

***Microrhagus pyrenaeus* BONVOULOIR, 1872 and *Otho spondyloides* (GERMAR, 1818) (Coleoptera: Eucnemidae) in Austria**

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Abstract

We report recent findings of two rare species of saproxylic beetles in the family Eucnemidae from Austria. *Microrhagus pyrenaeus* BONVOULOIR, 1872 and *Otho spondyloides* (GERMAR, 1818) were collected from the lower March River floodplains at the WWF Auenreservat Marchegg (Weinviertel, Lower Austria). *Otho spondyloides* was also collected in Drösing (Weinviertel, Lower Austria) and Schallendorf near Rauchwart (Güssing, Burgenland). *Microrhagus pyrenaeus* is a new record for Austria and *Otho spondyloides* has not been recorded in Austria for about fifty years. Both species are considered indicators of relict primeval forest. Their presence highlights the conservation value of floodplain wetlands along the lower March and their associated riparian woodlands within the reserve. Here we describe these findings and summarise the natural history of the two species.

Key words: Faunistics, ecology, *Microrhagus pyrenaeus*, *Otho spondyloides*, Eucnemidae, Coleoptera, Austria.

Zusammenfassung

Wir melden Funde zweier seltener xylobionter Käferarten aus der Familie der Eucnemidae in Österreich. *Microrhagus pyrenaeus* BONVOULOIR, 1872 und *Otho spondyloides* (GERMAR, 1818) wurden in den Auen der Unteren March im WWF-Auenreservat Marchegg (Weinviertel, Niederösterreich) erfasst. *Otho spondyloides* wurde außerdem in Drösing (Weinviertel, Niederösterreich) und Schallendorf bei Rauchwart (Bezirk Güssing, Burgenland) dokumentiert. *Microrhagus pyrenaeus* wird in Österreich erstmals nachgewiesen; neue Vorkommen von *Otho spondyloides* sind die ersten seit etwa fünfzig Jahren in diesem Land. Beide gelten als Urwaldreliktarten, und ihre Anwesenheit zeigt den hohen Schutzwert der Auwälder entlang der unteren March und der Waldgebiete im Reservat. Wir beschreiben die Fundumstände und präsentieren eine Zusammenfassung der Biologie beider Spezies.

Introduction and methods

Saproxylic beetles are a highly diverse group of beetles associated with dead and decaying wood. While some may be ubiquitous pest species, many more are rare, and threatened by anthropogenic pressure. This is especially true of those depending on large, veteran trees, or of species requiring expanses of intact old-growth forest with sufficient amounts of deadwood (ECKELT et al. 2018).

The floodplain or riparian woodlands of the lower March and Thaya Rivers represent one of the largest and richest remaining areas of lowland hardwood forest in Central Europe (MIKLÍN & ČÍZEK 2014). The area is renowned as a refuge for numerous rare invertebrate species, such as saproxylic beetles. With 1,100 hectares of wetland, flood meadows, and riparian forest, the World Wildlife Fund (WWF) Auenreservat Marchegg is the largest reserve in this part of Europe. The forests were previously managed as coppice and pasture woodlands. These practices were neglected for a period of time but have recently been reinstated as part of the current management regime of the reserve, implemented by WWF Austria.

With the exception of surveys conducted by ZABRANSKY (1991), the saproxylic beetle fauna of the reserve has not been comprehensively or systematically studied. We surveyed for saproxylic beetles in the reserve using cross-panel flight interception traps. The material collected contained two exceptionally rare species of the family Eucnemidae, *Microrhagus pyrenaeus* BONVOULOIR, 1872 and *Otho spondylioides* (GERMAR, 1818). Further, we present three other findings of *O. spondylioides* from Lower Austria and Burgenland.

Results and Discussion

Microrhagus pyrenaeus BONVOULOIR, 1872 (Fig. 1)

Material examined: Austria bor. or., Niederösterreich, Weinviertel region: 1 km NW of Marchegg, N 48° 17.376', E 16° 53.693', 25.VI.–8.VII.2015, 1 female was retrieved from a flight interception trap attached to a dying pedunculate oak (*Quercus robur*), 92 cm diameter at breast height (= DBH), growing at the forest edge, M. Weiss & L. Čížek leg., J. Vávra det. and coll.; 2.5 km NE of Baumgarten an der March, N 48° 19.292', E 16° 53.870', 8.–22.VII.2015, 1 female was found in a flight interception trap attached to a moribund pedunculate oak (*Quercus robur*), 95 cm DBH, standing in a partially cut stand of coppice with standards ("Mittelwald"), M. Weiss & L. Čížek leg., J. Vávra det., coll. Tiroler Landesmuseum Ferdinandeum, Innsbruck, Austria.

Distribution: *Microrhagus pyrenaeus* is new for Austria. It has a wide but scattered distribution across Europe. It was first described from France and later recorded in Bulgaria, the Czech Republic, France, Germany, Greece, Italy, Poland, Slovakia, and Switzerland (MUONA 2007, BRUSTEL & VAN MEER 2008, MERTLIK et al. 2009, CHITTARO & BLANC 2012, REDOLFI DE ZAN et al. 2014, VÁVRA et al. 2014, HILSZCZAŃSKI et al. 2015, KRÁTKÝ 2017). The distribution map presented in HILSZCZAŃSKI et al. (2015) summarises the known distribution of *M. pyrenaeus*. It is listed as regionally extinct in Germany where only old records exist (KÖHLER & KLAUSNITZER 1998).

Ecology: Across its range, this species is rare and threatened. Voucher data indicate that *M. pyrenaeus* was predominantly found in well-preserved tree stands with large volumes of dead and decaying wood. The larvae are known to inhabit the fungiform wood of broadleaved trees affected by white rot. Larvae were reared from dry wood of *Carpinus* in Aschaffenburg, Bavaria (HORION 1953). Prepupae were also found in a rotten, fallen, shaded *Quercus* branch near Varna in Bulgaria during the month of May (BURAKOWSKI 1991). BRUSTEL & VAN MEER (2008) also consider *Alnus* to be a likely host. Adults are active from May to August (BURAKOWSKI 1991, BRUSTEL & VAN MEER 2008, CHITTARO & BLANC 2012, VÁVRA et al. 2014, HILSZCZAŃSKI et al. 2015, KRÁTKÝ 2017).



Figs. 1–2: Habitus in dorsal view of (1) *Microrhagus pyrenaeus* (body length 4.9 mm) and (2) *Otho spondyloides* (body length 7.0 mm), both from the WWF Auenreservat Marchegg (Lower Austria). © Martin Novák.

***Otho spondyloides* (GERMAR, 1818) (Fig. 2)**

Material examined: Austria bor. or., Niederösterreich, Weinviertel region: Baumgarten an der March, N 48° 19.779', E 16° 51.099', 1.VII.1994, 1 specimen, beating, M. Egger leg., det. and coll.; Austria bor. or., Niederösterreich, Weinviertel region: 2.7 km NE of Baumgarten an der March, N 48° 19.235', E 16° 54.162', 8.–22.VII.2015, 1 female was recovered from a flight interception trap attached to a dying pollard willow (*Salix alba*, 40 cm DBH) growing in a wet wooded meadow in a sparse stand of pollard willows, M. Weiss & L. Čížek leg., J. Vávra det. and coll.; Austria bor. or., Niederösterreich, Weinviertel region: Drösing, near Großer Breitsee, N 48° 32.755', E 16° 56.215',

27.VI.2020, 1 specimen, beating, M. Egger leg., det. and coll.; Austria mer. or., Burgenland, Güssing district: Rauchwart – Schallendorf, N 47° 7.417', E 16° 14.285', 28.VI.2020, 2 specimens collected by beating at a forest cemetery, M. Egger leg., det. and coll.

Distribution: *Otho spondyloides* has a Eurosiberian distribution. In Central Europe it is known from Austria, Germany, Poland, and Hungary (BURAKOWSKI 1991, MUONA 2007). Two individuals are known from Austria, including a female from Carinthia: Dobratsch, 1600 m a.s.l., 4.VII.1947 (HÖLZEL 1951) and an individual without precise location data (“Austria”) that is deposited in the collection of the Deutsches Entomologisches Institut, Berlin (HORION 1953). This is the first confirmed occurrence in Austria after approximately 50 years.

Ecology: Similarly to *M. pyrenaicus*, *O. spondyloides* is a saproxylic species associated with old-growth forest (e.g., BURAKOWSKI et al. 1985, BURAKOWSKI 1991). Its larvae develop in broadleaved trees such as *Carpinus*, *Populus*, *Quercus*, and *Tilia*, where they are also associated with white rot (MAMAEV 1976, BURAKOWSKI et al. 1985, LUCHT 1989). The description of larval morphology was based on material collected from *Tilia*, near Voronezh in Russia (MAMAEV 1976). PALM (1972) reports mature larvae from branches infected with soft, white rot of *Carpinus*, found near Băile Herculane (Romania). LUCHT (1989) adds further observations of larvae from Romania (near Babadag) probably also from *Tilia*. Jiří Vávra reared several individuals from *Carpinus* in Krakovski gozd forest near Kostanjevica na Krki in Slovenia, under conditions similar to those reported by PALM (1972) and BURAKOWSKI et al. (1985). Larvae in pupal chambers have been found in upper, rotten parts of thin, standing *Carpinus* snags that were 1–2 m high.

Larval development of *O. spondyloides* takes at least two years, with larvae overwintering and pupating in the following spring. Adults emerge in June and July (BURAKOWSKI et al. 1985, LUCHT 1989, BURAKOWSKI 1991, MUONA 1993).

These two species are among some of the rarest and most enigmatic saproxylic beetles in Europe. Their co-occurrence in the WWF Auenreservat Marchegg highlights the importance of conserving old-growth riparian woodland in the March-Thaya floodplain. The addition of novel lowland records of *O. spondyloides*, together with the previous record from a much higher altitude on the Dobratsch (1600 m a.s.l.), demonstrate that even very rare saproxylic beetles can possess broad ecological amplitudes. This suggests that site history and management are potentially more important to certain saproxylic organisms than abiotic conditions, and adds support to the current management strategies conducted by WWF Austria.

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