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THE FIRST RECORD OF *HELOPHORUS MINUTUS* FABRICIUS, 1775 (COLEOPTERA: HELOPHORIDAE) FOR PORTUGAL WITH SOME NOTES ABOUT *H. CALPENSIS* ANGUS, 1988

Шатровський, О. Г., Ангус, Р. Б. Перша згадка *Helophorus minutus* Fabricius 1775 (Coleoptera: Helophoridae) для Португалії з деякими нотатками щодо *H. calpensis* Angus, 1988. *Вісті Харківського ентомологічного товариства*. 2024. Т. XXXII, вип. 1–2. С. 21–29. DOI: 10.36016/KhESG-2024-32-1-2-2.

Helophorus minutus Fabricius, 1775 уперше вказаний для континентальної території Португалії. Наведені дані щодо можливого поширення близького виду *H. calpensis* Angus, 1988. Наведені мапи із зазначенням знаходжень обох видів у Португалії та загального поширення *H. minutus*. 59 рис., 17 назв.

Ключові слова: водолюби, фауна, розповсюдження, Піренейський півострів.

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Helophorus minutus Fabricius, 1775 is reported for the first time from mainland Portugal. Data on the possible presence of the closely related species *H. calpensis* Angus, 1988 is presented. Maps of the collecting places of both species in Portugal and the general distribution of *H. minutus* are given. 59 figs., 17 refs.

Keywords: water scavenger beetles, fauna, distribution, Iberian Peninsula.

I n t r o d u c t i o n . Continental Portugal is situated in the far west of Europe covering a relatively small area of 91,470 km^2 on the Iberian Peninsula. Despite its size, the country is distinguished by its remarkable diversity of landscapes. There are 18 landscape areas consisting of three associations (Franco, 1971). Among them, there are both the plains and mountain landscapes of temperate and subtropical climate zones. The spurs of the mountain systems of the Leon Mountains and the Central Chain come here from Spain from the north and east. Common fauna from Southern Europe and the endemic fauna of the Iberian Peninsula penetrates from these directions. Some species common in Africa also penetrate here through the southern Andalusian lowland. These geological features determine the unique faunal complexes of the region.

Despite the undoubted interest of researchers, the insect fauna of Portugal has not been sufficiently studied as a whole. The catalogue by Oliveira ([1887]) remains the only accumulation of the knowledge of beetles of Portugal. From our point of view, Oliveira's work deserves more attention than it currently receives in the literature. Another question to be solved is the issue date of Oliveira's paper. It was published by University of Coimbra without printing date on the title. The issue date accepted here was handwritten on the title in pencil, so it is now difficult to establish the exact time of publication. In various references it was dated from 1882 to 1894 (Millán *et al.*, 2014 and Millán's pers. comm.). However, the latest specimens of Hydrophiloidea from Oliveira's collection in Coimbra are dated 1882. Later specimens come from places not included in his monograph. Oliveira cited 41 species of the water scavenger beetles (Hydrophiloidea) in Portugal, including 10 species of *Helophorus* Fabricius, 1775. *H. minutus* Fabricius, 1775 was not mentioned but is present in Oliveira's collection in misidentified material.

The valid status of *H. minutus* was justified by Angus (1969). Further, Angus (1974) presented data on the distribution of this species and pointed out the need to confirm the status of some related species by hybridization in laboratory. Based on chromosomal analysis, he confirmed the status of *H. minutus*, and discovered *H. paraminutus* Angus, 1986, a new twin species (Angus 1986, 2021). Two years later, a closely related species, *H. calpensis* Angus, 1988, was also described based on karyotype analysis (Angus, 1988b). In contrast to the widespread *H. paraminutus*, known from a large material, *H. calpensis* was known from three specimens collected in Gibraltar and their offspring (four specimens) bred in the laboratory. Despite significant differences in karyotypes, specimens of *H. calpensis* are morphologically very similar to *H. minutus*. Based on the established morphological differences of the type series, specimens of *H. calpensis* are still being identified.

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The recent atlas on the water beetles of the Iberian Peninsula (Millán *et al.*, 2014) mentioned 63 water scavenger beetles for Portugal including 13 species of the genus *Helophorus.* But this work omitted terrestrial forms of Hydrophiloidea on the adult stages, as family Georissidae, subfamily Sphaeridiinae and four species of *Helophorus* (*Empleurus*) Hope, 1838: i.e. *H. hispanicus* Sharp, 1915, *H. schmidti* A. Villa et G. B. Villa, 1838, *H. porculus* (Bedel, 1881), and *H. rufipes* (Bosc, 1791). *Helophorus hispanicus* is known only in Spain. The remaining species occur in Portugal according to Oliveira ([1887]): *Helophorus rufipes* was recorded as *H. rugosus* (Olivier, 1795), while *H. schmidti* was mentioned by him as *H. fracticostis* Fairmaire, 1859, and *H. porculus* Bedel, 1881 was specified under a valid name.

Portugal was less studied in the Atlas compared to Spain, and therefore it requires additional research. Upon studying of Portuguese material, on the genus *Helophorus* we found that *H. minutus* mentioned by Millán *et al.* (2014) only to Spain, is common species for northern and central Portugal. In southern Portugal, this species is possibly replaced by *H. calpensis* Angus, 1988, previously known from the south of the Iberian Peninsula.

Materials and methods. Repositories. The material for this study was collected by authors in Portugal during 2010, 2012 and 2022−2023. The specimens are housed in the National Museum of Natural History and Science in Lisbon, Portugal (MNHNC) and the Museum of Natural History of the V. N. Karazin Kharkiv National University, Kharkiv, Ukraine (KUMN). Data of general distribution of *H. minutus* is based on the specimens from KUMN; Centro Nazionale per lo Studio e la Conservazione della Biodiversita Forestale 'Bosco Fontana' di Verona, Marmirolo, Mantua, Italy (CNBFVR); collection of R. B. Angus, London, United Kingdom; Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia (ZIN). Additional material is supplied from the Natural History Museum, London, United Kingdom (NHMUK). Specimens cited in Oliveira's monograph were examined along with other material in the Science Museum of the University of Coimbra (SMUC).

Dissection and imaging. MBS-9 binocular microscope and Bressler Advance ICD 10–160× trinocular microscope were used for dissection, identification and macrophotography. Figs. 17−21 and 23−25 were made with Leica Z6 APO microscope in MNHNC. Figs. 29−42 and 49−54 were done in the Sackler Imaging Laboratory (NHMUK). Figs. 1−16, 22, and 26−28 were taken using Leica MZ125 stereomicroscope in NHMUK. The aedeagi were photographed with Zeiss Axioskop bright field compound microscope, equipped with Canon DSLR camera in MNHNC. Figs. 43−48 and 55−56 were completed in Microscope Software Platform Leica Application Suite X 5.20.26130 in MNHNC. The images were stacked using Helicon Focus. The dissected male genitalia were put into a drop of DMHF (Steedman, 1958) and mounted transparent plates on the pins together with specimens.

Identification. Characters for identification of *Helophorus minutus* and *H. calpensis* given in the keys to European Helophoridae (Angus, 1992, p. 68) are used here. Two males (NHMUK, figs. 49–50) from Marisma del Chapatal **(**Spain, Andalucía, Cádiz, (36.858667, –6.275701), 04.1985 (R. B. Angus and G. N. Foster) — 3 ♂♂ 14 ♀♀ (NHMUK) (figs. 49–50) which share intermediate character states are not assigned to either species.

Mapping. The occurrences are based on GBIF dataset (GBIF, 2023), some publications (see remarks about species' distribution), collection specimens and the personal database of the first author (Shatrovskiy, 2015, see Additional material below). The points layer was combined with the Google Maps background and edited in Photoshop CC version SP1 6.1.7601.24545.

Results and discussion. *Helophorus minutus*, a new species to Portugal, is presented in comparison with the very similar *H. calpensis*. The latter species was described from a small series, including the paratypes bred in a laboratory. Therefore, reliable separation of the two species is currently possible only through karyotype analysis (Angus, Aouad, 2009). The characters mentioned in the original description need to be studied on additional material.

Family HELOPHORIDAE Leach, 1815

The monotypic family Helophoridae, according to Millán *et al.* (2014), was represented in Portugal by 13 species from four subgenera (including three Iberian endemics). Millán *et al.* (2014), did not include for Portugal three species of the subgenus *Empleurus* mentioned by Oliveira ([1887]) (see above) and two species, discussed in this article. With these additions, the mainland Portuguese fauna now harbors 19 known *Helophorus* species.

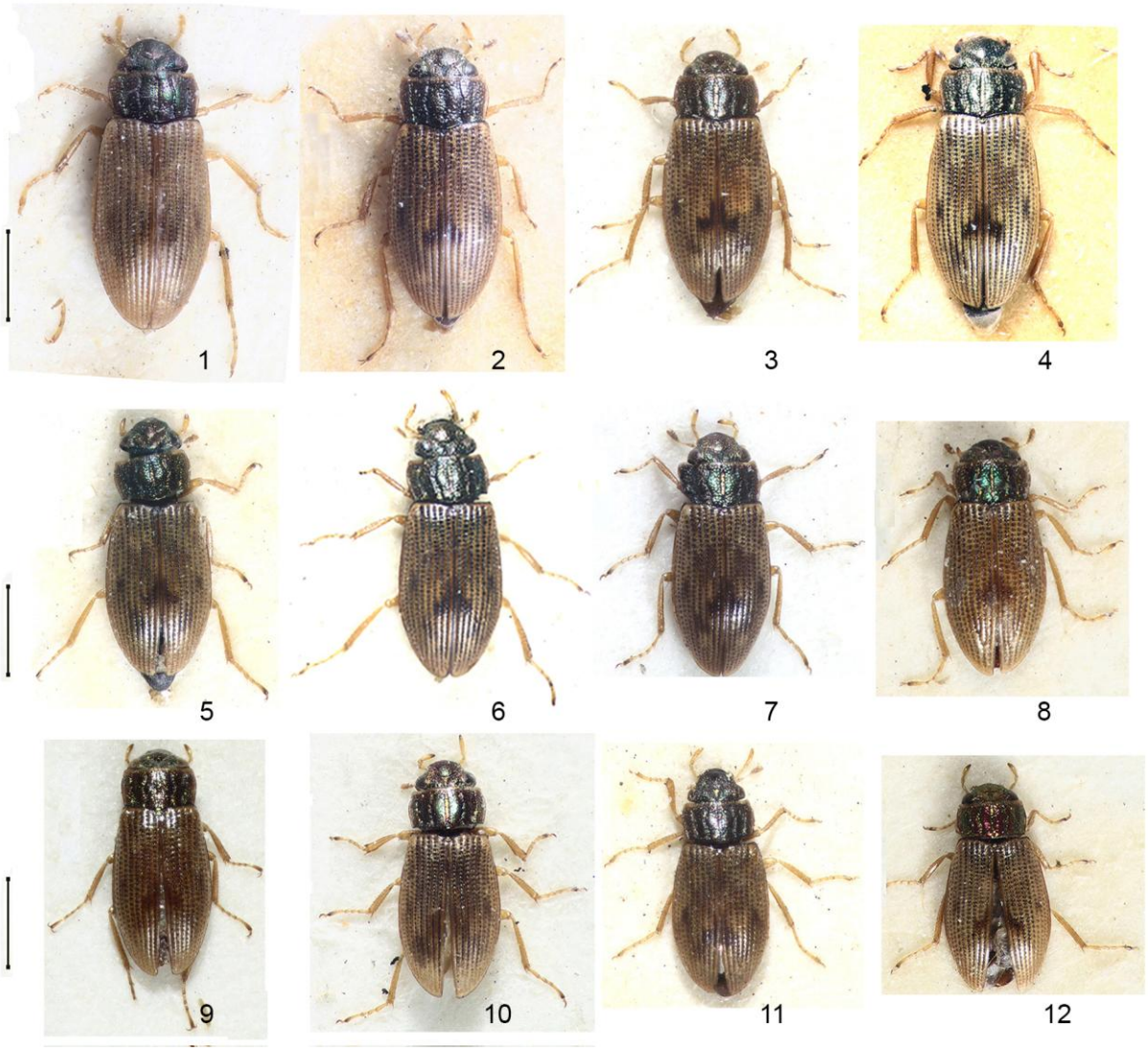
Genus *Helophorus* Fabricius, 1775

Both considered species belong to the subgenus *Rhopalohelophorus* Kuwert, 1886. *Helophorus (Rh.) minutus* is widely distributed (fig. 57), *H. (Rh.) calpensis* is an Iberian endemic known from the south.

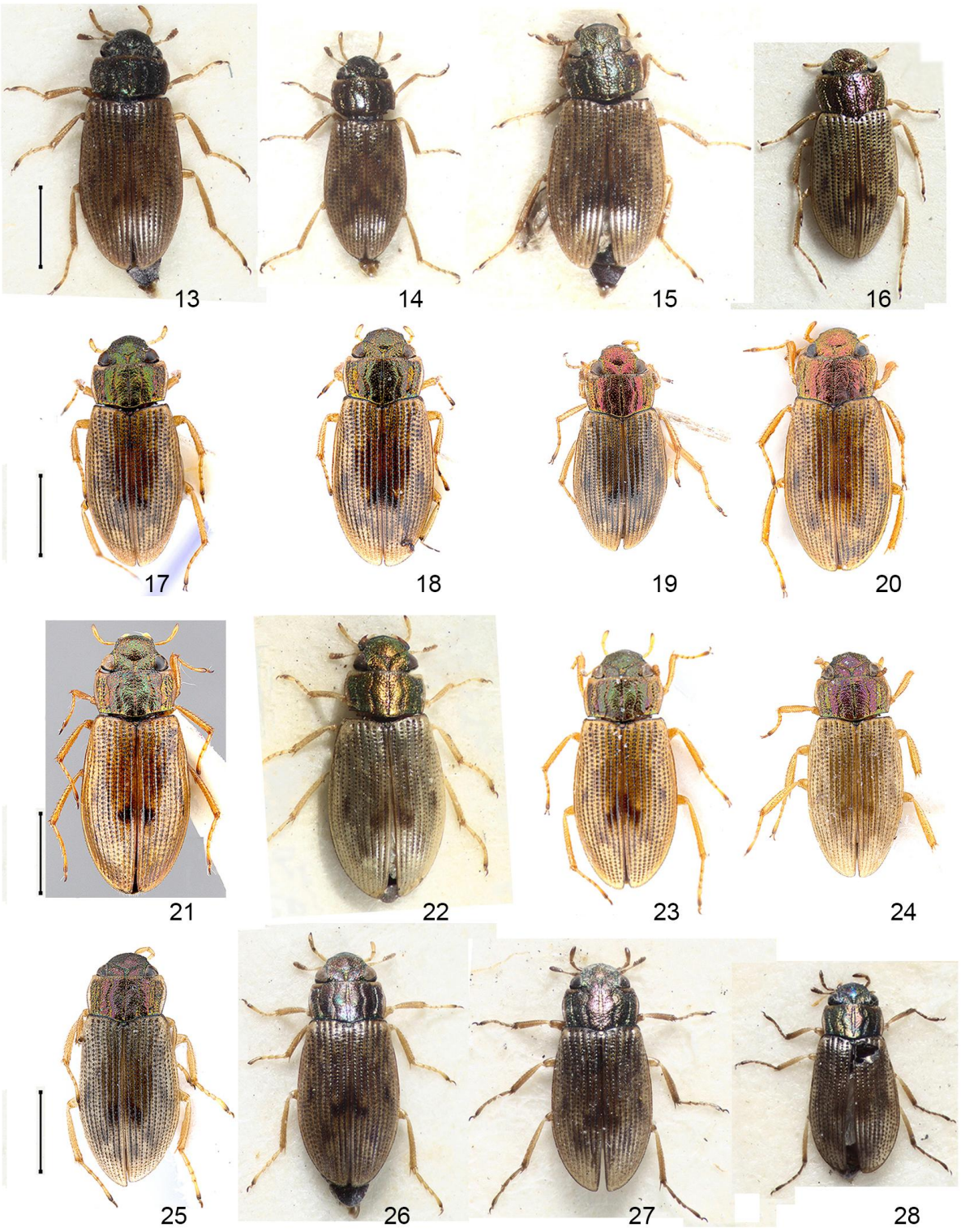
KEY TO SEPARATE *HELOPHORUS (RH.) MINUTUS* FABRICIUS, 1775 FROM *H. (RH.) CALPENSIS* ANGUS, 1988

1 (2) Elytral striae fine, the interstices flat, about twice as wide as striae (figs. 22−28). Aedeagus (figs. 51−56) smaller, length not exceeding 0.5 mm, but not separable from that of *H. minutus.* Beetle length — 2.3–2.9 mm ..... ***H. (Rh.) calpensis* Angus, 1988**

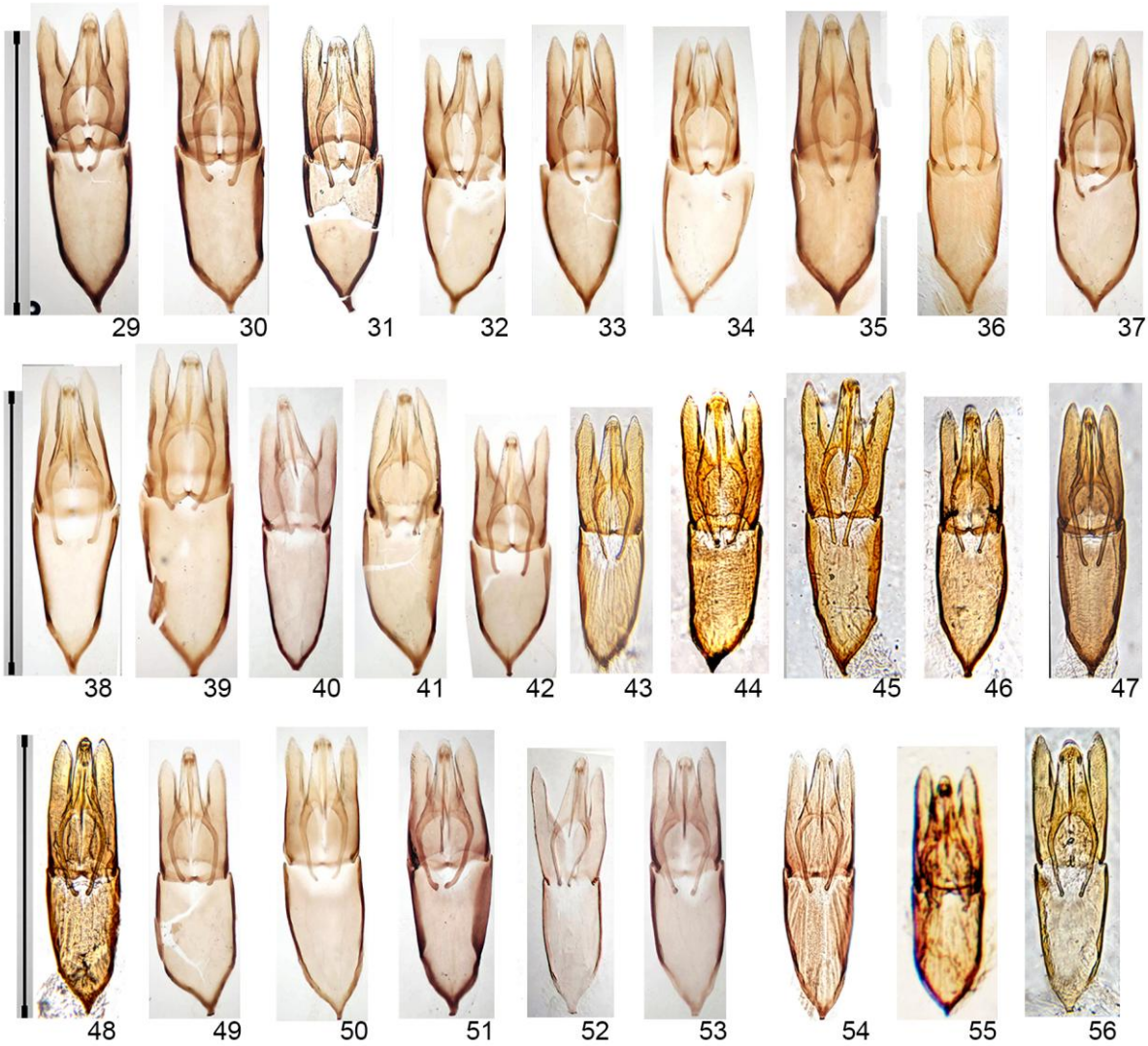
2 (1) Elytral striae variable, but often stronger, more than half the width of the interstices, and interstices somewhat convex (figs. 1−21). Aedeagus (figs. 29−50) is sometimes larger, to 0.54 or 0.59 mm. Beetle length — 2.4–3.4 mm ..... ***H. (Rh.) minutus* Fabricius, 1775**



Figs. 1–12. **Habitus (dorsal view) of non-Iberian *H. minutus*:** 1 — Romsey, UK, 2 — Radley, UK, 3 — Val de Ropa, Corfu, Greece, 4 — Llanrhidian, UK, 5 — Sorigny S Tours, France, 6 — Brandon, UK, 7 — Runnymede, UK, 8 — Perm, Russia, 9 — Hula, Israel, 10 — Sardinia, Italy, 11 — Öland, Sweden, 12 — Temploni, Corfu, Greece. Scale bar = 1.0 mm.



Figs. 13–28. **Habitus (dorsal view) of Iberian *Helophorus*:** 13–21 — *H. minutus:* 13 — La Costana, Cantabria, Spain, 14 — Segovia, Cuéllar, Spain, 15 — Oviedo, Llanes, Spain, 16 — Rio Mondego, Beira Alta, Portugal, 17–19 — Cartaxo, Ribatejo, Portugal, 20 — Paços da Serra, Seia, Guarda, Portugal, 21 — Cartaxo, Ribatejo, Portugal, 22–25 — *H.* pr. *calpensis:* 22 — Huelva, El Rocio, Spain, 23–24 — Quinta das Chantus, Alcanhões, Santarém, Ribatejo, 25 — Riba Moncarapacho, Algarve, Portugal, 26–28 — *H. calpensis*, Tarifa: 26 — holotype, 27–28 — paratypes. Scale bar = 1.0 mm.



Figs. 29–56. **Aedeagi of *Helophorus*:** 29−50 — *H. minutus*: 29 — La Costana, Cantabria, Spain, 30 — Oviedo, Llanes, Spain, 31 — Hospital de Orbigo, Leon, Spain, 32 — Segovia, Cuellar, Spain, 33 — Sorigny S Tours, France, 34 — Öland, Sweden, 35 — Perm, Russia, 36 — Hula, Israel, 37 — Berrow, UK, 38 — Romsey, UK, 39 — Radley, UK, 40 — Sardinia, Italy, 41 — Ropa, Corfu, Greece, 42 — Temploni, Corfu, Greece, 43−48 — Cartaxo, Ribatejo, Portugal, 49, 50—undetermined specimens: Marisma del Chapatal, Cádiz, Spain, 51−53 — *H. calpensis*, Tarifa: 51 — holotype, 52−53 — paratypes, 54−56 — *H.* pr. *calpensis*: 54 — Ribeira da Asseca, Algarve, Portugal; 55 — Quinta das Chantus, Alcanhões, Santarém, Ribatejo, 56 — N Moncarapacho, Algarve, Portugal. Scale bar = 0.5 mm.

Helophorus (*Rhopalohelophorus*) *minutus* Fabricius, 1775

References. Fabricius, 1775; Angus, 1969, 1974, 1986, 1988a, 1988b, 1992, 2011, 2021; Angus, Aouad, 2009; Millán *et al*, 2014.

Material from Portugal. Prov. Entre-Douro-e-Minho, Termas do Gerês (41.728727, −8.161932) — 1 spec. (SMUC); prov. Entre-Douro-e-Minho, Vizela (41.3666667, −8.2666667), 01.09.1880 (P. de Oliveira) — 4 spec. (SMUC); prov. Entre-Douro-e-Minho, Porto (41.149444, −8.610833) — 1 spec. (SMUC); prov. Beira Alta: Rio Mondego (40.64949, −7.393182) — 1 spec. (NHMUK); Freineda (40.5830556, −6.8911111), 09.1880 (P. de Oliveira) — 1 ♂, 1 spec.; Guarda (40.5322194, −7.2268222) (P. de Oliveira) — 2 spec. (SMUC); prov. Beira Baixa, Guarda, Paços da Serra, Seia (40.4087417, −7.7096917), 11.07.1977 (P. Medoça) — 1 ♂ (MNHNC); prov. Beira Litoral, Coimbra (40.2027778, −8.4138889) (P. de Oliveira) — 2 spec. (SMUC); prov. Ribatejo, distr. Santarém: Quinta das Chantus, Alcanhões (39.2095611, −8.6316889), 10.06.1977 (P. Medoça) — 1 ♀ (MNHNC); 200 m N Cartaxo, flooded lowland (39.1806778, −8.78715),

28.12.2022 (A. Shatrovskiy) — 1 ♂, 1 ♀ (MNHNC); Cartaxo, near Circular Urbana, flooded lowland among pines (39.1768833, −8.7887167), 28.12.2022 (A. Shatrovskiy) — 2 ♂♂, 3 ♀♀ (MNHNC); Cartaxo (39.1768833, −8.7887167) — 1 ♂ (NHMUK); Cartaxo, Urb. Quinta do Outeiro, puddle (39.1680972, −8.7918444), 28.12.2022 (A. Shatrovskiy) — 3 ♂♂, 3 ♀♀ (MNHNC); ibidem., reocrene-type rill (39.1669083, −8.7928806), 15.02.2023 (V. Shatrovska) — 1 ♂ (MNHNC); 200 m E Cartaxo Railway Station, puddle (39.1434806, −8.7567917), 14.02.2023 (A. Shatrovskiy) — 2 ♂♂, 4 ♀♀, 2 spec. (MNHNC); prov. Estremadura, Azambuja (39.067778, −8.869167) (P. de Oliveira) — 4 spec. (SMUC).

Additional material. Ireland: Galway, Oranmore and near, 2022–2023 (A. Shatrovskiy) — 11 ♂♂, 7 ♀♀, 34 spec. (MNHNC).

Sweden: Island Öland, 06.1971 (J. Landin) — 1 ♂, 11 ♀♀; ibidem, 14.04.1999 —1 ♂, 1 ♀ (coll. R. B. Angus) (fig. 11).

France: Centre-Val de Loire Sorigny S Tours (47.243206, 0.694707) — 1 ♂, 1 ♀ (coll. R. B. Angus) (figs. 5, 33).

Spain: Astúrias, Navia (43.539440, −6.724781), 18.07.1972 — 2 ♂♂, 9 ♀♀ (coll. R. B. Angus); Cantabria: Comillas (43.385279, −4.292212), 17.07.1972 — 1 ♂ (coll. R. B. Angus); La Costana (43.016007, −4.005077), 22.04.1988 — 1 ♂, 2 ♀♀ (coll. R. B. Angus) (figs. 13, 29); Oviedo, Llanes (43.360104, −5.849054), 17.07.1973 — 5 ♂♂, 7 ♀♀ (coll. R. B. Angus) (figs. 15, 30); Lugo, Meira (43.213254, −7.294299), 18.07.1972 — 2 ♂♂, 1 ♀ (coll. R. B. Angus); Hospital de Orbigo, Leon (42.462836, −5.877952) — 1 ♂ (coll. R. B. Angus) (fig. 31); Segovia: Cuéllar (41.401301, −4.310824), 01.04.1985 — 1 ♂ (coll. R. B. Angus) (figs. 14, 32); Villacastín (40.775555, −4.443953), 05.1974? — 1 ♂ (coll. R. B. Angus).

Italy: Sardinia: prov. Nuoro, vale di Lanaittu (40.2611389, 9.5055528), 1987 (A. van Berge Henegouven) — 1 ♂, 1 ♀ (NHMUK); (Angus, 1988a); prov. Medio Campidano, Villacidro: source s'acqua Frischedda, in residual pools, rio Cannisoni, 382 m (39.414126, 8.632822), 21.05.2006 (P. Cornacchia, M. Bardiani, D. Birtele, D. Whitmore) — 1 spec.; ibidem, left bank clearing, 401 m (39.414132, 8.633611), 24.V.2006 (P. Cornacchia, M. Bardiani, D. Birtele, D. Whitmore) —1 spec.; ibidem, Canal le Monincu, 450 m (39.419836, 8.628708), 21.05.2006 (P. Cornacchia, M. Bardiani, D. Birtele, D. Whitmore) —2 spec.; prov. Carbonia-Iglesias, Domusnovas, L. Siuru, 322 m, in small affluent (39.761791, 8.952420), 06.06.2004 (G. Nardi) — 2 spec.; ibidem, 22.03.2006 (P. Cornacchia) — 1 spec.; ibidem, 23.03.2006 (P. Cornacchia, M. Bardiani, D. Birtele, D. Whitmore) — 5 spec.; prov. Carbonia-Iglesias, Iglesias, Mamenga, 610 m (39.356414, 8.563776), 01.03.2006 (L. Fancello) — 1 spec. (Angus, 2011); all material stored in CNBFVR; Sardinia, 04.1994 — 1 ♂ (coll. R. B. Angus) (fig. 40).

Greece: Val de Ropa, Corfu (39.615173, 19.794993), 04.1986 — 1 ♂ (coll. R. B. Angus) (fig. 3); Templonion, Corfu (39.640309, 19.804888), 04.1986 — 1 ♂ (coll. R. B. Angus) (fig. 12).

Russia: Permskiy Territory, Perm (fig. 8), (58.020118, 56.213872) (C. Nyberg) —1 ♂ (NHMUK) (Angus, 1974); Moscow Region: Volokolamsk (56.03333, 35.95), 21.06.1984 (V. Belov) — 1 ♀ (KUMN); Serebriany Bor (55.78028, 37.41611), 18.05.1987 (V. Grachev) — 1 spec. (KUMN): Samara Region: Samara (53.18333, 50.11667), 16.04.1978 — 1 spec. (KUMN); ibidem, 01.05.1983 (S. Sachkov) — 1 ♂, 1 ♀ (KUMN); Voronezh Region, Usmanskiy Bor (51.81861, 39.37611), puddle, 26.06.2000 (A. Prokin) — 3 spec. (KUMN); Kursk Region, Lgov (51.66667, 35.26667), 01.08.1995 (A. Bartenev) — 2 spec. (KUMN); Orenburg Region, Yasniy (51.03333, 59.86667), flooded lowland, 12.05.1966 — 1♂, 1♀ (KUMN); Republic of Kalmykia: Malye Derbety (47.94389, 44.69556), in freshwater lake, 02.05.1984 (V. Kukareka) — 1 ♂, 2 spec. (KUMN); Yalmata River, (47.87472, 44.70278), in river, 14.07.1984 (V. Kukareka) — 1 ♀ 2 spec. (KUMN); Tsagan-Nur (47.36889, 45.23306), river, 04.06.1985 (V. Kukareka) — 5 ♂♂, 1 ♀, 8 spec. (KUMN); Partizanskiy (47.23528, 44.50139), 13.07.1984 (V. Kukareka) — 1 ♂, 17 spec. (KUMN); Sarpa Lake (47.08222, 45.49972), 06.05.1986 (N. Kalyuzhnaya) — 1 ♂ (KUMN), ibidem,12.07.1984 (N. Kalyuzhnaya) —1 ♀, 1 spec. (KUMN); Konurka Lake (46.46917, 45.09806), in freshwater lake, 11.07.1984 (V. Kukareka) — 2 spec. (KUMN); Ded-Khulsun Lake (46.29556, 45.16833), 22.07.1983 (N. Kalyuzhnaya) — 1 ♂ (KUMN); ibidem, 02.07.1984. (V. Kukareka) — 3 ♂♂, 1 ♀ (KUMN); ibidem, 03.07.1984 (V. Kukareka) — 1 ♂, 1 ♀ 2 spec. (KUMN); ibidem, 09.07.1984. (V. Kukareka) — 1 ♂, 1 ♀ (KUMN); ibidem, puddle, 20.07.1984. (V. Kukareka) — 2 ♂♂, 2 spec. (KUMN); Arshan (46.275, 44.24111), 12.08.1983 (N. Kalyuzhnaya) — 2 spec. (KUMN); Priyutnoe (46.10028, 43.50806), freshwater lake, 25.06.1985 (V. Kukareka) — 1 spec. (KUMN); Iki-Burul (45.82028, 44.64), puddle, 18.06.1985 (V. Kukareka) — 1 spec. (KUMN); Krasnodarskiy Territory, Adler (43.43361, 39.91611), 11.06.1909 (G. Sumakov) — 1 spec. (ZIN).

Belarus: Vitebsk Region: Verkhnedvinsk (55.7666667, 27.9333333), 17.06.1986 — 2 spec. (KUMN); Domzharytsy (54.7458333, 28.3180556), damp coast of the lake, 16.06.1986, (Maximenkov) — 3 spec. (KUMN); Minsk Region: Narach (54.9066667, 26.7066667), marsh, 12.06.1990 (S. Ryndevich) — 1 ♀ (KUMN); Maslianka (54.3525, 29,11), 12.09.1986 (O. Alexandrovich) — 1 spec. (KUMN); Zelenaya (53.9805556, 27.2905556), 10.08.1986 (O. Alexandrovich) — 1 ♂ (KUMN); Stolbtsy (53.4833333, 26.7333333), flooded lowland, 19.04.1990 (S. Ryndevich) — 1 ♂ (KUMN); Gorodeya (53.3166667, 26.5166667), puddle, pH = 6.9, 20.07.1990, (S. Ryndevich) — 1 spec. (KUMN); ibidem, treatment facilities, pH = 7.3, 20.07.1990 (S. Ryndevich) — 1 spec. (KUMN); Brest Region: Molchad (53.6333333, 25.3166667), 15.06.1984 — 6 spec. (KUMN); Puszcza Białowieska (52.7161111, 23.8438889), 27.04.1986 O. Alexandrovich) — 8 spec. (KUMN).

Ukraine: Volyn Region: Shatsk National Natural Park, Pischa (51.605, 23.81), pond, 24.04.2008 (A. Kravchenko) — 2 ♀♀ (KUMN); ibidem, 01.04.2007 (A. Kravchenko) — 2 ♂♂, 1 ♀ (KUMN); ibidem, 06.05.2007 (A. Kravchenko) — 2 ♂♂, 1 ♀ (KUMN); Transcarpathia Region: Uzhhorod (48.6166667, 22.3), puddle, 06.05.1971 (M. Mateleshko) — 45 ♂♂, 29 ♀♀, 128 spec. (KUMN); Mereshor (48.4008333, 23.6613889), puddle, 11.07.1997 (S. Stolyar) — 2 ♂♂, 1 spec. (KUMN); Velyka Bakta (48.1608333, 22.6638889), flooded lowland, 08.06.1977 (A. Koval) — 1 ♀ (KUMN); Khmelnytskyi Region: Kamenets-Podolskiy (48.6666667, 26.5666667), 09.05.1908 (Yakubowski), 1 ♂ (ZIN); Kyiv Region: Kyiv (50.4333333, 30.5166667), river, 03.05.1919 — 1 ♂, 1 ♀ (KUMN); Cherkassy Region: Kaniv Nature Reserve (49.7444444, 31.4558333), 24.04.1947 (A. Kryshtal) — 1 spec. (KUMN); Chernihiv Region: Kamin (52.2877778, 32.355), river, 14.07.1987 (P. Sheshurak) — 1 spec. (KUMN); Obmachiv (51.3758333, 32.8166667), in river, 20.07.1987 (P. Sheshurak) — 5 spec. (KUMN); Yaduty, 15 km N Borzna (51.3741667, 32.3386111), 15.04.2000 (P. Sheshurak) — 1 ♀ (KUMN); Kuzky, (51.2891667, 33.2858333), flooded lowland, 16.07.1987 (P. Sheshurak) — 2 spec. (KUMN); Bakhmach District, Krasne (51.2677778, 33), 17.07.1987 (P. Sheshurak) — 1 spec. (KUMN); Nizhyn (51.0377944, 31.8881), light trap, 09.08.1994 (P. Sheshurak) — 1 ♂ (KUMN); Yeline (51.0202778, 31.9755556), marsh, 03.07.1995 (P. Sheshurak) — 1 ♀ (KUMN); ibidem, in river, 16.07.1995 (P. Sheshurak) — 2 spec. (KUMN); Gurbyntsi (50.6119444, 32.8363889), marsh, 10.05.1990 (P. Sheshurak) — 5 spec. (KUMN); Sumy Region: Khyzhky (51.3636111, 33.5830556), river, 13.07.1987 (P. Sheshurak) — 1 spec. (KUMN); Kharkiv Region: Chornohlazivka (50.2355556, 36.0538889), 21.06.1971 (R. Ogul) — 1 spec. (KUMN); Kharkiv, Oleksiyivka (50.0383333, 36.1841667), damp bank of the river, 27.04.1997 (S. Stolyar) — 1 spec. (KUMN); ibidem, damp bank of the river, 01.05.1997 (S. Stolyar) — 2 ♂♂, 3 ♀♀ (KUMN); Chervona Khvylia (49.9733333, 37.3266667), 25.06.1997 (V. Gorbunov) — 2 ♂♂, 1 ♀ (KUMN); Gnilushka River, in river, (49.9416667, 37.0102778), 23.06.1996 (A. Shatrovskiy) — 1 ♂ (KUMN); Gorila Dolyna (49.6316667, 36.5480556), flooded lowlands, 23.05.1978 (A. Shatrovskiy) — 1 spec. (KUMN); ibidem, flooded lowlands, 30.05.1978 (A. Shatrovskiy) — 1 ♂, 2 ♀♀ (KUMN); Borove Lake (49.5625, 36.4305556), in freshwater lake, 18.07.1978 (A. Shatrovskiy) — 1 ♂, 1 ♀ (KUMN); Izium District, Ivanivka (49.2780556, 37.0966667), flooded lowland,

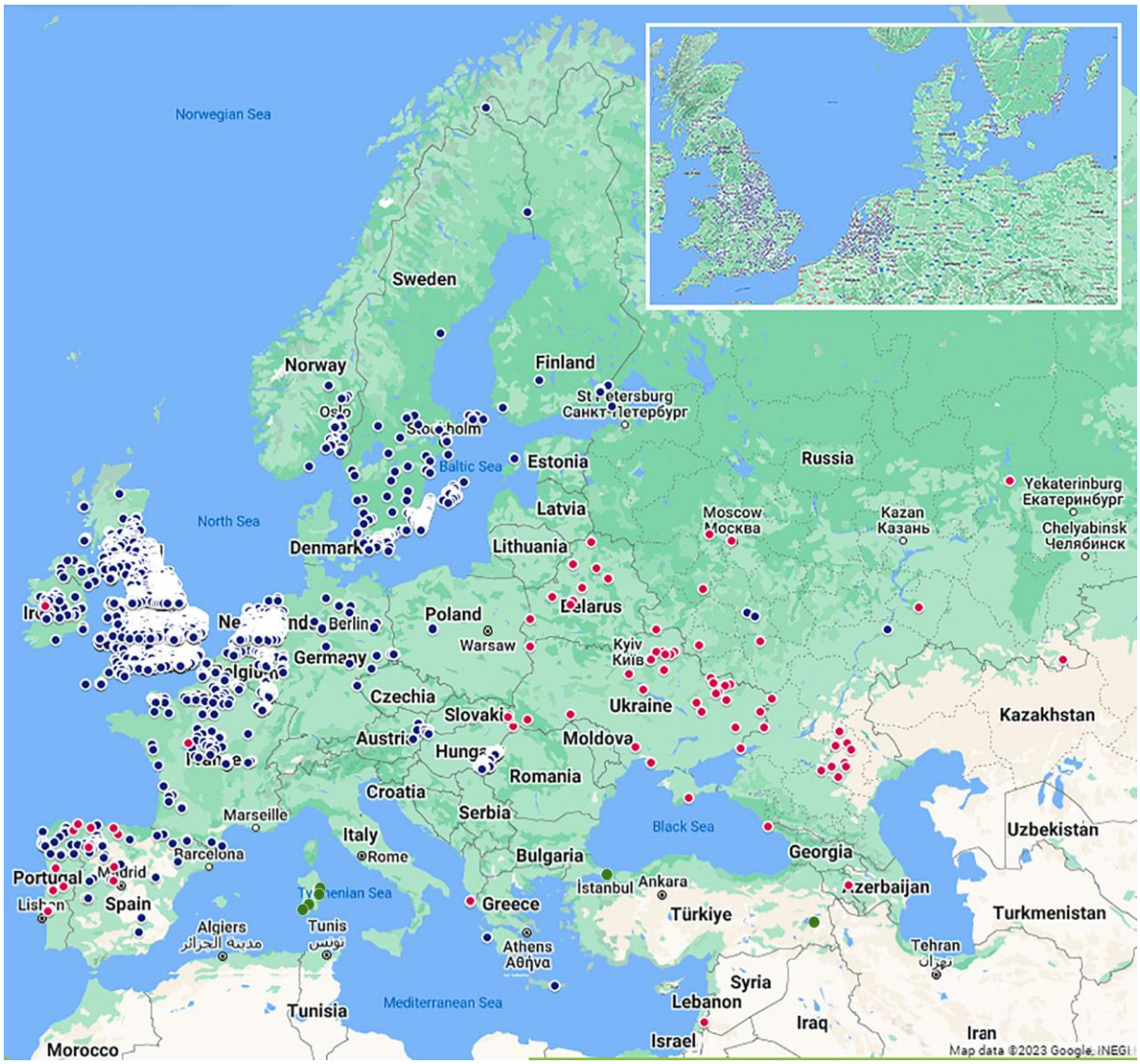
31.05.1981 (A. Shatrovskiy) — 5 ♂♂, 3 ♀♀, 8 spec. (KUMN); Velykyi Orchik, (49.2077778, 35.0716667), flooded lowland, 21.04.1980 (A. Shatrovskiy) — 2 ♂♂, 5 ♀♀ (KUMN); Velykyi Orchik, (49.2077778, 35.0716667), freshwater lake, 21.04.1980 (A. Shatrovskiy) — 2 ♂♂, 3 ♀♀ (KUMN); Dnipropetrovsk Region: Andriivka, Prisamarskyi Statsionar (48.7563889, 35.4611111), light trap, 25.06.1978 (A. Shatrovskiy) — 1 ♂ (KUMN); Lugansk Region: Milove (49.3730556, 40.1377778), light trap, 22.07.2002 (P. Sheshurak) — 1 spec. (KUMN); ibidem, light trap, 25.07.2002 (P. Sheshurak) — 1 spec. (KUMN); Stanytsia-Luhanska Reserve (48.7569444, 39.3583333), light trap, 08.07.2002 (P. Sheshurak) — 1 spec. (KUMN); Dovzhansk (48.0583333, 39.6583333), light trap, 18.07.2002 (P. Sheshurak) — 1 spec. (KUMN); Donetsk Region: Vesele (48.0627778, 37.7222222), 06.07.1997 (V. Martynov), — 1 spec. (KUMN); Novoazovsk (47.1166667, 38.0833333), 22.05.1998 — 1 ♀ (KUMN); Odessa Region: Beresivka (47.2038889, 30.9125), river, 31.03.2001 (A. Gontarenko)— 1 spec. (private collection); Kherson Region, Black Sea Biosphere Reserve, Solodke Lake (46.4575, 31.9666667), freshwater lake, 06.07.1978 (A. Shatrovskiy) — 2 ♂♂ 1♀ (KUMN); Autonomous Republic of Crimea, Chighenitra (44.825932, 34.576107), 02.05.1998 (S. Stolyar) — 1 ♂ (KUMN).

A r m e n i a : Prov. Gegharkunik, Sevan Lake (40.4847222, 45.3663889), 01.07.1923 (Ph. Zaitzev) — 2 spec. (ZIN).

T u r k e y : Istanbul il, Altinşehir (41.066843, 28.744467), 28.07.1969 (Besuchet) — 3 ♀♀ (Natural History Museum, Geneva) (Angus, 1988b). Istanbul il, Halkali (41.033282, 28.792821), 03.08.1969 (Besuchet) — 2 ♀♀ (Natural History Museum, Geneva) (Angus, 1988b); Basin Lake Van (38.569523, 43.197543) (Taşar *et al*., 2012).

I s r a e l : Hula Lake (33.109806, 35.607033), 1989 (Reuven Ortal) — 1 ♂ (figs. 9, 36) (NHMUK).

G e o g r a p h i c d i s t r i b u t i o n . West Palearctic species (fig. 57). All previous data about occurring at the North Africa are wrong (Angus, Aouad, 2009). The localities of the Portuguese specimens are separately given in the fig. 58.



F i g . 5 7 . General distribution of *H. minutus*: blue dots — data from GBIF (2023), red dots — new data, green dots — data from other publications (see distributional remarks).

Fig. 58. New records of *H. minutus* in Portugal.

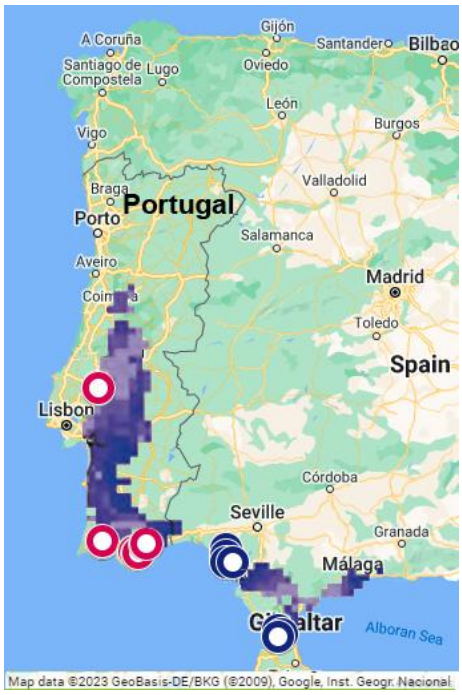


Fig. 59. General distribution of *H. calpensis*: blue donuts — known data, red donuts — *H.* prope *calpensis* new records. Purple raster shows the predicted distribution (Millán *et al.*, 2014).

Helophorus (*Rhopalohelophorus*) prope *calpensis* Angus, 1988

References. Angus, 1988b, 1992; Angus, Aouad, 2009; Millán *et al.*, 2014.

Material. Portugal: prov. Ribatejo, distr. Santarém, Quinta das Chantus, Alcanhões (39.2095611, −8.6316889), 10.06.1977 (P. Medoça) — 2 ♂, 2♀♀ (MNHNC) (figs. 23–24, 55); prov. Algarve: distr. Faro, 2 km W Faro, Ludo, drainage channel (37.0336833, −7.9898694), 30.05.2010 (A. Shatrovskiy) — 1 ♂, 1 ♀ (KUMN); ibidem., fresh pool near salt lake (37.0344056, −7.9874056), 05.06.2010 (A. Shatrovskiy) — 5 ♂♂, 4 ♀♀ (KUMN); Mordago Golf Field N Portimão, freshwater lake on the golf field (37.1936111, −8.5694444), 28.06.2012 (A. Shatrovskiy) — 2 ♂♂ (KUMN); distr. Faro, N Moncarapacho, rio (37.105575, −7.788515), 26.03.2023 (V. Shatrovska) — 1 ♂ (MNHNC) (figs. 25, 55); 7 km W Tavira, S Bus road, Ribeira da Asseca (37.149251, −7.719200), 7.05.1966 (M. Bacchus) — 1 ♂ (NHMUK) (fig. 54).

Spain: Andalucía, Huelva, El Rocío (37.131236 -6.488549), 19.05.1974 — 1 ♂, 2 ♀♀ (coll. R. B. Angus) (fig. 22).

Geographic distribution. Endemic of south-west part of the Iberian Peninsula (Fig. 59).

Remarks. The authors noted that specimens from the south Portugal differ from the typical *H. minutus* by flat elytral interstices and smaller punctures in the rows. Therefore, before studying the karyotypes of living material from these places, specimens with similar characteristics are provisionally assigned to *H. calpensis*. The aedeagi of both species are identical (see figs. 29–56). Finds of both forms (relatively, both species) are known from the central Portugal, but *H. minutus* is more often found here.

Conclusions. We discovered that *H. minutus* is common for northern and central Portugal. In southern Portugal *H. minutus* possibly co-occurs with or is replaced by *H. calpensis* Angus, 1988, Iberian endemic, which was previously known from the south of the Iberian Peninsula. *H. minutus* is recorded for the first time in Portugal. It was found in Minho, Beira Baixa, Beira Litoral, Ribatejo, and Algarve provinces.

Specimens of probably *H. calpensis* were found in Ribatejo and Algarve provinces. These records cannot be considered confirmed, but fit with the predicted distribution according to the ecological niche model in Millán *et al.* (2014).

Finally, new localities are given for *H. minutus* distribution on the east part of its range.

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