Gastropods

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The Silurian gastropods and monoplacophorans of Gotland are principally known through the monographic study of Lindström (1884) – a classic work summarising in detail earlier studies and describing 174 species with superb illustrations made by G. Liljevall. Lindström's monograph has remained essentially unrevised. Several of his described species have subsequently been renamed or designated type species of new genera, although often only on the basis of the original descriptions and illustrations. Lindström's unusual conception of Gotland stratigraphy and the passage of time have left their mark, but the work remains a scholarly and uniform treatment of the entire fauna as then known. As such, it inevitably forms the basis for the identification of the material from Vattenfallet.

The total number of gastropod specimens from the section is 235. A large proportion of species entered in the log (Fig. 29) is only identified at an ill-defined systematic level, e.g. Platyceratacea sp. indet. *a*. To some extent this open nomenclature reflects material which needs to be revised monographically before a meaningful identification can be presented. The principal reason, however, is poor preservation. Many specimens are represented by internal moulds without any remaining trace of the shell. This is in itself a common feature of gastropod faunas from many areas and is due to the preferential solubility of aragonite. Other forms, such as *Euomphalopterus, Oriostoma* and *Platyceras,* frequently have an excellently preserved shell surface, owing to a thin outer calcitic layer in the shell that is apparently missing in many of the other taxa.

Annotated faunal list

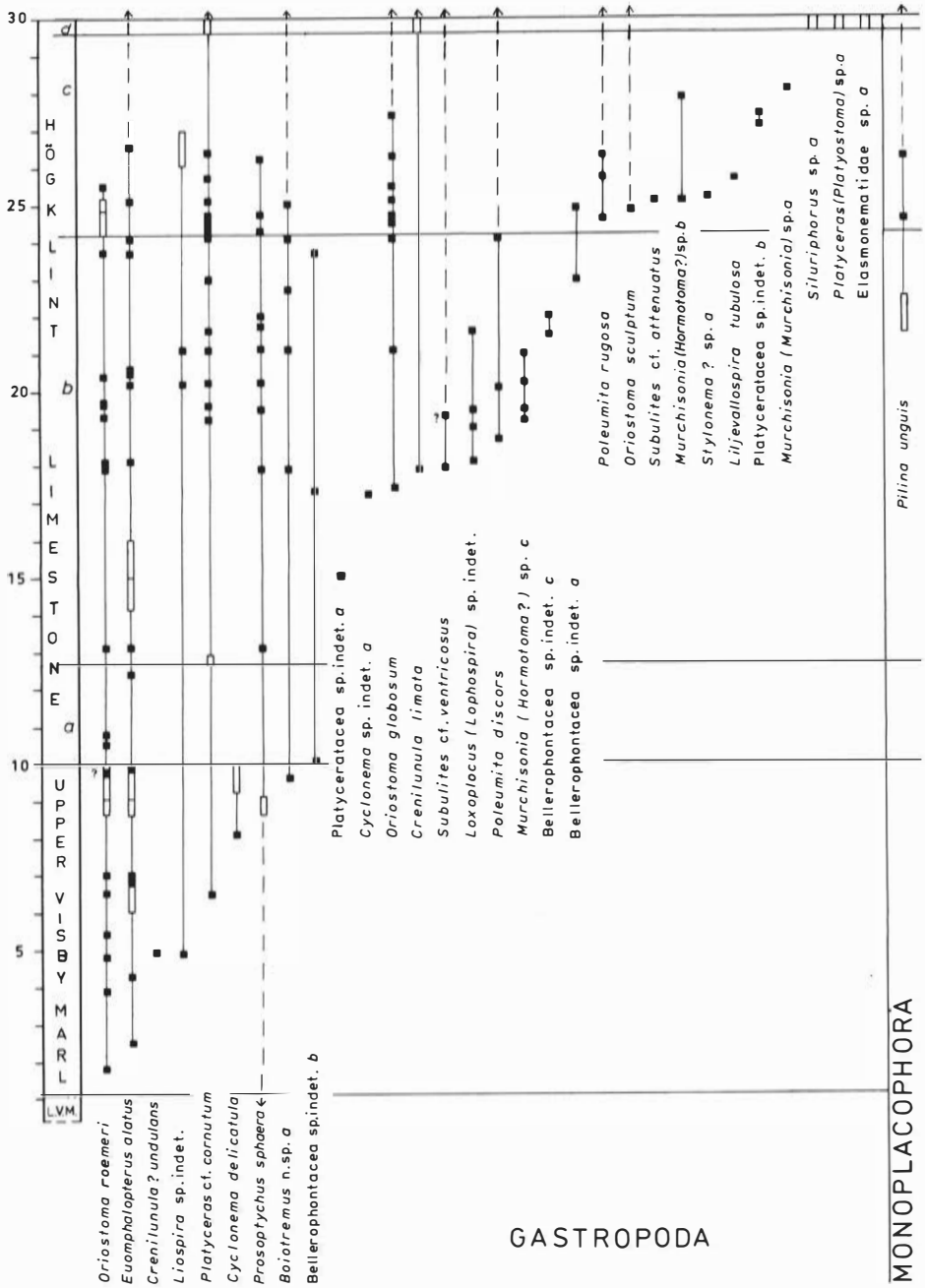
Bellerophontacea

Prosoptychus sphaera (Lindström), *Boiotremus* n.sp. *a, Liljevallospira tubulosa* (Lindström), Bellerophontacea sp. indet. *a, b* and *c*.

Boiotremus n.sp. *a* (Peel, in ms.) differs from the characteristic *B. longitudinalis* (Lindström) from the Upper Visby Marl in being smaller, having a less expanding aperture, and in frequently developing coarser ornamentation.

Euomphalacea

Poleumita discors (Sowerby), *P. rugosa* (Sowerby), Euomphalidae sp. indet. *a* (15–16 m).


30
25
20
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UPPER VISBY MARL
LVM
HÖGKLINT LIMESTONE
a
b
c
d
Oriostoma roemeri
Euomphalopterus alatus
Crenilunula? undulans
Liospira sp. indet.
Platyceras cf. cornutum
Cyclonema delicatula
Prosoptychus sphaera
Boiotremus n.sp. a
Bellerophontacea sp. indet. b
Platyceratacea sp. indet. a
Cyclonema sp. indet. a
Oriostoma globosum
Crenilunula limata
Subulites cf. ventricosus
Loxoplacus (Lophospira) sp. indet.
Poleumita discors
Murchisonia (Hormotoma?) sp. c
Bellerophontacea sp. indet. c
Bellerophontacea sp. indet. a
Poleumita rugosa
Oriostoma sculptum
Subulites cf. attenuatus
Murchisonia(Hormotoma?)sp. b
Stylonema ? sp. a
Lilyevallospira tubulosa
Platyceratacea sp. indet. b
Murchisonia (Murchisonia) sp. a
Siluriphorus sp. a
Platyceras(Platyostoma) sp. a
Elasmonematidae sp. a
Pilina unguis
GASTROPODA
MONOPLACOPHORA

Fig. 29.

Pleurotomariacea

Crenilunula limata (Lindström), *C.? undulans* (Lindström), *Euomphalopterus alatus* (Wahlenberg), *Liospira* sp. indet., *Loxoplocus (Lophospira)* sp. indet.

Knight (1945) in designating *Pleurotomaria limata* Lindström, 1884 as type species of *Crenilunula* equated the Gotland species with *Euomphalus carinatus* Sowerby in Murchison, 1839. Unfortunately, most of Sowerby's Silurian gastropods are poorly known and inadequately illustrated and there is little to be gained from enforcing the synonymies without a thorough revision.

Platyceratacea

Platyceras (Platyostoma?) cf. *cornutum* (Hisinger), *P. (Platyostoma)* sp. *a*, *Cyclonema (Cyclonema) delicatulum* (Lindström), *C. (C.)*. sp. indet. *a*, Elasmonematidae sp. *a*, Platyceratacea sp. indet. *a* and *b*.

A variety of platyceratids, compared to *P. cornutum* (Hisinger), occurs throughout the Vattenfallet section. The coprophagous mode of life of these gastropods produces tremendous variation in shell morphology. In the absence of monographic revision it is not considered meaningful to attempt to recognize distinct species within this complex.

Oriostomatacea

Oriostoma globosum (Schlotheim), *O. sculptum* (Sowerby), *O. roemeri* Lindström.

Murchisoniacea

Murchisonia (Murchisonia) sp. *a*, *M. (Hormotoma?)* sp. *b*, *M.* (*H.*?) sp. *c*, Murchisoniidae sp. indet. *a* (1.7–1.9 m) and *b* (22.80 m).

Pseudophoracea

Siluriphorus sp. *a*.

Loxonematacea

Stylonema? sp. *a*.

Subulitacea

Subulites cf. *attenuatus* Lindström, *S.* cf. *ventricosus* Hall, *S.* sp. indet. (2.5 m).

Ecological comments

The great majority of Lower Palaeozoic gastropods were referred to the Archaeogastropoda by Knight et al. (1960). In contrast, two thirds of present

day prosobranchs are referred to the Caenogastropoda (= Mesogastropoda + Neogastropoda) and have relatively advanced ctenidia capable of coping with fine suspended sediment in soft substratum environments. Lower Palaeozoic archaeogastropods are generally considered to be herbivores living on relatively firm substrata in conditions of clear water, by analogy with most extant members of the order. However, many Lower Palaeozoic archaeogastropods display morphological characters which are readily interpreted as adaptation to life on relatively soft substrata. Others are associated with fine-grained sediments possibly indicative of similar bottom conditions. Their presence in such environments can partly be explained in terms of various types of foliage support but the frequent large size and heavy calcification of shells of many species provides difficulties in this respect. It is becoming increasingly evident that close ecological comparison between extant archaeogastropods and Lower Palaeozoic supposed archaeogastropods provides a seriously limited picture of the range in modes of life followed by gastropods in the Lower Palaeozoic.

Most of the Vattenfallet gastropods were probably epifaunal deposit feeding microherbivores, although some may have browsed on algal foliage. It is difficult to find evidence of carnivorism but the rare caenogastropod *Subulites* possibly lived in this way. Platyceratids are frequently coprophagous, living on the calices of echinoderms and ingesting their expelled faeces. Other, more regularly coiled platyceratids, e.g. *Cyclonema,* were probably sluggish carnivores or scavengers.

Several species of *Oriostoma* are of common occurrence at Vattenfallet. Their abundance, large size and thick, heavily ornamented shells suggest a deposit feeding existence. The common pleurotomariacean *Euomphalopterus alatus,* also probably a deposit feeder, is characterized by a wide flange at the whorl periphery which may be an adaptation to prevent sinking into a soft substratum by increase in surface area.

The development of an explanate aperture in bellerophontaceans has been interpreted as an adaptation to life on a soft substratum (Peel 1974). *Boiotremus* n.sp. *a*, and to a lesser extent *Prosoptychus sphaera,* develop such expanded apertures during the later growth stages.

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