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First records of *Lygaeus creticus* Lucas, 1854 for Lebanon and several Mediterranean islands, with remarks on some distribution records

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Abstract. The first record of *Lygaeus creticus* Lucas, 1854 (Hemiptera: Heteroptera: Lygaeidae) for Lebanon is provided. Further records for several Mediterranean islands are also reported. Some country records are discussed: those for Saudi Arabia and North Macedonia are preventively excluded from the distribution of this species pending further research.

Key words: Hemiptera, Heteroptera, Lygaeidae, faunistics, distribution, Albania, Croatia, Greece, Italy, Lebanon, North Macedonia, Saudi Arabia, Spain.

Introduction

Lygaeus creticus Lucas, 1854 is a species of Lygaeidae with a Turano-Mediterranean distribution (*sensu* Vigna Taglianti et al. 1999) (see Cianferoni et al. 2017). Originally described from the Greek island of Crete (Lucas 1854), hence the name, it was known so far from Afghanistan, Iran, Oman, Arab Emirates, Iraq, Syria, Jordan, Israel, Turkey, Cyprus, Greece (including several islands), Libya (Cyrenaica), Albania, Montenegro, Bosnia and Herzegovina, Croatia, Slovenia, Italy (including Sicily, Sardinia and some minor islands), Malta, Switzerland (Tessin), France (Corsica and southern mainland), and Spain (Carapezza 1993; Péricart 1999, 2001; Aukema et al. 2013; Linnavuori et al. 2014; Cianferoni et al. 2017; Cornuel-Willermoz & Dusoulier 2017; van der Heyden 2017; Gogala et al. 2018; Bolt 2020; Boninsegna & Poggi 2020; Aukema 2023). The species is reported as doubtful also for Saudi Arabia (Péricart 2001). Moreover, van der Heyden (2017) listed *L. creticus* also for North Macedonia, but this record needs to be confirmed (see discussion below for further detail).

Recently, the species has been expanding its range, especially in Southern Europe: it was recorded for the first time in 2016 for Slovenia (Gogala et al. 2018), in 2017 for Corsica (Cianferoni et al. 2017; Cornuel-Willermoz & Dusoulier 2017; van der Heyden 2017) and southern mainland of France (Cornuel-Willermoz & Dusoulier 2017), in 2019 for Tessin, Switzerland (Bolt 2020). Even in the southern Balkans, the species was recorded for Albania for the first time only in 2017 (van der Heyden 2017).

Many new recent records of *L. creticus* were provided also for several Italian regions (Dioli & Grazioli 2012; Cianferoni et al. 2017; Cornuel-Willermoz & Dusoulier 2017; Hilpold & Demetz 2017; Boninsegna & Poggi 2020; Dioli & Salvetti 2021).

The species seems to prefer mainly *Nerium oleander* L. (Apocynaceae), but it has also been recorded on some species of the genus *Sorbus* (Rosaceae) (Lindberg 1948; Stichel 1957; Péricart 1999). However, the species' biology is still insufficiently known (Linnavuori et al. 2014).

Material and methods

The specimen from Lebanon comes from an ecological survey of the river systems of the country made by one of the authors (AD) and it is the subject of a dedicated article (Cianferoni & Dia, in prep.); its sampling in water is accidental.

Further material was picked from the platform "iNaturalist", a system for sharing biodiversity records (www.inaturalist.org), and is in part accessible also through GBIF (iNaturalist contributors, iNaturalist, 2023), and from the Spanish platform "Biodiversidad Virtual" (www.biodiversidadvirtual.org). The freely usable observations are reported in detail and adequately credited (according to their licence), while others are only quoted generically.

The material examined (physical specimen and photographic documentation) were identified or confirmed by the first author (FC).

For each site, the following information is given: country, first-level administrative division, island and/or locality (when appropriate after transliterations, the original name is indicated in square brackets), collecting site, geographical coordinates (decimal degrees; *datum* WGS84),

elevation (when available from the original source), date, collector/photographer, number of specimens, sex (only for the collected specimen) and life cycle stage, type of storage/source. Records are approximately listed from east to west and south to north. The data uncertainty (in metres) was indicated according to the point-radius method (Wieczorek et al. 2004). Concerning the observations from iNaturalist: the term accuracy is used when this information was not provided; six decimal digits are reported for all the coordinates, as standardized in the platform, including cases where the uncertainty is very high).

Abbreviations used in the text: obs. = observation; spec. = specimen/s.

Collection acronym: MLUB = Natural History Museum, Faculty of Science, Lebanese University (Beirut, Lebanon).

Results

The material examined is listed below.

LEBANON: South Governorate, El-Tassé or Et-Tasse [الطاسة], spring-brook, between the villages of Jarjouaa or Jarjou [جرجوع] and El-Louaïzé or Al-Lwaiza [اللويزة], 33.45263° N 35.53258° E (uncertainty = 70 m), 695 m a.s.l., 15.VI.2008, Aref Dia legit, 1 adult female, MLUB.

GREECE: North Aegean, Agios Efstratios [Αγιος Ευστράτιος] Island, 39.53876° N 24.990064° E (uncertainty = 4 m), 8.V.2022, 1 adult spec., photo by Savvas Zafeiriou (Σάββας Ζαφειρίου), inaturalist.org (obs. ID 117374462).

East Macedonia and Thrace, Thasos Island, Thasos (town) [Λιμένας Θάσου], 40.780201° N 24.711792° E (accuracy not provided), 18.V.2022, 1 adult spec., photo by Sofia Giakoumi, inaturalist.org (obs. ID 117558190).

Central Macedonia, Kampanis [Καμπάνης], 40.891059° N 22.915009° E (uncertainty = 1 m), 13.I.2023, 1 adult spec., photo by Panagiotis Rafailidis [Παναγιώτης Ραφαηλίδης], inaturalist.org (obs. ID 146463823). *Remark:* This record is just over 30 km from the border with North Macedonia (see Discussion).

Ionian Islands, Lefkada Island, 38.836792° N 20.711810° E (uncertainty = 4 m), 19.II.2021, 1 adult spec., photo by Nikolaos Papageorgioum, inaturalist.org (obs. ID 70331709); Lefkada Island, Kariotes [Καριώτες], 38.802422° N 20.715380° E (uncertainty = 31 m), 27.II.2021, 1 adult spec., photo by Nikolaos Papageorgioum, inaturalist.org (obs. ID 70335287); Lefkada Island, surroundings of Kariotes, 38.799435° N 20.709841° E (uncertainty = 4 m), 7.III.2021, 1 adult spec., photo by Nikolaos Papageorgioum, inaturalist.org (obs. ID 71139244); Lefkada Island, Kariotes [Καριώτες], 38.800888° N 20.715595° E (uncertainty = 8 m), 16.V.2021, 1 immature spec., photo by "lamprisdimitris", inaturalist.org (obs. ID 79134092).

Note: A record for Rhodos Island (South Aegean, Dodecanese) is also available (iNaturalist).

ALBANIA: Vlorë, Sazan Island, 40.498300° N 19.286413° E (uncertainty = 101 m), 20.V.2017, 1 adult spec., photo by Eridan Xharahi, inaturalist.org (obs. ID 6303810).

CROATIA: Split-Dalmatia, Hvar Island, 43.183936° N 16.594449° E (accuracy not provided), 15.VII.2022, 1 adult spec., photo by T. Abe Lloyd, inaturalist.org (obs. ID 126386432); Brač Island, 43.304891° N 16.652710° E (uncertainty = 22.21 km), 29.V.2007, 1 adult spec., photo by Gábor Keresztes, inaturalist.org (obs. ID 147451077).

Zadar, Vir Island, 44.305908° N 15.096447° E (uncertainty = 76 m), 24.VI.2022, 1 adult spec., photo by "yana1978", inaturalist.org (obs. ID 123252972). Premuda Island, 44.344007° N 14.599219° E (accuracy not provided), 27.VIII.2022, 1 adult spec., photo by Danijel Ostović, inaturalist.org (obs. ID 132557138).

Primorje-Gorski Kotar, Lošinj Island, 44.525085° N 14.476593° E (uncertainty = 14.13 km), 28.XII.2021, 2 mating adult spec., photo by Andrea Benocci, inaturalist.org (obs. ID 103840353). Krk Island, Baška, 44.971871° N 14.755028° E (accuracy not provided), 19.III.2022, 1 adult spec., photo by Dean Zagorac, inaturalist.org (obs. ID 108998980); Krk Island, 45.021903° N 14.571107° E (accuracy not provided), 1.XI.2022, 1 adult spec., photo by "croatianiguana", inaturalist.org (obs. ID 140765531).

Note: Records for Čiovo Island (Split-Dalmatia) and Silba Island (Zadar) are also available (iNaturalist).

ITALY: Sicily, Lipari Island, Canneto, 38.483281° N 14.962139° E (uncertainty = 23 m), 4.VIII.2022, 1 adult spec., photo by Sara Pedone, inaturalist.org (obs. ID 129386891); Vulcano Island, Vulcano Porto, 38.412334° N 14.950405° E (uncertainty = 371 m), 2.I.2015, 1 adult spec., photo by Mario Bassini (Fig. 1), inaturalist.org (obs. ID 105456125).

Tuscany, Capraia Island, 43.04825° N 9.842614° E (accuracy not provided), 12.VI.2022, 1 immature spec., photo by Lorenzo Dotti, inaturalist.org (obs. ID 122034173).

Note: A record for Giglio Island (Tuscany) is also available (iNaturalist). The species was previously known in the Aeolian archipelago (Sicily) from a single record from Vulcano Island (Carapezza 1993).

SPAIN: Madrid, Madrid, Ensanche de Vallecas, 40.378256° 3.610755° W (accuracy not provided), 12.IV.2020, 2 mating adult spec., photo by "lamoscadrosophila", inaturalist.org (obs. ID 41990077); Madrid 40.351255° N 3.761372° W (uncertainty = 300 m), 19.VII.2022, 1 adult spec., photo by Álvaro Díaz, inaturalist.org (obs. ID 127014450).

Note: Further observations (n = 26 at June 2023) by Pedro Antonio Làzaro from the Madrid urban area are available on Biodiversidad Virtual (biodiversidadvirtual.org).

Fig. 1. Specimen of *Lygaeus creticus* Lucas, 1854 from Vulcano island, Sicily (photo by Mario Bassini).

Discussion

The species was not recorded so far for Lebanon (cf. e.g., Puton 1881; Giglio-Tos 1894; Horváth 1926, 1929; Péricart 1999, 2001; Aukema et al. 2013; Aukema 2023; Matocq & Azar 2023 - Note that some old references have been overlooked in subsequent catalogues and checklists). Only the online source "Lygaeoidea Species File" (Dellapé & Henry 2023) reported Lebanon for this species, but the country occurrence is wrongly attributed to the "Catalogue of the Heteroptera of the Palaearctic Region" (Péricart 2001), where this country is not listed. Perhaps a misinterpretation of similar country acronyms occurred.

Péricart (1999) also quoted the record for "Palestine" by Bodenheimer (1937), bringing it back to the current "Israel and Syria". However, the territories of present-day Lebanon are excluded. Therefore, this record represents the first one for Lebanon for *L. creticus*, However, it falls entirely within the range of the species, which is already reported for the neighbouring countries (see, e.g., Péricart 2001).

Based on observations from iNaturalist, the first records for several Mediterranean islands are also reported: Greece: Agios Efstratios, Rhodos, Thasos (Aegean Sea), and Lefkada (Ionian Sea); Albania: Sazan; Croatia: Hvar, Brač, Čiovo, Vir, Premuda, Lošinj, and Krk; Italy: Lipari (Sicily), Giglio and Capraia (Tuscany). Some considerations can be made for some doubtful country records.

Lygaeus creticus was reported for Saudi Arabia as doubtful by Péricart (2001) and quoted in this way by several subsequent authors (e.g., Dioli & Grazioli 2012; van der Heyden 2017; Boninsegna & Poggi 2020; Dioli & Salvetti 2021). The record "SA?" [=doubtful for Saudi Arabia] listed in Péricart (2001) comes evidently from Péricart (1999), who listed "Arabie (Winkler & Kerzhner 1977) (à vérifier)". Winkler & Kerzhner (1977) for *L. creticus* reported the occurrence in "Аравийский п-ов" [=Arabian Peninsula]. The source for this distribution is unknown, but it is clear that the presence in Saudi Arabia is a subsequent interpretation not supported by evidence. Linnavuori et al. (2014) correctly quoted this record as "Arabian Peninsula (?Saudi Arabia)" and reported the first records for this species for Oman and the United Arab Emirates where specimens darker than the Mediterranean ones and with a different pattern of colouration occur ("Arabian form colouration"). Therefore, the possible presence of the species in Saudi Arabia is very likely. However, currently lacking evidence, *L. creticus* is here preventively excluded from the fauna of Saudi Arabia pending further research.

More recently, *L. creticus* was listed also for "Macedonia" [currently North Macedonia] by van der Heyden (2017) based on the online source "Lygaeoidea Species File" (Dellapé & Henry 2023), where this country occurrence is listed and wrongly attributed to the "Catalogue of the Heteroptera of the Palaearctic Region" (Péricart 2001) which instead does not list this country in the distribution of this species. Maybe even in this case, a misinterpretation of similar country acronyms occurred. In Péricart (2001) the occurrence for Malta (MA) is reported, but Malta is not listed by Dellapé & Henry (2023). Also, in this case, given the presence in the Greek region of Macedonia (see Material examined), the possible occurrence in North Macedonia is probable. In any case, in the absence of direct evidence, North Macedonia is preventively excluded from the distribution of this species pending further research. Dellapé & Henry (2023) also listed Serbia together with Macedonia, but also in this case this country record is never quoted in literature (cf. e.g., Protić 2011).

Considering the occurrence of the species in Cyrenaica (Libya), the presence of *L. creticus* in Egypt (Mediterranean part) is expected (as well as in North Macedonia and Saudi Arabia, although it is also not supported by any evidence).

Recently, *L. creticus* was reported for Spain by Boninsegna & Poggi (2020) based on an observation on iNaturalist (inaturalist.org) of April 2020 (two mating specimens). Further observations are available on the same platform from the same area (one further observation from the city of Madrid) and on Biodiversidad Virtual (biodiversidadvirtual.org) with many observations from the Madrid urban area (see the material examined). Therefore, it seems evident that there is a population in the city area. However, given that the closest populations known so far are from southern France, the Spanish specimens may have originated from accidental transport (anthropogenic long-distance dispersal - LDD) rather than natural short-distance dispersal (SDD). If this were ascertained, this "Madrid population" should be considered as alien in Spain at least for the moment. In any case, the western dispersal of *L. creticus* will likely continue until the different populations come into contact. It is to remember that this kind of dispersal is always a complex process, often with the stratification of a natural SDD and an anthropogenic LDD (see, for example, Butikofer et al. 2018 and Cianferoni et al. 2021).

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References

Aukema B. 2023 Catalogue of the Palaearctic Heteroptera. Available online at: https://catpalhet.linnaeus.naturalis.nl/ Last access: 13 March 2023.

Aukema B., Rieger C., Rabitsch W. 2013. *Catalogue of the Heteroptera of the Palaearctic Region.* Volume 6. Supplement. *The Netherlands Entomological Society*, Amsterdam, XXIII + 629 pp.

Bodenheimer F.S. 1937. Prodromus Faunæ Palestinæ. Essai sur les éléments zoogéographiques et historiques du sud-ouest du sous-régne paléarctique. *Mémoires présenés a l'Institut d'Égypte* **33**: 1–286.

Bolt D. 2020. Die Oleander-Ritterwanze *Lygaeus creticus* (Lucas, 1854) hat auch die Schweiz erreicht (Heteroptera, Lygaeidae). *Entomo Helvetica* **13**: 147–148.

Boninsegna C., Poggi F. 2020. *Lygaeus creticus* Lucas, 1854 (Hemiptera, Heteroptera, Lygaeidae). Aggiornamento della diffusione in Italia e prima segnalazione per la Spagna. *Rivista del Museo Civico di Scienze Naturali "Enrico Caffi"*, Bergamo, **33**: 83–86.

Butikofer L., Jones B., Sacchi R., Mangiacotti M., Ji W. 2018. A new method for modelling biological invasions from early spread data accounting for anthropogenic dispersal. *PLoS ONE* **13 (11)**: e0205591. https://doi.org/10.1371/journal.pone.0205591

Carapezza A. 1993. Eterotteri nuovi per le isole Eolie, Ustica e le isole Egadi, con nuove sinonimie (Insecta, Rhynchota). *Il Naturalista siciliano*, series IV, **17 (3-4)**: 291–303.

Cianferoni F., Ceccolini F., Dioli P. 2017. Nuovi dati di *Lygaeus creticus* Lucas, 1854 in Italia e Corsica (Hemiptera: Heteroptera: Lygaeidae). Natural History Sciences **5 (1)** (2018): 77–78. https://doi.org/10.4081/nhs.2018.346

Cianferoni F., Roggero M., Pantaleoni R.A., Loru L., 2021. *Nagusta goedelii* (Kolenati, 1857) (Hemiptera Heteroptera Reduviidae) in Sardinia: human-mediated dispersal aids this species to spread west. *Biodiversity Journal* **12 (2)**: 297–300. http://dx.doi.org/10.31396/Biodiv.Jour.2021.12.2.297.300

Cornuel-Willermoz A., Dusoulier F. 2017. Découverte de *Lygaeus creticus* Lucas, 1853 en Corse et dans le Var: une nouvelle espèce de Lygaeidae pour la faune de France (Hemiptera Heteroptera). *L'Entomologiste* **73 (4)**: 273–275.

Dellapé P.M., Henry T.J. 2023 Lygaeoidea Species File. Version 5.0/5.0. Available online at: http://Lygaeoidea.SpeciesFile.org Last access: 13 March 2023.

Dioli P., Grazioli L. 2012. Prime segnalazioni di *Lygaeus creticus* Lucas, 1854 per il Veneto e altre regioni dell'Italia peninsulare (Insecta, Heteroptera, Lygaeidae). *Bollettino del Museo di Storia Naturale di Venezia* **63**: 19–25.

Dioli P., Salvetti M. 2021. Ligeidi nuovi per la Liguria e nuove segnalazioni in Italia e Portogallo (Madera) (Hemiptera, Lygaeidae). *Annali del Museo Civico di Storia Naturale "G. Doria"* **114**: 367–376.

Giglio-Tos E. 1894. Viaggio del Dr. E. Festa in Palestina, nel Libano e regioni vicine. VII. Rincoti. *Bollettino dei Musei di Zoologia ed Anatomia Comparata della Regia Università di Torino* **9 (169)**: 1–14.

Gogala A., Kamin J., Kastelic M., Vadnjal D., Zdešar M. 2018. First or rare records of Heteroptera species in Slovenia. *Acta entomologica slovenica* **26 (1)**: 55–62.

Hilpold A., Demetz T. 2017. *Lygaeus creticus* (Lucas, 1854) neu für Südtirol und den Alpenraum und Wiederbestätigung von *Ischnodemus sabuleti* (Fallén, 1826) für Südtirol (Insecta, Heteroptera, Lygaeoidea). *Gredleriana* **17**: 245–248.

Horváth G. 1926. Hémiptères, pp. 107–119. [in:] *Voyage Zoologique d'Henri Gadeau de Kerville en Syrie. I (Avril-Juin 1908).* Bailliere et fils, Paris.

Horváth G. 1929. Rhynchoten aus Palästina und Syrien. Zoologische Studienreise von R. Ebner 1928 mit Unterstützung der Akademie der Wissenschaften in Wien. *Sitzungsberichte der Akademie der Wissenschaften in Wien, Mathematisch-naturwissenschaftliche Klasse*, Abteilung 1 **138 (7)**: 329–334.

iNaturalist contributors, iNaturalist 2023. iNaturalist Research-grade Observations. iNaturalist.org. Occurrence dataset https://doi.org/10.15468/ab3s5x accessed via GBIF.org on 13 March 2023.

Lindberg H. 1948. On the insect fauna of Cyprus. Results of the expedition of 1939 by Harald, Håkan and P. H. Lindberg. II. Heteroptera und Homoptera Cicadina der Insel Zypern. *Commentationes Biologicae* **10 (7)**: 24–175.

Linnavuori R., Kment P., Carapezza A. 2014. Order Hemiptera, suborder Heteroptera Infraorder Pentatomomorpha, superfamily Lygaeoidea. *Arthropod fauna of UAE* **5**: 192–246.

Lucas H. 1854. Essai sur les animaux articulés qui habitant l'île de Crète. *Revue et magasin de Zoologie pure et appliquée*, 2a serie, **6**: 278–285.Matocq A., Azar D. 2023. Preliminary inventory of terrestrial Heteroptera from Lebanon (Hemiptera: Leptopodomorpha, Cimicomorpha and Pentatomomorpha). *Zootaxa* **5230 (1)**: 1–26.

Péricart J. 1999. *Hémiptères Lygaeidae euro-méditerranéens. Volume 1. Généralités. Systématique: première partie.* Faune de France. 84/A (1998). Fédération Française des Sociétés de Sciences naturelles, Paris, 468 pp. + 6 pls.

Péricart J. 2001. Superfamily Lygaeoidea Schilling, 1829. Family Lygaeidae Schilling, 1829 – Seedbugs, pp. 35–220. [in:] Aukema B., Rieger Ch. (eds). *Catalogue of the Heteroptera of the Palaearctic Region. Vol. 4. Pentatomomorpha I.* The Netherlands Entomological Society, Amsterdam, XIV + 346 pp.

Protić L. 2011. *Heteroptera.* Prirodnjački Muzej u Beogradu. Special editions. Vol. 43. Belgrade, 359 pp. [in Serbian]

Puton A. 1881. Enumération des Hémiptères récoltés en Syrie par M. Abeille de Perrin avec la description des espèces nouvelles. *Mittheilungen der Schweizerischen entomologischen Gesellschaft* **6 (3)**: 119–129.

Stichel W. 1957. Lygaeidae. [in:] Stichel W. (ed.). *Illustrierte Bestimmungstabellen der Wanzen. II. Europa (Hemiptera-Heteroptera Europae).* Vol. 4. Stichel, Berlin-Hermsdorf, 838 pp.

van der Heyden T. 2017. First records of *Lygaeus creticus* Lucas, 1854 (Hemiptera: Heteroptera: Lygaeidae: Lygaeinae) for Albania and France. *Arquivos Entomolóxicos* **18**: 65–66.

Vigna Taglianti A., Audisio P.A., Biondi M., Bologna M.A., Carpaneto G.M., De Biase A., Fattorini S., Piattella E., Sindaco R., Venchi A., Zapparoli M. 1999. A proposal for chorotype classification of the Near East fauna, in the framework of the Western Palearctic region. *Biogeographia.* Lavori della Società italiana di Biogeografia, New Series **20**: 31–59.

Wieczorek J., Guo Q., Hijmans R.J. 2004. The point-radius method for georeferencing locality descriptions and calculating associated uncertainty. *International Journal of Geographical Information Science* **18 (8)**: 745–767.

Winkler N.G., Kerzhner I.M. 1977. Palearktičeskie vidy poluzhestkokrylykh roda *Lygaeus* F. (Heteroptera, Lygaeidae) | Palaearctic species of the genus *Lygaeus* F. (Heteroptera, Lygaeidae). *Nasekomye Mongolii [= Insects of Mongolia]* **5**: 254–267. [in Russian, English title]

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