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RESEARCH ARTICLE

Nomenclatural and faunistic notes on some Italian Dytiscidae (Insecta: Coleoptera)

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Abstract

Unusual Italian records witnessing the active flight of two predaceous diving beetles, *Rhantus suturalis* (W. S. Macleay, 1825) and *Acilius* (*Acilius*) *sulcatus* (Linnaeus, 1758), are provided. The second species is recorded from the Aosta Valley region (N Italy) and from three northern Italian provinces (Asti, Padua, Sondrio) for the first time. The conservation status in Italy of both species is updated. *Deronectes silphoides* (Ponza, 1805), from the environs of Saluzzo in the Piedmont region (N Italy), was in the past treated as a *nomen dubium*. Later it was placed, as a *nomen oblitum*, in synonymy with *D. opatrinus* (Germar, 1824) (*nomen protectum*). However, it is herein newly declared a *nomen dubium* and removed from the above synonymy, since its type specimen is lost and its type locality is outside the area of distribution of the *D. opatrinus* species-group. At the same time, the identity of *Hydroporus silphoides* Villa & Villa, 1833 (*nomen nudum*), previously referred to *H. obscurus* Sturm, 1835, is declared as uncertain.

Keywords: Colymbetinae, Dytiscinae, Hydroporinae, nomenclature, chronogeonemy, conservation, flight, Italy.

Zusammenfassung

Der aktive Flug zweier Schwimmkäfer, *Rhantus suturalis* (W. S. Macleay, 1825) und *Acilius* (*Acilius*) *sulcatus* (Linnaeus, 1758), wird ungewöhnlicherweise aus Italien berichtet. Außerdem wird die letztgenannte Art zum ersten Mal aus der Region des Aosta-Tals (Norditalien) und aus drei norditalienischen Provinzen (Asti, Padua, Sondrio) nachgewiesen. Der Schutzstatus beider Arten für Italien wird aktualisiert. *Deronectes silphoides* (Ponza, 1805) aus der Umgebung von Saluzzo in der Region Piemont (Norditalien) wurde in der Vergangenheit als *nomen dubium* behandelt. Später wurde die Art als *nomen oblitum* als Synonym zu *D. opatrinus* (Germar, 1824) behandelt (*nomen protectum*). Sie wird hier erneut als *nomen dubium* deklariert und aus der obigen Synonymie entfernt, da ihr Typusexemplar verloren gegangen ist und ihre Typuslokalität außerhalb des Verbreitungsgebietes der *D. opatrinus*-Artengruppe liegt. Zugleich wird die Identität von *Hydroporus silphoides* Villa & Villa, 1833 (*nomen nudum*), die bisher als *H. obscurus* Sturm, 1835 behandelt wurde, für unsicher erklärt.

Introduction

The aim of this short paper is to provide and discuss unusual Italian records of *Rhantus suturalis* (W. S. Macleay, 1825) and *Acilius* (*Acilius*) *sulcatus* (Linnaeus, 1758) related to their flight capacity, and update their chronogeonemy (sensu Brandmayr et al. 2007) and conservation status (Bologna 2007; Rocchi 2007). The status of *Deronectes silphoides* (Ponza, 1805) from the Piedmont region (N Italy) is also discussed.

Material and methods

The specimens examined herein were identified according to Franciscolo (1979), Dettner (1983) and Nilsson & Holmen (1995); the systematics and nomenclature follow Nilsson & Hájek (2022a). In the past (e.g. Franciscolo 1979; Rocchi 1982; Rastelli & Della Beffa 2007; Rocchi 2007), *Rhantus suturalis* (W. S. Macleay, 1825) was known as *R. pulverosus* (Stephens, 1828); for practical reasons, this latter name was not listed in the relative literature citations hereunder.

As stated also by Colonnelli & Nardi (2019), the illustrations of the beetles in Ponza (1805) are on two plates, where single illustrations are aligned, the lines ("Lin.") are numbered in the captions (Ponza 1805: 93–94), whereas individual illustrations in each plate are unnumbered. The names of the illustrated species are written in succession in the captions, whereas on the plates they are reported above each illustration. Hereunder, this information—the plate (pl.), the line (Lin.) and, in square brackets, the position of the illustration in the line—for the illustration of *Dytiscus silphoides* is reported as follows: "pl. 1, Lin. 4[.3]".

The labels of the examined specimens are written in Italian; for practical reasons, the names of the administrative regions and provinces and collecting methods were translated into English hereunder, while other toponyms are written in Italian. The Italian regions are listed from North to South and from West to East, while other toponyms are listed alphabetically. The administrative provinces are listed according to the labels of the specimens, so provinces of recent institution (e.g., Prato in Tuscany,

Oristano in Sardinia, etc.) were not used. Possible interpolations are given in square brackets. Chorotypes were attributed according to Vigna Taglianti et al. (1999).

The conservation status in Italy of the involved species follows Rocchi (2007) but was updated according to the IUCN (2022) criteria based on previously overlooked and subsequently published records (e.g., Ponza 1805; von Martens 1824; Contarini 1843; Sella 1864; Disconzi 1865; Ragazzi 1878; Paglia 1879; Lazzarini 1895; Imparati 1897; Ragusa 1921; Heyrovsky 1968; Marcuzzi & Turchetto Lafisca 1977; Giachino 1982; Stoch & Dolce 1984; Pilon 2002; Sapuppo 2002; Nardi 2004, 2005; Dettner 2006; Rocchi & Mascagni 2006; Toledo 2006; Rastelli & Della Beffa 2007; Mazza et al. 2008; Pederzani & Pesarini 2008; Bosi et al. 2009; Corradi 2009; Ferraro 2009; Mazzoldi 2009; Romano 2010; Terzani et al. 2011; Fornaciari 2011; Sorgi et al. 2011; Fabbri et al. 2012; Mazza et al. 2012; Viglioglia 2012; Gubellini 2013; Melandri 2013; Pezzi 2013; Cianferoni et al. 2014; Lupi et al. 2014; Leo 2015; Gatti et al. 2016; Rocchi & Terzani 2016; Rocchi et al. 2017; Lencioni et al. 2019; Toledo & Grottolo 2019; Angelini 2020; Grottolo 2020; Hendrich & Balke 2020; Rocchi & Poggi 2020; Mola & Toledo 2021; Rocchi et al. 2021a, 2021b, 2021c; Stauble 2021) and on the material examined.

All material examined for this study is deposited in Italian collections. The following abbreviations are used in the text: Coll. = Collection of; dint. = dintorni = environs; ex = specimen/s; Fraz. = Frazione = Hamlet; loc. = locality; hn = hand net; nc = no collector; ncd = no collection date; prov. = province; reg. = region; sdb = same data but. Acronyms of depositories are as follows:

ARDE	Coll. Associazione Romana di Entomologia c/o Museo Civico di Zoologia, Rome
CED	Coll. Ernesto De Maggi c/o Museo civico di Zoologia, Rome
CEG	Coll. Emilio Garavaglia c/o Museo civico di Zoologia, Rome
CEM	Coll. Enrico Migliaccio, Rome
CEP	Coll. Eugenio Pacieri c/o Museo di Storia Naturale dell'Università degli Studi di Firenze, Sezione di Zoologia "La Specola", Florence
CFB	Coll. Francesco Biegeleben c/o Museo civico di Zoologia, Rome
CGN	Author's private coll., Cisterna di Latina (Latina)
CGP	Coll. Giuseppe Pace, Rome
CGR	Coll. Giovanni Emilio Rasetti c/o Museo civico di Zoologia, Rome
CMC	Coll. Marcello Cerruti c/o Museo di Zoologia, Sapienza Università di Roma, Rome
CNCB	Centro Nazionale Carabinieri Biodiversità "Bosco Fontana", Marmirolo (Mantua)
CNS	Coll. Nino Sanfilippo c/o Museo Civico di Storia Naturale "G. Doria", Genova (S. Rocchi, pers. comm., 2022)
CPaC	Coll. Paolo Cornacchia, Porto Mantovano (Mantua)
CPaM	Coll. Paolo Maltzeff, Rome
CPiC	Coll. Pietro Cosimi c/o Museo di Storia Naturale dell'Università degli Studi di Firenze, Sezione di Zoologia "La Specola", Florence
CVS	Coll. Vittorio Rosa c/o Museo di Zoologia, Sapienza Università degli Studi di Roma, Rome
MCC	Museo Civico di Storia Naturale di Carmagnola (Turin).

Results

Rhantus suturalis (W. S. Macleay, 1825)

Material examined

Piedmont reg., Cuneo prov.: Caramagna, 1973, nc, 2 ♂♂ (MCC); sdb 26.IV.1975, 1 ♀ (MCC); Caramagna, Bosco [del] Merlino, stagno, 28.III.1976, G. Curletti leg., 3 ♂♂, 3 ♀♀ (MCC). Piedmont reg., Torino prov.: Piobesi, 3.VI.1992, M. Rastelli leg., 1 ♀ (MCC); Torino, Basse di Stura, 250 m a.s.l., 21.X.1971, D. Gianasso leg., 1 ♂ (CPaC). Veneto reg., Venice prov.: [San Michele al Tagliamento, Fraz.] Bibione, [1 m a.s.l.,] 23.VI.1983, Costella leg., 1 ♂ (CGN). Veneto reg., Verona prov.: Valeggio sul Mincio, Via I Maggio, 45°20′57″N 10°43′41″E, 87 m a.s.l., 3.VI.2018, in letterbox, G. Nardi leg., 1 ex (CGN). Lombardy reg., Mantua prov.: Marmirolo, Riserva Naturale Statale "Bosco Fontana", Piazza Carbone, 45°12′09″N 10°45′00″E, 48 m a.s.l., 5.IX.2018, G. Nardi leg., at 90 W incandescent light, 20:00–21:00 hrs, 1 ♀ (CNCB). Lombardy reg., Pavia prov.: Torre d'Isola, 14.III.1990, G. Pace leg., puddle in a canal, 1 ♀ (CGN). Tuscany reg., Florence prov.: Prato, dint. Centrale ENEL, 30.III.1985, I. Scali leg., 1 ♂, 2 ♀♀ (CGN). Tuscany reg., Livorno prov.: Tirrenia, VIII.1963, E. Migliaccio leg., 1 ♀. (CEM). Abruzzo reg., Pescara prov.: Montesilvano, 22.VII.1975, [P. Maltzeff leg.], 1 ♀ (CPaM). Lazio reg., Latina prov.: Cisterna di Latina, strada parallela al Fosso Teppia [= Via Tivera], 41°35′22″N 12°52′42″, 73 m a.s.l., 23.IV.1989, G. Nardi & C. Esposito leg., shallow cemented basin with rainwater in a large meadow with asphodels, 1 ♀ (CGN): sdb 31.III.1991, G. Nardi leg., sdb water temperature 14°.5 C, 1 ♀ (CGN). Lazio reg., Rome prov.: [Roma], Maccarese, 12.V.1912, Luig. [= P. Luigioni leg.], 1 ♂ (CMC); Roma, Settecamini, 1991, C. De Liberato leg., 1 ♀ (CGN). Sardinia reg., Cagliari prov.: Domusnovas, 2.VI.1980, L. Fancello leg., 1 ♀ (CGN). Sardinia reg., Nuoro prov.: [Siniscola,] Case Capo Comino, 14–19.VI.2007, P. Cornacchia leg., attached to a wall in a house, attracted by artificial lights, 1 ♀ (CPaC); sdb 20–29.VI.2007, on the ground in a house, attracted by artificial lights, 1 ♀ (CPaC). Sardinia reg., Sassari prov.: Torre Grande di Oristano, 4–7.VII.1988, E. Migliaccio leg., at lights, 1 ♂ (CEM).

Chorotype and distribution

Subcosmopolitan (cf. Nilsson & Hájek 2022a). *Rhantus suturalis*, originated in the highlands of New Guinea ca. 6.0–2.7 Mya (Balke et al. 2009; Toussaint et al. 2013), is a supertramp and is the most widely distributed dytiscid on earth, being widespread in the Palaearctic, Oriental, Pacific and Australian regions (Bilton 2014; Hájek 2017; Hendrich & Balke 2021; Nilsson & Hájek 2022a, 2002b). In Italy it is recorded from all regions except Aosta Valley (Rocchi 2007; S. Rocchi, pers. comm. 2022).

Ecology

This euryoecious pioneer species occurs chiefly in stagnant waters, from sea level to high mountains; it is an excellent flyer and is frequently collected at light (cf. Franciscolo 1979; Rocchi 1982; Nilsson & Holmen 1995; Angelini 1998; Nardi & Maltzeff 2001; Šustek 2002; Castro et al. 2003; Nardi 2005; Kehl & Dettner 2007; Rocchi 2007; Burghelea et al. 2008; López-Pérez &

Millán Sánchez 2012; Bilton 2014; Leo 2015; Toledo & Grottolo 2019; Matsushima & Yokoi 2020; Mola & Toledo 2021; Ramadan & Ramadan 2021) and in Malaise traps (Majzlan 2014, 2020). The diel flight activity of this species has one peak in the early/late evening, in summer and autumn (Csabai et al. 2012). Adults are generalist predators and scavengers (Bosi 2001). An experiment demonstrated that *R. suturalis* females release sex pheromones to attract mating partners (Herbst et al. 2011). Groppali (1992: 37) recorded two specimens of "*Rhanthus* [sic!] *notatus* (Fabr.)" found among the stomach contents of five *Glareola pratinicola* Linnaeus, 1758 (Aves: Charadriformes: Glareolidae) in Apulia (SE Italy). *Rhantus notatus* sensu (Fabricius, 1781) is currently known as *R. frontalis* (Marsham, 1802) (cf. Franciscolo 1979; Nilsson & Holmen 1995; Nilsson & Hájek 2022b). This species is known with certainty in Italy only from the Piedmont region (N Italy) and on the basis of very old specimens (Rocchi 2007). In this framework, the record by Groppali (1992) probably refers to *R. suturalis*, which is the sole congeneric species occurring in the Apulia region (Rocchi 2007).

Conservation status in Italy

This species is widespread and generally common in Italy. Based on the available data, it is hereunder evaluated as of "Least Concern (LC)" at the Italian scale, whereas previously it had been classified as "Data Deficient (DD)" (Rocchi 2007).

Notes

The above localities in the Verona province (Veneto region) and Lombardy are in the Po Plain, where the species has been recorded from many sites, chiefly in the temporary, stagnant waters of ponds, rain puddles, flooded meadows, rice fields, etc. (cf. Nardi 2004; Toledo 2006; Rocchi 2007; Lupi et al. 2014; Toledo & Grottolo 2019). The above specimen from Valeggio sul Mincio (Verona prov.) was found in the author's letterbox in a recently-built neighbourhood located at the foot of a small (120 m), wooded morainic hill and on the outskirts of town, not far from the cultivated fields of the Po Plain. The letterbox is attached to a gate in front of a road and some private gardens. There are no water bodies within a radius of 100 m except for a fish pond in a private garden and some swimming pools, but the Mincio river is only 480 m from the collecting site. The species was already recorded from another site in the same commune and from bordering areas (Nardi 2004; Toledo 2006; Rocchi 2007; Toledo & Grottolo 2019). The letterbox is a metallic, aluminium-coloured parallelepiped (31 x 22 x 10 cm) with a 17.5 x 3 cm slot at the top for inserting mail, covered by a small, liftable metal flap. Many species of water beetles, including *R. suturalis*, are attracted in flight by reflection-polarization signals emitted by the surface of, e.g., coloured car roofs (Muggleton 1966; Jäch 1997; Nilsson 1997; Vondel 1998; Kriska et al. 2006; Rocchi 2011; G. Nardi, unpublished data). This behaviour would also explain the above unusual find: the small flap of the letterbox was left open by the postman, after which the beetle landed in the small slot at the top of the letterbox and ended up trapped inside, where it died from heat exposure. The only other beetle trapped in the same letterbox during 2013–2022 was a specimen of *Mimela junii junii* (Duftschmid, 1805) (Scarabaeidae: Rutelinae) on 1.XI.2018.

The listed specimen of *Rhantus suturalis* from Mantua prov. (Lombardy) comes from a Nature Reserve where the species had been previously collected, but never at light (Nardi 2004). Malaise and window flight traps were heavily used in this reserve in the last two decades (cf. Cerretti et al. 2004; Birtele & Hardersen 2012); however, differently from other areas (Majzlan 2014, 2020), the only dytiscid so far collected with these methods was a specimen of *Bidessus minutissimus* (Germar, 1824) (Nardi 2004; P. Cornacchia & G. Nardi, unpublished data).

The above records of *R. suturalis* from other regions are provided for a better knowledge of its Italian chronogeonemy or are related to the flight capacity of this species. Surprisingly, in the Cuneo province (Piedmont region, N Italy) it had so far been recorded from a single site only (Rastelli & Della Beffa 2007).

Acilius (*Acilius*) *sulcatus* (Linnaeus, 1758)

Material examined

Trentino-Alto Adige/Südtirol reg., Bolzano prov.: Aslago [= Bolzano, Oltrisarco-Aslago quarter], 11.III.1930, nc, 1 ♂ (CFB); Bolzano, Renon, VIII.[19]36, Reanda [leg.], 1 ♂ (CMC); Eppan [= Appiano sulla strada del vino], 15.V.1929, nc, 1 ♂ (CFB); sdb 21.V.1929, 1 ♀ (CFB); Eppan [= Appiano sulla strada del vino], illegible loc., 8.V.1929, nc, 2 ♂♂ (CFB); Eppan, Unterrain [= Appiano sulla strada del vino, Fraz. Riva di Sotto], 27.IV.1929, nc, 2 ♀♀ (CFB). Piedmont reg., Asti prov.: Castelnuovo Don Bosco, 6.VIII.1964, D. Gianasso leg., 1 ♂ (CEM). Piedmont reg., Novara prov.: Fontaneto d'Agogna, 300 m a.s.l., 10.IX.1987, D. Fontaneto leg., 1 ♀ (CGN); sdb 16.X.1989, 1 ♀ (CGN); sdb 20.X.1989, 1 ♂ (CGN); Valenzani, 8.IX.1966, P. Testa leg., 2 ex (CNS). Lombardy reg., Brescia prov.: Brescia dint., ncd, Marchesi [leg.], 2 ♂♂ (CMC); sdb III.1938 2 ♀♀ (CMC). Lombardy reg., Sondrio prov.: Aprica, Pian Zembro, 21.VII.1957, [M.] Barajon leg., 1 ♀ (CVS). Aosta Valley reg., Aosta prov.: Gran Villa, Lozoe, loc. Champloeg, 1650 m a.s.l., 14.V.1992, R. Sindaco leg., 1 ♀ (MCC). Veneto reg., Padua prov.: Colli Euganei, [Torreglia, Fraz.] Luvigliano, [about 30 m a.s.l.] X.1965, Lomazzi leg., 1 ♂ (CPaC). Veneto reg., Treviso prov.: Monte Pizzo, 29.V.1989, nc, 1 ♂, 1 ♀ (CGN). Emilia-Romagna reg., [Forlì prov.]: [Cesenatico, Fraz.] Sala, 15.X.[19]32, nc, 1 ♂ (CMC). Emilia-Romagna reg., Piacenza prov.: App. Piacent. [= Piacentine Apennines], lago Cacciasù [untraced site], 9.VI.1956, [M.] Barajon leg., 2 ♀♀ (CVS). Emilia-Romagna reg., Ravenna prov.: Ravenna, 28.V.1961, Senni leg., 1 ♂, 1 ♀

(ARDE). Umbria reg., Perugia prov.: Castel Ritaldi, Fraz. Bruna, summer 1949, nc, 1 ♂ (CPaM). [Lago] Trasimeno, IX. [no year], nc, 1 ♂ (CGR). Tuscany reg., Arezzo prov.: [Cavriglia, Fraz.] Montegonzi, 28.VII.1990, R. Lisa leg., 1 ♂ (CGN); Cortona, 700 m a.s.l., VI.1931, nc, 1 ♀ (CEG); sdb no altitude, ncd, E. Garavaglia leg., 1 ♂ (CEG); sdb Garavaglia F.lli [= Fratelli = Brothers] [leg.], 2 ♀♀ (CEG); sdb 22.VII.[no year], E. Garavaglia leg., 1 ♂ (CEG). Tuscany reg., Florence prov.: Massarella, Padule di Fucecchio, 4.II.1990, I. Scali leg., 1 ♂ (CGN). Tuscany reg., Livorno prov.: Livorno dint., VIII.[19]36, D. C. [= ? leg.], 1 ♀ (CMC); Livorno, Tombolo, VII.[19]34, nc, 1 £ (CMC). Tuscany reg., Pisa prov.: Pisa, ncd, G. E. Rasetti leg., 1 ♂ (CGR); Pisa, Marina, ncd, nc, 1 ♀ (CGR); Tombolo, 5.VII.1936, nc, 1 ♀ (CGR). Lazio reg., Frosinone prov.: Monti Lepini, Morolo, Monte Alto, versante E [= E slope], 1300 m a.s.l., 7.V.2001, C. Esposito leg., deep tank (diameter 75 m) in cement and fiberglass, 2 ♀♀ (CGN); Paliano, loc. La Selva, 25.VIII.1982, M. Mei leg., 1 ♀ (CGN). Lazio reg., Latina prov.: Cisterna di Latina, Via. E. Fermi, 41°35′21″N 12°50′18″E, 70 m a.s.l., 8.IV.1980, G. Nardi leg., in a small, almost dry puddle, in the excavation of the foundation of a house under construction, 1 ♀ (CNA); sdb 41°35′25″N 12°50′08″E. 15.IV.1984, 76 m a.s.l., R. Pergolesi leg., on small, low wall of vegetable garden, away from aquatic environments, 1 ♂ (CNA); Monti Lepini, Bassiano, loc. Antignana, 400 m a.s.l., 19.V.1991, G. Nardi leg., cattle pond devoid of vegetation, water temperature 19 °C, 1 ♀ (CGN); Monti Lepini, Norma, Monte Gorgoglione, Pozzo di Monte, 700 m a.s.l., 19.VI.1999, C. Esposito leg., large pond, 1 ♀ (CGN). Lazio reg., Rome prov.: [Colli Albani,] Grottaferrata, [200–300 m] 7.X.1945, [E.] De Maggi leg., 1 ♂ (CED); Roma, Acilia, 6.IV.[19]31, nc, 1 ♀ (CMC); sdb 6.XI.1932, Coll. Castellani, 1 ♀ (CMC); sdb 18.IV.1934, 1 ♂ (CMC); sdb 3.IV.[19]38, [M.] Cerruti [leg.], 1 ♀ (CMC); Roma, Capocotta, 14.VIII.[19]39, [E.] De Maggi [leg.], 1 ♀ (CMC). Abruzzo reg., L'Aquila prov.: Gran Sasso, Campo Imperatore [1500−2100 m], IV.1977, E. Pacieri leg., 1 ♀ (CPiC); sdb 30.IV.1977, 1 ♀ (CEP); [Parco Nazionale d'Abruzzo,] Pescasseroli, VI.[19]36, [M.] Cerruti leg. 1 ♂ (CMC).

Chorotype and distribution

Sibero-European, reaching Algeria (Nilsson & Hájek 2022b). A recent detailed record from the Oriental region (India, West Bengal) (Chandra et al. 2008) appears erroneous since it was later ignored (Ghosh & Nilsson 2012; Bukontaite et al. 2014; Chandra et al. 2017; Hájek 2017; Chandra et al. 2021; Nilsson & Hájek 2022a, 2022b). In Italy, *A.* (*A.*) *sulcatus* was previously recorded from all regions except Aosta Valley and Molise (Rocchi 2007; Rocchi et al. 2018; Rocchi, pers. comm. 2021); it is here recorded from Aosta Valley (N Italy) for the first time.

Ecology

Acilius (*Acilius*) *sulcatus* is a pioneer species whose adults have high flight ability and can disperse from overwintering ponds to temporary pools in the spring, returning to permanent waters in the summer as the temporary pools dry up (cf. Davy-Bowker 2002; Kehl & Dettner 2007; Gioria 2014; Iversen et al. 2017). Its altitudinal range varies from sea level up to 1776 m (Bergsten & Miller 2006; Rocchi 2007; Sorgi et al. 2011; Enkhnasan & Boldgiv 2019). In Italy, this species is characteristic of muddy pools, often turbid and devoid of vegetation, typically in water basins for livestock, even of artificial origin, where it is often quite abundant; more rarely it lives in large ponds, as long as there are areas free from aquatic vegetation (Toledo 2016; Toledo & Grottolo 2019), and is most common in the absence of fish; adults overwinter in the water, even when covered by ice (Bergsten & Miller 2006), and can be preyed upon by the grey heron (*Ardea cinerea* Linnaeus, 1758) (Aves: Ciconiiformes: Ardeidae) (Draulans et al. 1987). Adults have also been collected by Malaise traps (Majzlan 2014, 2020) and in flight (Muggleton 1966; Fornaciari 2011; Melandri 2013).

Conservation status in Italy

This species is relatively widespread but localized in Italy; it is here evaluated as of "Least Concern (LC)" at the Italian scale, whereas it had previously been classified as "Data Deficient (DD)" by Rocchi (2007).

Notes

The above specimens from Cisterna di Latina (Latium, Latina prov.) confirm the high flight ability of this species. At the time of collection there were cultivated fields and natural meadows interspersed with houses and gardens. The only aquatic environments present were small roadside gutters for the collection of rainwater, large temporary puddles in the meadows and very few small, natural ditches. The female collected in 1980 was netted in a small, almost dry puddle in the foundations of a house under construction. A male of *Colymbetes fuscus* (Linnaeus, 1758) and some specimens of *Agabus* (*Gaurodytes*) *bipustulatus* (Linnaeus, 1767) were also netted (CGN) from a different part of the same foundations. The above specimen from 1984 was found attached to the small, low wall of a vegetable garden, away from aquatic environments. In the following decades, this site underwent intense building development and these species were no longer collected there (G. Nardi, unpublished data). Fortunately, in the same province, *Acilius* (*Acilius*) *sulcatus* was recorded also from a National Park (Nardi 2005) and is here recorded from the Lepini Mountains, an unprotected area of great conservation value (cf. Corsetti et al. 2015; Corsetti & Marozza 2020).

The other above records are provided for a better understanding of the Italian chronogeonemy of this localized species; it was previously (Rocchi 2007) unrecorded from the Aosta Valley region. The elevation of the Aosta Valley site (1650 m) is also interesting, since the species ranges from 0 to 1776 m in Italy (Rocchi 2007; Sorgi et al. 2011), but most records come from elevations lower than 1300 m (cf. Rocchi 2007; Mazza et al. 2012; Gatti et al. 2016; Lencioni et al. 2019; Toledo & Grottolo 2019). The species had so far not been recorded (cf. Rocchi 2007) from

the Asti (Piedmont), Padua (Veneto), and Sondrio (Lombardy) provinces, whereas it was only known from single sites in the provinces of Novara (Piedmont), Frosinone (Lazio) and L'Aquila (Abruzzo) (Contarini 1843; Romano 2010; Viglioglia 2012; IPLA 2017).

Deronectes silphoides (Ponza, 1805) (*nomen dubium*)

Dytiscus Silphoides Ponza, 1805. Ponza 1805: : 82, pl. 1, Lin. 4[.3]

Notes

The original description of this species is as follows: "Magnitudo *D. Fulvi* [= *Dytiscus fulvus*]: depressus , ovatus, niger ; thorace utrique marginato , margine incrassatro ; antennis setaceis , femoribusque rufis." (Ponza 1805: 82, as *Dytiscus silphoides*). No type locality is listed, but as stated in the title of the paper it is in the environs of Saluzzo (Cuneo province, Piedmont region, Italy).

The above "*D. Fulvi*", is "D. Fulvus. *Ent. Paris*. I. 66. 5. *Geoffr. Paris*. I. 184. 5" (Ponza 1805: 81), and corresponds to *Dytiscus fulvus* Fabricius, 1801, currently *Haliplus* (*Liaphlus*) *fulvus* (Haliplidae) (cf. Vondel 1997: 66).

Although the type material of *Dytiscus silphoides* is lost (Dutto et al. 2009) and the original description does not conform to modern standards, the illustration of its habitus (Ponza 1805: pl. 1, Lin. 4[.3]) is sufficiently diagnostic to be assigned to *Deronectes* Sharp, 1882, and not to *Haliplus* Latreille, 1802.

Ponza's species was later listed in a few papers (e.g., Anonymous 1806: 280, as *Dytiscus silphoides* Ponza; von Martens 1824: 502, as *D. silphoides* [no author]; Gemminger & Harold 1868: 426, as *Haliplus silphoides* Ponza; Sherborn 1930: n. 5989, as *D. silphoides* Ponza; Dutto et al. 2009: 429, as *D. Silphoides* Ponza), but it was overlooked in capital works (e.g., Zimmerman 1920; Franciscolo 1979).

Recently, Nilsson (2001: 151) treated *Dytiscus silphoides* as a *nomen dubium* in the genus *Deronectes* Sharp, 1882. Later, Nilsson & Fery (2006: 58) declared this species as a *nomen oblitum*, in order to ensure the continuous usage of its junior synonym *Deronectes opatrinus* (Germar, 1824) as a valid name (*nomen protectum*), and this is the current status of these two names (Nilsson & Hájek 2022b: 29).

Nevertheless, for three reasons, it is not possible that *Deronectes silphoides* (Ponza) is a synonym of *D. opatrinus*:

(1) No species of the *Deronectes opatrinus* species-group (Fery & Brancucci 1997; Fery & Ribera 2018) occurs in Italy (cf. Rocchi 2007, 2021; Nilsson & Hájek 2022b).

(2) The old Italian literature records of *D. opatrinus* are based on misidentifications of *D. fairmairei* (Leprieur, 1876) (Franciscolo 1979: 442) and/or *D. moestus inconspectus* (Leprieur, 1876) [cf. Angelini 1984: 107, as *D. moestus* (Fairmaire, 1858)]. These species are not close to *D. opatrinus* but belong to two other species-groups (Fery & Brancucci 1997; Nilsson 2001).

(3) Nilsson & Fery (2006: 58) attributed such synonymy to Villa & Villa (1833: 7), who under "*Hydroporus opatrinus* Ill. [*sic*!]" listed "*Hydroporus silphoides* Peirol. [= Peiroleri]", not *Dytiscus silphoides* Ponza.

No paper by Peiroleri mentioning *H. silphoides* was found, so the authorship of this name is as follows: *Hydroporus silphoides* Villa & Villa, 1833 (*nomen nudum*). Later, the same authors (Villa & Villa 1844: 424, as "*Hydroporus silphoides* Peirol.") listed it from the plain of Lombardy, with *obscurus* Jan (*nomen nudum*) [not *H. obscurus* Sturm, 1835] and *opatrinus* [sensu] Villa [& Villa], 1833 as its synonyms. *Hydroporus obscurus* Jan was already listed as a "synonym" of "*Hydroporus opatrinus* Ill. [*sic*!]" by Villa & Villa (1833); it corresponds to *H. obscurus* De Cristofori & Jan, 1832 (*nomen nudum*) from Sicily (De Cristofori & Jan 1832: 14, as *H. obscurus nob.* [= *nobis* = De Cristofori & Jan]). It must be underlined that the authorship of this *nomen nudum* must be assigned to both these authors, not only to Jan (Villa & Villa 1833, 1844) or De Cristofori (Nilsson & Hájek 2022b).

Ghiliani (1887: 227) recorded *Hydroporus* "*silphoides* Peiroleri, Ponza (*obscurus* Hen. [(sic!)])" from Borgomanero (Novara prov., Piedmont) and *H.* "*opatrinus* Villa, Germ. Aubè" from brooks of the Novara and Saluzzo areas (Piedmont). Baudi (1890: 35) referred the former Ghiliani record to *H.* "*obscurus* St. [= Sturm, 1835] (*silphoides* Peirol., Ponza, p. 227)", while the latter one to *Deronectes bombycinus* (Leprieur, 1876), which is a synonym of *D. fairmairei* (Leprieur, 1876) (Nilsson & Hájek 2022a, 2022b).

Luigioni (1929: 155), following Baudi (1890), referred "*silphoides* Ponza" to *Hydroporus obscurus* Sturm, 1835.

Angelini (1984: 106), based on the records of Ghiliani (1887, as *H. silphoides* Peir.) and Villa & Villa (1844, as *H. silphoides* Peirol), listed *Hydroporus obscurus* Sturm, 1835 as doubtful for the Italian fauna, and this Holarctic species is currently unrecorded from Italy (Rocchi 2021; Nilsson & Hájek 2022b). In this framework, the identity of *Hydroporus silphoides* Villa & Villa, 1833 (*nomen nudum*) remains uncertain.

Five species of *Deronectes* are recorded from the Piedmont region (cf. Rocchi 2007): *D. angelinii* Fery & Brancucci, 1997, *D. aubei aubei* (Mulsant, 1843), *D. semirufus* (Germar, 1845), *D. fairmairei* and *D. moestus inconspectus*. Excluding *D. fairmairei*, which is known from Piedmont with doubt, the remaining taxa are known also from the Cuneo province (cf. Rocchi 2007). *Deronectes silphoides* (Ponza, 1805) is therefore identical to one of these species; unfortunately, on the basis of its very short description (Ponza 1805), it is only possible to establish

that it is different from *D. angelinii* and *D. semirufus*. Therefore, *Deronectes silphoides* (Ponza, 1805) is here newly (see Nilsson 2001) declared as a *nomen dubium*. In this way, since *Deronectes silphoides* has priority over all five *Deronectes* taxa mentioned above as well as *D. moestus moestus*, no nomenclatural instability is created.

Discussion

The faunistic knowledge on Italian Dytiscidae was optimally summarized by Rocchi (2007), which represents the basis for updating the conservation status of species in this family in Italy. Unfortunately, the conservation status of many species in this family appears to be clearly worsening, especially in lowland areas and agricultural landscapes where lentic aquatic environments are often destroyed and/or altered by human activities (cf. Minelli 2001; Battisti 2004; Stoch 2005; Stoch & Naselli-Flores 2014). An additional threat is the Louisiana crayfish, *Procambarus clarkii* Girard, 1852 (Malacostraca: Decapoda: Cambaridae), an invasive predaceous species that is spreading throughout Italy (cf. Battisti & Scalici 2020; Lo Parrino et al. 2020), causing the decrease and/or disappearance of many populations of water beetles (cf. Pederzani & Fabbri 2006; Bazzato et al. 2016). In this framework, it is important and useful to provide recent faunistic data on water beetles allowing a correct evaluation of their conservation status; unfortunately, it is easy to predict that the conservation status of one of the above species, *Acilius* (*Acilius*) *sulcatus*, now classified as "Least concern", will worsen, since its aquatic environments are often destroyed and/or altered by human activities.

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