OĽGA ČORNÁ*

SOME TRIASSIC MIOSPORES FROM WEST CARPATHIANS

(*Pl. I—VII*)

Abstract: The autoress gives here short preliminary information about some Triassic sporomorphs found in West Carpathians for the first time. The investigation material originates from the outcrop of Huty (West Carpathians). The miospores are corroded but qualitatively and quantitatively very rich. The assemblage of Huty is formed mostly by *Ovalipollis* spp., bisaccate pollen grains, inaperturate pollen grains, and spores. Small forms of microplankton are especially abundant.

Introduction

This paper reports about the first finding of Triassic pollen grains. The previous laboratory macerations of the Triassic material did not give any good results. The preceding material is corroded but very rich, and it seems to be necessary to inform about this finding. Preliminary description of Triassic microflora from the West Carpathians may be of interest for the knowledge about the evolution of the Mesozoic flora of the Alpine geosynclinal zone.

Acknowledgments

I should like to thank to Dr. J. Melo (Geological Institute of Dionýz Štúr) who collected the Triassic samples and Mrs. H. Kaličiaková for her help in extracting the microfossils from these very complicated sediments.

Location of samples

The sample studied was found in the cutting near the village Huty in the valley of Kvačany on the southern side of the village. The probable age is Lunz-Karnian-stage of Triassic.

Lithology

The spore-bearing sample (438-HT-68) was collected from dark-grey, noncalcareous marine shales, hard and metamorphic, particularly weathered.

Maceration technique

Acid insoluble microfossils were extracted by several methods. The sample 438-HT-68 was divided into eight parts (50 grams each) and dissolved in 40 per cent. cold hydrofluoric acid. The reaction was very quick. 2—3 hours were enough for dissolving. Thereupon the residue is warmed with dilute hydrochloric acid in the water-boiling

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bath to dissolve fluorsilicates originating from the hydrofluoric treatment. The residue was left for about two hours in the water-boiling bath and then dilute was decanted. The material was washed several times with 10 per cent. hot hydrochloric acid and left until tomorrow in the distilled water. The next step of maceration is described in the paper „Palynological Results of Comparative Maceration of Marine Sediments" (O. Čorná 1969). The best method of treatments for this material is the following:

I — boil in 40 per cent. hydrofluoric acid in water-boiling bath about twenty minutes. add hot 20 per cent. hydrochloric acid. wash many times:

II — add hot dilute 5 per cent. $Na_4P_2O_7$ and decant about 5—7 days:

III — use CdJ to concentrate the sporomorphs by flotation.

Miospores are classified here in accordance with the morphological system introduced by R. Potonié and G. Kremp (1953), R. Potonié (1956, 1958, 1960) and M. Dettman (1963), W. Klaus (1960).

In general, the material from the Triassic in West Carpathians is badly preserved but in the sample 438-HT-68 very rich quantitative and qualitative pollen, spores have been found, and relatively well-preserved microplankton, especially for quantitative study. Species determination and illustration of many microfossils are difficult, some spores and pollen of the group of *Ovalipollis* sp. A (a larger forms), inaperturate pollen (the biggest forms) are dark in colour and corroded which prevents to see and photography of some important detail. In many cases, exine is destroyed and very thin, sometimes without any ornament or structure. Some specimens have therefore been determined only approximately.

The assemblages from Huty contain many bisaccate pollen grains, about 30—40 per cent. of the whole complex. Most important is the group of small striate pollen grains type as *Lueckisporites, Taeniaesporites* and different non-striate bisoccate pollen grain as *Misporites*. The pollen of *Ovalipollis* (different types, mostly larger forms as *Ovalipollis* sp. B), many pollen *Ovalipollis ovalis* Krutzsch 1955 represent the next important group in the studied material. Approximately 10 per cent. of the spectrum is composed by Inaperturate pollen grains with the size from 60 mi to 150 mi. This pollen is without any special detail, mostly having finely reticulate structure of exine, folded, their determination as for species being difficult. Furthermore in the investigation material spores represent only a few per cent, and may be assigneted to Turma Triletes Reinsh 1883.

Microplankton is observed in great quantity and is assigned in most cases to genera *Michystridium* and *Baltisphaeridium*.

Generally, every slide is overcrowded with plant detritus.

Systematical Part

Anteturma *Sporites* H. Potonié 1893

Turma *Triletes* (Reinsch 1881) Dettmann 1963

Suprasubturma *Acavatitriletes* Dettmann 1963

Subturma *Azonotriletes* (Luber 1935) Dettmann 1963

Infraturma *Laevigati* (Bennie and Kidston 1886) Potonié 1956

Genus *Cyathidites* Couper 1953

Cyathidites minor Couper 1953

(Pl. I. fig. 3)

Example: sl. 13-HT-68.

Occurrence: rare.

Genus *Stereisporites* Pflug 1953

Stereisporites sp.
(Pl. I, fig. 1)

Example: sl. 12-HT-68.
Occurrence: rare.

Genus *Dictyophyllidites* Couper 1958

Dictyophyllidites cf. *harrisii* Couper 1958
(Pl. I, fig. 2)

Example: sl. 14-HT-68.
Occurrence: rare.

Genus *Toroisporis* Krutzsch 1959

Toroisporis sp.
(Pl. I, fig. 4, 5, 8, 11)

Example: fig. 4 — sl. 17-HT-68. fig. 5 — sl. 11-HT-68. fig. 8 — 7-HT-68.
Occurrence: one-two specimens with toris about Y-mark in every slides.

Genus *Paraconcavisporites* Klaus 1960

Paraconcavisporites sp.
(Pl. I, fig. 10)

Example: sl. 9-HT-68.
Occurrence: rare.

Infraturma *Apiculati* (Bennie and Kidston) Potonié 1956
Genus *Baculatisporites* Thomson and Pflug 1953

Baculatisporites sp.
(Pl. II, fig. 12)

Example: sl. 5-HT-68.
Occurrence: rare.

Genus *Conbaculatisporites* Klaus 1960

Conbaculatisporites mesozoicus Klaus 1960
(Pl. I, fig. 9)

Example: sl. 8-HT-68.
Occurrence: rare.

Genus *Lophotriletes* (Naumova) Potonié and Kremp 1954

Lophotriletes novicus Singh 1964
(Pl. I, fig. 12—14)

Example: sl. 9-HT-68.
Occurrence: more often than another spores.

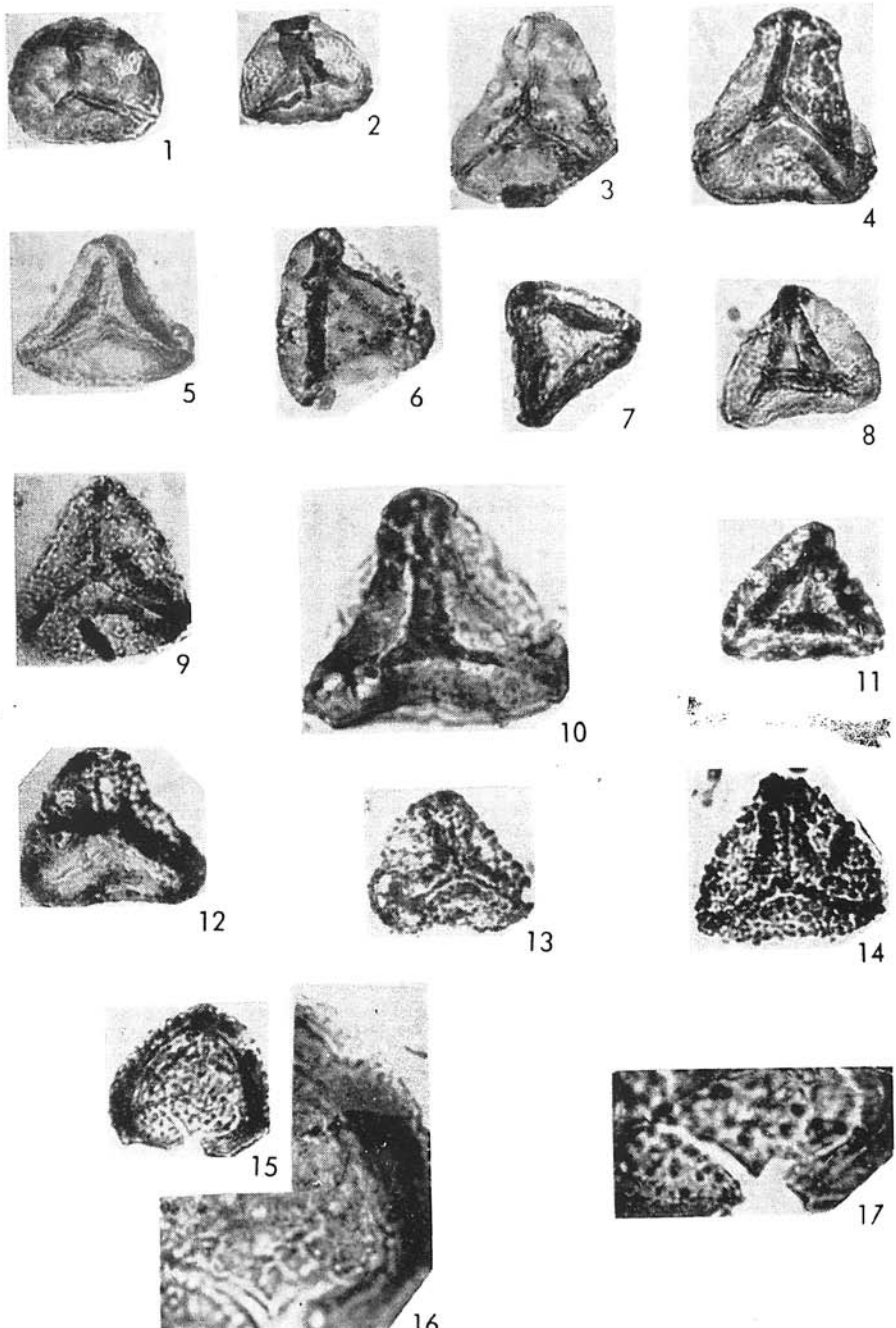


Plate 1

Fig. 1. *Stereisporites* sp. — Fig. 2. *Dictyophyllidites* cf. *harrisii* Couper 1958. — Fig. 3. *Cyathidites minor* Couper 1958. — Fig. 4, 5, 8, 11. *Foroisporis* sp. — Fig. 6—7. *Duplicisporites* sp. — Fig. 10. *Paraconcavisporites* sp. — Fig. 9. *Conbaculatisporites mesozoicus* Klaus 1960. — Fig. 12—14. *Lophotriletes novicus* Singh 1964. — Fig. 15—17. *Anguisporites minutus* Singh 1964. Locality Huty. Magn. fig. 1—9, 11—15 — 500 ×, fig. 10, 16—17 — 1200 ×. Photo by O. Čorná.

Genus *Apiculatisporites* Potonié and Kremp 1956

Apiculatisporites sp. A
(Pl. II. fig. 6—9)

Example: sl. 7-HT-68.
Occurrence: five specimens in the investigation material.
Remarks: Spherical spores with closely spaced spines about 1 mi high, spines form structure of exines as reticulum with round small and deep fovea in the beginning, size 36—40 μ.

Genus *Duplicisporites* Leschik 1955

Duplicisporites sp.
(Pl. I. fig. 6—7)

Example: fig. 6 — sl. 5-HT-68. fig. 7 — sl. 12-HT-68.
Occurrence: rare.

Infraturma *Murornati* Potonié and Kremp 1954
Genus *Lycopodiumsporites* Thiergart Delcourt and Sprumont 1955

Lycopodiumsporites sp.
(Pl. II. fig. 2)

Example: sl. 1-HT-68.
Occurrence: two grains in the our material.

Genus *Lycopodiacidites* (Couper) R. Potonié 1956

Lycopodiacidites kuepperi Klaus 1960
(Pl. II. fig. 1)

Example: 5-HT-68.
Occurrence: rare.

Genus *Dictyotriletes* (Naumova 1937) Potonié and Kremp 1955

Dictyotriletes sp. A
(Pl. II. fig. 3—5)

Example: 5-HT-68.
Occurrence: single grains.

Genus *Chomotriletes* Naumova 1937

Chomotriletes sp. A
(Pl. II. fig. 10—11)

Example: 6-HT-68.
Occurrence: single grain.

Turma *Zonales* (Bennie and Kidston 1886 von Ibr.) Potonié 1956
Subturma *Zonotriletes* Waltz 1935
Infraturma *Cingulati* Potonié and Klaus 1954

Genus *Anguisporites* Potonié and Klaus 1954

Anguisporites minutus Singh 1964
(Pl. I, fig. 15—17)

Example: sl. 10-HT-68.
Occurrence: single grain.

Genus *Cingulizonates* Dybova and Jachowicz 1957

Cingulizonates delicatus Orlowska-Zwolińska 1966
(Pl. II, fig. 13)

Example: sl. 7-HT-68.
Occurrence: two specimens.

Infraturma *Zonati* Potonié and Kremp 1954
Genus *Cirratriradites* Wilson and Coe 1940

Cirratriradites surrangei Singh 1964
(Pl. II, fig. 14)

Example: sl. 2-HT-68.
Occurrence: two specimens.

Anteturma *Pollenites* Potonié 1931
Subanteturma *Praepollenites* Pant 1954
Infraturma *Striatiti* Pant 1954
Genus: *Ovalipollis* (Krutzsch 1955) Klaus 1960
Ovalipollis ovalis Krutzsch 1955
(Pl. III, fig. 9, 11)

Example: fig. 9 — sl. 5-HT-68, fig. 11 — 24-HT-68.
Occurrence: in abundance.

Ovalipollis lunzensis Klaus 1960
(Pl. III, fig. 7)

Example: sl. 19-HT-68.
Occurrence: often.

Ovalipollis sp. A
(Pl. III, fig. 8, 12)

Example: fig. 8 — 4-HT-68, fig. 12 — sl. 6-HT-68.
Occurrence: often.

Ovalipollis sp. B
(Pl. III, fig. 13, 14, 15)

Example: fig. 13—14 — 8-HT-68, fig. 15 — 13-HT-68.

Remarks: This type of *Ovalipollis* is in abundance in our material and differs from another types *Ovalipollis*. They are the biggest pollen in the whole material (100—150 mi).

Ovalipollis grebeae Klaus 1960
(Pl. III, fig. 10)

Example: sl. 5-HT-68.
Occurrence: often.

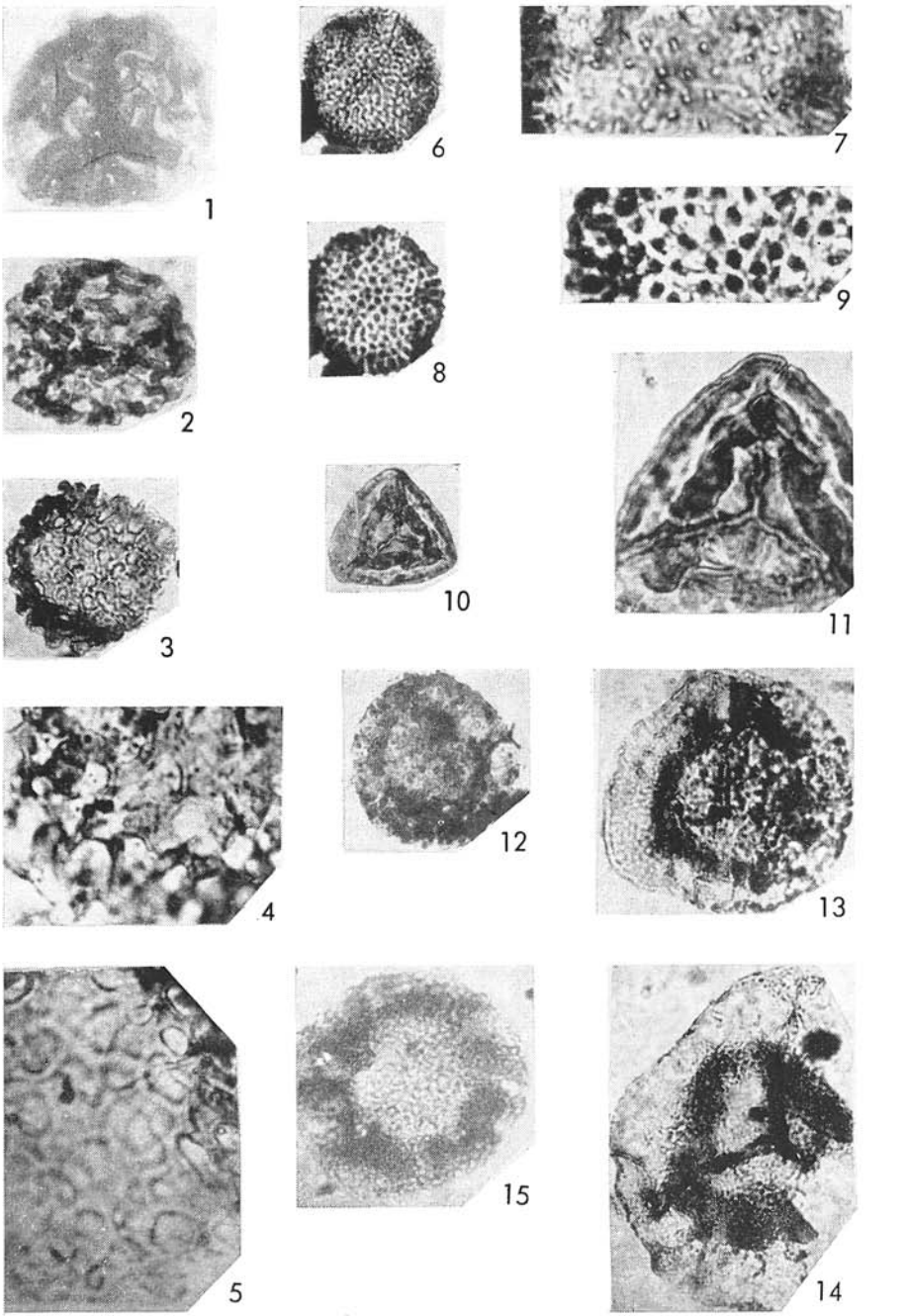


Plate II

Fig. 1. *Lycopodiacidites kuepperi* K l a u s 1960. — Fig. 2. *Lycopodiumsporites* sp. — Fig. 3—5 *Dictyotriletes* sp. A. — Fig. 6—9, *Apiculatisporites* sp. A. — Fig. 10, 11. *Chomotriletes* sp. A. — Fig. 12, *Baculatisporites* sp. — Fig. 13, *Cingulizonates delicatus* O r ł o w s k a - Z w o l i ń s k a 1966. — Fig. 14, *Cirratriradites surrangei* S i n g h 1964. — Fig. 15, *Patinasporites* sp. Locality Huty. Magn. fig. 1—3, 6, 8, 10, 12—14 — 500 ×, fig. 4—5, 7, 9, 11 — 1200 ×. Photo by O. Č o r n á.

Ovalipollis sp.
(Pl. III, fig. 16)

Example: sl. 32-HT-68.
Occurrence: often.

Genus *Lueckisporites* Potonié and Klaus 1954

Lueckisporites cf. *virkkiae* Potonié and Klaus 1954
(Pl. III, fig. 1—3)

Example: fig. 1 — sl. 8-HT-68, fig. 2 — sl. 4-HT-68, fig. 3 — sl. 7-HT-68.
Occurrence: often.

Genus *Taeniaesporites* Leschik 1955

Taeniaesporites cf. *kraeuseli* Leschik 1955
(Pl. III, fig. 4, 5, 6)

Example: fig. 4, 5 — sl. 21-HT-68, fig. 6 — sl. 15-HT-68.
Occurrence: often.

Subanteturma *Eulopollenites* Klaus 1960
Infraturma *Metesaccites* Leschik 1955
Genus *Enzonalasporites* Leschik 1955

Enzonalasporites sp.
(Pl. VI, fig. 5)

Example: sl. 6-HT-68.
Occurrence: several specimens in the studying material.

Genus *Patinasporites* (Leschik 1955) Klaus 1960

Patinasporites sp.
(Pl. II, fig. 15)

Example: sl. 16-HT-68.
Occurrence: two specimens.

Turma *Saccites* Erdtman 1947
Subturma *Disaccites* Cookson 1947
Infraturma *Disaccitriletes* (Leschik 1955) Potonié 1958
Genus *Vitreisporites* Leschik 1955

Vitreisporites pallidus (Reissinger) Nilsson 1958
(Pl. IV, fig. 12—13)

Example: fig. 12 — sl. 7-HT-68, fig. 13 — sl. 9-HT-68.
Occurrence: six specimens.

Genus *Pteruchipollenites* Couper 1958

Pteruchipollenites pannelai Jain 1968
(Pl. IV, fig. 4, 9)

Example: sl. 6-HT-68.
Occurrence: often.

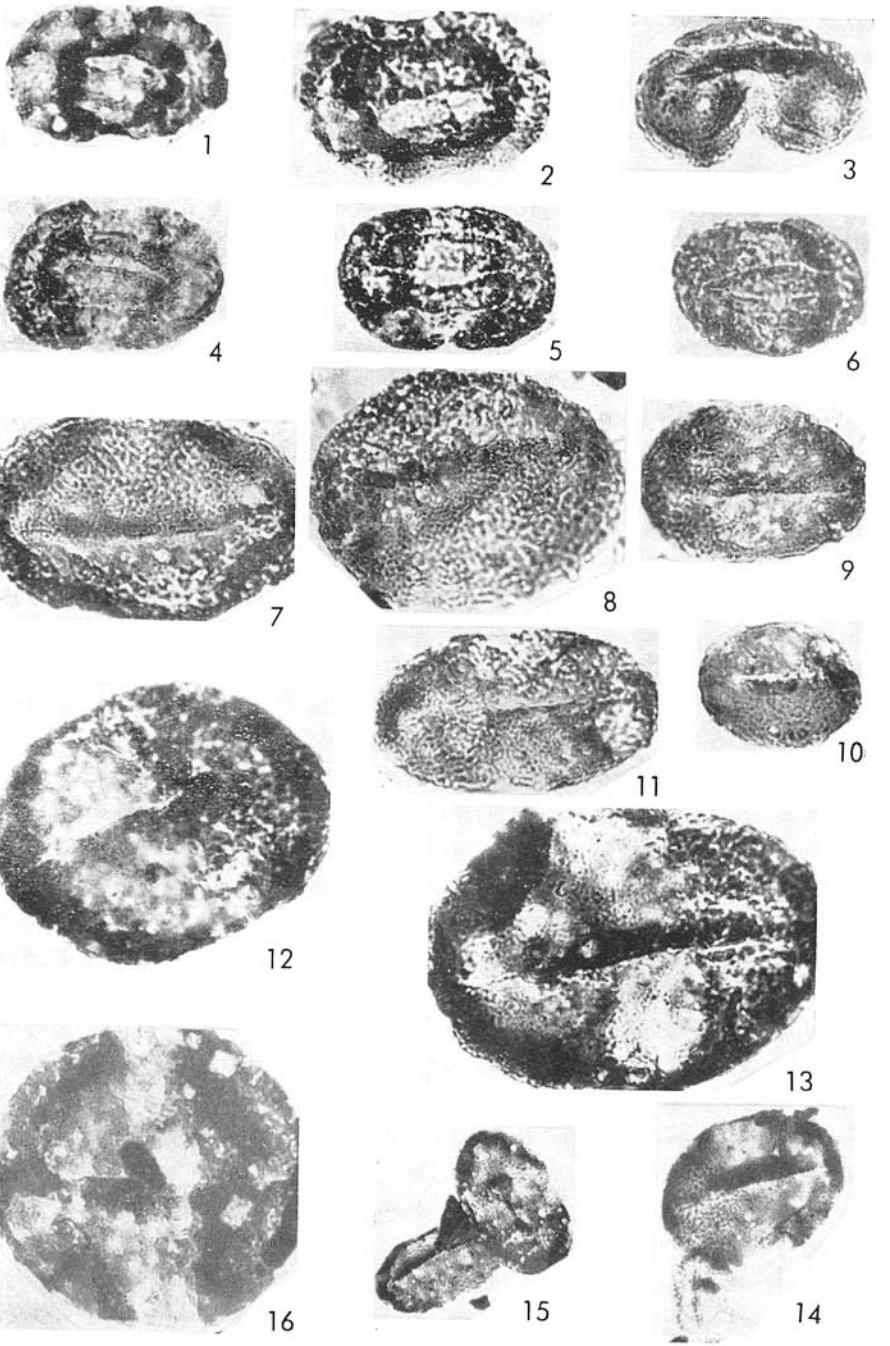
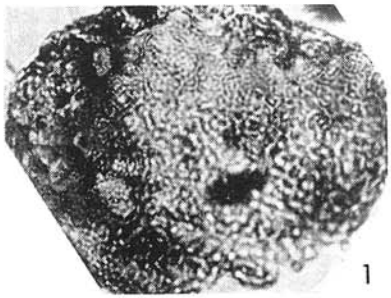
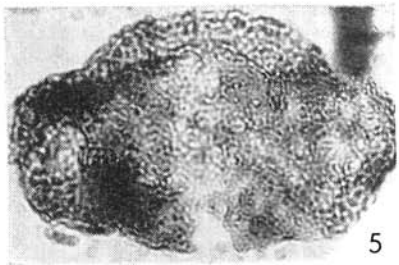
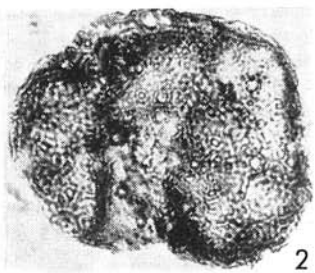


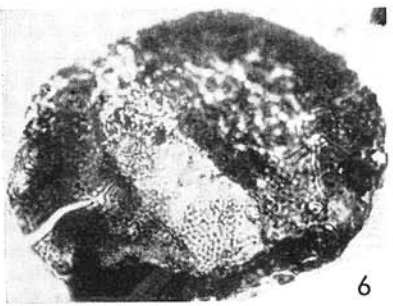
Plate III

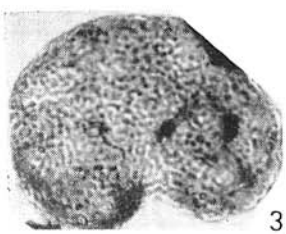
Fig. 1–3. *Lueckisporites* cf. *virkkiae* Potonié and Klaus 1954. — Fig. 4–6. *Taeniaesporites* sp. — Fig. 7. *Ovalipollis lunzensis* Klaus 1960. — Fig. 8, 12. *Ovalipollis* sp. A. — Fig. 9, 11. *Ovalipollis ovalis* Krutzsch 1955. — Fig. 10. *Ovalipollis grebeae* Klaus 1960. — Fig. 13. *Ovalipollis* sp. B. — Fig. 14–15. *Ovalipollis* sp. B (massula). Fig. 16. *Ovalipollis* sp. Locality Huty Magn. 1–15 500×. Photo by O. Čorná.

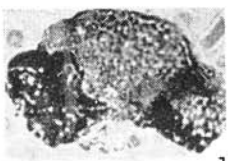


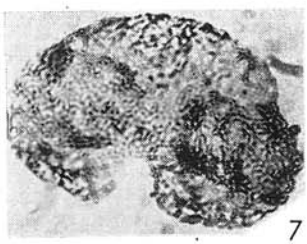


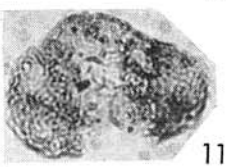












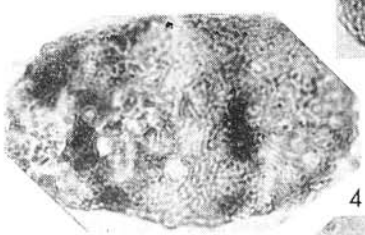


Plate IV

Fig. 1. *Alisporites* cf. *ovatus* (Balme and Hennely) Jansonius 1962. — Fig. 2, 3. *Cedripites* sp. — Fig. 4. *Pteruchipollenites pannelai* Jain 1968. — Fig. 5. *Vesicaspora jansoniusii* Jain 1968. — Fig. 6. *Sulcatisporites* sp. — Fig. 7. *Alisporites* sp. ?. — Fig. 8. *Podocarpidites* sp. — Fig. 9. *Pteruchipollenites* sp. ? — Fig. 10. *Alisporites minutisaccus* Clarke 1965. — Fig. 11. *Alisporites* sp. — Fig. 12—13. *Vitreisporites pallidus* (Ressinger) Nilsson 1958. Locality Huty, Magn. 50×. Photo by O. Čorná.

Genus *Klausipollenites* Jansonius 1962
Klausipollenites decipiens Jansonius 1962
(Pl. V, fig. 14)

Example: sl. 11-HT-68.
Occurrence: several specimens.

Klausipollenites staplinii Jansonius 1962
(Pl. V, fig. 15)

Example: sl. 5-HT-68.
Occurrence: three specimens.

Infraturma *Disacimonoletus* Klaus 1963
Genus *Labiisporites* (Leschik) Klaus 1963

Labiisporites sp.
(Pl. V, fig. 11—12)

Example: sl. 7-HT-68.
Occurrence: several specimens.

Infraturma *Disacciatrileti* (Leschik 1955) Potonié 1958
Genus *Vesicaspora* Schemel 1951

Vesicaspora jansoniusii Jain 1968
(Pl. IV, fig. 5)

Example: sl. 9-HT-68.
Occurrence: two specimens.

Infraturma *Pinosacciti* (Erdtman 1946) Potonié 1958
Genus *Misporites* Daugherti 1941

Misporites cf. *ovatus* (Balme and Hennely) Jansonius 1962
(Pl. IV, fig. 1)

Example: sl. 3-HT-68.
Occurrence: five specimens.

Misporites minutisaccus Clarke 1965
(Pl. IV, fig. 10—11)

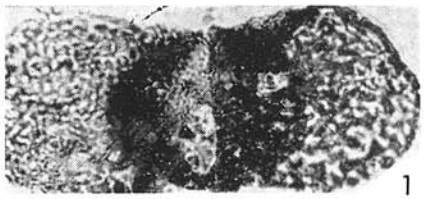
Example: fig. 10 — sl. 6-HT-68, fig. 11 — sl. 13-HT-68.
Occurrence: four specimens.

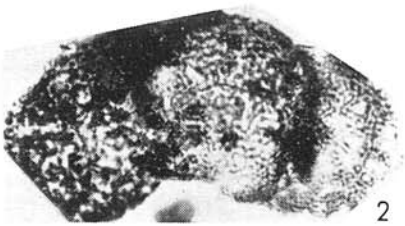
Misporites cf. *australis* de Jersey 1962
(Pl. V, fig. 4, 5, 13)

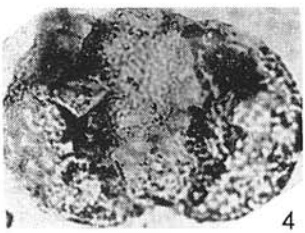
Example: fig. 4 — sl. 19-HT-68, fig. 5 — sl. 14-HT-68.
Occurrence: often.

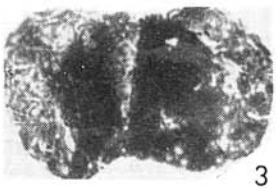
Misporites sp.
(Pl. IV, fig. 11, pl. V, fig. 6, 7, 10)

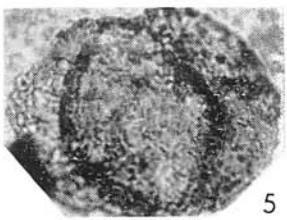
Remarks: different bisaccate pollen grains with nondetermined species (type *Misporites* pollen).

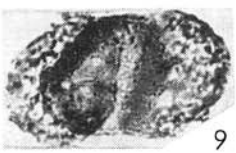


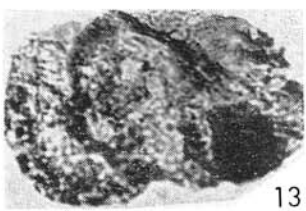


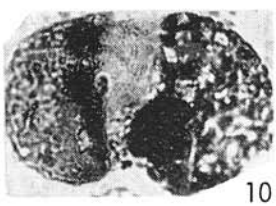


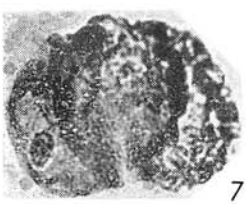


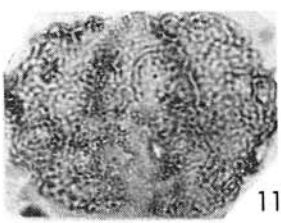


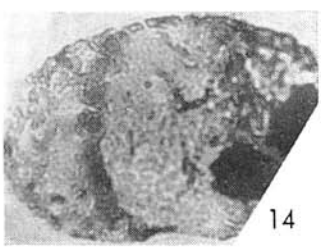


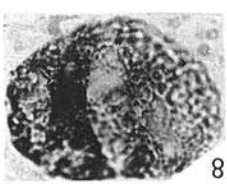


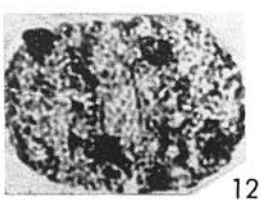












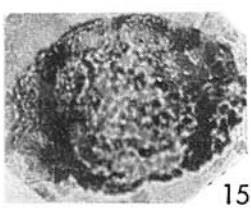


Plate V

Fig. 1—3. *Platysaccus papillionis* Potonié and Klaus 1954. — Fig. 9. *Platysaccus* sp. — Fig. 4—5, 13. *Alisporites* cf. *australis* de Jersey 1962. — Fig. 6—7. *Alisporites* sp. (small forms). — Fig. 8. *Labiisporites* sp. — Fig. 10. *Alisporites* sp. — Fig. 11—12. *Favisporites* sp. — Fig. 14. *Klausipollenites* cf. *decipiens* Jansonius 1962. — Fig. 15. *Klausipollenites* cf. *staplinii* Jansonius 1962. Locality Huty, magn. 500 ×. Photo by O. Černá.

Genus *Favisporites* Leschik 1956

Favisporites sp.
(Pl. V, fig. 11, 12)

Example: fig. 11 — sl. 8-HT-68.
Occurrence: several specimens.

Genus *Sulcatisporites* Leschik 1955

Sulcatisporites sp.
(Pl. IV, fig. 6)

Example: sl. 16-HT-68.
Occurrence: single grains.

Infraturma *Cedrosacciti* Erdtman 1945
Genus Cedripites Wodehouse 1933

Cedripites sp.
(Pl. IV, fig. 2—3)

Example: sl. 5-HT-68.
Occurrence: often.

Infraturma *Podocarpoiditi* Potonié, Thomson and Thiergart 1950
Genus *Platysaccus* (Naumova 1937) Potonié and Klaus 1954

Platysaccus papillionis Potonié and Klaus 1954
(Pl. V, fig. 1—3)

Example: fig. 1 — sl. 9-HT-68, fig. 2 — sl. 5-HT-68, fig. 3 — sl. 11-HT-68.
Occurrence: five specimens.

Platysaccus sp.
(Pl. V, fig. 9)

Example: sl. 7-HT-68.
Occurrence: several specimens.

Genus *Podocarpidites* (Cookson 1947) Potonié 1958

Podocarpidites sp.
(Pl. IV, fig. 8)

Example: sl. 31-HT-68.
Occurrence: three specimens.

Turma *Aletes* Ibrahim 1933
Subturma *Azonales* Luber 1935 Potonié and Kremp 1954
Infraturma *Psilonapiti* Erdtman 1947
Genus *Laricoidites* Potonié, Thomson and Thiergart 1950

Laricoidites sp.
(Pl. VI, fig. 1—4)

Remarks: Material from Huty has pollen type as *Laricoidites* (inaperturate pollen without specially details, mostly 80—150 mi size) in abundance. Their species determination need special attention.

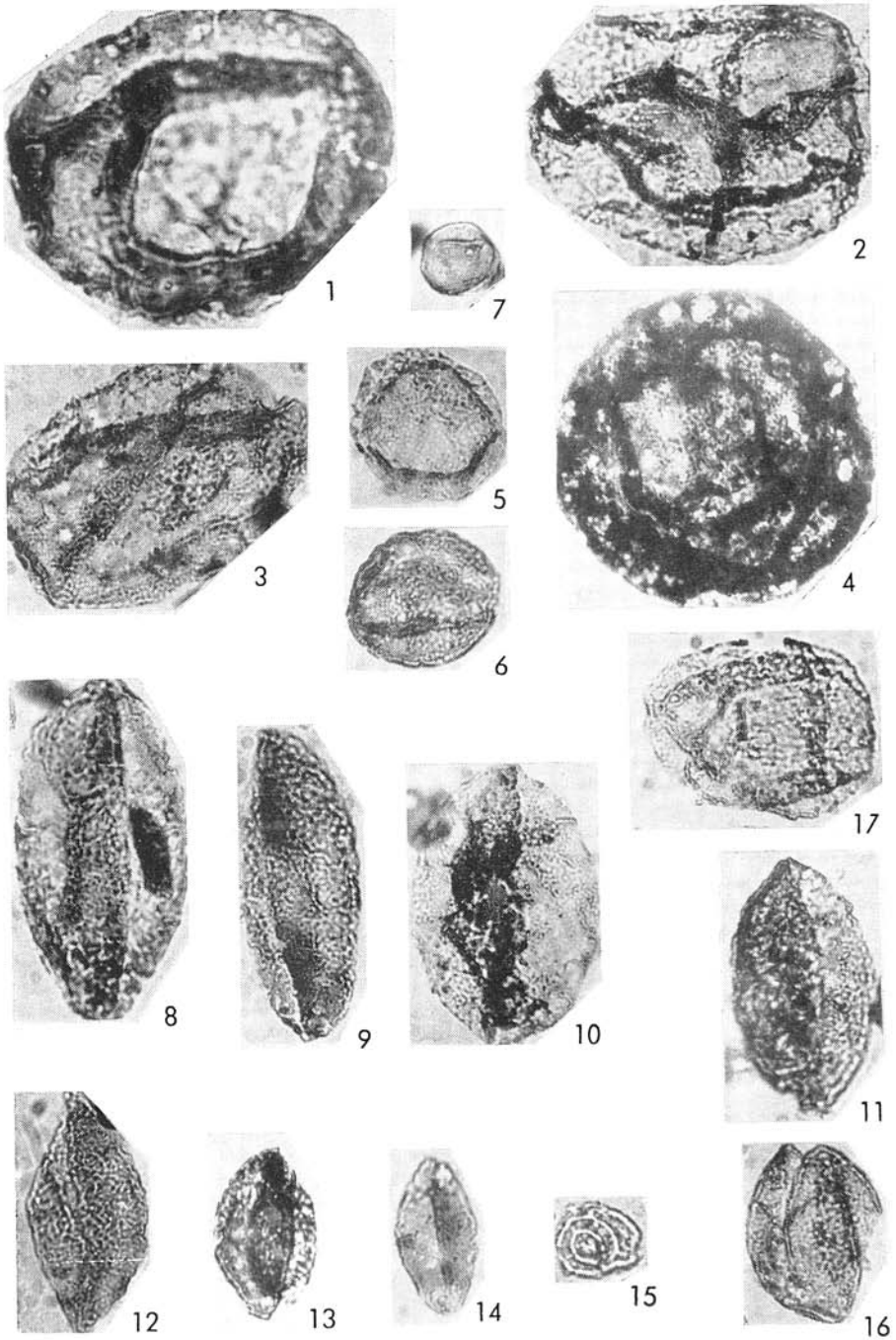


Plate VI

Fig. 1—4. *Laricoidites* sp. — Fig. 5. *Enzonalasporites* sp. — Fig. 6. *Spheripollenites* sp. — Fig. 7. *Inaperturopollenites globulus* de Jersey 1962. — Fig. 8. *Ginkgocycadophytus magnus* de Jersey 1962. — Fig. 10—13. *Ginkgocycadophytus* sp. — Fig. 14. *Ginkgocycadophytus nitidus* (Balme) de Jersey 1962. — Fig. 15. *Circulisporites parvus* (de Jersey) Norris 1965. — Fig. 16. *Schizosporis* sp. — Fig. 17. *Inaperturopollenites* sp. Locality Huty, magn. 500×. Photo by O. Čorná.

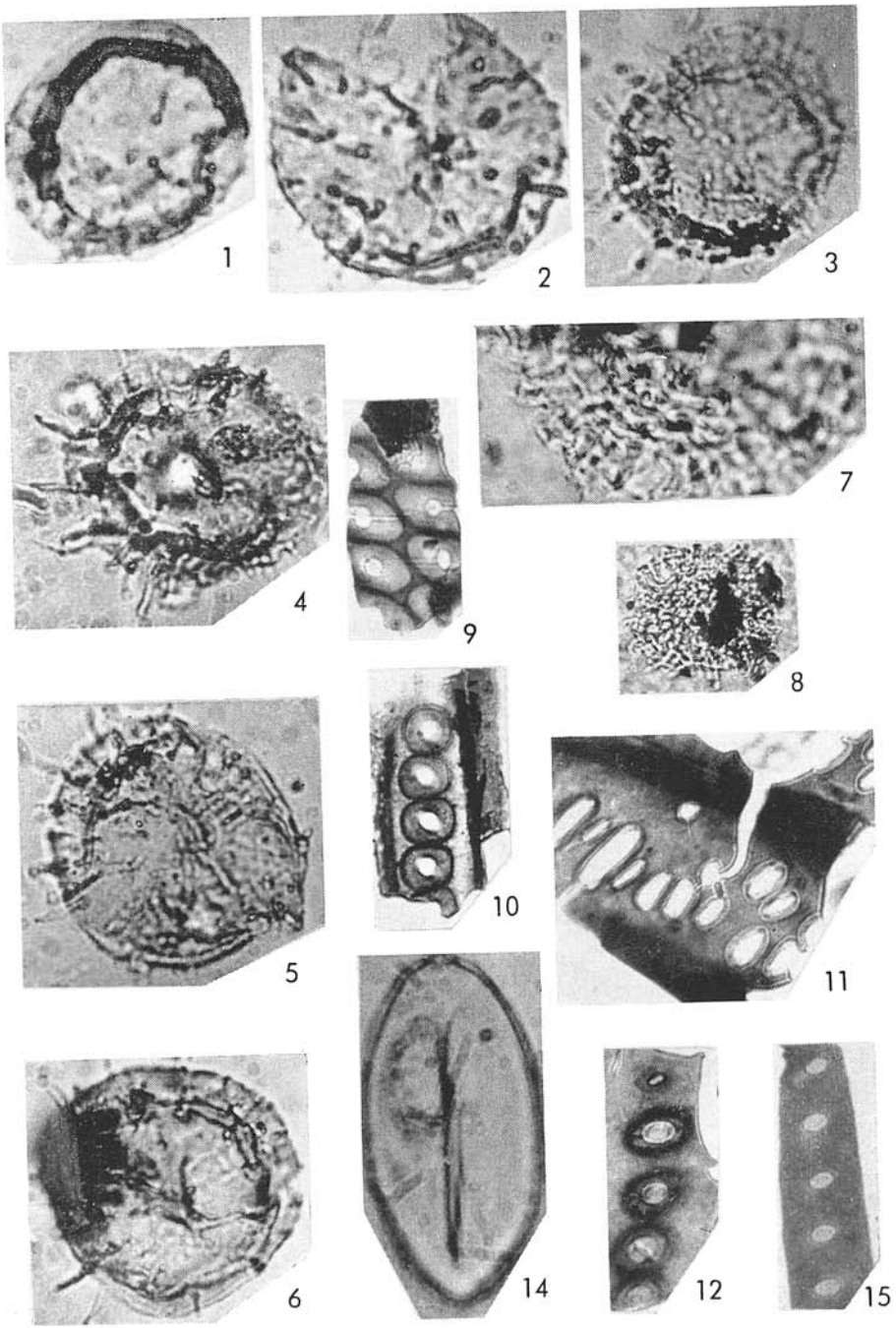


Plate VII

Fig. 1. *Baltisphaeridium* sp. — Fig. 2. *Micrhystridium* sp. — Fig. 3, 5. *Micrhystridium* cf. *fragile* Deflandre. — Fig. 4. *Micrhystridium* cf. *privetiaui* Valensi. — Fig. 6. *Micrhystridium recurvatum* Valensi. — Fig. 7—8. *Hystrichosphaeridium* sp. — Fig. 9—13. *Tracheides*. — Fig. 14. *Incertae sedis*. Locality Huty. Magn. fig. 1—7 — 1200 ×, fig. 8—13 — 500 ×, fig. 14 — 1200 ×. Photo by O. Čorná.

Genus *Inaperturopollenites* (Pflug 1952, Thomson and Pflug 1953) Potonié 1958

Inaperturopollenites globulus Nilsson 1958
(Pl. VI. fig. 7)

Example: sl. 19-HT-68.
Occurrence: six specimens.

Genus *Spheripollenites* Couper 1958

Spheripollenites sp.
(Pl. VI. fig. 6)

Example: sl. 17-HT-68.
Occurrence: often.

Turma *Plicates* (Naumova 1939) Potonié 1960
Subturma *Monocolpates* Iversen and Troels-Smith 1950
Infraturma *Intortes* (Naumova 1937) Potonié 1958
Genus *Ginkgocycadophytus* Samoilovitch 1953

Ginkgocycadophytus magnus de Jersey 1962
(Pl. VI. fig. 10)

Example: sl. 19-HT-68.
Occurrence: three specimens.

Ginkgocycadophytus nitidus (Balme) de Jersey 1962
(Pl. VI. fig. 14)

Example: sl. 9-HT-68.
Occurrence: five specimens.

Ginkgocycadophytus sp.
(Pl. VI. fig. 9—13)

Example: fig. 9 — sl. 16-HT-68, fig. 10 — sl. 23-HT-68, fig. 11 — sl. 8-HT-68, fig. 12, 13 — sl. 13-HT-68.

Occurrence: pollen like *Ginkgocycadophytus* is not so often in our material.

Remarks: The authors conception of genus Ginkgocycadophytus as accodring S. Samoilovitch (1953, p. 30).

Spores *Incertae sedis*
Genus *Schizosporis* Cookson and Dettman 1959

Schizosporis sp.
(Pl. VI. fig. 16)

Example: sl. 6-HT-68.
Occurrence: rare.

Microplankton

The investigation material has microplankton in abundance and it seems to need the more detail study in the future.

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