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A new Eurypterid from the Saaremaa- (Oesel-) beds in Estonia

By Leif Störmer.

The famous *Eurypterus fischeri*-fauna of Rootsiküla (Rootsiküll), Saaremaa, became known to science through the monographs of Nieszkowski (1858), Schmidt (1883), and Holm (1898). The unique preservation of the eurypterid shells has made it possible to study in detail the finest morphological structures of these old arthropods. By means of a special method, Holm succeeded in separating the chitinous tests from the matrix.

The Saaremaa beds have also furnished a considerable supply of vertebrates and crustaceans.

In later years Professor dr. W. Patten from Dartmouth College, Hanover, N. H., U. S. A. made extensive collections in the Saaremaa beds. He was specially interested in the remains of the primitive vertebrates, but also collected a considerable material of merostomes. The sad death of Professor Patten in the fall of 1932 prevented him from finishing his interesting studies on the valuable material of primitive vertebrates. In May 1932 I had the fortunate opportunity to visit Professor Patten in Dartmouth College. He very kindly showed me his fine collections of eurypterids from Saaremaa. Looking through the material I became aware of an eurypterid specimen, belonging to a genus not known, from the *Eurypterus fischeri*-fauna of Saaremaa.

Some time ago I wrote an application to the Dartmouth College to borrow the specimen for description. Dr. G. M. Robertson very kindly acceded to my request. Professor Dr. A. Öpik informs me that the species described below does not occur in the University Museum collections of Tartu. I wish to express my thanks to Professor Öpik for his kind assistance during the preparation of this article.

Systematic description.

Genus *Hughmilleria* Sarle 1903.

The American species *Hughmilleria socialis* Sarle, is distinguished from the species of the genus *Eurypterus* chiefly by the

lanceolate body, the small and narrow prosoma with the parabolic outline and the marginal eyes, the narrow swimming legs, and the *Pterygotus*-like ornamentation of the test. Clarke and Ruedemann (1912) and later Ruedemann (1921) have described a number of different species of the genus *Hughmilleria*. Clarke and Ruedemann (1912) among others, have pointed out that certain European species of the genus *Eurypterus* have to be included in the genus *Hughmilleria* which is related to the genus *Pterygotus*. In most described species of *Hughmilleria* the lateral eyes are not marginal, but submarginal. In a monograph on the Eurypterida of Rudstangen, Ringerike, Norway, I am discussing in detail the species belonging to the genus (Störmer (1934). The British species *Eurypterus lanceolatus* Salter and most specimens of *Pterygotus banksii* seem to belong to the genus *Hughmilleria*.

In the well-known eurypterid faunas from the Saaremaa-beds of Esthonia and the Bertie Waterlime of New York, the genus *Eurypterus* is the most important. In other faunas however, the genus *Eurypterus* is more or less replaced by the genus *Hughmilleria*. This is the case with the Shawangunk and Pittford faunas of North America and the Ludlovian-Downtonian faunas of Great Britain and Norway.

Hughmilleria patteni, n. sp.

Fig. 1 and pl. I.

Diagnosis: Prosoma rather broad with pointed anterior part. Posterior position of median ocelli and lateral eyes. Anterior portion of prosoma with distinct transverse striæ. (Prosomal appendages and abdomen unknown.)

Holotype: Specimen figured (fig. 1, pl. I) belongs to the collections of Professor W. Patten in Dartmouth College.

General description: Prosoma rather broad, with parabolic outline. Ratio length-width of prosoma = 4:5. Anterior part of prosoma not preserved, but the rather pointed rostral portion is indicated on the mould. Posterior border slightly convex. Postlateral corners not well preserved. Lateral margins bordered by a narrow rim appearing dark brown in contrast to the lighter brown test of the rest of the prosoma.

Surface of prosoma gently arched. Central portion rather level. Lateral eyes well preserved, especially on the right side. Out-

line of lateral eye bean-shaped. The whole surface of the eye is distinguished from the surrounding part of the prosoma by a very thin and light-coloured test.

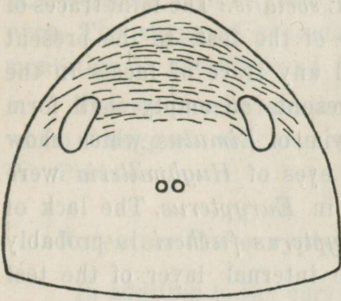


Fig. 1. *Hughmilleria patteni*, n. sp. $\times 3$. Reconstruction of prosoma. Median and lateral eyes and ornamentation indicated.

No eye-lid developed. Visual surface of eye without traces of facets. Median ocelli situated in the posterior half of prosoma. Distance to posterior border = $\frac{3}{8}$ of the prosomal length. Median ocelli consist of two circular spots distinguished by their very thin and light-coloured test. Prosomal appendages and opisthosoma unknown.

Ornamentation. Anterior portion of prosoma shows a distinct ornamentation while the posterior part is smooth. Anterior part extends posteriorly to a transverse line across

the posterior part of the lateral eyes. The sculpture is shown in fig. 1, Pl. I and indicated in fig. 2 Pl. I. The photograph gives a partly wrong impression of the structure. The transverse, distinct lines are not developed as very deep furrows, but appear dark on account of a thickening of the test along these lines. In the photograph (fig. 2, Pl. I.) the more solid marginal rim (mgr) has the same dark colour.

Dimensions: Length of prosoma = 19,5 mm, width = 22 mm (probably 23 mm) Length of lateral eyes = 4,5 mm.

Occurrence: *Eurypterus fischeri*-beds of Rootsiküla, Saaremaa. Only one specimen known.

Remarks: The structure of the lateral eyes is of considerable interest since the earlier described species of *Hughmilleria* have not been found in this excellent state of preservation. Clarke and Ruedemann (1912, p. 36) point out that *Pterygotus*, *Slimonia* and *Hughmilleria* form a separate group in regard to the structure and position of the lateral eyes. In the genera mentioned the visual area of the lateral eyes occupies . . . „the whole node, is marginal and faceted.“ In *Hughmilleria patteni* the visual area of the eye occupies the whole node. Certain other species of *H.*, as e. g., *H. norvegica*, have a narrow eye-lid indicated, and hence are not very different from *Eurypterus* in regard to the structure

of the eyes. The submarginal position of the lateral eyes is typical for most species of the genus *Hughmilleria*.

Clarke and Ruedemann (l. c. p. 332) thought they might find traces of facets in the lateral eye of *H. socialis*. The faint traces of facets were found, only on the inside of the test. In the present species it has not been possible to find any trace of facets in the visual area. The specimen probably represents an empty shell form the moulting, but I have examined exuviae of *Limulus* which show the facets very distinctly. The lateral eyes of *Hughmilleria* were probably not very different from those in *Eurypterus*. The lack of facets in *Hughmilleria patteni* and *Eurypterus fischeri* is probably due to the matter of preservation. The internal layer of the test covering the eyes, might have escaped preservation.

Relationship. The present species shows relationship to British, North American and Norwegian species of the genus *Hughmilleria*. The British species *H. lanceolatus* (Salter) described by Woodward (1866—78, p. 140) as an *Eurypterus*, is closely allied. The species differs to some extent in the shape of the prosoma and the lateral eyes. According to the description of Woodward (l. c. p. 143) the species shows, on the operculum and the anterior half of each tergite, an ornamentation consisting of minute scale-like markings. Transverse lines on the prosoma are not described. *Eurypterus pygmaeus* Salter (Salter 1859, pl. 10, fig. 7) has several Hughmillerian characters. The transverse striae recall the present species, but the size and shape of prosoma deny a closer identity. *Eurypterus linearis* Salter (1859) evidently belongs to the genus *Hughmilleria*. Since only the telson of this form has been described a closer comparison cannot be discussed. *Eurypterus conicus* Laurie (1892, p. 157) seems to belong to the same genus. Laurie pointed out the relationship to some of the above mentioned species. His figure do not show the structures of the prosoma very well, but according to his description the surface shows "fine anastomosing veins" probably like those in the present species. *Hughmilleria conicus* differs from the present species in having larger lateral eyes of a more posterior position.

The American species *H. socialis* Sarle has marginal eyes. *H. shawangunk* Clarke (Clarke and Ruedemann 1912, pl. 64 — 66 and pl. 69, fig. 1) has apparently the same ornamentation as the Baltic species, but the positions of the lateral and

particularly the median ocelli are different. *H. phelpsae* Ruedm. (Ruedemann 1921) has a different ornamentation. The Ordovician species show no closer resemblance. The Norwegian species *H. norvegica* (Kiær) has a more anterior position of the lateral eyes. The shape of prosoma is also different. The peculiar ornamentation is not observed in the Norwegian species.

The specimen described seems to represent a new species for which I suggest the name *Hughmilleria patteni* after Prof. Dr. W. Patten.

Notes on the eurypterid fauna of the Saaremaa beds.

In addition to the eurypterid remains described by Schmidt in 1883 and Holm 1898, Schmidt described (Schmidt 1904) a new interesting eurypterid which he called *Stylonurus* (?) *Simonsoni*, n. sp. In a more recent paper Ruedemann (1921, p. 7) pointed out that this species probably belongs to the genus *Mixopterus*. A detailed study of the large and well preserved Norwegian specimens of *Mixopterus* from the Downtonian sandstone of Ringerike has confirmed this view (Kiær 1924, Störmer 1934). As to the earlier described species, Holm (1898, p. 56) and to some extent Clarke and Ruedemann (1912, p. 172, 261) have suggested that *Eurypterus laticeps* might belong to the genus *Dolichopterus*. Störmer however, (1933, p. 120) regards this species as a typical *Eurypterus*. Holm (1898, p. 56) separates the two species of *Dolichopterus* from the Saaremaa beds. An operculum and a metastoma is supposed to represent one species related to the American species *Dolichopterus macrochirus* Hall.

Holm regarded the operculum and metastoma as belonging to the same species as the prosoma described by Schmidt as *Eurypterus laticeps* and therefore did not suggest any new specific name, but uses the name *Eurypterus (Dolichopterus) laticeps* for all three parts. In the explanations of the figures on the plates the name *Dolichopterus laticeps* is applied to the specimens of the operculum and metastoma. Since *Eurypterus laticeps* based on the prosoma described by Schmidt, and *Dolichopterus laticeps* based on the operculum and metastoma, seem to be different species, it might be possible to retain both names meaning two separate species.

Another specimen of metastoma belongs to a different, more undetermined species of *Dolichopterus*.

The list of Eurypterids from the Saaremaa beds consists, therefore, of the following species:

Eurypterus fischeri Eichw.

— *laticeps* Schmidt.

Pterygotus (Erettopterus) osiliensis Schmidt,

Hughmilleria patteni Störmer.

Dolichopterus laticeps Holm.

„ sp.

Mixopterus simonsoni (Schmidt).

The fauna of the Saaremaa beds are mentioned in a recent paper by Luha (1930).

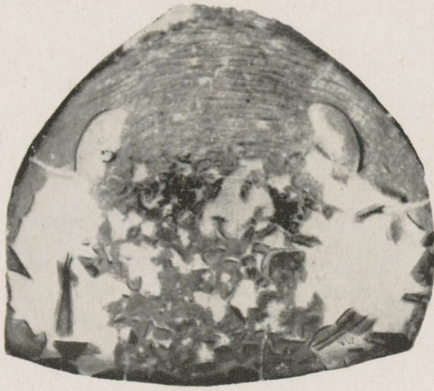


Fig. 1. *Hughmilleria patteni* n. sp. $\times 4$. Holotype. Prosoma. From the Eurypterus beds of Rootsiküla, Saaremaa. Coll. W. Patten. Specimen belongs to W. Patten's collections in Dartmouth College, N. H., U. S. A. Photograph, taken of specimen inbedded in alcohol, is not retouched.

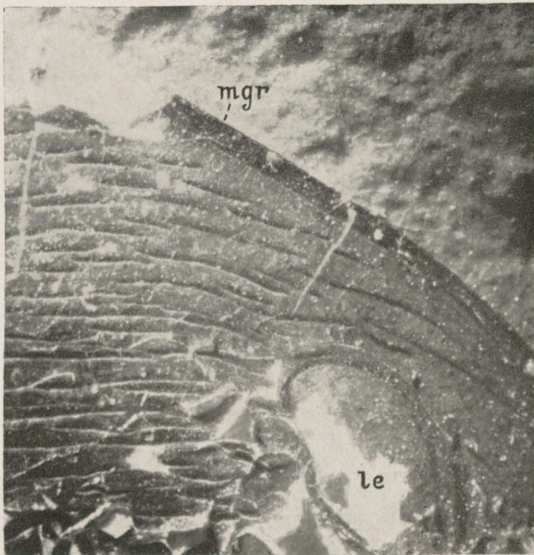


Fig. 2. *Hughmilleria patteni* n. sp. $\times 11$. Detail of holotype (fig. 1) showing Antelateral margin (mgr), lateral eye (le) and ornamentation of the test.

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