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New country records and rediscoveries of *Protapalochrus* (s.str.) *flavolimbatus* (Mulsant & Rey, 1853) (Coleoptera: Melyridae), with notes on habitat loss

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Abstract

The soft-winged flower beetle *Protapalochrus* (s.str.) *flavolimbatus* (Mulsant & Rey, 1853) (Coleoptera: Melyridae: Malachiinae) is recorded for the first time from Austria, Bulgaria, and Israel. Furthermore, more or less recent records from Greece, Lebanon, Romania, and Turkey are reported as rediscoveries confirming records from the 19th century. Some of the populations reported previously or herein are already extinct due to destruction of their wetland habitats by intensified agriculture (Romania), urbanization (Athens) or malaria control (Turkey).

Keywords. *Protapalochrus flavolimbatus*, distribution, faunistics, habitat loss, new country record, rediscovery, Austria, Bulgaria, Greece, Israel, Romania, Turkey, Lebanon.

Zusammenfassung

Neue Ländernachweise und Wiederfunde von *Protapalochrus* (s.str.) *flavolimbatus* (Mulsant & Rey, 1853) (Coleoptera: Melyridae), mit Anmerkungen zum Lebensraumverlust. – Der Zipfelkäfer *Protapalochrus* (s.str.) *flavolimbatus* (Mulsant & Rey, 1853) (Coleoptera: Melyridae: Malachiinae) wird zum ersten Mal aus Österreich, Bulgarien und Israel gemeldet. Darüber hinaus werden mehr oder weniger aktuelle Nachweise aus Griechenland, dem Libanon, Rumänien und der Türkei gemeldet, bei denen es sich um Wiederentdeckungen handelt, die Nachweise aus dem 19. Jahrhundert bestätigen. Einige der zuvor oder hier gemeldeten Populationen sind bereits ausgestorben, da ihre Feuchtgebietshabitate zu Gunsten einer intensivierten Landwirtschaft (Rumänien) oder durch Verstädterung (Athen) und Malaria-Bekämpfung (Türkei) zerstört wurden.

Introduction

The soft-winged flower beetle *Protapalochrus* (s.str.) *flavolimbatus* (Mulsant & Rey, 1853) can be reliably identified by its characteristic habitus and colouration (Figs 1, 2). It is a hygrophilous species living on "various grasses", viz. in the west-Mediterranean region mainly on reed (*Phragmites australis* (Cav.) Trin ex. Steud.), but also on broad-leaved bulrush (*Typha latifolia* L.) or rush (*Juncus* spp.) (Kiesenwetter 1859, Tholin 1882, Mulsant 1884, Mollandin de Boissy 1910, Pic 1914, Binaghi 1972, Poher et al. 2017). In its habitat, it is mostly captured individually or in quite small series, and is therefore classified as rare in general.

Figs 1–2. *Protapalochrus flavolimbatus*, habitus of a male (1) and a female (2) from Romania (Grandul Saele). Lacking leg parts and antennomeres digitally supplemented. © C. O. Manci.

Nomenclature

Protapalochrus flavolimbatus was first described from France under the genus *Apalochrus* Erichson, 1840 (Mulsant & Rey 1853). Kiesenwetter (1859) described it a second time as *Apalochrus tricolor* based upon material from Greece. Aubé & Grenier (1865) discussed a probable synonymy between *A. flavolimbatus* and *A. tricolor*. Kiesenwetter (1866) synonymized both taxa. Pic (1903, 1935) described other colour varieties, viz. *Apalochrus flavolimbatus* var. *cretica* from Greece, and var. *latenotatus* from Marocco. An incorrect subsequent spelling of the species name, viz. *Hapalochrus flavomaculatus*, was introduced by Montandon (1887) and perpetuated in the subsequent faunistic literature of Romania. For some time, the species was placed in the genus *Paratinus* Abeille de Perrin, 1891. Evers (1987) erected the genus *Protapalochrus* and designated *A. flavolimbatus* as its type species.

Material and methods

The specimens reported below were all collected with classic methods, killed with ethyl acetate in the field, and are now dry preserved as mounts on small paper cards.

The label data of the material reported below is not quoted verbatim. The reported data of the material not collected by the authors of the present study, viz. the specimens retrieved from Israel, Lebanon, and Turkey (collected by Manfred A. Jäch, Brian Levey, and Günther Wewalka), represent interpretations of the more or less exact label data, often supplemented with the field notes of the aforementioned collectors.

The literature review was carried out by ISP in two steps: First, the literature cited in two catalogues (Greiner 1937, Mayor, in prep.) or collected during the past two decades was evaluated. Then, further faunistic data was searched online using a common search engine and various databases with digitised books, journals and other periodicals. The databases were the Biodiversity Heritage Library (https://www.biodiversitylibrary.org), Gallica (https://gallica.bnf.fr), the Internet Archive (https://archive.org), Persée (https://www.persee.fr), and ZOBODAT (https://www.zobodat.at). The generic names "Apalochrus", "Hapalochrus", "Paratinus" and "Protapalochrus" were used as search terms individually or combined with the epiteths "creticus", "flavo-limbatus", "flavolimbatus", "latenotatus" and "tricolor". Queries and searches were carried out in July 2023. Only the work of Tholin (1879), whose quotation was found during the online search, had to be ordered from the Bibliothèque nationale de France.

Results

Published records

Protapalochrus flavolimbatus has so far been known from the following countries, Mediterranean islands or "regions": Portugal (Valkenburg & Grosso-Silva 2022), Spain (Kiesenwetter 1866, Peyron 1877, Abeille de Perrin 1891, Uhagón 1901, Moroder Sala 1924, Fuente 1931, Pardo Alcaide 1975, Plata Negrache & Santiago Hernández 1990, Plata Negrache 2012), Balearic Islands (Cardona Órfila 1878, Plata Negrache & Santiago Hernández 1990, Tshernyshev 2016), France (Mulsant & Rey 1853, Aubé & Grenier 1865, Peyron 1877, Tholin 1879, 1882, Mulsant 1884, Abeille de Perrin 1891, Gavoy 1901, Mollandin de Boissy 1910, Pic 1914, Anonymous 1919, Ponel 1993, Allemand et al. 2011, Tshernyshev 2016), Corsica (Abeille de Perrin 1891, Luigioni 1929, Ponel et al. 2017), Sardinia (Baudi 1871, Bertolini 1872, Peyron 1877, Costa 1888, Abeille de Perrin 1891, Gestro 1904, Luigioni 1929), Sicily (Baudi 1871, Bertolini 1872, Peyron 1877, Abeille de Perrin 1891, Ragusa 1894, Luigioni 1929, Pasqual & Angelini 2001), Elba (Binaghi 1972), Italy (Abeille de Perrin 1891, Luigioni 1929, Binaghi 1972, Ratti 1979, 1981, Poggi 1983, Pasqual & Angelini 2001, Pasqual 2010, Tshernyshev 2016, Angelini 2020), Hungary (Szalóki & Merkl 2005), Romania (sub "*Hapalochrus flavomaculatus* Muls.": Montandon 1887, Fleck 1905, Montandon 1906), Greece (Kiesenwetter 1859, sub "*Apalochrus tricolor*", Pic 1914), Crete (Pic 1903), Lesbos (Sahlberg 1913), Cyprus (Baudi 1871, Peyron 1877, Abeille de Perrin 1891), Turkey (Peyron 1877, Abeille de Perrin 1891, Tshernyshev 2016), "Caucasus" (Abeille de Perrin 1891), Russia (Krasnodar) (Solodovnikov 1994, Tshernyshev 2016), Iran (Tshernyshev 2016), Lebanon (Pic 1935), Egypt (Pic 1899, Ebner 1921, Wittmer 1934, Pic 1935, El-Torkey et al. 2012), Tunesia (Abeille de Perrin 1891),

Algeria (Aubé & Grenier 1865, Peyron 1877, Abeille de Perrin 1891, Pic 1914, 1935) and Morocco (Escalera 1914, Kocher 1956, 1964).

The review of the literature has revealed that the list of countries in Mayor (2007) is incomplete – Lebanon (LB), Romania (RO) and Turkey (TR) are missing.

The occurrence information for Tajikistan in Tshernyshev (2016) is an error. This was confirmed by the author of the work (S.E. Tshernyshev, in lit.; e-mail dated 2.IX.2023).

New country records

Austria

Material examined. Burgenland, Neusiedl am See, National Park Neusiedlersee-Seewinkel, W Biological Station Illmitz, lake dam, 47°46′10″ N, 16°45′22″ E, 116 m a.s.l., 16.VI.2018, A. Link leg., 1 ♂ (coll. A. Link, Ansfelden, Austria).

Collecting circumstances. The reported specimen was collected by sweeping wetland vegetation on the flank of the lake dam with an insect net.

Habitat. The lake dam is an artificial habitat built into the reed belt of a Pannonian lake. Its edges are vegetated with bushes (e.g. *Sambucus nigra* L.) and smaller trees (especially *Robinia pseudoacacia* L.) (H. Grabenhofer, in lit.; e-mail dated 29.VIII.2023).

Faunistics. The specimen reported above is the first documented record of *P. flavolimbatus* from Austria. A second finding has been documented photographically by Elie Gaget in the lakeside foreland of Neusiedl am See village on 22.VIII.2021 (https://www.inaturalist.org/observations/100164083).

Bulgaria

Material examined. Blagoewgrad, Sandanski, NE Lozenitsa, stream ditch, 41°30′42″ N, 23°22′36″ E, 320 m a.s.l., 5.VI.2013, O. Konvička leg., 1 ♂ (coll. O. Konvička, Zlín, Czechia).

Habitat. See Figures 3–4.

Faunistics. This is the first published record of *P. flavolimbatus* from Bulgaria.

Israel

Material examined. Northern district, Akko, Akkon city environment, 16.IV.1981, G. Wewalka leg., 1 ♀ (coll. Natural History Museum Vienna, Austria); Upper Galilee, Hula Nature Reserve [33°04′23.7″ N, 35°36′02.6″ E], 19.IV.1981, G. Wewalka leg., 1 ♀ (coll. Natural History Museum Vienna, Austria); Golan, Betiha Nature Reserve, lakeside foreland between mouths of Jordan und Meshushim rivers, ca. 32°53′38.5″ N, 35°37′01.4″ E, 210 m b.s.l., 31.VII.1985, M.A. Jäch leg., 1 ♀ (coll. Natural History Museum Vienna, Austria); ibidem, Aqeb [probably: 32°52′06.7″ N, 35°38′36.0″ E], 7.III.1986, M.A. Jäch leg., 1 ♀ (coll. Natural History Museum Vienna, Austria); Haifa, Hadera, Hadera city environment, 21.III.1986, M.A. Jäch leg., 1 ♀ (coll. Natural History Museum Vienna, Austria); Southern district, Ashkelon, S Zikim, Shikma Reservoir [31°36′01.0″ N 34°30′52.0″ E] – Nahel Shikma, 24.VII.1985, M.A. Jäch leg., 1 ♀ (coll. Natural History Museum Vienna, Austria).

Habitat. The wetland vegetation of Lake Kinneret and Israel have been characterised in summary by Baruch (1986) and Danin (1992). For example, the "banks of the lake [Kinneret] support vegetations of *Phragmites australis* and *Vitex agnus-castus* [L.]. Marsh vegetation (...) is found in the Buteiha plain, northeast of the lake, where it consists of *Typha domingensis* [Pers.] and various Cyperaceae" (Baruch 1986). A plant-sociological

Figs 3–4: Habitat of *Protapalochrus flavolimbatus* in the vicinity of Lozenitsa, Bulgaria. © O. Konvička.

Fig. 5. Habitat of *Protapalochrus flavolimbatus* next to the Shikma Water Reservoir in Israel. © M.A. Jäch.

syntaxonomy or a habitat classification was not ascertainable. Figure 5 shows the habitat (reed thicket) from the finding next to the Shikma reservoir.

Notes. The occurrence in Israel has probably been known for a while, but has never been published. The examined material from the Natural History Museum Vienna, which is formally reported here to close the distribution gap between Egypt and Lebanon, was already partly correctly determined by W. Wittmer as "*Paratinus flavolimbatus* Muls." (the specimens collected by M.A. Jäch in 1985–1986), partly misidentified as "*Paratinus notatus* Zoubk." (the specimens collected by G. Wewalka in 1981). The latter are specimens with completely black femora and blackened tibiae (= *P. f.* var. *creticus* Pic, 1903) – *Apalochrus notatus* (Zoubkoff, 1833), on the other hand, possesses a differently shaped pronotum and completely unicoloured elytra and mesepimeres (Tshernyshev 2015).

Rediscoveries

Greece

Material examined. Central Macedonia, Thessaloniki, Saloniki, 1908, V. Apfelbeck leg., 1 ♂, 3 ♀♀ (coll. Naturhistorisches Museum Wien, Austria); Peloponnese, Laconia, East Mani, NE Gythio, marshland behind Valtaki beach, 36°47′24.6″ N, 22°35′05.1″ E, 26.IV.2016, I.S. Plonski leg, 4 ex. (coll. I. Plonski, Vienna, Austria).

Collecting circumstances. The specimens collected by Isidor S. Plonski were swept off the top parts of over-man-high reed plants with an insect net.

Habitat. The collecting site geo-referenced above is a marshland densely vegetated with reed.

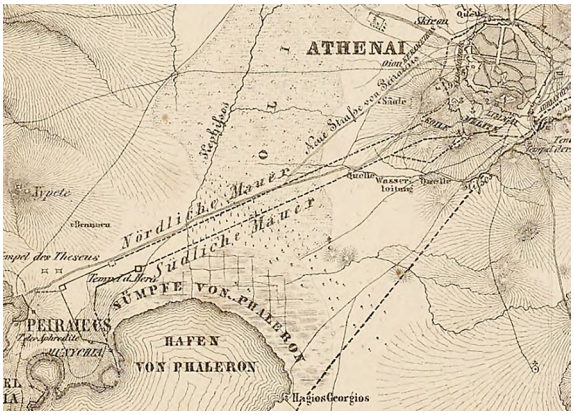

Fig. 6: Map cut-out from the "Atlas zur alten Geschichte" in Höfler (1859) showing the historical situation of the type locality of *Apalochrus tricolor* Kiesenwetter, 1859.

Faunistics. Until now, *P. flavolimbatus* was known from the type localities of *P. f.* var. *tricolor* and *P. f.* var. *creticus*.

Notes. The type locality of *Apalochrus tricolor* were the marshes (Fig. 6) next to port Phalereus of historical Athens (Kiesenwetter 1859). The population from this locality is now extinct because of complete habitat loss caused by urbanization of Athens and Piraeus. The population from the environment of Thessaloniki sampled by Viktor Apfelbeck in 1908 is most likely still viable – suitable wetlands are protected by the Axios Delta National Park in the northwest corner of the Thermaic Gulf.

Romania

Material examined. Dobrudja, Constanța, Danube Delta Biosphere Reserve, Grindul Saele, marshy area N Vadu village, 44°28′32.5″ N, 28°44′42.4″ E, 5.VII.2023, C. O. Manci leg., 1 ♀ (coll. C. O. Manci, Valea Lupului, Romania); ibidem, marshy area near road SW Histria fortress, 44°32′26.5″ N, 28°45′36.7″ E, 6.VII.2023, C. O. Manci leg., 1 ♂, 1 ♀ (coll. C. O. Manci, Valea Lupului, Romania); ibidem, Tulcea, Danube Delta Biosphere Reserve, Musura Island, 45°10′09.68″ N 29°45′27.24″ E, 1.VI.2024, A. M. Pintilioaie leg., 1 ♀ (coll. A. M. Pintilioaie, Agigea, Romania).

Collecting circumstances. The three specimens from Grindul Saele were collected by sweeping vegetation with an insect net. The specimen from Musura Island was found sitting on a piece of driftwood, viz. a log, and was hand captured.

Habitat. Grindul Saele is a sandbank with waterbodies and a low dune and dune slack system, which started to form 5000 years ago. Due to its bi-phasic development, it is older in the west and younger in the east (Vespremeanu-Stroe et al. 2016). Although it has a relatively small area, a uniform relief and a uniform lithology, its flora and vegetation are diverse, because of soils differing in moisture and salinity and anthropic influences – 287 species of vascular plants (including *Phragmites australis*, *Typha latifolis* and four *Juncus* species) forming 27–29 vegetal associations, of which some are endemic, have been reported so far (Drăgulescu 1998, Ştefan et al. 2001, Doniță et al. 2005, Sanda et al. 2008). At the two collecting sites geo-referenced above, Hanganu et al. (2002) maps reed vegetation on salinised soil accompanied by coastal low dune vegetation of the North Pontic type, and vegetation in depressions between dunes of the North Pontic type on slightly salinised soil respectively.

Fig. 7: Habitat of the *Protapalochrus flavolimbatus* finding from Musura Island in Romania. © A. M. Pintilioaie.

Musura Island is a recently formed sandbank over two decades of age (Bondar & Toader 2011a, b). In 2009, it supported a pioneer vegetation consisting of 37 vascular plant species forming eight vegetal associations (Sârbu et al. 2011). Currently, it also supports reed vegetation (Fig. 7).

Faunistics. *Protapalochrus flavolimbatus* was previously reported from the marshes next to Măcin and from a lake foreland next to Mangalia (Montandon 1887; cf. Fleck 1905; cf. Montandon 1906).

Notes. The population from the environment of Măcin is probably extinct because of destruction of nearly all wetlands (comp. Figs 8 and 9) during the first three quarters of the 20th century (Iordan 1987, Romenescu 2004, Kucsicsa et al. 2015). The population from the environment of Mangalia is most likely still viable because of the good condition of marshes and lakes.

Turkey

Material examined. Adana, Ceyhan, 12–24.V.1965, F. Schubert leg., 2 ♀♀ (coll. Natural History Museum Vienna, Austria); Mersin, Erdemli, Kızkalesi town environment, pond, 1.IX.1981, M.A. Jäch leg., 1 ♀ (coll. Natural History Museum Vienna, Austria).

Faunistics. In the 19th century, *P. flavolimbatus* became known from the Taurus Mountains and former Karamania (Peyron 1877, cf. Abeille de Perrin 1891). Tshernyshev (2016) reports a specimen collected in the environment of Antalya.

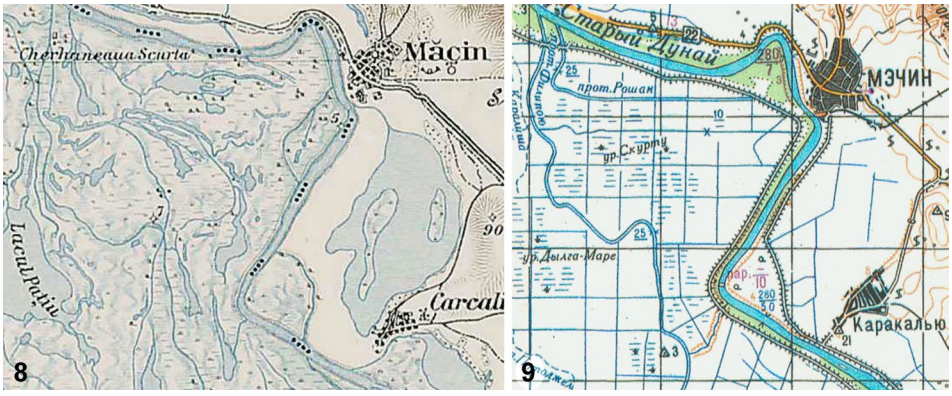

Fig. 8–9: (8) Map cut-out from Noltz et al. (1901) showing the original alluvial landscape and wetlands around Măcin (Romania). (9) Map cut-out from Anonimnyy (1977) showing the anthropogenic modifications (drainage ditches, levees) and transformation of the original landscape around Măcin (Romania) into arable land.

Notes. The status of the population sampled in the environment of Ceyhan is currently unknown. Historical maps documenting the extent of wetlands (cf. Ataol & Onmuş 2021) could not be accessed. It is assumed that the wetlands around the meandering river have been eradicated during the efforts of Malaria control and were transformed into arable lands. The population sampled in Kızkalesi in 1981 is most likely extinct because no waterbody has been found on recent satellite images – the so-called pond fell victim to the transformation process of the populated area from village to town, and was probably drained and filled in.

Lebanon

Material examined. North Governorate, Batrun (or Koura), Valley of Nahr el-Jaouz next to Boqsmaïya [34°15′ N, 35°46′ E], 1.VI.2001, B. Levey leg., 1 ♀ (coll. National Museum of Wales, Cardiff, UK).

Habitat. Because the specimen is labelled with imprecise coordinates, the habitat could not be clearly determined. Most likely, the specimen was collected in a habitat flanking the river. Note that sedges and reed bed habitats occurring in humid and wet areas are the most widely represented wetland habitats in Lebanon (El Zein et al. 2022).

Faunistics. Until now, there was only an incidental mention of a specimen of the colour variety *P. f.* var. *tricolor* collected in the environment of Beirut (Pic 1935).

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