New distributional data and ecological insights on the microhisterid *Bacanius* (*Bacanius*) *consobrinus* (Aubé 1850), with notes on rarity and detectability (Coleoptera: Histeridae)

Fabio Penati[1]*, Michel Secq[2], Tomáš Lackner[3]

Abstract - A combined review of published and unpublished data significantly updates the distribution, ecology, and detectability of *Bacanius (Bacanius) consobrinus* (Aubé 1850), a saproxylic microhisterid of Turano-European distribution. The species is newly recorded from Iran, Turkey, Cyprus, and Bosnia-Herzegovina, with several additional localities documented for the Caucasus, the Balkans, Italy (including the first record for Puglia), and France. Available evidence shows that the species inhabits saproxylic microhabitats exclusively associated with broadleaf trees, in environments ranging from sea level up to ca 1000 m a.s.l., and often moderately disturbed or urbanised, challenging its proposed value as an indicator of well-preserved forest ecosystems. Targeted sampling (deep sifting; cavity-facing window traps) revealed high local abundances otherwise missed by non-targeted methods, indicating that the species' perceived rarity is mainly due to low detectability. The expanded Italian dataset contradicts the assumptions underlying its former "Critically Endangered" assessment in the national Red List of saproxylic beetles, and strongly supports a re-evaluation of its conservation status.

Key words: conservation status, distribution, ecology, sampling bias, saproxylic beetles.

Riassunto - Nuovi dati distributivi e osservazioni ecologiche sul microisteride *Bacanius* (*Bacanius*) *consobrinus* (Aubé 1850), con note su rarità e rilevabilità (Coleoptera: Histeridae).

La revisione dei dati pubblicati e di numerosi dati inediti aggiorna significativamente la distribuzione, l'ecologia e la rilevabilità di *Bacanius (Bacanius) consobrinus* (Aubé 1850), microisteride saproxilico a distribuzione Turano-Europea. La specie è segnalata per la prima volta di Iran, Turchia, Cipro e Bosnia-Erzegovina, e numerose nuove località sono riportate per Caucaso, Balcani, Italia (inclusa la prima segnalazione per la Puglia) e Francia. I dati disponibili mostrano che la specie è legata a microhabitat saproxilici esclusivamente associati a latifoglie, in ambienti distribuiti dal livello del mare fino a circa 1000 m s.l.m. e spesso moderatamente disturbati o urbanizzati, mettendo in discussione il suo presunto valore come indicatore di ecosistemi forestali ben conservati. Campionamenti mirati (setacciatura profonda; trappole ad intercettazione poste davanti a cavità arboree) hanno rivelato elevate abbondanze locali, altrimenti non rilevabili con metodi non mirati, indicando che la rarità percepita dipende principalmente dalla bassa rilevabilità. I dati aggiornati per l'Italia contraddicono le premesse alla base della sua precedente classificazione come "Critically Endangered" nella Lista Rossa nazionale dei coleotteri saproxilici, e supportano fortemente una rivalutazione del suo stato di conservazione.

Parole chiave: bias di campionamento, coleotteri saproxilici, distribuzione, ecologia, stato di conservazione.

Bacanius (*Bacanius*) *consobrinus* (Aubé 1850) is a microhisterid (Fig. 1) belonging to the tribe Bacaniini Kryzhanovskij, 1976, subfamily Dendrophilinae Reitter 1909. Its distribution corresponds to the Turano-European chorotype (*sensu* Vigna Taglianti *et al*., 1999), rather than to the S-European (Penati & Vienna, 2005) or European chorotypes (Lagarde & Secq, 2023). To date, the species has been reported from Azerbaijan, Georgia (patria typica), southern Russia, Bulgaria, Romania, Croatia, Italy, France, Spain (Lackner *et al*., 2015; Newton, 2025), and from Greece (Mazur, 2011; Lagarde & Secq, 2023). The records listed below newly document its presence in Iran, Turkey, Cyprus, and Bosnia-Herzegovina, and add several localities for countries where it was already known, including Georgia, southern Russia, Greece, Bulgaria, Italy, and France.

According to the literature, *B. consobrinus* is considered rare, usually reported as single individuals or in very low numbers, and from a limited number of localities and countries. It is typically associated with specialized saproxylic microhabitats, such as decomposed wood, debris accumulated in trunk hollows, and subcortical layers of old or senescent trees (Kryzhanovskij & Reichardt, 1976; Vienna, 1980; Yélamos, 2002; Gomy & Millarakis, 2012). In Italy, the species is listed in the national Red List of saproxylic beetles (Carpaneto *et al*., 2015) as Critically Endangered (CR). In France, it is considered of high patrimonial value due to its rarity, its association with specific microhabitats, and its potential role as a bioindicator of well-preserved forest ecosystems (Gomy & Millarakis, 2012).

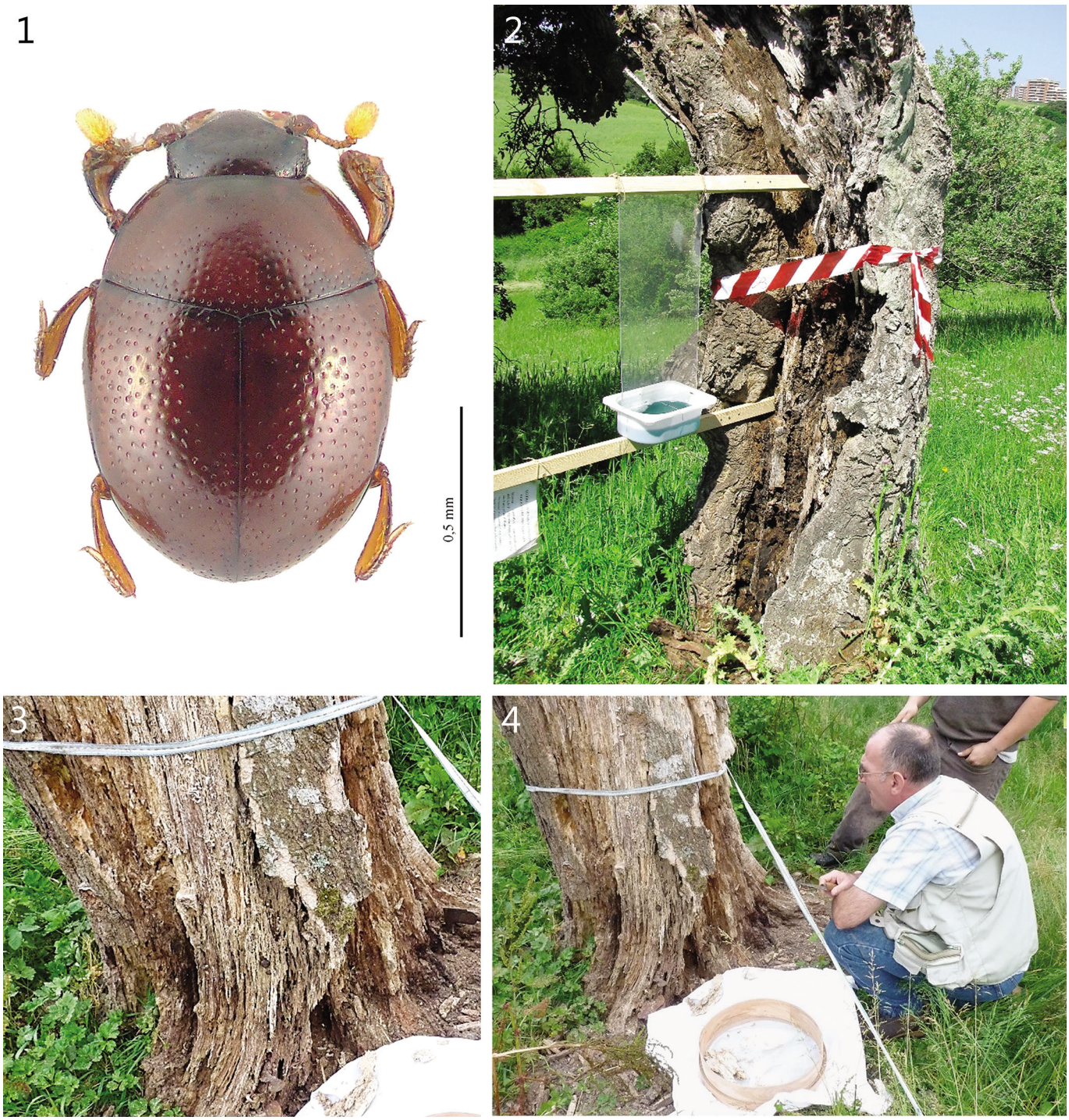
[1] Via dei Sedini 47A, 23017 Morbegno (Sondrio), Italia.
[2] 177 route du Périgord pourpre, 24230 Montcaret, France.
[3] Department of Environmental Systems Science, ETH Zürich, Weinbergstrasse 56, CH-8092 Zürich, Switzerland.

* Corresponding author: fabio.penati60@gmail.com

© 2026 Fabio Penati, Michel Secq, Tomáš Lackner

Received for publication: 7 January 2026
Accepted for publication: 27 May 2026
Early access: 28 August 2026
Online publication: 5 November 2026

OPEN ACCESS
BY-NC
pagepress



Figs. 1-4 - 1) *Bacanius* (*Bacanius*) *consobrinus* (Aubé, 1850), dorsal habitus (Palazzo Rossi, 15.i.2022, MSNM). 2) One of the custom window traps used at Sughereta di Pomezia, placed in front of a hollow trunk of *Quercus suber*. 3) Example of a saproxylic microhabitat: white rot in a large standing dead trunk of *Quercus* sp. (Bretagne-de-Marsan, France). 4) One of the authors (M.S.) sifting wood debris in situ from the microhabitat shown in fig. 3 (18.v.2014). / 1) *Bacanius* (*Bacanius*) *consobrinus* (Aubé, 1850), visione dorsale (Palazzo Rossi, 15.i.2022, MSNM). 2) Una delle window trap speciali utilizzate alla Sughereta di Pomezia, posizionata davanti a un tronco cavo di *Quercus suber*. 3) Esempio di microhabitat saproxilico: carie bianca in un grosso tronco morto in piedi di *Quercus* sp. (Bretagne-de-Marsan, France). 4) Uno degli autori (M.S.) mentre setaccia sul posto i residui legnosi del microhabitat mostrato in fig. 3. (Photo / Foto: 1 - M. Zilioli; 2 - A. Zauli; 3-4 - B. Secq).

Redescriptions, keys, and figures for *B. consobrinus* are available in the following works (in chronological order): Marseul (1862: redescription, illustration of dorsal habitus), Schmidt (1885: key), Reitter (1886 and 1912: key), Müller (1925: key), Reichardt (1941: redescription, key), Vienna (1971: illustration of aedeagus), Kryzhanovskij & Reichardt (1976: redescription, key), Vienna (1980: redescription, key, illustrations of dorsal

and ventral habitus), Yélamos (2002: redescription, key, illustrations of dorsal habitus and aedeagus), Secq & Secq (2017: key), Jiroux (2021: photo of dorsal habitus).

All known records, both published and unpublished, are listed below by country, from east to west. Literature data were integrated, when possible, with information from original labels or directly from the collectors. Repositories are reported when known. The following acronyms for public collections (Evenhuis, 2020) are used throughout the text. Names in brackets refer to those who provided the data, and may not correspond to the current curators or collection managers. Acronyms for private collections are listed at the end.

HNHM Hungarian Museum of Natural History, Budapest, Hungary (György Makranczy)

MCST-MU Museo Civico di Storia Naturale - coll. G. Müller, Trieste, Italy (Pierpaolo Vienna)

MHNG Muséum d'Histoire Naturelle, Genève, Switzerland (Giulio Cuccodoro)

MHNG-MA Muséum d'Histoire Naturelle - coll. S. Mazur, Genève, Switzerland (Giulio Cuccodoro)

MNCN Museo Nacional de Ciencias Naturales, Madrid, Spain

MNHN-TH Muséum National d'Histoire Naturelle - coll. J. Thérond, Paris, France (Antoine Mantilleri)

MRA-CO Muséum Requien - coll. J. Coffin, Avignon, France

MSNG-MA Museo di Storia Naturale "Giacomo Doria" - coll. S. Mazur, Genova, Italy (Roberto Poggi)

MSNM Museo Civico di Storia Naturale, Milano, Italy (Fabrizio Rigato)

MSNV Museo Civico di Storia Naturale, Verona, Italy (Leonardo Latella)

MZUF-AN Museo Zoologico "La Specola" - coll. F. Angelini, Firenze, Italy (Giuseppe Federico Turrisi)

NHM The Natural History Museum, London, United Kingdom (Max Barclay & Michael Geiser)

NHMB Naturhistorische Museum, Basel, Switzerland (Christoph Germann)

NMPC National Museum (Natural History), Prague, Czech Republic (Jiří Hájek)

RMNH Naturalis Biodiversity Center, Leiden, Netherlands (Oscar Vorst)

ZIN Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (Svetlana Andreeva)

ZSM Zoologische Staatssammlung München, Munich, Germany (Ditta Balke)

FPMI private collection of Fabio Penati, Morbegno, Italy

GPRI private collection of Giuseppe Pace, Roma, Italy

GRGI private collection of Giovanni Ratto, Genova, Italy

JSPHC private collection of Jan Simon-Pražák, Hradec Králové, Czech Republic

MBSMF private collection of Michel & Bernard Secq, Montcaret, France

NDPF private collection of Nicolas Degallier, Paris, France

NGBG private collection of Nicolas Gompel, Bonn, Germany

OVUN private collection of Oscar Vorst, Utrecht, Netherlands

PFEF private collection of Pierre Frapa, Entrevennes, France

PVVI private collection of Pierpaolo Vienna, Venezia, Italy

TLMG private collection of Tomáš Lackner, Munich, Germany (temporarily housed at ZSM)

VLGF private collection of Vincent Lefebvre, Grenade-sur-l'Adour, France

Specimens data and collection records

IRAN (**first record**). Mazandaran Prov.: Neyrang env., [~130 m], 36.614515° N - 51.481414° E, fit trap in grazed pollarded forest, 31.v.2018, leg. K. Klapsha & L. Čížek, 1 ex. TLMG.

Note. The occurrence of the species in Iran had already been suggested by Kryzhanovskij (1974) based on its presence in the adjacent "South-East Transcaucasia" (i.e., Lankaran in Azerbaijan, see below).

AZERBAIJAN. Lankaran-Astara Reg.: Lenkoran [= Lankaran] (Reitter, 1886; Reichardt, 1941; Kryzhanovskij & Reichardt, 1976).

Note. One specimen labelled "Lenkoran / Leder / (Reitter)" [printed] // G. Lewis Coll. / B.M.1926-369. [printed] // *consobrinus* / 26.I.83 [handwritten in pencil by Reitter]" is housed in NHM. The date is most likely the collecting date, as Hans Leder (the collector) was active in the Caucasus during those years (Hetschko, 1922). A second specimen, with the same collecting data, is housed in HNHM.

GEORGIA. Adjara Reg.: "… aux environs de Batoum en Iméritie" [= Batumi env.], [before 1850], leg. A.L. Montandon, 3 exx. (**type locality**; Aubé, 1850 as *Abroeus* (sic!) *consobrinus*; Marseul, 1856 as *Acritus consobrinus*; Marseul, 1862 as *Bacanius consobrinus*). Kakheti Reg.: Alazani river valley NW of Lagodekhi, Chiauri [floodplain] forest, under the bark of a fallen trunk of *Populus* sp., 3.vi.1977, leg. A. Kirejtchuk, [det. Kryzhanovskij], 1 ex. ZIN (**new locality**). Mtisdziri, 41°54'36.74" N - 46°05'33.41" E, beech commercial forest, flight trap, vii.−viii.2021, unknown collector, det. F. Penati, 1 ex. FPMI (**new locality**).

RUSSIA. Dagestan: Samur Forest, 20.−21. iv.1990, leg. B. Korotjaev, det. Kryzhanovskij 1990, 1 ex. ZIN (**new locality**). Krasnodar Krai: "Adler / 15.VI.[19]09 / G. Sumakov [handwritten + printed] // Bacanius consobrinus [handwritten]", 1 ex. ZIN; "Cauc. occ. Adler / Dr. Lgocki VIII [printed] // coll. / Lgocki [printed]", 1 ex. ZIN (Reichardt, 1941; Kryzhanovskij & Reichardt, 1976). Krasnaya Polyana, vii.1910, leg. J. Roubal, ex coll. Auzat, 2 exx. MNHN-TH; "Cauc. occ. / Krasna. Polana / Dr. Lgocki VIII. [printed] // coll. / Lgocki [printed] // Bacanius / consobrinus Aubé / A. Reichardt det. [handwritten + printed]", 1 ex. ZIN (Reichardt, 1941; Kryzhanovskij & Reichardt, 1976). Caucasian Nature Reserve, settlement of Khosta, yew-boxwood grove, window trap on boxwood, 29.vii.–4.viii.2006, leg. A.R. Bibin, 1 ex. (Nikitsky *et al*., 2008).

Note. The Khosta Yew-Boxwood Grove (Sochi, Krasnodar Krai) is a relict subtropical forest dominated by *Taxus baccata* L. (yew) and *Buxus colchica* Pojark. (boxwood), hosting a unique assemblage of pre-glacial flora.

TURKEY (**first record**). Düzce Prov.: 20 km N of Uzce [= Düzce], rotting tree stump, 28.viii.1973, leg. S. Vít, det. S. Mazur, 2 exx. MHNG.

CYPRUS (**first record**). Paphos Distr.: Alonoudi Junction, 600 m, 20c [= sifting an old stump of *Alnus* sp.], 15.vii.1977, leg. C. Besuchet, [identification handwritten by S. Mazur], 2 exx. MHNG.

GREECE. Central Macedonia: Chalkidiki Reg., Kalýves [Polygýrou], 20.v.1987, leg. F. Hebauer, ex coll. H. Hebauer, [det. not specified, supposedly S. Mazur], 1 ex. MHNG-MA (**new locality**). Pieria Reg., Neos Panteleimonas, 12.−23.vi.1993, leg. D. Král, det. A. Olexa, 1 ex. NMPC (**new locality**). Thessaly: Larissa Reg., NE slopes [of] Mt. Kissavos [= Mt. Ossa], NW [of] Kokkino Nero, 100 m, 13.iv.2006, sifted, leg. S. Vít, det. T. Lackner, 1 ex. TLMG (**new locality**). Magnesia Reg., W of Lambinou, 400 m, sifted soil at the foot of a dead *Castanea sativa* Mill., 9.v.2004, leg. S. Vít, det. T. Lackner, 125 exx. TLMG, 50 exx. ZSM, 6 exx. JSPHC (**new locality**); Plataniás env., hollow trunk of *Platanus* sp., 12.iv.2004, leg. S. Vít, det. T. Lackner, 71 exx. TLMG, 8 exx. MHNG, 5 exx. ZSM, 3 exx. MSNG-MA, 1 ex. NDPF (**new locality**).

Note. Earlier references to the species in Greece were unlocalised (Mazur, 2011; Lagarde & Secq, 2023).

BULGARIA. Burgas Prov.: Kruszevec [= Krushevets] env., Str. [= Strandzha Mountain], sifted from a hollow trunk of *Quercus* sp., 27.viii.1972, leg. and det. S. Mazur, 1 ex. MSNG-MA, 1 ex. RMNH (**new locality**). Plovdiv Prov.: Bačkovo [= Bachkovo], [no date], leg. Ing. Machulka, det. A. Olexa, 6 exx. NMPC, 1 ex. JSPHC (**new locality**).

Note. Previous records referred only generically to "Bulgaria", without specific locality data (Lackner *et al*., 2015; Newton, 2025).

ROMANIA. "Transilvania" [no further data] (Müller, 1925; Reichardt, 1941).

Note. The locality reported by Müller (1925) is followed by "!", indicating that the author personally examined specimen(s) from that area. In MCST-MU, only four Histeridae from "Transilvania" are present (labelled "Transilvania, Várhegy [= now Chinari], [leg.] Zoppa"): three specimens of *Abraeus raddei* Reitter, 1877 (det. Müller; now assigned to *Anapleus* Horn, 1873) and one damaged specimen (head and pronotum missing) of *Abraeus zoppae* Penecke, 1901 (anonymous det.; now a junior synonym of *Abraeomorphus minutissimus* (Reitter, 1884)); none belong to *B. consobrinus* (P. Vienna, pers. comm.). The repository of the specimen(s) examined by Müller remains unknown.

BOSNIA-HERZEGOVINA (**first record**). Raška Gora, [no further data], [leg.] Dr. Grabowski, det. J. Thérond 1963, 1 ex. HNHM.

CROATIA. "Dalmazia: Zemonico" (Müller, 1925).

Note. Two specimens labelled "Zemonico [= Zemunik Donji], 23.vii.1916, [leg.] Novak" are housed in MCST-MU (P. Vienna, pers. comm.).

ITALY. Emilia-Romagna: Spilamberto (Modena), 9.iv.1902, leg. G. Rangoni, ex coll. Moscardini, det. J. Thérond, 1 ex. MSNV, 1 ex. PVVI (Vienna, 1971, 1980; Penati & Vienna, 2005). Castenaso (Bologna), riparian park along the Idice stream, in a hollow trunk of *Populus* sp., 30.xi.2011, leg. L. Colacurcio, det. G. Ratto, several exx. [number unknown] GRGI (Penati *et al*., 2020). Sasso Marconi (Bologna), Palazzo Rossi, on the left bank of the Reno river, sifting debris collected from inside a decaying fallen trunk of *Populus* sp., 12.xii.2020, leg. L. Colacurcio, det. F. Penati, 3 exx. FPMI; *idem*, but 15.i.2022, 1 ex. MSNM (fig. 1; **new locality**). Toscana: Firenze, Parco delle Cascine, tra il Piazzale delle Cascine e l'anfiteatro E. De Pascale, 43°47'11" N - 11°12'31" E, under bark of old stumps, 25.iii.2023, leg. F. Terzani & S. Rocchi, det. P. Vienna, 1 ex. PVVI (Rocchi *et al*., 2025). Lazio: Nettuno (Roma), Bosco del Foglino, under bark, 22.iii.1997, leg. and det. G. Pace, 1 ex. GPRI (Penati *et al*., 2020). Pomezia (Roma), Sughereta di Pomezia, 50–80 m, several old hollow trees of *Quercus suber* L., iv.2009, 9 exx. window traps (WT; fig. 2), 1 ex. pitfall traps (PT); v.2009, 43 exx. WT; vi.2009, 46 exx. WT, 3 exx. PT; vii.2009, 6 exx. WT, 1 ex. PT; viii.2009, 6 exx. WT; iv.2010, 1 ex. PT; v.2010, 86 exx. WT, 4 exx. PT; vi.2010, 33 exx. WT, 1 ex. PT; vii.2010, 2 exx. WT; viii.2010, 1 ex. WT (site description, Della Rocca *et al*., 2022; specimens and traps, F. Della Rocca, pers. comm.); *ibidem*, under bark of *Quercus suber* L., 4.iii.2013, leg. and det. G. Pace, 1 ex. GPRI (Penati *et al*., 2020). Priverno (Latina), Bosco Polverino, 20–70 m, several old hollow trees of *Quercus suber* L., iv.2009, 1 ex. WT, 1 ex. PT; v.2009, 7 exx. WT, 2 exx. PT; vi.2009, 1 ex. WT, 1 ex. PT; vii.2009, 1 ex. WT, 1 ex. PT; v.2010, 1 ex. PT; vii.2010, 1 ex. WT, 1 ex. PT; viii.2010, 1 ex. WT (site description, Della Rocca *et al*., 2022; specimens and traps, F. Della Rocca, pers. comm.). Sabaudia (Latina), Selva del Circeo, 25 m, 41.34515° N - 13.01866° E, sifted from a completely rotten tree trunk (probably *Quercus* sp.), 16.v.2003, leg. and det. O. Vorst, 4 exx. OVUN (**new locality**). Basilicata: Pietrapertosa (Potenza), 1000 m, 13.i.1996, leg. F. Montemurro, det. P. Vienna, 1 ex. PVVI (**new locality**). San Severino [Lucano] (Potenza), 670 m, sifting beech [= *Fagus sylvatica* L.] litter, 7.vi.1987, leg. F. Angelini, det. P. Vienna, 1 ex. MZUF-AN, 1 ex. PVVI (Penati & Vienna, 2005). Puglia: "Murgien, San Basilio [= Mottola, fraz. San Basilio (Taranto)], [iii.−v.1907], [leg.] Paganetti", det. Y. Gomy, 1 ex. ZSM (**new locality** and first record for the region Puglia).

Note. The collecting date of the specimen from San Basilio was desumed from Paganetti-Hummler (1918: 69).

FRANCE. Corse du Sud: San-Gavino-di-Carbini (2A300), Arragiu [= Arraggio], in moist soil at the foot of a *Quercus suber* L., 6.vi.2005, leg. Y. Thieren, 1 ex. (Thieren & Delwaide, 2009; Lagarde & Secq, 2023); *idem*, but 26.ix.2005, leg. M. Delwaide, 7 exx. (Thieren & Delwaide, 2009; Lagarde & Secq, 2023). Var: Bagnols-en-Forêt (83600), 7.iv.1954, leg. P. Bonadona, det. J. Thérond, 1 ex. MNHN-TH (**new locality**). Bormes [-les-Mimosas] (83230), Forêt du Dom, *Quercus suber* L., in the galleries of *Cerambyx cerdo* L., 2.ix.1963, leg. P. Teocchi, det. J. Thérond, 1 ex. MNHN-TH (**new locality**). Fréjus (83061), in litter of *Quercus suber* L., 23.iii.1947,

leg. P. Bonadona, det. J. Thérond, 4 exx. (Thérond, 1948; Lagarde & Secq, 2023); *ibidem*, vallon du Reyran, Malpasset, along the stream, old declining trees of *Populus* sp., 30.v.2010, leg. R. Allemand, det. Y. Gomy, [number of exx. unknown] (Allemand *et al*., 2011). Les Adrets[-de-l'Estérel] (83001), in litter of *Quercus suber* L., 3.ii.1952, leg. P. Bonadona, det. J. Thérond, 1 ex. MNHN-TH (**new locality**; empty mounting card, specimen lost). Les Arcs[-sur-Argens] (83004), Vallée de l'Argens, in hollow of *Quercus suber* L., 21.iii.1948, leg. P. Bonadona, det. J. Thérond, 1 ex. MNHN-TH (**new locality**). Roquebrune-sur-Argens (83107), Saint-Blaise, 130 m, cork-oak woodland, stump of *Quercus suber* L., in association with *Camponotus* sp., 4.vii.2011, leg. N. Gompel, det. M. Secq, 1 ex. NGBG (**new locality**). Saint-Raphaël (83118), Agay, in litter of *Quercus suber* L., 3.i.1948, leg. P. Bonadona, det. J. Thérond, 1 ex. (Thérond, 1948; Lagarde & Secq, 2023). Bouches-du-Rhône: Arles (13004), Albaron, sifting debris from the cavity of a senescent *Ulmus* sp., among numerous *Euplectus bonvouloiri narentinus* Reitter, 1882, 10.vii.1931, leg. and det. J. Thérond, 2 exx. MNHN-TH (Thérond, 1946, 1975; Lagarde & Secq, 2023). Vaucluse: Châteauneuf-du-Pape (84037), Islon-Saint-Luc, under bark of *Populus* sp., 8.iv.1994, leg. J. Coffin, det. M. Secq, 1 ex. MBSMF (Secq, 2000; Lagarde & Secq, 2023). Saint-Martin-de-Castillon (84112), "Le Paraire", 306 m, aerial interception trap, 25.vi.–16.vii.2004, leg. P. Frapa, det. M. Secq, 1 ex. PFEF (Gomy, 2013; Lagarde & Secq, 2023). Sarrians (84122), decaying trunk of *Salix* sp., 5.iv.1994, leg. J. Coffin, det. M. Secq, 1 ex. MRA-CO (Secq, 2000; Lagarde & Secq, 2023); *idem*, but 20.iv.1994, 1 ex. MRA-CO, 1 ex. MBSMF (Secq, 2000; Lagarde & Secq, 2023). Sorgues (84129), île d'Oiselet, Le Chalet, 25 m, sifting decayed wood and humus from a *Platanus* sp. hollow trunk, 29.vi.2000, leg. M. Secq & J. Coffin, det. M. Secq, 17 exx. MBSMF (Gomy & Secq, 2011; Lagarde & Secq, 2023). Hérault: Canet (34051), on the banks of the Hérault River, sifting a large log of *Populus* sp. with brown rot inhabited by hundreds of *Euplectus brunneus* (Grimmer, 1841) and of *Scydmaenus* (*Cholerus*) *cornutus* Motschulsky, 1844, and some *Euplectus kirbii kirbii* Denny, 1825, 08.x.2021, leg. V. Lefebvre, det. M. Secq, 2 exx. VLGF (**new locality**).

SPAIN. Madrid, 7 exx. MNCN (Yélamos, 1990, 2002).

Note. Apart from the specimens listed above, labelled only as "Madrid" with no additional data, no other records from Spain are known. Therefore, the presence in this country remains to be confirmed.

Ecological remarks

Collecting data listed above enable a broader understanding of the species' ecology. To the microhabitats already documented in the literature – namely decomposed wood (Fig. 3), debris accumulated in trunk hollows, and subcortical layers of old or senescent trees – should now be added deciduous leaf litter (*Fagus sylvatica* in San Severino Lucano, Basilicata, Italy) and soil at the base of trees (*Castanea sativa* in Lambinou, Thessaly, Greece, and *Quercus suber* in Arragiu, Corsica, France). Particularly noteworthy is the exceptional abundance recorded in the latter microhabitat, where a total of 181 exx. were collected by sifting the soil up to 20 cm deep at the base of a dead *Castanea sativa*, already partly debarked and damaged by fire. These findings were described in detail by Lackner (2008: 80) in reference to a specimen of the very rare bacanine *Triballodes acritoides* (Reitter 1884), found together with *B. consobrinus*. Despite the great difference in specimen number, a comparable vertical distribution was observed also in Arragiu (Corsica), where 8 exx. were recovered by sifting the middle layer (10-20 cm depth) of moist soil accumulated at the base of a *Quercus suber* tree (Thieren & Delwaide, 2009: 310), suggesting a strong preference for intermediate subterranean strata characterised by humidity, decomposed organic matter, and active fungal growth. In addition, among the species' "classic" microhabitats, debris in hollow trunks of *Platanus* sp. yielded the highest numbers of individuals (88 exx. from Plataniás, Thessaly, Greece, and 17 exx. from île d'Oiselet, Vaucluse, France).

Although differing in specific features, all known microhabitats confirm the species' saproxylic nature and, more importantly, are exclusively associated with broadleaf tree species belonging to various families: Buxaceae (*Buxus colchica* Pojark.), Betulaceae (*Alnus* sp.), Fagaceae (*Castanea sativa* Mill., *Fagus sylvatica* L., *Quercus* sp., *Quercus suber* L.), Platanaceae (*Platanus* sp.), Salicaceae (*Populus* sp., *Salix* sp.), and Ulmaceae (*Ulmus* sp.). This exclusive association with broadleaf trees may be linked to biochemical, physical, or ecological factors, such as wood structure or fungal communities characteristic of broadleaf habitats.

In this context, the species' diet may also influence its microhabitat preferences. Although no direct data are available for *B. consobrinus*, Kovarik & Caterino (2016: 289) reported that saproxylic species of *Bacanius* feed primarily on fungal spores. According to P. Kovarik (pers. comm.), gut content analyses of alcohol-preserved specimens revealed large quantities of fungal conidia – common in moist litter and decomposing wood. Since hyphae tend to be embedded in the substrate while conidia are exposed for spore dispersal, these asexual, non-motile spores produced externally by filamentous fungi (moulds) are likely the main dietary resource. Conidia were also recently documented in the gut of the Neotropical *Bacanius* (*Bacanius*) *globulinus* Casey 1893 (Degallier *et al*., 2025: 22). If confirmed for *B. consobrinus*, such highly specialised feeding behaviour – more accurately described as "conidiophagy" rather than the more general "sporophagy" – may not only be ecologically significant, but also represent the key factor driving the species' selection of saproxylic microhabitats. This hypothesis, deserving further investigation, strongly suggests that it should be considered mycophagous (MY), rather than predatory (PR), as it is currently classified in the Italian Red List of saproxylic beetles (Carpaneto *et al*., 2015).

Beyond microhabitat structure, the broader environmental context in which *B. consobrinus* has been recorded provides additional insights into its ecological preferences. Based on currently available data, the species

appears to be confined to low elevations throughout its range, with collection sites ranging from sea level up to approximately 1000 m a.s.l. (Pietrapertosa, Basilicata, Italy) – a range that broadly overlaps with the altitudinal distribution of deciduous trees in the regions concerned.

Among the documented collection sites, in addition to several woodland or forested areas (e.g., the Khosta Yew-Boxwood Grove in southern Russia, Bosco del Foglino, Selva del Circeo and San Severino Lucano in Italy, Forêt du Dom in France) and numerous cork oak forests (in the broad sense) such as Polverino and Pomezia (Italy) or Arragiu, Fréjus and Agay (France), a significant number of localities are associated with riparian habitats. These include areas along or near freshwater courses such as Castenaso, Sasso Marconi, and Parco delle Cascine in Florence (Italy); Malpasset-vallon du Reyran, Islon-Saint-Luc, "Le Paraire" in Saint-Martin-de-Castillon, île d'Oiselet, and the banks of the Hérault River (France). This pattern may reflect an increased availability of suitable microhabitats – such as cavities and moist, decomposing wood – associated with hygrophilous deciduous trees (*Alnus*, *Platanus*, *Populus*, *Salix*, *Ulmus*).

Abundance and detectability remarks

Bacanius consobrinus has long been considered a rare species, typically recorded as singletons or in very low numbers, often through casual or unsystematic collecting efforts. This pattern is widely documented in the literature, where most records refer to a single or very few individuals per locality (e.g., Kryzhanovskij & Reichardt, 1976; Vienna, 1980; Penati & Vienna, 2005; Penati *et al*., 2020; Lagarde & Secq, 2023).

However, an analysis of the available collecting data suggests that this apparent rarity may primarily result from low detectability due to the species' minute size, its hypogean and cryptic lifestyle, and the limited use of appropriate sampling methods. When intensive or targeted techniques were employed – specifically: (1) deep sifting of soil and litter accumulated at the base of trees; (2) sifting of decomposed wood (Fig. 4) and humus from within hollow trunks; and (3) use of window traps placed in front of trunk cavities – significantly higher numbers of specimens were recorded. The most notable examples include 181 specimens recovered from the root zone of a dead *Castanea sativa* in Lambinou (Greece); 88 and 17 specimens sifted from decomposed organic matter inside hollow trunks of *Platanus* sp. at Plataniás (Greece) and île d'Oiselet (France), respectively; and 232 specimens captured over two years using cavity-facing window traps (Fig. 2) in a cork oak forest in Pomezia (Italy) – demonstrating that adults may actively exit or patrol cavity entrances, enabling passive capture under favourable conditions.

Conversely, standard litter sifting or hand-collecting under bark usually yielded single individuals or very small series, confirming the inefficiency of such methods in assessing actual population size and distribution. This strong dependence on sampling technique highlights the risk of underestimating the species' abundance when relying exclusively on traditional, non-targeted sampling approaches.

Therefore, although *Bacanius consobrinus* appears to be patchily distributed across its known range (Fig. 5), its population density at favourable sites can be unexpectedly high. These observations support the hypothesis that the species' perceived rarity is largely an artefact of sampling limitations, rather than an indication of true ecological scarcity. As such, assessments of its conservation status should carefully consider the strong influence of detection bias on the currently available data.

Conservation remarks

In the Italian Red List of saproxylic beetles (Carpaneto *et al*., 2015), *Bacanius consobrinus* was assessed as Critically Endangered (CR) based on criteria "B2ab(i,ii)", which consider the area of occupancy (B2 < 10 km²), and the following two conditions: severely fragmented (a), and continuing decline observed, estimated, inferred or projected (b) in extent of occurrence (i) and area of occupancy (ii). However, this assessment was based on the only two published records available at the time (Penati & Vienna, 2005), i.e., Spilamberto (Emilia-

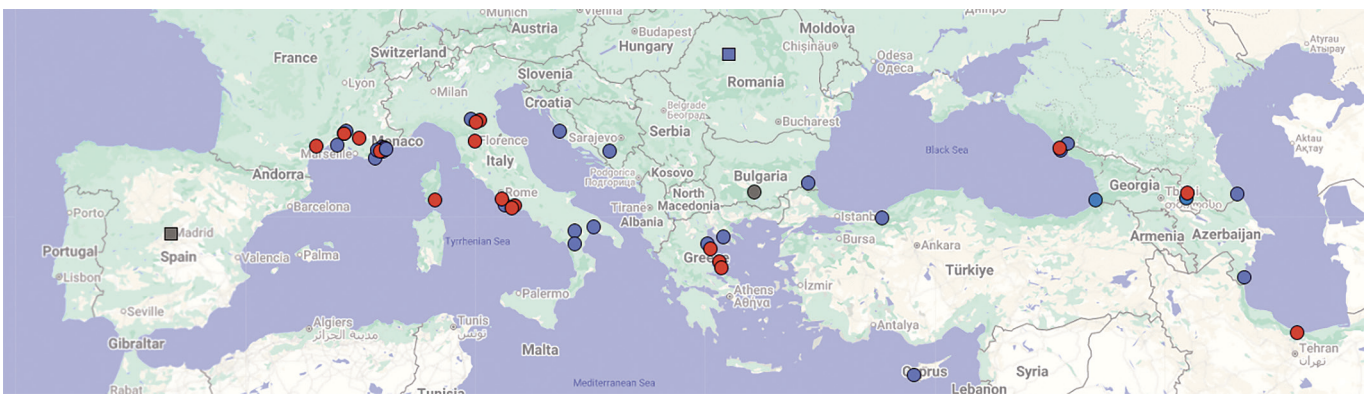


Fig. 5. Distribution map of *Bacanius consobrinus*. Records from 2000 onwards in red; historical records (≤1999) in blue; undated records in grey. Circles indicate precise localities; squares indicate imprecise (Transilvania) or doubtful (Madrid) localities. / Carta di distribuzione di *Bacanius consobrinus*. Rinvenimenti dal 2000 in poi in rosso; dati storici (≤1999) in blu; località prive di data in grigio. I punti indicano località precise; i quadrati indicano località imprecise (Transilvania) o dubbie (Madrid).

Romagna) and San Severino Lucano (Basilicata). Our updated dataset, by contrast, includes 11 distinct localities across five Italian regions (Emilia-Romagna, Toscana, Lazio, Basilicata, and Puglia), with over 280 specimens collected in total, most of them in recent years (2003-2023), and across a variety of habitats, including partially disturbed or anthropogenic sites (e.g., urban parks and managed riparian woodlands). Notably, the species was found multiple times over two years (2009-2010) and in high numbers (262 exx. in total) associated with hollow trunks of *Quercus suber* in the cork oak woodlands of "Sughereta di Pomezia" and "Bosco Polverino". These findings suggest that the species is not restricted to a single location, nor is it necessarily declining. Instead, as already stated in the previous section "Abundance and detectability remarks", its apparent rarity likely results from its cryptic lifestyle, minute size, and the technical difficulty of detecting it without refined sampling protocols, such as deep sifting or window traps placed at the cavity entrance of old trees (as demonstrated by data from "Sughereta di Pomezia" and "Bosco Polverino"). Considering this updated evidence, a reassessment of its Red List status in Italy is strongly recommended. Although the species remains poorly known and potentially sensitive to the loss of microhabitat continuity, the CR status no longer seems justified under the original IUCN criteria B2ab(i,ii), and its current conservation status should be revised accordingly.

Moreover, *B. consobrinus* has been frequently recorded in anthropogenically influenced or moderately disturbed habitats, including managed forests, coppice woodlands, or urban parks located in riparian areas (e.g., Neyrang in Iran, Sasso Marconi and Parco delle Cascine in Italy, Albaron in France). This challenges its proposed value as an indicator of "well-preserved forest ecosystems" (e.g., Gomy & Millarakis, 2012), or at least suggests that the availability of key microhabitats – rather than the overall quality of the forest ecosystem – may be the main factor influencing its occurrence.

Acknowledgments

We are grateful to Loris Colacurcio (Zola Predosa, Bologna, Italy) for donating the specimens from Palazzo Rossi and providing detailed site and collecting method information. We also thank Francesca Della Rocca (University of Pavia, Italy) for unpublished data on specimens collected at Sughereta di Pomezia and Bosco Polverino, Peter W. Kovarik (Columbus, Ohio, USA) for his unpublished observations on the gut contents of *Bacanius* specimens, and Pierpaolo Vienna for additional data on specimens in his own and Müller's collections. We are indebted to Sławomir Mazur (Warszawa, Poland) for information on his collections in Bulgaria, and to Oscar Vorst for unpublished records and access to his private material. We also wish to thank Alexey Tishechkin for assistance with the transliteration of Russian labels; Dimitar Rodozov (Library of Agricultural University Plovdiv, Bulgaria) for providing literature data; Boris Kataev (Saint Petersburg, Russia), Rémy Gilardet (Le Cannet-des-Maures, France), Andreas Sanchez (Info Fauna, Neuchâtel, Switzerland), and Matthias Seidel (Naturhistorisches Museum Wien, Austria) for valuable information; Michele Zilioli (Museo di Storia naturale di Milano, Italy) for the dorsal habitus image of *B. consobrinus*; Agnese Zauli (Centro di ricerca per l'Agrobiologia e la Pedologia, Firenze, Italy) for the photograph of the window trap; and Bernard Secq for the photographs of the saproxylic microhabitat and the sifting procedure. We further acknowledge the curators and colleagues named in the acronyms section for kindly providing access to collection data and facilitating our research. Language editing and substantial support in the structuring and drafting of the manuscript were provided through the use of a large language model (ChatGPT, OpenAI).

REFERENCES

Allemand R., Prudhomme J.-C. & Ponel P., 2011 − Compte rendu faunistique de la sortie entomologique à Fréjus (Var) (29-30 mai 2010): les étangs de Villepey et le vallon du Reyran - Premières citations pour la France de *Philonthus diversiceps* Bernhauer (Coleoptera Staphylinidae). *Bulletin mensuel de la Société linnéenne de Lyon*, 80 (5-6): 131-142. <http://www.persee.fr/doc/linly_0366-1326_2011_num_80_5_12686> (Retrieved in August 2025).

Aubé C., 1850 − Description de quelques insectes Coléoptères appartenant a l'Europe et a l'Algérie. *Annales de la Société Entomologique de France*, (2) 8: 299-346. <https://gallica.bnf.fr/ark:/12148/bpt6k6347467r/f295.item> (Retrieved in August 2025).

Carpaneto G.M., Baviera C., Biscaccianti A.B., Brandmayr P., Mazzei A., Mason F., Battistoni A., Teofili C., Rondinini C., Fattorini S. & Audisio P., 2015 − A red list of Italian Saproxylic beetles: taxonomic overview, ecological features and conservation issues (Coleoptera). *Fragmenta Entomologica*, 47 (2): 53-126. <https://doi.org/10.13133/2284-4880/138>

Degallier N., Tishechkin A.K., Kovarik P.W., Vomero V. & Gomy Y., 2025 − Contribution à la connaissance des Bacaniini Kryzhanovskij du Nouveau Monde avec une clé des espèces et la description de trois espèces nouvelles (Coleoptera, Histeridae, Dendrophilinae). *Faunitaxys*, 13 (34): 1-66. <https://doi.org/10.57800/faunitaxys-13(34)>

Della Rocca F., Jansson N., Chiari S., Zauli A. & Carpaneto G.M., 2022 − Micro-habitat drivers of saproxylic beetle assemblages in old woodlands of Mediterranean cork oak (*Quercus suber*). *Agricultural and Forest Entomology*, 25 (1): 77-90. <https://doi.org/10.1111/afe.12532>

Evenhuis N.L., 2020 − The insect and spider collections of the world website. <http://hbs.bishopmuseum.org/codens> (Last accessed: 27/09/2025).

Gomy Y., 2013 − Contribution à l'établissement des catalogues régionaux: Coleoptera Histeroidea XI. *L'Entomologiste*, 69 (4): 217-248. <https://lentomologiste.fr/wp-content/uploads/lentomologiste_2013_69_4.pdf> (Retrieved in August 2025).

Gomy Y. & Millarakis P., 2012 − Les Histeridae dits «saproxyliques» de la France continentale, bio-indicateurs de l'équilibre des forêts (Coleoptera). *L'Entomologiste*, 68 (5): 267-272. <https://lentomologiste.fr/wp-content/uploads/lentomologiste_2012_68_5.pdf> (Retrieved in August 2025).

Gomy Y. & Secq M., 2011 − Contribution à l'établissement des catalogues régionaux: Coleoptera Histeridae X. *L'Entomologiste*, 67 (5): 261-284. <https://lentomologiste.fr/wp-content/uploads/2011-67/lentomologiste_2011_67_5.pdf> (Retrieved in August 2025).

Hetschko A., 1922 − Hans Leder. *Wiener entomologische Zeitung*, 39 (1-4): 95-96. <https://www.biodiversitylibrary.org/page/11969598#page/109/mode/1up>(Retrieved in September 2025).

Jiroux E., 2021 − Coléoptères de Corse. Vol. 3, Familles des Histeridae Gyllenhal, 1808 - Silphidae MacLeay, 1818. *Magellanes*, Conflans-Sainte-Honorine.

Kovarik P.W. & Caterino M.S., 2016 − 13.3 Histeridae Gyllenhal, 1808. In: Handbook of zoology. Coleoptera, Beetles. Morphology and Systematics. Beutel R.G. & Leschen R.A.B. (eds.). 2nd ed. *Walter De Gruyter*, Berlin, 1: 281-314.

Kryzhanovskij O.L., 1974 − Results of the Czechoslovak-Iranian entomological expedition to Iran 1970. No. 11: Coleoptera, Histeridae. *Acta Entomologica Musei Nationalis Pragae*, supp. 6: 109-118. <https://www.aemnp.eu/data/article-974/955-6_0_109.pdf> (Retrieved in August 2025).

Kryzhanovskij O.L. & Reichardt A.N., 1976 − Fauna SSSR, Zhestkokrylye, Vol. 5, No. 4. Zhuki nadsemeystva Histeroidea (semeystva Sphaeritidae, Histeridae, Synteliidae). *Nauka*, Leningrad. (In Russian).

Lackner T., 2008 − Re-discovery of *Triballodes acritoides*, an enigmatic species from Greece (Coleoptera: Histeridae). *Folia Heyrovskyana, series A*, 16 (1): 77-82. <https://www.researchgate.net/publication/272351086_Re-discovery_of_Triballodes_acritoides_an_enigmatic_species_from_Greece_Coleoptera_Histeridae> (Retrieved in August 2025).

Lackner T., Mazur S. & Newton A.F., 2015 − Family Histeridae. In: Catalogue of Palaearctic Coleoptera. Volume 2/1. Hydrophiloidea - Staphylinoidea. Revised and updated edition. Volume 1. Löbl I. & Löbl D. (eds.). *Brill*, Leiden/Boston: 76-130.

Lagarde M. & Secq M., 2023 − Catalogue et distribution des Coléoptères Histeridae de France métropolitaine. *Mémoires de la Société Linnéenne de Bordeaux*, 20.

Marseul S.-A., 1856 − Essai monographique sur la famille des Histérides (suite). *Annales de la Société entomologique de France*, Sér. 3, 4: 549-628. <https://www.biodiversitylibrary.org/item/34154#page/555/mode/1up> (Retrieved in August 2025).

Marseul S.-A., 1862 − Supplément a la monographie des Histérides (suite). *Annales de la Société entomologique de France*, Sér. 4, 2: 669-702. <https://www.biodiversitylibrary.org/item/34140#page/675/mode/1up> (Retrieved in August 2025).

Mazur S., 2011 − A concise catalogue of the Histeridae (Insecta: Coleoptera). *WULS - SGGW Press*, Warsaw.

Müller G., 1925 − Le specie europee del genere *Bacanius* Lec. *Studi entomologici: raccolta di lavori di entomologia sistematica particolarmente dedicati all'entomofauna italiana*, 1: 18-20.

Newton A., 2025 − StaphBase (version Aug 2022). In: Catalogue of Life (Version 2025-07-10). Bánki O., Roskov Y., Döring M., Ower G., Hernández Robles D.R., Plata Corredor C.A., Stjernegaard Jeppesen T., Örn A., Pape T., Hobern D., Garnett S., Little H., DeWalt R.E., Miller J., Orrell T., Aalbu R., Abbott J., Aedo C., Aescht E. *et al*. *Catalogue of Life Foundation*, Amsterdam, Netherlands. <https://doi.org/10.48580/dg9ld-3gk>

Nikitsky N.B., Bibin A.R. & Dolgin M.M., 2008 − Xylophilous beetles (Coleoptera) of the Caucasian State Biospheric Natural Reserve and adjacent territories. *Institute of Biology of Komi Scientific Centre of the Ural Branch of the Russian Academy of Sciences*, Syktyvkar. (In Russian). <https://www.zin.ru/animalia/coleoptera/pdf/nikitsky_bibin_dolgin_2008_xylophilous_coleoptera_caucasian_reserve.pdf> (Retrieved in August 2025).

Paganetti-Hummler G., 1918 − Beiträge zur Coleopterenfauna Italiens. Murgien. *Neue Beitrage zur systematischen Insektenkunde*, 1 (9): 69-72. <https://archive.org/download/neuebeitragezurs1919unse/page/n8_w484> (Retrieved in October 2025).

Penati F. & Vienna P., 2005 − Insecta Coleoptera Histeridae. In: Checklist e distribuzione della fauna italiana. Ruffo S. & Stoch F. (eds.). *Memorie del Museo Civico di Storia naturale di Verona, 2ª Serie, Sezione Scienze della Vita*, 16: 173-175 (data on CD-ROM).

Penati F., Bastianini M., Colacurcio L., Franzini A., Giovagnoli G., Morelli A., Pace G., Paglialunga M. & Vienna P., 2020 − New interesting records of Histeridae (Coleoptera) for the Italian mainland and Sardinia. *Entomologist's Gazette*, 71 (4): 278-282.

Reichardt A., 1941 − Semeystva Sphaeritidae i Histeridae (Vol. 1). [Families Sphaeritidae and Histeridae]. Fauna SSSR, Nasekomye Zhestokrylye, V, 3. *Nauka*, Moskva-Leningrad. (In Russian).

Reitter E., 1886 − Ueber die mit *Abraeus* Leach verwandten Coleopteren-Gattungen. *Wiener Entomologische Zeitung*, 5 (8): 271-274. <https://www.zobodat.at/pdf/WEZ_5_0271-0274.pdf> (Retrieved in August 2025).

Reitter E., 1912 − Ein neur *Bacanius* aus Dalmatien und Übersicht der bekannten palaearktischen Arten. *Wiener entomologische Zeitung*, 31: 251-252. <https://www.biodiversitylibrary.org/page/12080446#page/283/mode/1up> (Retrieved in January 2026).

Rocchi S., Terzani F. & Mascagni A., 2025 − Coleotteri (Insecta: Coleoptera) raccolti nel biennio 2023-2024 a Firenze (Toscana) nel Parco delle Cascine e nelle sue immediate vicinanze. *Onychium*, 18 (3): 145-174. <https://www.nuovogruppoentomologicotoscano.it/wp-content/uploads/2025/07/15-Rocchi-et-al.-Corticicoli-Cascine-2023-24-print-draft_Fabri_08.07.2025.pdf> (Retrieved in August 2025).

Secq M., 2000 − Contribution à l'inventaire des Histeridae de France continentale et de Corse (Coleoptera) (suite). *Bulletin de la Société linnéenne de Bordeaux*, 28 (3): 159-179. <https://www.researchgate.net/publication/363777035_Contribution_a_l'inventaire_des_Histeridae_de_France_continentale_et_de_Corse_Coleoptera_a_28_2_77-96_b_28_3_159-179_c_28_4_215-237> (Retrieved in August 2025).

Secq M. & Secq B., 2017 − *Bacanius* (s. str.) *punctiformis* (J.L. LeConte, 1853), espèce nouvelle pour la faune de France (Coleoptera Histeridae). *L'Entomologiste*, 73 (1): 5-8. <https://www.researchgate.net/publication/363739450_Bacanius_s_str_punctiformis_J_L_LeConte_1853_espece_nouvelle_pour_la_faune_de_France_Coleoptera_Histeridae> (Retrieved in January 2026).

Schmidt J., 1885 − Tabellen zur Bestimmung der europäischen Histeriden. *Berliner entomologische Zeitschrift*, 29 (2): 279-330. <https://www.biodiversitylibrary.org/item/34991#page/309/mode/1up> (Retrieved in January 2026).

Thérond J., 1946 − Acquisition de deux espèces d'Histérides au catalogue des Coléoptères de France. *L'Entomologiste*, 2 (5): 208.

Thérond J., 1948 − Au sujet de *Bacanius consobrinus*, Aubé. *L'Entomologiste*, 4 (3-4): 160.

Thérond J., 1975 − Catalogue des Coléoptères de la Camargue et du Gard, 1ère partie. Mémoire n° 10. *Société d'Étude des Sciences Naturelles de Nîmes*, Nîmes.

Thieren Y. & Delwaide M., 2009 − Apport à la connaissance des Histeridae de Corse (Coleoptera). *L'Entomologiste*, 65 (5): 307-313. <https://lentomologiste.fr/wp-content/uploads/2009-65/lentomologiste_2009_65_5.pdf> (Retrieved in August 2025).

Vienna P., 1971 − Gli Histeridae del Museo civico di Storia naturale di Verona. *Memorie del Museo Civico di Storia naturale di Verona*, 19: 267-301.

Vienna P., 1980 − Coleoptera Histeridae. Fauna d'Italia 16. *Edizioni Calderini*, Bologna.

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 a chorotype classification of the Near East fauna, in the framework of the Western Palearctic region. *Biogeographia*, 20: 31-59. <https://escholarship.org/uc/item/99z6q99r> (Retrieved in June 2025).

Yélamos T., 1990 − Nuevos datos sobre los Histéridos de la Península Ibérica (Coleoptera: Histeridae). *Sessió Conjunta d'Entomologia*, 6: 37-43. <https://raco.cat/index.php/SessioEnto/article/view/351535> (Retrieved in June 2025).

Yélamos T., 2002 − Coleoptera Histeridae. In: Fauna Ibérica 17. Ramos M.A., Tercedor J.A., Bellés-Ros X., Gosálbeznoguera J., Sierra Á.G., Mayol E.M., Piera F.M., Marino J.S. & González J.T. (eds.). *Museo Nacional de Ciencias Naturales, CSCI*, Madrid.