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Representatives of the Family Holcodiscidae SPATH,1924 (Ammonitina) in Rumania

Rappresentanti della Famiglia Holcodiscidae SPATH, 1924 (Ammonitina) in Romania

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IGCP Projects
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ABSTRACT - The family Holcodiscidae is represented in Rumania in the Upper Valanginian-Lower Barremian interval by species of the genera *Jeanthieuloyites*, *Astieridiscus*, *Spitidiscus* and *Holcodiscus*, as follows: 1) in the Upper Valanginian deposits of the Brasov Formation, round the Brasov town, Central Rumania; in the Valanginian deposits of the Carhaga Formation, in the Persani Mts.,East Carpathians; 2) in the Hauterivian fossiliferous successions of the Dâmbovicioara Formation/Dealul Sasului Member of the Dâmbovicioara Couloir, and the Murguceva Formation of the Svinita region (Central Rumania and south-western Rumania, respectively); 3) in the Barremian rock-sequences of the Dâmbovicioara Couloir, in the East Carpathians Flysch (in the Baraolt Mts., and in the Zizin and Târlung valleys basins), and in the Svinita region. The condensed sedimentation (of the lowermost member of the Brasov Formation) and, in places, the relatively narrow successions (of the Lower Barremian deposits in the Baraolt Mts. and in the Svinita region) prevent the accurate establishment of the holcodiscid species stratigraphic range, except when it is checked by the complementary ammonite assemblage of the same strata. Thus, except *Jeanthieuloyites nodosus* (MANDOV) which passes into the Lower Hauterivian, the other species of *Jeanthieuloyites* are restricted to the Verrucosum and Trinodosum Zones of the Upper Valanginian; *Jeantieuloyites* cf.*nodosus* and *Spitidiscus*? *meneghinii* (DE ZIGNO in RODIGHIERO) were recorded in association with *Leopoldia leopoldina* (D'ORBIGNY) in the Lower Hauterivian; *Spitidiscus intermedius* (D'ORBIGNY), *S. cf. darderi* FALLOT & TERMIER, and *S. cf. rotula* (SOWERBY) (assembled with *Lyticoceras cf. vicarius* (VACEK), *Crioceratites matsumotoi* SARKAR, etc.) are also of Early Hauterivian age; *Spitidiscus vandeckii* (D'ORBIGNY), *S. oosteri* (SARASIN & SCHÖNDELMAYER) and *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY) were found in association with *Pulchellia changarnieri* (SAYN) in the Dâmbovicioara "Couloir", immediately above the beds with *Pseudothurmannia*; but almost all the holcodiscid species of the Early Barremian age are crowded in an about 4-5 m thick rock-sequence, together with *Leptoceratoides* spp., *Subpulchellia* spp., *Patruliusiceras* spp., *Silesites* ex gr. *vulpes* (COQUAND) and *Melchiorites* spp., in the Svinita area, or are recorded in a few larger successions, rich in almost the same ammonite species (*Spitidiscus seunesi* (KILIAN), *Holcodiscus diversecostatus* (COQUAND), *H. gastaldii* KILIAN (*non* D'ORBIGNY), *H. ziczac* KARAKASCH, *H. geronimaeformis* TZANKOV) together with *Leptoceratoides* spp., *Subpulchellia sauvageaui* (HERMITE), etc.; then, *Astieridiscus elegans* KARAKASCH, *Holcodiscus* cf.*caillaudianus* (D'ORBIGNY) *H. tzankovi* n.sp., *H. diversecostatus* (COQUAND), assembled with *Torcàpella suessi* (SIMIONESCU), i.e. at the top of the Lower Barremian, in the Dâmbovicioara Couloir. Four new species of the genus *Holcodiscus* have been defined: *H. tzankovi* n.sp, *H. simionescui* n. sp., *H. decorus* n. sp and *H. ouachensis* n. sp.

KEY WORDS: Lower Cretaceous, Ammonitina, Holcodiscidae, Taxonomy, Biostratigraphy, Rumania.

RIASSUNTO - La famiglia Holcodiscidae è rappresentata in Romania nell'intervallo Valanginiano superiore-Barremiano inferiore, dalle specie dei generi *Jeanthieuloyites*, *Astieridiscus*, *Spitidiscus* e *Holcodiscus* come segue: 1) nei depositi del Valanginiano superiore della Formazione di Brasov (vicino alla citta' di Brasov, Romania centrale), e nella Formazione di Carhaga nei Monti Persani (Carpazi Orientali); 2) nella successione hauteriviana della Formazione di Dâmbovicioara (Membro Dealul Sasului nel "Colouoir" Dâmbovicioara, Romania centrale) e nella Formazione Murguceva della regione di Svinita (Romania sud-occidentale); 3) gli holcodiscidi barremiani sono abbondantemente rappresentati nel "Colouoir" Dâmbovicioara, nei depositi flyschoidi dei Carpazi Orientali (nei Monti Baraolt e nei bacini idrografici di Zizin e Târlung) e nella regione di Svini-

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ta. La sedimentazione condensata (membro inferiore della Formazione di Brasov) e, a luoghi, la successione a spessore relativamente ridotto dei depositi del Barremiano inferiore dei Monti Baraolt e della regione di Svinita impediscono l'accurata definizione della sicura distribuzione stratigrafica delle specie, salvo quando essa è evidenziata, per quanto possibile, da associazioni complementari raccolte negli stessi strati. Ad eccezione di *Jeanthieuloyites nodosus* (MANDOV), che passa nell' Hauteriviano inferiore, le specie del genere *Jeanthieuloyites* sono limitate alle Zone a Verrucosum ed a Trinodosum del Valanginiano superiore; *Jeanthieuloyites* cf. *nodosus* e *Spitidiscus ? meneghinii* (DE ZIGNO in RODIGHIERO) sono associati con *Leopoldia leopoldina* (D'ORBIGNY) nell' Hauteriviano inferiore; *Spitidiscus intermedius* (D'ORBIGNY), *S* cf. *darderi* FALLOT & TERMIER e *S. cf. rotula* (SOWERBY) (associati con *Lyticoceras* cf. *vicarius* (VACEK), *Crioceratites matsumotoi* SARKAR, etc.) sono anch'essi dell' Hauteriviano inferiore; *Spitidiscus vandeckii* (D'ORBIGNY), *S. oosteri* (SARASIN & SCHÖNDELMAYER) e *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY) sono stati rinvenuti in associazione con *Pulchellia changarnieri* (SAYN) nel "Couloir" Dâmbovicioara, nei livelli immediatamente soprastanti quelli con *Pseudothurmannia*; quasi tutte le specie di holcodi scidi del Barremiano inferiore sono concentrati in una successione di 4-5 m di spessore, insieme con *Leptoceratoides* spp., *Subpulchellia* spp., *Patruliusiceras* spp., *Silesites* ex gr. *vulpes* (COQUAND) e *Melchiorites* spp. nell'area di Svinita; altri sono stati ritrovati in una successione piu spessa caratterizzata dalle stesse associazioni ad ammoniti (*Spitidiscus seunesi* (KILIAN), *Holcodiscus diversecostatus* (COQUAND), *H. gastaldii* KILIAN (*non* D'ORBIGNY), *H. ziczac* KARAKASCH, *H. geronimaeformis* TZANKOV) insieme a *Leptoceratoides* spp., *Subpulchellia sauvageaui* (HERMITE) ecc.; infine, *Astieridiscus elegans* KARAKASCH, *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY), *H. tzankovi* n. sp., *H. diversecostatus* (COQUAND), associati con *Torcapella suessi* (SIMIONESCU), nella parte superiore del Barremiano inferiore nel "Couloir" Dâmbovicioara. Nel genere *Holcodiscus* sono state istituite quattro nuove specie: *H. tzankovi* n.sp, *H. simionescui* n. sp., *H. decorus* n. sp. e *H. ouachensis* n. sp.

PAROLE CHIAVE: Cretaceo inferiore, Ammonitina, Holcodiscidae, Tassonomia, Biostratigrafia, Romania

1. - INTRODUCTION

The present paper attempts to present together all the data existing now on the holcodiscid representatives in Rumania as they could be controlled with the paleontologic material still existing in repositories. These data refer to species of the genera *Jeanthieuloyites, Spitidiscus, Holcodiscus* and *Astieridiscus* yielded by the Valanginian-Lower Barremian fossiliferous successions of the Persani, Ciuc and Baraolt Mts. and on the Zizin, Târlung and Doftana valleys (all situated in the East Carpathians), of the Brasov-Codlea area, Dâmbovicioara Couloir (which corresponds to the structural unit and morphologic depression developed SSW-NNE between the crystalline massifs of Leaota and Iezer Mts.) and Svinita village area (from the South Carpathians), and of the western part of the Carpathians foreland southern unit - the Moesian Platform (Fig. 1), as follows:

1) in the Persani Mts., the upper, marly member of the Tithonian-Hauterivian Carhaga Formation provided an unidentifiable species of *Jeanthieuloyites*, preserved in the repository of the Geological Institute of Rumania, listed as *Spitidiscus* sp. ex gr. *S. incertus* (D'ORBIGNY) by PATRULIUS & AVRAM (1976 a);

2) in the Ciuc Mts., NICOLAESCU *et alii* (1970) pointed out a *Spitidiscus* aff. *S. fallacior* COQUAND within the Barremian flysch, namely in the Bistra Formation, but this badly figured specimen is lost;

3) the same Bistra Formation yielded in the Baraolt Mts. (KISS, 1911; VADASZ, 1911; KUSKO & SAVU, 1970; AVRAM & KUSKO, 1984) a rich assemblage of Barremian ammonites, including *Holcodiscus, Spitidiscus* and *Astieridiscus* species; among them only the fossils collected by the last authors (listed here below, in the chapter on the biostratigraphic value of the holcodiscispecies) are still available; they are preserved in the repository of the Geological Institute of Rumania;

4) the upper part, Barremian in age, of the Sinaia Formation, exposed on the Zizin valley (East of Brasov) presented some crushed holcodiscids, such as *Holcodiscus caillaudianus* (D'ORBIGNY) and *H.* aff. *perezianus razgradi* TZANKOV (recognised by GRÄF, 1970, 1975), but these fossils are not available anymore;

5) in the same lithostratigraphic unit of the East Carpathians flysch, but southwards, AVRAM (1976 a) recorded in the Târlung valley: *Spitidiscus* sp., *Holcodiscus perezianus* (D'ORBIGNY), *H.* cf. *geronimae* (HERMITE), *Holcodiscus* sp. aff. *H. nicklesi* KARAKASCH, and in the Doftana valley - crushed specimens of *Holcodiscus*, all lodged in the repository of the Geological Institute of Rumania;

6) in the Upper Valanginian-?Aptian Brasov Formation, developed both in the Brasov and Codlea towns areas, JEKELIUS (1915) signaled a *Holcodiscus (Spitidiscus) lorioli* KILIAN (lost collection), in the Dracului valley; then, VALCEANU (1960) and SEMAKA (1967) (revised by PATRULIUS, 1969, listed in the Valea Lata, near Codlea: *Spitidiscus intermedius* (D'ORBIGNY), *S. vandecki* (D'ORBIGNY), *S.* aff. *heeri* OOSTER (an assemblage also lost), and AVRAM & GRADINARU (1993) recorded in the basal, condensed bed of the formation, exposed in the "Piatra Mare" quarry: *Jeanthieuloyites keyserlingiformis* n.sp., *J. trapezoidalis* n.sp., *J. nodosus* (MANDOV) and an unnamed new species of the same genus, an assemblage now preserved in the Bucharest University repository;

7) south of Brasov, in the Dâmbovicioara Couloir, HERBICH (1888), POPOVICI-HATZEG (1898), SIMIONESCU (1898), PATRULIUS (1969), PATRULIUS & AVRAM (1976 b) and AVRAM (1988), and also NEAGU, BULMEZ, GRIGORESCU and ANDRASANU (in coll.) listed the rich ammonite content of the Upper Valanginian - Lower Aptian Dâmbovicioara Formation; except HERBICH's material, which is housed in the Cluj University reposito-

ry, and partly SIMIONESCU's collections, preserved in the Iassy University and in the Bucharest University repositories, the paleontological collections of these authors are lodged in the repository of the Geological Institute of Rumania (an up-to-date list of the holcodiscid species coming from Dâmbovicioara results from the present revision) ;

8) the Svinita village area is highly important by the pyritised, well preserved Lower Barremian ammonites, among which numerous species of holcodiscids were assigned (AVRAM, 1976 b, 1988, revised here below), yielded by the Murguceva and Svinita Formations; these are also preserved in the repository of the Geological Institute of Rumania ;

9) finally, from the Hauterivian limestone sequence of the western part of the Moesian Platform, developed in subsurface, MUTIU (1967) cited *Spitidiscus* sp. and *Holcodiscus* sp., none of them stored in any official repository.

The main result of the present paleontological study is the revision of the *Holcodiscus caillaudianus* (d'ORBIGNY) group of species, by the ontogenetic study of both the Rumanian holcodiscid representatives and the species figured in the paleontological literature.

On the other hand, the pyritised ammonites from Svinita illustrate the large diversity of the holcodiscid morphology, especially within the genus *Holcodiscus*,with a consequence in the new interpretation presented below, of some already published taxa and in the proposition of some new species.

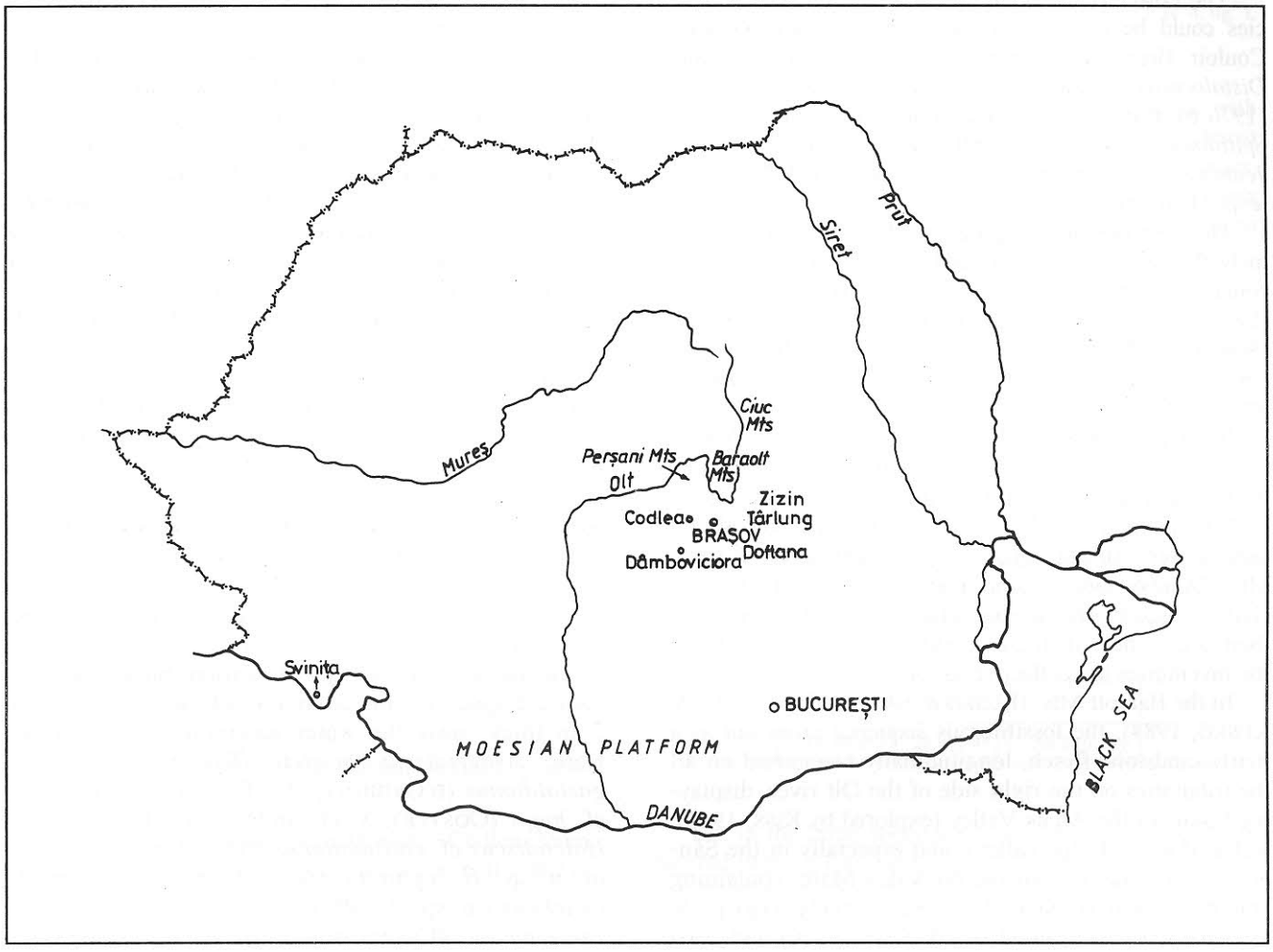

Fig. 1 - Location in Rumania of the fossiliferous sites displaying Holcodiscidae representatives.
- *Ubicazione in Romania delle località fossilifere con rappresentanti delle Holcodiscidae.*

2. - BIOSTRATIGRAPHIC VALUE OF THE HOLCODISCID SPECIES

Of all the region mentioned above, only the Baraolt Mts., Brasov-Codlea region, Dâmbovicioara Couloir and Svinita village area are indicative for the biostratigraphic position of the holcodiscid species. Even in these regions the unfavourable structural setting and, in places, the uncomplete exposure of fossiliferous successions made possible the estimation of the biostratigraphic value of the species only when they are directly assembled to non-holcodiscid index taxa.

As a matter of fact, the Upper Valanginian species of the genus *Jeanthieuloyites* come from an Upper Valanginian, almost 20 cm thick, condensed bed at the base of the Brasov Formation in the Codlea town area; there they were assembled to numerous ammonite species of the Verrucosum and Trinodosum Zones; moreover, in the bed next to the condensed base *Eleniceras transsylvanicum* (JEKELIUS) was recognised, a species which supports the latest Valanginian age (Callidiscus Zone).

The Lower Hauterivian age of some holcodiscid species could be checked up only in the Dâmbovicioara Couloir. Here, a biozone with *Leopoldia leopoldina* and *Distoloceras* sp. was proposed by PATRULIUS & AVRAM (1976 b), this biozone containing in the same outcrop: *Spitidiscus* ? *meneghinii* (de ZIGNO in RODIGHIERO), *Jeanthieuloyites* cf. *nodosus* (MANDOV) and *Leopoldia leopoldina* (D'ORBIGNY).

The next biozone proposed by the same authors, namely that with *Lyticoceras* and *Spitidiscus intermedius*, contains: *Spitidiscus intermedius* (D'ORBIGNY), *S.* cf. *darderi* FALLOT & TERMIER, and also *S.* cf. *rotula* (SOWERBY) (here revised), in assemblege with *Lyticoceras* cf. *vicarius* (VACEK), *Crioceratites matsumotoi* SARKAR, *C. sornayi* SARKAR, etc.

It should be also emphasized the presence of *Spitidiscus* ? *meneghinii* (example here figured in pl. 2, fig. 1), in the uppermost Hauterivian, in assemblage with *Pseudothurmannia* spp. The Lower Barremian holcodiscid species were almost equally represented in the Baraolt Mts., Dâmbovicioara Couloir and in Svinita region, all characterised by the narrow interval (of some meters) of their occurrence. In these conditions the largest part of the inventories are collective as follows:

In the Baraolt Mts. (KUSKO & SAVU, 1970; AVRAM & KUSKO, 1984), the fossiliferous sequence crops out as a marly-sandstone flysch, longitudinally recognised on all the tributaries on the right side of the Olt river, displaying fossils in the Arcus Valley (explored by KISS, 1911), Valea Mare (= Large valley), and especially in the Sâncrai valley. The assemblage on Valea Mare, containing *Spitidiscus oosteri* (SARASIN & SCHÖNDELMAYER) (= *S. fallacior* COQUAND, in KUSKO & SAVU, 1970) and *Psilotissotia* sp. (unregistered in any repositories) seems to be situated lower than the assemblage on the Sâncrai valley, where a very rich ammonite assemblage was gathered in a sequence almost 1 m thick; among these species *Crioceratites* aff. *emerici* LÉVEILLÉ, *Leptoceras subtile* UHLIG, *L. pumilum* UHLIG, *Eoleptoceras* (*E.*) aff. *fragile* (UHLIG), *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY), *H. gastaldii* KILIAN (*non* D'ORBIGNY), *H. irregularis* TZANKOV, *H.* aff. *nodosus* KARAKASCH, *Spitidiscus hugii* (OOSTER), *S. oosteri* (SARASIN & SCHÖNDELMAYER), *S. andrussowi* (KARAKASCH), *Astieridiscus uhligi* KARAKASCH, beside *Pulchellia* aff. *compressissima* (D'ORBIGNY), *Subpulchellia sauvageaui* (HERMITE), *Silesites* ex gr. *vulpes* (COQUAND), *Patruliusiceras* spp., *Barremites* cf. *difficilis* (D'ORBIGNY), *Melchiorites* spp. were recorded.

In the Dâmbovicioara Couloir, the Lower Barremian assemblage containing Holcodiscids were counted (PATRULIUS & AVRAM, 1976 b) as the biozone with *Pulchellia changarnieri* (SAYN) and *Spitidiscus* spp., and the biozone with *Pulchellia compressissima* (D'ORBIGNY), *Leptoceratoides* spp., *Holcodiscus* spp. and *Torcapella suessi* (SIMIONESCU). The former was recognised along the Brasov - Rucar route on the western slope of the Sasului Hill, where *Pulchellia changarnieri, Subpulchellia sauvageaui* (HERMITE), *Spitidiscus vandeckii* (D'ORBIGNY), *S. oosteri* (SARASIN & SCHÖNDELMAYER), *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY), *Crioceratites* sp. were recorded within an almost 3-4 m sequence above the beds with *Pseudothurmannia*. The latter was identified as an about 5-10 m thick sequences on the Muierii, Zamvelei, Oratii and Cheii valleys as follows: in the Muierii valley: *Leptoceras pumilum* (UHLIG), *L. subtilis* (UHLIG), *Pulchellia* cf. *compressissima* (D'ORBIGNY), *Subpulchellia sauvageaui* (HERMITE), *Spitidiscus seunesi* (KILIAN), *Holcodiscus diversecostatus* (COQUAND), *H. gastaldii* KILIAN (*non* D'ORBIGNY), *H. ziczac* KARAKASCH, *H. geronimaeformis* TZANKOV, *Barremites* spp., etc.; in the Oratii valley: *Leptoceras* sp., *Pulchellia compressissima* (D'ORBIGNY), *Silesites vulpes* (COQUAND), *Barremites* spp., *Torcapella suessi* (SIMIONESCU), *Crioceratites* ex gr. *thiollierei* ASTIER, etc., and *Astieridiscus elegans* KARAKASCH, *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY), *H. diversecostatus* (COQUAND); in the Zamvelei valley: *Spitidiscus* cf. *vandeckii* (D'ORBIGNY), *Holcodiscus tzankovi* n.sp., *H.* cf. *caillaudianus* (D'ORBIGNY), *Barremites* spp. and *Torcapella suessi* (SIMIONESCU).

In the Svinita area all the Lower Barremian holcodiscid species come from a single sequence, almost 5 m thick, near the water reservoir of the village. Here, *Astieridiscus morleti* (KILIAN), *Spitidiscus gastaldianus* (D'ORBIGNY), *S.* cf. *seunesi* (KILIAN), *S.* cf. *hugii* (OOSTER), *S.* cf. *andrussowi* (KARAKASCH), *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY), *H. tzankovi* n. sp., *H. alpha* TZANKOV, *H. decorus* n. sp., *H. ouachensis* n. sp., *H.* aff. *nodosus* KARAKASCH, *H. diversecostatus* (COQUAND), *H. ziczac* KARAKASCH, *H.* aff. *cadoceroides* (KARAKASCH), are assembled with *Leptoceras* spp., *Eoleptoceras* (*E.*) *wrighti* (MANOLOV), *E.* (*E.*) cf. *pumilum* (UHLIG), *E.* (*Tzankoviceras*) n. sp., *Veleziceras* aff. *saharievae* (MANOLOV), *Subpulchellia nicklesi* HYATT, *S. sauvageaui* (HERMITE) and *Melchiorites* spp. occur.

3. - PALAEONTOLOGICAL DESCRIPTIONS

The repositories which allowed the present revision are the follows: the repository of the Geological Institute of Rumania (indicated "IG" in the next quotations), the Bucharest University repository (BU), the Cluj University (CU) and Iassy University (IU) repositories.

The following symbols were used for the shell measurements: D = diameter of the shell; U = width of the umbilical area, as it is limited by the umbilical seam, at a measured diameter; H = whorl heght, along the same diameter; W = whorl width at the measured diameter, all expressed in mm; u, h, w, mean the U/D, H/D and W/D ratio, respectively; the index of involution represents the ratio between the part covered by the next whorl and the complete height of the whorl.

GENUS ***Jeanthieuloyites*** COOPER, 1981

TYPE SPECIES: *Rogersites quinquestriatus* BESAIRIE, 1936

As shown by AVRAM & GRADINARU (1993) the genus *Jeanthieuloyites* is surprisingly frequent in Rumania, with some Upper Valanginian species such as *J. keyserlingiformis* AVRAM & GRADINARU, *J. trapezoidalis* AVRAM & GRADINARU, *Jeanthieuloyites* sp. ind., beside *J. nodosus* (MANDOV) which crosses the Valanginian-Hauterivian boundary.

Jeanthieuloyites keyserlingiformis AVRAM & GRADINARU
Pl. 1, fig. 1 a-c; pl. 7, fig. 1

v 1993 *Jeanthieuloyites keyserlingiformis* AVRAM & GRADINARU, p. 674, pl. 1, fig. 13; pl. 2, fig. 11; pl. 4, fig. 3; text-fig. 2/1 (all showing the holotype).

SPECIFIC CHARACTERS - Very depressed, oval whorl section; the inner whorls display a *Spitidiscus*-like ornamentation, but with bunches of 2-4 ribs starting from periumbilical swellings; outer whorl (still septate in the holotype) resembles *Polyptychites keyserlingi* NEUMAYR & UHLIG but bears also 6 deep, almost straight, prorsiradiate constrictions.

OCCURRENCE - Upper Valanginian, Codlea town area, Central Rumania (E. GRADINARU's coll., BU - 00613).

Jeanthieuloyites trapezoidalis AVRAM & GRADINARU
Pl. 1, fig. 2 a-c; pl. 7, fig. 3

v 1993 *Jeanthieuloyites trapezoidalis* AVRAM & GRADINARU, p. 675, pl. 1, fig. 15; pl. 2, fig. 14; pl. 4, fig. 4; text-fig. 2/3 (all showing the holotype).

SPECIFIC CHARACTERS - Trapeze-shaped, gently depressed whorl section; narrow and deep umbilicus (u=0.25); 7 almost straight, prorsiradiate deep constrictions on the (still septate) last whorl, bordered by 2 ribs; 4 to 5 umbilical costae in bunches of 2 or 3 from 2 periumbilical swellings on each interval between the constrictions, bifurcating/polifurcating on the sides.

OCCURRENCE - As in *Jeanthieuloyites keyserlingiformis* (E. GRADINARU's coll., BU - 00615).

Jeanthieuloyites nodosus (MANDOV)
Pl. 1, fig. 3 a-b; pl. 7, fig. 2a, b

1919 *Polyptychites Meneghinii* de ZIGNO; RODIGHIERO, pl. X, fig. 4 (only).

1976 *Spitidiscus nodosus* MANDOV, p. 99, pl. XX, fig. 1; pl. XXI, fig. 1 (holotype).

? 1976 *Spitidiscus Meneghinii* ((DE ZIGNO) RODIGHIERO); MANDOV, p. 85, pl. XXII, fig. 2.

1986 *Spitidiscus nodosus* MANDOV; VASICEK & MICHALIK, p. 472, pl. V, fig. 3.

1993 *Jeanthieuloyites nodosus* (MANDOV); AVRAM & GRADINARU, p. 673, pl. 1, fig. 14; pl. 2, fig. 12, 13; pl. 4, fig. 1, 2, text-fig. 1/2.

SPECIFIC CHARACTERS - Medium sized species, with relatively wide umbilicus, and an involution of almost 1/3; its ornamentation is composed of six constrictions, wide, gently prorsiradiate on the last whorl, each of them bounded by 2 ribs, sharpened near the umbilicus and on the ventral area; between constrictions there are 6 to 2 (progressively fewer towards the aperture) umbilical ribs, generally bifurcated on the mid-sides, some of them rising in bunches of 2-3 from the periumbilical swellings, these disposed behind the constrictions; the ribs are parallel to the adapically situated constriction and fall obliquely on the adorally disposed constriction.

MATERIAL - 3 septate specimens recorded in the Codlea town area (E. GRADINARU's coll., BU - 00274).

MEASUREMENTS - No measurements were presented for the holotype, which is deformed. In the better preserved material from the Codlea town area, they are:

D	U	H	W	W/H
62.5	15.6 (0.25)	28.6(0.45)	30.8 (0.49)	1.07

But in the large specimen from Dâmbovicioara (here figured in pl. 2, fig.3 and in pl. 7, fig. 5 as *Jeanthieuloyites* cf. *nodosus* (MANDOV)) the umbilicus is wider, the ribbing is denser and the constrictions are 7 in number instead of 6, in the holotype. This specimen displays umbilical swellings only at the beginning of the last whorl.

OCCURRENCE - Lower Hauterivian in Bulgaria and in Slovakia. In Rumania it was recorded in the Upper Valanginian (in the Codlea town area) and in the Lower Hauterivian (with *Leopoldia leopoldina* (D'ORBIGNY)), in Dâmbovicioara.

Jeanthieuloyites sp.ind.
Pl. 1, fig. 4; pl. 7, fig. 4

v 1993 *Jeanthieuloyites* n.sp.ind., AVRAM & GRADINARU, p. 675, pl. 1, fig. 16; pl. 4, fig. 5, 6; text-fig. 1/4.

DESCRIPTION - Two septate specimens (E. GRADINARU's coll., BU-00616), characterised by a semicircular, depressed whorl section, by the deep and middle-sized umbilicus, and a ribbing density very different from young to mature stage; they also bear straight, wide constrictions, prorsiradiate on the sides and describing on the venter an angle towards the aperture. They are partly similar by the general shape and the thin ribbing on inner whorls, to *Jeanthieuloyites quinquestriatus* (BESAIRIE), but are different from this species by their narrower umbilicus and fewer depressed whorl section.

OCCURRENCE - As for *Jeanthieuloyites keyserlingiformis* AVRAM & GRADINARU.

GENUS ***Holcodiscus*** UHLIG, 1882

TYPE SPECIES: *Ammonites Caillaudianus* D'ORBIGNY, 1850

Well represented in Rumania, the genus *Holcodiscus* was recognised in the Lower Barremian deposits in all the fossiliferous sites displaying holcodiscid ammonites. After the revision presented below, 17 species, a lot of them belonging to the *Holcodiscus caillaudianus* group, were counted in Rumania.

Holcodiscus caillaudianus (D'ORBIGNY)

Pl. 3, fig. 1, 2 a-b, 3 a-b, 4-7; pl. 6, fig. 1; pl. 7, fig. 11

1850 *Ammonites Caillaudianus* D'ORBIGNY, p. 99, n. 600.

non 1883 *Holcodiscus Caillaudianus* D'ORBIGNY; UHLIG, p. 243, pl. XIX, fig. 2-4, 6-7, 13-14 (= *H.tzankovi* n.sp.), 8-9 (= *H. gastaldii* KILIAN *non* d'ORBIGNY).

v 1888 *Holcodiscus Caillaudi* D'ORBIGNY; KILIAN, p. 669, pl. XIX, fig. 2 (first figuration of the holotype).

non 1907 *Holcodiscus Caillaudi* D'ORBIGNY; KARAKASCH, p. 103, pl. IX, fig. 1-5 (= *H.* aff. *gastaldii* KILIAN *non* D'ORBIGNY).

? 1907 *Holcodiscus Perezi* D'ORBIGNY; KARAKASCH, pl. IX, fig. 10 (only).

1923 *Holcodiscus Perezi* D'ORBIGNY; FALLOT & TERMIER, pl. IV, fig. 10 (only).

1935 *Holcodiscus caillaudianus* D'ORBIGNY; TZANKOV, p. 76, pl. 3, fig. 6-8.

1937 *Ammonites Caillaudianus* D'ORBIGNY; COTTREAU, p. 57, pl. LXXVII, fig. 24, 25 (type refigured).

? 1955 *Holcodiscus caillaudi* D'ORBIGNY; ERISTAVI, p. 73, pl. III, fig. 1 (crushed specimen).

non 1960 *Holcodiscus caillaudianus* ORBIGNY; DRUSHICHITS, p. 304, pl. XLVI, figs. 1-2 (= *H. tzankovi* n. sp.).

? 1966 *Holcodiscus caillaudianus* (D'ORBIGNY); BRESKOVSKI, p. 101, pl. I, fig. 5-6.

1967 *Holcodiscus caillaudianus* (D'ORBIGNY); DIMITROVA, p. 156, pl. LXXI, fig. 5.

1975 *Holcodiscus caillaudianus* (D'ORBIGNY); GRÂF, p. 111, pl. I, fig. 3.

v 1984 *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY) KILIAN; AVRAM & KUSKO, p. 17, pl. III, fig. 8.

1985 *Holcodiscus perezianus caillaudianus* (D'ORBIGNY); TZANKOV & BRESKOVSKI, p. 21, pl. VI, fig. 4-8.

SPECIFIC CHARACTERS - The species is here accepted after the figuration and (partly) the description of the type made by KILIAN (1888), although its first interpretation was published by UHLIG (1883). Namely, the holotype is medium in size, its whorls displaying almost flat side and flat venter, almost isometric, subquadrate whorl-section (W/H= 1.1), a relatively small umbilicus (u = 0.33 at a diameter of 46.5 mm) and an ornamentation composed of main, bituberculate ribs, and thinner, nontuberculate intercalatories; the former are 8 in number on a half-whorl, and the latter - from 4 to 6 on every interspace. The ventro-lateral tubercles are stronger than the lateral ones, which are bullate; the intercalatory ribs are somewhere bifurcated and, as in almost all the Holcodiscid species, the last of them on each interspace falls obliquely on the main tuberculate adorally disposed rib. The ventro-lateral tubercles seem to smoothen at a larger diameter than 45 mm. On the inner whorls, the main ribs bounding adapically the constrictions and bearing marginal tubercles are differentiated beginning from a diameter of 12-15 mm, but the bifurcate intercalatories are more frequent than in mature stages.

MATERIAL - 28 specimens, 16 of them recorded in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18689, 18690, 18692; D. POPESCU-RAILEANU's coll., IG P- 18691; G. BULMEZ's coll., BU-0263), 9 in the Svinita region (E. AVRAM's coll., IG P-18669) and 2 in the Baraolt Mts. (M. KUSKO & M. SAVU's coll., IG P-6463).

MEASUREMENTS - Specimen figured in pl. 3, fig. 2.

D	U	H	W
22.7	7.1 (0.31)	9.2 (0.40)	10.1 (0.44)

REMARKS - The *Holcodiscus caillaudianus* group is remarquable by its large diversity of the ontogenetic evolution of the species: from almost typical *H. caillaudianus*, bearing minute lateral and strong marginal tubercles in almost all the growing stages, to the specimen figured here in pl. 3, fig. 16, which presents bituberculate (with lateral and marginal bullae) main ribs on the last-but-one whorl, and only nontuberculate main ribs bordering the constrictions, on the end of the shell, or UHLIG's specimens figured in his pl. XIX, fig. 8-9, which display denser ornamentation, bullate on the ventral margin. In these conditions a revision of the entire group was necessary, the species here discussed being restricted to the specimens well related to the holotype.

Among the Rumanian specimens, all identified as *Holcodiscus* cf. *caillaudianus* because of their rounded and not subquadrate whorl-section, the best preserved are the pyritised nuclei recorded in the Svinita village area. They are small, completely septate, displaying a slightly depressed (W/H=1.1), but subcircular whorl-section; almost 10-11 straight main ribs bearing minute lateral bullae and ventro-lateral tubercles, and 2-4 single or bi-

furcated intercalatories on each interval between the main ribs are observed, two of them joined to the main adorally situated rib; all the ribs are strengthened on the rounded ventral side.

The crushed specimens of the Dâmbovicioara Couloir (Pl. 3, fig. 1, 5-7) present the lateral ornamentation very similar to that of the holotype, although they have more numerous intercalatories and fewer main ribs in youth.

Finally, the two specimens of the Baraolt Mts. are also crushed and much resemble the holotype by the numerous main ribs, the small lateral bullae, the strong ventro-lateral tubercles and the bifurcate intercalatories.

OCCURRENCE - Lower Barremian in France, Silezia, Bulgaria, Crimea, Caucasus; Upper Barremian (!) in Bulgaria. In Rumania all the specimens are recorded in the Lower Barremian.

Holcodiscus fallax (COQUAND in MATHERON)
Pl. 4, fig. 12

1878 *Ammonites fallax* COQUAND in Coll., MATHERON, pl. C-19, fig. 5 a-b (lectotype), 5 c-d.

1888 *Holcodiscus fallax* COQUAND in MATHERON; KILIAN, p. 667, pl. XX, fig. l.

1955 *Holcodiscus fallax* COQUAND; ERISTAVI, p. 75.

non 1966 *Holcodiscus fallax* (COQUAND); BRESKOVSKI, p. 102, pl. VII, fig. 3 (= *Holcodiscus* n. sp. ind.).

1967 *Holcodiscus fallax* (COQUAND in MATHERON); DIMITROVA, p. 160, pl. LXXVIII, fig. 9.

1985 *Holcodiscus fallax* (COQUAND in MATHERON); TZANKOV & BRESKOVSKI, p. 24,. pl. VII, fig. 4-8.

SPECIFIC CHARACTERS - KILIAN (1888) first described the species, considering it very variable, similar to *Holcodiscus caillaudianus* (d'ORBIGNY) but devoid of the lateral bullae and displaying denser (10 to 14) main ribs (which bear only ventro-lateral tubercles). After the figuration of the type, its ge-rontic ornamantation is characterised by a kind of ridges, separated by constrictions (but no note concerning the constrictions was given by the cited author).

MATERIAL - A single, fragmentary specimen, recorded in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18701).

REMARKS - The fragmentary specimen, here presented as *Holcodiscus* aff. *fallax*, displays the straight, radial, almost parallel lateral ornamentation of the species, the main ribs bearing only marginal tubercles, and single or, rarely, bifurcated intercalatories. But unlike the type, on the aged end of the shell appear true constrictions, bounded adapically by a main, tuberculate rib, and adorally - by a sharp and strong simple (nontuberculate) rib.

OCCURRENCE - Barremian in France and Georgia; Lower Barremian in Bulgaria and in Rumania.

Holcodiscus tzankovi n. sp.
Pl. 3, fig. 8, 9, 10 a-c, 11 a-b, 12 a-b; pl. 6, fig. 2; pl. 7, fig. 13

1888 *Holcodiscus Caillaudianus* D'ORBIGNY; UHLIG, pl. XIX, figs. 2-4, 6-7, 13-14.

? 1923 *Holcodiscus Perezi* D'ORBIGNY; FALLOT & TERMIER, p. 47, pl. IV, fig. 7-9 (only).

1935 *Holcodiscus perezianus* D'ORBIGNY; TZANKOV, p. 77, pl. IV, fig. 7-9, ? pl. V, fig. l.

1960 *Holcodiscus caillaudianus* ORBIGNY; DRUSHTCHITS, p. 304, pl. XLVI, fig. l, 2.

1976 *Holcodiscus perezianus* (D'ORBIGNY); AVRAM, 1976 a, p. 48, pl. IV, fig. l3.

1985 *Holcodiscus perezianus perezianus* (D'ORBIGNY); TZANKOV & BRESKOVSKI, pl. VI, fig. l-3 (only).

HOLOTYPUS - The pyritised phragmocone figured in pl.3, fig.10 (E.AVRAM's coll., IG P-18671).

DERIVATIO NOMINIS - In the memory of the Bulgarian eminent paleontologist, professor V.TZANKOV

LOCUS TYPICUS - The Svinita village area, Banat, SW Rumania.

STRATUM TYPICUM - Svinita Formation, lower part of the Temeneacia Member, Lower Barremian in age.

DIAGNOSIS - Middle sized Holcodiscid, with rounded, slightly depressed whorl section, 7-8 main ribs bearing bullate lateral and marginal tubercles and 3-5 single or bifurcated intercalatories on each interval between the main ribs.

DESCRIPTION - The holotype preserves in good conditions only the last whorls of the phragmocone. It displays an oval, almost isometric (gently depressed) whorl section, seven almost straight constrictions, adapically bordered by sharp, tuberculate ribs, progressively stronger towards the ventral margin, and bearing lateral and perisiphonal bullate tubercles. On every interval between the tuberculate ribs, rise 4-5 single or bifurcate intercalatories, 1 or, rarely, 2 of them falling obliquely on the main adorally disposed rib.

The other specimens, generally smaller, present the inner whorls, displaying the same features as the holotype from the smallest diameter observed (almost 10 mm), except the rarer (six) constrictions and almost all the bifurcate intercalatories.

MATERIAL - 12 pyritised nuclei, recorded in the Svinita village area (E. AVRAM's coll., IG P-18670, 18671); three other specimens coming from the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18694; P. DUMITRICA's coll., IG P-18693, 18695) and one from the East Carpathian flysch (E. AVRAM's coll., IG P-11167).

MEASUREMENTS - Holotype

D	U	H	W	W/H
29.6	9.8 (0.33)	l2.4 (0.42)	14.2 (0.48)	1.14
22.6	7 (0.31)	9.8 (0.43)	11.2 (0.49)	1.14

REMARKS - *Holcodiscus tzankovi* includes a homogeneous group of specimens, very frequent in the Lower

Barremian deposits of Rumania, resembling both *Holcodiscus caillaudianus* (d'ORBIGNY) and *H.perezianus* (d'ORBIGNY): in fact, the largest part of the specimens assigned in literature to the d'ORBIGNY's above mentioned species are related to the species here described. It differs from both mentioned species by its subcircular whorl-section, rapid growth of the whorls, and by its ornamentation with strong lateral tubercles (even in youth).

OCCURRENCE - Lower Barremian in Rumania, Silezia, Bulgaria; Upper Barremian (!) in Bulgaria (under *Holcodiscus perezianus perezianus).*

Holcodiscus alpha TZANKOV

Pl. 3, fig. 13 a-b, 14 a-b, 15 a-b; pl. 7, fig. 12, 14.

1890 *Holcodiscus* cf. *Perezianus* d'ORBIGNY; TOULA , pl. I, fig. 3.
? 1907 *Holcodiscus Perezi* D'ORBIGNY; KARAKASCH, pl. IX, fig. 6-13 (6 = a different species, without tubercles on its ventral side; 7-8, 10-13 = *Holcodiscus* ex gr. *tzankovi;* 9 = indeterminable, poorly preserved specimen).
1923 *Holcodiscus Perezi* D'ORBIGNY; FALLOT & TERMIER (*partim*), p. 47, pl. IV, fig. 7-9, *non* fig. 10 (= *H. caillaudianus* (d'ORBIGNY)).
1935 *Holcodiscus perezianus* mut. *alpha* TZANKOV, p. 78, pl. IV, fig. 4-6 (holotype).
1935 *Holcodiscus perezianus* mut. *toulai* TZANKOV, p. 78, pl. V, fig. 2.
? 1935 *Holcodiscus angulatus* TZANKOV, p. 80, pl. VI, fig. 3, 4.
? 1955 *Holcodiscus gastaldi* D'ORBIGNY; ERISTAVI, p. 74, pl. III, fig. 3.
1966 *Holcodiscus perezianus* (D'ORBIGNY); BRESKOVSKI, p. 102, pl. VI, fig. 6.
1967 *Holcodiscus perezianus* (D'ORBIGNY); DIMITROVA, p. 156, pl. LXXIX, fig. 1 (only).
1967 *Holcodiscus perezianus alpha* TZANKOV; DIMITROVA, p. 157, pl. LXXIX, fig. 7 (type refigured).
1985 *Holcodiscus perezianus perezianus* (D'ORBIGNY); TZANKOV & BRESKOVSKI, p. 20, pl. V, fig. 10, 11.

SPECIFIC CHARACTERS - The species *Holcodiscus alpha* is characterised by its very depressed whorl-section (W/H = 1.5), by a relatively narrow umbilicus (u = 0.31) and high, very convex sides (h = 0.45), and the ornamentation displaying nine constrictions bounded by stronger than usual ribs, slightly projected on the venter, one of them (which is situated adapically) bearing lateral and ventro-lateral tubercles, and also 6 to 2 intercalatory ribs between two consecutive constrictions, bifurcating rarely.

MATERIAL - 12 specimens, very different in size (from the smallest size up to the diameter of almost 30 mm), preserved as pyritised nuclei; all recorded in the Svinita village area (E. AVRAM's coll.,IG P-18672).

REMARKS - *Holcodiscus alpha* displays the same whorl-section as *H. perezianus* mut. *toulai* TZANKOV (see the complete figuration of this "mutation" in TZANKOV & BRESKOVSKI, 1985) and *H. angulatus* TZANKOV, small differences in ornamentation of which are due to the very different size of the type specimens; consequently, all these "mutations" are to be included in a single taxon, the species "*alpha*" having the priority according to the Code (ICZN).

On the other hand *Holcodiscus alpha* reminds the more frequent species *H. tzankovi* n. sp. by its lateral ornamentation and especially by the large development of the lateral tubercles, although the whorl sections are very different.

The Rumanian specimens, with their strong main ribs, strong lateral (beginning from a diameter of 5 mm) and ventro-lateral tubercles (these starting at a diameter of almost 8 mm), and numerous intercalatories, are nearer to the "mutation" *toulai* TZANKOV than to the "mutation" *alpha.*They also remind *Holcodiscus sophonisba* (COQUAND in SAYN) at a comparable diameter, by the presence of the lateral and marginal tubercles and by the frequency of the bifurcate intercalatory ribs, but they are different because of the earlier appearance of the constrictions (from a diameter of 8 mm) and by a larger umbilicus even in youth.

MEASUREMENTS - (on a small pyritised specimen):

D	U	H	W	W/H
11.2	3.3 (0.30)	4.4 (0.39)	5.9 (0.52)	1.34

OCCURRENCE - Barremian in Bulgaria and in the Balearic Islands; Lower Barremian in Rumania.

Holcodiscus gastaldii KILIAN (*non* D'ORBIGNY)

Pl. 3, fig. 18 a-b, 19 a-b; pl. 4, fig. 10

1883 *Holcodiscus Caillaudianus* D'ORBIGNY; UHLIG, pl. XIX, fig. 8, 9.
non 1883 *Holcodiscus Gastaldinus* D'ORBIGNY; UHLIG, p. 245, pl. XIX, fig. 10 (= *Holcodiscus* sp. ex gr. *H. caillaudianus* (d'ORBIGNY)).
1888 *Holcodiscus Gastaldii* D'ORBIGNY; KILIAN, p. 671, pl. XIX, fig. 3 (holotype).
non 1891 *Holcodiscus gastaldii* D'ORBIGNY; SAYN, p. 53, pl. III, fig. 3 (= *Holcodiscus* sp. ex gr. *H. diversecostatus* (COQUAND)).
non 1898 *Holcodiscus Gastaldii* D'ORBIGNY; SIMIONESCU, p. 134, pl. VI, fig. 6 (= *Holcodiscus simionescui* n. sp.).
1907 *Holcodiscus Gastaldii* D'ORBIGNY; KARAKASCH, p. 106, pl. IX, fig. 17.
1935 *Holcodiscus gastaldianus* D'ORBIGNY; TZANKOV, p. 76, pl. IV, fig. 1-3.
non 1937 *Ammonites Gastaldianus* D'ORBIGNY; COTTREAU, p. 58, pl. VI, fig. 6 (= ? *Holcodiscus* n. sp.), fig. 27-29 (= *Spitidiscus gastaldianus* (D'ORBIGNY)).
non 1955 *Holcodiscus gastaldi* D'ORBIGNY; ERISTAVI, p. 74, pl. III, fig. 3 (= *Holcodiscus* sp. ex gr. *H. tzankovi* n. sp.).
non 1960 *Holcodiscus gastaldinus* ORBIGNY; DRUSHITCHITS, p. 304, pl. XLVI, fig. 3, 4 (= *Holcodiscus* n. sp. ex gr. *H. tzankovi).*
1984 *Holcodiscus* aff. *gastaldinus* UHLIG (*non* D'ORBIGNY); AVRAM & KUSKO, p. 18, pl. III, fig. 6.
? 1985 *Holcodiscus dimitrovae* TZANKOV & BRESKOVSKI, p. 40, pl. IX, fig. 10-11 and 12, 13 (only).
? 1985 *Holcodiscus monotuberculatus* TZANKOV & BRESKOVSKI, p. 44, pl. X, fig. 3-4.

SPECIFIC CHARACTERS - According to KILIAN (1888) who described in great detail the holotype, the species is characterised by the compressed, subquadrate whorl-

section, with flat venter and sides, covered by thin, flexuous, mostly bifurcated ribs, part of them (almost 10 on the last half-whorl), a little stronger than the other, bearing marginal tubercles; these tubercles join also the last secondary rib on the flanks, and the pair of ribs thus obteined crosses the venter marking a fair sinus forwards.

MATERIAL - Three specimens, two of them recorded in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18696; V. POPOVICI-HATZEG's coll., IG P-760), and one in the Baraolt Mts. (M. KUSKO & M. SAVU's coll., IG P-6465).

REMARKS - As BRESKOVSKI (1966) discussed, the late figuration (by COTTREAU, 1937) of the *Ammonites Gastaldianus* D'ORBIGNY type, which is a *Spitidiscus*, brought in question the name of *Holcodiscus Gastaldii* D'ORBIGNY in KILIAN (1888) and of *H. Gastaldinus* D'ORBIGNY in UHLIG (1883). According to the Code (XII, Homonimy, Article 57 c) the name *Holcodiscus gastaldii* is valid for the taxon thus defined by KILIAN (1888). I prefer now to use KILIAN's definition of this taxon, because *H. gastaldinus* figured by UHLIG (1883) is in fact a transitional example to the *Holcodiscus caillaudianus* group, by its well developed lateral bullae.

Holcodiscus dimitrovae TZANKOV & BRESKOVSKI (1985) is very near to the here discussed species, only the fewer constrictions (8 instead of 10) justifying its separation. *Holcodiscus monotuberculatus* TZANKOV & BRESKOVSKI seems also to be an accidental individual variation (lacking a row of perisiphonal tubercles) of *H. gastaldii* KILIAN.

The Rumanian individuals of the species, recorded in the Dâmbovicioara Couloir are almost identical to the holotype. But the one found in the Baraolt Mts. (here figured in the plate 4, fig.10) displays stronger and almost straight main ribs, being also related to *Holcodiscus caillaudianus* (D'ORBIGNY); its appartenance to the species under discussion is based on the complete lack of the lateral tubercles.

OCCURRENCE - Lower Barremian in France, Rumania, Bulgaria, Crimea.

Holcodiscus simionescui n. sp.
Pl. 3, fig. 17 a-c; pl. 7, fig. 8

v 1898 *Holcodiscus Gastaldii* D'ORBIGNY; SIMIONESCU, p. 134, pl. VI, fig. 6.

HOLOTYPUS - the (incomplete) specimen here figured in pl. 3, fig.17 (D. PATRULIUS & E.AVRAM's coll., IG P-18697).

DERIVATIO NOMINIS - in the memory of the Rumanian eminent paleontologist Professor I.SIMIONESCU.

LOCUS TYPICUS - Dâmbovicioara Formation, Muierii valley.

STRATUM TYPICUM - Lower Barremian, Dâmbovicioara Formation, Muierii valley Member.

DIAGNOSIS - *Holcodiscus* with dense, bifurcate ribs, sharpened at the point of bifurcation in youth; mature stage with main, bituberculate ribs and bifurcate intercalatories, too.

DESCRIPTION - Even incomplete, the holotype presents some very peculiar features which define a new species: the end of the last-but-one whorl is almost identical with the specimen figured by SIMIONESCU's (1898) by lacking true constrictions and by the dense and bifurcate ribbing, somewhere rising in small crests at the point of bifurcation; its whorl section is subtrapezoidal, and the venter is crossed by thin, equal ribs, part of them bearing small, bullate tubercles, as in *Holcodiscus gastaldii* KILIAN (*non* D'ORBIGNY). In the mature stage, dense constrictions bordered adapically by strong, flexuous ribs bearing lateral bullae (and also ventro-lateral ones ?), and 2 or 3 flexuous, generally bifurcate intercalatories are observed on the side, all these features resembling the specimen figured as *Holcodiscus Gastaldinus* d'ORBIGNY by UHLIG (1883) in his pl. XIX, fig. 10 a.

The other specimens are smaller, displaying the thin, regularly bifurcate ribbing, and lacking the constrictions of the young stage of the species SIMIONESCU's (1898) specimen also presents dense ventro-lateral pairs of tubercles, poorely preserved and unfigured by the author.

MATERIAL - Beside the holotype, SIMIONESCU's specimen (IU, no.Crb D 99) and another, recorded also in Dâmboviciara by PATRULIUS & AVRAM (IG P-18698).

OCCURRENCE - All the specimens studied come from the Lower Barremian rock-sequence.

Holcodiscus geronimae (HERMITE)
Pl. 4, fig. 14

1891 *Holcodiscus Geronimae* HERMITE; SAYN, p. 56, pl. III, fig. 4.

1923 *Holcodiscus Geronimae* HERMITE; FALLOT & TERMIER, p. 51, pl. V, fig. 3, 7-14.

1976 *Holcodiscus* cf. *geronimae* (HERMITE); AVRAM, (1976 a), p. 48, pl. IV, fig. 14.

MATERIAL - Only a specimen (E. AVRAM's coll., IG P-11168), recorded in the East Carpathian flysch deposits, on the Târlung valley (= *Holcodiscus* cf. *geronimae* (HERMITE)).

REMARKS - No indication about the original figure and description I had. Consequently, I reported the specimen under discussion to HERMITE's species on the ground of SAYN's and FALLOT & TERMIER's figurations and descriptions: small species, characterised by wide,

depressed, subhexagonal in section and rapidly growing whorls, small and deep umbilicus and ornamentation composed of 15-17 tuberculate ribs on a whorl, stronger between the umbilical margin and the lateral, strong, tubercles,and fasciculate by 3 or 4 of these tubercles towards the ventral part; well developed marginal tubercles also appear, irregularly disposed on two secondary ribs, without any relation with the lateral ones; intercalatory ribs are very rare or lack.

The Rumanian specimen is larger than SAYN's and FALLOT & TERMIER's ones and crushed, differing from these by its flexuous ribs, part of them (almost 12 on the last whorl) bearing lateral tubercles and bifurcating on the outer half of the side; marginal tubercles are irregularly disposed on both a secondary and an intercalatory ribs. With these features it stands between the typical *Holcodiscus geronimae* and the wider umbilicate *H. geronimaeformis* TZANKOV.

OCCURRENCE - Barremian in Algeria and Neocomian (!) in the Balearic Islands; Lower Barremian in Rumania.

Holcodiscus geronimaeformis TZANKOV
Pl. 4, fig. 13

1935 *Holcodiscus geronimaeformis* TZANKOV, p. 79, pl. V, fig. 8-10 (lectotype established by BRESKOVSKI, 1966), pl. VI, fig. 1-2.
1937 *Ammonites Perezianus* D'ORBIGNY; COTTREAU, pl. LXXVII, fig. 22, 23 (only).
1966 *Holcodiscus geronimaeformis* TZANKOV; BRESKOVSKI, p. 106, pl. X, fig. 6.
1967 *Holcodiscus geronimaeformis* TZANKOV; DIMITROVA, p. 157, pl. LXXIX, fig. 9, 10.
1985 *Holcodiscus geronimaeformis* TZANKOV; TZANKOV & BRESKOVSKI, p. 26, pl. VII, fig. 10, 11 (type refigured), pl. VIII, fig. 1, 2.

SPECIFIC CHARACTERS - According to the revised description by TZANKOV & BRESKOVSKI (1985) the species is small, with medium-sized umbilicus, and involution of about 1/3 ; its ornamentation consists of 12 prorsiradiate constrictions on a whorl, each of them bounded by 2 strong ribs: the adapically disposed rib bears a lateral and a larger marginal tubercle, between which it bifurcates or, in places, trifurcates. The marginal tubercles are also irregularly joined over the siphuncle by 1-3 secondary ribs. Almost 3 intercalatory ribs between the tuberculate ones are also present. MATERIAL - A fragmentary specimen, recorded in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., unregistered).

REMARKS - Even fragmentary, the individual from Dâmbovicioara displays the wide umbilicus and the characteristic ornamentation of TZANKOV's species, favouring a sure identification.

OCCURRENCE - Lower Barremian in Bulgaria; the same age in Rumania.

Holcodiscus decorus n. sp.
Pl. 4, fig. 2 a-d, 3, 4; pl. 6, fig. 3; pl. 7, fig. 6, 15.

HOLOTYPUS - The pyritised nucleus figured in pl. 4, fig. 2, pl. 6. fig. 3, pl. 7, fig. 6, 15 (IG P-18673).

DERIVATIO NOMINIS - Its nice, decorative ornamentation.

LOCUS TYPICUS - Svinita, Banat (SW Rumania).

STRATUM TYPICUM - Lower part of the Svinita Formation, Temeneacia Member; Lower Barremian.

DIAGNOSIS - Very ornamented *Holcodiscus*, with subcircular whorl section, 10 constrictions on a whorl, strougly bituberculate main ribs, 1 to 3 secondary ribs starting from the lateral tubercles and also 1-2 bifurcate intercalatories, one of their secondaries bearing a supplementary marginal tubercle on every interval between the constrictions.

DESCRIPTION - The holotype is a nucleus preserving a whorl and a quarter, at a diameter of 20 mm. It displays an almost circular (slightly depressed) whorl-section, with gentle convex sides and flat venter, growing quite rapidly and covering one another on almost 1/2. Its ornamentation consists of 10 constrictions bordered by sharp ribs, from which that situated adorally is stronger near the umbilicus and that disposed adapically rises just below the middle of the sides, is progressively stronger towards the venter and bears strong and high lateral marginal bullate tubercles. 1 to 3 thinner secondary ribs start from the lateral tubercle or above it, and crosses the venter without any diminution. Usually 1 (rarely 2) intercalatory rib appears between constrictions and generally bifurcates in the middle of the flanks, one of the secondaries bearing also a strong marginal tubercle, at mid-distance between the main ribs; in places, these intercalatories rise in a tubercle at the point of bifurcation too.

Because of the supplementary tuberculation, the pairs outer tubercles are almost 18 on a whorl.

The body chamber of the largest specimen (pl. 4, fig. 4) is preserved on almost half a whorl, beginning at a diameter of 25 mm. The number of the main ribs varies between 6 and 11 (denser in youth) and the number of the marginal tubercles could be up to 19 on a whorl. As an exception, two other tubercles could be observed on the ribs between the main ones.

MATERIAL - 18 pyritised nuclei, partly crushed or fragmentary; 1 specimen preserved as an impresion in marls. All of them recorded in the same bed, at the water reservoir of the Svinita village (E. AVRAM's coll., IG P-18673,18674).

MEASUREMENTS

Specimen	D	U	H	W	W/H
Pl. 4, fig. 4	37.2	11 (0.30)	6 (0.43)	-	-
Holotype	18.4	5.7 (0.31)	7.5 (0.41)	8.1 (0.44)	1.08
Pl. 4, fig. 3	16	4.6 (0.29)	6.2 (0.39)	7.2 (0.45)	1.16

REMARKS - The peculiar development of the ribs bounding the constrictions (including also their large tubercles) makes the species here described comparable to *Holcodiscus geronimaeformis* TZANKOV; but it is different by the supplementary marginal tubercles and lack of the secondary ribs between the marginal tubercles in the ventral area. The stronger and irregularly disposed ribbing, and also the supplementary marginal tubercles separate *Holcodiscus decorus* from *H. razgradi* TZANKOV, too. The presence of the intercalatory ribs makes it different from *H. acutituberculatus* BRESKOVSKI. Finally, the presence of the supplementary marginal tubercles makes it comparable to *H. irregularis* TZANKOV.

On the other hand, 14 other pyritised specimens, recorded in the same site and interval as *H. decorus* (presented in the present paper as *H.* aff. *decorus* in pl. 4, fig. 1, 5-7, pl. 6, fig. 4, pl. 7, fig. 16) are different from the type by having regularly 2 (rarely 1) bifurcate or single intercalatories on each interspace between the main, tuberculate ribs, one of them bearing also a marginal tubercle, up to the diameter of almost 18 mm. So, some 14-15 marginal pairs of tubercles (only 1 or 2 supported by intercalatories) can be counted. The body chamber begins at a diameter of 30-31 mm and is longer than half a whorl.

This second group is nearer to *Holcodiscus razgradi* TZANKOV than the typical specimens, but it differs because of the supplementary tuberculation inthe young stage.

OCCURRENCE - Lower Barremian.

Holcodiscus irregularis TZANKOV
Pl. 4, fig. 11.

1935 *Holcodiscus irregularis* TZANKOV; p. 92, pl. III, fig. 3-5 (holotype).

1966 *Holcodiscus irregularis* TZANKOV; DIMITROVA, p. 155, pl. LXXIX, fig. 3,4.

1984 *Holcodiscus irregularis* TZANKOV; AVRAM & KUSKO, p. 18, pl. III, fig. 5.

1985 *Holcodiscus irregularis* TZANKOV; TZANKOV & BRESKOVSKI, p. 23, pl. VII, fig. 1-3.

SPECIFIC CHARACTERS - Medium-sized, with relatively small umbilicus and subtrapezoidal-oval, slightly compressed whorl-section; flexuous constrictions on the last whorl, adapically bordered by a main rib, progressively stronger towards the venter, bearing lateral bullae and sharp marginal tubercles; the bullae and the tubercles are also related each other by a secondary rib, making "clasps" on the outer half of the sides and on the venter; the intercalatory ribs are thinner, single or bifurcate, in mature stage one of them bearing a marginal tubercle, too, at mid-distance between the main ribs.

MATERIAL - A single specimen, compressed, recorded in the Baraolt Mts. (M. KUSKO & M. SAVU's coll., IG P-6475).

REMARKS - The Rumanian specimen is identical by the lateral ornamentation with the holotype, at an equal diameter.

OCCURRENCE - Lower Barremian in Bulgaria; the same age in Rumania.

Holcodiscus ouachensis n. sp.
Pl. 4, fig. 8, 9 a-c; pl. 6, fig. 5; pl. 7. fig. 7, 17.

1891 *Holcodiscus Gastaldii* D'ORBIGNY; SAYN, p. 53, pl. III, fig. 3.

HOLOTYPUS - The specimen figured in pl. 4, fig. 9, pl. 6, fig. 5, pl. 7, fig. 7.

DERIVATIO NOMINIS - From Djebel Ouach, the site where the first individual of the species was gathered.

LOCUS TYPICUS - Svinita, Banat (SW Rumania).

STRATUM TYPICUS - Svinita Formation, lower part of the Temeneacia Member; Lower Barremian.

DIAGNOSIS - *Holcodiscus* with almost isometric whorl section, dense main ribs bearing marginal and, in places, minute lateral tubercles, and also very few intercalatories.

DESCRIPTION - The holotype is a nucleus almost identical with the specimen figured by SAYN (1891) as *Holcodiscus gastaldii*. It displays almost isometric whorl-section, a deep, medium-sized umbilicus, and thin straight, single or bifurcate ribs bearing perisiphonal tubercles, and, in places, minute lateral ones, situated above the middle of the sides and supported by some of the ribs bearing marginal tubercles, too. The immature ornamentation, at the beginning of the last whorl, resembles *Holcodiscus diversecostatus* (COQUAND in NICKLÈS 1890) (= *H. nicklesi* KARAKASCH) by its fine, dense ribs, single or bifurcate on the sides and joined by two at the marginal tubercles.

The paratype (IG P-18677), larger in size but poorer preserved, shows numerous shallow constrictions, bordered adorally by a single rib, which rises above the umbilical margin, becomes stronger on the upper part of the sides and normal on the ventral area. In places, one intercalatory rib, bearing a marginal tubercle, is observed beside some shorter ones (1 or 2), which regularly start behind the tuberculate ribs, but are not clearly branched from.

MATERIAL - 2 pyritised nuclei, collected in the same bed, in the Svinita village area (E. AVRAM's coll., IG P-18676, 18677).

REMARKS - *Holcodiscus ouachensis* is partly comparable to *H. decorus* n. sp., but this species is more strongly tuberculate and displays rarer perisiphonal tubercles because of more numerous nontuberculate intercalatories.

OCCURRENCE - Lower Barremian in Rumania and in Algeria.

Holcodiscus nodosus KARAKASCH
Pl. 4, fig. 17, 18.

1907 *Holcodiscus nodosus* KARAKASCH, p. 120, pl. X, fig. 1, 2 (lectotype here established), 4.

1984 *Holcodiscus* aff. *nodosus* KARAKASCH; AVRAM & KUSKO, p. 19, pl. III, fig. 7.

SPECIFIC CHARACTERS - Small *Holcodiscus,* characterised (after KARAKASCH, 1907) by its isometric whorls, deep umbilicus, large development of the perisiphonal tubercles of the main ribs, these tubercles gathering 1 or 2 or, in places, 3 thin ribs, which then cross the venter; the main ribs rise from the umbilical margin and, between them occur 1-2 shorter intercalatories, part of them crossing the siphonal area, the other ending in the perisiphonal tubercles. No mention about the lateral tubercles in KARAKASCH's diagnosis is given, although they are clearly seen on the paralectotypes in KARAKASCH's figures 1 and 4.

MATERIAL - 9 specimens coming from the Svinita village area (7 of them - E. AVRAM's coll., IG P-18679) and from the Baraolt Mts.(2 specimens, KUSKO's coll., IG P-17124).

MEASUREMENTS - Specimen figured in pl. 4, fig. 18.

D	U	H	W
7.5	2.2 (0. 29)	3.2 (0.40)	3.7 (0.48)

REMARKS - The Rumanian specimens identified as *Holcodiscus* aff. *nodosus* are all very small, with largely developed perisiphonal tubercles, but in places with small lateral ones up to the diameter of almost 7-8 mm. The phragmocone ends in gerontic specimens at a diameter of 9.2-9.5 mm. Besides, the specimens recorded in the Baraolt Mts. display thinner and more flexuous ribbing on the sides than in the lectotype.

OCCURRENCE - Lower Barremian in Crimea; the same age in Rumania.

Holcodiscus diversecostatus (COQUAND)
Pl. 4, fig. 22.

1880 *Ammonites diverse-costatus* COQUAND; p. 19.

1886 *Ammonites diverse-costatus* COQUAND; HEINZ, pl. I (holotype).

1890 *Holcodiscus diverse-costatus* COQUAND; NICKLÈS, (*partim*) p. 26, pl. I (VIII), fig. 20; *non* pl. I, fig. 21-24, pl. II, fig. 14-19, pl. IV, fig. 1 (=*H. nicklesi* KARAKASCH).

1891 *Holcodiscus diverse-costatus* COQUAND; SAYN, p. 53, pl. III, fig. 1, 2.

1907 *Holcodiscus diverse-costatus* COQUAND; KARAKASCH, p. 118, pl. IX, fig. 15, 16.

1923 *Holcodiscus diverse-costatus* COQUAND *non* NICKLES; FALLOT & TERMIER, p. 52.

non 1935 *Holcodiscus diversecostatus* COQUAND; TZANKOV, p. 82, pl. VI, fig. 8, 9 (= *H. nicklesi* KARAKASCH).

? 1960 *Holcodiscus diverse-costatus* COQUAND; DRUSHTCHITS, p. 305, pl. XLVI, fig. 8.

? 1967 *Holcodiscus diversecostatus* COQUAND; DIMITROVA, p. 158, pl. LXXVIII, fig. 6.

1985 *Holcodiscus diversecostatus diversecostatus* (COQUAND); TZANKOV & BRESKOVSKI, p. 34, pl. VIII, fig. 23, 24.

SPECIFIC CHARACTERS - Small species, with flat whorl-sides and narrow, flat ventrum, and with narrow umbilical area; shell covered by dense, thin, flexuous ribs, bifurcate or with shorter inter-calatories on the outer half of the sides; two or three ribs are sometimes buckled in small and sharp marginal tubercles, the other (1 or 2 on each interval) crossing the venter without any interruption; the marginal tubercles are united over the venter by 1 or 2 ribs, not always symetrically.

MATERIAL - 10 specimens, 8 of them recorded in the Dâmbovicioara Couloir, and 2 - in the Svinita village area (D. PATRULIUS & E. AVRAM's coll., IG P-18700, and E. AVRAM's coll., IG P-18681, respectively). They are very different in size, the former preserved in marls, and the latter - as pyritised nuclei.

REMARKS - The above described ornamentation is obvious on all specimens studied, from a diameter of almost 6 mm up to (the largest diameter of) 30 mm; at a diameter smaller than 6 mm, which is seen only on some of the pyritised nuclei, the ribs start as bunches of 2 from minute periumbilical tubercles.

As for the specimens figured in the literature as *Holcodiscus diversecostatus,* such as those figured by TZANKOV and by DIMITROVA, they seem to be transitional to *H. nicklesi* by their ribs which are stronger, rarer and buckled in a different kind to the marginal tubercles than in typical examples.

OCCURRENCE - *Holcodiscus diversecostatus* was recorded in the Barremian, in France and Balearic Islands, and also in the Lower Barremian in Rumania, Bulgaria and Crimea.

Holcodiscus ziczac KARAKASCH
Pl. 4, fig. 19 a-b, 20 a-b, 21.

1890 *Holcodiscus ziczac* KARAKASCH; p. 436, pl. 1, fig. 8 (holotype), 10.

1907 *Holcodiscus ziczac* KARAKASCH; KARAKASCH, p. 118, pl. I, fig. 3, 5, 14.

v ? 1960 *Holcodiscus ziczac* KARAKASCH; DRUSHTCHITS, p. 305, pl. XLVI, fig. 5, 6.

1966 *Holcodiscus ziczac* (KARAKASCH); BRESKOVSKI, p. 105, pl. X, fig. 5.

1967 *Holcodiscus ziczac* (KARAKASCH); DIMITROVA, p.160, pl. LXXVIII, fig. 10.

1985 *Holcodiscus ziczac* (KARAKASCH); TZANKOV & BRESKOVSKI, p. 32, pl. VIII, fig. 15,16

SPECIFIC CHARACTERS - According to KARAKASCH (1890, 1907) the species is small (maximum 18 mm in diameter), with flat whorl sides and venter, and relatively narrow umbilicus; sides covered by fine, flexuous ribs, in places progressively stronger towards the ventral margin, where 2 or 3 of them are buckled in sharp marginal tubercles. Besides, rare intercalatory ribs cross independently the ventral area. The perisiphonal tubercles, usually disposed asymetrically from one side to another, are joined over the siphonal area by ribs drawing a "zigzagged" ornamentation.

MATERIAL - 7 small, pyritised, flattened specimens, coming from the same beds as almost all the Lower Barremian holcodiscid species in the Svinita area (E. AVRAM's coll., IG P-18680) and one (D. PATRULIUS & E. AVRAM's coll., unregistered) from the Dâmbovicioara Couloir.

REMARKS - Only two of the Rumanian specimens show the alternate ventrolateral tubercles. But all of them are almost identical with the holotype by the lateral ornamentation, although the ribs are denser in some specimens, as in *Holcodiscus nicklesi* KARAKASCH.

OCCURRENCE - Barremian in Crimea; Lower Barremian in Bulgaria and Rumania.

Holcodiscus cadoceroides (KARAKASCH)
Pl. 4, fig. 23 a, 23 b.

1907 *Astieria cadoceroides* KARAKASCH; p. 127, pl. X, fig. 20 (holotype).
1935 *Holcodiscus (Astieridiscus) cadoceroides* KARAKASCH; TZANKOV, p. 82.

SPECIFIC CHARACTERS - According to KARAKASCH (1907) *Holcodiscus cadoceroides* is small, coronate, with medium-sized umbilicus. The lower part of the whorl-sides is covered by thin, short, prorsiradiate ribs, thickening on the lateral edge in small tubercles. Almost all these ribs are bifurcate on the outer half of the sides (in places, even trifurcate). From the beginning of the body chamber, the shell is covered by parabolic ribs supporting on the ventral side 2 tubercles, very near one another.

MATERIAL - A single, very crushed specimen, recorded in the Svinita area (E. AVRAM's coll., IG P-18682).

REMARKS - Even very deformed, the Rumanian specimen (here identified as *Holcodiscus* aff. *cadoceroides)* displays an "*Astieria*" type of ornamentation up to the diameter of some 15 mm, with bunches of 2 or 3 secondary ribs on the outer part of the whorl-sides and on the venter. But 3 strong ribs, tuberculate at the lateral edge and perisiphonal, are observed on the mature quarter of the last whorl, instead of only one marginal tubercle, at the larger diameter, of the holotype. These strong ribs border adapically shallow constrictions and are separated one another by some 3-4 intercalatories. The body chamber is observed on 2/3 of the last whorl.

OCCURRENCE - Barremian in Crimea and Bulgaria; Lower Barremian in Rumania.

Holcodiscus sp.ind.
Pl. 4, fig. 15, 16 a-b; pl. 7, fig. 9, 10.

DESCRIPTION - Small specimens, with medium wide umbilicus and almost isometrical whorl section. The innermost whorls rather smooth, then with rare lateral, round tubercles; from a diameter of 5 mm, appear 2-3 thin, bifurcate ribs between the tuberculate ones, wich are also bifurcate or trifurcate, their secondaries situated adapically bearing progressively stronger marginal tubercles, too. At a diameter of almost 8 mm, the marginal tubercles are denser and join together the secondary ribs pertaining to the bifurcate intercalatories disposed in front of and behind them, thus resulting a zigzagged ornamentation on the sides; the marginal tubercles are joined over the venter by a double rib, in places interrupted along the siphuncle. At a larger diameter (seen on the crushed, larger specimen figured), the lateral and marginal tubercles (both bullate) rise on different ribs developed independently one another; some of these ribs are well developed and stronger on the sides and the other, stronger on the venter, are short and fall on the sides behind the former. On the body chamber (the fourth unfigured specimen) appear rare constrictions, bordered by equal ribs, from which that disposed adorally is bifurcated, one of its secondaries bearing a sharp, bullate, marginal tubercle; between the constrictions, the ribs bearing both latero-external and marginal tubercles rise higher on the sides and join near the ventral margin the intercalatory rib situated foreward; there are also single or bifurcate intercalatory ribs, in places united in a marginal tubercle, too.

MATERIAL - 4 pyritised nuclei; 2 of them are very small, while the others are crushed and present the adult stages, including a part of the body chamber (E. AVRAM's coll., IG P-18683).

REMARKS - The nuclei here described are considered to belong to a new species, apart from all the strongly tuberculate and strongly ribbed holcodiscids by the irregular ornamentation on the sides - with ribs long and short, zigzagged or only joined together in the latero-external tubercles. This new species is here only signaled, because of the unsatisfactory preservation of the specimens studied which prevents an accurate definition.

OCCURRENCE - Lower Barremian.

GENUS ***Spitidiscus*** KILIAN, 1910

TYPE SPECIES: *Ammonites rotula* SOWERBY, 1827.

The genus *Spitidiscus* is mainly represented in Rumania in the Brasov-Dâmbovicioara areas, in the East

Carpathian flysch deposits (Baraolt Mts.), and in the Svinita region, where 11 species have been identified.

Spitidiscus rotula (SOWERBY)
Pl. 5, fig. 1, 2, 3 a-b

1892 *Holcostephanus* (*Holcodiscus*) *rotula* SOWERBY; PAVLOW & LAMPLUGH (*partim*) p. 131, pl. V (XVII), fig. 13, *non* fig. 11-12 (= *Spitidiscus pavlowi* (KARAKASCH)).

1907 *Holcodiscus rotula* SOWERBY; KARAKASCH, p. 116, pl. IX, fig. 27.

1912 *Spitidiscus* (*Holcodiscus*) *rotula* var. *inflata* KILIAN, p. 2, pl. I, fig. 2.

1957 *Holcodiscus* aff. *rotula* SOWERBY; BUSNARDO & DAVID, p. 98, pl. 2, fig. 2.

1972 *Spitidiscus rotula inflatus* KILIAN; THIEULOY, p. 32, pl. 2, fig. 4-5, pl. 3, fig. 2-3, pl. 4, fig. 2.

? 1976 *Spitidiscus* cf. *rotula* (SOWERBY); MANDOV, p. 86, pl. XX, fig. 3.

1981 *Spitidiscus* cf. *rotula* (SOWERBY); KEMPER, RAWSON & THIEULOY, pl. 34, fig. 7, 8.

1981 *Spitidiscus rotula* (SOWERBY); KEMPER, RAWSON & THIEULOY., p. 304, pl. 34, fig. 11-15 (11-13 = type refigured).

1984 *Spitidiscus rotula* (SOWERBY); TZANKOV & BRESKOVSKI, p. 7, pl. I, fig. 4-6.

1988 *Spitidiscus rotula* SOWERBY); WILKE, pl. II, fig. 19.

SPECIFIC CHARACTERS - Because of the incomplete and partly deformed specimens studied, the species is here accepted in a larger sense, to include also the subspecies *Spitidiscus rotula inflatus* KILIAN. It is characterised by a discoidal shell, with almost isometric, trapezoidal whorls (W/H= 1.11-1.23), narrow and deep umbilicus, displaying 5-7 constrictions; these are typically prorsiradiate and straight on the sides and strongly projected on the venter, where the ribs bounding them adapically strengthen in a calosity. Thin and dense intermediary ribs, in places bifurcate on the sides and/or near the ventral margin, part of them falling oblique on the constriction disposed adorally, are also observed.

MATERIAL - Four specimens, more or less fragmentary: three of them have been collected in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18704, 18705) and one in the Svinita area (E. AVRAM's coll., unregistered).

REMARKS - Except the representatives of *Spitidiscus rotula inflatus*, there are two types to which the paleontological material in the literature was reported: the holotype and PAVLOW's (1892) type, the latter with rather arched on the sides and more calibrate constrictions. The Rumanian specimens, much larger than the holotype (thus identified with caution), are more comparable to the former by the shape and the number of their constrictions, narrow umbilicus, etc.

MEASUREMENTS - Specimen figured in pl. 5, fig. 2

D	U	H	W
57.5	10 (0.17)	26.5 (0.43)	25.5 (0.47)

OCCURRENCE - Lower Hauterivian in England, France, Germany, Bulgaria, Crimea, N Africa. In Rumania, this species was recorded in the Lower Hauterivian too, assembled with *Lyticoceras* spp.

Spitidiscus ? meneghinii (DE ZIGNO in RODIGHIERO)
Pl. 1, fig. 5 a-b, 6; pl. 2, fig. 1.

1919 *Polyptychites Meneghinii* DE ZIGNO; RODIGHIERO (*partim*), p. 94, pl. X (III), fig. 7 (lectotype established by DIMITROVA, 1967), *non* fig.4 (=*Jeanthieuloyites nodosus* (MANDOV)).

non 1967 *Spitidiscus meneghinii* (ZIGNO in RODIGHIERO); DIMITROVA, p. 150, pl.LXXVII, fig.5 (= *Spitidiscus cancovi* VASICEK).

? 1976 *Spitidiscus meneghinii* (ZIGNO(RODIGHIERO)); MANDOV, p. 85, pl. XXII, fig. 2 (?= *Jeanthieuloyites nodosus* (MANDOV)).

non 1985 *Spitidiscus meneghinii* (ZIGNO in RODIGHIERO); TZANKOV & BRESKOVSKI, p. 9, pl. II, fig. 2 (= *Spitidiscus cancovi* VASICEK).

SPECIFIC CHARACTERS - Large species with small umbilicus (u= 0.22-023), high and flat whorl-sides (h=0.45-0.46) and rounded venter, the whorls covering one another 2/3 of their height; ornamentation composed of almost 6 prorsiradiate, deep constrictions on every whorl, straight on the sides and slightly projected on the venter, bounded by two ribs from which that disposed adorally is simple, stronger on the lower part of the sides, and the opposite one is stronger only on the ventral area. Some 5, gentle flexuous, intercalatory ribs on each interval between constrictions start single or in bunches of 2 from the umbilical margin, and almost all bifurcate in the middle of the sides. When bifurcate at the umbilical margin they rise in a node at the point of bifurcation (also observed by RODIGHIERO). There are also at least three single or bifurcate ribs which fall oblique on the rib bounding adapically the constrictions.

MATERIAL - Seven specimens, all coming from the Dâmbovicioara Couloir (4 of them - D. PATRULIUS & E. AVRAM's coll., IG P-17004, 18707; 3 others - T. NEAGU's coll., BU - 0079 A).

REMARKS - The presence of umbilical nodes in the holotype of *Spitidiscus ? meneghinii* could be accidental, and not usual as in *Jeanthieuloyites nodosus* (MANDOV); besides, coarser ribbed and larger umbilicate MANDOV's species could not be confused with the species here in discussion. On the other hand, both species are very close (TZANKOV & BRESKOVSKI, 1985, even considered them a single species) because of their periumbilical tubercles, a character rather of *Jeanthieuloyites* than of *Spitidiscus*. *S. ? meneghinii* is generally represented in Rumania by typical specimens, very comparable to the lectotype by ornamentation, including also the presence of the periumbilical tubercles, and by the dimensional characters.

MEASUREMENTS - Specimen figured in pl. 1, fig. 5

D	U	H	W
101	24.5 (0.24)	45 (0.45)	-

OCCURRENCE - Hauterivian in Italy; Lower Hauterivian in Bulgaria, Slovakia. In Rumania almost all the specimens here discussed come from the Lower Hauterivian, in assemblage with *Leopoldia leopoldina*. Only one deformed specimen (figured in pl. 2, fig. 1) was collected from the beds with *Pseudothurmannia*, in the late Hauterivian.

Spitidiscus cankovi VASICEK

Pl. 2, fig. 4 a-b.

1935 *Holcodiscus (Spitidiscus) van-de-heckei* D'ORBIGNY; TZANKOV, p. 71, pl. 2, fig. 1.

1967 *Spitidiscus meneghinii* (ZIGNO in RODIGHIERO); DIMITROVA, p. 150, pl. LXXVII, fig. 5

1986 *Spitidiscus cankovi* VASICEK, p. 474, pl. VI, fig. 1 (holotype).

1985 *Spitidiscus meneghinii* (ZIGNO in RODIGHIERO); TZANKOV & BRESKOVSKI, p. 9, pl. II, fig. 1, 2.

SPECIFIC CHARACTERS - As described by VASICEK (1986), *Spitidiscus cankovi* is characterised by a semiinvolute shell, with 7 deep, straight, projected constrictions per whorl, bordered by ribs thicker than the others; except the rib bounding adapically the constrictions, which is always simple, all the other bifurcate or trifurcate on the sides, so that there are almost 5 ribs at the umbilical margin and 10-12 on the periphery; the general shape of the ornamentation reminds *Spitidiscus? meneghinii* (DE ZIGNO in RODIGHIERO) except the presence of the periumbilical nodes in the latter species.

MATERIAL - One specimen, found in the Dâmbovicioara Couloir (T. NEAGU's coll., BU - 0079 B).

REMARKS - The Rumanian specimen is apart from the *Spitidiscus cankovi* type, by a narrower umbilicus and some higher whorl-sides. Thus, it is better related to the Bulgarian individual figured by TZANKOV (1935), DIMITROVA (1967) and TZANKOV & BRESKOVSKI (1985), and considered by VASICEK as pertaining to his new species.

MEASUREMENTS

Specimen	D	U	H	W
Holotype	82	21 (0.25)	35 (0.43)	-
Pl. 2, fig. 4, right side	97	8.3 (0.188)	43.3 (0.44)	28 (0.28)
left side	-	18.7 (0.19)	47 (0.48)	-

OCCURRENCE - Lower Hauterivian in Slovak Republic and in Bulgaria; in the Valanginian-Hauterivian boundary beds, in Rumania.

Spitidiscus intermedius (D'ORBIGNY)

Pl. 5, fig. 7, 8.

1840-1841 *Ammonites intermedius* D'ORBIGNY, p. 128, pl. 38, fig. 5-6 (holotype).

non 1890 *Holcostephanus intermedius* D'ORBIGNY; NICKLÈS, p. 24, pl. II, fig. 12-13, pl. IV, fig. 2 (=*Spitidiscus querolensis* BUSNARDO & DAVID).

1901 *Holcodiscus intermedius* D'ORBIGNY; SARASIN & SCHÖNDELMAYER, p. 43, pl. IV, fig. 4-5

1919 *Holcodiscus (Spitidiscus) intermedius* D'ORBIGNY; RODIGHIERO, p. 99, pl. X, fig. 5.

1923 *Spitidiscus intermedius* D'ORBIGNY; FALLOT & TERMIER, p. 59.

non 1935 *Holcodiscus (Spitidiscus) intermedius* D'ORBIGNY; TZANKOV, p. 68, pl. I, fig. 1-4 (=*Spitidiscus rotula inflatus* KILIAN ?).

1966 *Spitidiscus douvillei* (NICKLÈS); BRESKOVSKI, p. 100, pl. X, fig. 1.

? 1967 *Spitidiscus douvillei* (NICKLÈS); DIMITROVA, p. 152, pl. LXXVIII, fig. 16.

? 1985 *Spitidiscus intermedius* (D'ORBIGNY); TZANKOV & BRESKOVSKI, p. 10, pl. III, fig. 2-7.

SPECIFIC CHARACTERS - Small, compressed, with medium-sized umbilicus, involution of almost 1/2, and high-oval whorl section. Six deep, arcuate and prorsiradiate constrictions are seen on the last whorl, with some 13, partly bifurcate, thin ribs inbetween.

MATERIAL - Two deformed specimens, all recorded in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18713), here identified as *Spitidiscus* cf. *intermedius*.

REMARKS - No specification about any stronger ribs accompanying the constrictions is given by d'ORBIGNY, although they are seen even on the holotype. These stronger ribs are also present on the deformed (crushed) specimens studied, which display a relatively wide (and crenulated) umbilicus, beside 6 constrictions, arcuate forward in a symmetrically deformed specimen, but bordered adorally by a main stronger rib, on the outer half of the sides. There are also typically thin, in places bifurcate ribs in the interspace between the constrictions. It is also to be emphasized the relationship between the here described specimen and those identified as *Spitidiscus* cf. *darderi* FALLOT & TERMIER, in spite of their different shape of the main ribs and the wider umbilicus.

OCCURRENCE - Neocomian in France, Hauterivian in Italy, Barremian in the Baleares; from the Lower Hauterivian (Radiatus Zone) up to the Lower Barremian in Bulgaria. The Rumanian examples are recorded in the Lower Hauterivian, in assemblage with *Lyticoceras* spp.

Spitidiscus darderi FALLOT & TERMIER

Pl. 5, fig. 9.

1923 *Spitidiscus Darderi* FALLOT & TERMIER, p. 62, pl. IV, fig. 3 (holotype).

1985 *Spitidiscus darderi darderi* (FALLOT & TERMIER); TZANKOV & BRESKOVSKI, p. 5, pl. I, fig. 2.

SPECIFIC CHARACTERS - Small and compressed, with rather narrow, crenulated umbilicus, involution of almost 3/4 and high, subtrapezoidal whorl-section. Whorls di-

splaying 6 to 8 flexuous constrictions, cut longitudinally by the main ribs, and with fasciculate intercalatories in between.

MATERIAL - Two crushed specimens, both recorded in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18714) and identified here as *Spitidiscus* cf. *darderi*.

REMARKS - The Rumanian specimens bear narrow umbilicus (with crenulated umbilicus) and display 7 to 8 flexuous main ribs bordered (adorally and adapically) by shallow, also flexuous constrictions. On each interval between the main ribs, there are almost 7-8 flexuous, thin intercalatories, whose largest part bifurcate or trifurcate on the sides.

Although it is very close to *Spitidiscus fasciger* THIEULOY, *S. darderi* differs by its smaller number of main ribs and by their presence in the middle of larger constrictions.

OCCURRENCE - Hauterivian in the Balearic Islands and in Bulgaria, *Spitidiscus darderi* was recognised in Rumania in the Lower Hauterivian (with *Lyticoceras* spp.).

Spitidiscus hugii (OOSTER)
Pl. 5, fig. 14 a-b, 15; pl. 6, fig. 11; pl. 7, fig. 18.

1860 *Ammonites Hugii* OOSTER (*partim*): p. 103, pl. 24, fig. 11 (lectotype selected by TZANKOV, 1935), *non* fig. 7-10, 12 ?, 14, 15 (=*Spitidiscus oosteri* (SARASIN & SCHÖNDELMAYER)).

1901 *Holcodiscus Hugii* OOSTER; SARASIN & SCHÖNDELMAYER (*partim*), p. 47, pl. IV, fig. 9 (type refigured), *non* fig. 8, 10, 11 (=*Spitidiscus oosteri* (SARASIN & SCHÖNDELMAYER)).

1907 *Holcodiscus Andrussowi* KARAKASCH, pl. IX, fig. 22 (only).

v 1960 *Holcodiscus andrussowi* KARAKASCH; DRUSHTCHITS, pl. XLVII, fig. 1, 2 (only).

1984 *Spitidiscus hugii* (SARASIN & SCHÖNDELMAYER); AVRAM & KUSKO, p. 16, pl. III, fig. 4.

SPECIFIC CHARACTERS - Only the coarser-ribbed type figured by OOSTER (1860) in plate 24, fig.11(= SARASIN & SCHÖNDELMAYER, 1901, pl.IV, fig.9) was kept in the species by TZANKOV (1935). In this interpretation *Spitidiscus hugii* is rather medium in size, with a narrow umbilicus (u=0.23) and involution of almost 2/3, with high, flat sides and rounded venter; it is covered by flexuous ribs, about 57-60 on half a whorl at a diameter of 51 mm; there are primary and intercalatory ribs starting in bunches from the umbilical margin, the latter also bifurcating below the mid-sides; almost 5 shallow, flexuous constrictions on the last half a whorl, are more evident only on the lower part of the sides.

MATERIAL - Five specimens, four of them are small pyritised nuclei yielded from the Svinita region (E. AVRAM's coll., IG P-18687) and one larger individual comes from the Baraolt Mts (M. KUSKO & M. SAVU's coll., IG P-6464).

REMARKS - The larger Rumanian specimen is very near to the lectotype at a comparable diameter. The pyritised specimens, which could be measured, present a subtrapezoidal,almost isometric whorl-section, and a thin, partly bifurcate, flexuous ribbing, interrupted in places by shallow, flexuous constrictions, bounded by ribs stronger than the others.

MEASUREMENTS

Specimens	D	U	H	W
Pl. 5, fig. 14	16.5	3.9 (0.23)	8.2 (0.50)	8.2 (0.50)
	15.6	3.4 (0.22)	7.5 (0.48)	8 (0.51)
	12.6	2.8 (0.22)	6.2 (0.49)	5.9 (0.47)
Pl. 5, fig. 15	29	7 (0.24)	13 (0.45)	-

OCCURRENCE - Barremian in Switzerland; Lower Barremian in Crimea and in Rumania.

Spitidiscus oosteri (SARASIN & SCHÖNDELMAYER)
Pl. 5, fig. 18, 19.

1860 *Ammonites Hugii* OOSTER, p. 103, pl. 24, fig. 7-9, 10 (holotype), 12 ?, 14, 15 (only).

1901 *Holcodiscus Hugii* OOSTER; SARASIN & SCHÖNDELMAYER, p. 48, pl. IV, fig. 8, 10, 11 (only).

1901 *Holcodiscus Oosteri* SARASIN & SCHÖNDELMAYER, p. 48, pl. IV, fig. 6 (holotype), 7.

1934 *Holcodiscus* (*Spitidiscus*) *oosteri* SARASIN & SCHÖNDELMAYER; TZANKOV, p. 71, pl. II, fig. 2-5.

1966 *Spitidiscus oosteri* (SARASIN & SCHÖNDELMAYER); BRESKOVSKI, p. 99, pl. VIII, fig. 8.

1967 *Spitidiscus oosteri oosteri* (SARASIN & SCHÖNDELMAYER); DIMITROVA, p. 153, pl. LXXVII, fig. 1.

v 1970 *Spitidiscus fallacior* COQUAND; KUSKO & SAVU, p. 74.

1985 *Spitidiscus oosteri oosteri* (SARASIN & SCHÖNDELMAYER); TZANKOV & BRESKOVSKI, p. 16, pl. IV, fig. 4-6.

SPECIFIC CHARACTERS - Like *Spitidiscus hugii* (OOSTER), but with smaller umbilicus and high whorl sides, very thin ribs and more distinct constrictions (at least at a larger diameter than 40 mm); the constrictions are flexuous, shallow and projected on the venter, but bordered adapically by a main rib, progressively stronger forward and on the venter. In the young stage, these main ribs smoothen, so that the constrictions are less evident.

MATERIAL - Three specimens, found in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18702, 18706; T. NEAGU's coll., BU-0281); four were collected in the Baraolt Mts. (M. KUSKO & M. SAVU's coll., IG P-6484; E. AVRAM's coll., IG P-17122).

REMARKS - The here adopted interpretation of the species is related to TZANKOV's re-group of the OOSTER's and SARASIN & SCHÖNDELMAYER's type specimens (see synonimy). The Rumanian individuals are smaller then the types, but display the clear constrictions and the thin ribbing of the species.

OCCURRENCE - Barremian in Switzerland; Lower Barremian in France, Rumania, Bulgaria; Upper Barremian (!) in Bulgaria.

Spitidiscus vandeckii (D'ORBIGNY)
Pl. 5, fig. 20

1850 *Ammonites Vandeckii* D'ORBIGNY, p. 99, n. 602.
non 1861 *Ammonites Vandecki* D'ORBIGNY; LORIOL, p. 28, pl. II, fig. 4, 5, 6 (=*Spitidiscus lorioli* (KILIAN))
1888 *Holcodiscus van-den-heckei* D'ORBIGNY; KILIAN, p. 673, pl. XIX, fig. 4 (holotype).
1901 *Holcodiscus van-den-Heckei* D'ORBIGNY; SARASIN & SCHÖNDELMAYER, p. 43, pl. V, fig. 4.
non 1935 *Holcodiscus* (*Spitidiscus*) *van-den-heckei* D'ORBIGNY; TZANKOV, p. 71, pl. II, fig. 1 (=*Spitidiscus* ? *meneghinii* (DE ZIGNO in RODIGHIERO)).
1937 *Ammonites Vandeckii* D'ORBIGNY; COTTREAU, p. 59, pl. LXXVIII, fig. 1, 2-3, 4 (type refigured).
1966 *Spitidiscus vandenheckei* (D'ORBIGNY); BRESKOVSKI, p. 98, pl. II, fig. 8; pl. III, fig. 5.
1967 *Spitidiscus vandeckii* (D'ORBIGNY); DIMITROVA, p. 151, pl. LXXVII, fig. 13, 14.
1985 *Spitidiscus vandeckii* (D'ORBIGNY); TZANKOV & BRESKOVSKI, p. 12, pl. III, fig. 8-10.

SPECIFIC CHARACTERS - According to KILIAN (1888), *Spitidiscus vandeckii* displays a discoidal shell, whorls overlapping each other on almost 1/3 of their height, ornamentation composed of 6 to 9 deep, prorsiradiate constrictions which describe on the venter, together with the ribs, a sinus towards the peristome; 4 to 8 intercalatory ribs, partly bifurcate near the middle of the sides, are less oblique than the constrictions, so that the rib disposed immediately behind the constriction joins it above the umbilical margin.

KILIAN's diagnosis needs to be supplied, observing the type material published by COTTREAU, with such features as the presence of two ribs bounding the constrictions, of which that situated adorally is stronger and higher on the lower part of the sides, and that disposed adapically is progressively stronger towards the external part of the sides and on the venter.

MATERIAL - Two specimens, both found in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18711; P. DUMITRICA's coll., IG P-18712).

REMARKS - Except little lower whorls, wider umbilicus, and also rather thinner intercalatory ribs, the best preserved Rumanian specimen is very comparable with the specimen figured by COTTREAU (1937, pl. LXXVIII, fig. 2-3) and wrongly selected as lectotype by BRESKOVSKI (1966).

The second specimen is a fragment displaying the specific characters such as the large umbilicus, the prorsiradiate-constrictions and bifurcate intercalatory ribs, but these are straight and not flexuous as in the typical specimens.

OCCURRENCE - *Spitidiscus vandeckii* is known from the Late Hauterivian (Late Neocomian) and Early Barremian in France, Switzerland, Bulgaria. It was found in Lower Barremian, in Rumania.

Spitidiscus seunesi (KILIAN)
Pl. 4, fig. 4, 5, 6

1888 *Holcodiscus Seunesi* KILIAN, p. 675, pl. XVIII, fig. 3 (holotype).
1901 *Holcodiscus Seunesi* KILIAN; SARASIN & SCHÖNDELMAYER, p. 46, pl. V, fig. 1, 2.
1907 *Holcodiscus Seunesi* KILIAN; KARAKASCH, p. 107, pl. IX, fig. 23, 24, 26.
1960 *Spitidiscus seunesi* KILIAN; DRUSHTCHITS, p. 305, pl. XLVII, fig. 4.
1966 *Spitidiscus seunesi* (KILIAN); BRESKOVSKI, p. 99, pl. I, fig. 4.
1967 *Spitidiscus seunesi* (KILIAN); DIMITROVA, p. 152, pl. LXXVIII, fig. 17.
1985 *Spitidiscus seunesi* (KILIAN); TZANKOV & BRESKOVSKI, p. 13, pl. IV, fig. 1-3; ? pl. III, fig. 13 (= ? *S. vandeckii* (D'ORBIGNY)).

SPECIFIC CHARACTERS - According to KILIAN (1888), *Spitidiscus seunesi* is characterised by a discoidal shell, displaying thin ribbing in the young stage, then covered by dense, straight and blunt ribs, single, bifurcate or, in places, trifurcate on the inner third of the whorl-sides. The ribs cross transversally, without any diminution, the ventral area, but progressively smoothen in larger specimens. In addition, 8 to 10 straight and deep constrictions on every whorl are present from the smallest diameter; they are bounded adapically and adorally by swellings, former stronger and callous on the ventral side, with a typical angular shape.

KILIAN's diagnosis needs to be supplied with data on the intercalatory ribs, the last 1-2 of them on every interspace falling obliquely on the constrictions, on the large umbilicus (u=0.39), the involution of almost 1/4 and almost isometric whorl-section (W/H=1.03).

MATERIAL - Four specimens, 2 of them coming from the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18708, 18709), the others from the Svinita village area (E. AVRAM's coll., IG P-18686).

REMARKS - The species is homogeneously interpreted in the literature. The Rumanian specimens are also typical.

OCCURRENCE - Barremian in France, Switzerland, Crimea, N Caucasus, Georgia. Lower Barremian in Rumania and in Bulgaria.

Spitidiscus andrussowi (KARAKASCH)
Pl. 5, fig. 16, 17 a-b; pl. 6, fig. 10; pl. 7, 20.

1890 *Holcodiscus Andrussowi* KARAKASCH, p. 437, pl. I, fig. 6, 7 (holotype).
1907 *Holcodiscus Andrussowi* KARAKASCH; KARAKASCH (*partim*), p. 107, pl. IX, fig. 25, *non* fig. 22 (= *Spitidiscus hugii* (OOSTER)).
v 1960 *Spitidiscus andrussovi* KARAKASCH; DRUSHTCHITS (*partim*), p. 306, pl. XLVII, fig. 3, *non* fig. 1, 2 (=*Spitidiscus hugii* (OOSTER)).
1984 *Spitidiscus andrussowi* (KARAKASCH); AVRAM & KUSKO, p. 16, pl. III, fig. 2.

SPECIFIC CHARACTERS - According to KARAKASCH (1890, 1907) this species is situated near *Spitidiscus vandeckii* (D'ORBIGNY) and *S. seunesi* (KILIAN), but it is different from them because of the very compressed whorls (W/H=0.77), the involution of almost 2/5, the relatively higher whorls (h=0.45) and also the strongly sinuous ribbing. It is especially similar to *Spitidiscus vandeckii*, differing from it only by the particular shape of the constrictions, reminding *S. seunesi.*

MATERIAL - 1 flattened specimen, recorded in the Baraolt Mts (M. KUSKO & M. SAVU's coll., IG P-6461); 2 pyritised nuclei, found in the Svinita village area (E. AVRAM's coll., IG P-18688).

REMARKS - Among the specimens figured by KARAKASCH (1907), that presented in plate IX, fig. 22 is almost identical to the lectotype of the species *Spitidiscus hugii* (OOSTER). Our specimens are comparable to KARAKASCH's (1907) individual from plate IX, fig. 25, and re-figured by DRUSHTCHITS (1960) in his plate XLVII, fig. 3.

OCCURRENCE - Known in the Lower Barremian deposits from Crimea and Georgia; it is found in the same interval in Rumania.

Spitidiscus gastaldianus (D'ORBIGNY)
Pl. 5, fig. 10 a-c, 11, 12, 13 a, b; pl. 6, fig. 7-9; pl. 7, fig. 19

1850 *Ammonites Gastaldianus* D'ORBIGNY, p. 99, n. 601.
v 1888 *Lytoceras Stefanescuanum* HERBICH, p. 238, pl. IX, fig. 1.
1907 *Holcodiscus fallacior* COQUAND; KARAKASCH, p. 115, pl. IX, fig. 28-31.
1935 *Holcodiscus (Spitidiscus) fallacior* COQUAND; TZANKOV, p. 70, pl. I, fig. 8-10.
1937 *Ammonites Gastaldianus* D'ORBIGNY; COTTREAU (*partim*), p. 58, pl. LXXVII, fig. 27-29 (lectotype selected by BRESKOVSKI, 1966), *non* fig. 26 (=? *Holcodiscus* n. sp.).
1966 *Spitidiscus gastaldianus* (D'ORBIGNY); BRESKOVSKI, p. 97, pl. III, fig. 3, 4.
1966 *Spitidiscus fallacior* (COQUAND); BRESKOVSKI, p. 100, pl. VI, fig. 5.
1967 *Spitidiscus gastaldianus* (D'ORBIGNY); DIMITROVA, p. 151, pl. LXXVIII, fig. 17.
1985 *Spitidiscus gastaldianus* (D'ORBIGNY); TZANKOV & BRESKOVSKI, p. 12, pl. III, fig. 11, 12.

SPECIFIC CHARACTERS - Globulous, with depressed oval whorl-section (W/H=1.3), deep medium-sized umbilicus (u=0.29), and large, rounded venter. Its ornamentation consists of almost 4 radial constrictions on the last whorl (but starting prorsiradiate from the umbilical wall), bounded adapically by a large, callous rib, and of 8 to 10 intercalatory ribs on each interval between constrictions; they are almost all bifurcated in the middle of the sides, and cross continuously the ventral area.

MATERIAL - Five pyritised nuclei and a small specimen preserved in marls, in the Svinita village area (E. AVRAM's coll., IG P-18685); three larger specimenss coming from the Dâmbovicioara Couloir (one in F. HERBICH's coll., CU-4943; two other in G. BULMEZ's coll., BU-0273).

REMARKS - The misinterpretation of the species by UHLIG (1883) and KILIAN (1888), and the late publication of d'ORBIGNY's type specimen by COTTREAU (1937) led to differentiate a *Spitidiscus gastaldianus* (d'ORBIGNY) and a *Holcodiscus gastaldii* KILIAN (see above). As interpreted now, *S.gastaldianus* is rather frequent, the Rumanian specimens being very close to the type by proportions, by the callous rib bounding the constricitons, by the dense, bifurcate intercalatories and the general aspect of the ornamentation. In addition, there are up to 6 constrictions on a whorl, and the body chamber begins at a diameter of almost 20 mm and is at least l/2 whorl long.

MEASUREMENTS - A pyritised specimen from Svinita:

D	U	H	W	W/H
16.6	4.1 (0.24)	8 (0.48)	9.1 (0.55)	1.14

OCCURRENCE - Barremian in France, Crimea; Lower Barremian in Bulgaria and Rumania.

GENUS ***Astieridiscus*** KILIAN, 1910

TYPE SPECIES *Holcodiscus Morleti* KILIAN, 1888

As accepted by WRIGHT (in MOORE, 1957), the genus is characterised by oval, compressed whorl section, with slightly flattened sides and rounded wenter, and with dense, sharp, slightly flexuous, simple or branching ribs. It has no constrictions and no tubercles.

Astieridiscus morleti (KILIAN)
Pl. 5, fig. 23 a-b, 24 a-b; pl. 7, fig. 21

1888 *Holcodiscus Morleti* KILIAN, p. 676, pl. XII, fig. 4 (holotype).
non 1907 *Holcodiscus Morleti* KILIAN; KARAKASCH, p. 110, pl. IX, fig. 18 (=*Spitidiscus* sp.)
non 1960 *Astieridiscus morleti* KILIAN; DRUSHTCHITS, p. 306, pl. XLVI, fig. 9 (=*Spitidiscus* sp.).
1966 *Astieridiscus morleti* (KILIAN); BRESKOVSKI, p. 106, pl. X, fig. 8.
1967 *Astieridiscus morleti* (KILIAN); DIMITROVA, p. 161, pl. LXXVIII, fig. 18.
1985 *Astieridiscus morleti* (KILIAN); TZANKOV & BRESKOVSKI, p. 46, pl. XI, fig. 6, 7.

SPECIFIC CHARACTERS - Discoidal shell, with almost isometric whorl-section; whorls covering one another 1/2 of their height, displaying equal, bifurcate or even trifurcate in the middle of the sides ribs; they start prorsiradiate from the umbilical wall and became radial on the outer half of the sides. No constriction is observed.

MATERIAL - A flattened specimen, recorded in the Dâmbovicioara Couloir (G. BULMEZ's coll., BU-0259); a single pyritised nucleus, coming from the Svinita village area (E. AVRAM's coll., IG P-18684).

REMARKS - The Rumanian specimens are very close to the holotype by the lateral ornamentation; but the measurable pyritised one is apart because of its whorl-section which is compressed and not isometric as in the typical specimens.

MEASUREMENTS - The specimen figured in pl. 5, fig. 23.

D	U	H	W	W/H
15.8	4 (0.25)	7.5 (0.46)	6.7 (0.42)	0.89

OCCURRENCE - Lower Barremian in France, Bulgaria; the same age in Rumania.

Astieridiscus elegans (KARAKASCH)
Pl. 5, fig. 22 a, b

1907 *Astieria elegans* KARAKASCH, p. 126, pl. X, fig. 11 (lectotype selected by BRESKOVSKI, 1966), 18.

1943 *Astieria elegans* KARAKASCH; TZANKOV, p. 27, pl. V, fig. 4.

v 1960 *Astieridiscus elegans* KARAKASCH; DRUSHTCHITS, p. 306, pl. XVI, fig. 3.

1966 *Astieridiscus elegans* (KARAKASCH); BRESKOVSKI, p. 107, pl. X, fig. 9.

1967 *Astieridiscus elegans* (KARAKASCH); DIMITROVA, p. 162, pl. LXXVIII, fig. 19, 20.

1985 *Astieridiscus elegans* (KARAKASCH); TZANKOV & BRESKOVSKI, p. 47, pl. XI, fig. 4, 5

SPECIFIC CHARACTERS - The type specimens display a medium-sized umbilicus (u=0.28) and wide (w=0.62), oval-depressed whorls (h=0.33). Their ornamentation consists of thin, almost radial, equal ribs, bifurcate in the middle of the sides; in places, single (not bifurcate) ribs are also observed. All the ribs cross continuously the ventral area.

MATERIAL - A single specimen, recorded in the Dâmbovicioara Couloir (D. PATRULIUS & E. AVRAM's coll., IG P-18715).

REMARKS - The Rumanian specimen, entirely septate, is slightly deformed but presents all the typical features of the species, except denser umbilical ribs (39 instead of 29), although the ribs on the outline are almost equal in number with those of the type (70).

OCCURRENCE - Lower Barremian in Crimea and also in Rumania (the top of the Lower Barremian, assembled with *Torcapella suessi* (SIMIONESCU)).

Astieridiscus uhligi (KARAKASCH)
Pl. 5, fig. 21.

1907 *Holcodiscus Uhligi* KARAKASCH, p. 113, pl. IX, fig. 19 (holotype).

SPECIFIC CHARACTERS - The holotype is discoidal, compressed (W/H=0.81), with slightly convex sides, medium-sized umbilicus (w=0.27), and involuton of almost 1/2. Its last whorl, at a diameter of almost 30 mm, is covered by 48-50 thin umbilical ribs; they cross, gently flexuous, the sides, regularly bifurcated at the middle of the sides (becoming higher and stronger at the point of bifurcation) and pass, slightly projected, over the ventral area. 96-100 ribs are counted at the periphery.

MATERIAL - A very fragmentary specimen (half a whorl, at a diameter of 19 mm) recorded in the Baraolt Mts. (M. KUSKO & M. SAVU's coll., IG P-6472).

REMARKS - Although it is very close to *Astieridiscus morleti* KILIAN, *A. uhligi* differs by its denser and very regular bifurcate ribs. The Rumanian specimen is identical to the younger half of the last whorl of the holotype.

OCCURRENCE - Barremian in Crimea; Lower Barremian in Rumania.

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PLATE 1

Fig. 1 a-c. *Jeanthieuloyites keyserlingiformis* AVRAM & GRADINARU. Holotype, E. GRADINARU's coll., BU-00613.
Fig. 2 a-c - *Jeanthieuloyites trapezoidalis* AVRAM & GRADINARU. Holotype, E. GRADINARU's coll., BU-00615.
Fig. 3 a-b - *Jeanthieuloyites nodosus* (MANDOV). E. GRADINARU's coll., BU-00614.
Fig. 4 - *Jeanthieuloyites* sp.ind. E. GRADINARU's coll., BU-00616.
Fig. 5 a-b, 6 - *Spitidiscus? meneghinii* (DE ZIGNO in RODIGHIERO). 5, T. NEAGU's coll., BU-0079 A; 6, D. PATRULIUS & E. AVRAM's coll., IG P-17004.

All figures natural size except figure 5, reduced 5/6.

TAVOLA 1

Fig. 1 a-c. Jeanthieuloyites keyserlingiformis *AVRAM & GRADINARU. Olotipo, collezione E. GRADINARU, BU-00613.*
Fig. 2 a-c - Jeanthieuloyites trapezoidalis *AVRAM & GRADINARU. Olotipo, collezione E. GRADINARU., BU-00615.*
Fig. 3 a-b - Jeanthieuloyites nodosus *(MANDOV). Collezione E. GRADINARU, BU-00614.*
Fig. 4 - Jeanthieuloyites *sp.ind. Collezione E. GRADINARU., BU-00616.*
Fig. 5 a-b, 6 - Spitidiscus ? meneghinii *(DE ZIGNO in RODIGHIERO). 5, collezione T. NEAGU., BU-0079 A; 6, collezione D. PATRULIUS & E. AVRAM, IG P-17004.*

Tutte le figure sono a grandezza naturale, salvo la fig. 5 ridotta di 5/6.

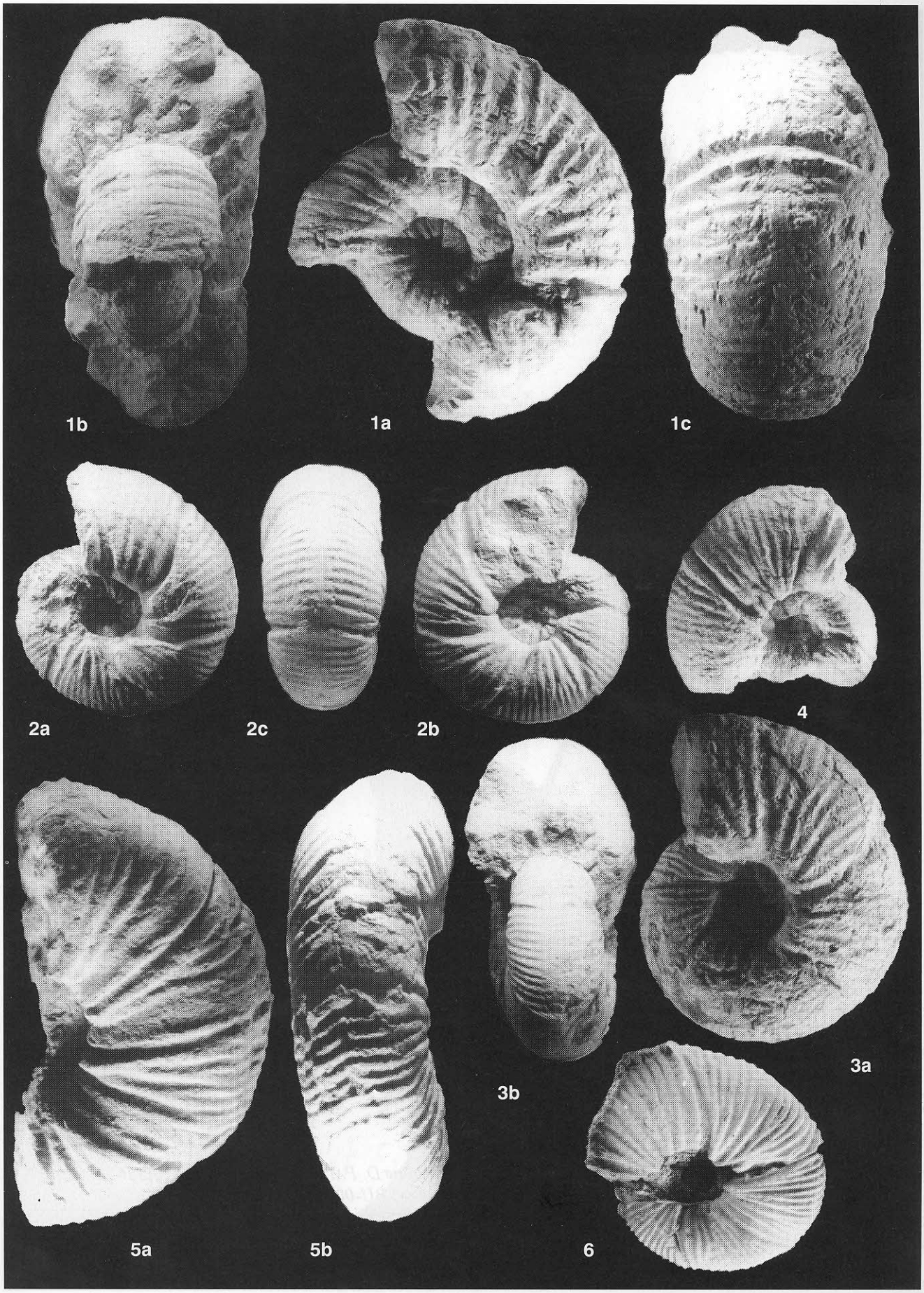
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PLATE 2

Fig. 1 - *Spitidiscus ? meneghinii* (DE ZIGNO in RODIGHIERO). D. PATRULIUS & E. AVRAM's coll., IG P-18707.
Fig. 2 - *Jeanthieuloyites nodosus* (MANDOV). E. GRADINARU's coll., BU-00614.
Fig. 3 - *Jeanthieuloyites* cf. *nodosus* (MANDOV). D. GRIGORESCU's coll., BU-0274.
Fig. 4 a-b - *Spitidiscus cankovi* VASICEK. T. NEAGU's coll., BU-0079 B.

All the specimens are figured in natural size.

TAVOLA 2

Fig. 1 - Spitidiscus ? meneghinii *(DE ZIGNO in RODIGHIERO). Collezione D. PATRULIUS & E. AVRAM , IG P-18707.*
Fig. 2 - Jeanthieuloyites nodosus *(MANDOV). Collezione E. GRADINARU, BU-00614.*
Fig. 3 - Jeanthieuloyites *cf.* nodosus *(MANDOV). Collezione D. GRIGORESCU, BU-0274.*
Fig. 4 a-b - Spitidiscus cankovi *VASICEK. Collezione T. NEAGU, BU-0079 B.*

Tutti gli esemplari sono figurati a grandezza naturale


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PLATE 3

Fig. 1, 2 a-b, 3 a-b, 4, 5, 6, 7 - *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY). 1, D. POPESCU-RAILEANU's coll., IG P-18691; 2, 3, E. AVRAM's coll., IG P-18669; 4, M. KUSKO & M. SAVU's coll., IG P-6463; 5, D. PATRULIUS & E. AVRAM's coll., IG P-18689; 6, 7, G. BULMEZ's coll., BU0263.

Fig. 8, 9, 10 a-c, 11 a-b, 12 a-b - *Holcodiscus tzankovi* n. sp.: 8, D. PATRULIUS & E. AVRAM's coll., IG P-18693; 9, P. DUMITRICA's coll., IG P-18694; 10 (holotype), E. AVRAM's coll., IG P 18671; 11, 12, E. AVRAM's coll., IG P-18670.

Fig. 13 a-b, 14 a-b, 15 a-b - *Holcodiscus alpha* TZANKOV. E. AVRAM's coll, IG P-18672.

Fig.16 - *Holcodiscus* sp. ex gr. *H. caillaudianus* (D'ORBIGNY). T. NEAGU's coll., BU-0062 (note the mature ornamentation with untuberculate double ribs bounding the constrictions).

Fig. 17 a-c - *Holcodiscus simionescui* n. sp., holotype: b, c = the fore-last whorl, with strengthened ribs at the mid-sides where they bifurcate. D. PATRULIUS & E. AVRAM's coll., IG P-18697.

Fig. 18 a-b, 19 a-b - *Holcodiscus gastaldii* KILIAN (*non* D'ORBIGNY): 18, V. POPOVICI-HATZEG's coll., IG P-760; 19, D. PATRULIUS & E. AVRAM's coll., IG P-18696.

All the specimens are figured in matural size.

TAVOLA 3

Fig. 1, 2 a-b, 3 a-b, 4, 5, 6, 7 - Holcodiscus *cf.* caillaudianus *(D'ORBIGNY). 1, collezione D. POPESCU- RAILEANU, IG P-18691; 2, 3, collezione E. AVRAM, IG P-18669; 4, collezione M. KUSKO & M. SAVU, IG P-6463; 5, collezione D. PATRULIUS & E. AVRAM, IG P-18689; 6, 7, collezione G. BULMEZ, BU0263.*

Fig. 8, 9, 10 a-c, 11 a-b, 12 a-b - Holcodiscus tzankovi *n. sp.: 8, collezione D. PATRULIUS & E. AVRAM, IG P-18693; 9, collezione P. DUMITRICA, IG P-18694; 10 (olotipo), collezione E. AVRAM, IG P 18671; 11, 12, collezione E. AVRAM, IG P-18670.*

Fig. 13 a-b, 14 a-b, 15 a-b - Holcodiscus alpha *TZANKOV. Collezione E. AVRAM, IG P-18672.*

Fig.16 - Holcodiscus *sp. ex gr.* H. caillaudianus *(D'ORBIGNY). Collezione T. NEAGU's coll., BU-0062 (si noti l'ornamentazione matura con coste non tubercolate bordanti le strozzature).*

Fig. 17 a-c - Holcodiscus simionescui *n. sp., olotipo: b, c = penultimo giro con coste rafforzate a metà fianco nel punto di biforcazione. Collezione D. PATRULIUS & E. AVRAM, IG P-18697.*

Fig. 18 a-b, 19 a-b - Holcodiscus gastaldii *KILIAN* (non *D'ORBIGNY*): *18, collezione V. POPOVICI-HATZEG, IG P-760; 19, collezione D. PATRULIUS & E. AVRAM, IG P-18696.*

Tutti gli esemplari sono figurati a grandezza naturale

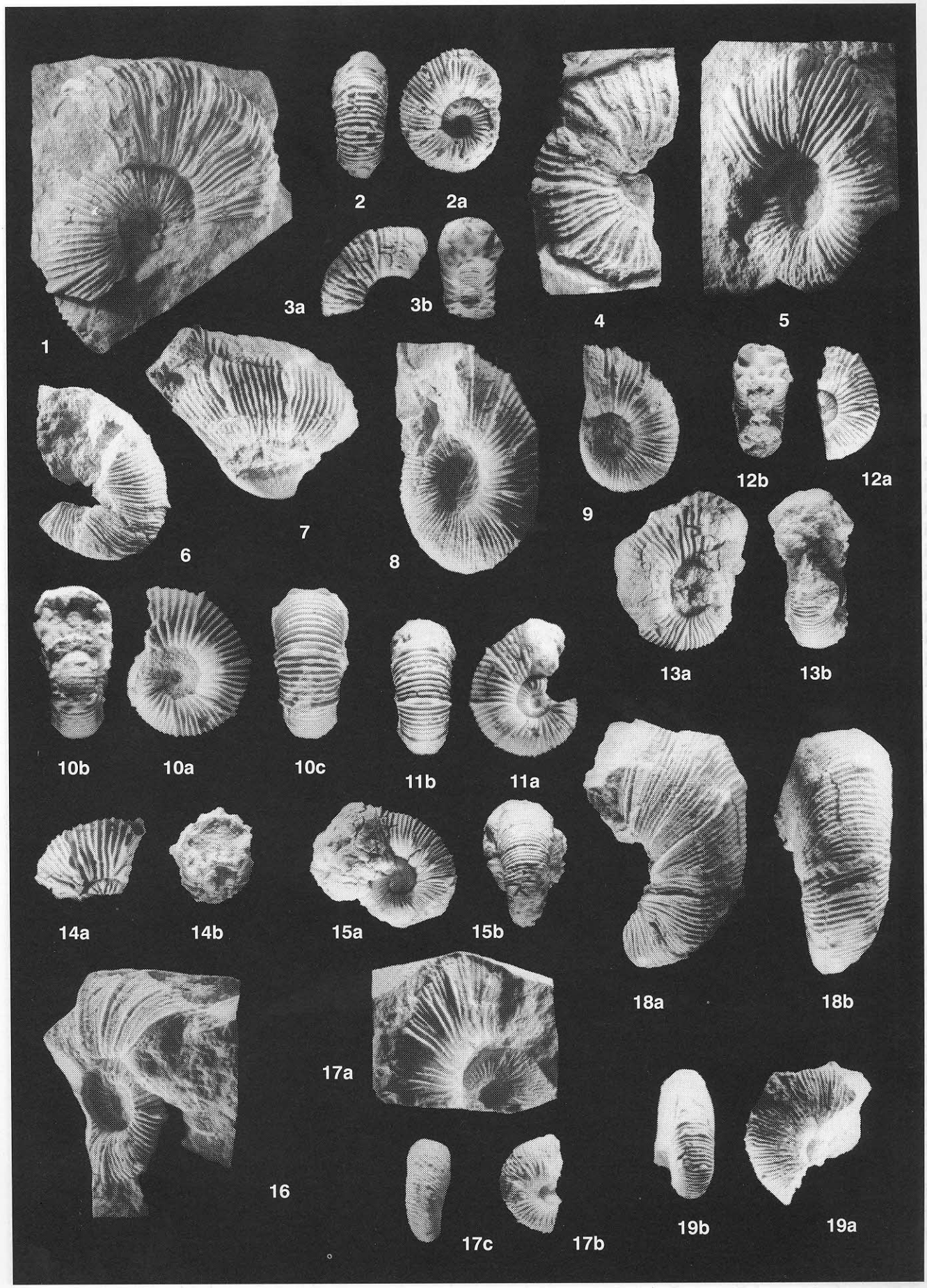
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PLATE 4

Fig. 1 a-b, 5 a-b, 6 a-b, 7 - *Holcodiscus* aff. *decorus* n. sp. E. AVRAM's coll., IG P-18674.
Fig. 2 a-d, 3, 4. *Holcodiscus decorus* n. sp. E.AVRAM's coll.: 2, holotype = IG P-18673; 3 and 4 = IG P-18674.
Fig. 8, 9 a-c - *Holcodiscus ouachensis* n. sp. E. AVRAM's coll.: 9, holotype = IG P-18676; 8 = IG P-18677.
Fig.10 - *Holcodiscus* aff. *gastaldii* KILIAN (*non* D'ORBIGNY). M. KUSKO & M. SAVU's coll., IG P-6465.
Fig.11 - *Holcodiscus irregularis* TZANKOV. M. KUSKO & M. SAVU's coll., IG P-6475.
Fig.12 - *Holcodiscus* aff. *fallax* ((COQUAND) MATHERON). D. PATRULIUS & E. AVRAM's coll., IG P-18701.
Fig.13 - *Holcodiscus geronimaeformis* TZANKOV. D. PATRULIUS & E. AVRAM's coll., unregistered.
Fig.14 - *Holcodiscus* cf. *geronimae* (HERMITE). E. AVRAM's coll., IG P-11168.
Fig. 15, 16 a-b - *Holcodiscus* sp. ind. E. AVRAM's coll., IG P-18685.
Fig. 17, 18 - *Holcodiscus* aff. *nodosus* KARAKASCH. E. AVRAM's coll., IG P-18679.
Fig. 19 a-b, 20 a-b, 21 - *Holcodiscus ziczac* KARAKASCH: 19, 20, E. AVRAM's coll., IG P-18680; 21, D. PATRULIUS & E. AVRAM's coll., unregistered.
Fig.22 - *Holcodiscus diversecostatus* (COQUAND). D. PATRULIUS & E. AVRAM's coll., IG P-18700.
Figs.23 a-b - *Holcodiscus* aff. *cadoceroides* (KARAKASCH). E. AVRAM's coll., IG P-18682.
Figs.24 a-c. *Holcodiscus* sp. ind. Nucleus of *H. caillaudianus* (D'ORBIGNY) ?. E.AVRAM's coll., IG P-18678.

All the specimens are figured in natural size, except 2d, 9 b-c, 16 b, 19 b, 20 b and 20 c (x 2).

TAVOLA 4

Fig. 1 a-b, 5 a-b, 6 a-b, 7 - Holcodiscus *aff.* decorus *n. sp. Collezione E. AVRAM, IG P-18674.*
Fig. 2 a-d, 3, 4. Holcodiscus decorus *n. sp. Collezione E.AVRAM: 2, olotipo = IG P-18673; 3 e 4 = IG P-18674.*
Fig. 8, 9 a-c - Holcodiscus ouachensis *n. sp. Collezione E. AVRAM: 9, olotipo = IG P-18676; 8 = IG P-18677.*
Fig.10 - Holcodiscus *aff.* gastaldii *KILIAN (non D'ORBIGNY). Collezione M. KUSKO & M. SAVU, IG P-6465.*
Fig.11 - Holcodiscus irregularis *TZANKOV. Collezione M. KUSKO & M. SAVU, IG P-6475.*
Fig.12 - Holcodiscus *aff.* fallax *((COQUAND) MATHERON). Collezione D. PATRULIUS & E. AVRAM, IG P-18701.*
Fig.13 - Holcodiscus geronimaeformis *TZANKOV. Collezione D. PATRULIUS & E. AVRAM, non repertoriato.*
Fig.14 - Holcodiscus *cf.* geronimae *(HERMITE). Collezione E. AVRAM, IG P-11168.*
Fig. 15, 16 a-b - Holcodiscus *sp. ind. Collezione E. AVRAM, IG P-18685.*
Fig. 17, 18 - Holcodiscus *aff.* nodosus *KARAKASCH. Collezione E. AVRAM., IG P-18679.*
Fig. 19 a-b, 20 a-b, 21 - Holcodiscus ziczac *KARAKASCH: 19, 20, collezione E. AVRAM, IG P-18680; 21, collezione D. PATRULIUS & E. AVRAM, non repertoriato.*
Fig.22 - Holcodiscus diversecostatus *(COQUAND). Collezione D. PATRULIUS & E. AVRAM, IG P-18700.*
Figs.23 a-b - Holcodiscus *aff.* cadoceroides *(KARAKASCH). Collezione E. AVRAM, IG P-18682.*
Figs.24 a-c. Holcodiscus *sp. ind. Nucleo di H. caillaudianus (D'ORBIGNY) ?. Collezione E.AVRAM, IG P-18678.*

Tutti gli esemplari sono figurati a grandezza naturale, salvo 2d, 9 b-c, 16 b, 19 b, 20 b e 20 c (x 2).

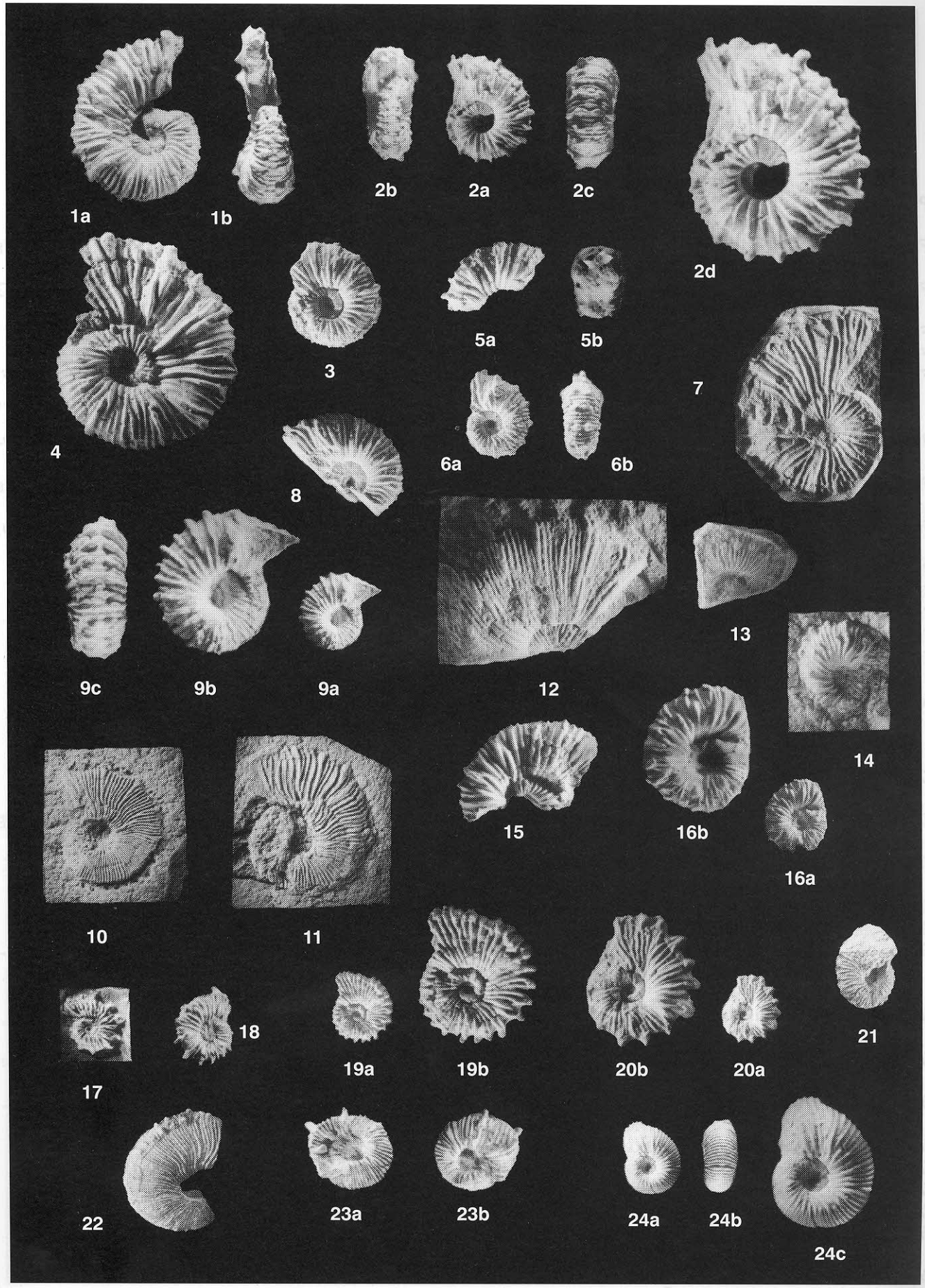
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PLATE 5

Fig. 1, 2, 3 a-b - *Spitidiscus* cf. *rotula* (SOWERBY): 1, S. BORDEA's coll., IG P-13799; 2, 3, D. PATRULIUS & E. AVRAM's coll., IG P-18704 and 18705, respectively.
Fig. 4, 5, 6 - *Spitidiscus seunesi* (KILIAN): 4, 5, E. AVRAM's coll., IG P-18686; 6, D. PATRULIUS & E. AVRAM's coll., IG P-18708.
Fig. 7, 8 - *Spitidiscus* cf. *intermedius* (D'ORBIGNY). D. PATRULIUS & E.AVRAM's coll., IG P-18713.
Fig.9 - *Spitidiscus* cf. *darderi* FALLOT & TERMIER. D. PATRULIUS & E. AVRAM's coll., IG P-18714.
Fig. 10 a-c, 11, 12, 13 a-b - *Spitidiscus gastaldianus* (D'ORBIGNY): 10, 11, E. AVRAM's coll., IG P-18685; 12, F. HERBICH's coll., CU-4924 (= *Lytoceras Stefanescuanum* HERBICH, 1888, pl. IX, fig. 1); 13, G. BULMEZ's coll., BU-0273.
Fig. 14 a-b, 15 - *Spitidiscus hugii* (OOSTER): 14, E. AVRAM's coll., IG P-18687; 15, M. KUSKO & M. SAVU's coll., IG P-6464.
Fig. 16, 17 a-b - *Spitidiscus andrussowi* (KARAKASCH): 16, M. KUSKO & M. SAVU's coll., IG P-6461; 17, E. AVRAM's coll., IG P-18688.
Fig. 18, 19 - *Spitidiscus oosteri* (SARASIN & SCHÖNDELMAYER): 18, M. KUSKO & M. SAVU's coll., IG P-6484; 19, D. PATRULIUS & E. AVRAM's coll., IG P-18706.
Fig. 20 - *Spitidiscus vandeckii* (D'ORBIGNY). D. PATRULIUS & E. AVRAM's coll., IG P-18711.
Fig. 21 - *Astieridiscus uhligi* (KARAKASCH). M. KUSKO & M. SAVU's coll., IG P-6472.
Fig. 22 a-b - *Astieridiscus elegans* (KARAKASCH). D. PATRULIUS & E. AVRAM's coll., IG P-18715.
Fig. 23 a-b - *Astieridiscus* cf. *morleti* (KILIAN). E. AVRAM's coll., IG P-18684.
Fig. 24 a-b - *Astieridiscus morleti* (KILIAN). G. BULMEZ's coll., BU-0259.

All the specimens are figured in natural size.

TAVOLA 5

Fig. 1, 2, 3 a-b - Spitidiscus *cf.* rotula *(SOWERBY): 1, collezione S. BORDEA, IG P-13799; 2, 3, collezione D. PATRULIUS & E. AVRAM, IG P-18704 e 18705, rispettivamente.*
Fig. 4, 5, 6 - Spitidiscus seunesi *(KILIAN): 4, 5, collezione E. AVRAM, IG P-18686; 6, collezione D. PATRULIUS & E. AVRAM, IG P-18708.*
Fig. 7, 8 - Spitidiscus *cf.* intermedius *(D'ORBIGNY). Collezione D. PATRULIUS & E.AVRAM, IG P-18713.*
Fig.9 - Spitidiscus *cf.* darderi *FALLOT & TERMIER. Collezione D. PATRULIUS & E. AVRAM, IG P-18714.*
Fig. 10 a-c, 11, 12, 13 a-b - Spitidiscus gastaldianus *(D'ORBIGNY): 10, 11, collezione E. AVRAM, IG P-18685; 12, collezione F. HERBICH, CU-4924 (= Lytoceras Stefanescuanum HERBICH, 1888, pl. IX, fig. 1); 13, collezione G. BULMEZ, BU-0273.*
Fig. 14 a-b, 15 - Spitidiscus hugii *(OOSTER): 14, collezione E. AVRAM, IG P-18687; 15, collezione M. KUSKO & M. SAVU, IG P-6464.*
Fig. 16, 17 a-b - Spitidiscus andrussowi *(KARAKASCH): 16, collezione M. KUSKO & M. SAVU, IG P-6461; 17, collezione E. AVRAM, IG P-18688.*
Fig. 18, 19 - Spitidiscus oosteri *(SARASIN & SCHÖNDELMAYER): 18, collezione M. KUSKO & M. SAVU, IG P-6484; 19, collezione D. PATRULIUS & E. AVRAM, IG P-18706.*
Fig. 20 - Spitidiscus vandeckii *(D'ORBIGNY). Collezione D. PATRULIUS & E. AVRAM, IG P-18711.*
Fig. 21 - Astieridiscus uhligi *(KARAKASCH). Collezione M. KUSKO & M. SAVU, IG P-6472.*
Fig. 22 a-b - Astieridiscus elegans *(KARAKASCH). Collezione D. PATRULIUS & E. AVRAM, IG P-18715.*
Fig. 23 a-b - Astieridiscus *cf.* morleti *(KILIAN). Collezione E. AVRAM, IG P-18684.*
Fig. 24 a-b - Astieridiscus morleti *(KILIAN). Collezione G. BULMEZ, BU-0259.*

Tutti gli esemplari sono figurati a grandezza naturale.

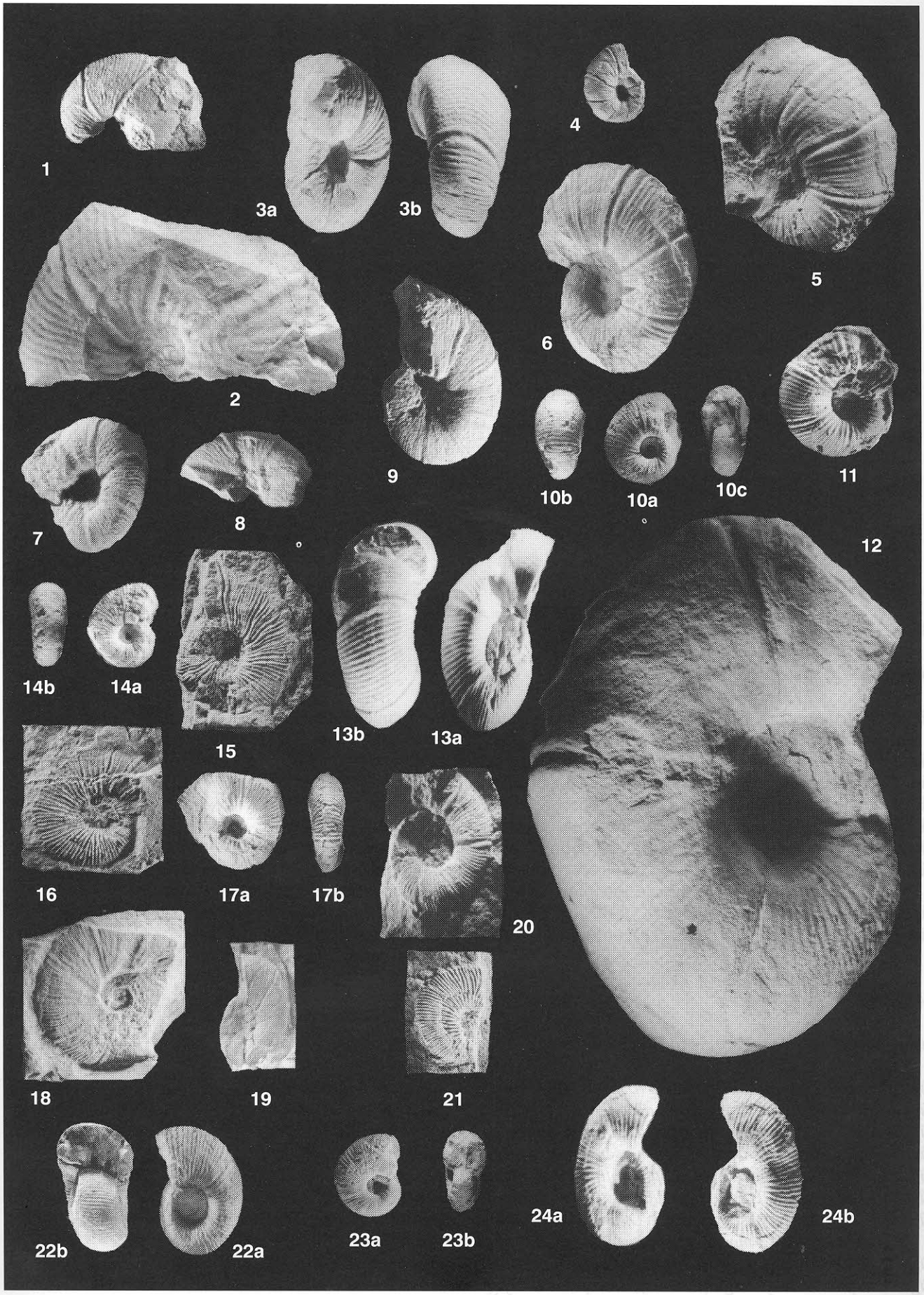
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PLATE 6

Suture lines of some holcodiscid species

Fig. 1 - *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY), suture of the specimen figured in pl. 3, fig. 2, at a diameter of 21 mm.
Fig. 2 - *Holcodiscus tzankovi* n. sp., holotype, at a diameter of 25 mm.
Fig. 3 - *Holcodiscus decorus* n. sp., holotype, at a diameter of 18 mm.
Fig. 4 - *Holcodiscus* aff. *decorus* n. sp., the specimen figured in pl. 4, fig. 1.
Fig. 5 - *Holcodiscus ouachensis* n. sp., holotype, at a diameter of 11.6 mm.
Fig. 6 - *Holcodiscus* aff. *nodosus* KARAKASCH, unfigured specimen, at a diameter of 7 mm.
Fig. 7-9 - *Spitidiscus gastaldianus* (D'ORBIGNY): 7, the specimen figured in pl. 5, fig. 11; 8, unfigured specimen, at a diameter of 13 mm; 9, the specimen figured in pl. 5, fig. 10, at a diameter of 15 mm.
Fig. 10 - *Spitidiscus* cf. *andrussowi* (KARAKASCH), the specimen figured in pl. 5, fig. 17, at a diameter of 18 mm.
Fig. 11 - *Spitidiscus* cf. *hugii* (OOSTER), unfigured specimen, at a diameter of 15.6 mm.

TAVOLA 6

Linee di sutura di alcune specie di Holcodiscidae.

Fig. 1 - Holcodiscus *cf.* caillaudianus *(D'ORBIGNY), sutura dell'esemplare figurato in tav. 3, fig. 2, al diametro di 21 mm.*
Fig. 2 - Holcodiscus tzankovi *n. sp., olotipo, al diametro di 25 mm.*
Fig. 3 - Holcodiscus decorus *n. sp., olotipo, al diametro di 18 mm.*
Fig. 4 - Holcodiscus *aff.* decorus *n. sp., esemplare figurato in tav. 4, fig. 1.*
Fig. 5 - Holcodiscus ouachensis *n. sp., olotipo, al diametro di 11.6 mm.*
Fig. 6 - Holcodiscus *aff.* nodosus *KARAKASCH, esemplare non figurato, al diametro di 7 mm.*
Fig. 7-9 - Spitidiscus gastaldianus *(D'ORBIGNY): 7, esemplare figurato in tav. 5, fig. 11; 8, esemplare non figurato, al diametro di 13 mm; 9, esemplare figurato in tav. 5, fig. 10, al diametro di 15 mm.*
Fig. 10 - Spitidiscus *cf.* andrussowi *(KARAKASCH), esemplare figurato in tav. 5, fig. 17, al diametro di 18 mm.*
Fig. 11 - Spitidiscus *cf.* hugii *(OOSTER), esemplare non figurato, al diametro di 15.6 mm.*

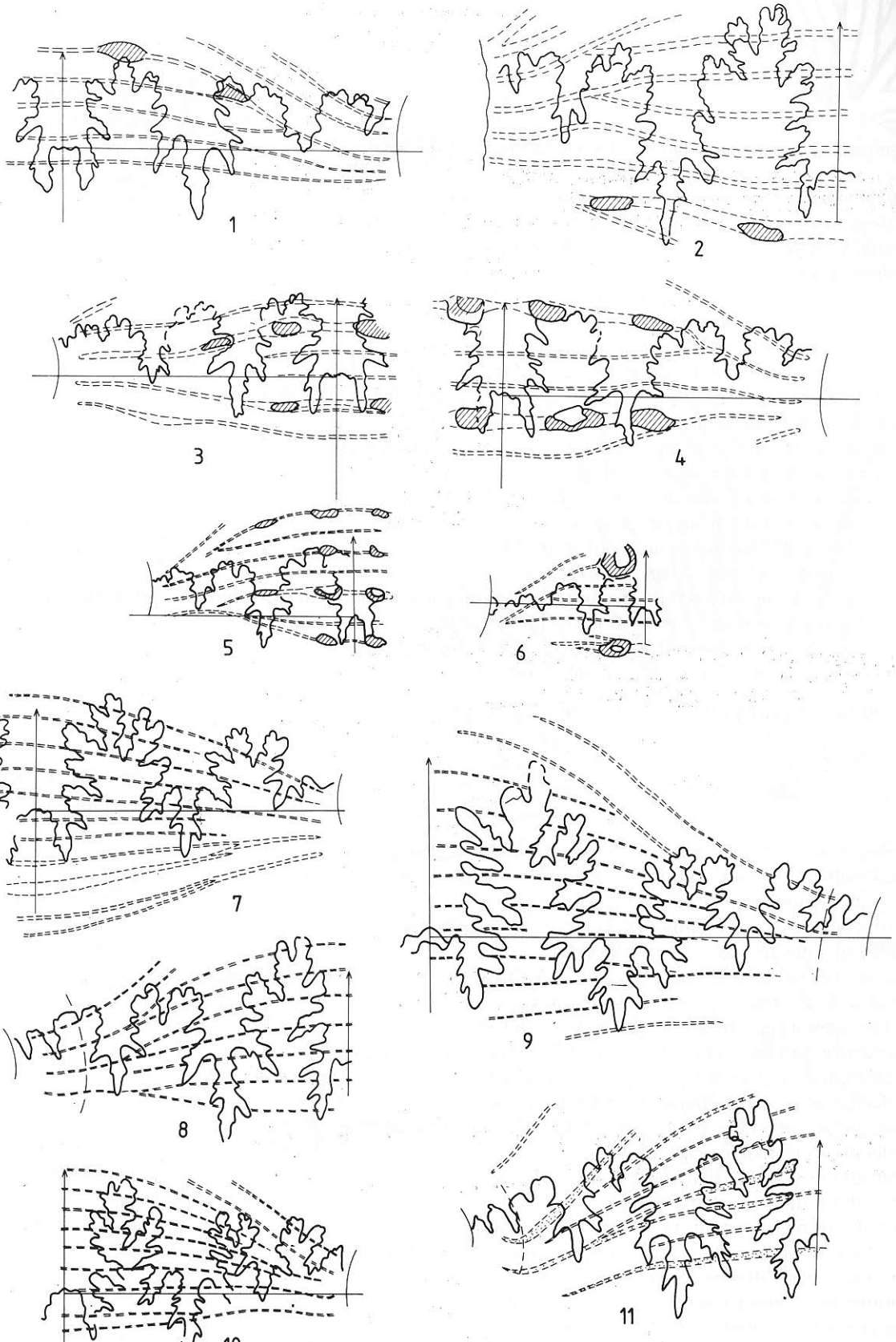
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PLATE 7

Lateral ornamentation and whorl section of some holcodiscid species.

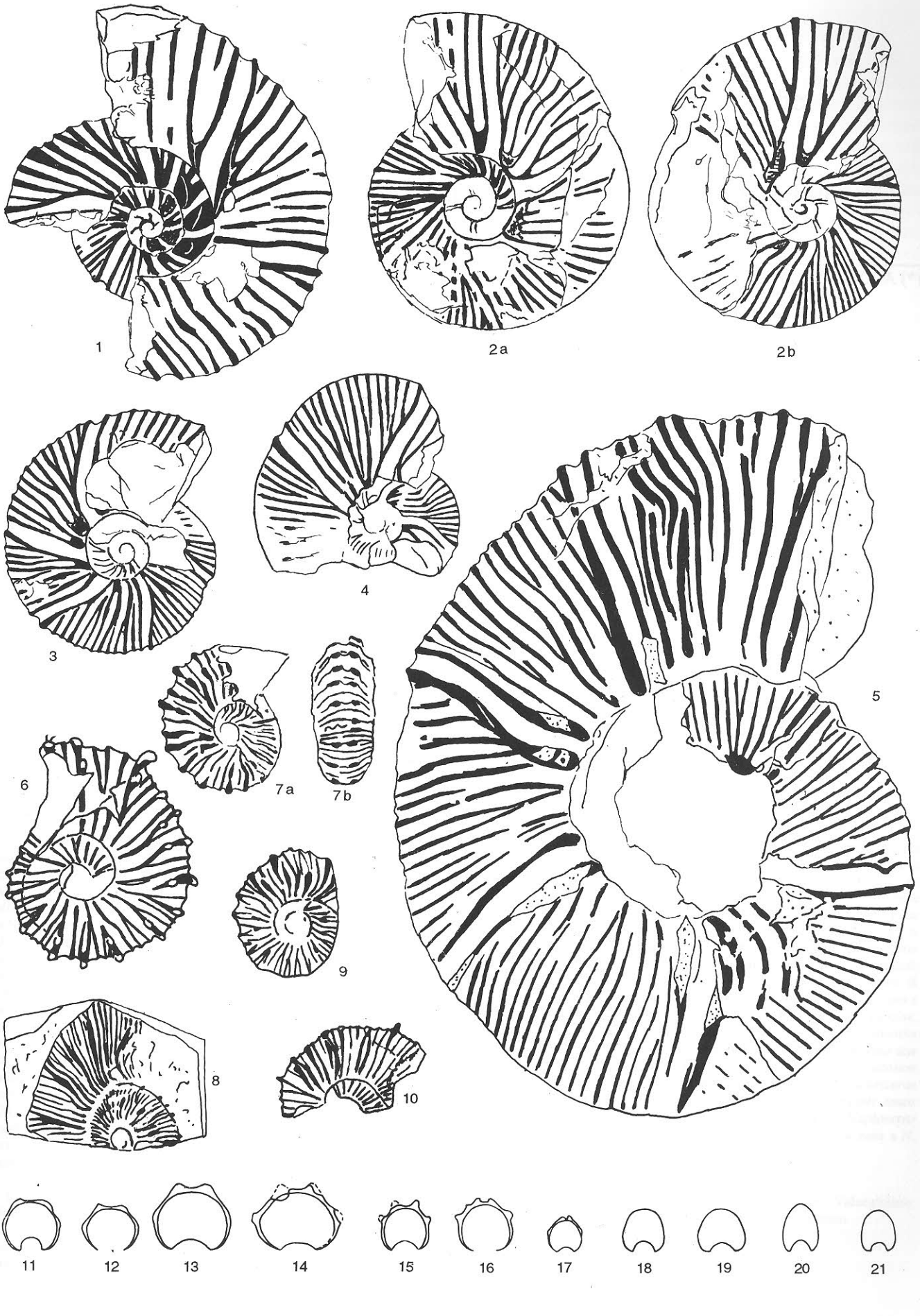
Fig. 1 - *Jeanthieuloyites keyserlingiformis* AVRAM & GRADINARU, holotype.
Fig. 2 a-b - *Jeanthieuloyites nodosus* (MANDOV).
Fig. 3 - *Jeanthieuloyites trapezoidalis* AVRAM & GRADINARU, holotype.
Fig. 4 - *Jeanthieuloyites* sp. ind. (= pl. 1, fig. 4).
Fig. 5 - *Jeanthieuloyites* cf. *nodosus* (MANDOV), a very large, gerontic individual (= pl. 2, fig. 3).
Fig. 6 - *Holcodiscus decorus* n. sp., holotype (enlarged x 2).
Fig. 7 a-b - *Holcodiscus ouachensis* n. sp., holotype (enlarged x 2).
Fig. 8 - *Holcodiscus simionescui* n. sp., plaster cast of the holotype (= pl. 3, fig. 17).
Fig. 9, 10 - *Holcodiscus* sp. ind. (= pl. 4, fig. 16 and 15, respectively; 9 enlarged x 2).
Fig. 11 - *Holcodiscus* cf. *caillaudianus* (D'ORBIGNY) (= pl. 3, fig. 2).
Fig. 12 - *Holcodiscus alpha* TZANKOV (= pl. 3, fig. 15, vanished specimen).
Fig. 13 - *Holcodiscus tzankovi* n. sp., holotype.
Fig. 14 - *Holcodiscus alpha* TZANKOV (= pl. 3, fig. 14).
Fig. 15 - *Holcodiscus decorus* n. sp., holotype.
Fig. 16 - *Holcodiscus* aff. *decorus* n. sp. (= pl. 4, fig. l).
Fig. 17 - *Holcodiscus ouachensis* n. sp., holotype.
Fig. 18 - *Spitidiscus* cf. *hugii* (OOSTER), the unfigured specimen which offered the suture line, pl. 6, fig. 11.
Fig. 19 - *Spitidiscus gastaldianus* (D'ORBIGNY) (= pl. 5, fig. 10).
Fig. 20 - *Spitidiscus* cf. *andrussowi* (KARAKASCH) (= pl. 5, fig. 17).
Fig. 21 - *Astieridiscus* cf. *morleti* (KILIAN) (= pl. 5, fig. 23).

All figures natural size, except figures 6, 7 a-b and 9.

TAVOLA 7

Ornamentazione e sezione della spira di alcune specie di Holcodiscidae.
Fig. 1 - Jeanthieuloyites keyserlingiformis *AVRAM & GRADINARU, olotipo.*
Fig. 2 a-b - Jeanthieuloyites nodosus *(MANDOV).*
Fig. 3 - Jeanthieuloyites trapezoidalis *AVRAM & GRADINARU, olotipo.*
Fig. 4 - Jeanthieuloyites *sp. ind. (= tav. 1, fig. 4).*
Fig. 5 - Jeanthieuloyites *cf.* nodosus *(MANDOV), individuo gerontico di grandissima taglia (= tav. 2, fig. 3).*
Fig. 6, Holcodiscus decorus *n. sp., olotipo (ingrandito x 2).*
Fig. 7 a-b - Holcodiscus ouachensis *n. sp., olotipo (ingrandito x 2).*
Fig. 8 - Holcodiscus simionescui *n. sp., calco dell'olotipo (= tav. 3, fig. 17).*
Fig. 9, 10 - Holcodiscus *sp. ind. (= tav. 4, fig. 16 e 15, rispettivamente; 9 ingrandito x 2).*
Fig. 11 - Holcodiscus *cf.* caillaudianus *(D'ORBIGNY) (= tav. 3, fig. 2).*
Fig. 12 - Holcodiscus alpha *TZANKOV (= tav. 3, fig. 15, esemplare smarrito).*
Fig. 13 - Holcodiscus tzankovi *n. sp., olotipo.*
Fig. 14 - Holcodiscus alpha *TZANKOV (14 = tav. 3, fig. 14).*
Fig. 15 - Holcodiscus decorus *n. sp., olotipo.*
Fig. 17) Holcodiscus ouachensis *n. sp., olotipo (7 ingrandito x 2).*
Fig. 18) Spitidiscus *cf.* hugii *(OOSTER), l'esemplare non figurato da cui è rilevata la sutura di pl. 6, fig. 11;.*
Fig. 19) Spitidiscus gastaldianus *(D'ORBIGNY) (= tav. 5, fig. 10).*
Fig. 20) Spitidiscus *cf.* andrussowi *(KARAKASCH) (= tav. 5, fig. 17).*
Fig. 21) Astieridiscus *cf.* morleti *(KILIAN) (= tav. 5, fig. 23).*

Tutte le figure sono a grandezza naturale, salvo le figure 6, 7 a-b e 9.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