

**First record of *Apate monachus* in Hungary, with a checklist of and a key to the Hungarian powderpost beetles (Coleoptera: Bostrichidae)**

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**Abstract** – *Apate monachus* Fabricius, 1775 is recorded for the first time from Hungary. A checklist and a key of Bostrichidae of Hungary (15 species) is given. With 15 figures.

**Key words** – *Apate monachus*, black borer, Bostrichidae, Hungary, powderpost beetles, checklist, new country record

## INTRODUCTION

The family of powderpost beetles (Bostrichidae) contains around 700 species worldwide, and almost 160 species in the Palearctic region (BOROWSKI 2007). Several species are considered serious pests, especially members of the subfamilies Dinoderinae and Lyctinae. Although only a few species, mostly from the tropical regions, are able to attack living trees, maturation feeding of the adults can cause health problems on plants (LIU *et al* 2008). One of the potentially harmful species, the black borer, *Apate monachus* Fabricius, 1775, was found in Hungary in the late summer of 2015, which raised the number of the species known to occur in the country to 15.

*Abbreviation* – HNHM = Hungarian Natural History Museum, Budapest.

## MATERIAL AND METHODS

The pictures were taken with Nikon D5200 and Nikon AF Micro Nikkor 60 mm lens and Mitutoyo M Plan Apo 5X microscope lens. Multiple exposures were stacked in Zerene Stacker, subsequent image work was done with Photoshop CS5.

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## APATE MONACHUS IN HUNGARY

*Collecting data* – Hungary, Budapest, IV. kerület [district], Rév utca [street], Duna-part [bank of the river Danube], alkonyatkor egyelve [hand-collected at sunset], 2015.VIII.26., leg. Kotán Attila, Németh Tamás & Tari Zoltán (one male specimen, deposited in the HNHM).

*Remarks* – The black borer is native throughout Africa, and has expanded northwards to the Mediterranean. It is known from the following European countries: Azerbaijan, France, Great Britain, Germany, Georgia, Italy, The Netherlands, Portugal, Spain, Sweden and Switzerland (BOROWSKI 2007). It has also been introduced to South America and the Caribbean (BONSIGNORE 2012). The species is considered to be a pest of 80 different plant species (NARDI & MIFSUD 2015), including carob trees (*Ceratonia siliqua*), pomegranate (*Punica granatum*), coffee shrubs (*Coffea arabica*) (WALLER *et al.* 2007) and date palms (*Phoenix dactylifera*) (SADOK & GERINI 1988). BONSIGNORE (2012) reports serious damage in a plant nursery in southern Italy.

The male specimen was found flying above the water of the Danube while the collectors were angling. The exact breeding place of the species in Budapest is still unknown.

## CHECKLIST OF BOSTRICHIDAE OF HUNGARY

The family Bostrichidae is represented by 15 species in Hungary, belonging to 11 genera of 4 subfamilies. The last comprehensive list with 8 species was published by KUTHY (1897). Further species were added by KAUFMANN (1914), MERKL (1998, 2002, 2006) and MERKL & NÉMETH (2008).

*Psoa dubia* Rossi, 1792 was mentioned by KUTHY (1897), based on KIESENWETTER (1877), but neither voucher specimens nor exact localities are available.

In the Coleoptera Collection of the HNHM, there are two specimens of *Stephanopachys substriatus* (Paykull, 1800) from Balatonfüred and Budapest. Their labels must be erroneous, as occurrence of this montane–subalpine species associated with mature forests of Norway spruce is unlikely in Hungary.

In the subsequent checklist, every species name is followed by a reference, which is thought to include the first locality record of the given species for present-day Hungary. These references are based on reliably identified specimens from Hungarian localities. Synonymy is restricted to names mentioned in the Hungarian literature. Hungarian vernacular names are proposed for all species and subfamilies.

## Bostrichinae Latreille, 1802 – Igazicsuklyásszú-formák

*Apate* Fabricius, 1775*Apate monachus* Fabricius, 1775: present paper – nagy csuklyásszú*Bostrichus* Geoffroy, 1762*Bostrichus capucinus* (Linnaeus, 1758): KUTHY (1897) – piros csuklyásszú*Lichenophanes* Lesne, 1899*Lichenophanes varius* (Illiger, 1801): KUTHY (1897) – tarka csuklyásszú*Scobicia* Lesne, 1901*Scobicia chevrieri* (A. Villa et J. B. Villa, 1835): MERKL (1998) – pilláshomlokú csuklyásszú*Sinoxylon* Dufschmid, 1825*Sinoxylon muricatum* (Linnaeus, 1767) (= *sexdentatum* A. G. Olivier, 1790): KUTHY (1897) – hatfogú csuklyásszú*Sinoxylon perforans* (Schrank, 1789) (= *bispinosum* A. G. Olivier, 1790): KUTHY (1897) – nagytüskés csuklyásszú*Xylopertha* Guérin-Méneville, 1845 = *Xylonites* Lesne, 1901*Xylopertha retusa* (A. G. Olivier, 1790): KUTHY (1897) – fekete csuklyásszú

## Dinoderinae C. G. Thomson, 1863 – Törpecsuklyásszú-formák

*Dinoderus* Stephens, 1830*Dinoderus minutus* (Fabricius, 1775): MERKL (2006) – bambuszfűró csuklyásszú*Rhyzopertha* Stephens, 1830*Rhyzopertha dominica* (Fabricius, 1792): MERKL (2002) – gabonacsuklyásszú

## Lyctinae Billberg, 1820 – Falisztbogárformák

*Lyctus* Fabricius, 1792*Lyctus* Fabricius, 1792*Lyctus (Lyctus) linearis* (Goeze, 1777) (= *unipunctatus* Herbst, 1783): KUTHY (1897) – közönséges falisztbogár*Lyctus (Lyctus) pubescens* Panzer, 1792: KAUFMANN (1914) – nagy falisztbogár*Xylotrogus* Stephens, 1830*Lyctus (Xylotrogus) brunneus* (Stephens, 1830): MERKL & NÉMETH (2008) – barna falisztbogár*Trogoxylon* LeConte, 1862*Trogoxylon impressum* (Comolli, 1837): KUTHY (1897) – gödrös falisztbogár*Trogoxylon parallelipipedum* (Melsheimer, 1846): MERKL & NÉMETH (2008) – amerikai falisztbogár

## Psoinae Blanchard, 1851 – Ösztövércsuklyásszú-formák

*Psoa* Herbst, 1797*Psoa viennensis* Herbst, 1797: KUTHY (1897) – venyigecsuklyásszú

## Key to the Hungarian species of Bostrichidae

- 1 Body cylindrical. Head covered by pronotum. Pronotum strongly convex, hooded, surface of anterior half or one-third rough and rasp-like, at least partly covered with tubercles. Elytra with distinct apical declivity, often with spines or tubercles ..... 2
- Body depressed. Head visible from above, not inserted into prothorax. Pronotum less convex to deplanate, with simple punctation. Apical part of elytra simple, plane ..... 10
- 2 Apical part of elytra simple, rounded, without spines or keel formed by elytral suture ..... 3
- Apical part of elytra with spines or keel formed by elytral suture ..... 6
- 3 Smaller species with body length less than 3 mm. Body brown, pronotum sometimes darker ..... 4
- Larger species, with average body length 10 mm. Pronotum black, elytra red or whole body brown, with mottled golden pubescence ..... 5
- 4 Pronotum black. Elytra brown, less than 1.5× longer than pronotum. Elytral punctures deep, not arranged in rows, interspaces smaller than puncture diameters. 2.4–3.8 mm. – Important pest with worldwide distribution, originated from Southeast Asia. Known from Hungary by two specimens reared from bamboo imported from Indonesia .... *Dinoderus minutus* (Fig. 1)
- Body unicoloured brown, shiny. Elytra almost 2× longer than pronotum. Elytral punctures shallow, arranged in rows, interspaces shiny, equal to puncture diameters, 2 mm. – Serious stored product pest of tropical origin, introduced worldwide by international trade. Larvae damage cereal grains, spices and other dry commodities. Larval development requires about



**Figs 1–15.** Bostrychidae of Hungary. 1 = *Dinoderus minutus* (Fabricius, 1775), 2 = *Rhyzopertha dominica* (Fabricius, 1792), 3 = *Sinoxylon perforans* (Schrank, 1789), 4 = *Sinoxylon muricatum* (Linnaeus, 1767), 5 = *Xylopertha retusa* (A. G. Olivier, 1790), 6 = *Lyctus pubescens* Panzer, 1792, 7 = *Lyctus linearis* (Goeze, 1777), 8 = *Lyctus brunneus* (Stephens, 1830), 9 = *Bostrichus capucinus* (Linnaeus, 1758), 10 = *Scobicia chevrieri* (A. Villa et J. B. Villa, 1835), 11 = *Apate monachus* Fabricius, 1775, 12 = *Lichenophanes varius* (Illiger, 1801), 13 = *Psoa viennensis* Herbst, 1797, 14 = *Trogoxylon parallelipipedum* (Melsheimer, 1846), 15 = *Trogoxylon impressum* (Comolli, 1837)

- 25 days under ideal temperature. Occurs in mills and storehouses, but uncommon in Hungary because does not tolerate frost ..... *Rhyzopertha dominica* (Fig. 2)
- 5 Body black, elytra and abdominal ventrites red, rarely dark brown. 8–14 mm. – Common in Hungary, mostly on stacked wood and fallen trees ..... *Bostrichus capucinus* (Fig. 9)
- Body light brown, dorsal surface covered with mottled golden pubescence. 8–13 mm. – Occurs in warmer oak forests, larvae develop in thicker branches. Adults on dry branches in mid-summer, frequently attracted by light ..... *Lichenophanes varius* (Fig. 12)
- 6 Elongate species, elytra almost 2× longer than pronotum. Body unicoloured dark or bicoloured. Apical declivity of elytra without spines, with keel on suture ..... 7
- More robust species, elytra about 1.5× longer than pronotum. Pronotum black, elytra reddish-brown. Apical declivity of elytra with two bigger and few smaller spines..... 9
- 7 Body bicoloured. Anterior part of pronotum and posterior part of elytra black, posterior part of pronotum and anterior part of elytra reddish. Frons with long, erected, yellow setae. Last antennomere nearly as long as two preceding combined. 3–4 mm. – Since its first record in Hungary (MERKL 1998) it was found in many localities. Polyphagous species, larvae develop in grapevine, fruit trees and ornamental trees ..... *Scobicia chevrieri* (Fig. 10)
- Body unicoloured, dark. Frons with much shorter hairs. Last antennomere much shorter than two preceding combined ..... 8
- 8 Elytra without costae. 3–4 mm. – Occurs mostly in warmer oak woods. Larvae develop in dry, thin branches ..... *Xylopertha retusa* (Fig. 5)
- Elytra with three obsolete costae, vanishing anteriorly, two inner ending in spine posteriorly. 20–25 mm, largest species in Hungary. – Invasive species, introduced to several European countries ..... *Apate monachus* (Fig. 11)
- 9 Two large teeth of elytra not aligned with outer, smaller ones. Larger species, 5–8 mm. – Larvae develop mostly in sun exposed oak branches. Adults on dry branches or stacked wood ..... *Sinoxylon perforans* (Fig. 3)
- Four large teeth of elytra horizontally aligned. Smaller species, 4 mm. – Old records are known from Budapest, and a more recent one from Vas county (Szentgotthárd: Farkasfa, Fekete-tó, 6.IX.1993, leg. R. Dankovics, in the Savaria Museum, Szombathely) ..... *Sinoxylon muricatum* (Fig. 4)
- 10 Antennal club three-segmented. Body bronzy, elytra light orange, sometimes with bluish tint. Larger species, 6–12 mm. – Develops in dry grape canes, occurs wherever grapevine is cultivated ..... *Psoa viennensis* (Fig. 13)
- Antennal club two-segmented. Body brown. Smaller species, 2.5–3 mm ..... 11
- 11 Elytral pubescence sericeous, not forming longitudinal stripes, elytra confusedly punctate. Pronotum flat, almost tetragonal, with right-angled corners ..... 12
- Elytral pubescence forming longitudinal stripes, elytra at least with irregular puncture rows. Pronotum more convex, posterior corners rounded, anterior corners rounded or right-angled ... 13
- 12 Head with small teeth in front of eyes. Body unicoloured brown. Pronotum with Y-shaped impression, lateral margins parallel. – Rare in Hungary, develops in various trees ..... *Trogoxylon impressum* (Fig. 15)
- Head without teeth in front of eyes. Body brown, pronotum darker. Pronotum without Y-shaped impression, lateral margins slightly divergent anteriorly. – Introduced to Europe from North America, it is known from a few localities of Southern Transdanubia (Drávfok, Murakeresztúr, Teklafalu) ..... *Trogoxylon parallelipedum* (Fig. 14)
- 13 Pronotum without mid-longitudinal furrow, lateral margins concave, anterior corners divergent. Body brown. – Originated from Southeast Asia, introduced with timber and furniture to many tropical and temperate areas ..... *Lyctus brunneus* (Fig. 8)
- Pronotum with mid-longitudinal furrow, lateral margins slightly convex ..... 14



- 14 Pronotum with short, deep mid-longitudinal furrow not reaching anterior and posterior margins. Body light brown. – Develops in many hardwood species, including walnut, oak and black locust. Common in hovels, wood storages, also outdoors, on dry stumps and branches ..... *Lyctus linearis* (Fig. 7)
- Pronotum with long, shallow mid-longitudinal furrow reaching anterior and posterior margins. Body brown, pronotum sometimes darker. – Rarer than the previous species, develops also in poplar and willow ..... *Lyctus pubescens* (Fig. 6)

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