

FIRST RECORDS OF *ZONITOIDES ARBOREUS* (SAY, 1817) FROM THE CANARY ISLANDS

Zonitoides arboreus (Say, 1817) (Gastrodontidae) is a widespread land snail species native to North and Central America¹ and introduced to all other continents except Antarctica². In Europe it was first recorded from greenhouses in Finland in 1901^{3,4}, Czechia in 1909⁴, Ireland in 1911⁴, Germany in 1914⁵, Switzerland in 1917⁶, the Netherlands in 1927^{7,8}, Sweden in 1938⁹, Great Britain in 1946¹⁰, Denmark in 1966¹¹, Iceland in 1966¹¹, Hungary in 1974¹², Slovakia in 1976¹³, Poland in 1993¹⁴, Austria in 1996¹⁵ and France in 2004¹⁶. The first report of an outdoor colony in Europe was from a park in Moscow close to greenhouses in 1907^{4,17} — however, this population does not exist anymore¹⁸. Since then, additional outdoor populations have been reported from Czechia in 1983¹⁹, from Italy²⁰, Sweden²¹ and Germany^{21,22} in the 1990's, from Hungary²³ and Spain²⁴ in 2001 and from Portugal²⁵ in 2013. In Israel, *Z. arboreus* was already established in plantations by 1970²⁶. It was also recorded from Morocco in 1993²⁷. From the Atlantic Islands outdoor colonies of the species are known from Madeira^{27,28}. From the Azores a similar species has been described as endemic *Zonitoides azoricus* (Riedel, 1964)²⁹ however, there is controversy whether this is a synonym of *Z. arboreus*³⁰ or a distinct species³¹.

Among land snails collected by the late Eberhard Clauss in Tenerife in 1991, which were identified only recently, two samples of *Zonitoides arboreus* were found. They are from the botanical garden in Puerto de la Cruz and from the lawn at Hotel Neptuno in Bajamar. These specimens represent some of the oldest recorded outdoor colonies in the western Palaearctic. It should be investigated whether *Z. arboreus* has remained restricted to synanthropic environments in Tenerife or whether it has now invaded more natural habitats as it does, e.g. in South Africa². It was not recorded during recent surveys of laurel forests on Tenerife³².

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¹ PILSBRY HA 1946 *Land Mollusca of North America (north of Mexico)*, Vol. 2, part 1. Philadelphia (Academy of Natural Sciences of Philadelphia).

- ² HERBERT DG 2010 *The introduced terrestrial Mollusca of South Africa*. Pretoria (South African National Biodiversity Institute).
- ³ LUTHER A 1901 Bidrag till kännedomen om Land- och Sötvattengastropodernas utbredning i Finland. *Acta Societatis pro Fauna et Flora Fennica* **20**(3): 1–125, 1 map.
- ⁴ BOETTGER CR 1929 Eingeschleppte Tiere in Berliner Gewächshäusern. *Zeitschrift für Morphologie und Ökologie der Tiere* **15**: 674–704.
- ⁵ JAECKEL SH & PLATE HP 1967 Land- und Süßwasserschnecken aus den Gewächshäusern des Botanischen Gartens Berlin-Dahlem. *Zeitschrift für angewandte Zoologie* **54**: 361–371.
- ⁶ TURNER H, KUIPER JGJ, THEW N, BERNASCONI R, RÜETSCHI J, WÜTHRICH M & GOSTELI M 1998 *Atlas der Mollusken der Schweiz und Liechtensteins*. Neuchâtel (Centre Suisse de cartographie de la faune).
- ⁷ MEEUSE ADJ & HUBERT B 1949 The mollusc fauna of glasshouses in the Netherlands. *Basteria* **13**: 1–44.
- ⁸ VAN BRUGGEN AC 1955 *Lymnaea columella* Say and *Zonitoides arboreus* (Say) in den Gewächshäusern des Basler Botanischen Gartens (Moll., Gastr., Pulm.). *Verhandlungen der Naturforschenden Gesellschaft in Basel* **66**: 1–4.
- ⁹ WALDÉN HW 1960 Om ett par för Sverige nya, anthropochora landmollusker, *Limax valentianus* Férussac och *Deroceras caruanae* (Pollonera), jämte några andra, kulturbundna arter. *Göteborgs Kungliga Vetenskaps- och Vitterhets-Samhälles handlingar*, ser. B **8**(8): 1–48.
- ¹⁰ MEEUSE ADJ 1948 Mollusca. In: SHAW HKA (ed.) *Additions to the wild fauna and flora of the Royal Botanic Gardens, Kew: XX. Kew Bulletin* **3**: 113–124.
- ¹¹ WALDÉN HW 1966 Einige Bemerkungen zum Ergänzungsband zu Ehrmann's "Mollusca" in "Die Tierwelt Mitteleuropas". *Archiv für Molluskenkunde* **95**: 49–68.
- ¹² PINTÉR L 1974 Katalog der rezenten Mollusken Ungarns. *Folia historico-naturalia Musei Matraensis* **2**: 123–148.
- ¹³ FLASAR I & KROUPOVÁ V 1976 Die Malakofauna der Gewächshäuser in Bratislava (Tschechoslowakei). *Malakologische Abhandlungen* **5**: 139–154.
- ¹⁴ ALEXANDROWICZ SW 1993 Water snails introduced into the Botanic Garden in Cracow. *Folia Malacologica* **5**: 109–113.
- ¹⁵ LEISS A & REISCHÜTZ PL 1996 Ein Beitrag zur Kenntnis der Molluskenfauna der Gewächshäuser in Wien und Niederösterreich. *Wissenschaftliche Mitteilungen Niederösterreichisches Landesmuseum* **9**: 173–184.
- ¹⁶ BRAULT JP & GERVAIS M 2004 *Les Mollusques du Loiret-Cher*. Romorantin-Lanthenay (Sologne Nature Environnement).
- ¹⁷ LINDHOLM WA 1922 Miscellaneous notes on palaearctic land and freshwater Mollusks. *Ezhegodnik*

- zoologicheskogo Muzeia rossiyskoy Akademii Nauk **23**: 304–320.
- ¹⁸ TAPPERT A 2009 Die Molluskenfauna von Moskau und der Moskauer Oblast, Russland. *Schriften zur Malakozoologie* **24**: 5–62.
- ¹⁹ KROUPA O 1983 Plž *Zonitoides arboreus* (Say, 1816) v československu v normálních klimatických podmínkách. *Časopis Národního Muzea. Řada přírodovědná* **152**: 226.
- ²⁰ EVANGELISTA M, BODON M, CIANFANELLI S & BIRINDELLI S 2013 *Zonitoides arboreus* (Say, 1816): un altro gastropode terrestre introdotto in Italia (Pulmonata: Gastrodontidae). *Bollettino Malacologico* **49**: 18–25.
- ²¹ JUEG U & VON PROSCHWITZ T 2003 Ein Freilandfund von *Zonitoides arboreus* (Say 1816) im Landkreis Ludwigslust (Mecklenburg-Vorpommern). *Mitteilungen der Deutschen Malakozoologischen Gesellschaft* **69/70**: 15–19.
- ²² SCHMID G 2002 Der Bambus-Tick oder *Paralaoma servilis*, die Gerippte Punktschnecke, in SW-Deutschland. In: FALKNER M, GROH K & SPEIGHT MCD (eds): *Collectanea Malacologica. Festschrift für Gerhard Falkner*, pp. 377–403. Hackenheim (ConchBooks).
- ²³ BANK, FALKNER G, NORDSIECK H & RIPKEN TEJ 2001 First Update to Systematics and Nomenclature of the CLECOM-Checklists, including Corrigenda et Addenda to the printed Lists. *Heldia* **4 Supplement**: A1–A6.
- ²⁴ ANDERSON R 2003 *Ganula lanuginosa* (Boissy) and other additions to the fauna of Ibiza. *Journal of Conchology* **38**: 95.
- ²⁵ HOLYOAK, DT, HOLYOAK, GA & DA COSTA MENDES R 2014 New and noteworthy distributional records of land and freshwater Mollusca (Gastropoda) in Portugal. *Noticiario de la Sociedad Española de Malacología* **61**: 45–54.
- ²⁶ MIENIS HK 1977 North American land snails in Israel. *The Nautilus* **91**: 30–31.
- ²⁷ SEDDON MB & HOLYOAK DT 1993 Land Gastropoda of NW. Africa: new distributional data and nomenclature. *Journal of Conchology* **34**: 321–331.
- ²⁸ WALDÉN HW 1983 Systematic and biogeographical studies of the terrestrial Gastropoda of Madeira. With an annotated check-list. *Annales Zoologici Fennici* **20**: 255–275.
- ²⁹ RIEDEL A 1964 Zonitidae (Gastropoda) der Azoren. *Boletim do Museu municipal do Funchal* **18**: 5–60.
- ³⁰ BANK RA, GROH K & RIPKEN TEJ 2002 Catalogue and bibliography of the non-marine Mollusca of Macaronesia. In: FALKNER M, GROH K & SPEIGHT MCD (eds): *Collectanea Malacologica. Festschrift für Gerhard Falkner*, pp. 89–235. Hackenheim (ConchBooks).
- ³¹ CAMERON RA, POKRYSZKO BM & MARTINS AMF 2012 Land snail faunas on Santa Maria (Azores): local diversity in an old, isolated and disturbed island. *Journal of Molluscan Studies* **78**: 268–274.
- ³² KAPPES H, DELGADO JD, ALONSO MR & IBÁÑEZ M 2009 Native and introduced gastropods in laurel forests on Tenerife, Canary Islands. *Acta Oecologica* **35**: 581–589.

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