Amblystomus niger (Heer, 1841) (Coleoptera, Carabidae) new to the British Isles with observations on the Coleoptera of Dorset with particular reference to windblown assemblages

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Introductory comment

Given that the national entomological journals are now reduced in number and regional publications appear to be expanding I enquired of the editor of the Worcestershire Record (observing Brown, 2022) whether that publication might formally announce the occurrence of an insect new to Britain from beyond the Worcestershire vice-county boundary. The response was affirmative with the proviso that some link with Worcestershire might be proposed. It is difficult to formulate possibilities on the basis of a single individual. The insect in question, *Amblystomus niger* (Heer, 1841) is capable of flight, and if its presence in Britain is a response to humanly-created impacts including climatic warming, it could penetrate inland.

The only suitable habitat for *A. niger* in Worcestershire are the salt meadows at Upton Warren, Dodderhill CP (Maskew, 2014) which have produced numerous flies of euhaline affinitities (teste G.H. Green, in litt., 2 November 2023) and from where I observed the largely coastal weevil *Gronops lunatus* (Fabricius, 1775) at *Spergularia marina* (L.) Besser on 20 June 1981, a rare Worcestershire species largely limited to Triassic-derived sediments.

Evidence of wind assemblage ptovided here has relevance to the faunal dynamic of the Malvern Hills in particular and additional records given here include species recently included in the British fauna that may eventually colonise Worcestershire.

***Amblystomus niger* (Heer, 1841) at Stair Hole, West Lulworth, Dorset**

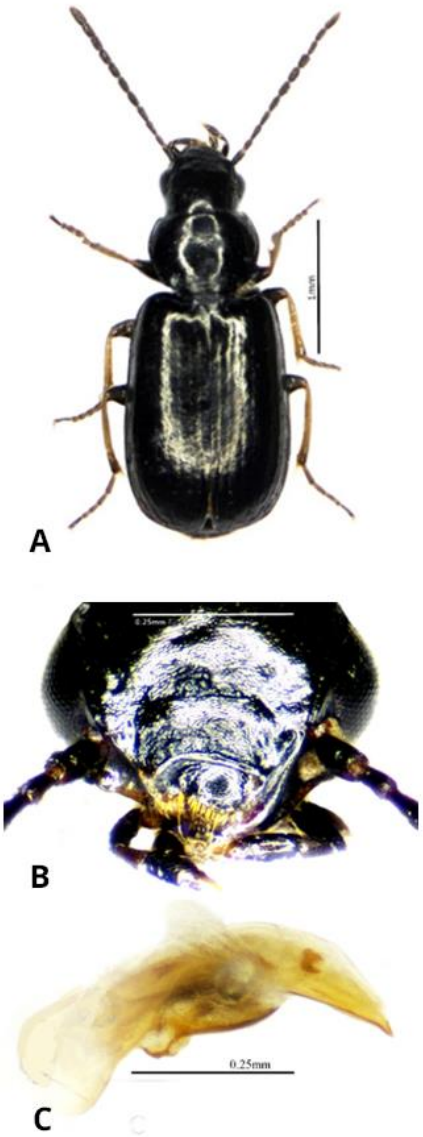
A male *Amblystomus niger* (Heer, 1841) was observed on Cretaceous Wealden soft sediments at Stair Hole, Dorset 50o61'N 02o25'W SY821798 14 m a.s.l. on 22 May 2023. The specimen was collected and its aedeagus isolated (01C). *Amblystomus niger* is amongst the more widespread of the 18 Palaearctic species of *Amblystomus* (Jaeger & Wrase, 2003; Wrase & Magrini, 2012). Hitherto the genus *Amblystomus* was unpresented in the fauna of the British Isles.

Geology of Stair Hole

The solid geology of Stair Hole is complex and has a strong bearing on the presence of *A. niger* there. At an unknown time in the past Cretaceous Wealden sands and clays breached the Jurassic Limestone that defines the incipient cove and formed a collapse feature with slumping and limited faulting. The soft sediments are subject both to gravitational and hydraulic pressure and entrain evaporites that locally precipitate out around seepage trickles at the land surface. The biological merits of soft rock cliffs are well-documented (Howe, 2015) and at Stair Hole they support an apparently small population of *A. niger*. The angle of slope is such that no dramatically sudden monumental collapse features that often characterise the Jurassic Coast and that might militate against the survival of the carabid are likely. The finding of a single male beetle does not of course, confirm the extent of a population but it is unlikely to be a stray.

Identification

Amblystomus niger is a small black carabid beetle some three millimetres in length that could on sight be confounded with species of *Bembidion* or *Acupalpus*. The asymmetrical clypeus, a somewhat variable feature, hallmarks the genus and is a conspicuous feature of the Stair Hole example (01). The internal armature of the aedeagus of *A. niger* (01) is diagnostic. The identification of Palaearctic Amblystomus remained highly problematical until Wrase & Magrini (2012) revised the fauna of the Mediterranean Sea area and provided dichotomous keys for 11 species. Of these species 04 compares *A. algirinus* and the widespread *A. metallescens*, which could well occur in Britain, and highlights points of distinction between them. The somewhat obovoid elytra of *A. niger* (01) are distinctive but are shared by the slightly more iridescent *A. metallescens* (02) which has a more transverse distinctly and continuously rounded pronotum.



01. *Amblystomus niger* male, Stair Hole, Dorset, 22 May 2023. A habitus. B frons showing asymmetrical clypeus. C aedeagus lateral aspect. Paul Whitehead.

Synecology

Amblystomus niger is a specialised hygrophilous carabid with an affinity for the fringes of euhaline or base rich water bodies; it is widespread in Europe occurring east to Kazakhstan, Uzbekistan and Mongolia. This habitat is shared by its close relatives *Amblystomus algirinus* Reitter, 1887 and the holomediterranean Amblystomus metallescens (Dejean, 1829) the latter species requiring careful separation from A. niger. The author has experience of A. algirinus both at the Quaternary aquifer of Tazoghrane in Tunisia where the fringing muds are high in evaporites (Ben Moussa, Mzali, Zouari & Hezzi, 2014) and in Greece on the euhaline littoral muds of the now fragmented Mália wetlands, Kríti, where it coexists with A. metallescens. Bedel (1895) associated A. algirinus with “saline clay.” Ratti (1983) regarded A. metallescens (as Amblystomus levantinus Reitter, 1883) as “halobiontic on the Adriatic coast.” *Amblystomus* is not represented in the rich carabid faunas of ancient freshwater wetlands. For example, the ancient basin wetland complex north of Invrea in Italy supports at least 112 species of Carabidae amongst which Amblystomus is unrepresented (Casale & Giachino, 1994).

02. Top. *Amblystomus algirinus* female, Tazoghrane, Tunisia, 9 June 1988. Arrows indicate the relatively flat eyes, rectilinear pronotum and subparallel elytra with slightly impressed sides.
Bottom *Amblystomus metallescens*, Mália, Kríti, Greece, 10 May 2004. Arrow indicates relatively transverse pronotum with arcuate sides. Paul Whitehead.

Origin of *Amblystomus niger* at Stair Hole

A key question surrounds the origin in time of the Stair Hole *A. niger* and whether other populations exist elsewhere on the Jurassic coast which has been well studied (e.g. Godfrey, 2012). As a warm temperate species without any fossil or subfossil presence in Britain A. niger must be a post-glacial colonist and one which is capable of flight (Kádár & Szél, 1989). It could be one of many recent British animal colonists that have been aided by passive transportation; this possibility is strengthened by the recently documented westward spread of A. niger in Central Europe (Vonička, Veselý & Linhart, 2014). It could less certainly be a native species limited geographically by virtue of its thermophily. In this context it should be noted that the physiography at Stair Hole is unique on the British coast; the incipient cove provides shelter from the north, west and east and also to some extent from southerly maritime influence, supporting what may well be an equally unique time-honoured biota. On 22 May 2023 a rather rare tipulid fly *Tipula marginella* Theowald, 1980 was observed ovipositing around the trickles. Given climate change it is possible that *A. niger* will appear more widely in Britain especially as its south Palaearctic habitats become increasingly subject to rapid environmental change.

Wind-assembled insects at Stair Hole headland, Dorset

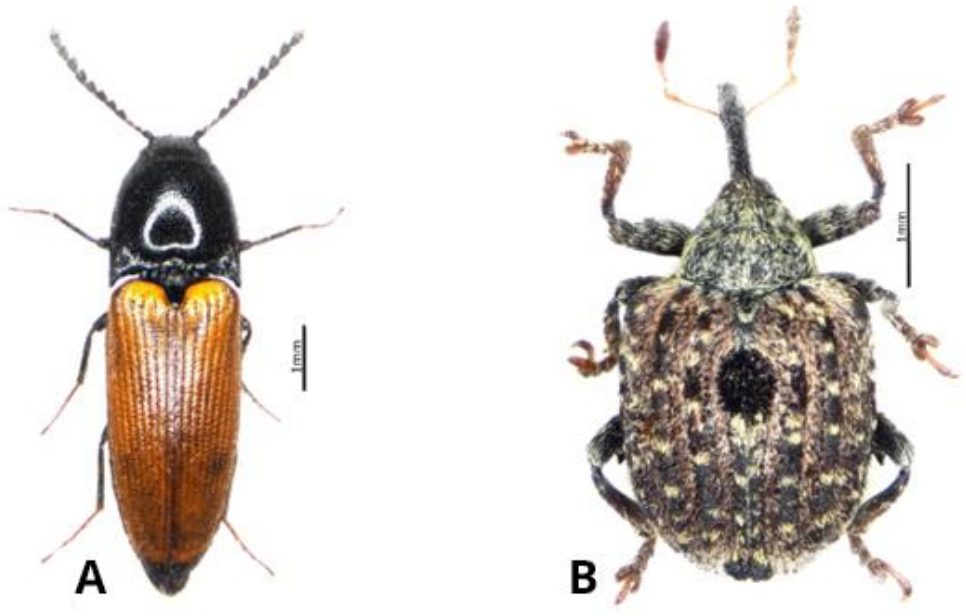
On occasion wind and landforms may align to effectively conserve and safeguard entire assemblages of weather-assembled species. This was evidenced on 22 May 2023 when a remarkable allochthonous concentration of intensely disparate species was observed on sea cliffs above Stair Hole, Dorset, which was unparalleled elsewhere on the Dorset coast during that month. The experience at Stair Hole is difficult to rationalise. The arc of Lulworth Cove is defined by pincer-like headlands that can be accessed on foot. They are created by the differential weathering of soft Cretaceous Chalk and folded Jurassic Limestones. Close examination of the eroded eastern headland on 22 May 2023 demonstrated no insects assembled by the persistent moderate to fresh north-north-easterly flow. 335 metres to the west at Stair Hole that was completely reversed.

Stair Hole (50o61'N 02o25'W SY821798) (03) is an incipient sea-cove in the making (03), its western headland composed of grass-clad cliffs that descend steeply to the sea. At this exact spot between 1240 and 1350 hrs BST on 22 May 2023 it literally rained beetles that bounced off the human body without interruption. Judging by the great mass of insects clinging to the herbage this must have commenced earlier in the morning. Tens of thousands of insects had been dumped on the cliff side by rapidly descending air currents that significantly reduced what would otherwise have been mass mortality. These were most concentrated in an area of herbage some 18 m2 and as far as one could see were dominated by ca4000 Brassicogethes aeneus (Fabricius, 1775) (Nitidulidae); how far downslope they descended was impossible to say but the greatest concentration is marked in red in 03. Similar even more dramatic nitidulid swarming events associated with sea cliffs and offshore winds have been reported by Kenward (1984) and Whitehead (2011b). As offshore winds pass over cliff tops their circulation rotates landward (03) and this process abruptly dropped the Stair Hole insects in the lee of the wind.

This beetle assemblage was remarkable for its diversity comprising 42 species in 16 taxonomic families and must have been scoured from a range of hinterland habitats; quite why they were so precisely focussed at one spot along kilometres of coast would require extended research beyond present scope. Might one assume that 10 *Ampedus elongatulus* (Fabricius, 1787) were scoured from one spot or, if not, by what mechanism where they reassembled and from what distance? The following species which occurred singly unless otherwise stated demonstrate this diversity and include some that would normally be entirely out of place on a sea-cliff viz: *Helophorus griseus* Herbst, 1793 (Hydrophilidae); *Atholus duodecimstriatus* (Schrank, 1781) (Histeridae); *Aleochara verna* Say, 1833 (Staphylinidae) (ca72); *Ampedus elongatulus* (Fabricius, 1787) (Elateridae) (10) (04A); *Limonius poneli* (Leseigneur & Mertlik, 2007) (Elateridae); *Grammoptera ruficornis* (Fabricius, 1781) (Cerambycidae); *Cionus nigritarsis* Reitter, 1904 (Curculionidae) (04B); *Ceutorhynchus picitarsis* Gyllenhal, 1837 (Curculionidae) (2); *Stenocarus ruficornis* (Stephens, 1831) (Curculionidae); *Hylastes angustatus* (Herbst, 1794) (Curculionidae) and *Hylastes opacus* Erichson, 1836.

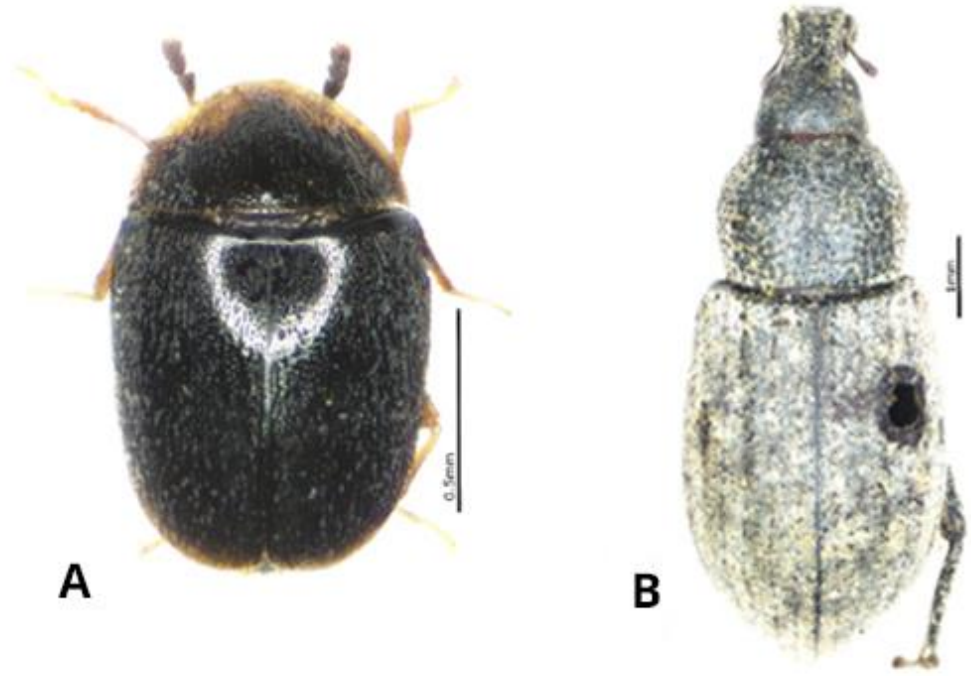
03. Stair Hole cove and western cliff, Dorset, 22 May 2023. Wind flow with deposition site of wind-driven insects marked in red.

Some of these beetle species are little known in Dorset. That *Aleochara verna* exhibited marked numerical dominance over other species of the subgenus *Coprochara* is of interest since this finding is mirrored by recent observations in midland England. Leseigneur (1972) lists six tree genera that host *Ampedus elongatulus* (04.A) which is dominantly a southern species in Britain. According to NBN data accessed 25 July 2023 there are six dated Dorset records between 1996 and 2007 with strongholds further west in the New Forest; recent evidence of aerial dispersal has been documented in Oxfordshire (Pollard et al., 2022). *Cionus nigritarsis* (04.B) is a Nationally Rare weevil associated with Scrophulariaceae most usually *Verbascum spp.* and is evidently hitherto unrecorded in Dorset. *Stenocarus ruficornis* is also little-known in Dorset but since it will accept poppies *Papaver sp*. (Campobasso et al., 1999) cultivated in gardens may be under-recorded there. *Hylastes opacus* is largely associated with pine *Pinus spp*. (Pfeffer, 1995) and may be a seldom-recorded component of vernal dispersals; the author observed one under driftwood on the Sefton Coast of Lancashire (SD277094) on 1 May 1995. In suburban Bath, Somerset, examples have been found associated with moribund Leyland Cypress *Cupressus x leylandii* A.B. Jacks. & Dallim. As a native species with subfossil records at Thorne Moors (Whitehouse, 1998) it now follows the human footprint but may remain under-recorded generally. *Hylastes angustatus* shares the same host tree preferences as *H. opacus* but is much scarcer generally with no certain Dorset records; Duffy (1953) regarded it as localised and southern and the NBN Atlas (accessed 25 July 2023) carries few data for a species which has an early Holocene presence at Strangford Loch in Northern Ireland (Whitehouse, 2006) and which has subsequently adapted to the plantations of the Anthropocene.



04. Dorset Coleoptera 2023. A. *Ampedus elongatulus*, Stair Hole cliff, 22 May. B. *Cionus nigritarsis* Stair Hole cliff, 22 May.

Other orders of insects represented in the Stair Hole melee include hunting asilid flies *Dioctria rufipes* (DeGeer, 1776) and the ichneumonid wasp *Alomya debellator* (Fabricius, 1775). Hemiptera were represented by six families viz. *Zicrona caerulea* (Linnaeus, 1758) (Pentatomidae); *Drymus sylvaticus* (Fabricius, 1775) (Lygaeidae); *Legnotus limbosus* (Geoffroy, 1785) (Cydnidae); *Coreus marginatus* (Linnaeus, 1758) (Coreidae); *Corizus hyoscyami* (Linnaeus, 1758) and *Liorhyssus hyalinus* (Fabricius, 1794) (both Rhopalidae) and the auchenorhynchan *Cixius sp.* (Cixiidae). Weather-related dispersal and subsequent mortality of assemblages of beetles and other insects have been documented (Whitehead, 1985; 1994). Such dispersals include massed nocturnal movements of insects along the major English river valleys and the coastal zone (Whitehead, 2011a, 2011b) not only of the British Isles. Judging by the numbers of insects descending to artificial light sources along English lowland flyways the aerial biomass on favourable nights must be enormous (Lane & Mann, 2006; Whitehead, 1997). Large-scale vernal dispersals of insects in coastal zones are often subject to mass mortality when influenced by weather and they may disperse well out to sea (Hardy & Milne, 1937; Whitehead, 1985) or be killed rapidly in the hostile environment of the arid hot littoral (Whitehead, 2014). Trans-oceanic entomofaunal drift may be global in extent (Scudder, 1968) and beneficial for certain species but massed swarming is not always influenced by prevailing weather and large aggregations of beetles may remain largely in situ (Assing, 2017; Morgan, 1993). The Hercynian north-south orientated rock wall of midland England's Malvern Hills supports thermophilous species on its southern flanks but insects from the eastern lowlands may be wind-blasted far up its ice-cut valleys (Whitehead, 1994).



05. Dorset Coleoptera 2023. A. *Arthrolips obscura*, Bincombe settlement, 20 May. B. *Barynotus squamosus*, Portland Bill, 23 May, the elytral perforation is the work of an experimental rodent.

Additional observations on Dorset Coleoptera

The following additional species of beetles of interest were observed in Dorset during May 2023.

Carabidae

Brachinus crepitans (Linnaeus, 1758). Portland CP, Portland Bill, SY684692 29 m a.s.l. traditional grassland 25 May 2023. Female attending freshly killed Harpalus dimidiatus (Rossi, 1790) (Coleoptera, Carabidae).

Ophonus azureus (Fabricius, 1775) var. similis Dejean. Nationally Scarce. Portland CP, Coombefield Quarry, SY687704, 56 m a.s.l. 21 May 2023.

Laemostenus complanatus (Dejean, 1828), Portland CP, Chiswell, SY684731, 12 m a.s.l. environs of old cottages, 20 May 2023.

Hydraenidae

Ochthebius lejolisii Mulsant & Rey, 1861. Portland CP, Portland Bill, Rhys Clif, SY679684, 2 m a.s.l., saline pool on dry wave-cut rock platform, 21 May 2023. Modern record for Dorset at a long-recognised site.

Staphylinidae

Philonthus spinipes Sharp, 1874. Portland CP, Portland Bill, SY677692, 53 m a.s.l at Equus faeces in open exposure, 25 May 2023.

Scarabaeidae

Calamosternus granarius (Linnaeus, 1767). West Lulworth CP, Durdle Door, SY811803, 90 m a.s.l. chalk downland, faeces Bos. Dominant and abundant; frequently >60 imagines crowded in a single faecal deposit, 22 May 2023.

Onthophagus medius (Kugelann, 1792). Nationally Scarce. Portland CP, Portland Bill, SY677692, 53 m a.s.l. two at Equus faeces on limestone grassland, 25 May 2023. Modern VC record but apparently rare and highly localised.

Cetonia aurata (Linnaeus, 1761). Rose Chafer. Burgeoning limestone cliff-pocket populations exist on the eastern side of Portland especially towards Southwell. Larval habitat mirrors that in the Isles of Scilly (Whitehead, 2017) with larvae primarily consuming fleshy roots of *Crithum maritimum* L. but also of the shrubby *Veronica x franciscana* Eastw. in addition to scavenging. This is a major population with considerable competition for larval niches and high targeted mortality of imagines by passerine birds and/or Viviparous Lizards *Zootoca vivipara* (Lichtenstein, 1823). Some depauperate scree-inhabiting larvae subsisted only on rootlets of *Viburnum lantana* L. and *Ligustrum vulgare* L. At Pennsylvania Castle gardens, SY696710, 49 m a.s.l. a healthy imagine was found in the nest of ant *Lasius niger* Linnaeus, 1758 on 21 May 2023. At nearby St Andrew's Church ruins (36 m a.s.l.) *C. aurata* bred in a limestone block wall sediment pocket recycling organic litter amongst rootlets of Atlantic Ivy *Hedera hibernica* (G. Kirchn.) Bean cv '*Hibernica*' and with evidence on 26 May 2023 of the skeleton of *Otiorhynchus tenebricosus* (Herbst, 1784) (Coleoptera,

Curculionidae) having been partially consumed. Here remains of adult *C. aurata* were dispersed within the larval pabulum.
Corylophidae
Arthrolips obscura (05.A) (C. R. Sahlberg, 1833) (04C). New to VC9. Bincombe CP, Bincombe settlement, SY685844 65 m a.s.l. 20 May 2023. Two in decayed fungal sporophore of *Daldinia concentrica* (Bolton) Ces. & De Not. (Xylariaceae) on fallen ash tree *Fraxinus excelsior* L. A point of interest is how this recent British colonist (Allen & Duff, 2013) is already adapting to niches previously recorded more widely in the Palaearctic region (Dr Alexander N. Drogvalenko, Kharkiv, Ukraine teste Bowestead, 1999).
Curculionidae
Otiorhynchus tenebricosus (Herbst, 1784). Portland CP, St Andrew's Church ruins 50o53'N 02o42'W SY696711 36 m a.s.l. Remains of adult evidently consumed by larvae of Cetonia aurata in larval faecal bed, ruined church wall sediment pocket 26 May 2023.
Barynotus squamosus Germar, 1824. (05.B). Evidently new to VC9. Portland CP, Portland Bill, Blacknor Point, SY679717, 76 m a.s.l. Jurassic Limestone clifftop, dead, 23 May 2023. A species with strong northern affinities in the UK but with small contracted sometimes isolated populations in the south e.g. on Jurassic Limestone of north Cotswold escarpment VC33 (Whitehead, P. F., pers. obs.) which must be post-glacial relicts (in this context see Booth, 2020; Telfer, 2001).

Additionally a small colony of the ant *Lasius emarginatus* (Olivier, 1792) was found at the escarpment crest at Chiswell, SY687729 103 m a.s.l. on 23 May 2023 but not elsewhere and as a new site for Portland CP. *Lasius emarginatus* was described as new to Britain by Pontin (2008) who also discusses the mechanism of its arrival here.

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Dr Pjotr Oosterbroek (Leiden) kindly identified Tipula marginella. Dr Jiří Hejkal (Kraslice) kindly provided some background data.

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Images

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