

# A wingless intertidal ground beetle, new to the Belgian fauna, in the river IJzer estuary nature restoration site : *Bembidion nigropiceum* Marsham, 1802

Konjev Desender

Royal Belgian Institute of Natural Sciences, Dept. Entomology, Vautierstraat 29, B-1000 Brussels

Corresponding author: Konjev Desender, e-mail : Konjev.Desender@naturalsciences.be

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At two occasions during the spring of 2003, we collected (by pitfall trapping) a brachypterous female of a small carabid beetle, *Bembidion* (subgenus *Lymnaeum*) *nigropiceum* Marsham, 1802, hitherto unknown from Belgium, in the river IJzer estuary at Nieuwpoort. The two sampling sites (2°43'58" E – 51°09'00" N; 2°44'05" E – 51°08'56" N) are situated very near to each other within the area of a recent salt marsh nature development project (Fig. 1). The main digging and dike remodelling activities had been finished some months earlier only. A first specimen of *B. nigropiceum* was caught between 9 and 22 May, the second between 22 May and 6 June 2003. Both sampling sites are situated at the basis of a newly created artificial dike near the high tide water line, in an area with sand and some rubble. At both sites we regularly observed freshwater seeping out the dikes, but it is unclear whether the occurrence of the beetle is related to this phenomenon. During the same sampling periods, some 30 other sites were sampled with three pitfall traps each, within the context of a multidisciplinary monitoring project, along transects distributed over the entire study area, both in the newly created and already existing dune and salt marsh habitats. These sites have continuously been sampled for ground beetles for more than 15 years (9).

The geographic distribution of *B. nigropiceum* (Fig. 2, based on all data compiled from the literature, including unpublished data of Jeanne, in litt.) shows it is strictly confined to the tidal zone along parts of the Atlantic coasts, the Mediterranean and the Black Sea/Azov Sea. The closely related species *B. abeillei* Bedel, 1879 is known from other parts of the Mediterranean coast (France, Corsica and Spain), where it appears to replace its congener. A third species, *B. eichleri* Marggi & Wrase, 2002, has been recently described from the coast of Tunisia (2). In the UK, *B. nigropiceum* is confined to coastal localities (seven recent ones only) in southern England from Kent to Pembrokeshire, with a single recent record from south Wales (4), and is classified as nationally scarce (5). Because of its sporadic occurrence in the south it has been given special attention within the UK Biodiversity Action Plan. Little is known of the ecology of this beetle and it is probably constantly wingless, as opposed

to the two other species of the subgenus *Lymnaeum*, which are winged. Until now, the beetle was also mentioned in Atlantic Europe from France only, from the Gulf of Morbihan northernmost up to Dieppe (north of the Seine estuary) (6, 7). In France, it has mainly been found under stones and in crevasses on rocky shores, which are submerged during high tide. In UK also, *B. nigropiceum* is found mainly in shingle and coarse sand, as well as among rubble at the base of cliffs, where it appears to have a partly interstitial way of life. The beetle has been found to 75 cm deep in the soil, especially where there is some detritus (8). It is supposed to have an annual life cycle, most probably breeding in spring with summer larvae (8). Both adults and larvae are supposed to be predatory on small invertebrates and may usually be subterranean. *B. nigropiceum* may be vulnerable to certain types of coastal development, but, on the other hand, can also temporarily appear on disturbed coastal sites between debris and stones in the intertidal (8). This could very well fit our own observations of the species in Belgium. Near Venice, a temporary but rather large population was observed in an artificial habitat near the harbour (8). The species probably disappeared again rather quickly because the habitat changed towards a much more fine-grained sandy beach. In that area also, the species lived at the basis of an artificial cliff protecting the narrow shore against sea-storms.

*B. nigropiceum* (Fig. 2) measures about 3,5 to 4 mm but does not at all look like a typical *Bembidion* species. Instead, it has a relatively large head with small and flattened eyes, a possible adaptation to an interstitial and partly subterranean way of life. It also lacks strong shoulders on the flattened elytra, possibly related to its constant brachyptery (as observed in other wingless beetles). Its coloration is unusual reddish-brown, as in other subterranean or cave ground beetle species.

The ecology, diversity and population dynamics of terrestrial invertebrates have been studied for many years along the river IJzer estuary, including the beachfront, coastal dunes and salt marshes. Ground beetles and spiders have been sampled and studied continuously since the early nineties. These long-term studies take place in the existing dune and salt marsh habitats and micro-habitats and even included sampling of available ecotones (gradients between habitats) and dikes (9). It is therefore very unlikely that even a small population of *B. nigropiceum* would have been overlooked earlier in this area. Whether a population of this beetle has been estab-

lished in this estuary remains uncertain, but will be monitored during forthcoming years. In view of its suggested habitat preference for coarse-sand to rocky shores this 'newcomer' might not be expected to be able to persist a long time in the area, in view of the fine-sand and silt soils that are expected in due time at these disturbed salt marsh restoration sites.

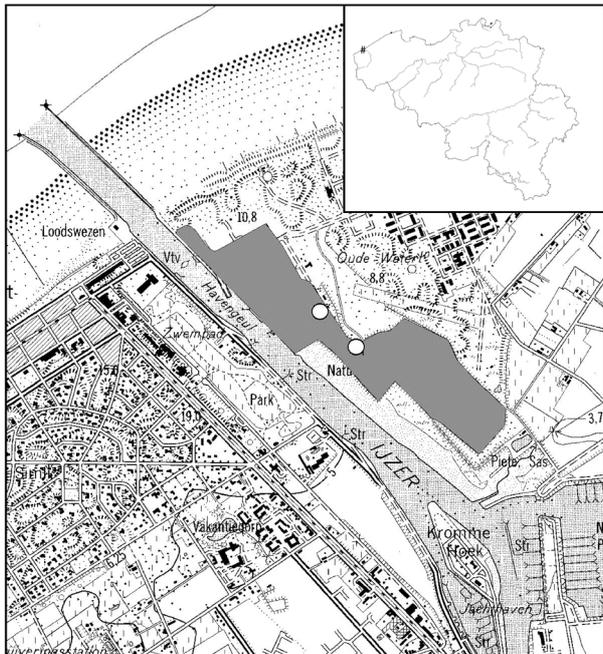


Fig. 1. – Detailed location of two sampling sites (white dots) in the river IJzer estuary where *Bembidion nigropiceum* was discovered in 2003; nature restoration area in grey.

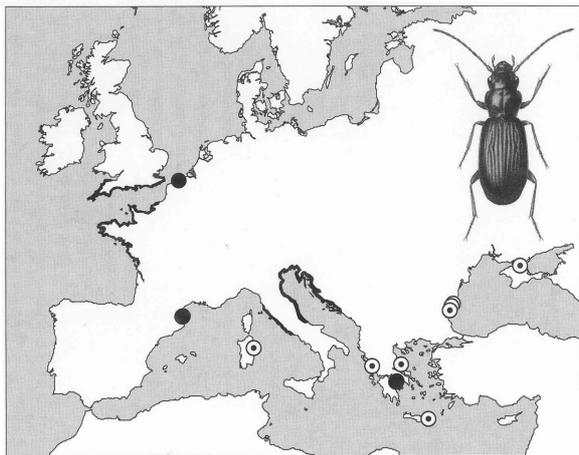


Fig. 2. – Geographic distribution of *Bembidion nigropiceum* (added figure; total length 4 mm) with more or less continuous areas in black, scattered sites (⊙) and new findings (●).

Possible sites of origin for these founding beetles only are known at large distance, both at the other side of the

Channel (nearest sites with the species at about 100 km) and in France (at about 200 km). We cannot entirely exclude that the species might have been overlooked at somewhat closer sites, especially in the north of France. *B. nigropiceum* seems to be highly adapted to marine conditions, surely must support saline conditions and supposedly can survive longer periods of submersion by seawater. In view of its wingless state (brachyptery) and its special ecology, it is therefore hypothesised to have been washed ashore with floating debris originating from the south of England or the north of France. These recent captures add a new and peculiar ground beetle to the Belgian fauna and at the same time suggest that this carabid beetle is extending its range further north, a phenomenon recently observed for other terrestrial invertebrates in our region, e.g. the Mediterranean dwarf spider *Diplocephalus graecus* (10).

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