

**A key to the Recent European species of the genus *Bittium* Leach  
(Gastropoda, Prosobranchia, Cerithiidae)**

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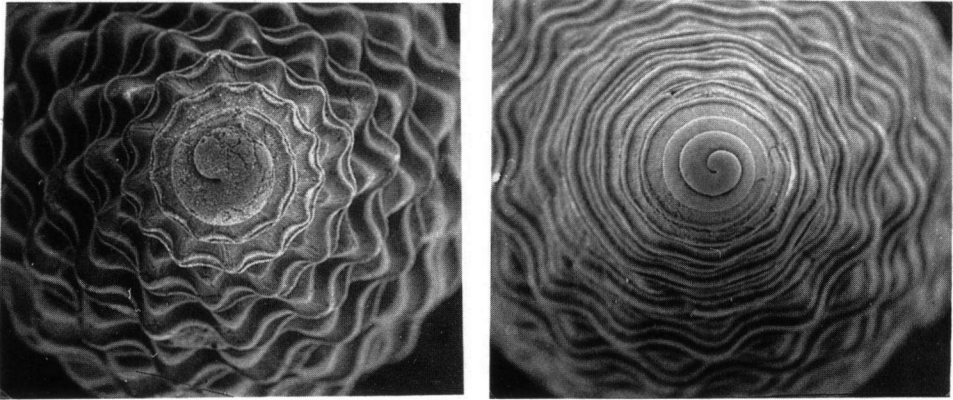
A simple key, based on studies by A. Verduin, for the identification of the recent European species of the genus *Bittium* is presented.

Key words: Gastropoda, Prosobranchia, Cerithiidae, *Bittium*, taxonomy, Europe.

In spite of the extensive and detailed studies by A. Verduin (1976, 1982) on the taxonomy of the Recent European species of the genus *Bittium* Leach, 1847, the identification of these species appears to remain problematic for many shell collectors. In the opinion of the authors, this is due to the fact that the vast amount of detailed information on the various *Bittium* species in Verduin's papers is dispersed over many pages, and hence somewhat difficult to summarize for those not yet familiar with this genus. The following table, based on Verduin's papers, has proven a useful tool in those cases. Abbreviations: NNM = Nationaal Natuurhistorisch Museum, Leiden; WA = private collection of W.M. Wagner, Amsterdam.

**KEY TO RECENT EUROPEAN BITTIUM SPECIES**

1. a Top-whorls broad (knob-shaped),  $D_o = 0.25-0.30$  mm (cf. fig. 1). Three basal spirals ..... 2
- b Top-whorls small (tapering),  $D_o = 0.10-0.15$  mm (cf. fig. 2). Six basal spirals ..... 3
2. a The colour of the shell is white (or very light yellowish brown) .....  
    .....*Bittium lacteum* (Philippi, 1836) (fig. 3)
- b The colour of the shell is yellow- to dark-brown. The upper spiral of each whorl is much lighter coloured (up to white) than the remainder of the shell .....  
    .....*Bittium incile* Watson, 1897 (fig. 4)
3. a The shell is clearly conical and has very flat whorls .....  
    .....*Bittium latreillei* (Payraudeau, 1826) (figs. 5 and 6)
- b The shell is (slender) cylindrical, the whorls are somewhat convex ..... 4
4. a The shell has three spirals (nos. 2, 3 and 4) .....  
    .....*Bittium scabrum* (Olivi, 1792) (figs. 7 and 8)
- b The shell has four spirals ..... 5
5. a The four spirals are equidistant. The shell has either no varices, or only on the last  $1\frac{1}{2}$  whorl ..... *Bittium jadertinum* (Brusina, 1865) (figs. 9 and 10)



Figs. 1-2. Apex of *Bittium* species. 1 (left), broad top of *B. incile*. 2 (right), narrower top of *B. reticulatum*. Highly enlarged, S.E.M. photographs.

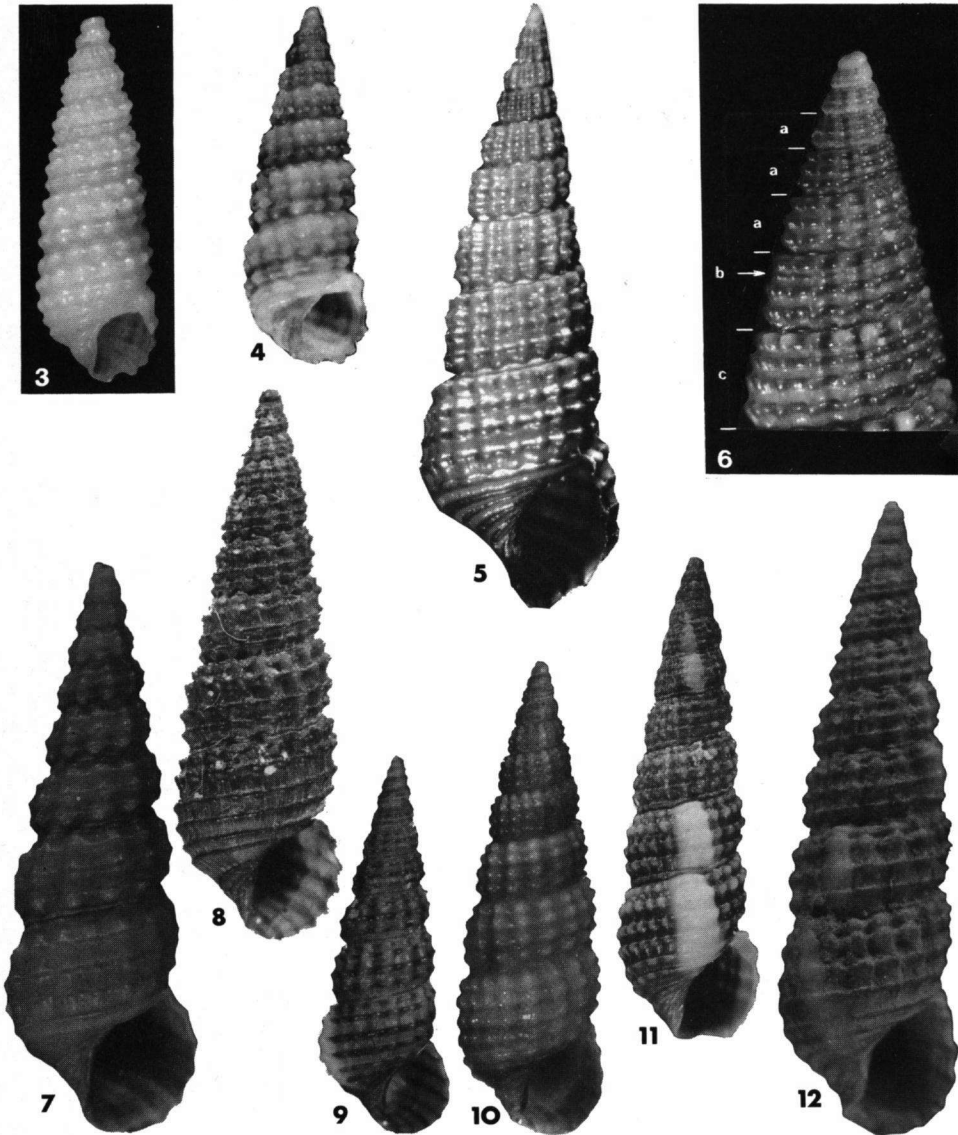
- b The second spiral has somewhat shifted towards the first, so that the distance between spirals 1 and 2 is smaller than that between the other spirals. The shell very often has varices; there may be many, distributed over all whorls . . . . .  
 . . . . . *Bittium reticulatum* (Da Costa, 1778) (figs. 11 and 12)

Notes to 1a and 1b.

- (1) The differences in the dimensions of the top whorls ( $D_0$  = diameter first half whorl, cf. Verduin, 1982: 94) are very clearly visible (figs. 1 and 2) and do not require very accurate measurement. Of course, only specimens with undamaged protoconchs should be studied.
- (2)' The basal spirals are visible on the last whorl, as smooth spirals below the knobbed ones; one just above the aperture, the others beside it.

Notes to 2a and 2b.

- (1) Both species have three spirals per whorl, occasionally four on the last whorls. The additional spiral originates by splitting of the upper one (cf. also Note to 3a). There are generally three, but occasionally four, basal spirals.
- (2) Both species never have varices.
- (3) The possible subspecies of *B. lacteum* are not considered in this table.
- (4) Verduin considered *B. incile* also as a subspecies of *B. lacteum*.
- (5) *B. incile* only occurs around the Canary Islands and Madeira.
- (6) Occasionally, *B. incile* can be completely white. The shell can then still be distinguished from *B. lacteum* by the fact that the knobs on the spirals of *B. lacteum* are spinous rather than spherical.
- (7) It seems that *B. canariense* Nordsieck, 1975, differs from *B. incile* in secondary details only, and should (at most) be considered as a variety of this species.
- (8) The differences between *B. lacteum* and *B. incile* on the one side, and all other *Bittium* on the other side, are so large that the question whether both groups belong to different genera seems justified.



Figs. 3-12. Shells of *Bittium* species. 3, *B. lacteum*, Mondello (Palermo, Italy), WA, length 6.2 mm; 4, *B. incile*, Arinaga (Gran Canaria), WA, length 6.0 mm; 5, *B. latreillei*, Antibes (France), WA, length 10 mm; 6, *B. latreillei*, appearance of fourth spiral, which is absent on whorls a, appearing on whorl b (arrow), four equivalent spirals on whorl c; 7, *B. scabrum*, Palavas (Montpellier, France), NNM, length 9.7 mm; 8, *B. scabrum*, Grado (Trieste, Italy), NNM, length 6.2 mm (fig. 9) and 7.7 mm (fig. 10); 9-10, *B. jaderinum*, Agrópoli (Salerno, Italy), NNM, length 6.2 mm (fig. 9) and 7.7 mm (fig. 10); 11, *B. reticulatum*, Port le Niel (Hyères, France), NNM, length 8.1 mm; 12, *B. reticulatum*, Fusetas (Faro, Portugal), NNM, length 11.2 mm. Fig. 6 ex Verduin, 1972 (originally fig. 2, right), figs. 7-12 ex Verduin (1982, originally figs. 29, 20e, 4d, 4f, 6d, 21c).

## Note to 3a.

Varices occur regularly, generally on the last whorl, but also on the older ones. The characteristic feature of *B. latreillei* is the spiral sculpture: the upper whorls have three spirals, nos. 1, 3 and 4. Then comes one whorl on which spiral no. 2 appears as a very thin line (fig. 6). The next whorls have four, equivalent, spirals. In large specimens, a fifth spiral can appear on the lower part of the shell, as a thin line between spirals nos. 1 and 2.

The always formed fourth spiral in *B. latreillei* is essentially different from the only rarely occurring extra spiral in *B. lacteum*. In *B. latreillei* spiral no. 2 appears independently, as a thin, wavy, line in the middle of the space between spirals nos. 1 and 3, whereas in *B. lacteum* the extra spiral originates as a doubling of the upper spiral; these two initially are lying completely together, and the extra spiral hence is provided with knobs from its start onward.

## Note to 4a.

Sometimes spiral no. 1 is present as well, but then clearly less developed than the other spirals, and with nos. 1 and 2 much closer together than the other spirals. *B. scabrum* may have varices, also on the older part of the shell. Particularly specimens from the Mediterranean show strongly developed scaly knobs on the spirals. Studying a large number of samples, it occurred to the authors that *B. scabrum* shells are often somewhat thinner and more "glassy" than all other *Bittium* species, but this is not an identification criterion.

## Note to 5a and 5b.

Verduin (1982) has pointed out that it may sometimes be extremely difficult to distinguish between *B. jadertinum* and *B. reticulatum*. Only the presence of varices may be conclusive; if there are varices on the shell above the last 1½ whorls, then the shell must belong to *B. reticulatum*.

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