0	0
Idastrandiella allardi (Reitter, 1884)	0	0	0	0	0	0	0	0	0	0	0	0	1

continued

	1870-1880	1880-1890	1890-1900	1900-1910	1910-1920	1920-1930	1930-1940	1940-1950	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000
Idastrandiella graeca (Kraatz, 1877)	1	0	0	0	0	0	0	0	0	0	0	0	0
Idastrandiella mucorea (Waltl, 1838)	1	0	0	0	0	0	0	0	0	0	0	0	0
Iphthiminus italicus croaticus (Truqui, 1857)	0	1	0	0	0	0	0	0	0	0	0	1	0
Laena apfelbecki Schuster, 1915	1	0	0	0	0	0	0	0	0	0	0	0	0
Laena ferruginea Küster, 1846	0	1	0	0	0	0	0	0	0	0	1	0	0
Laena oertzeni Reitter, 1885	0	0	0	0	1	0	0	0	0	0	0	0	0
Leichenum pulchellum cf. *pumilum* Baudi, 1876	0	0	0	0	0	0	0	0	0	0	0	0	0
Menephilus cylindricus cylindricus (Herbst, 1784)	0	1	0	0	0	0	0	0	0	0	0	1	1
Micrositus orbicularis Mulsant & Rey, 1854	1	1	0	1	1	0	1	0	0	0	1	0	1
Microtelus asiaticus Solier, 1838	0	1	0	0	0	0	0	0	0	0	1	0	0
Nalassus plebejus (Küster, 1850)	0	0	0	0	0	0	0	0	0	0	0	0	1
Oochrotus glaber rhodicus Koch, 1935	0	0	0	0	0	0	1	0	0	0	1	0	0
Opatroides punctulatus Brullé, 1832	1	0	0	0	0	1	1	1	0	0	1	1	1
Opatrum geminatum s.l. Brullé, 1832	0	0	0	1	0	0	0	0	0	0	0	0	0
Opatrum obesum Olivier, 1811	1	1	0	1	0	0	1	1	0	0	1	1	1
Opatrum sabulosum sabulosum (Linné, 1758)	0	0	0	0	0	0	1	0	1	0	1	1	1
Opatrum verrucosum Germar, 1817	1	1	0	0	0	0	0	0	0	0	0	0	1
Pachychila frioli Solier, 1835	0	0	0	0	1	0	0	0	0	0	1	0	0
Pachyscelis villosa (Drapiez, 1820)	1	0	0	0	0	1	1	0	0	0	1	1	1
Palorus depressus (Fabricius, 1790)	0	1	0	0	0	0	0	0	0	0	0	0	0
Pedinus oblongus Mulsant & Rey, 1853	0	0	0	0	0	0	1	0	0	0	0	0	0
Pedinus olivieri Mulsant & Rey, 1853	0	0	0	0	1	1	0	1	0	0	1	1	0
Pedinus quadratus Brullé, 1832	1	1	0	0	0	0	1	0	0	0	1	1	1
Pedinus subdepressus Brullé, 1832	0	1	0	0	0	0	0	0	0	0	1	0	0
Pentaphyllus chrysomeloides (Rossi, 1792)	0	1	0	0	0	0	0	0	0	0	0	0	0
Phaleria acuminata s.l. Küster, 1852	0	0	0	0	0	0	0	0	0	0	0	1	0
Phaleria bimaculata s.l. (Linné, 1767)	0	0	1	0	1	0	1	1	0	0	1	1	1
Pimelia minos Lucas, 1853	0	1	0	0	1	0	0	1	0	0	1	1	0
Pimelia subglobosa (Pallas, 1781)	1	1	0	1	0	0	1	1	0	0	1	1	1
Platydema europaeum Laporte & Brullé, 1831	0	0	0	1	0	0	0	0	0	0	0	0	1
Platynosum paulinae Mulsant & Rey, 1859	0	0	0	0	0	0	1	0	0	0	0	0	0
Polycoelogastridium sexcostatum (Motschulsky, 1858)	0	0	0	1	0	0	1	0	0	0	1	0	0
Probaticus euboeicus (Reitter, 1885)	0	1	0	0	0	0	1	0	0	0	0	0	1
Probaticus graius (Allard, 1885)	0	1	0	0	0	0	0	0	0	0	0	0	0
Probaticus mori (Brullé, 1832)	0	0	0	0	0	0	1	1	0	0	0	1	1
Probaticus n. sp.	0	0	0	0	0	0	0	0	0	0	0	0	0
Probaticus obesus (Frivaldski, 1832)	0	0	0	0	0	0	0	0	0	0	0	1	0
Probaticus tenebricosus (Brullé, 1832)	0	0	0	0	0	0	1	0	0	0	0	0	0
Probaticus tentyrioides (Küster, 1851)	1	1	0	0	0	0	0	0	0	0	0	0	0
Raiboscelis azureus obliteratus Allard, 1878	1	0	0	0	0	0	1	1	0	0	0	1	1
Raiboscelis coelestinus s.l. (Waltl, 1838)	0	0	0	0	0	0	1	0	0	0	1	1	1
Raiboscelis corvinus brodskyi Picka, 1984	0	0	0	0	0	0	0	0	0	0	0	1	1
Raiboscelis corvinus corvinus (Küster, 1850)	0	1	0	0	0	0	0	1	0	0	0	1	1
Raiboscelis corvinus slamai Picka, 1984	0	0	0	0	0	0	0	0	0	0	0	1	0
Scaurus aegyptiacus aegyptiacus Solier, 1838	0	0	0	0	0	0	1	0	0	0	1	0	0
Scleron multistriatum (Forskål, 1775)	1	0	0	1	0	0	0	0	0	0	1	1	0
Stenosis cretica Koch, 1940	0	0	0	0	0	0	0	0	0	0	0	1	1
Stenosis crivellari Koch, 1935	0	0	0	0	0	0	1	0	0	0	0	0	0
Stenosis esau Sahlberg, 1907	0	1	0	0	0	0	0	0	0	0	0	0	0
Stenosis intermedia dalmatina Reitter, 1916	0	1	0	0	0	0	0	0	0	0	1	0	0

continued

	1870-1880	1880-1890	1890-1900	1900-1910	1910-1920	1920-1930	1930-1940	1940-1950	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000
Stenosis keosana Koch, 1948	0	1	0	0	0	0	0	0	0	0	0	0	0
Stenosis milosana Koch, 1948	0	0	0	0	0	0	0	0	0	0	0	0	0
Stenosis rhodica Koch, 1935	0	0	0	0	0	0	1	0	0	0	0	1	0
Stenosis silvestrii Koch, 1935	0	0	0	0	0	0	1	0	0	0	1	0	0
Stenosis syrensis naxica Koch, 1940	0	1	0	0	0	0	0	0	0	0	1	0	1
Stenosis syrensis syrensis Koch, 1936	0	1	0	0	0	0	0	0	0	0	0	0	0
Strongylium saracenum (Reiche & Saulci, 1857)	0	0	0	0	0	0	0	0	0	0	0	0	1
Tentyria grossa grossa Besser, 1832	0	0	0	0	1	0	0	0	0	0	1	1	0
Tentyria rotundata angulata Brullé, 1832	0	0	0	0	0	0	1	1	0	0	1	0	1
Tentyria rotundata mittrei Solier, 1835	1	0	0	0	0	1	1	0	0	0	1	1	1
Tentyria rotundata orbicollis Solier, 1835	1	0	0	0	0	1	1	0	0	0	0	0	1
Tentyria rotundata paganettii Schuster, 1915	0	0	0	0	1	0	0	1	0	0	0	1	0
Tentyria rotundata sulcatipennis Schuster, 1936	0	0	0	0	0	1	1	1	0	0	1	1	0
Tentyria sporadica sporadica Reitter, 1900	0	0	0	0	0	1	1	0	0	0	0	0	0
Trachyderma lima (Petagna, 1819)	1	1	0	0	0	0	0	0	0	0	1	1	0
Trachyderma philistina Reiche, 1857	0	0	0	0	0	0	1	0	0	0	0	0	0
Trachyscelis aphodioides Latreille, 1809	1	0	0	0	0	0	0	0	0	0	1	1	0
Uloma culinaris (Linné, 1758)	0	1	0	0	1	0	0	0	0	0	0	0	0
Uloma cypraea Kraatz, 1873	0	0	0	0	0	0	0	0	0	0	0	0	1
Xanthomus cyprius Grimm, 1991	0	0	0	0	0	0	0	0	0	0	0	0	1
Xanthomus graecus Dajoz, 1984	0	0	0	0	0	0	0	0	0	0	0	0	1
Xanthomus ovulus (Seidlitz, 1898)	0	0	0	1	0	0	1	0	0	0	1	1	0
Zophosis dilatata Deyrolle, 1867	0	0	0	0	0	0	1	0	0	0	1	1	0
Zophosis punctata punctata Brullé, 1832	1	1	1	0	1	1	1	1	0	0	1	1	1
TOTALS	**37**	**58**	**3**	**13**	**23**	**22**	**70**	**35**	**1**	**0**	**70**	**75**	**68**

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SUMMARY

Three measures of species rarity were calculated to investigate possible spatial patterns of variation in tenebrionid community rarity on the Aegean islands. For each species rarity was evaluated as geographic distribution (mean incidence of species on islands in the archipelago), ecological tolerance (total area of the islands occupied) and population density (number of decades of species' records from 1870 to 2000). In addition, Kattan's index of vulnerability was computed. These rarity and vulnerability measures were used to construct analogous indexes at community level. Plotting species richness on island coordinates, produced a map where richness decreased in the centre of the archipelago, reaching highest values on peripheral islands. Geographic rarity increased from the centre of the archipelago to periphery. By contrast, ecological tolerance and population density show the following pattern: islands located very close to the Anatolian mainland, as well as those that are clumped, host the most eurytopic and

abundant species, while remote southern islands have ecologically specialized faunas with low population density. Vulnerability (i.e. the reverse of Kattan's index applied to communities) decreased in remote islands, which are usually also the smallest. As a whole the tenebrionid beetles on the Aegean Islands constitute threatened faunal assemblages of great 'rarity' under several dimensions, and some islands are especially rich in rare species, deserving special attention in conservation efforts.

RIASSUNTO

Variazioni spaziali della rarità nei coleotteri tenebrionidi delle Isole dell'Egeo (Coleoptera, Tenebrionidae).

Tre misure di rarità specifica sono state calcolate per studiare possibili variazioni spaziali nella rarità dei tenebrionidi delle isole egee a livello di comunità. Per ciascuna specie la rarità è stata calcolata in termini di distribuzione geografica (numero di isole occupate dalla specie sul totale delle isole considerate), tolleranza ecologica (area totale delle isole occupate) e densità delle popolazioni (numero di decadi per cui sono noti reperti dal 1870 al 2000). Inoltre è stato calcolato, da queste misure, l'indice di vulnerabilità di Kattan. Tali misure di rarità e vulnerabilità sono state quindi utilizzate per sviluppare misure analoghe a livello di comunità. La loro rappresentazione rispetto alle coordinate geografiche mostra diversi modelli di variazione. La ricchezza di specie diminuisce al centro dell'arcipelago, mostrando i valori maggiori nelle isole periferiche. La rarità geografica incrementa anch'essa dal centro alla periferia. Al contrario, la tolleranza ecologica e la densità di popolazione presentano i valori maggiori nelle isole collocate vicino alla costa anatolica, così come in quelle che formano gruppi di isole strettamente aggregate. La vulnerabilità (cioè l'inverso dell'indice di Kattan) diminuisce nelle isole remote, che sono di norma anche le più piccole. Tali risultati sono interpretati alla luce del carattere relittuale dei tenebrionidi dell'Egeo. Nel complesso, i tenebrionidi egeici costituiscono una fauna minacciata ad alta rarità sotto diversi profili ed alcune isole appaiono particolarmente ricche di specie rare, risultando pertanto di notevole interesse conservazionistico.

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