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A review of the genus *Agnathus* (Coleoptera: Pyrochroidae: Agnathinae), with description of *Agnathus secundus* sp. nov. from China

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Abstract. Catalogue and bibliography of the subfamily Agnathinae is provided, along with a discussion on the systematic position of the genus *Agnathus* Germar, 1825. Known data on its geographic distribution and bionomy are reviewed and new observations on the biology of *Agnathus decoratus* (Germar, 1818) are given. A new species, *Agnathus secundus* sp. nov., is described from the mountain forests of southwestern China (Yunnan).

Key words. Coleoptera, Pyrochroidae, Agnathinae, *Agnathus*, taxonomy, new species, catalogue, bibliography, biology, distribution, conservation, Palaearctic Region

Introduction

The hitherto monotypic genus *Agnathus* Germar, 1825 became soon after its description a puzzle for coleopterists because of its obscure systematic position. Confusion concerning the classification of *Agnathus* probably resulted also in its absence from Schenkling's edition of Coleopterorum Catalogus (Schenkling 1940). Therefore the only, albeit incomplete catalogue of the genus was published by Borchmann (1936). Even though the chief aim of this paper was the description of the second species of *Agnathus*, we feel it reasonable at this opportunity to summarize all available information on the genus and to comment briefly on its classification due to its enigmatic status.

Material and methods

Published data on the distribution of *Agnathus decoratus* (Germar, 1818) are given in detail, including the number of specimens and their depository (if available) and with rele-

vant reference(s). All localities are given under current names and within current geopolitical boundaries. Original toponyms on labels, if different, are given in parentheses and brackets. Names of the localities from the Czech Republic and Slovakia are complemented with the grid mapping codes according to Zelený (1972) in square brackets.

Material examined. *Agnathus decoratus*: 66 specimens from the Czech Republic (Morava), Bosnia Herzegovina, Bulgaria, Croatia, France, Italy, Slovakia and Ukraine (MMBC, NHMB, NMPC, ZKCM). *Cononotus sericans* LeConte, 1851: 1 specimen (NMPC): 'Cal., Palm Springs, 24.2.', T. J. Spilman det.

The following codens are used in the text:

CHCV Carolus Holzschuh collection, Villach, Austria;
DEI Deutsches Entomologisches Institut, Müncheberg, Germany;
HNHM Hungarian Natural History Museum, Budapest, Hungary;
IJCO Ivo Jeniš collection, Náklo u Olomouce, Czech Republic;
JRCP Jakub Rolčík collection, Praha, Czech Republic;
JSBC Jan Sychra collection, Brno, Czech Republic;
JVCO Jiří Ch. Vávra collection, Ostrava, Czech Republic;
LMBC Ladislav and Milada Bocák collection, Olomouc, Czech Republic;
MBCO Michal Bednařík collection, Olomouc, Czech Republic;
MBCP Milan Boukal collection, Pardubice, Czech Republic;
MHBC Michal Horsák collection, Brno, Czech Republic;
MHNG Muséum d'Histoire Naturelle, Geneve, Switzerland;
MKCY Mark Yu. Kalashian collection, Yerevan, Armenia;
MMBC Moravian Museum, Brno, Czech Republic;
MSOC Michal Straka collection, Ochoz u Brna, Czech Republic;
MTBC Michal Tkoč, collection, Brno, Czech Republic;
NHMB Naturhistorisches Museum, Basel, Switzerland;
NHMW Naturhistorisches Museum, Wien, Austria;
NLHW Niederösterreichisches Landesmuseum, Wien, Austria;
NMPC National Museum, Prague, Czech Republic;
ONCL Oto Nakládal collection, Litovel-Víska, Czech Republic;
PNCP Petr Nohel collection, Praha, Czech Republic;
PZCW Petr Zábranský collection, Wien, Austria;
RSCW Rudolf Schuh collection, Wiener Neustadt, Austria;
SLJG Landesmuseum Joanneum, Graz, Austria;
SMBC Saris Museum, Bardejov, Slovakia;
SMOC Museum Silesiae, Opava, Czech Republic;
SNMC Slovak National Museum, Bratislava, Slovakia;
TKCH Tomáš Kopecký collection, Hradec Králové, Czech Republic;
TSCO Tomáš Sitek collection, Ostrava, Czech Republic;
VVCO Vladimír Vyhnálek collection, Olomouc, Czech Republic;
ZIN Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia;
ZKCM Zdeněk Kraus collection, Mikulovice u Znojma, Czech Republic;
ZMUB Zoological Museum, State University of Belarus, Minsk, Belarus;
ZMUM Zoological Museum, Moscow Lomonosov State University, Moskva, Russia;
ZSMC Zoologische Staatssammlung, München, Germany.

History of *Agnathus*

The taxonomy of the monotypic genus *Agnathus* has been complex. Up to date the only known species of the genus was *A. decoratus*, originally described by Germar in Germar & Zincken (1818) in the genus *Notoxus* sensu Fabricius (1775 and 1801) corresponding to modern Cleridae (not *Notoxus* Geoffroy, 1762, Anthicidae) and compared with '*Notoxus mollis*', now *Opilo mollis* (Linnaeus, 1758) of the Cleridae. However, Germar (1818: 229–232) himself doubted the relationship to the genera *Trichodes* Herbst, 1792 and *Notoxus* sensu Fabricius (Cleridae) because of the four-segmented posterior tarsi in *Agnathus*. Germar (1818: 232) also remarked that a similar or even the same species was in the collection Megerle von Mühlfeld under the name *Agnathus ornatus* ['Megerle v. Mühlfeld hat einen diesem entweder sehr ähnlichen, oder vielleicht gar denselben Käfer *Agnathus ornatus* genannt']. The genus-group name *Agnathus* is thus mentioned only as possibly referring to *Notoxus decoratus* and cannot be available according to article 12.2.5 of ICZN (1999). *Agnathus* is therefore made available according to article 12.2.5 (ICZN 1999) only by the combination *Agnathus decoratus* in Germar (1825). Nevertheless, most authors dated the name incorrectly as '*Agnathus* Germar, 1818' (among recent authors, e. g., Nardi (2007) and Pollock & Young (2008)), even though the availability of the name *Agnathus*, its authorship and correct dating were elucidated already by Abdullah (1974). LaFerté-Sénectère (1849) provided the first detailed information on known records of *A. decoratus* and listed the specimens donated to Museum Wien by Megerle von Mühlfeld under the name '*Agnathus ornatus*' as the oldest record dated before 1818. That is, he already considered those specimens as undoubtedly conspecific with *A. decoratus* contrary to Germar (1818).

The systematic position of the genus *Agnathus* is not yet clear, and the obscurity of its taxonomic position and frequent transfers between various groups probably caused its absence from Schenkling's Coleopterorum Catalogus (Schenkling 1940). *Agnathus decoratus* was originally described as *Notoxus* sensu Fabricius (see above) and placed in the family Cleridae, in which it was classified also by Dejean (1834, 1836). LaFerté-Sénectère (1849) classified *Agnathus* as a taxon equivalent to his 'Anthicites' and 'Pseudo-Anthicites' in his revision of Anthicidae. Redtenbacher (1845, 1849) placed the genus in Serropalpidae. Lacordaire (1859) proposed for it a distinct taxon 'Agnathides' in the family Pythidae. Seidlitz (1875) transferred the tribe Agnathini in the family Lagriidae (now the tribe Lagriini of the Tenebrionidae) and Borchmann (1936) included the Agnathinae, even if with doubts, in the same family.

Agnathus remained in the Lagriidae until 1953, when Crowson (1953, 1955) placed *Agnathus* along with *Cononotus* LeConte, 1862 and *Lagrioida* Fairmaire & Germain, 1860 in his family Cononotidae. Abdullah (1974) classified this group as the subfamily Lagrioidinae of the Anthicidae. The Gondwanian genus *Lagrioida* shares with *Agnathus* and *Cononotus* some characters such as slightly clubbed antennae, internally closed procoxal cavities and connate abdominal ventrites 1–2, but, on the other hand, differs from them in the absence of notosternal sutures, open mesocoxal cavities, deeply bilobed ventral lobes of the penultimate tarsomeres, narrowly separated metacoxae and, in the larva, by the absence of urogomphal pits on the abdominal segment IX. Lawrence & Britton (1994) therefore excluded *Lagrioida* from the Cononotidae and included it as a distinct subfamily Lagrioidinae of the Anthicidae, but

they remarked that 'the genus differs from all other anthicids in a number of adult and larval features, and it may be misplaced in this family'. Currently the Lagrioidinae are classified as a taxon incertae sedis within Tenebrionoidea (Lawrence et al. 2009).

Moreover, Iablokoff-Khnzorian (1985) placed the genus *Agnathus* again in the Pythidae as part of a distinct subfamily Cononotinae in his revision of Palaearctic Pythidae even if Mamaev (1976) and Doyen (1979) described the larvae of *Agnathus* and *Cononotus* and transferred both genera in a distinct subfamily Cononotinae to the Pedilidae. Young (1991) placed the Pedilidae in the Pyrochroidae, Young & Pollock (1991) discussed the placement of the Cononotinae in the Pyrochroidae, and Pollock (1994) discussed the classification of *Agnathus* and *Cononotus* as a distinct group within the family Pyrochroidae. Lawrence & Newton (1995) then stated that the name Agnathinae has priority over Cononotinae. The Agnathinae are currently placed as Pyrochroidae incertae sedis (Lawrence & Newton 1995, Young 2002, Nardi 2007, Pollock & Young 2008) even if Nikitsky et al. (2008) classified it as a distinct family Agnathidae (for discussion see below).

Systematic part

Agnathinae Lacordaire, 1859

Agnathides Lacordaire, 1859: 524 (key), 531 (as 'Tribu III.' in 'Famille L. Pythides'; characters). Type genus: *Agnathus* Germar, 1825.

Agnathides: Mulsant & Rey (1866a): 268 (key), 269 (characters), 282 (list; in 'Tribu des Simplicitarses'); Mulsant & Rey (1866b): 6 (list), 180 (key), 181 (characters; in 'Tribu des Simplicitarses').

Agnathites: Fairmaire (1863): 457 (characters), 459 (key; in Pythidae).

Agnathina: Jakobson (1915): 1016 (key), 1017 (list; in Lagriidae).

Agnathini: Seidlitz (1875): 100 (key), 368 (list; in Lagriidae); Stein & Weise (1877): 123 (catalogue; in Lagriidae); Heyden (1883): 138 (catalogue; in Lagriidae); Bielz (1887): 81 (list; in Lagriidae); Schilsky (1888): 92 (list; in Lagriidae); Seidlitz (1890): 137 (key), 528 (list; in Lagriidae); Seidlitz (1891): 137 (key), 567 (list; in Lagriidae); Heyden (1891): 256 (catalogue; in Lagriidae); Seidlitz (1898): 319 (key), 320 (list), 321 (characters; in Lagriidae); Warnier (1901): 121 (catalogue; in Lagriidae); Barthe (1902): 57 (list; in Lagriidae); Reitter (1906): 462 (catalogue; in Lagriidae); Schilsky (1908): 126 (list; in Lagriidae); Kuhnt (1912): 730 (in key; in Lagriidae); Petri (1912): column 231 (list; in Lagriidae); Jakobson (1915): 1016 (key), 1017 (list; in Lagriidae); Portevin (1931): 109 (as Agnathiini; in Lagriidae); Kaszab (1969): 214 (key; in Lagriidae); Abdullah (1974): 22 (key), 24 (catalogue; in Anthicidae: Lagrioidinae).

Agnathinae: Winkler (1928): column 900 (catalogue; in Lagriidae); Fleischer (1930): 299 (list; in Lagriidae); Fleischer (1933): 105 (list; in Lagriidae); Borchmann (1936): 538 (monography; characters; in Lagriidae); Sainte-Claire Deville (1937): 315 (list; in Lagriidae); Lawrence & Newton (1995): 899 (priority over Cononotinae; in Pyrochroidae as subfamily incertae sedis); Klausnitzer (1996): 316 (comment; in Cononotidae); Young (2002): 541 (key), 542 (list; in Pyrochroidae as subfamily incertae sedis); Nardi (2007): web page (list; in Pyrochroidae); Hunt et al. (2007): 1915 (phylogeny; in Tenebrionoidea); Pollock & Young (2008): 417 (catalogue; in Pyrochroidae as subfamily incertae sedis).

Agnathidae: Gozis (1875): 65 (catalogue; in Diversitarses); Desbrochers des Loges (1900): 3 (characters), 39 (list); Seidlitz (1916): 341 (quoting); Jelínek (2005): 524 (red list; comment; Czech Republic); Nikitsky et al. (2008): 318 (list).

Cononotini LeConte, 1862: 254 (characters; in Pythidae; with genus *Cononotus* only). Type genus: *Cononotus* LeConte, 1851.

Cononotini: LeConte & Horn (1883): 402 (key); 403 (characters; in Pythidae; with genus *Cononotus* only); Abdullah (1974): 22 (key), 23 (catalogue; in Anthicidae: Lagrioidinae).

Cononotinae: Seidlitz (1917): 87 (as 'Unterfam. Cononotini' in Pythidae and probaly separate family; with genus *Cononotus* only); Blair (1928): 28 (catalogue; in Pythidae; with genus *Cononotus* only); Doyen (1979): 39 (comment; in Pedilidae); Iablokoff-Khnzorian (1985): 197 (key), 222 (revision; characters; in Pythidae); Young & Pollock (1991): 2238 (comment; in Pyrochroidae); Lawrence & Newton (1995): 899 (junior synonym of Agnathinae).

Cononotidae: Seidlitz (1916): 128 (revision; differential characters; with genus *Cononotus* only); Seidlitz (1917): 87 (revision; key to species; probable rank; with genus *Cononotus* only); Crowson (1953): 52; Crowson (1955): 117 (key), 129 (characters); Burakowski et al. (1987): 159 (catalogue); Jelínek (1993): 116 (list); Alexandrovich et al. (1996): 44 (catalogue); Klausnitzer (1996): 306 (larva; key), 316 (larva; characters; comment; in Lagriidae).

Agnathus Germar, 1825

Agnathus: Germar (1818): 232 (unavailable name).

Agnathus Germar, 1825: (4), pl. 4. Type species: *Notoxus decoratus* Germar, 1818.

Agnathus: Dejean (1834): 216 (catalogue; in Trachélides); Dejean (1836): 237 (catalogue; in Trachélides); Duponchel (1842): 199 (dictionary; in Trachélides); Redtenbacher (1845): 131 (key; in Serropalpidae); Kiesenwetter (1849): 53 (catalogue; in Anthicides); LaFerté-Sénectère (1849): ix, x, xi (key), 293 (characters; comment; in '?Trachélides'); Gaubil (1849): 237 (list; in Anthicidae); Redtenbacher (1849): 54 (key), 608 (characters; in Serropalpidae); Imhoff (1856): 258 (diagnostic note); Dohrn (1858): 69 (catalogue; in Anthicidae); Redtenbacher (1858): cxi (key), 635 (characters; in Anthicidae); Bach (1859): 282 (characters; in Anthicidae); Schaum (1859): 75 (catalogue; in Anthicidae); Gutfleisch & Bose (1859): 430 (characters; in Anthicidae); Lacordaire (1859): 521, 522 (comment), 532 (characters; in Pythidae as Agnathides); Schaum (1862): 77 (catalogue; in Pythidae); Fairmaire (1863): 454 (comment), 458 (characters), 459 (key) (in Pythidae); Marseul (1863): 191 (catalogue; in Pythidae); Marseul (1866): 86 (catalogue; in Pythidae); Bach (1866): xlii (list; in Pythidae); Mulsant & Rey (1866a): 269 (characters; in 'Tribu des Simplicitarses'), 282 (list); Mulsant & Rey (1866b): 6 (list), 181 (characters, in 'Tribu des Simplicitarses'); Stein (1868): 86 (catalogue; in Pythidae); Gemminger & Harold (1869): 2062 (catalogue; in Pythidae); Reitter (1870): 123 (list; in Pythidae); Brancsik (1871): 73 (list; in Pythidae); Stierlin & Gautard (1871): 224 (list; in Pythidae); Abeille de Perrin (1874): 24 (key; in Salpingiens); Redtenbacher (1874): cxxi (key), 138 (characters; in Pythidae); Bertolini (1874): 155 (list; in Pythidae); Seidlitz (1875): 100 (key), 368 (list; in Lagriidae); Gozis (1875): 65 (catalogue; in Agnathidae); Stein & Weise (1877): 123 (catalogue; in Lagriidae); Schneider & Leder (1878): 248 (list; in Lagriidae); Schlosser Klekovski (1878): 568 (key), 571 (characters; in Pythidae); Heyden (1883): 138 (catalogue; in Lagriidae); Marseul (1887): 344 (catalogue; in Pythidae); Bielz (1887): 81 (list; in Lagriidae); Schilsky (1888): 92 (list; in Lagriidae); Baudi di Selve (1889): 145 (list; in Lagriidae); Gerhardt (1890): 295 (list; Silesia; in Lagriidae); Seidlitz (1890): 137 (key), 528 (list; in Lagriidae); Stierlin (1890): 160 (list; in Lagriidae); Seidlitz (1891): 137 (key), 567 (list; in Lagriidae); Heyden (1891): 256 (catalogue; in Lagriidae); Kuthy (1897): 133 (list; in Lagriidae); Seidlitz (1898): 320 (list; in Lagriidae), 359 (characters; comments); Desbrochers des Loges (1900): 4 (characters), 39 (list); Warnier (1901): 121 (catalogue; in Lagriidae); Barthe (1902): 57 (list; in Lagriidae); Reitter (1906): 462 (catalogue; in Lagriidae); Schilsky (1908): 126 (list; in Lagriidae); Gerhardt (1910): 279 (list; Silesia; in Lagriidae); Reitter (1911): 413 (characters in key; in Lagriidae); Kuhnt (1912): 730 (key; in Lagriidae); Petri (1912): column 231 (list; in Lagriidae); Łomnicki (1913): 117 (list; in Lagriidae); Seidlitz (1916): 324, 329 (characters; in Lagriidae), 328, 329, 333 (quoting); Jakobson (1915): 1016 (key), 1017 (list); Abot (1928): 234 (list; in Lagriidae); Winkler (1928): column 900 (catalogue; in Lagriidae); Fleischer (1930): 299 (list; in Lagriidae); Portevin (1931): 109 (characters; in Lagriidae); Galibert (1932): 307 (list; in Lagriidae); Fleischer (1933): 105 (list; in Lagriidae); Porta (1934): 78 (list; characters; in Lagriidae); Borchmann (1936): 9, 538 (monography; characters; in Lagriidae); Sainte-Claire Deville (1937): 315 (list; in Lagriidae); Borchert (1938): 84 (list; in Lagriidae); Pittioni (1943): 129 (list; in Lagriidae); Horion (1951): 349 (list; in Lagriidae); Borchert (1951): 161 (list; in Lagriidae); Crowson (1953): 52 (comments), fig. 143; Crowson (1955): 129 (comments), fig. 143; Horion (1956): 173 (list; in Lagriidae); Kaszab (1957): 71 (key), 73 (characters; in Lagriidae); Balthasar (1957): 444 (key; in Lagriidae); Medvedev (1965): 350 (key; in Lagriidae); Kaszab (1969): 214 (key), 215 (characters; in Lagriidae); Abdullah (1974): 18–20 (discussion), 22 (key), 24 (catalogue; fixation of genus name dating as 1825; in Anthicidae); Mamaev (1976): 642, 644 (larval characters; comment; in Pedilidae); Doyen (1979): 33,

37–39 (characters; comment; in Pedilidae); Iablokoff-Khnzorian (1985): 194–195 (comments), 197 (key), 223 (revision; characters; in Pythidae); Lucht (1987): 226 (list; in Lagriidae); Burakowski et al. (1987): 159 (catalogue; in Cononotidae); Young (1991): 544 (larva; in Pedilidae); Koch (1989): 329 (list; in Lagriidae); Jelínek (1993): 116 (list; in Cononotidae); Pollock (1994): 524 (comment; with *Cononotus* as distinct group in Pyrochroidae); Angelini et al. (1995): 19 (list; in Pedilidae); Lawrence & Newton (1995): 899 (list; comment; in Pyrochroidae as Agnathinae, subfamily incertae sedis); Alexandrovich et al. (1996): 44 (catalogue; in Cononotidae); Klausnitzer (1996): 317 (larva; in Cononotidae); Young (2002): 542 (list; in Pyrochroidae as Agnathinae, subfamily incertae sedis); Nardi (2007): web page (list; genus name dating 1818; in Pyrochroidae); Pollock & Young (2008): 417 (catalogue; genus name dating 1818; in Pyrochroidae as Agnathinae, subfamily incertae sedis).

Agnathus secundus sp. nov.

(Figs. 1–4, 10-12)

Type locality. Southwestern China, northeastern Yunnan province, Habashan Mts., western of Haba village, 27°22′54.3″N, 100°06′03.2″ E, 3200 m a.s.l.

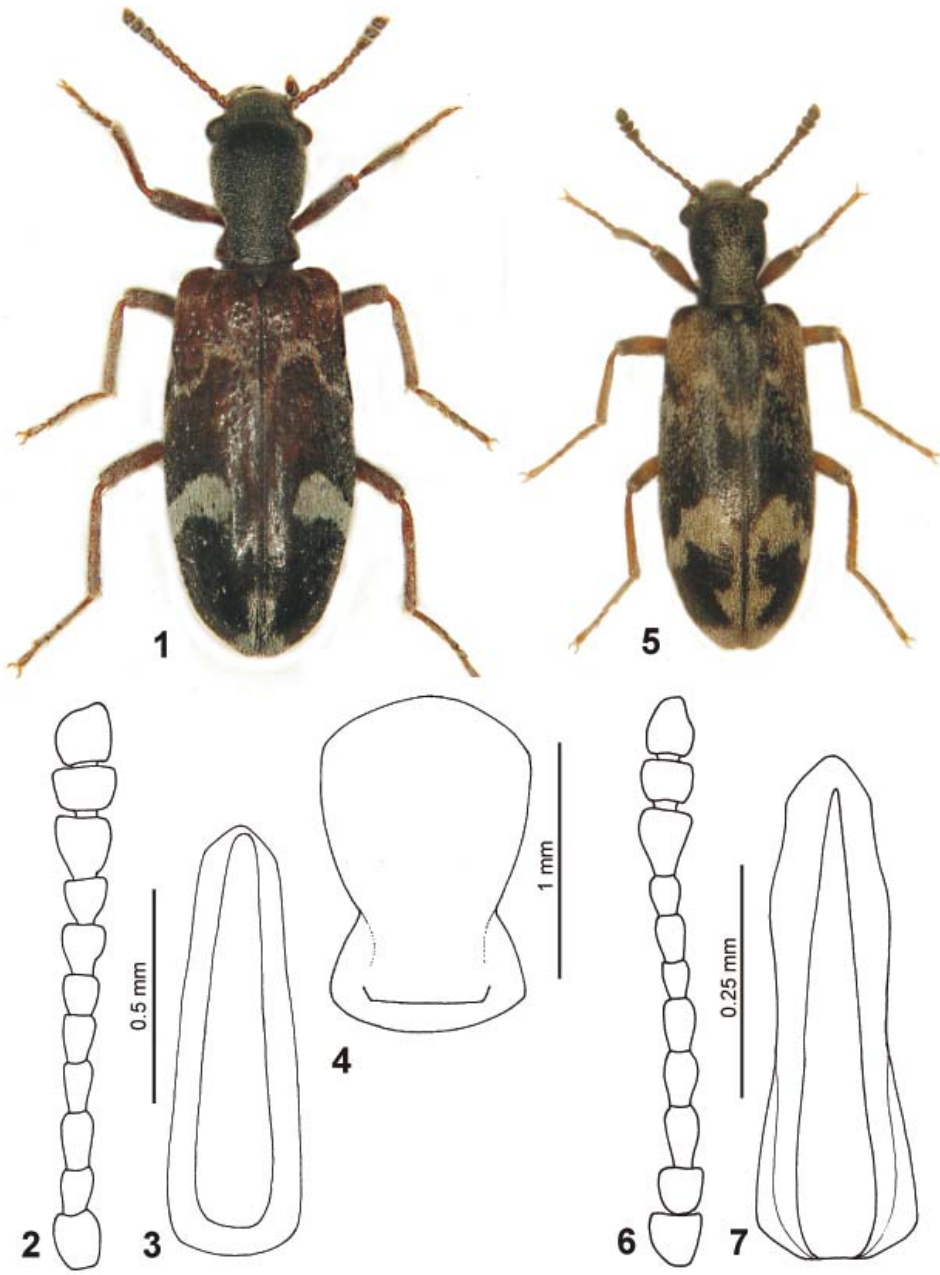
Type material. Holotype: ♂, 'CHINA, N.W.Yunnan, Haba shan – Haba, 3200 m, N 27°22′54.3″, E 100°06′03.2″, 15.7.2006, leg. Janata M.' (NMPC). Paratypes: 3 ♀♀, 'CHINA-SW, NW Yunnan, Hengduan Mts.: massif BAIMA env., ~3900 m, 28°20′N 99°03′E, 27.vii.1996, V. Kubáň leg.' (IJCO, JRCP, NMPC).

Description. Body oblong, pronotum strongly transversely convex and constricted at basal fourth, dull, elytra moderately transversely convex (flattened along suture), shining. Body black, basal fourth of elytra dark red with the colour extending more caudad along suture; mouthparts, antennae and legs dark brown. Vestiture dark, thin, long and recumbent. Dense short white tomentum making up well-defined pattern on elytra consisting of short and thin transverse bar at posterior end of humeral bulge, narrow zigzag transverse band at about one third of elytra and reaching from lateral margin to suture, broad transverse bar at ca. two thirds of elytral length, broadly interrupted at suture, and small apical area projecting anteriorly along suture (Fig. 1). Body length 5.2 mm, width 1.7 mm.

Head transverse, width across eyes ca. twice the length between posterior ends of eyes to anterior margin of clypeus. Eyes strongly convex, prominent, coarsely facetted. Temples strongly converging posteriorly, nearly as long as antennomere IV. Frons flat, shallowly longitudinally impressed besides antennal insertions, its anterior margin truncate with broad, impunctate and shining border. Punctures smaller than eye facets and separated by less than one diameter, becoming sparser anteriorly; interspaces obsoletely alutaceous, dull. Antennae ca. as long as pronotum, eleven-segmented with three-segmented subcylindrical club. Antennomeres I to XI 1.12, 1.07, 1.83, 1.66, 1.66, 1.33, 1.33, 1.33, 1.00, 0.72 and 1.09 times as long as wide, respectively. Width of scape 1.23 times that of pedicel, width of antennal club 1.83 times that of flagellum, terminal antennomere subovate, asymmetrically pointed (Fig. 2).

Ventral side of head broadly arcuately impressed. Collum at sides densely punctate and transversely rugose. Gular lines narrowly interrupted in the middle, with broad impunctate stripe along their outer side. Gula in anterior half diffusely punctate, in posterior half impunctate with shallow transverse wrinkles.

Pronotum 1.55 times as long as wide, widest at anterior margin, strongly constricted at basal fourth, gradually narrowed towards the constriction. Constriction developed as deeply incised furrow separating differently punctate anterior and posterior portion of prothorax. Base in the middle with transverse groove curved laterocraniad at sides and partly overlapped by its raised anterior edge (Fig. 4). Punctures deep, in front of constriction and at sides almost equal



Figs. 1–7. 1–4 – *Agnathus secundus* sp. nov.: 1 – holotype, habitus, 5.2 mm; 2 – antenna; 3 – aedeagus; 4 – pronotum. 5–7 – *A. decoratus* (Germar, 1818): 5 – habitus, specimen from Czech Republic (Moravia, Strážnice env.), 4.8 mm; 6 – antenna; 7 – aedeagus.

in size to eye facets and separated by ca. one diameter, becoming gradually smaller and less regularly dispersed anteriorly; interspaces densely reticulate, dull. Basal border and lateral parts behind prebasal constriction sparsely punctate with smaller and shallower punctures, interspaces shallowly reticulate, somewhat shining. Scutellum small, heart-shaped, densely finely punctulate. Prosternum short, densely punctate with intermixed larger punctures. Mesosternum long, triangular, shining, densely finely punctate with deep pit-shaped punctures fairly equal in size to eye-facets and separated by ca. one diameter or less. Mesepisterna large, triangular, punctate like prosternum, but the pit-shaped punctures larger and closer than those on mesosternum, widely separated from mesocoxal cavities by broad posterolateral processes of mesosternum. Narrow praepectus developed on mesepisterna, in middle interrupted by pointed anterior tip of mesosternum. Posterior intercoxal process of mesosternum narrow, pointed, with blunt median longitudinal carina. Metasternum convex, shining, with fine simple and dense punctures intermixed at sides and behind mesocoxae with widely spaced pit-shaped punctures equal in size to eye facets. Mesocoxal lines close to posterior margins of coxal cavities, interconnected at obtuse angle in middle. Posterior intercoxal margin with angulate excision prolonged by short and very deep mediolongitudinal groove. Metepisterna with pit-shaped punctures closer than those on metasternum, fine punctures indistinct.

Elytra twice as long as their combined width, ovate, widest somewhat behind midlength and reaching maximum length at suture. Surface strongly transversely convex at sides, less so at suture; lateral margins not visible simultaneously from above except for short portion behind humeral bulge. Humeral bulges strongly prominent, concealing humeral angles. Broader and lower bulge situated posteromesad of humeral bulge on each elytron. Elytra moderately transversely depressed behind the bulges, the depression extending laterally towards lateral margins of elytra. Surface impressed along suture between posterior transverse bar and apical white spot. Punctures ca. as large as eye facets, umbilicate, irregularly diffuse, separated by one to several diameters; interspaces microscopically punctulate, shining; large punctures abruptly replaced with fine, indistinct and widely spaced punctures behind posterior white bar.

Femora long and slender, rugosely punctate at distal end, ratios of length-to-width of pro-, meso- and metafemur equal to 4.1, 5.0 and 5.8 respectively. Tibiae slender, without longitudinal keels or angles (cross-section oval), widest at distal end, ratios of length-to-width of pro-, meso- and metatibia equal to 6.5, 6.5 and 8.5, respectively. Pro- and metatibiae straight, mesotibia broadly and shallowly concave behind midlength. Tarsal formula 5–5–4, all tarsi simple, slender, tarsal claws obtusely angulate at their base.

Protarsus 0.73 times as long as fore tibia. Tarsomere I twice as long as wide, tarsomeres II and III shorter, subequal. Terminal tarsomere as long as 0.38 of total length of tarsus, slightly longer than tarsomeres I and II combined. Mesotarsus almost as long as mesotibia, ratio of lengths of tarsomeres I–V as 23:10:10:6:20. Length of metatarsus 0.8 times that of metatibia, ratios of lengths of tarsomeres I–IV as 30:12:8:20.

Abdominal ventrites duller than metaventrite, densely microscopically punctulate with widely scattered larger punctures, the latter smaller than eye facets. Ratios of lengths of ventrites I–V as 75:45:25:20:15. First ventrite with triangular anterior intercoxal process and posterior margin broadly arcuately outcurved in its median third. Posterior margins of following ventrites straight.

Table 1. Diagnostic characters of *Agnathus* species.

***Agnathus secundus* sp. nov.** (Fig. 1)	***Agnathus decoratus*** (Fig. 5)
Body length 5.2–6.0 mm.	Body length 4.3–4.7 mm.
Elytra 1.95–2.00 times as long as their combined width.	Elytra 2.12–2.22 times as long as their combined width.
Width of head across eyes twice the length between posterior ends of eyes to anterior margin of clypeus.	Width of head across eyes ca. 1.70 times the length between posterior ends of eyes to anterior margin of clypeus.
Frons flat, punctures smaller than eye facets and separated by less than one diameter, interspaces obsoletely alutaceous, dull.	Frons with transverse impression between antennal insertions, more coarsely and somewhat rugosely punctate, interspaces smooth and shining.
Antennae thicker, 1.30 times as long as the width of head across eyes (Fig. 2).	Antennae more slender, 1.45 times as long as the width of head across eyes (Fig. 6).
Base of pronotum in the middle with transverse U-shaped groove with raised anterior margin (Fig. 4).	Base of pronotum simple, without groove or raised edge.
Elytral punctures impressed, umbilicate, nearly equal in size to eye facets and rather irregularly dispersed, separated by one to several diameters. This coarse and deep puncturation is replaced with indistinct minute and widely spaced punctures on apical portion of elytra behind the posterior white transverse bar.	Elytral punctures uniform, simple, hardly equal in size to eye facets, separated by one to two diameters, more regularly dispersed and becoming gradually finer distad.
Elytra black, their basal fourth completely dark red, the colour extending more caudad along suture.	Elytra black with red elongate subtriangular humeral spot just behind the black humeral bulge.
Anterior white zigzag bar equally narrow everywhere, at sides leading into a clearly defined triangular spot.	Anterior white zigzag bar of varying width, at lateral margins of elytra ending in an area of intermixed white and dark setae.
Posterior white bar broad, simple, widely interrupted at suture and completely separated by dark vestiture from the white apical area.	Posterior white bar very broad with several indentations both anteriorly and posteriorly, contiguous at suture, narrowly interconnected along suture with white tomentose apex and a small lunular preapical spot.
Tegmen tapering distad, its lateral margins almost rectilinear. Tip of median lobe blunt (Fig. 3).	Lateral margins of tegmen broadly and shallowly concave at about their midlength. Median lobe of aedeagus tapering towards acutely pointed apex (Fig. 7).

Male genitalia. Tegmen gradually tapering towards narrowly rounded apex, its lateral margins almost rectilinear. Tip of median lobe blunt (Fig. 3).

Variation. No substantial variation or sexual dimorphism is apparent in the type series. Body length 5.2–6.0 mm, width 1.7–2.0 mm. Pronotum 1.52–1.56 times as long as wide, elytra 1.95–2.01 times as long as their combined width.

Differential diagnosis. *Agnathus secundus* sp. nov. differs from *A. decoratus* in the traits summarized in Table 1.

Etymology. *Secundus*, Latin adjective meaning second, for the species is the second known species of the genus.

Collecting circumstances. The holotype (male) was collected by M. Janata (pers. comm.) running along with some Cleridae on fallen trunks of various conifers (*Abies* sp., *Pinus* sp., *Picea* sp. and *Larix* sp.) (Figs. 11–12). Three paratypes (females) were collected by one of us (V.K.) in the massif Baima in a deep valley directed southwards on lower parts of southeastern slopes at an altitude of 3,900 m. The adults were quickly running around in bark crevices of a fallen trunk of a fir (*Abies* sp.) during sunny warm weather at about midday. The behaviour of the beetles resembled that of some species of the family Cleridae and was suggestive of prey-searching behaviour of a predator. Trunk of a freshly cut tree, about 4 m long and about 40 cm in diameter laid on a place insolated between ca. 10 a.m. and 3 p.m (see Fig. 10). A fast torrent was found about 150 m from the spot, with pieces of dead wood located in more quiet water.

Two weeks later, V.K. observed one specimen, which he failed to collect, on a similar locality in Hengduan Mts., massif Meili, 28°00′N 98°52′E, 11.vii.1996, about 40 km southwest of the first locality (Baima massif). The beetle was running at about midday on the bark of an uprooted but still fresh fir tree, 15–20 m high and ca. 80 cm in diameter, hanging on its branches 1–4 m above surface. The tree was situated in a lower part of a cirque with a spring at an altitude of 3,650 m on a southern slope with remnants of a predominantly coniferous forest near tree-line. There was also a small brook about 200 m away from the tree.

Distribution. Mountain primeval forests of Yunnan Province in southwestern China.

Agnathus decoratus (Germar, 1818)

(Figs. 5–9)

Notoxus decoratus Germar, 1818: 229. Type locality: Central Germany, Sachsen-Anhalt, Halle env., near river.

Agnathus ornatus Megerle von Mühlfeld' in Germar (1818): 232 (unavailable name). – Gemminger & Harold (1869): 2062 (catalogue; in synonymy; unavailable name); Seidlitz (1898): 363 (comment; unavailable name); Abdullah (1974): 24 (comment; unavailable name).

Agnathus decoratus: Germar (1825): (4), pl. 4. (characters); Dejean (1834): 216 (catalogue; France); Dejean (1836): 237 (catalogue; France); Duponchel (1842): 199 (dictionary); Kiesenwetter (1849): 53 (catalogue); LaFerté-Sénectère (1849): 295 (characters; biology; distribution; localities in France and Germany); Gaubil (1849): 237 (list of species; distribution); Redtenbacher (1849): 609 (characters; locality in Austria); Mulsant & Rey (1856a): 114–118, pl. I, figs. 1–4 (descriptions of larva and pupa); Mulsant & Rey (1856b): 114–118, pl. I, figs. 1–4 (descriptions of larva and pupa); Dohrn (1858): 69 (catalogue); Redtenbacher (1858): 635 (characters; locality in Austria); Bach (1859): 282 (characters); Schaum (1859): 75 (catalogue); Gutfleisch & Bose (1859): 430 (characters); Lacordaire (1859): 523 (larva; pupa; characters), 532 (characters; distribution); Schaum (1862): 77 (catalogue); Fairmaire (1863): 458 (characters), pl. 100, figs. 500, 500a,b; Marseul (1863): 191 (catalogue); Marseul (1866): 86 (catalogue); Bach (1866): xlii (list of species; Germany); Mulsant & Rey (1866a): 269, figs. 1–4 (characters of adult), 271 (biology; distribution; locality in France), 272, figs. 5–7 (characters of larva), 274, fig. 8 (characters of pupa), 282 (list of species); Mulsant & Rey (1866b): 6 (list of species), 181, figs. 1–4 (characters of adult), 183 (biology; distribution; locality in France), 184, figs. 5–7 (characters of larva), 186, fig. 8 (characters of pupa); Stein (1868): 86 (catalogue); Rózsay (1868): [page ?] (list of species; locality in Slovakia); Gemminger & Harold (1869): 2062 (catalogue; in Pythidae); Reitter (1870): 123 (list of species; biology; locality in Moravia); Brancsik (1871): 73 (list of species; biology; locality in Slovenia); Stierlin & Gautard (1871): 224 (list of species; locality in Switzerland); Abeille de Perrin (1874): [page ?] (study); Redtenbacher (1874): 138 (characters; locality in Austria); Bertolini (1874): 155 (list of species; distribution in Italy); Seidlitz (1875): 368 (list of species; distribution); Gozis (1875): 65 (catalogue; France); Stein & Weise (1877): 123 (catalogue; distribution); Delherm de Larcenne (1877): [page ?] (list of species; locality in France); Baudi di Selve (1877): 407 (localities in Italy; biological note); Schneider & Leder (1878): 248 (list of species; locality

in Georgia); Schlosser Klekovski (1878): 568 (key), 571 (characters; localities in Croatia); Buysson (1879): 151 (colour plate with 1 fig.); Buysson (1880): 72 (biology); Heyden (1883): 138 (catalogue; distribution); Rey (1884): 428 (comments in favour of the placement in Anthicidae); Marseul (1887): 344 (catalogue); Bielz (1887): 81 (list of species; locality in Romania); Schilsky (1888): 92 (list of species; distribution in Germany, Prussia, Silesia, Moravia and Austria); Quedenfeldt (1888): (8) (locality in Germany); Baudi di Selve (1889): 145 (list of species; distribution in Piemonte); Gerhardt (1890): 295 (list of species; locality in Moravia); Seidlitz (1890): 528 (list of species; distribution); Stierlin (1890): 160 (list of species; localities in Switzerland); Seidlitz (1891): 567 (list of species; distribution); Heyden (1891): 256 (catalogue; distribution); Kuthy (1897): 133 (list of species; localities in Hungary, Slovakia and Romania); Seidlitz (1898): 360 (larval characters), 362 (characters; comments; biology; distribution; localities); Buysson (1898): 129 (biology); Desbrochers des Loges (1900): 4 (characters; localities in France), 39 (list; distribution in France); Warnier (1901): 121 (catalogue); Barthe (1902): 57 (list of species; France); Reitter (1906): 462 (catalogue; distribution); Formánek (1907): 52 (biological note); Eggers (1908): 5 (biological note); Reitter (1908): 21 (biological data; locality in Moravia); Schilsky (1908): 126 (list of species; distribution in Germany, Prussia, Silesia, Moravia and Austria); Buysson (1910): 106 (biology; distribution; localities in France); Gerhardt (1910): 279 (list of species; locality in Moravia); Reitter (1911): 413 (characters in key; biological data; localities in Germany); Falcoz (1912): 19, 51 (list, in Lagriidae; note; locality in France); Kuhnt (1912): 730 (key; distribution); Petri (1912): column 231 (list of species; locality in Romania); Łomnicki (1913): 117 (list of species; Silesia); Jakobson (1915): 1017 (list of species; distribution; locality in Georgia; bibliography), pl. 79, fig. 20; Purkynĕ (1926): 94 (biological data; locality in western Ukraine); Abot (1928): 234 (list of species; biological data; locality in France); Winkler (1928): column 900 (catalogue; distribution); Stammer (1929): 24 (biological data); Fleischer (1930): 299 (list of species; biological data); Portevin (1931): 109 (key; characters), fig. 214; Galibert (1932): 307 (list of species; biological data; locality in France); Fleischer (1933): 105 (list of species; biological data); Porta (1934): 78 (key; distribution in Italy); Roubal (1934): 177 (biological data and reflections on bionomy; localities in former Czechoslovakia); Roubal (1936): 298 (list of species; biology; distribution; localities in Slovakia and Transcarpathian Ukraine; bibliography); Borchmann (1936): 539, pl. 8, fig. 63e,f, pl. 9, fig. 70 (monograph; distribution); Sainte-Claire Deville (1937): 315 (list of species; distribution in France); Borchert (1938): 84 (list of species; distribution); Träger (1937): 7 (list; locality in Hungary); Hudeček (1940): 184 (biological data; locality in Moravia, Czech Republic); Roubal (1941): 270, 276 (biological note); Pittioni (1943): 129 (list of species; locality in Austria); Horion (1951): 349 (list of species; distribution in Central Europe); Borchert (1951): 161 (list of species; from type locality only); Pfeffer (1955): 53 (biological data; in Lagriidae); Horion (1956): 173 (list of species; biology; distribution; localities in Europe; bibliography); Kaszab (1957): 73 (characters; biological data; distribution; not in Hungary – but see also Kovács et al. (2000)), fig. 53; Balthasar (1957): 444 (key; biological data); Hlisnikovský (1958): 213 (collecting circumstances; localities in Moravia and Bulgaria); Medvedev (1965): 351 (key of species); Kaszab (1969): 215 (key; distribution); Abdullah (1974): 20 (comments), 22 (key), 24 (catalogue); Franz (1974): 299 (list of species; distribution; localities in northern Austria; in Lagriidae); Mamaev (1976): 642 (larva; description); Iablokoff-Khnzorian (1985): 223 (revision; characters; biology; distribution), fig. 12(1–6); Lucht (1987): 226 (list of species; distribution in Central Europe); Burakowski et al. (1987): 159 (catalogue; biological data; distribution; records from Silesia probably refer to Moravian Silesia in the Czech Republic; unknown from Poland); Koch (1989): 329 (distribution; biology); Renner (1991): 135 (list; locality in Westphalia, Germany); Jelínek (1993): 116 (list of species; distribution in former Czechoslovakia); Angelini et al. (1995): 19 (list of species; distribution in Italy); Alexand-rovich (1995): 72 (list of species; locality in Belarus; in Cononotidae); Alexandrovich et al. (1996): 44 (catalogue; Belarus); Klausnitzer (1996): 316–317 (larva; characters; biological data), figs. 1–3; Köhler & Klausnitzer (1998): 126 (list of species; distribution in Germany); Szalóki (1999): 197 (locality in Hungary; in Pyrochroidae); Kovács et al. (2000): 201 (*Agnathus*-bibliography for Hungary; localities in Hungary; in Pyrochroidae); Jászay (2001): 139 (list of species; locality in Slovakia), 193, 203 (conservation); Jäch et al. (2002): 211 (faunistics; biological data; distribution; localities in Austria, Czech Republic and European part of Turkey; in Pyrochroidae); Bouyon & Van Meer (2004): 87 (new observations; distribution; localities in France; in Pyrochroidae); Hůrka (2005): 211 (list of species; in Pyrochroidae); Jelínek (2005): 524 (red list; in Agnathidae); Nardi (2007): web page (list of species; distribution: Italian mainland only(!); dating of species name 1825); Théry (2007): 165 (locality in France; in Pyrochroidae); Pollock & Young (2008): 417 (catalogue; general distribution); Nikitsky et al. (2008): 318 (list of species; localities in southern European Russia; in Agnathidae).

Geographic distribution (Fig. 8)

Polock & Young (2008: 417) listed *A. decoratus* from the following countries: Austria, Bosnia Herzegovina, Belarus, Croatia, Czech Republic, France, Georgia, Germany, Italy, Poland, Romania, Slovakia, Russia: South European Territory, Switzerland, Ukraine and Asian Turkey. Occurrence in Bulgaria (published by Roubal 1936) and in Slovenia is not mentioned. The record from 'Steiermark... bei St. Leonhard' (Brancsik 1871, subsequently Horion 1956 etc.) refers to nowadays Slovenia (Lenart v Slovenskih Goricah). A record from the Asian part of Turkey is probably based on misinterpretation of data from Jäch et al. (2002), who recorded the species from the European part of Turkey (see below).

Published records. AUSTRIA: 'Österreich', early 19th century [as '*Agnathus ornatus* Megerle von Mühlfeld'] (Germar 1818; LaFerté-Sénectère 1849; Seidlitz 1898). **Kärnten:** Völkermarkt Bezirk, Gallizien, Vellach river bank, 28.vii.2001, R. Schuh leg. and det., 5 spec., RSCW [1 spec. in CHCV, C. Holzschuh pers. comm.] (Jäch et al. 2002). **Niederösterreich:** Wien env., Dr. C. Hampe leg., repeatedly (Redtenbacher 1849, 1858, 1874); Wien-XIV Bezirk, Kellerwiese bei Purkersdorf, 250 m a.s.l., R. Reithoffer leg., 1 spec., ex coll. M. Curti [destroyed, NLHW] (Pittioni 1943). **Steiermark:** Spielfeld, ca. 1900, Weber leg., 1 spec., SLJG (Horion 1956). **BELARUS: Hrodno:** Grodnenskii reg.: Novoselki village env., Avgustovskii canal bank, 21.v.1990, O. R. Alexandrovich leg., 3 spec., ZIN, ZMUB (Alexandrovich 1995). **BOSNIA HERZEGOVINA:** 'Bosnien', 1 spec., DEI (Horion 1956). **BULGARIA:** 'Blg.' (Roubal 1936). **Blagoevgrad:** SW of Gotse Delchev [as 'Nevrokop'] in Alibotush Mts., J. Hlisnikovský leg. (Hlisnikovský 1958). **Burgas:** Strandzha planina Mts., Malko Tarnovo env., J. Hlisnikovský leg. (Hlisnikovský 1958). **CROATIA:** 'Kroatien', 1 spec., NHMB in coll. G. Frey ['Croat.', V.K. revid.] (Horion 1956); near Križevci; Podravina reg.: near Čukovec and Ludbreg (Schlosser Klekovski 1878: 571). **CZECH REPUBLIC: Moravia:** Paskov env., Olešná brook-Ostravice river valley [6275d], 17.iv.1869, on *Quercus* stump, E. Reitter leg., more spec. (Reitter 1870); Olešná brook near Paskov [6275d], ~1871, *Alnus* stump, E. Reitter leg., 32 spec. (Reitter 1908, 1911); Litovel env. [62–6368], ~1920, on *Alnus* stump in flooded brook, J. Slavíček leg. (Hudeček 1940); 'Morava', formerly more abundant (Fleischer 1930); Moravia (without exact data), 1990's, more spec. (Jäch et al. 2002; see also 'Unpublished records'); Hynkov env. [6369a], 24.vi.2006, 1 spec. (Nakládal 2008); Litovel [6368b], 2.vii.2006, gravel bank – on a poplar log (*Populus* sp.) above the water level of the Morava river, 5 spec. (Nakládal 2008). **Silesia:** Ostravice (1.5 km NW), Ostravice river, 'Peřeje' [now 'PP Koryto řeky Ostravice' nature reserve, 49°33′04.50″N 18°22′59.30″E] [6476c], 400 m a.s.l., July-August 1953, J. Hlisnikovský leg., 2 ♂♂, 3 ♀♀ (Hlisnikovský 1958). **FRANCE:** 'Gallia' (Dejean 1834, 1836). **Allier:** Saint-Pourçain-sur-Sioule (Desbrochers des Loges 1900); Broût-Vernet, H. du Buysson leg., 3 spec., NHMB in coll. G. Frey [all V.K. revid., one with '8.x.07'] (Horion 1956); Saint Pourçain, Sioule river, 20.viii.2003, 15 spec. (Bouyon & Van Meer 2004). **Allier** and **Puy-de-Dôme:** Sioule and Allier rivers (Buysson 1910). **Gers:** Adour river (Delherm de Larcenne 1877; sec. rec. Desbrochers des Loges 1900). **Gironde:** Belin-Beliet, La Leyre river, 20.ix.2003, 15 spec., 9.xi.2003, 6 spec. (Bouyon & Van Meer 2004). **Loiret:** Saint-Benoît-sur Loire, 27.vii.2007, 2 spec. (Théry 2007). **Lot:** Cabreret, Célé river, 27.xi.1991, 1 spec.; Vayrac, Dordogne river, 1 spec.; Martel, 1 spec., all D. Delpy leg. (Bouyon & Van Meer 2004). **Maine-et-Loire:** Sainte-Gemmes-sur-Loire, J. Gallois leg. (Abot 1928). **Rhône:** d'Izeron brook near Lyon, September 1843, more spec., C. Rey leg. (LaFerté-Sénectère 1849, Mulsant & Rey 1866); Vallon d'Oullins, 15.v. and 3.vii.1845, E. Foudras leg. (Falcoz 1912). **Tarn:** Agout river, Castres, Beaudecamy, 24.viii., on *Alnus*, H. Galibert leg., 9 spec. (Galibert 1932). **GERMANY: Bayern:** Donaustauf (E of Regensburg), Donau river bank under Walhalla monument, 4.vi.1949, H. Wichmann leg., 1 spec., (Horion 1956). **Brandenburg:** Berlin, by flood, 2 spec. (LaFerté-Sénectère 1849); Oberspreewald [ca 60 km SE of Berlin], in flood debris (Quedenfeldt 1888). **Sachsen-Anhalt:** Halle [type locality], on river at flight [?Saale river], 7.v.[?1818], 1 spec. (Germar 1818, LaFerté-Sénectère 1849). **Westfalen:** Telgte env. [near Münster], 1.vi.1972, C. Rövekamp leg. (Renner 1991). **GEORGIA:** Borzhomi, June, O. Schneider leg., 1 spec. (Schneider & Leder 1878); Tbilisi (Jakobson 1915). **HUNGARY:** 'Ungarn', Miller leg., 4 spec., ZSMC (Horion 1956). **Szabolcs-Szatmár-Bereg:** Tiszacsécse: Kis-mező, FU33, 11.v.2000, T. Kovács leg. (Kovács et al. 2000). **Vas:** Szentgotthárd: Zsida valley, from *Alnus* stump (Träger 1937, Szalóki 1999). **ITALY:** Upper Italy (Bertolini 1874). **Emilia Romagna:** near Piacenza: at Po river (Baudi di Selve 1877); Po river near Piacenza, many spec., Meda leg. (Seidlitz 1898); Piacenza, Meda leg., 2 spec., NHMB in coll.

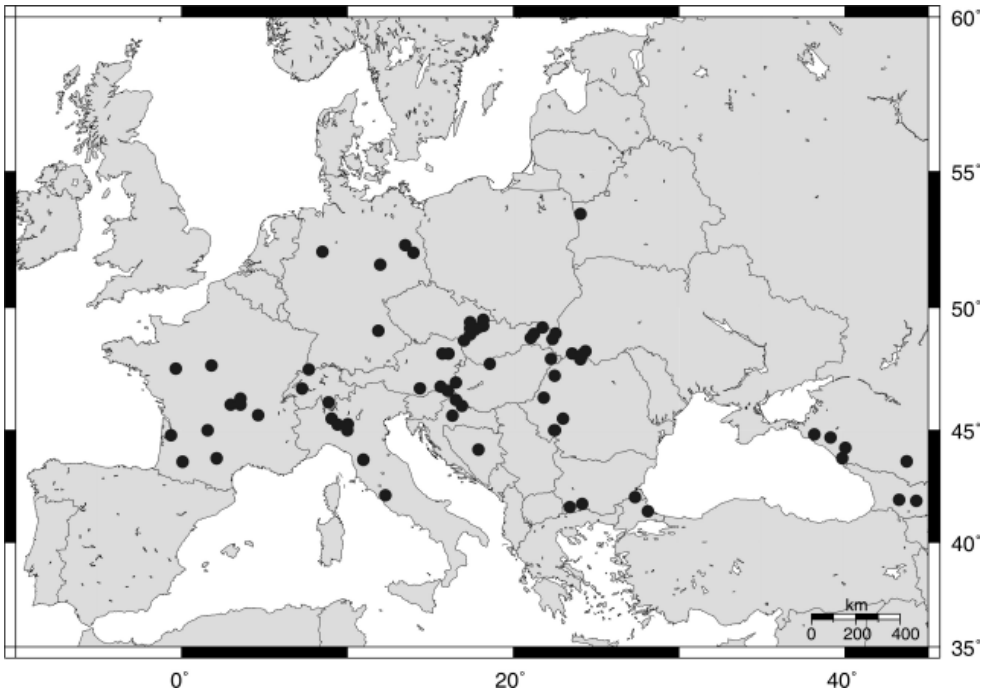


Fig. 8. Distribution of *Agnathus decoratus* (Germar, 1818).

G. Frey [V.K. revid.] (Horion 1956). **Lazio:** (Porta 1934). **Lombardia:** Pavia (Baudi di Selve 1877); Milano, 4 spec., ZSMC (Horion 1956). **Piemonte:** at Po and Ticino rivers (Baudi di Selve 1889). **Toscana:** (Bertolini 1874); Pisa (Baudi di Selve 1877). **POLAND:** 'Silesia' (by Schilsky (1888, 1908); and subsequently Kuhnt (1912); Łomnicki (1913)); 'Silesia' sensu Schilsky (1888, 1908) is not Polish Silesia – unknown in Poland (Burakovski et al. 1987). **ROMANIA: Arad:** Sebiş [as 'Borossebes'], near Crişul Alb [= Fehér-Kőrös] river (Kuthy 1897). **Caraş-Severin:** Băile Herculane, near Cerna river, 1932, K. Dorn leg., more spec. (Horion 1956). **Hunedoara:** Haţeg [as 'Hátszeg'] (Bielz 1887; Kuthy 1897; Petri 1912). **Satu Mare:** Tăşnad [as 'Tasnád'] (Kuthy 1897). **EUROPEAN RUSSIA:** NW Caucasus Mts.: **Adygeya:** Maikop reg., Novoprokhladnoe env., 1958 [no collector data], 1 spec. (Nikitsky et al. 2008). **Krasnodar Region:** Krasnaya Polyana env., Mzymta river valley, June 1996, on *Alnus*, B. M. Mamaev leg., larvae – more spec. (Mamaev 1976); Ubinskaya village, Ubinskoe lesnichestvo [forest district], viii.1971, at light, B. N. Nikitsky leg., 1 spec., ZMUM (Nikitsky et al. 2008). **SLOVAKIA:** Košice [as 'Kaschau'] [72–7393] (Rózsay 1868 – sec. rec. Roubal 1936); Medzilaborce [as 'Mezőlaborcz'] [6797a] (Kuthy 1897); Nová Sedlica, Zbojský brook valley [6901ac], 15.vi.1998, on *Alnus*, T. Jászay leg., 1 spec., SMBC (Jászay 2001). **SLOVENIA:** Lenart v Slovenskih Goricah, on *Prunus padus* L., 1 spec., J. N. Spitzy leg. ['Die Käfer der Steiermark.', 'Auf *Prunus Padus* bei St. Leonhard 1 Ex. (Sp.)'] (Brancsik 1871). **SWITZERLAND: Basel:** Basel env., L. Imhoff leg., 1 spec. (Stierlin & Gautard 1871; Stierlin 1890). **Bern:** Laupen (Horion 1956). **Ticino:** Lugano, Stabile leg. (Stierlin & Gautard 1871, Stierlin 1890). **EUROPEAN TURKEY: İstanbul:** Istranca [= Binkılıç], M. Jäch leg., 1 spec., NHMW (Jäch et al. 2002). **UKRAINE: Transcarpathian Ukraine:** Shopurka river [near Velikiy Buchkov], July 1924, on *Fagus*, C. Purkyně leg., more spec. (Purkyně 1926); Kosova rika river, 660 m a.s.l., August, on *Alnus incana* L., A. Pfeffer leg. (Roubal 1934, 1936).

Unpublished records. BELARUS: Hrodno: Grodnenskii reg., Novoselki village env., Avgustovskii canal, 21.v.1990, O. R. Alexandrovich leg. (1 spec., ZIN, B. A. Korotayev and M. G. Volkovitsh pers. comm.). **BOSNIA HERZEGOVINA:** 'Bosnia' (1 spec., NMPC). **BULGARIA: Blagoevgrad:** Pirin Mts., August 1957, A. Pfeffer

leg. (1 spec., NMPC). **Burgas:** Strandzha planina Mts., Malko Tarnovo, 17.v.1939, J. Hlisnikowski leg. (1 spec., NMPC) [see also Hlisnikovský 1958]; Strandzha planina Mts., July 1934, A. Pfeffer leg. (4 spec., NHMB in coll. J. Gottwald; 12 spec., NMPC). **CZECH REPUBLIC:** 'Moravia Reitter' (1 spec., NMPC). **Moravia-C:** Chřiby hills, Divoky near Těšánky [6769d] (1 spec., MMBC in coll. E. Jagemann); 'CHKO Litovelské Pomoraví' Protected Landscape Area, 10 km NW of Olomouc: Hynkov (ca 1 km E) [6369a], Morava river bank: January 1991, by sifting, V. Vyhnálek leg. (1 spec., ZKCM; 2 spec., VVCO); 23.iii.–3.iv.1991, by sifting, overwintering in bark crevices under moss at base of a poplar trunk (*Populus* sp.), M. Bednařík, R. Fornůsek, I. Martinů & V. Vyhnálek leg. (ca 80 spec., MBCO, VVCO, etc., M. Bednařík pers. comm.; also labelled as: 'Střeň', 'Střeň/Litovel env.' or 'Štěpánov, bř[eh]. Moravy [i.e. Morava river bank]'); 28.iii.1991, R. Fornůsek leg. (1 spec., HNHM, O. Merkl pers. comm.); 30.iii.1991, V. Vyhnálek leg. (1 spec., PZCW, P. Zabransky pers. comm.; 1 spec., ZKCM); 3.iv.1991, M. Bednařík leg. (1 spec., NMPC; 1 spec., PZCW, P. Zabransky pers. comm.); Hynkov (0.8 km NE) [6369a], 'NPR Ramena řeky Moravy' near 'PR Kenický' Nature Reserve, 49°40′24,7″N 17°10′52,4″E, 19.viii.2008, M. Horsák, M. Straka & A. Lacina leg. (8 spec., JSBC, MHBC, MMBC, MSOC, MTBC, P. Kment pers. comm.; 4 spec. NMPC); Litovel-Víska, ca. 20 m from Mlýnecký brook, on a white wall below a street light, 22.iv.2004, O. Nakládal leg. and det. (1 spec., ONCL). **Moravia-S:** near Bzenec-Přívoz [7069d]: 'Černé jezero' forest, by sifting mosses at feet of *Juglans nigra* and *Quercus* sp., 18.x.2003, M. Boukal leg. and det. (1 spec., MBCP); ditto, by sifting rotten wood, detritus and moss at foot of an oak (*Quercus*), 17.ii.2007, M. Boukal leg. and det. (1 spec., MBCP); near Bzenec-Přívoz [7069d], meander of Morava river: 25.xi.2003, J. Ch. Vávra leg. and det. (many spec., JVCO); 6.xii.2003, J. Ch. Vávra and T. Sitek leg., J. Ch. Vávra det. (many spec., JVCO, TSCO; 1 spec., ZKCM); Strážnice (3.5 km NW), 'PP Osypané břehy' nature reserve, meander of Morava river [7069d], 48°55′N 17°16′30″E, 170 m a.s.l., 5.ii.2009, V. Kubáň leg. (1 ♂, 2 ♀♀, NMPC); Břeclav (S env.): 'Pohansko' [7267c], meadow near a path, sweeping, 1.viii.2007, R. Fornůsek leg. and det. (1 spec., not collected, M. Boukal, pers. comm.). **Silesia:** Beskydy Mts.: Lysá hora massif, Kobylík brook [6476d], ca. 500 m a.s.l., ~1960, several spec., J. Hlisnikovský leg. (Petr Nohel, pers. comm.); Krásná (3 km S), near Řepčonka, Mt. Trávný (W slope), near the confluence of Česnekový potok brook and Mohelnice river [6476b], ca. 600 m a.s.l., 3.ix.1967, on *Alnus*, P. Nohel leg. and det. (1 dead spec., PNCP). **FRANCE:** 'Frankreich' (2 spec., NHMB in coll. general); 'Gallia' (1 spec., MMBC). **Allier:** Broût-Vernet, on *Alnus*, H. du Buysson leg.: 7.x.1906 (1 spec., NMPC), 3.x.1907 (4 spec., NMPC; 1 spec., SNMC, I. Rychlík pers. comm.), 18.x.1908 (2 spec., NMPC), without date (4 spec., HNHM, O. Merkl pers. comm.; 1 spec., NHMB in coll. J. Gottwald; 2 spec., NMPC); 'Allier' (2 spec., NMPC); Montluçon, ii.1888, abbé Chanrion leg. (1 spec., CHCV, C. Holzschuh pers. comm.). **ITALY:** 'Italia, Dohrn' (1 spec., ZIN, B. A. Korotayev and M. G. Volkovitsh pers. comm.); 'Italia, Rosenhauer' (1 spec., NMPC). **EUROPEAN RUSSIA:** 'Caucas.' [or GEORGIA] (1 spec., ZIN, B. A. Korotayev and M. G. Volkovitsh pers. comm.). NW Caucasus Mts.: **Kabardino-Balkaria:** Urvanskij reg. [Urvan', 10 km E of Nal'chik], Chernaya rechka [Black river], 22.iii.1986, under bark of poplar (*Populus*), Kravets leg. (1 spec., MKCY, M. Yu. Kalashian pers. comm.). **Krasnodar:** Black Sea coast, 15 km SE of Novorossiisk, Kabardinka (1 spec., ZIN, B. A. Korotayev and M. G. Volkovitsh pers. comm.); 40 km NEE of Sochi, Krasnaya Polyana, A. Yu. Solodovnikov leg. (1 spec., ZIN, B. Korotyaev pers. comm.). **SLOVAKIA:** Kamenica nad Hronom, Hron river bank [8178c], in stump, 9.v.1978, L. Bocák leg. and det. (1 spec., LMBC); Giraltovce [6895c], 1933, V. Depta leg. (1 spec., MMBC; 1 spec., NMPC; 1 spec., SNMC, I. Rychlík pers. comm.); Remetské Hámre [7199ac], 21.vi.1965, Z. Tesař leg. (1 spec., SMOC, J. Roháček pers. comm.); Ulič, ca 50 m from the confluence of brooks Ulička and Zbojský [7000b], at dusk, sandy bank, flying, July 1995, T. Kopecký leg. and det. (1 spec., TKCH). **SWITZERLAND:** 'Swisse-Tessin, Lugano, Stierlin.' (1 spec., MHNG, coll. Switzerland, G. Cuccodoro pers. comm.). **UKRAINE: Transcarpathian Ukraine:** 'Carp. or.' (2 spec., NMPC); 'Podk[arpatská]. Rus [= Transcarpathian Ukraine]' (1 spec., NMPC); Šopurka river, [vii.] 1924, C. Purkyně leg. (1 spec., SNMC, I. Rychlík pers. comm.); Chernaya Tisa river valley east of Mt. Goverla [as 'Howerla'], C. Purkyně leg. (2 spec., NMPC); Kvasy [as 'Kuzy'], July 1928, A. Pfeffer leg. (2 spec., NMPC); Kevelovo [as 'Apšinec'], C. Purkyně leg. (1 spec., MMBC; 1 spec., NHMB in coll. J. Gottwald; 1 spec., NMPC).

Known distribution. Austria (Kärnten, Niederösterreich, Steiermark); Belarus (Hrodno); Bosnia Herzegovina; Bulgaria (Blagoevgrad, Burgas); Croatia (in the north); Czech Republic (Moravia, Silesia); France (Allier, Gers, Gironde, Isère, Loiret, Lot, Maine-et-Loire, Puy-de-Dôme, Rhône, Tarn); Germany (Bayern, Brandenburg, Sachsen-Anhalt, Westfalen); Georgia (Borzhomi, Tbilisi); Hungary (Szabolcs-Szatmár-Bereg, Vas); Italy (Emilia-Romagna, Lazio,

Lombardia, Piemonte, Toscana); ?Poland; Romania (Arad, Caraş-Severin, Hunedoara, Satu Mare); European part of Russia (Adygeya, Kabardino-Balkaria, Krasnodar region); Slovakia (southern and eastern part); Slovenia (northeastern part); Switzerland (Basel, Bern, Ticino); European part of Turkey (İstanbul); Ukraine (Transcarpathian Ukraine).

Biology

Germar (1818) in his description of *A. decoratus* wrote 'Einmal bei Halle im Fluge gefangen. (7. Mai.) [once near Halle, caught in flight]'. The type specimen described by Germar (1818) was, according to LaFerté-Sénectère (1849), caught during a sail on a river; he mentioned further two specimens collected during a flood near Berlin and gave detailed collecting circumstances by C. Rey, who collected both adults and larvae on the trunks of alder (*Alnus*), partly submerged in water near Lyon (see also Mulsant & Rey 1866). Buysson (1910) described in detail his observations of the biology of *A. decoratus*. Review of all published and unpublished observations on the biology is given below.

Published biological data and collecting circumstances. LaFerté-Sénectère (1849: 295, 296): Alder (*Alnus*) trunks in water; together with *Xyleborus pfeilii* (Ratzeburg, 1837) (Coleoptera, Curculionidae, Ipinae). Mulsant & Rey (1866: 183): *Alnus* trunks in water. Reitter (1870: 123): *Quercus* stump in water, adults hidden in the crevices on the front side of the stump. Brancsik (1871: 73): On *Prunus padus* L. Delherm de Larcenne (1877): beating trees at a river bank (sec. rec. Desbrochers des Loges 1900). Baudi di Selve (1877: 407): on wood fungi – 'fixae fungis' (see also Iablokoff-Khnzorian 1985: 223). Schlosser Klekovski (1878: 571): adults at flowers, especially on *Prunus spinosa* L. Buysson (1880: 72): *Alnus* stump with *Xyleborus*. Quedenfeldt (1888: (8)) records from flood debris. Baudi di Selve (1889: 145): in rotten or moulded wood in water. Reitter (1908: 21): *Alnus* stump in water, together with *X. pfeilii* and *Rhizophagus* (*Cyanostolus*) *aeneus* Richter, 1820 (Monotomidae). Purkyně (1926: 94): *Fagus* stump in water, with *Xyloterus domesticus* (Linnaeus, 1758) (Coleoptera, Curculionidae, Scolytinae); always more specimens together on/under bark, flying in warm weather. Galibert (1932: 307): several partly teneral specimens in pupal chambers in the sapwood under bark of thick alder logs drifted ashore on 24 August 1932. Pfeffer (1955: 53): development in galleries of *X. pfeilii*, *Xyleborus dispar* (Fabricius, 1792) and *X. domesticus*. Bouyon & Van Meer (2004: 87-89): verification of the observations on the historical localities by Buysson (1910); role of *A. decoratus* in relation to the accompanying bark beetles not settled (predator or commensal). Nikitsky et al. (2008: 318): one specimen at light of a mercury-vapor lamp. Mamaev (1976: 643): larvae collected under bark of a dying alder in a river walley. Koch (1989: 329): stenotop – paludicol – corticol and lignicol, inhabiting swampy forests. Alexandrovich (1995: 72): under bark of *Ulmus*, trunk in water. Kovács et al. (2000: 202): one specimen caught flying over a wet place near river in sunny afternoon. Jászay (2001: 139): under bark of an alder trunk fallen in water.

Several authors gave more detailed accounts of the biology of *A. decoratus*, and we summarize them in the following text. Buysson (1910: 106–115, 117, 119, 123) published results of his long-term observations on the biology of *A. decoratus* and stated that this species is a member of the association of insects developing in trunks and branches of fallen alders

partly submersed in water. The trees are first attacked by *Xyleborus dispar* followed by *X. pfeilii* and *X. saxesenii* (Ratzeburg, 1837), which create conditions for development of some dipteran larvae along with *Rhizophagus* (*Rhizophagus*) *picipes* (Olivier, 1790) [as *R.* (*R.*) *politus* (Hellwig, 1792), junior synonym of *picipes*] and *R.* (*C.*) *aeneus* [as *R.* (*C.*) *coeruleus* Waltl, 1838, junior synonym of *aeneus*]. *Agnathus decoratus* is supposed to be the top predator whose larvae feed on the larvae of all preceding insects. Larvae of *A. decoratus* occur in and near galleries of bark beetles under bark and pupate in chambers in the crevices of bark filled with wood bits.

Roubal (1934: 177) considered *A. decoratus* as strictly associated with monophagous *Xyleborus pfeilii* and hence with alder (*Alnus*). He considered the record from oak (*Quercus*) by Reitter (1870) as an error and subsequent record from alder by Reitter (1908, 1911) as a correction of this earlier mistake. In fact there are two different records, one from 17.iv.1869 on an oak (*Quercus*) stump, and the second one 2–3 years later, this time on alder (*Alnus*) and along with *X. pfeilii* a *R.* (*C.*) *aeneus*. Later on, Roubal (1936: 298; 1941: 270, 276) stated that *A. decoratus* lives on alders fallen into water and slowly decaying there; thus the sap is transformed into a strongly stinking liquid with smell resembling that of hemp. These trunks are sometimes attacked by *X. pfeilii*, *Xyleborus* spp. (or *Xyleborinus* spp.) and *Xyloterus domesticus*; in their galleries or nearby under bark lives also *A. decoratus* along with *R.* (*C.*) *aeneus*. This phenomenon occurs exceptionally, especially after calamities, which explains the rarity of both *X. pfeilii* and *A. decoratus*. Roubal (1936) also mentioned the occurrence of *A. decoratus* in galleries of *Elateroides* (= *Hylecoetus*) *dermestoides* (Linnaeus, 1761) (Coleoptera, Lymexylidae), referring to Purkynė (1926), but this information is missing in the latter paper. As Roubal (1934) observed the development of *E. dermestoides* in alder in southwestern Slovakia (Malé Karpaty Mts.) but could find neither *X. pfeilii* nor *A. decoratus* at this locality, the data on the occurrence of *A. decoratus* in the galleries of *E. dermestoides* is apparently based on an error.

Horion (1956: 174) summarized all previously published observations on biology of *A. decoratus* and added that K. Dorn repeatedly collected adults on the walls of houses near the Cerna river with old trees on banks in Băile Herculane (Banat, Romania) and that a specimen from Bavaria (Germany) had been found under the bark of hornbeam (*Carpinus betulus* L.).

Hlisnikovský (1958: 213) described that heavy snowfall damaged forests in the Beskydy Mts. (Silesia, Czech Republic) and broke many birches and alders in the valley of the Ostravice river in early 1953. In the spring, the author observed a strong attack of bark beetles on one broken but still living tree of *Alnus glutinosa* and subsequently found five specimens of *A. decoratus* under loose bark of the tree in summer 1953. Finally, Jäch et al. (2002: 212) reported a finding from a trunk of an alder broken during flood and obliquely projecting from water in Carinthia (Austria). The adults sat on the lower side of the trunk or in bark crevices, accompanied by *Xyleborus dispar*. Flightless males of this bark beetle arrived in great numbers around scarce females, which were partly bored into wood (there were only 10 females among ca. 120 specimens of *X. dispar*). They were considered as possible prey of *A. decoratus*. Moreover, Jäch et al. (2002: 212) stated that *A. decoratus* could be found in winter by sifting moss from the trees in lowland forest, based on reports from Moravia (Czech Republic).

Figs. 9–10. 9 – Czech Republic, Moravia, Litovelské Pomoraví Protected Landscape Area – locality with common occurrence of *Agnathus decoratus* (Germar, 1818). Photo by E. Svobodová. 10 – China, northeastern Yunnan province, Hengduan Mts., Baima Massif, ~3900 m a.s.l. – locality of paratypes of *A. secundus* sp. nov. Photo by V. Kubáň.

Figs. 11–12. China, northeastern Yunnan province, Habashan Mts., west of Haba village, 3200 m a.s.l. – type locality of *Agnathus secundus* sp. nov. Photos by M. Janata.

Unpublished biological data and collecting circumstances. These data are based on personal communications (for collecting data see above). Michal Bednařík collected overwintering adults (23.iii.–3.iv.1991) on basal portion of trunks of poplars (*Populus*), growing along the Morava river near Olomouc (Czech Republic) on elevated places that are not flooded in spring. The adults were concentrated in bark crevices in places covered by moss. Oto Nakládal found one specimen sitting on a white wall illuminated by street lights at the Mlýnecký brook (Czech Republic) at dusk on 22.iv.2004, and on 2.vii.2006 in the afternoon (ca. between 2–3 pm) observed near Litovel (Czech Republic) adults running quickly on lower sides of poplar trunks lying across the streambed of the Morava river. Michal Horsák, P. Kment, M. Straka and A. Lacina observed active adults on a fallen trunk, probably poplar, lying across the streambed of the Morava river near Hynkov (Czech Republic) at 7–7:30 pm, i.e. ca 30 minutes before dark on 19.viii.2008 (see Fig. 9). The trunk was barkless with slightly rotten wet surface overgrown by algae and without apparent galleries of bark beetles. Many specimens were running especially on lower surface of the trunk.

One of us (V.K.) found adults of *A. decoratus* overwintering under moss at the base of a solitary poplar (ca 80 cm in diameter) and an oak (ca 70 cm in diameter) in the forest near an elevated bank of the Morava river near Strážnice on 5.ii.2009. No overwintering specimens were found in bark crevices of a nearby alder without a moss cover. A lot of dead wood, especially poplar and willow, could be seen in the slowly flowing and meandering river, about 40 m broad, but only single alders were scattered in the growth of the river banks. The adults, when disturbed, display thanatosis for several seconds at room temperature and then abruptly start and quickly fly away.

Jiří Ch. Vávra observed overwintering specimens of *A. decoratus* along the river near Bzenec-Přívoz. The beetles occurred at the bases of various living deciduous trees (*Fraxinus*, *Juglans, Populus*, *Tilia*) like ground beetles of the genus *Dromius* Bonelli, 1810 (Carabidae). The number of specimens decreased with the distance from the river. Dominant on the biotope were walnut, lime, ash and oak, with scattered willows and poplars and a few specimens of alder. Only some 10 barkless trunks of unidentifiable trees stood on the river banks, with no obvious traces of the activity of bark beetles of the genera *Xyleborus* or *Xyloterus*. The high number of observed overwintering adults of *A. decoratus* most probably surpassed the possibilities to develop merely on the dead wood in the corresponding part of the river. Rostislav Fornůsek (M. Boukal, Pardubice, Czech Republic, pers. comm.) swept one specimen in a meadow in a floodplain forest near Břeclav (Czech Republic).

Ladislav Bocák found one specimen along with some Anthicidae on a sandy beach ca. 50 m south of the bridge over the Hron river at Kamenica nad Hronom (Slovakia) under a crust of dry mud, grass and leaves on a stump drifted ashore. Growth on the river banks consisted of grown poplars and willows. Finally, Tomáš Kopecký caught one specimen flying over sandy bank at dusk near the confluence of the brooks Ulička and Zbojský potok (Slovakia) in July 1995.

Conservation

Agnathus decoratus was classified as critically endangered (CR) in the Red list of threatened invertebrates of the Czech Republic (Jelínek 2005: 659). It is included in the Decree of

the Ministry of Environment of the Slovak Republic no. 24/2003 Zb. in the List of protected animals as a species of national importance in Slovakia and given in category 1 in the Red list of threatened animals in Germany (Geiser 1998: 208).

Agnathus decoratus is also mentioned as an important species in the conservation of species biodiversity of protected areas in the National Park Poloniny in Slovakia (Jászay 2001: 193) and in the southeastern part of the Baltic region (Czachorowski et al. 2001: 5). It is given as an indicator of good environmental conditions by Müller et al. (2005: 112) and Möller (2005: 26) gives *A. decoratus* as an important faunal element associated with dead wood in water.

Leaving dead or decaying wood in water is employed in revitalisation of watercourses in Central Europe since mid 1980s (see Siemens et al. 2006). Management of the Litovelské Pomoraví Protected Landscape Area (Czech Republic) started this practice several years ago. It is also supported by the local presence of beaver (*Castor fiber* Linnaeus, 1758) since the beginning of 1990s. An analogous situation occurs along the lower course of the Morava river (Czech Republic). These changes along with increasing water quality apparently create better conditions for *A. decoratus* as well, as suggested by the more frequent observations in the past 1–2 decades. It follows from these observations, conservation of old trees on river banks as wintering grounds for adults, in addition to leaving sufficient amount of dead wood in water, is necessary for long-term viability and further spreading of the population of *A. decoratus*, which represents an outstanding element of the European fauna.

Summary

Larvae of both *Agnathus* (Mamaev 1976) and *Cononotus* (Doyen 1979) have characteristic paired urogomphal pits on the ninth abdominal tergum; this apomorphy is shared with the Pedilidae, Pyrochroidae and Boridae (Young & Pollock 1991). Therefore both Mamaev (1976) and Doyen (1979) transferred *Agnathus* and *Cononotus* as a distinct subfamily Cononotinae to the Pedilidae. Lawrence & Newton (1995) then stated that the name Agnathinae has priority over Cononotinae. Both genera agree in the principal diagnostic characters, but *Agnathus* differs from *Cononotus* especially in a strongly shortened transverse prosternum with a prominent anterior portion of pronotum. The Agnathinae (= Cononotinae) followed the transfer of the Pedilidae in the Pyrochroidae (Young 1991, Young & Pollock 1991), and are currently placed there as Pyrochroidae incertae sedis (Lawrence & Newton 1995, Young 2002, Nardi 2007, Pollock & Young 2008).

Adults of Agnathinae differ from other Pyrochroidae in several characters. The hypomera are developed as a broadly rounded, often impunctate lobe leaving the procoxal cavities both internally and externally open in the Pyrochroidae including *Pedilus* Fischer von Waldheim, 1822, whereas they are internally closed in the Agnathinae; ventrites 1 and 2 are connate in the Agnathinae but free in the Pyrochroidae. These differences apparently lead Nikitsky et al. (2008) to classify this taxon as a distinct family Agnathidae. This classification of the Agnathinae is in conflict with Hunt et al. (2007), who seem to return *Agnathus* in the vicinity of the Lagriidae (now Lagriini of the Tenebrionidae), but these results should be probably considered as tentative. It is evident that the phylogenetic relationships and systematic position

of the Agnathinae are by no means satisfactorily settled. Because an extensive comparative study is out of the scope of the present paper, we keep the currently prevailing classification of the taxon as Pyrochroidae incertae sedis. Disjunct range of the subfamily suggests its relic character.

Agnathus decoratus occurs in deciduous floodplain forests in southern and Central Europe, where it inhabits trunks and logs of deciduous trees (alder, beech, oak, poplar, willow) partly submerged in water. It is by no means associated exclusively with alder but is a member of a characteristic association of beetles to which further belong several species of the genus *Xyleborus* (Curculionidae: Scolytinae), *Rhizophagus aeneus* and *R. picipes* (Monotomidae). The larvae of *A. decoratus* develop in and near the galleries of the bark beetles and build their pupal chamber in the sapwood under bark. Adult beetles occur in bark crevices or under bark, especially on lower sides of the trunks, running quickly and readily flying away when disturbed. They seem to be active especially in afternoon and at dusk. Feeding habits of both larvae and adults are not known with certainty, even though they were originally considered as predators of other insects by Buysson (1910). Adults overwinter in bark crevices under moss at the bases of trunks of trees growing on river banks. *Agnathus secundus* sp. nov., on the contrary, inhabits coniferous mountain forests of soutwestern China at altitudes over 3,000 m and was collected on fallen trunks of conifers, especially firs (*Abies* sp.), not in immediate vicinity of mountain torrents. The observed behaviour of adults corresponds to that of *A. decoratus*.

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