Carboniferous algal microflora, Kap Jungersen and Foldedal Formations, Holm Land and Amdrup Land, eastern North Greenland

Bernard L. Mamet and Lars Stemmerik

A diverse assemblage of calcareous algae was recorded from the Moscovian–Gzelian Kap Jungersen and Foldedal Formations in Amdrup Land and Holm Land. The flora, consisting of 25 species, is dominated by rhodophytes and chlorophytes, most of them similar to or identical with species previously recognised in the Sverdrup Basin of Arctic Canada. One new genus and species, *Groenlandella enigmatica* n.gen. et n.sp., has been erected and is apparently endemic to the Wandel Sea Basin. The composition of the Greenland algal flora indicates that it belongs to the *Uraloporella* flora of the present-day northern hemisphere (Arctic Canada, Svalbard and Arctic Russia).

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Keywords: Calcareous algae, Carboniferous, *Groenlandella*, North Greenland, *Uraloporella*, Wandel Sea Basin

The Upper Palaeozoic microflora of the present-day northernmost hemisphere is relatively well studied in Arctic Canada and the Timan–Pechora Basin of Arctic Russia (Fig. 1; Korde 1950, 1951; Maslov 1956, 1962, 1976; Maslov & Kulik 1956; Chuvashov 1974; Mamet *et al.* 1979, 1987; Chuvashov *et al.* 1993). In contrast, little information is available from the Wandel Sea Basin of North Greenland. However, calcareous algae are found to be an important constituent of most shallow marine carbonates of the Moscovian Kap Jungersen Formation and the Moscovian–Gzelian Foldedal Formation of Holm Land and Amdrup Land in the south-eastern part of the Wandel Sea Basin (Fig. 1).

This paper illustrates the algal microflora from the Upper Carboniferous formations of Holm Land and Amdrup Land (Figs 3–10). Twenty-five taxa are recognised based on observations in more than 300 thin sections of shallow marine carbonates. The flora is best preserved in outcrops in southern Holm Land where the succession is composed of limestones (see *Frontispiece*), and generally more poorly preserved in Amdrup Land where dolomitisation is widespread.

Geological overview

The Upper Carboniferous cyclic shelf carbonates and siliciclastics in Holm Land and Amdrup Land represent the feather-edge of a large depositional area that covered the marginal parts of northern Greenland, the North-East Greenland Shelf and the Barents Sea. During the Late Carboniferous, this region was located approximately 25° north of the equator (Fig. 1; Golonka *et al.* 1994). Westwards, the area was connected to the Sverdrup Basin of Arctic Canada and it extended to the east to include the Timan–Pechora Basin of Arctic Russia (Fig. 1). The Upper Carboniferous sediments in Holm Land and Amdrup Land are included in the lower Moscovian Kap Jungersen Formation and the upper Moscovian to Gzelian Foldedal Formation (cf. Stemmerik *et al.* 1996), and they lie unconformably on older Carboniferous non-marine sediments or Caledonian-affected basement (Fig. 2; Håkansson *et al.* 1981). The formations are separated by a major hiatus from Artinskian and younger Permian carbonates (Stemmerik & Elvebakk 1994).

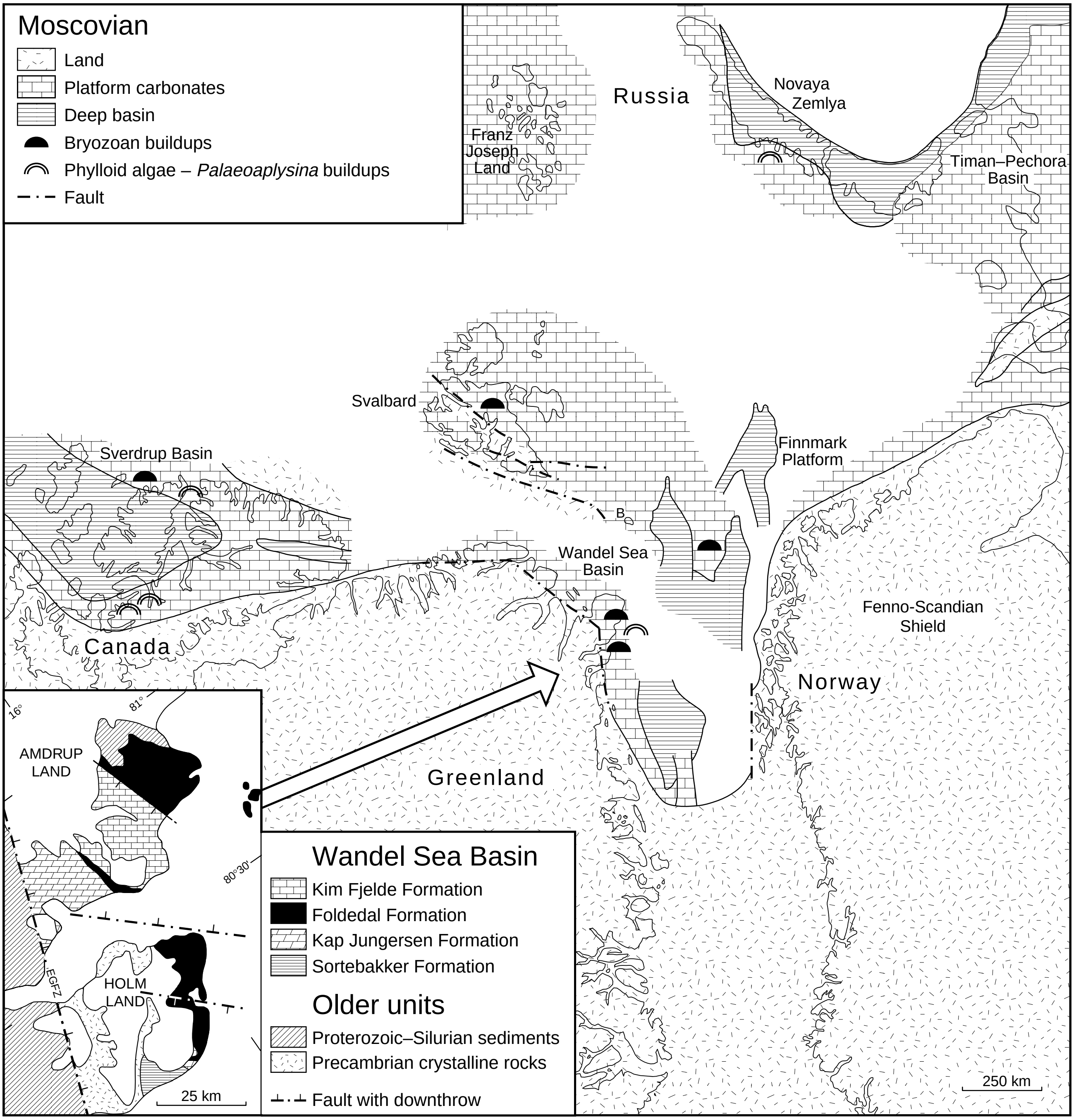

Fig. 1. Upper Carboniferous (Moscovian) palaeogeographic reconstruction of the northern margin of Pangea showing the positions of Wandel Sea Basin, Sverdrup Basin, Svalbard, Timan–Pechora Basin and other deposition sites. **B**: Bjørnøya. The inset map of Holm Land and Amdrup Land shows the outcrops of the Kap Jungersen and Foldedal Formations on which this paper is based; blank areas are ice. **EGFZ**: East Greenland fault zone. Modified from Stemmerik (2000).

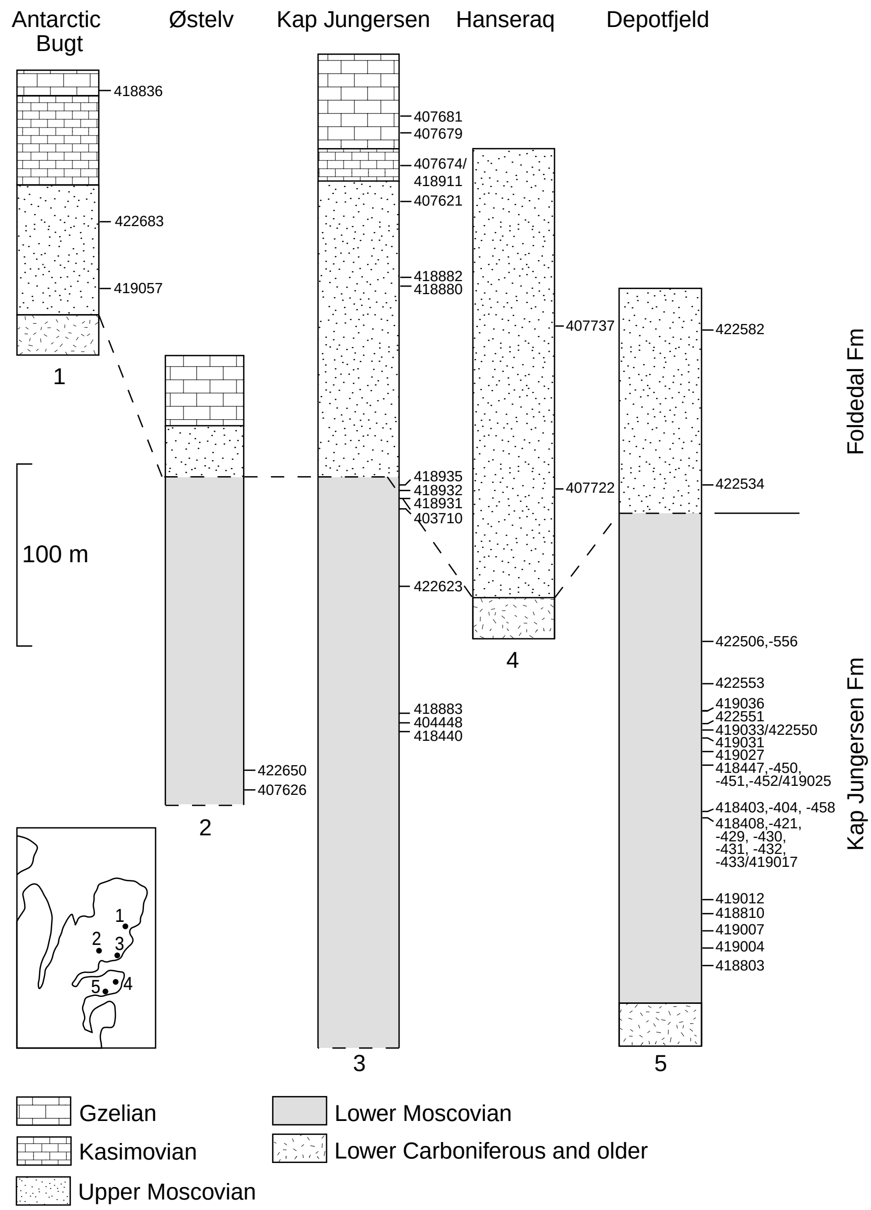

Fig. 2. Correlation of the Upper Carboniferous Kap Jungersen and Foldedal Formations in Holm Land and Amdrup Land. The approximate position of investigated samples is shown. Ages based on Nilsson (1994) and V. Davydov & I. Nilsson, written communication (1999). For geological map of Holm Land and Amdrup Land, see Fig. 1.

The succession in southern Holm Land is composed of more than 300 m of stacked, laterally widespread cycles of shallow shelf limestones and siliciclastics, and cyclic limestones in the upper part. Cycles range in thickness from 2 to 20 m and are typically 4-8 m thick. The mixed cycles are composed of a lower unit of open marine mid-shelf to outer-shelf carbonate facies that were deposited during transgressions and early highstands and an upper unit of inner-shelf siliciclastic deposits. Carbonate buildups are absent in southern Holm Land and high energy carbonate sediments are restricted to isolated shoals that received little or no siliciclastic material. Calcareous algae are particularly important as grain producers in the outer-shelf facies while mid-shelf sediments are dominated by fusulinid- and crinoid-rich facies except for the presence of thin discrete tabular units of *Donezella*- and *Beresella*-dominated bafflestones.

In southern Amdrup Land, the succession consists of more than 400 m of stacked shelf carbonates and siliciclastics. Most carbonates are preserved as dolostones and limestones are only common in the upper part. The succession is much more variable in composition than the time-equivalent succession at southern Holm Land. The southern Amdrup Land succession is composed of a series of tabular to wedge-shaped depositional sequences, where the tabular sequences consist of cyclic siliciclastics and carbonates resembling those in southern Holm Land. The wedge-shaped sequences record time intervals where carbonate platforms, with a maximum relief of 50-100 m, covered the eastern part of the area. These platforms include abundant carbonate buildups flanked by biogenic grainstones and appear to have formed in shallower water than observed in southern Holm Land. However, most buildups and platform carbonates have been dolomitised and the preservation of the algal fragments is poor.

Algal flora

The Greenland algal flora, illustrated in Figs 3–10 (arranged at the end of the text, pp. 84–99), belongs to the *Uraloporella* flora of Mamet (1992). The volumetrically most important forms are red ungdarellids with *Ungdarella uralica* (Fig. 7A–D) as the dominant taxon. The other important red algae include *Komia abundans* (Fig. 7E–I), *Stacheoides meandiformis* (Fig. 8E), *Fourstonella*, and *Cuneiphycus*(?) *johnsoni* (Fig. 8G). The green algae are dominated by beresellids. *Beresella* (Fig. 4J, K; Fig. 5B, F–M; Fig. 6A–J, N), *Dvinella* (Fig. 5A; Fig. 6K–M) and *Uraloporella variabilis* (Fig. 4A–I) are present at most levels and form *in situ* or slightly reworked bafflestones. *Donezella lutugini* (Fig. 5C–E) and *Groenlandella enigmatica* n.gen. et n.sp. (Fig. 10A–N) apparently have similar habits, but these genera have a more restricted occurrence in the lower part of the Kap Jungersen Formation in the southern part of Holm Land. The phylloid algae *Ivanovia tenuissima* (Fig. 9A) is locally present but due to pervasive dolomitisation of most carbonate buildups it is not clear to what degree it contributed to the buildups described by Stemmerik & Elvebakk (1994) and Stemmerik (1996) from southern Amdrup Land.

Dasyclads are scarce in the Moscovian part of the succession, but become somewhat more diverse in the Kasimovian and Gzelian. The most common epimastoporid is *Epimastoporella* (Fig. 3F). However, dasyclad cysts, *Calcisphaera* (Fig. 3C), are quite common suggesting that these green algae were more widespread than recognised in this study.

The prolific *Tubiphytes obscurus* (here considered as a rhodophyte) (Fig. 9H–J) is particularly common in the Gzelian part of the succession where it encrusts sponges and stabilises the sediment. Another strong encruster, *Archaeolithophyllum missouriensum* (Fig. 8A–D), is usually associated with *Palaeoaplysina* and most common in the younger parts of the succession. Other encrusters like *Claracrusta* (Fig. 9B–F) and *Ellesmerella* sp. (Fig. 3B) form complex oncolites ('*Osagia*') and are particularly common in reworked grainstones along the margins of small carbonate platforms in the southern part of Amdrup Land.

Other important features to note are the scarcity of Cyanobacteria–Cyanophyta (Porostromata–Spongiostromata), the absence of girvanelles and the poor representation of nodular codiaceans and red solenoporids. The latter is represented by scattered *Parachaetetes* sp. (Fig. 8F).

Finally, the enigmatic *Microcodium* (Fig. 10O–P) is restricted to the uppermost parts of the Gzelian succession in southern Amdrup Land where it records a period of freshwater influx into the carbonate platform. This limited occurrence of *Microcodium* is surprising when considering its abundance in the time-equivalent successions of Svalbard and the Sverdrup Basin (e.g. Mamet *et al.* 1987).

The described microflora is strikingly similar to that observed in the Canadian Arctic (Mamet *et al.* 1987). Practically all species have their counterparts in the Sverdrup Basin. The Greenland flora also shows a progressive increase of green algae from the mid-Carboniferous to Early Permian as recognised in the Sverdrup Basin (Mamet *et al.* 1987). The Sverdrup Basin flora appears more diverse, but this is due to a number of unrelated factors. The present description of the Greenland flora is based on a rather limited number of thin sections with a biased environmental distribution of open marine shallow-water to semi-restricted facies and few deep-water, shallow reefal and restricted carbonate facies.

Taxonomy

A new genus and species is described from this algal assemblage.

Division Chlorophyta

Genus *Groenlandella* n. gen.

Type genus. Groenlandella enigmatica n. gen., n. sp.

Derivation of name. From latinisation of Grønland (Greenland).

Diagnosis. Thallus elongated, cylindrical, with outer constrictions, slowly tapering, with random dichotomy. Cells suboval, hemispheric, with binary arrangement. Wall calcareous, yellowish, hyaline, perforated by thin, unramified pores.

Comparison. The puzzling dichotomy is reminiscent of the Tournaisian *Kulikaella* Berchenko 1981. However, the poorly illustrated type of that genus (*Kulikaella unistratosa* Berchenko 1981) does not show constrictions.

Possible binary cell division is shown in the Serpukhovian *Kulikaella partita* Ivanova 1990, as illustrated by Ivanova & Bogush (1992) and Chuvashov *et al*. (1993). It is not obvious that *K. partita* belongs to Berchenko's genus.

The constrictions are similar to those of *Pseudokamaena* Mamet *in* Petryk & Mamet (1972), but the cells of that Palaeoberesella are undivided.

The Viséan *Frustulata* Saltovskaya 1984 also displays erratic dichotomy, but the shape of the cells is different.

In conclusion, the systematic position of *Groenlandella* (and that of *Kulikaella* and *Frustulata*) is not clear. They could be distant cousins of the Palaeoberesellidae, but the type of vertical cell division is not known among that tribe, and we cannot confidently assign it to that tribe.

Occurrence. *Groenlandella* is known only from the lower Moscovian Kap Jungersen Formation in western Depotfjeld, southern Holm Land (Figs 1, 2).

***Groenlandella enigmatica* n.gen., n.sp.**
Fig. 10A–N

Holotype. MGUH 24758 from GGU 418429, Fig. 10F, here designated.

Derivation of name. From the puzzling systematic position.

Description. Thallus subcylindrical, ranging from 1000 to 2000 µm. Successions of 11–12 cells are between 900 and 1200 µm in length. Stouter thalli have 20 cells and are up to 1500–1800 µm long. Diameter increases slowly from 60 to 70 µm. Cells hemispherical, binary, divided by vertical partition that simulates a central 'axis' in thin section. Wall hyaline, ranging from 10 to 20 µm in thickness, finely perforated. Dichotomy very variable, sometimes at very low angle other times at right angle and erratic.

Occurrence. Same as genus.

Conclusions

Almost all of the reported specimens illustrated here are similar or identical to those described from the same stratigraphic level in the Sverdrup Basin of Arctic Canada. This is not surprising as the Wandel Sea Basin and the Sverdrup Basin were located at the same palaeolatitude in the Late Palaeozoic and formed part of a huge carbonate-dominated shelf along the northern margin of Pangaea (Golonka *et al*. 1994). The most obvious difference between the studied area of northern Greenland and other Arctic basins, is the limited occurrence of phylloid algal buildups in Greenland. Most buildups in southern Amdrup Land have the original fabric destroyed as a result of dolomitisation. Therefore, phylloids might have been more common than indicated by this study. The absence of phylloid algal, and other types of buildups in southern Holm Land, is in accordance with the updip position of the exposed section in a siliciclastic-influenced environment.

Acknowledgements

This paper is a contribution to the project 'Resources of the sedimentary basins of North and East Greenland' that is supported by the Danish Research Councils. Additional economic support from Saga Petroleum is acknowledged. The paper benefitted from reviews by Reed Wicander, Michigan, USA and Benoit Beauchamp, Calgary, Canada.

Figures 3 to 10 are arranged on pages 84–99 followed by *References*.

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Fig. 3. Miscellaneous Moscovian–Kasimovian algae from Kap Jungersen and Depotfjeld.

A: *Mitcheldaenia distans* (Conil & Lys 1964). Intertwined tubes forming a bafflestone associated with bacterial pellets and a sponge. MGUH 24681 from GGU 403710, Kap Jungersen Formation, Moscovian, × 27.

B: Close up of a bafflestone-bindstone (‘*Osagia*’) composed of algal tubules (*Ellesmerella* sp.), sessile foraminifera (‘*Nubecularia*’), bacterial crusts and vagrant globivalvulinids. MGUH 24682 from GGU 404448, × 70.

C: Calcisphere-rich (*Calcisphaera pachysphaerica* (Pronina 1963) pelletoidal packstone. A few beresellid algae and endothyrid foraminifera. MGUH 24683 from GGU 418458, × 27.

D: *Anthracoporellopsis machaveii* Maslov 1956. MGUH 24684 from GGU 419007, × 70.

E: *Anthracoporellopsis machaveii* Maslov 1956. MGUH 24685 from GGU 422551, × 70.

F: *Epimastoporella japonica* (Endo 1951). MGUH 24686 from GGU 418880, × 27.

G: *Epimastoporella japonica* (Endo 1951). MGUH 24687 from GGU 418880, × 27.

H: *Epimastoporella hunzaensis* (Zanin Buri 1965). MGUH 24688 from GGU 407674, × 70.

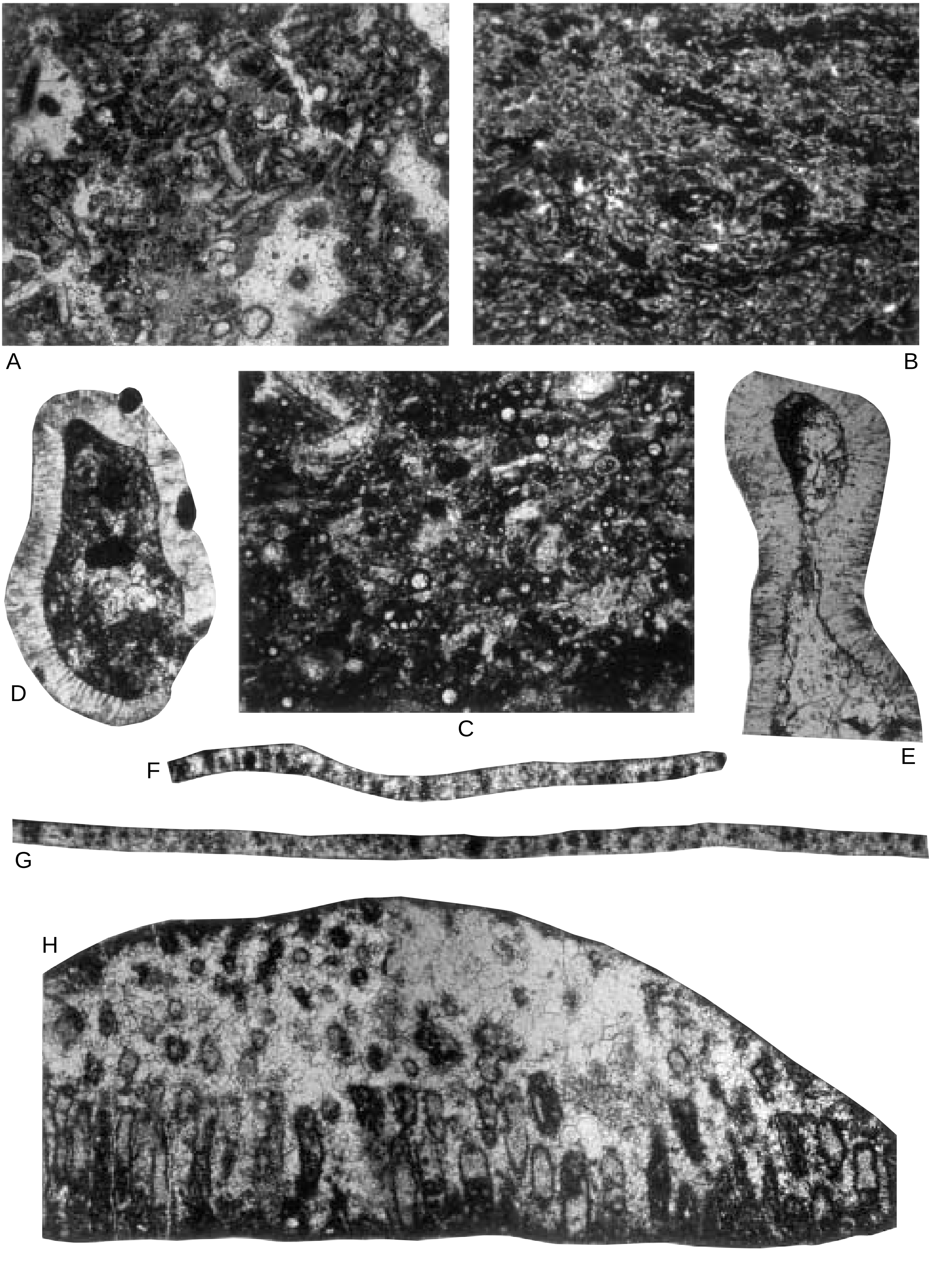
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Fig. 4. Moscovian beresellids from Depotfjeld and Antarctic Bugt.
A: *Uraloporella variabilis* Korde 1950. MGUH 24689 from GGU 419033, × 70.
B: *Uraloporella variabilis* Korde 1950. MGUH 24690 from GGU 422683, × 108.
C: *Uraloporella variabilis* Korde 1950. MGUH 24691 from GGU 419036, × 70.
D: *Uraloporella variabilis* Korde 1950. MGUH 24692 from GGU 419057, × 108.
E: *Uraloporella variabilis* Korde 1950. MGUH 24693 from GGU 419036, × 70.
F: *Uraloporella variabilis* Korde 1950. MGUH 24694 from GGU 419036, × 70.
G: *Uraloporella variabilis* Korde 1950. MGUH 24695 from GGU 418452, × 27.
H: *Uraloporella variabilis* Korde 1950. MGUH 24696 from GGU 418452, × 27.
I: *Uraloporella variabilis* Korde 1950. MGUH 24697 from GGU 418452, × 27.
G–I display erratic interruptions of the micritised pore rows that are probably related to the presence of parietal conceptacles.
J: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24698 from GGU 418447, × 70.
K: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24699 from GGU 419025, × 70.


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Fig. 5. Moscovian beresellids from Depotfjeld, Kap Jungersen and Østelv.

A: A dense thicket of *in situ* beresellid algae (*Dvinella bifurcata* Maslov & Kulik 1956). MGUH 24700 from GGU 422582, × 27.

B: Reworked *Beresella* ex.gr. *B. ishimica* Kulik 1964 boundstone. Transportation is minimal as the external mucilaginous coating (now, clear cement) is preserved. MGUH 24701 from GGU 419017, × 70.

C: *Donezella lutugini* Maslov 1929. MGUH 24702 from GGU 419031, × 108.

D: *Donezella lutugini* Maslov 1929. MGUH 24703 from GGU 407626, × 108.

E: *Donezella lutugini* Maslov 1929. MGUH 24704 from GGU 407626, × 108.

F: *Beresella* ex.gr. *B. polyramosa* Kulik 1964. MGUH 24705 from GGU 418931, × 70.

G: *Beresella* ex.gr. *B. polyramosa* Kulik 1964. MGUH 24706 from GGU 419036, × 70.

H: *Beresella* ex.gr. *B. polyramosa* Kulik 1964. MGUH 24707 from GGU 422650, × 70.

I: *Beresella* ex.gr. *B. polyramosa* Kulik 1964. MGUH 24708 from GGU 422553, × 70.

J: *Beresella* ex.gr. *B. polyramosa* Kulik 1964. MGUH 24709 from GGU 419036, × 70.

K: *Beresella translucea* Kulik 1964. MGUH 24710 from GGU 419027, × 70. Note that the thallus has completely dissolved pores and that only the interpores are fossilised. In that state, the fossil is reminiscent of *Palaeoberesella* sp.

L: *Beresella translucea* Kulik 1964. MGUH 24711 from GGU 418440, × 70.

M: *Beresella translucea* Kulik 1964. MGUH 24712 from GGU 419036, × 70.

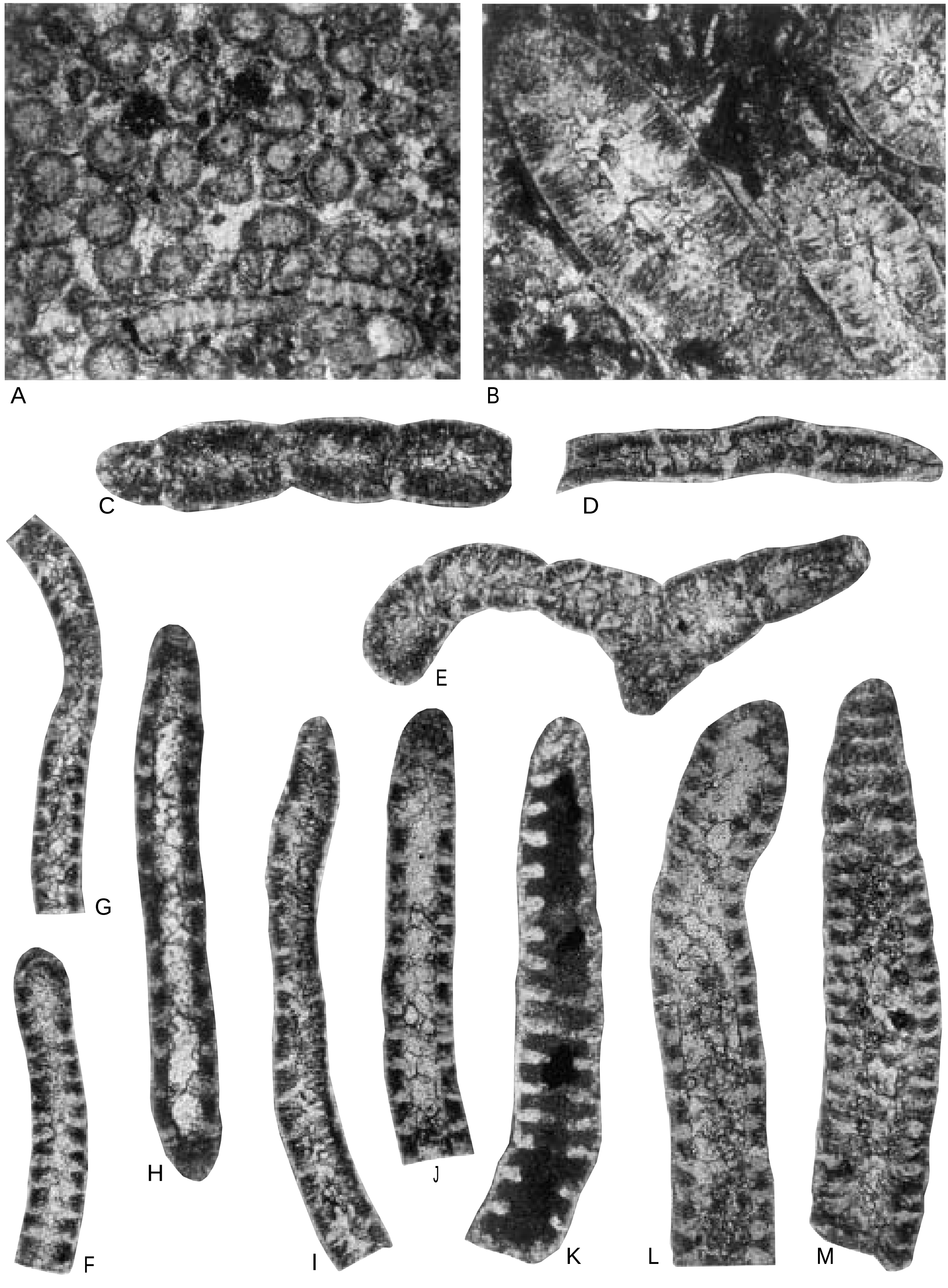
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Fig. 6. Moscovian beresellids from Depotfjeld and Kap Jungersen.

A: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24713 from GGU 418451, × 70.
B: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24714 from GGU 422556, × 70.
C: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24715 from GGU 418447, × 70.
D: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24716 from GGU 418932, × 70.
E: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24717 from GGU 418447, × 70.
F: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24718 from GGU 418403, × 70.
G: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24719 from GGU 418429, × 70.
H: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24720 from GGU 418408, × 70.
I: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24721 from GGU 418421, × 70.
J: *Beresella* ex.gr. *B. ishimica* Kulik 1964. MGUH 24722 from GGU 418450, × 70.
K: *Dvinella comata* Khvorova 1949. MGUH 24723 from GGU 419036, × 70.
L: *Dvinella comata* Khvorova 1949. MGUH 24724 from GGU 422550, × 70.
M: *Dvinella bifurcata* Maslov & Kulik 1956. MGUH 24725 from GGU 418911, × 70.
N: *Beresella* sp. Compare with *Beresella* sp. illustrated from the Canadian Arctic by Mamet & Rudloff 1972, plate V, figs 5–7. MGUH 24726 from GGU 418447, × 70.


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Fig. 7. Moscovian ungdarellids from Depotfjeld, Hanseraq and Kap Jungersen.
A: *Ungdarella uralica* Maslov 1956. MGUH 24727 from GGU 407737, × 33.
B: *Ungdarella uralica* Maslov 1956. MGUH 24728 from GGU 422623, × 70.
C: *Ungdarella uralica* Maslov 1956. MGUH 24729 from GGU 419004, × 27.
D: *Ungdarella uralica* Maslov 1956. MGUH 24730 from GGU 418810, × 27.
E: *Komia abundans* Korde 1951. MGUH 24731 from GGU 422534, × 70.
F: *Komia abundans* Korde 1951. MGUH 24732 from GGU 422534, × 70.
G: *Komia abundans* Korde 1951. MGUH 24733 from GGU 422534, × 70.
H: *Komia abundans* Korde 1951. MGUH 24734 from GGU 422534, × 46.
I: *Komia abundans* Korde 1951. MGUH 24735 from GGU 422534, × 46.

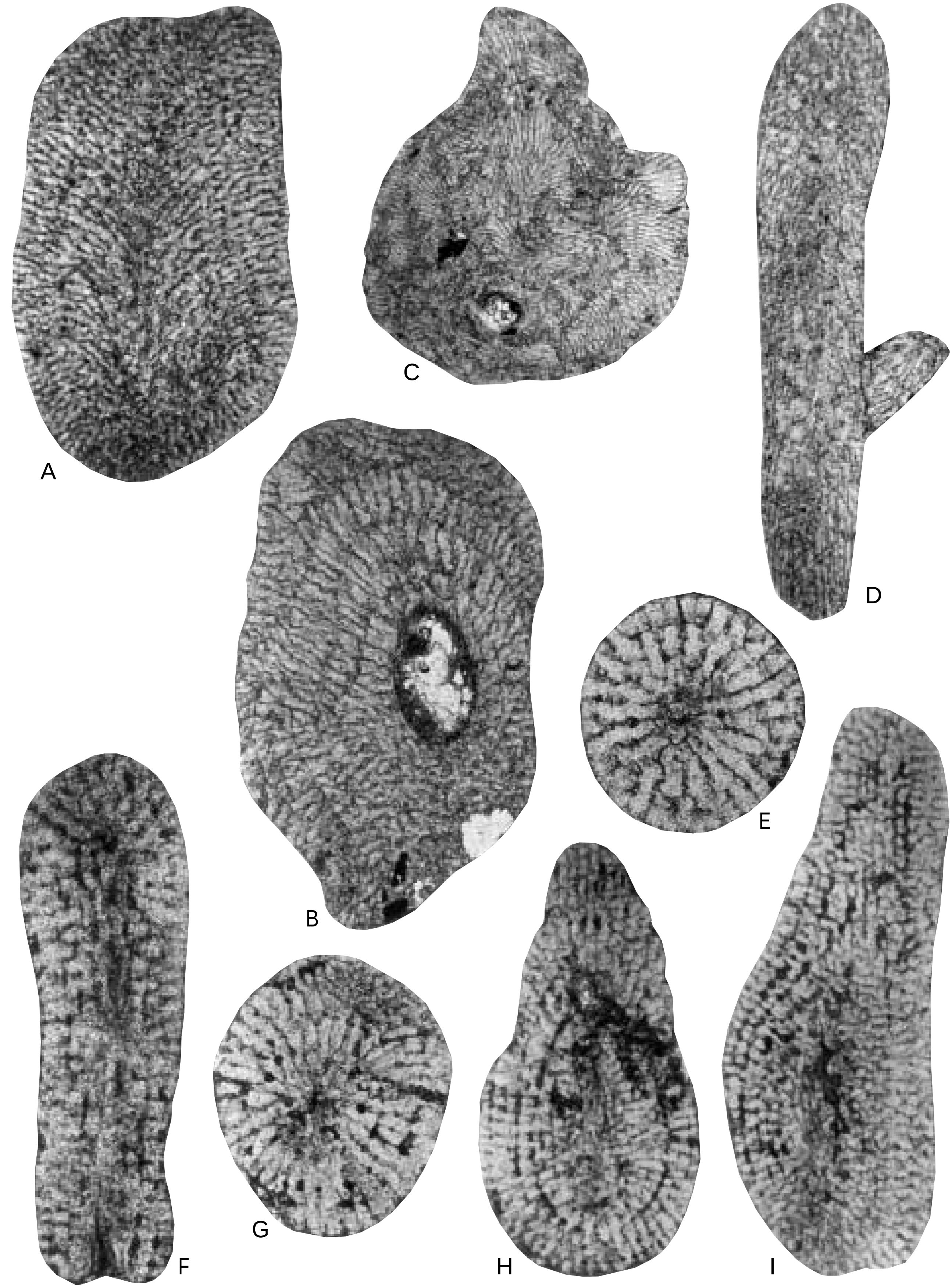
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Fig. 8. Miscellaneous Moscovian–Gzelian algae from Kap Jungersen, Antarctic Bugt and Depotfjeld.
A: *Archaeolithophyllum missouriensum* Johnson 1956 encrusting *Palaeoaplysina* sp. MGUH 24736 from GGU 418836, × 27.
B: *Archaeolithophyllum missouriensum* Johnson 1956 encrusting *Palaeoaplysina* sp. MGUH 24737 from GGU 407674, × 27.
C: *Archaeolithophyllum missouriensum* Johnson 1956 encrusting *Palaeoaplysina* sp. MGUH 24738 from GGU 407674, × 27.
D: *Archaeolithophyllum missouriensum* Johnson 1956 encrusting *Palaeoaplysina* sp. MGUH 24739 from GGU 407674, × 27.
E: *Stacheoides meandriformis* Mamet & Rudloff 1972. MGUH 24740 from GGU 418803, × 108.
F: *Parachaetetes* sp. MGUH 24741 from GGU 418935, × 70.
G: *Cuneiphycus*(?) *johnsoni* Flügel 1966. MGUH 24742 from GGU 418803, × 70.

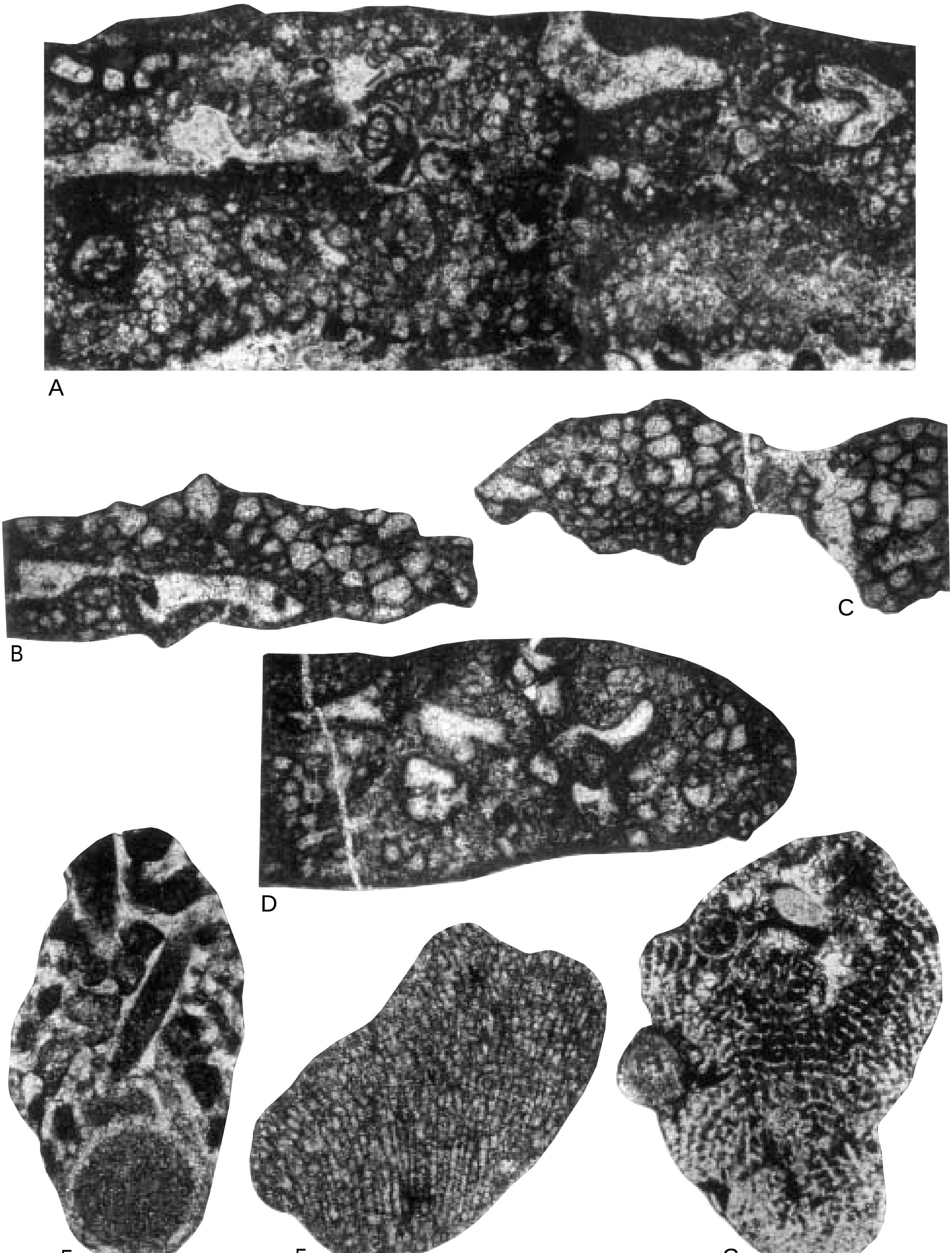
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Fig. 9. Miscellaneous Moscovian–Gzelian algae from Kap Jungersen, Hanseraq and Depotfjeld.

A: *Ivanovia tenuissima* Khvovora 1946. MGUH 24743 from GGU 418882, × 27.

B: *Claracrusta* sp. Cells partly or completely dissolved. The tallus could be confused with *Fasciella* sp. MGUH 24744 from GGU 407722, × 70.

C: *Claracrusta* sp. Cells partly or completely dissolved. The tallus could be confused with *Fasciella* sp. MGUH 24745 from GGU 407722, × 70.

D: *Claracrusta* sp. Cells partly or completely dissolved. The tallus could be confused with *Fasciella* sp. MGUH 24746 from GGU 419012, × 70.

E: *Claracrusta catenoides* (Homann 1972) (= *Berestovia* Berchenko 1982). MGUH 24747 from GGU 419007, × 46.

F: *Claracrusta catenoides* (Homann 1972) (= *Berestovia* Berchenko 1982). MGUH 24748 from GGU 418883, × 46.

G: *Nostocites vesiculosa* Maslov 1929 (=*Globochaete auct.*). Note the characteristic micritisation of the cells. MGUH 24749 from GGU 422506, × 70.

H: *Tubiphytes obscurus* Maslov 1956. Note the embedded sponge spicules and the *Claracrusta* strands. MGUH 24750 from GGU 407621, × 70.

I: *Tubiphytes obscurus* Maslov 1956. Note the embedded sponge spicules and the *Claracrusta* strands. MGUH 24751 from GGU 407679, × 27.

J: *Tubiphytes obscurus* Maslov 1956. Note the embedded sponge spicules and the *Claracrusta* strands. MGUH 24752 from GGU 407679, × 27.

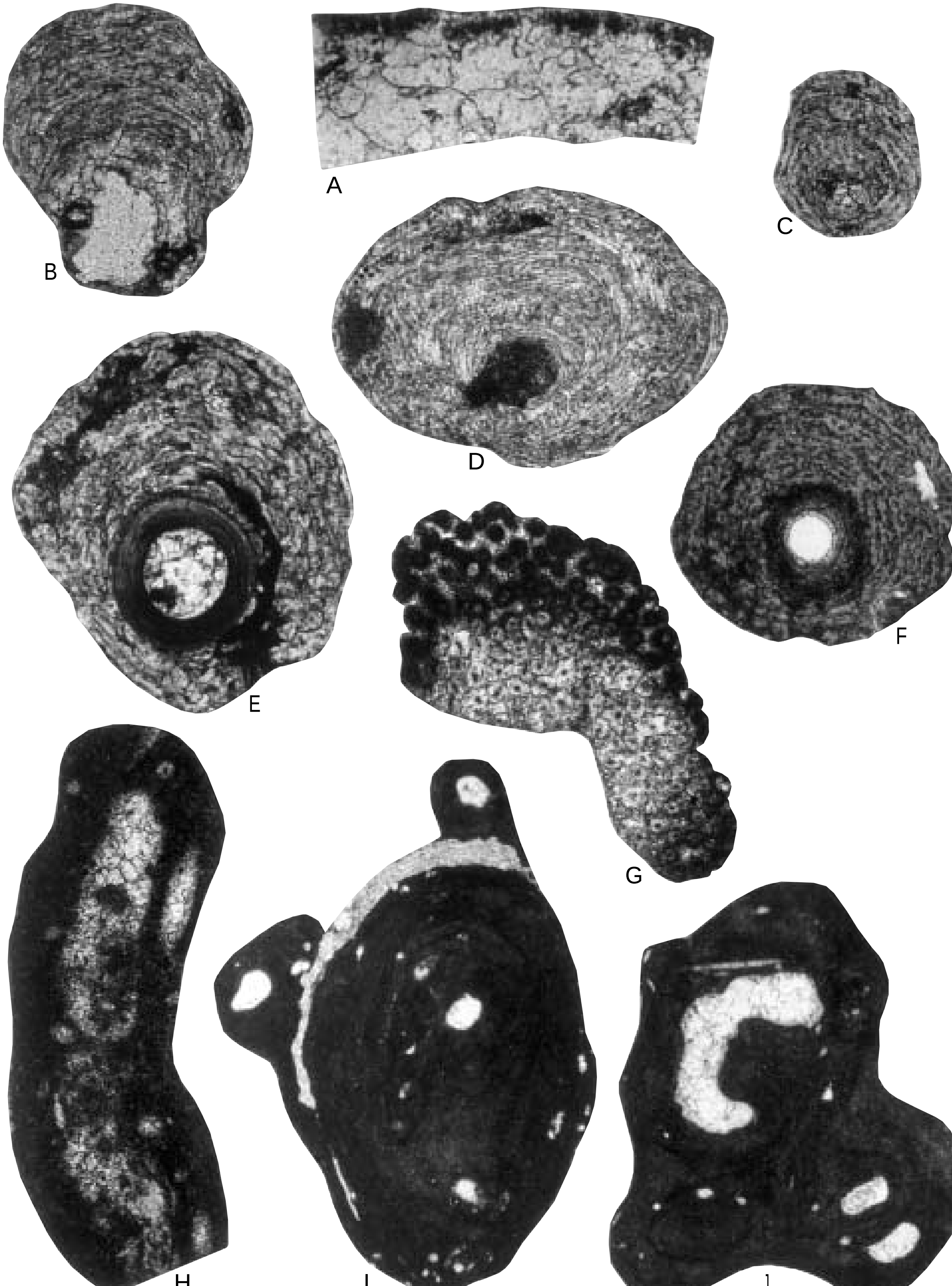
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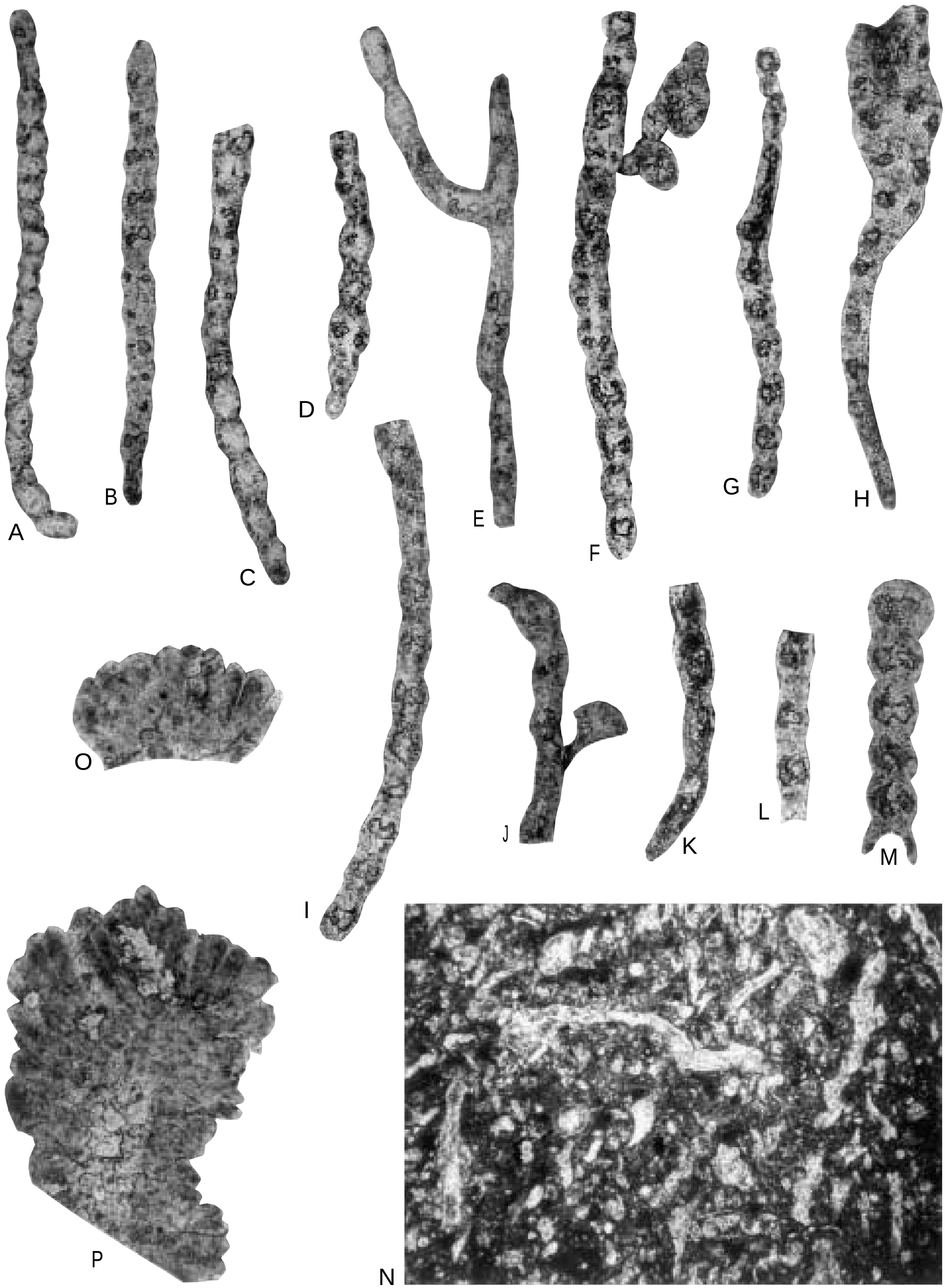
Fig. 10. *Groenlandella enigmatica* n.gen., n.sp. from the Moscovian of Holm Land and *Microcodium* sp. from the Gzelian of Amdrup Land.

A: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24753 from GGU 418430, Kap Jungersen Formation, Moscovian, × 70.
B: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24754 from GGU 418431, Kap Jungersen Formation, Moscovian, × 70.
C: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24755 from GGU 418430, Kap Jungersen Formation, Moscovian, × 70.
D: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24756 from GGU 418431, Kap Jungersen Formation, Moscovian, × 70.
E: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24757 from GGU 418431, Kap Jungersen Formation, Moscovian, × 70.
F: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24758 from GGU 418429, Kap Jungersen Formation, Moscovian, × 70. Holotype.
G: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24759 from GGU 418433, Kap Jungersen Formation, Moscovian, × 70.
H: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24760 from GGU 418432, Kap Jungersen Formation, Moscovian, × 70.
I: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24761 from GGU 418430, Kap Jungersen Formation, Moscovian, × 70.
J: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24762 from GGU 418431, Kap Jungersen Formation, Moscovian, × 70.
K: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24763 from GGU 418432, Kap Jungersen Formation, Moscovian, × 70.
L: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24764 from GGU 418431, Kap Jungersen Formation, Moscovian, × 70.
M: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24765 from GGU 418431, Kap Jungersen Formation, Moscovian, × 70.
N: *Groenlandella enigmatica* n.gen., n.sp. MGUH 24766 from GGU 418431, Kap Jungersen Formation, Moscovian, × 27. Illustrates the intertwined thalli associated with calcispheres, tuberitinids and beresellids.
O: *Microcodium* sp. MGUH 24767 from GGU 407681, Foldedal Formation, Gzelian, × 33.
P: *Microcodium* sp. MGUH 24768 from GGU 407681, Foldedal Formation, Gzelian, × 33.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