

Notes on Bulimulidae (Gastropoda, Euthyneura), 6¹.
The structure of the radula in some *Simpulopsis* species

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Recently we had the opportunity to investigate the radulae of several *Simpulopsis* species which in part were described by one of us (Breure, 1975). It now appears that the structure of the radula is quite variable within this genus.

Material of *Simpulopsis pseudosulculosa*, *S. wiebesi* and *S. araujo*i was collected by F. Plaumann in Brazil, State of Santa Catarina, Nova Teutonia. The specimens were received on loan from the Naturhistoriska Riksmuseet, Stockholm (NRS 2503, 2505 and 2442 respectively). *Simpulopsis citrinovitrea* was collected by A.S.H. Breure in Ecuador, Province Pichincha, 59 km W. Machachi, 1250 m, on leaves in cloud forest.

The specimens were elaborated via the methods described by Ploeger and Breure (1977) and viewed with a Cambridge scanning electron microscope.

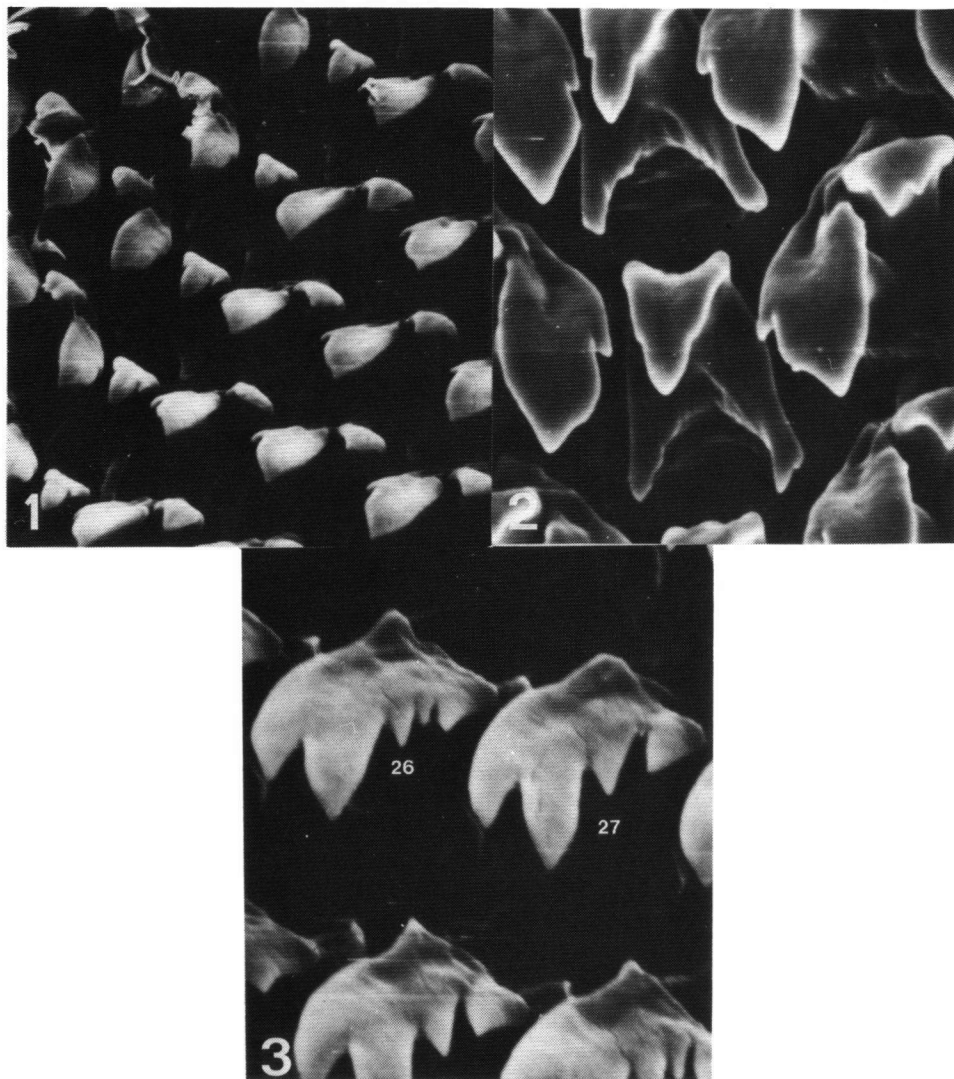
Simpulopsis (Simpulopsis) pseudosulculosa Breure, 1975

The structure of the radula is as follows (figs. 1-3): the transverse rows are slightly V-shaped. The central teeth are tricuspid with an elongate mesocone and two small ectocones; central teeth smaller than the laterals. Lateral teeth with a prominent elongate-ovate mesocone, a small endocone and a more or less triangular ectocone which may be bi- or trifold. Marginal teeth with an elongate mesocone, which is but slightly larger than the endocone. Ectocone bi- or trifold. Central and lateral teeth provided with supporting denticles (cf. Breure, 1974; Solem, 1972).

Simpulopsis (Simpulopsis) wiebesi Breure, 1975

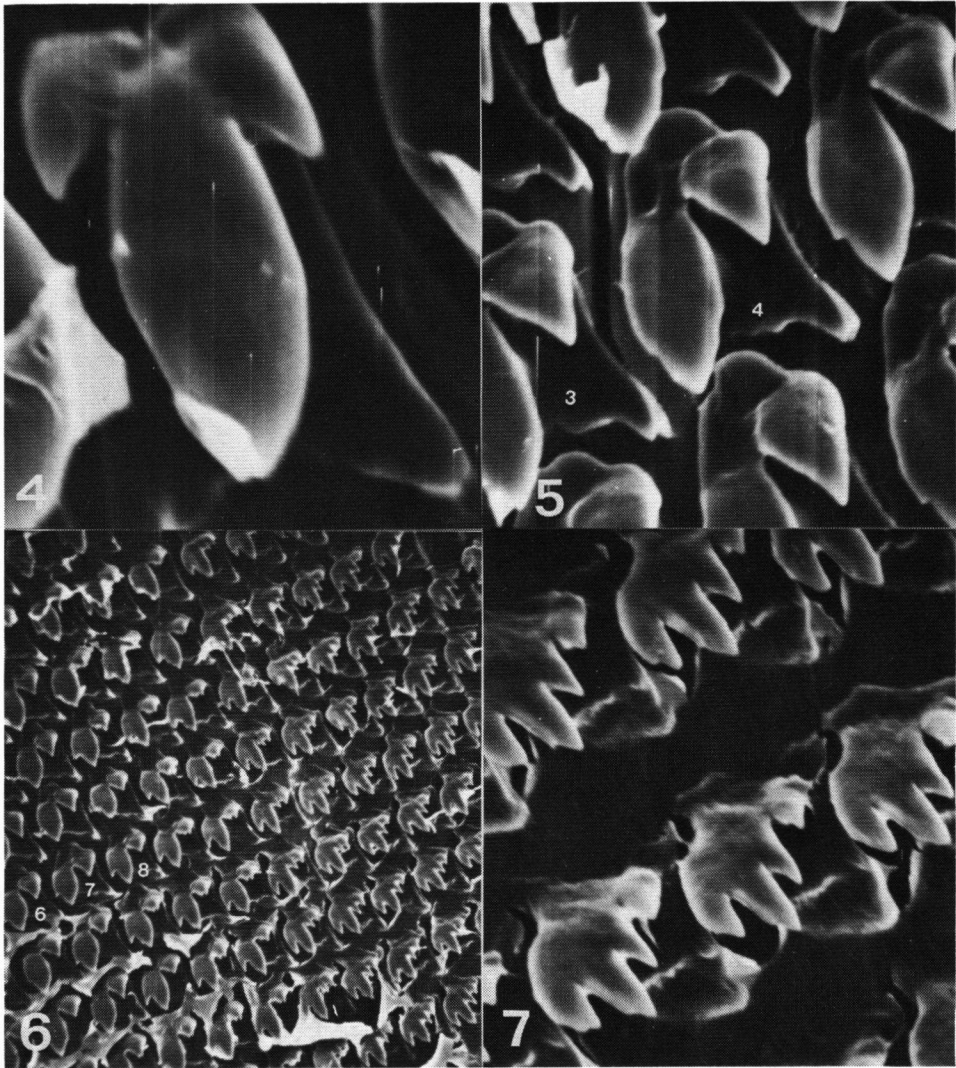
The structure of the radula is as follows (figs. 4-7): the transverse rows are slightly V-shaped. Central teeth with a lanceolate mesocone and two small ectocones at the basis of the teeth; central teeth smaller than laterals. Lateral teeth with a more or less

¹ Notes on Bulimulidae, 5, see Arch. Molluskenk. 108: in press.



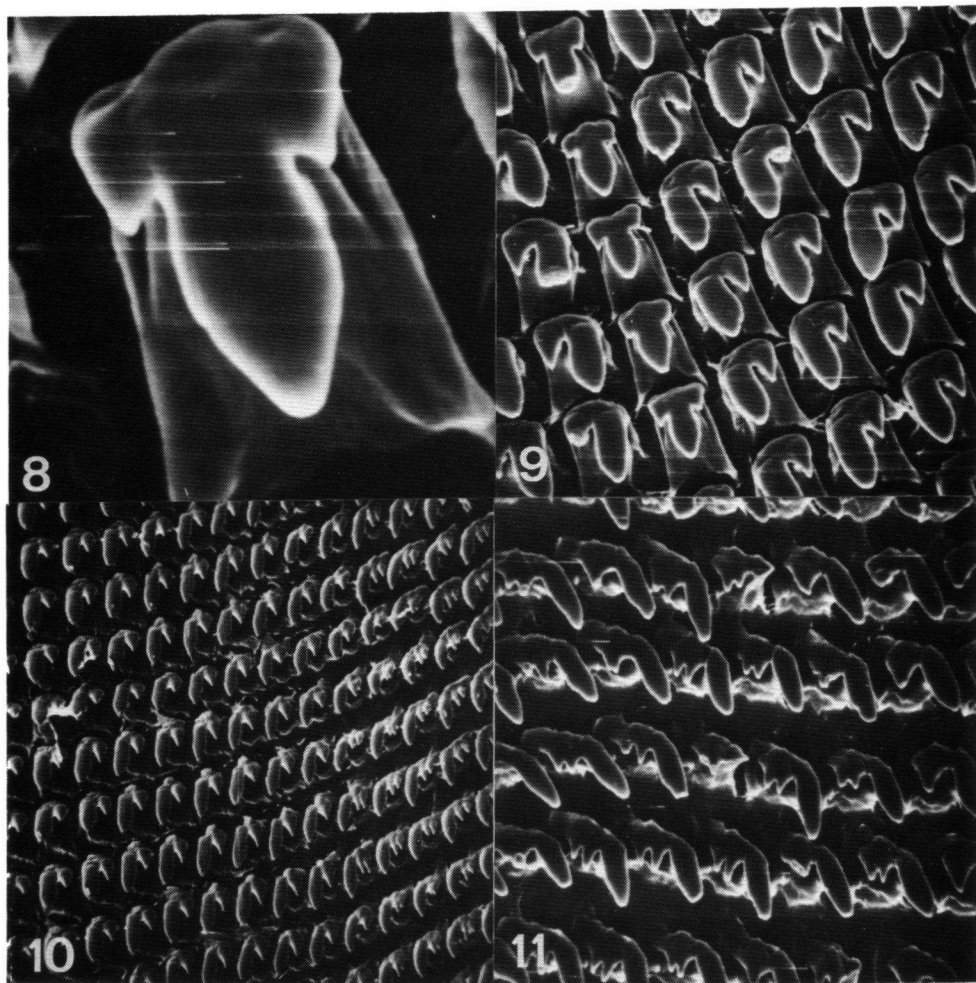
Figs. 1-3. *Simpulopsis* (*S.*) *pseudosulculosa* Breure, radula. 1, central part of radula (750 x); 2, do (1500 x); 3, marginal teeth (1500 x).

lanceolate mesocone, a triangular ectocone and a small endocone which becomes more prominent towards the marginals. Marginal teeth with an elongate mesocone, which is but



Figs. 4-7. *Simpulopsis (S.) wiebesi* Breure, radula. 4, central teeth (3750 x); 5, lateral teeth (1500 x); 6, transition lateral – marginal teeth (375 x); 7, marginal teeth (1500 x).

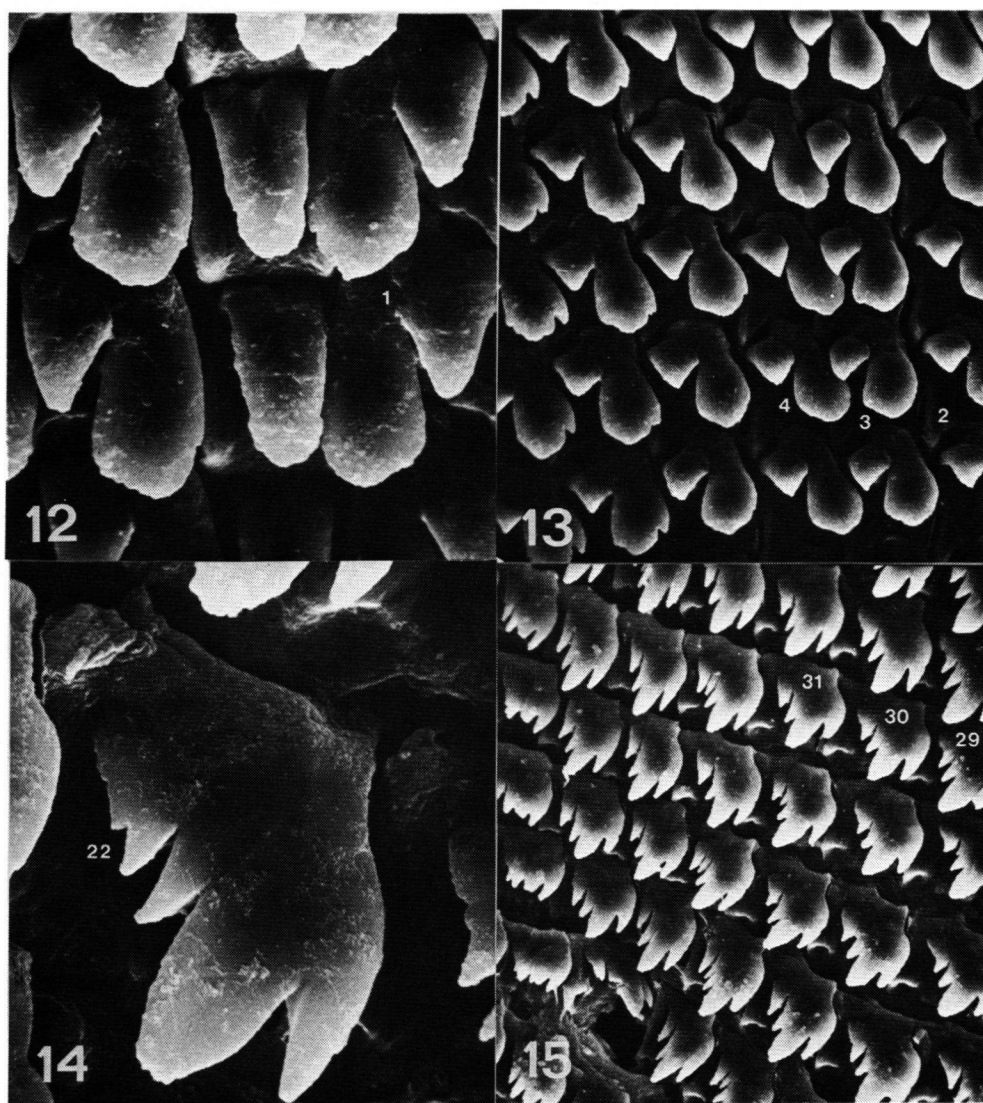
slightly larger than the endocone. Ectocone bi- or trifid. Central and lateral teeth with supporting denticles.



Figs. 8-11. *Simpulopsis (Eudiotus) araujoi* Breure, radula. 8, central teeth (3050 x); 9, central part of radula (610 x); 10, transition lateral – marginal teeth (305 x); 11, marginal teeth (610 x).

Simpulopsis (Eudiotus) araujoi Breure, 1975

The structure of the radula is as follows (figs. 8-11): transverse rows slightly V-shaped. Central teeth with an elongate-ovate mesocone and two small ectocones. Centrals as large as lateral teeth. Laterals with an elongate mesocone and a triangular, smaller ectocone. Marginal teeth with a narrowly elongate mesocone and a bifid ectocone (marginals and laterals thus without endocones). Central and lateral teeth with supporting denticles.



Figs. 12-15. *Simpulopsis (Eudiptus) citrinovitrea* (Moricand), radula. 12, central part of radula (900 \times); 13, lateral teeth (460 \times); 14, detail of marginal teeth (1800 \times); 15, marginal teeth (460 \times).

Simpulopsis (Eudioptus) citrinovitrea (Moricand, 1836)

The structure of the radula is as follows (figs. 12-15): the transverse rows are more or less straight. Central teeth are unicuspid, elongate and as large as the laterals. Lateral teeth with a club-shaped mesocone, a smaller, more or less triangular ectocone and a small endocone which is most prominent towards the marginals. Marginal teeth with elongate-ovate meso- and endocones, which are of about equal size (mesocone slightly larger) and a bifid ectocone. Central and lateral teeth with supporting denticles.

The structure as described here corresponds to the data given by Araujo (1971), as far as his figures are comparable.

The present data suggest a classification of the radulae of *Simpulopsis* in two types. In the first type the central teeth are tricuspid, the laterals possess a prominent mesocone, a smaller ectocone and a still smaller endocone. In the marginal teeth the endo- and mesocone are of about equal size and the ectocones are bi- or trifid. This group includes *Simpulopsis pseudosulculosa*, *S. wiebesi* and *S. ovata* (Araujo, 1975). In the first two species the central teeth are smaller than the laterals, whereas in *S. ovata* all teeth are of about equal size. *Simpulopsis (Eudioptus) araujo* also belongs to this group, but the lateral and marginal teeth are without an endocone.

The second type is characterized by the unicuspid central teeth, which have the same size as the laterals. To this group belong *Simpulopsis (S.) miersi* (cf. Araujo & Breure, 1977) and *S. (Eudioptus) citrinovitrea*.

The structure of the radula is apparently a characteristic which is of less value for a subgeneric classification of *Simpulopsis*, as the types of radulae are not congruent with the present subgenera.

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REFERENCES

- ARAUJO, J.L. Barros, 1971. Sobre a morfologia de *Simpulopsis citrino-vitrea* (Moricand, 1836). — Arq. Mus. nac. Rio de J. 54: 77-80.
- , 1975. Superfamilia Bulimuloidea do Brasil. Amphibulimidae: *Simpulopsis ovata* (Sowerby, 1822). — Arq. Mus. nac. Rio de J. 55: 15-20.
- & A.S.H. BREURE, 1977. Notes on Bulimulidae (Gastropoda, Euthyneura), 7. Anatomy and histology of *Simpulopsis (Simpulopsis) miersi* Pfeiffer, 1856. — Zool. Meded. Leiden: in press.
- BREURE, A.S.H., 1974. Notes on the genus *Gaeotis* Shuttleworth, 1854 (Mollusca, Gastropoda, Bulimulidae). — Neth. J. Zool. 24: 236-252.
- , 1975. Notes on Bulimulidae (Gastropoda, Euthyneura), 2. On a small collection of *Simpulopsis* Beck, 1837 from southern Brazil, with description of three new species. — Basteria 39: 97-113.
- PLOEGER, S., & A.S.H. BREURE, 1977. A rapid procedure for preparation of radulae for routine research with the Scanning Electron Microscope. — Basteria 41: 47-52.
- SOLEM, A., 1972. Malacological applications of scanning electron microscopy. II. Radular structure and functioning. — Veliger 14: 327-336.