

THE CARBONIFEROUS MEGASPORES FROM THE
ZONGULDAK AND AMASRA COAL BASIN AND
THEIR STRATIGRAPHICAL VALUES

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ABSTRACT. — In this paper the content of the Megaspores in the paleophytogenetic material has been investigated. The available material for this study consists of samples obtained from the borings carried out by the M.T.A. Institute in the Amasra and Zonguldak Carboniferous Basin. The samples chosen are collected from the coal seams at different galleries. As a result of this sporological study, 13 new Megaspore species have been found, described and stratigraphically evaluated.

SYSTEMATIC DESCRIPTION

Subclassis I. *TRILETES* REINSCH, 1881

Order I. Azonotriletes LUBER, 1935

Family I. *Laevigati* (B. and K., 1886) POT. and KR., 1954

Laevigatisporites culminatus n. sp.

Pl. I, Figs. 1, 2; holotype 2

Diagnosis. — Spore flattened in dorso-ventral direction, rounded or subtriangular in outline. The length of the spore body is 1200 microns. Triradiate ridges straight, about 150 microns long, 40 microns wide, and 30 microns high. Arcuate ridges developed into equatorial cingulum. Triradiate ridges sometimes merged into three folds of the coat, 350 microns long, 120 microns broad. Folds and triradiate ridges together about as long as the radius of the spore. The floor of the contact areas more elevated. Spore coat smooth and shining, 35 microns thick.

Remarks. — In some respect *Laevigatisporites culminatus* resembles *Laevigatisporites (Triletes) trilobatus* (DIJKSTRA, 1957) nov. comb., but its triradiate ridges, radial folds and size are larger than the latter and *Laevigatisporites culminatus* is only one-colored.

Locality. — Amasra, Boring No. 32, 875 m in depth.

Occurrence. — Westphalian B-C; rarely encountered.

Laevigatisporites depressus n. sp.

Pl.-I, Fig. 3

Diagnosis. — Spore flattened in proximal-distal direction, rounded in outline. Diameter of the body of the spore 430 microns. Triradiate ridges conspicuous,

nearly as long as the spore radius, 40 microns broad, 20 microns high. Arcuate ridges not distinguishable. Contact area less depressed than the rest of the spore coat. Spore coat 30 microns thick, smooth; every ornamentation lacking.

Locality. — Amasra, Boring No. 32, 945 m in depth.

Occurrence. — Westphalian B; very rare.

Laevigatisporites subglabratus n. sp.

Pl. I, Fig. 4

Diagnosis. — Spore triangular with broadly-rounded angles and concave sides, flattened in dorso-ventral direction; diameter of the spore body 390 microns. Triradiate ridges straight, 250 microns long, 95 microns broad, 25 microns high. Arcuate ridges absent, equatorial ridges distinguishable. Spore coat smooth, 20 microns thick; other ornamentation lacking.

Remarks. — This species — of which only one specimen could be found — resembles *Laevigatisporites (Triletes) glabratus*, from which it can easily be distinguished by the absence of arcuate ridges and its large size.

Locality. — Amasra, Boring No. 32, 957 m in depth.

Occurrence. — Westphalian B; very rare.

Family II. *Apiculati* (B. and K., 1886) POT. and K.R., 1954

Tuberculatisporites polycingulatus n. sp.

Pl. I, Figs. 5, 6; holotype 5

Diagnosis. — Spore oval in outline, flattened in lateral direction. Diameter 480 microns. Triradiate ridges about 3/4 of the diameter of the spore in length, 15 microns high and 20 microns broad. Arcuate ridges not clearly distinguishable. Coat of the spore — except contact faces — densely covered with ring-shaped papillae. Diameter of the rings 10 microns, height 5-7 microns. Contact faces finely granulated; granules about 2-3 microns in diameter.

Remarks. — This species most resembles *Tuberculatisporites subfuscus*, but it can be distinguished from it by its small size and ring-like papillae. The papillae of *Tuberculatisporites polycingulatus* are smaller and more crowded than papillae of *Tuberculatisporites subfuscus*.

Locality. — Amasra, Boring No. 32, 557 m in depth.

Occurrence. — Westphalian A; very rare.

Tuberculatisporites gemmatus n. sp.

Pl. I, Figs. 7-12; holotype 9

Diagnosis. — Spore flattened in proximal-distal direction, rounded in outline. Diameter 1140 microns. Triradiate ridges 720 microns long and 20 microns high, 25 microns in width. Spore coat ornamented with roundish, strongly shining tubercles in varying sizes, which are irregularly distributed; the densest and smallest in the middle of the contact faces. Arcuate ridges and triradiate ridges

ornamented with large tubercles, 100 microns high, 90 microns broad. Coat of the spore smooth, 35 microns thick, brown-colored.

Locality. — Amasra, Boring No. 35, 650 m in depth.

Occurrence. — Westphalian D; abundant.

Order II. Lagenotriletes POT. and KR.

Lagenicula (B. and K.) SCHOPF

Setosisporites kireçlikiensis n. sp.

Pl. II, Figs. 13-17; holotype 13

Diagnosis. — Spore generally subtriangular in outline, flattened in proximal-distal, sometimes lateral direction; diameter of the spore body 1050-1300 microns (the mean being 1000 microns, 10 spec, measured). Triradiate ridges 400 microns long; near the apex of the spore 30-35 microns broad and 25-30 microns high; to the periphery of the spore slightly swollen. Its triradiate ridges pass gradually in a protuberance (Gula) 150 microns in length, 120 microns in height. Arcuate ridges difficult to distinguish; if visible about 30 microns in height, 40 microns in width. Proximal and distal parts of the spore coat densely covered with conic papillae, 20-40 microns wide, 40-50 microns high; on the contact faces they are much smaller (about 5-10 microns), but always present. Spore coat black, 20-25 microns thick.

Remarks. — This species most resembles *Tuberculatisporites subfuscus*, from which it can be easily distinguished by having a neck-like projection (Gula) and longer triradiate ridges.

Locality. — Gallery —100 Kireçlik, Boring No. 32, 556 m in depth.

Occurrence. — Namurian-Westphalian A; rather numerous in Boring No. 32 and Gallery —100 in Hasanefendi coal seams.

Lagenoisporites laevigatus n. sp.

Pl. II, Fig. 18

Diagnosis. — Spore flattened in lateral, somewhat proximal-distal direction; whole spore subrounded in outline. Length of the spore body — contact faces included—600 microns. Triradiate ridges about 1/2 of the spore radius in length, 15 microns in width, 25 microns in height, and there where they meet arcuate ridges elevated 30 microns. Arcuate ridges clearly distinguishable, 20 microns wide, 30 microns high. Their contact faces are conspicuous. Spore coat black, smooth, without any ornamentation, 25 microns thick.

Remarks.— This spore resembles *Lagenoisporites (Lagenicula) simplex*, but it can be distinguished from it by its smaller size and lack of ornamentation.

Locality. — Gallery —50, Kireçlik.

Occurrence. — Namurian; very rare.

Setosisporites quasioarcuratus n. sp.

Pl. II, Fig: 19

Diagnosis. — Spore flattened in lateral, somewhat proximal-distal direction. Spore rounded in outline. Diameter of the spore body 360 microns. Triradiate ridges a little wavy, about 1/3 of the radius of the spore body in length, 15 microns broad, 10 microns high. Its triradiate ridges strongly folding the apex of the spore, forming a characteristic apical prominence. Coat of the spore — except contact faces — densely covered with semi-translucent spines, 20 - 25 microns long, 15 microns wide; contact faces smooth and clearly distinguishable. Spore coat 15 microns thick.

Remarks. — Of this species only one specimen has been found, but its conservation is excellent. This species resembles *Setosisporites (Triletes) hirsutus* var. *brevispinosa*, from which it can be distinguished by its smooth contact faces. It also resembles specimens of *Setosisporites (Triletes) hirsutus*, but it can be distinguished from them by its smaller size, shorter appendages and characteristic apical prominence.

Locality. — Kandilli (Tepeverenköy).

Occurrence. — Westphalian A; very rare.

Setosisporites cydotuberosus n. sp.

Pl. III, Figs. 20-22; holotype 20

Diagnosis. — Spore flattened in proximal-distal direction, rounded or oval in outline. Diameter 1000-1500 microns (the mean being 1250 microns, 10 specimens measured). Triradiate ridges straight, about 1/2 of the diameter of the spore in length, 40 microns broad and 30 microns high. Its triradiate ridges pass gradually into a protuberance 120 microns in height, 50 microns in width. Arcuate ridges not distinguishable. Spore coat — central area excepted — ornamented with very loosely-distributed tubercles, 10 microns in height, 25 microns in width. Spore wall often black, shining, 35 microns thick.

Remarks. — This spore most resembles *Setosisporites amasraiensis*, but its triradiate ridges are longer.

Locality. — Amasra, Boring No. 32, 556 m in depth.

Occurrence. — Westphalian A; rare.

Setosisporites amasraiensis n. sp.

Pl. III, Figs. 23-25; holotype 24

Diagnosis. — Spore generally roundly-triangular in outline, flattened in proximal-distal, sometimes lateral direction. Diameter of the spore body 960 microns. Triradate ridges 3/4, or more, of the radius of the spore in length; the apex of the spore 10-15 microns broad and high; to the periphery of the spore broader up to 100 microns and higher up to 80 microns. Apical prominence nearly pyramidally-shaped; at the base 120-130 microns broad, 120 microns high. Whole spore coat — excluding the contact area — ornamented with loosely-distribu-

ted sharp-pointed conic papillae, which are at the base some 15-20 microns in width and same in height. Arcuate ridges 30-40 microns broad, about 20-30 microns high. Spore coat black, 30-40 microns thick.

Remarks. — This spore most resembles *Tuberculatisporites* cf. *tuberosus*, but differs from it by its loosely-distributed conic papillae and neck-like prominence.

Locality. — Amasra, Boring No. 32, 556 m in depth.

Occurrence. — Westphalian A.

Subclassis II. *ZONALES* (B. and K., 1886) POT. and KR.

Order I. *Auritotriletes* POT. and KR.

Family *Auriculati* (SCHOPF) POT. and KR.

Vduissisporites multiundulatus n. sp.

Pl. III, Fig. 28

Diagnosis. — Spore slightly tri-lobate in outline, flattened in dorso-ventral, somewhat lateral direction. Diameter of the spore body 900 microns long. Triradiate ridges as broad as high (15 microns) and continuing to the end of the lobes. Lobes 200 microns in width. Spore coat — except the lobes — undulated in longitudinally-running rows, 20 microns high and 150 microns broad. Spore coat 35 microns thick.

Remarks. — This species most resembles *Valvissisporites autitus* (ZERNDT) POT. and KR., from which it can easily be distinguished by the structure of folds of the spore coat. *Valvissisporites multiundulatus* slightly resembles *Triletes* (*Valvissisporites*) *grandiosus* DIJKSTRA and PIERART, however the triradiate and arcuate ridges of *T. grandiosus* are considerably wider and higher.

Locality. — Amasra, Boring No. 32, 556 m in depth.

Occurrence. — Westphalian A; very rare.

Order II. *Zonotriletes* WALTZ, 1935

Family *Zonati* POT. and KR., 1954

Triangulatisporites furcatus n. sp.

Pl. III, Fig. 27

Diagnosis. — Spore oval in outline, flattened in proximal-distal direction. Diameter of the spore body —except the equatorial flange— 270 microns in length. Triradiate ridges ramified into two branches and continuing to the end of the equatorial ridges. Branchial ridges 10 microns high and 15 microns broad. Arcuate ridges absent. Whole spore coat —exclusive of the equatorial flange— densely covered with small verrucae. Spore coat light-brown in color, 20 microns thick.

Remarks. — This species most resembles *Triangulatisporites zonatus* and *Triangulatisporites tertius*, but it is distinguishable by its exospore, which is not reticulate, and by its futcate triradiate ridges.

Locality. — Amasra, Boring No. 32,- 557 m in depth.

Occurrence. — Westphalian A; very rare.

Subclassis *SACCITES* ERDTMAN, 1947

Order *Monosaccites* (CH. ITALEY, 1951) POT. and KR., 1954

Family *Saccizonati*

Endosporites delicatus n. sp.

Pl. III, Fig. 26

Diagnosis. — Spore flattened in proximal-distal direction, subtriangular in outline, diameter 300 microns. Body of the spore nearly round in outline, 150 microns in diameter. Triradiate ridges continuing to the end of the wing, about 15 microns high, 3 microns broad, the wing is thinner than the spore body, as broad as high (4 microns). Wing subtriangular in outline, 90 microns broad. The cuticle of the wing is thinner than the spore body. Marginal ring of the wing could not be distinguished.

Remarks. — Although this species most resembles *Endosporites chaloneri* — its dimensions being nearly identical—it can be distinguished from the latter by its triradiate ridges which are longer.

Locality. — Gallery —100 Kireçlik.

Occurrence. — Namurian; Gallery —100 in Hasanefendi coal seam; rare.

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EXPLANATION OF PLATES

PLATE I

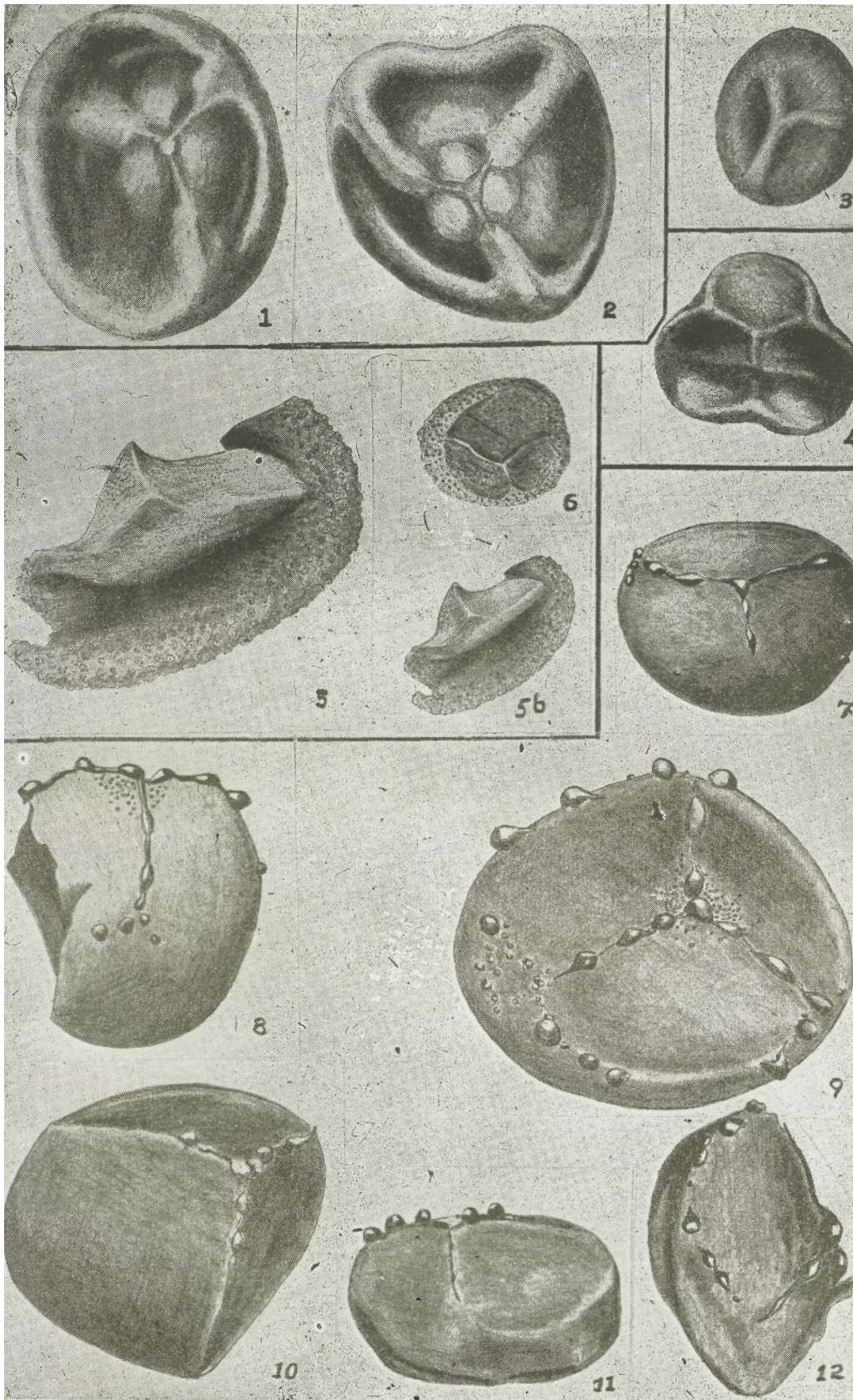
- Figs. 1-2 — *Laevigatisporites culminatus* n. sp. x 50
 Fig. 3 — *Laevigatisporites depressus* n. sp. x 50
 Fig. 4 — *Laevigatisporites subglabratus* n. sp. x 50
 Fig. 5 — *Tuberculatisporites polycingulatus* n. sp. x 100
 Figs. 56-b — *Tuberculatisporites polycingulatus* n. sp. x 50
 Figs. 7-12 — *Tuberculatisporites gemmatus* n. sp. x 50

PLATE II

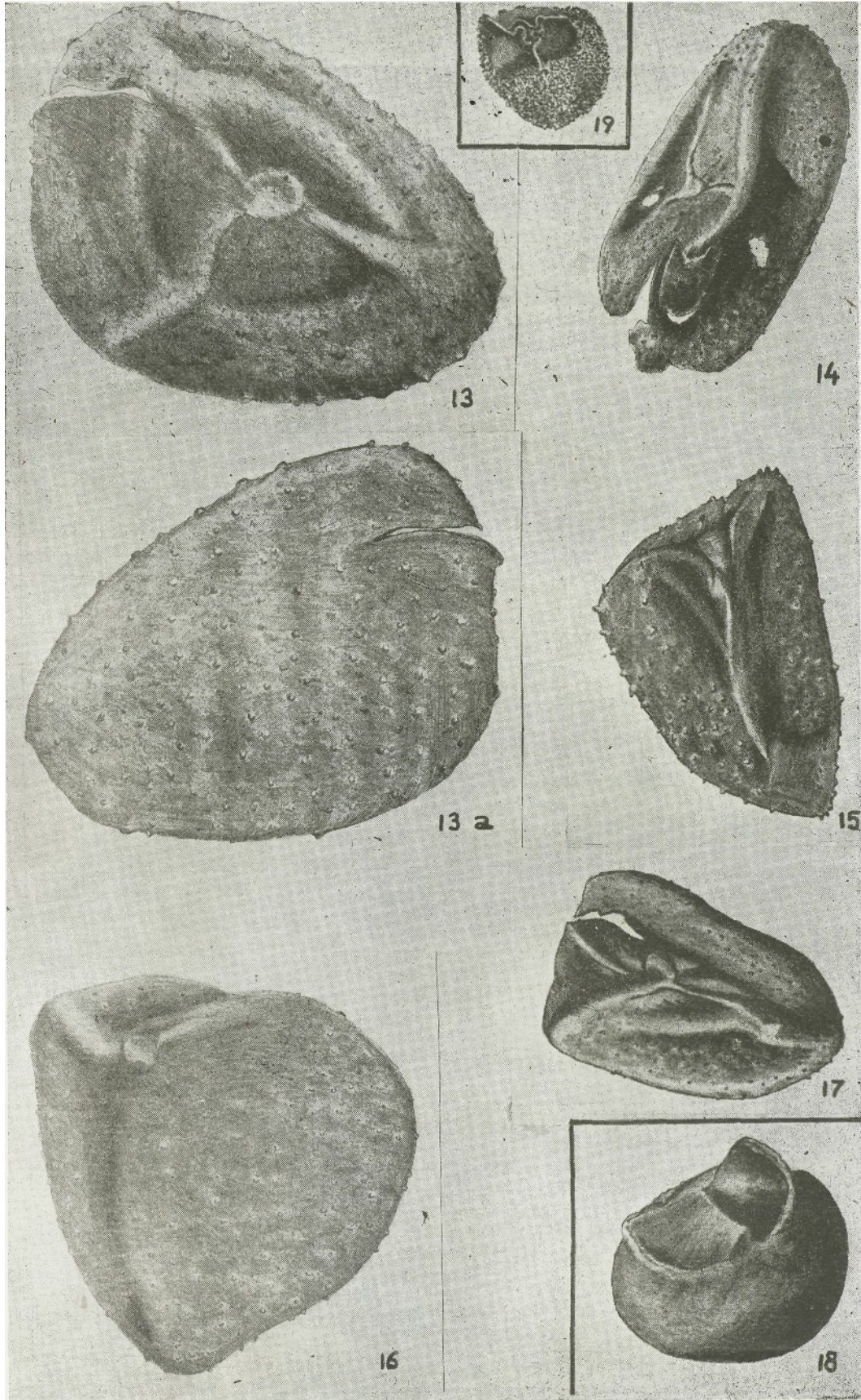
- Fig. 13 — *Setosisporites hirtflikiensis* n. sp. X 50
 Fig. 13a — *Setosisporites kireçlikiensis* n. sp. (distal area) x 50
 Figs. 14 17 — *Setosisporites kireçlikiensis* n. sp. X 50
 Fig. 18 — *Lagenosporites laevigatus* n. sp. x 50
 Fig. 19 — *Setosisporites quasioarcuratus* n. sp. x 50

PLATE III

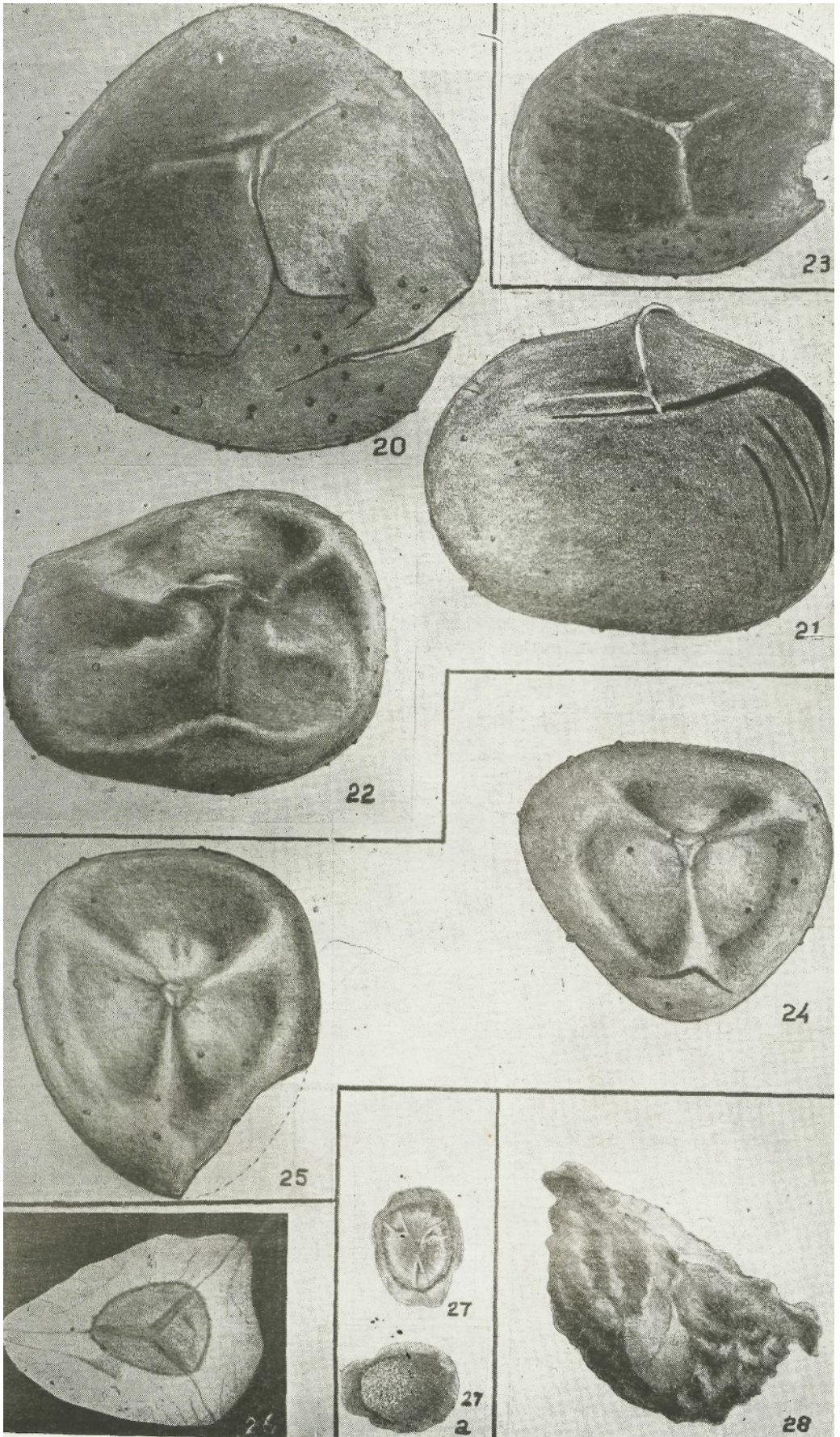
- Figs. 20-22 — *Setosisporites cyclotuberosus* n. sp. x 50
 Figs. 23-25 — *Setosisporites amasraiensis* n. sp. X 50
 Fig. 26 — *Endosporites delicatus* n. sp. x 100
 Fig. 27 — *Triangulatisporites furcatus* n. sp. X 50
 Fig. 27a — *Triangulatisporites furcatus* n. sp. (distal area) x 50
 Fig. 28 — *Valvissisporites multiundulatus* n. sp. x 50



Drawing by O. KARADENİZ



Drawing by O. KARADENİZ



Drawing by O. KARADENİZ

B I B L I O G R A P H Y

- 1 — ARNOLD, C. A. (1950) : Megaspores from the Michigan Coal Basin. *Contr. Mus. Paleont. Univ., Mich.*, Vol. V, No. 5, pp. 59-111.
- 2 — ARTÜZ, S. (1957) : Die Sporaee dispersae der Türkischen Steinkohle von Zonguldak-Gebiet (mit besonderer Beachtung der neuen Arten und Genera), Sdrie B. Tome XXII, Fasc. 4, Istanbul.
- 3 — BENNIE, I. and KIDSTON, R. (1886): On the Occurrence of Spores in the Carboniferous Formation of Scotland. *Proc. Royal. Phys. Soc. Edinb*, Vol. IX.
- 4 — BONET, M. C. y DIJKSTRA, S. J. (1956) : Megasporas Carboniferas de la Camocha. *Instituto de investigaciones Geologicas Lucas Mallada*, Madrid.
- 5 — BHARDWAJ, C. D. (1957) : The Palynological investigations of the Saar Coals. *Paleontographica*, Abt. B, Vol. 101, Liefg. 5-6, pp. 73-125, Stuttgart.
- 6 — BILGUTAY, U. (1959) : The Permian Calcareous Algae from southeastern Anatolia. *M. T. A. Bull.* No. 52, pp. 48-59, Ankara.
- 7 — Chaloner, W. G. (1951) : On Spencerisporites, gen. nov., and *S. karczewskit* (Zerndt), the isolated spores of *Spencerites insignis* Scott. *Ann. Mag. Nat. Hist.* T. IV, Ser. 12, pp 861-873. London.
- 8 —————(1952) : On *Lepidocarbon Waltoni*, sp. n. from the Lower Carboniferous of Scotland. *Ann. Mag. Nat. Hist.*, T. V, Ser. 12, page 572-582, 1 pl., London.
- 9 —————(1953) : A new species of *Lepidostrobus* containing unusual Spores. *Geol. Mag.* pp. 90, 97-11, pl. 2.
- 10 —————(1954) : Mississippian Megaspores from Michigan and adjacent states. *Contr, Mas. Paleont, Univ. Mich.*, Vol. XII, No. 3, pp. 23-35.
- 11 —————(1954) : Notes on the Spores of two British Carboniferous Lycopedes. *Ann. Mag. Nat. Hist.* 7. 8191, 10 Figs, London:
- 12 — DTJKSTRA, S. J. and P. H. Van VIERSSSEN TRIP. (1946) : Eine monographische Bearbeitung der karbonischen Megasporen *Med. Geol. Sticht.* Ser. C-III 1, pp. 1-101, Maastricht.
- 13 — DIJKSTRA, S. J. (1949) : Megaspores and some other small fossils from the Aachenian (Senonian) in South Limburg, Netherlands. *Med. Geol. Sticht.* Nw. Ser., Vol. III, pp. 19-33. Maastricht.
- 14 —————(1949) : La signification stratigraphique des Spores. *Soc. Geol. de Belgique.* T. L XXII, fascicule special.
- 15 —————(1950) : Carboniferous Megaspores in Tertiary and Quaternary Deposits of S. E. England. *Ann. Mag. Nat. Hist.* London, Ser. 12, Vol. III, pp. 865-887:
- 16 —————(1951) : Wealden Megaspores and their stratigraphical value. *Med. Geol. Sticht.*, Nw. Ser., Vol. V, pp. 7-21, Maastricht.
- 17 —————(1952a) : Megaspores of the Turkish Carboniferous and their stratigraphical value. *Int. Geol. Congr.* Report XVIII th Session, part. X Proc. of Sect. J. pp. 11-17.
- 18 —————(1952b) ;: New Carboniferous Megaspores from Turkey. *Ann. Mag. Nat. Hist.* London, Ser. 12, Vol. V, pp. 102-104.
- 19 —————(1952 c) : The stratigraphical value of Megaspores. 3. *Congr. Strat. Geol. Carb.*, Heerlen, pp. 163-168.
- 20 —————(1955) : The Megaspores of the Westphalian D and C. *Med, Geol, Sticht.* Nw. Ser. 8, pp. 5-11.

- 21 — DIJKSTRA, S. J. (1955) : La correlation des veines de charbon paries Megaspores. *Publ. Ass. Etud. Paleont., Brux.*, No. 21, Hors Ser. Vol. VIII, pp. 107-119.
- 22 —————(1955) : Megaspores carboniferas espanolas y su empleo en la correlacion estratigrafica (With English summary). *Estudios Geol.*, No. 27, 28, Vol. XI, pp. 277-354, Madrid.
- 23 —————(1956) : Some Brezilian Megaspores, Lower Permian in age, and their comparison with Lower Gondwana Spores from India. *Med. Geol. Sticht.*, Nw. Ser., Vol. IX, pp. 6, Maastricht.
- 24 —————(1956) : Lower Carboniferous Megaspores. *Med. Geol. Sticht.*, Nw. Ser., Vol 10, pp. 5- 18.
- 25 — DIJKSTRA, S. J. and PIERART, P. (1957) : Lower Carboniferous Megaspores from the Moscow Basin. *Med. Geol. Sticht.*, Nw. Ser, Vol. XI, pp. 5-19.
- 26 — İBRAHİM, A. G. (1933) : Sporenformen des Agirhorizontes des Ruhr-Reviers. Dissertation Berlin 1932, 46 S, 8 Tafeln. *Konrad Triltsch*, Würzburg.
- 27 — KALIBOVA, M. (1951) : Megaspores of the Radnice Coal Measure Zone of the Kladno-Rakovnik Coal Basin. *Geol. Surv. Czechoslovakia*, 18 (Pal.), 21-83, Tafeln 5-8, Prag.
- 28 — POTONIE, R., und KREMP, G. (1955) : Die Spora dwpersae des Ruhrkarbons.-Teil I und II Sonder. *Abdruck aus Palaeontographica*, Bd. 98 und 99, Abt. B, Hannover.
- 29 — PIERART, P. (1956) : Quelques megaspores continues dans les charbons stephaniens des bassins de Blanzly et de Decazeville.
- 30 — SCHOPF, J. (1936) : Spores characteristic of Illinois coal No. 6. *Trans. Illinois State Acad. Sci.* 28, No. 2, 173-176, Urbana.
- 31 —————(1938) : Spores from the Herrin (No. 6) Coal bed in Illinois. *Report of Invest. No. 50 of the Geol. Surv. of Illinois.* 25, 8 pis. Urbana.
- 32 — STACK, E. UND ZERNDT, J (1931) : Die Sporen in dem Flamm-, Gastflamm - und Gaskohlen des Ruhrkarbons. *Glückauf*, 67, 1118-1124, Essen.
- 33 — WICHER, C. A. (1931) ; Über Abortiverscheinungen bei fossilen Sporen und ihre phylogenetische Bedeutung. *Arb Inst. Paldobot Petrogr. Brennst.* 5,87-96, Preuss Geol L. — A. Berlin.
- 34 — ZERNDT, J. (1930) : Petrograficzne badania wegla z Podladu «Izabella» W Trzebini. *Przeglądu Gorniczo-Putniczaga Dabrow Goru Humiezezo*, 1-4, 5 Taleln.
- 35 —————(1932) : Megasporen aus den Zwickauer und Lugau-Ölsnitzer Karbon. *Jahresber. Berg und Hüttenwesen in Sachsen*, 9-16,4 Tafeln, Freiberg.
- 36 —————(1934) : Les Megaspores du bassin houiller Polonais I. *Bull, de l'Acad. Pol. des Sci. et des Lettres Trav. Geol.*, 1-56,32 Tafeln. Krakau.
- 37 —————(1937) : Les Megaspores du bassin houiller Polonais. II. *Bull, de l'Acad. Pol. des Sci. et des Lettres* 1-78,241-2 78, Krakau.
- 38 —————(1938) : Die Eignung von Megasporen als Leitfossilien. II. *Carbon-Congr. Heerlen, 1935, Compte Rendu* 3, 1711-1732, Maastricht.
- 39 —————(1939) : Sprawozdanie z baden Megaspore. *Przyczynki do Geologii*, Polski, 1-4.
- 40 —————(1940) : Megasporen de; Saarkarbons. *Palaeontographica* 84, Abt. B, 133-150. Tafeln 9-13, Stuttgart.
- 41 — YAŞİMAN, K. and ERGÖNÜL, Y. (1958) : The Sporological investigation and correlation of the coal seams in the Gallery E. K. 1. Amasra (Tarlaağzı). *M. T. A. Bull.* No. 51, p. 42, Ankara (in Turkish)
- 42 — YAŞİMAN, K. (1956) : About the stratigraphical age of the Azdavay coals. *M. T. A. Bull.* No. 48, p. 140 (in Turkish)

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