



HAL
open science

Two new introduced species of Coccinellidae (Insecta, Coleoptera) detected from Madeira and mainland Portugal

Alain Migeon, António Franquinho Aguiar, Miguel M Andrade

► **To cite this version:**

Alain Migeon, António Franquinho Aguiar, Miguel M Andrade. Two new introduced species of Coccinellidae (Insecta, Coleoptera) detected from Madeira and mainland Portugal. Boletín de la Asociación Española de Entomología, 2023. hal-04420137

HAL Id: hal-04420137

<https://hal.science/hal-04420137>

Submitted on 26 Jan 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Two new introduced species of Coccinellidae (Insecta, Coleoptera) detected from Madeira and mainland Portugal

Dos nuevas especies de Coccinellidae (Insecta, Coleoptera) para Madeira y Portugal continental

ALAIN MIGEON^{1*}, ANTÓNIO FRANQUINHO AGUIAR² and MIGUEL M. ANDRADE³

1*. CBGP, INRAE, CIRAD, Institut Agro, IRD, Univ Montpellier, Montpellier, France
alain.migeon@inrae.fr, <https://orcid.org/0000-0003-4041-5158>

2. Laboratório de Qualidade Agrícola, Caminho Municipal dos Caboucos, 61, 9135-372, Camacha, Madeira, Portugal. antonio.aguiar@madeira.gov.pt, <https://orcid.org/0000-0002-9572-2967>

3. Rua das Virtudes, Barreiros Golden I, Bloco I, R/C B; 9000-645, Madeira, Portugal.
miguelm.andrade@hotmail.com

Recbido: 17-10-2023. Aceptado: 10-02-2023
ISSN: 2792-2456 (versión online)

Publicado online: 23-02-2023
ISSN: 0210-8984 (versión impresa)

ABSTRACT

We report two alien species of Coccinellidae in Portugal. *Cheilomenes sexmaculata* was discovered in Algarve, mainland Portugal. The presence of *Olla v-nigrum* was confirmed in Madeira Island. It is the first and surprising report of *Cheilomenes sexmaculata* in Europe.

Key words: alien species, *Cheilomenes sexmaculata*, Macaronesia, new country record, *Olla v-nigrum*, Portugal.

RESUMEN

Señalamos dos especies foráneas de Coccinellidae en Portugal. *Cheilomenes sexmaculata* se descubrió en Algarve, Portugal continental. La presencia de *Olla v-nigrum* se confirmó en la isla de Madeira. Es el primer registro, sorprendente por otra parte, para *Cheilomenes sexmaculata* en Europa.

Palabras clave: especies foráneas, *Cheilomenes sexmaculata*, *Olla v-nigrum*, Madeira, Portugal continental, nuevas citas.

INTRODUCTION

Coccinellidae have been widely used in biological control since the nineteenth century and many species were introduced from one continent to another (see OBRICKY and KRING (1998) and RONDONI *et al.*, 2020 for reviews). In Europe and the Macaronesian Islands, eleven species can be considered as established (ROY and MIGEON, 2010). The recent invasion of *Harmonia axyridis* (Pallas, 1773) in many countries over the World

(BROWN *et al.*, 2011, LOMBAERT *et al.*, 2011, ROY *et al.*, 2016) and new considerations regarding the introduction of alien species (LOUDA *et al.*, 2003) has slowed down the rhythm of introductions of new species. However, previously introduced species are still expanding their range and alien Coccinellidae have increased their distribution in Europe from 107 to 131 species-country records during the period 2009-2017 (SOARES *et al.*, 2018). *Olla v-nigrum* (Mulsant, 1866) is the twelfth species recorded from Europe and Macaronesia

(SUÁREZ *et al.*, 2018) and its introduction is undocumented.

The recent checklist of Portuguese species of Coccinellidae (SOARES *et al.*, 2021) counts 101 species from mainland and Atlantic Islands of Portugal. Here we report two new species from this country, *Olla v-nigrum* in Madeira and *Cheilomenes sexmaculata* (Fabricius, 1781) in mainland.

MATERIAL AND METHODS

The collects were realized during a field survey in search of Tetranychids mites and were essentially made of opportunistic sampling. Trees and shrubs were beaten on a beating tray and insects collected using a pooter.

Specimens are deposited in the CBGP – Continental Arthropod Collection (CBGP Montferriez-sur-Lez, FRANCE) and Miguel M. Andrade personal collection.

RESULTS

Olla v-nigrum (Mulsant, 1866)

Olla v-nigrum was detected on Madeira Island, Funchal, Imaculado Coração de Maria, Jardim

Santa Luzia, ex *Abelia x grandiflora*, 32.65447°N, 16.91227°W, 65 m asl, 30-V-2018, 1 adult, Miguel M. Andrade leg., Jaroslav Vetrak det., Jaroslav Vetrak collection; Funchal, Se, 32.64687°N, 16.90764°W, 1 m asl, 11-XI-2021, 1 adult, J. Bento leg., Miguel Andrade Collection; Santana, Arco de São Jorge, Museu do Vinho e da Vinha, 32.82431°N, 16.95375°W, 139 m asl, 19-V-2022, 1 adult from an unidentified tree, A. Migeon leg. (Fig. 1), CBGP – Continental Arthropod Collection. This species is already recorded from Canary Islands (SUÁREZ *et al.*, 2018, ROMANOWSKI *et al.*, 2020b, GBIF 2022a) from the islands of Lanzarote, Gran Canaria and La Gomera. It was reported from Madeira recently (ROMANOWSKI & CERYNGIER, 2022) and our data confirm its establishment on the island. It remains undetected until now in Azores. It is a World spread species (GBIF, 2022a), originating from America where it is encountered from USA to Columbia and from Southern Brazil to Argentina (MICHAUD, 2001, GBIF 2022a). It was introduced in many countries for biological control purposes but established only in tropical areas (Fig. 2). Attempts of introductions were made in Europe (France, former Czechoslovakia) (KREITER, 1985) and in Israel (WISOKI, 1979), but didn't succeed. Its record in Germany (<https://>

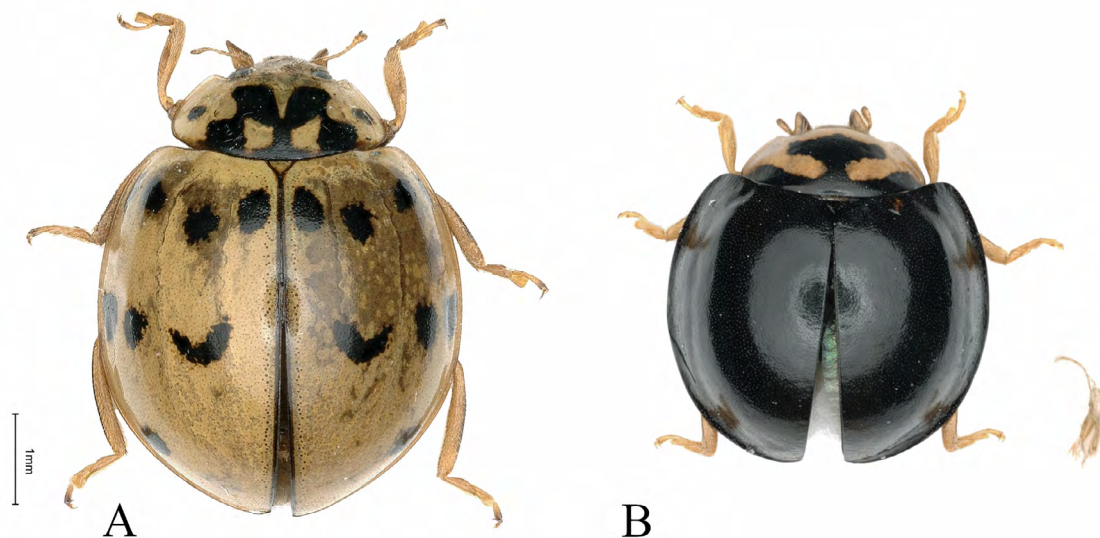


Fig. 1. A: *Olla v-nigrum* (Mulsant, 1866) from Madeira Island; B: *Cheilomenes sexmaculata* (Fabricius, 1781) from Algarve, Portugal. Photos CBGP – Continental Arthropod Collection (2021).

Fig. 1. A: *Olla v-nigrum* (Mulsant, 1866) de la Isla de Madeira; B: *Cheilomenes sexmaculata* (Fabricius, 1781) del Algarve, Portugal. Fotos CBGP - Continental Arthropod Collection (2021).

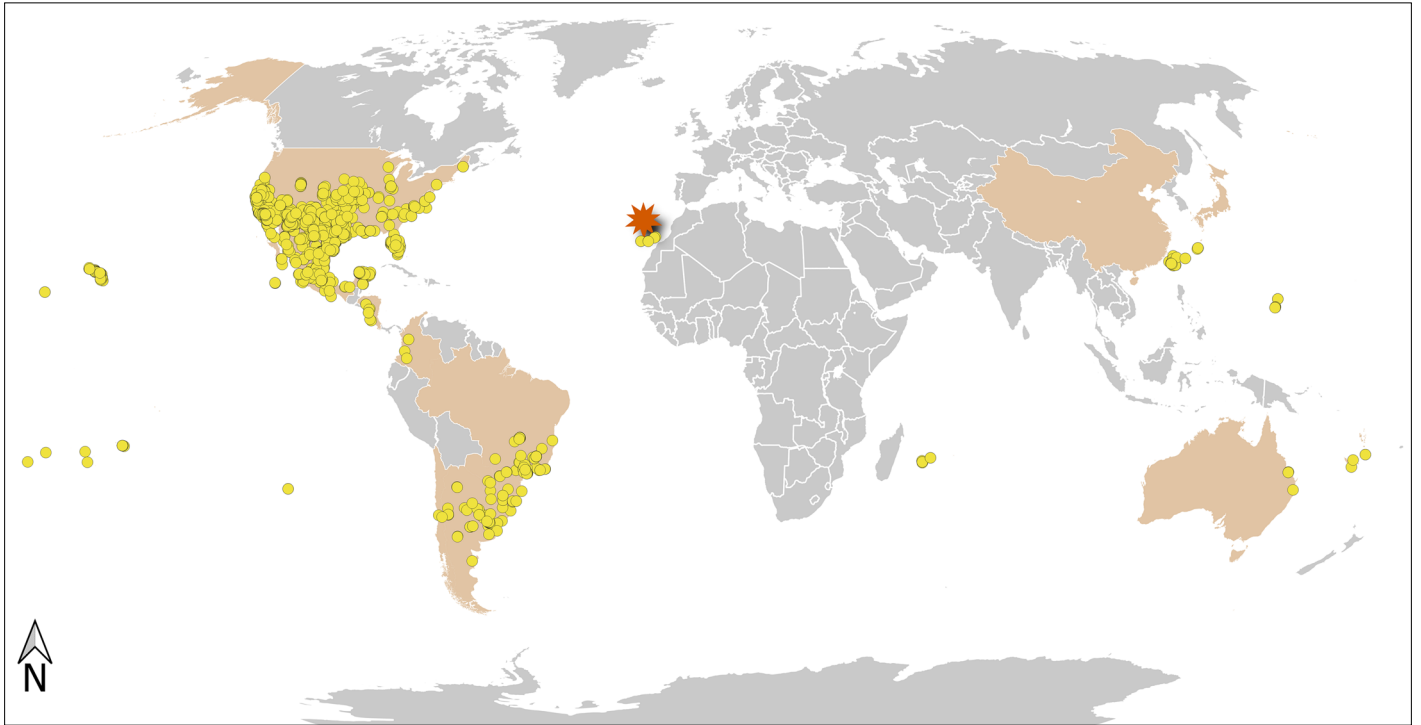


Fig. 2. World distribution of *Olla v-nigrum* (Mulsant, 1866). The star indicates the new record. Source: GBIF, 2022a and new data.

Fig. 2. Distribución mundial de *Olla v-nigrum* (Mulsant, 1866). La estrella indica el nuevo registro. Origen: GBIF, 2022a y nuevos datos.



Fig. 3. *Cheilomenes sexmaculata* (Fabricius, 1781). A: larva, B: nymph, C: adult. Photos A. Migeon.

Fig. 3. *Cheilomenes sexmaculata* (Fabricius, 1781). A: larva, B: ninfa, C: adulto. Fotos A. Migeon.

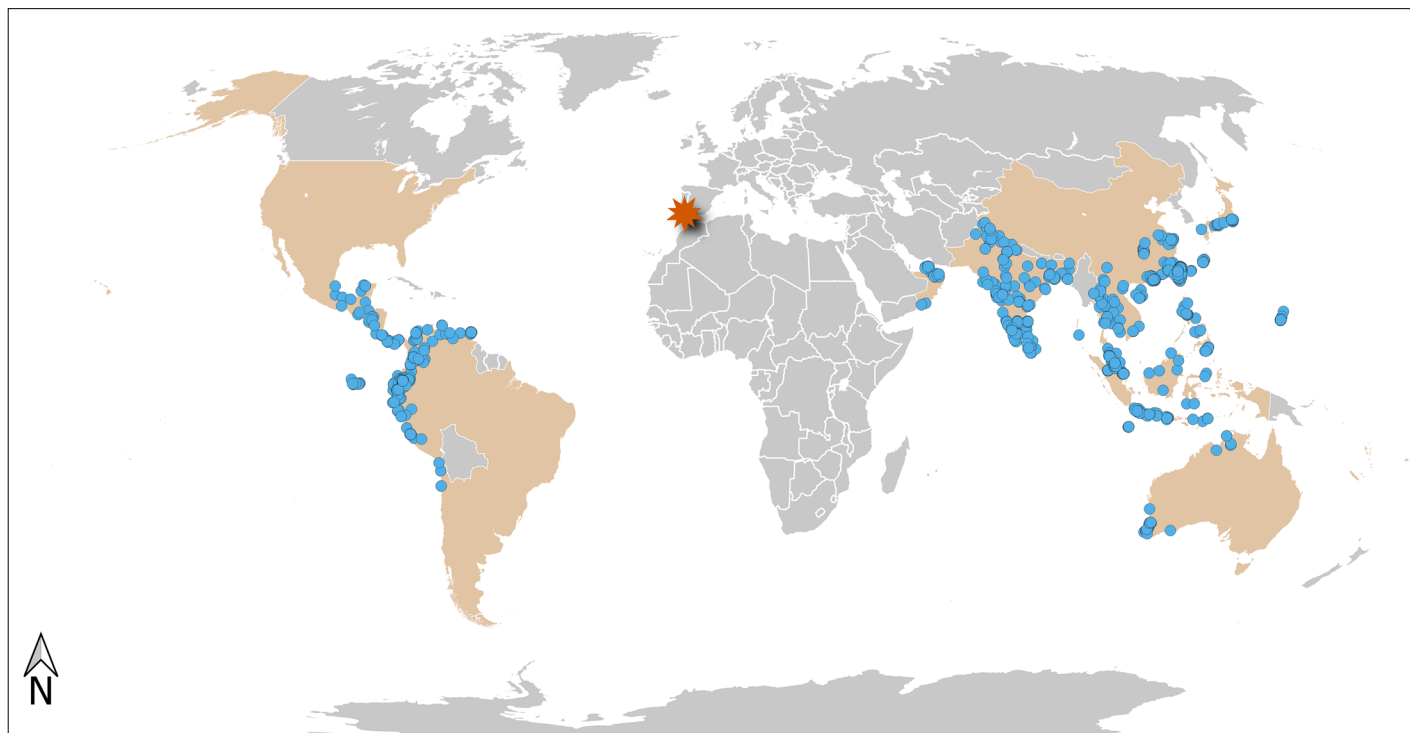


Fig. 4. World distribution of *Cheilomenes sexmaculata* (Fabricius, 1781). The star indicates the new record. Source: GBIF, 2022b and new data.
Fig. 4. Distribución mundial de *Cheilomenes sexmaculata* (Fabricius, 1781). La estrella indica el nuevo registro. Origen: GBIF, 2022b y nuevo dato.

naturgucker.de/?art=-1635105987) is not supported by any document, the photos illustrating the species in the German database were taken in Hawaii. Its introduction in Madeira, nor in Canarias, are documented and then the most likely hypothesis is an unintentional introduction along with infested plants. Its introduction and establishment in Madeira are not surprising given the proximity and rate of exchanges between the two archipelagos.

***Cheilomenes sexmaculata* (Fabricius, 1781)**

Cheilomenes sexmaculata was detected in Portugal mainland, Algarve, Faro, Alcoutim, Tavira, Praça D. A. Padinha, 37.12825°N, 7.64956°W, 5 m asl., 25-V-2022, larvae and adults from *Hibiscus rosa-sinensis* and *Nerium oleander*, A. Migeon leg. The specimens observed (Fig. 1 and Fig. 3) correspond to the *nigra* form (KAWAKAMI *et al.*, 2013) and was confirmed by the examination of the

tegmen (IABLOKOFF-KHNZORIAN, 1982). It is a widely used species for biological control (Fig. 4), originating from South-Western Asia and now present in tropical America (see ROMANOWSKI *et al.*, 2020a for a recent review) and in Australia (ŚLIPIŃSKI *et al.*, 2020). Its record in Germany (<https://naturgucker.de/?art=1414841824>), as for *Olla v-nigrum*, is not supported by any document. This species is unknown from any neighbouring countries and its discovery in mainland Europe constitute an unexpected and surprising fact. Its introduction is not documented and then the most likely hypothesis is an unintentional introduction along with infested plants, as for *Olla v-nigrum*.

ACKNOWLEDGEMENTS

This work was supported by the Portuguese Fundação para a Ciência e Tecnologia (FCT) and project EXPL/ASP-AGR/0082/2021 and by INRAE.

BIBLIOGRAPHY

- BROWN P.M.J., C. E. THOMAS, E. LOMBAERT, D.L. JEFFRIES, A. ESTOUP & L.-J. LAWSON HANDLEY, 2011. The global spread of *Harmonia axyridis* (Coleoptera: Coccinellidae): distribution, dispersal and routes of invasion. *BioControl*, 56: 623-641. <https://doi.org/10.1007/s10526-011-9379-1>
- CENTRE DE BIOLOGIE POUR LA GESTION DES POPULATIONS, 2022. CBGP – Continental Arthropod Collection (V2 edn). Portail Data INRAE. <https://doi.org/10.15454/D6XAKL>
- GBIF, 2022a. *Olla v-nigrum* GBIF.org (10 August 2022) GBIF Occurrence Download <https://doi.org/10.15468/dl.q7xbvq>
- GBIF, 2022b. *Cheilomenes sexmaculata* GBIF.org (10 August 2022) GBIF Occurrence Download <https://doi.org/10.15468/dl.267xcz>
- IABLOKOFF-KHNZORIAN S.M., 1982. *Les Coccinelles. Coléoptères-Coccinellidae. Tribu Coccinellini des régions Paléarctique et Orientale*. Société Nouvelle des Editions Boubée, Paris. pp. 568.
- KAWAKAMI Y., K. YAMAZAKI & K. OHASHI, 2013. Geographical variations of elytral color polymorphism in *Cheilomenes sexmaculata* (Fabricius) (Coleoptera: Coccinellidae). *Entomological Science*, 16: 235-242. <https://doi.org/10.1111/ens.12005>
- KREITER S., 1985. Etude bioécologique d'*Olla v-nigrum* (Mulsant) et essai de quantification de l'efficacité prédatrice d'*Adalia bipunctata* (L.) contre les aphides en verger de pêchers (Coleoptera-Coccinellidae) [PhD]. Université de droit, d'économie et des sciences d'Aix-Marseille. pp. 326.
- LOMBAERT E., T. GUILLEMAUD, C. E. THOMAS, L.-J. LAWSON HANDLEY, J. LI, S. WANG, H. PANG, I. GORYACHEVA, I. A. ZAKHAROV, E. JOUSSELIN, R. L. POLAND, A. MIGEON, J. VAN LENTEREN, P. DE CLERCQ, N. BERKVEN, W. JONES & A. ESTOUP, 2011. Inferring the origin of populations introduced from a genetically structured native range by approximate Bayesian computation: case study of the invasive ladybird *Harmonia axyridis*. *Molecular Ecology*, 20: 4654-4670. <https://doi.org/10.1111/j.1365-294X.2011.05322.x>
- LOUDA S.M., R. W. PEMBERTON, M. T. JOHNSON & P. A. FOLLETT, 2003. Nontarget effects —the Achilles' heel of biological control? Retrospective analyses to reduce risk associated with biocontrol introductions. *Annual Review of Entomology*, 48: 365-396. <https://doi.org/10.1146/annurev.ento.48.060402.102800>
- MICHAUD J. P., 2001. Numerical response of *Olla v-nigrum* (Coleoptera: Coccinellidae) to infestations of Asian Citrus Psyllid, (Hemiptera: Psyllidae) in Florida. *The Florida Entomologist*, 84: 608-612. <https://doi.org/10.2307/3496392>
- OBRYCKI J. J. & T. J. KRING, 1998. Predaceous Coccinellidae in biological control. *Annual Review of Entomology*, 43: 295-321. <https://doi.org/10.1146/annurev.ento.43.1.295>
- ROMANOWSKI J., P. CERYNGIER & Z. BANAK, 2020. First record of *Cheilomenes sexmaculata* (Fabricius, 1781) (Coleoptera: Coccinellidae) in Panama. *The Pan-Pacific Entomologist*, 95: 163-166. <https://doi.org/10.3956/2019-95.3.163>
- ROMANOWSKI J., P. CERYNGIER, J. VĚTROVEC, M. PIOTROWSKA & K. SZAWARYN, 2020. Endemics versus newcomers: The ladybird beetle (Coleoptera: Coccinellidae) Fauna of Gran Canaria. *Insects*, 11: 641
- ROMANOWSKI J. & P. CERYNGIER, 2022. Non-indigenous ladybird beetles (Coleoptera: Coccinellidae) in Madeira and other Macaronesian archipelagos. *BioInvasions Record*, 11: 876-886. <https://doi.org/10.3391/bir.2022.11.4.06>
- RONDONI G., I. BORGES, J. COLLATZ, E. CONTI, A. C. COSTAMAGNA, F. DUMONT, E. W. EVANS., A. A. GREZ, A. G. HOWE, E. LUCAS, J.-É. MAISONHAUTE, A. ONOFRE SOARES, T. ZAVIEZO & M. J. W. COCK, 2021. Exotic ladybirds for biological control of herbivorous insects – a review. *Entomologia Experimentalis et Applicata*, 169: 6-27. <https://doi.org/10.1111/eea.12963>
- ROY H. & A. MIGEON, 2010. Ladybeetles (Coccinellidae). Chapter 8.4. *BioRisk*, 4: 293-313. <https://doi.org/10.3897/biorisk.4.49>
- ROY H.E., P. M. J. BROWN, T. ADRIAENS, N. BERKVEN, I. BORGES, S. CLUSELLA-TRULLAS, R. F. COMONT, P. DE CLERCQ, R. ESCHEN, A. ESTOUP, E. W. EVANS, B. FACON, M. M. GARDINER, A. GIL, A. A. GREZ, T. GUILLEMAUD, D. HAELEWATERS, A. HERZ, A. HONEK, A. G. HOWE, C. HUI, W. D. HUTCHISON, M. KENIS, R. L. KOCH, J. KULFAN, L.-J. LAWSON HANDLEY, E. LOMBAERT, A. LOOMANS, J. LOSEY, A. O. LUKASHUK, D. MAES, A. MAGRO, K. M. MURRAY, G. SAN MARTIN, Z. MARTINKOVA, I. A. MINNAAR, O. NEDVED, M. J. ORLOVA-BIENKOWSKAJA, N. OSAWA, W. RABITSCH, H. P. RAVN, G. RONDONI, S. L. RORKE, S. K. RYNDEVICH, M.-G. SAETHRE, J. J. SLOGGETT, A. O. SOARES, R. STALS, M. C. TINSLEY, A. VANDEREYCKEN, P. VAN WIELINK, S. VIGLÁŠOVÁ, P. ZACH, I. A. ZAKHAROV, T. ZAVIEZO & Z. ZHAO, 2016. The harlequin ladybird, *Harmonia axyridis*: global perspectives on invasion history and ecology. *Biological Invasions*, 18: 997-1044. <https://doi.org/10.1007/s10530-016-1077-6>
- ŚLIPIŃSKI A., J. LI & H. PANG, 2020. *Ladybird beetles of the Australo-Pacific region: Coleoptera: Coccinellidae: Coccinellini*. CSIRO Publishing. pp. 231.
- SOARES A.O., H. R. CALADO, J. C. FRANCO, A. F. AGUIAR, M. M. ANDRADE, V. ZINA, O. M. C. C. AMEIXA, I. BORGES & A. MAGRO, 2021. An annotated checklist of ladybeetle species (Coleoptera, Coccinellidae) of Portugal, including the Azores and Madeira Archipelagos. *ZooKeys*, 1053: 107-144. <https://doi.org/10.3897/zookeys.1053.64268>
- SOARES A. O., A. HONĚK., Z. MARTINKOVA, P. M. J. BROWN & I. BORGES, 2018. Can native geographical

- range, dispersal ability and development rates predict the successful establishment of alien ladybird (Coleoptera: Coccinellidae) species in Europe? *Frontiers in Ecology and Evolution*, 6. <https://doi.org/10.3389/fevo.2018.00057>
- SUÁREZ D., D. HERNÁNDEZ-TEIXIDOR, A PÉREZ-DELGADO, M. ROCA-CUSACHS & P. OROMÍ, 2018. New distribution records for insects (Insecta, Coleoptera and Diptera) in the Canary Islands. *Boletín - Asociación Española de Entomología*, 42: 1-11.
- WISOKI M., 1979. Introduction of beneficial insects into Israel by the Institute of Plant Protection Quarantine Laboratory, ARO, during 1971-1978. *Phytoparasitica*, 7: 785-882. <https://doi.org/10.1007/BF02981583>