

The current state of knowledge of the taxonomy and distribution of non-marine molluscs in Belgium

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Abstract

A short historical overview emphasizes the existence of continuous malacological studies in Belgium from 1827 up to the present date.

A total of 199 species of non-marine molluscs are confirmed to be living in Belgium: 172 species of gastropods and 27 species of bivalves. This is an increase of 20 species (11 %) compared to our knowledge in the sixties. It is suggested that more species could be found living nowadays in Belgium, 10 of which are tentatively listed. Distributional data on landsnails are given: nearly 10,000 records of landsnails pre-1950 are available, distributed over 65 % of the 10 km UTM-squares; records from 1950 onwards represent a total of more than 30,000, distributed over more than 98 % of the 10 km UTM-squares, 376 squares cover the whole Belgian territory.

As approximately 50 species of landsnails are probably declining after 1950, it may be assumed that the faunal composition of landsnails in Belgium has changed considerably during the last four decades. It is suggested to take advantage of the potential offered by non-marine molluscs and to use them for nature conservation issues, especially in the field of site protection.

Key-words: non-marine molluscs, taxonomy, distribution, faunistics, Belgium.

Introduction

Malacology in Belgium has a long standing tradition, especially in the field of taxonomy, morphology and faunistics. A survey of the literature on Belgian molluscs reflects continuous studies and field work from 1827 up to the present date.

Leading malacologists in the second half of the 19th century decided to create in 1863 the "Société Malacologique de Belgique", which offered an excellent forum for the promoting and favoring of malacology. At the beginning of the 20th century, the scope of the "Société Royale Malacologique de Belgique" broadened, which was confirmed by two changes of the society's denomination (1904 and 1922). The center of malacological interest and study was thus shifted to the "Musée Royal d'Histoire naturelle de Belgique", presently the Royal Belgian Institute of Natural Sciences (R.B.I.N.S.), Brussels. A detailed historical review of malacological studies in Belgium up to 1947 is found in ADAM (1947). A review of current malacological research in Belgium is presented in VAN GOETHEM (1989).

The aim of this contribution is to provide information on the present knowledge of the non-marine molluscs of Belgium, and to suggest making better use of the potential of these animals within the field of nature conservation and the continuous struggle for the protection of sites.

Taxonomy

ADAM (1947) gave a very detailed revision and compilation of the non-marine molluscs in Belgium with a complete bibliography. ADAM (1960) remains the principle identification manual, which is still fairly accurate. However, the nomenclature of the treated species has changed considerably, and some twenty species which are nowadays found in Belgium, are not listed. VAN GOETHEM (1987; 1988) presented updated annotated checklists, useful tools in combination with ADAM (1960) and KERNEY *et al.* (1983). A complete bibliography of non-marine molluscs in Belgium from 1943 onwards is in preparation (NIJS *et al.*, in prep.).

At present, a total of 199 species of non-marine molluscs are confirmed to be present in Belgium: 172 species of gastropods, 27 species of bivalves. Amongst the gastropods, 120 species are terrestrial, 41 are freshwater species, 7 brackish water species, and another 4 can be found in either fresh or brackish water.

Amongst the bivalves, 25 species live in freshwater and 2 in brackish water (VAN GOETHEM, 1989, p. 84, see also remarks on p. 83). Some so called typical freshwater species show, however, a tolerance for slightly brackish water. On the other hand it is known that some species of gastropods and even bivalves (*Pisidium* spp.) have an amphibian way of life, making a strict separation between terrestrials and aquatics a difficult matter. *Assiminea grayana* FLEMING, 1828 and *Lymnaea (Galba) truncatula* (MÜLLER, 1774) are classical examples.

It is strongly believed that at the present time, even more species are present in Belgium, either autochthonous or more or less recently introduced species, which are currently known from regions close to our borders. Examples from the first category are a.o. *Granaria frumentum* (DRAPARNAUD, 1801), *Vallonia enniensis* (GREDLER, 1856), *Chondrula tridens* (MÜLLER, 1774), *Tandonia sowerbyi* (DE FÉRUSAC, 1823) and several Helicidae. Imported or introduced species could easily be expected in water bodies or on land, especially in gardens or other synanthropous surroundings: *Gyraulus parvus* (SAY, 1817), *Gyraulus chinensis* (DUNKER, 1848), *Milax nigricans* (PHILIPPI, 1836), *Deroceras sturanyi* (SIMROTH, 1894), *Deroceras lothari* GIUSTI, 1971, *Deroceras rodnae* GROSSU & LUPU, 1965, a.o. Furthermore, it is evident that a better taxonomical knowledge of certain families could lead to the discovery of new species, e.g. after the unraveling of species complexes within the genera *Arion*, *Trichia*, etc.

Identification manuals useful for Belgian non-marine molluscs are: ADAM (1960), CAMERON & REDFERN (1976), ELLIS (1978), GITTENBERGER *et al.* (1984), GLÖER *et al.* (1987), GRAHAM (1971), JANSSEN & DE VOGEL (1965), KERNEY & CAMERON (1980), KERNEY *et al.* (1983), THOMPSON & BROWN (1976).

Distribution

ADAM (1947) presented distribution maps for 162 species of non-marine molluscs based on the material present in the collections of the R.B.I.N.S. and on data from the literature.

In DE WILDE, MARQUET & VAN GOETHEM (1986) a total of 131 species and species-complexes of terrestrial gastropods are considered, each of them with a distribution map based on the UTM-grid with 10 x 10 km squares. A total of 376 UTM-squares are considered for Belgium, including squares with partial covering of Belgian territory and some trapezoidal spaces in the eastern part of the country inherent to the UTM grid. Records are indicated by six different symbols. This atlas is mainly

based on the general collections of the R.B.I.N.S., including the vast quantity of material collected by R. MARQUET *et al.* during the period 1977-82, additional data from private collections, all data from the literature pre-1947, some data from the literature from 1947 onwards, and few data from localities just across the Belgian border.

The atlas of terrestrial gastropods of Belgium (*op. cit.*) is described as "preliminary" because coverage of the literature is still in progress, while many additional records are currently being registered.

At present, about 10,000 records of landsnails pre-1950 are available (Fig. 1), distributed over 65 % of the 10 km squares. Records from 1950 onwards total more than 30,000, distributed over more than 98 % of the 10 km squares (Fig. 2).

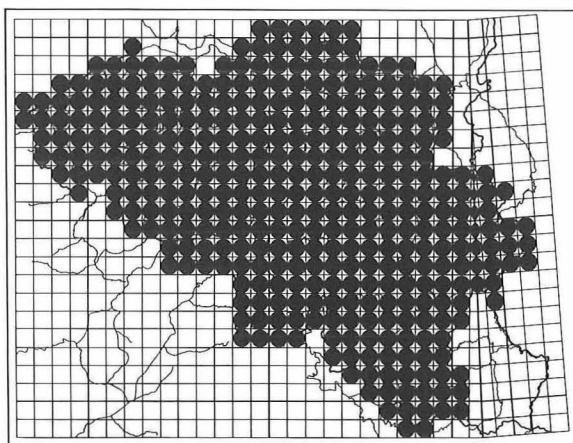
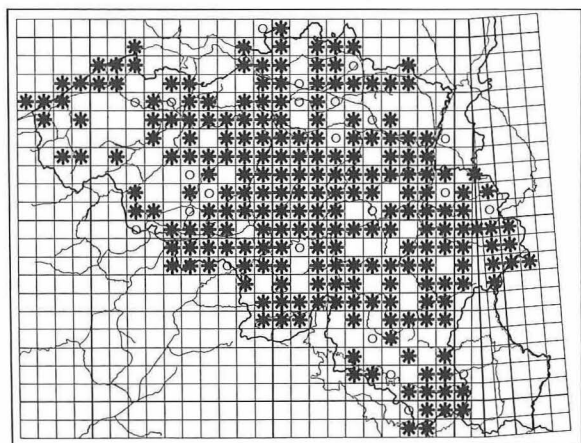


Fig. 1. All 10 km UTM-squares with records on landsnails pre-1950 only.

- records based on data from the literature
- * records based on collections.

Fig. 2. All 10 km UTM-squares with records on landsnails 1950 onwards

- records based on collections or observations

Situation 31 December 1991.

It is obvious that landsnail collecting was more intensive and wider spread in Belgium after 1950. Nevertheless, many maps present a lot of "pre-1950" symbols, not covered by "1950 onwards" symbols, thus indicating that the species concerned were no longer found after 1950. Such comparisons have to be done extremely careful, but at least three general trends are apparent.

1. Some, but not all, of the previously so-called rare or very rare species in Belgium, appear to be more widespread, probably as a result of a more intensive survey of landsnails from 1950 onwards, e.g. *Zonitoides excavatus* (ALDER, 1830) and *Oxychilus alliarius* (MILLER, 1822).
2. On the contrary, for at least 50 species the maps reflect an obvious decrease regarding their overall presence in the 10 km squares from 1950 onwards. This is the case with large species [*Helix pomatia* LINNAEUS, 1758, *H. aspersa* MÜLLER, 1774, *Cepaea nemoralis* (LINNAEUS, 1758), *Helicigona lapicida* (LINNAEUS, 1758), *Arion rufus* (LINNAEUS, 1758), etc.]; as well as with small species [*Vallonia pulchella* (MÜLLER, 1774), *Vertigo antivertigo* (DRAPARNAUD, 1801), etc.].

3. Introduced species, which within a few years became established and widespread members of the Belgian fauna are also known, *Boettgerilla pallens* SIMROTH, 1912, (first record in Belgium in 1967) and *Deroceras caruanae* (POLLONERA, 1891) (first record in Belgium in 1968). For further information, see DE WILDE *et al.* (1986a, 1986b); VAN GOETHEM *et al.* (1984); DE WILDE *et al.* (1983), VAN GOETHEM (1972 ; 1974).

For further analyses and comments on declining species, refer to VAN GOETHEM *et al.* (1987) or MARQUET *et al.* (1987).

In regard to fresh and brackish water molluscs, a long term project aiming at the realization of an atlas similar to the one of the landsnails of Belgium, was undertaken at the R.B.I.N.S. in 1987. Some maps are already presented in SABLON & VAN GOETHEM (1989; 1992). For further information refer to pp. 195-198 of this book.

Conclusions

ADAM (1947; 1960) presented a complete review of the taxonomical and faunistic knowledge of Belgian non-marine molluscs at his time. The author and his collaborators have been involved for a number of years in compiling an updated, complete review of the Belgian molluscan fauna (VAN GOETHEM, 1989). Therefore it is apparent that the recent non-marine Belgian Mollusca are reasonably well known.

Presently however, taxonomical confusion still exists in certain families and genera. This is especially the case in certain species complexes, e.g. within the genera *Arion*, *Trichia*. Bearing this in mind, as well as the possibility of several new species occurring in the Belgian fauna, identification must proceed carefully.

A preliminary distribution atlas exists for the terrestrial snails and slugs, which is currently being updated and completed. Work is underway at the Malacology section of the R.B.I.N.S. on a similar distribution atlas for fresh and brackish water molluscs.

On the basis of a preliminary analysis on the distributional data of terrestrial molluscs, the hypothesis is put forward that approximately 50 species have declined since 1950. However, other species are less rare than previously suspected. Introduced species can rapidly become widespread members of the Belgian fauna.

As many species of non-marine molluscs only occur in a narrow range of biotopes, are relatively easy to collect and identify, a greater use should be made of molluscs in nature conservation issues. Faunistic studies of sites of special scientific interest should include molluscs, as well as the classical groups of insects and spiders.

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References

- ADAM, W., 1947. Révision des mollusques de la Belgique. I. Mollusques terrestres et dulcicoles. *Mémoires du Musée royal d'Histoire naturelle de Belgique*, 106: 1-298, figs 1-4, pls 1-6, cartes 1-162.
- ADAM, W., 1960. Mollusques. I. Mollusques terrestres et dulcicoles. Patrimoine de l'Institut royal des Sciences naturelles de Belgique, série Faune de Belgique: 1-402, figs 1-163, pls 1-16, col.pls A-D.
- CAMERON, R.A.D. & REDFERN, M., 1976. British Land Snails. *Synopses of the British Fauna (New Series)*, Academic Press London, 6: 1-64, figs 1-31.
- DE WILDE, J.J., MARQUET, R. & VAN GOETHEM, J.L., 1986. Voorlopige Atlas van de landslakken van België / Atlas provisoire des gastéropodes terrestres de la Belgique. Patrimoine de l'Institut royal des Sciences naturelles de Belgique: 1-285, pls 1-133.
- DE WILDE, J.J., VAN GOETHEM, J.L. & MARQUET, R., 1983. Sur la distribution, l'extension et l'écologie de *Boettgerilla pallens* SIMROTH, 1912 en Belgique. *Documents de Travail de l'Institut royal des Sciences naturelles de Belgique*, 13: 1-31, figs 1-4, cartes 1-43.
- DE WILDE, J.J., VAN GOETHEM, J.L. & MARQUET, R., 1986a. Distribution and dispersal of *Boettgerilla pallens* SIMROTH, 1912 in Belgium (Gastropoda, Pulmonata, Boettgerillidae). In: PINTÉR, L. (Ed.), *Proceedings of the Eighth International Malacological Congress, Budapest*, 1983: 63-68, maps 1-26.
- DE WILDE, J.J., VAN GOETHEM, J.L. & MARQUET, R., 1986b. The distribution of the species of the genus *Deroceras* RAFINESQUE, 1820 in Belgium (Gastropoda, Pulmonata, Agriolimacidae). *Bulletin de l'Institut royal des Sciences naturelles de Belgique*, 56: 137-148, maps 1-65.
- ELLIS, A.E., 1978. British Freshwater Bivalve Mollusca. *Synopses of the British Fauna (New Series)*, Academic Press London, 11: 1-109, figs 1-39, pls 1-15.
- GITTENBERGER, E., BACKHUYS, W. & RIPKEN, Th.E.J., 1984. De landslakken van Nederland. Uitgave van de Koninklijke Nederlandse Natuurhistorische Vereniging, 37: 1-184, figs 1-102.
- GLÖER, P., MEIER-BROOK, Cl. & OSTERMANN, O., 1987. Süßwassermollusken. Deutscher Jugendbund für Naturbeobachtung, 85 pp., many figs.
- GRAHAM, A., 1971. British Prosobranchs. *Synopses of the British Fauna (New Series)*, Academic Press London, 2: 1-112, figs 1-119.
- JANSSEN, A.W. & DE VOGEL, E.F., 1965. Zoetwatermollusken van Nederland. Uitgave van de Nederlandse Jeugdbond voor Natuurstudie, Amsterdam, 160 pp., many figs.
- KERNEY, M.P. & CAMERON, R.A.D., 1980. Elseviers slakkengids. Elsevier, Amsterdam & Brussel, 310 pp., 1000 figs, 276 maps.
(Nederlandse bewerking van E. GITTENBERGER)
- KERNEY, M.P., CAMERON, R.A.D. & JUNGBLUTH, J.H., 1983. Die Landschnecken Nord- und Mitteleuropas. Verlag Paul PAREY, Hamburg & Berlin, 384 pp., 890 figs, 368 maps.
- MARQUET, R., DE WILDE, J.J. & VAN GOETHEM, J.L., 1987. Enkele besluiten uit de "Voorlopige Atlas van de landslakken van België". *Gloria Maris*, 26 (4): 65-75, figs 1-24.

- NJIS, E., VAN GOETHEM, J.L. & DE WILDE, J.J., in prep. Bibliography of the non-marine molluscs of Belgium, 1943-1992 (faunistics, morphology, taxonomy, distribution, ecology). *Documents de Travail de l'Institut royal des Sciences naturelles de Belgique*.
- SABLON, R. & VAN GOETHEM, J.L., 1989. Drie soorten Planorbidae nieuw voor de Belgische fauna (Mollusca, Gastropoda). In: WOUTERS, K. & BAERT, L. (Eds), *Verhandelingen van het Symposium "Invertebraten van België"*, pp. 113-118, K.B.I.N., Brussel.
- SABLON, R. & VAN GOETHEM, J.L., 1992. Towards a compilation of an atlas of the freshwater molluscs of Belgium: a preliminary report. In: VAN GOETHEM, J.L. & GROOTAERT, P. (Eds), *Proceedings of the 8th International E.I.S. Colloquium*, pp: 195-198, K.B.I.N., Brussel.
- THOMPSON, T.E. & BROWN, G.H., 1976. British Opisthobranch Molluscs (Mollusca: Gastropoda). *Synopses of the British Fauna (New Series)*, Academic Press London, 8: 1-293, figs 1-105.
- VAN GOETHEM, J.L., 1972. Contribution à l'étude de *Boettgerilla vermiformis* WIKTOR, 1959 (Mollusca Pulmonata). *Bulletin de l'Institut royal des Sciences naturelles de Belgique, Biologie*, 48 (14): 1-16, figs 1-26, 1 pl.
- VAN GOETHEM, J.L., 1974. Sur la présence en Belgique de *Deroceras caruanae* (POLLONERA, 1891) et de *Deroceras agreste* (LINNAEUS, 1758) (Mollusca, Pulmonata, Limacidae). *Bulletin de l'Institut royal des Sciences naturelles de Belgique, Biologie*, 50 (2): 1-21, figs 1-33, 1 pl.
- VAN GOETHEM, J.L., 1987. Nieuwe naamlijst met aantekeningen van de recente niet-mariene weekdieren van België. *Studiedocumenten van het Koninklijk Belgisch Instituut voor Natuurwetenschappen*, 44: 1-65, 1 fig.
- VAN GOETHEM, J.L., 1988. Nouvelle liste commentée des mollusques récents non-marins de Belgique. *Documents de Travail de l'Institut royal des Sciences naturelles de Belgique*, 53: 1-67, 1 fig.
- VAN GOETHEM, J.L., 1989. De recente niet-mariene Mollusca van België, een globaal overzicht. In: WOUTERS, K. & BAERT, L. (Eds), *Verhandelingen van het Symposium "Invertebraten van België"*, pp. 79-86, K.B.I.N., Brussel.
- VAN GOETHEM, J.L., DE WILDE, J.J. & MARQUET, R., 1984. Sur la distribution en Belgique des limaces du genre *Deroceras* RAFINESQUE, 1820 (Mollusca, Gastropoda, Agriolimacidae). *Documents de Travail de l'Institut royal des Sciences naturelles de Belgique*, 15: 1-45, figs 1-13, cartes 1-74.
- VAN GOETHEM, J.L., MARQUET, R. & DE WILDE, J.J., 1987. Quelques conclusions au sujet de l'"Atlas provisoire des gastéropodes terrestres de la Belgique". *Apex*, 2 (3-4): 85-97, figs 1-24.

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