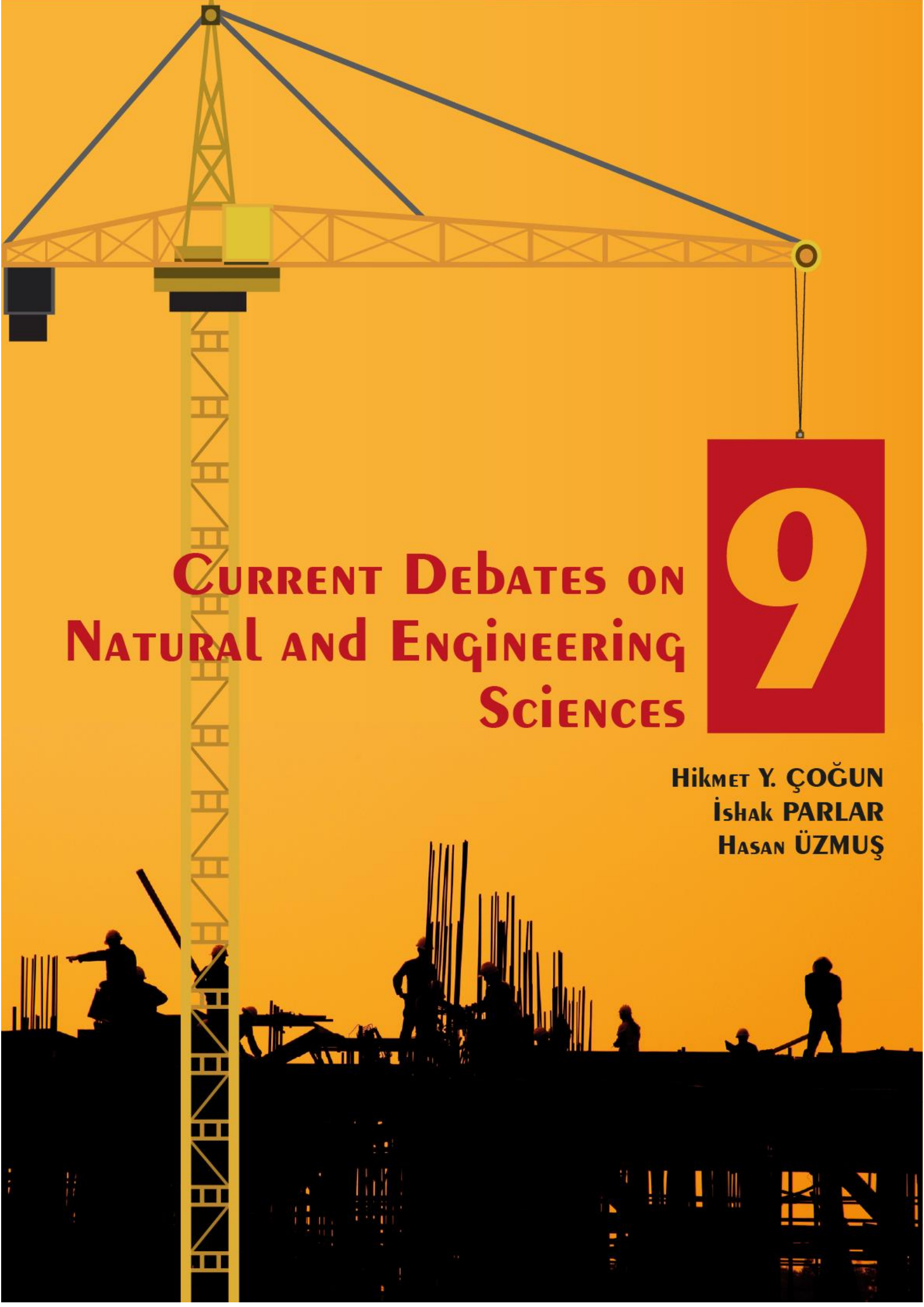

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9

Hikmet Y. ÇOĞUN
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Hasan ÜZMUŞ

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Petrographıc Features of The Hacıalabaz Formatıon (Upper Jurassıc) Lımestones North Of Hadım (Konya, Türkiye)

Ali Müjdat ÖZKAN[1],
Salih DİNÇ[2]

Introduction

This study, it was aimed to determine the sedimentary petrographic properties of the Late Jurassic Hacıalabaz Formation limestones located in the north of Hadim (Konya, Türkiye) district (Figure 1). A detailed stratigraphic study in the study area was made by Turan (1990), but the carbonates defined as Hacıalabaz limestone were not studied in detail.

The unit, which consists of dolostone, calcitic dolostone, dolomitic limestone, and limestone, was first described by Demirkol (1981) in the Sultan Mountains region under the name "Hacıalabaz limestone". Later, the unit was defined and named “Ovacık limestone” by Turan (1990) in and around the study area. However, Turan (1997) named this unit "Hacıalabaz limestone", adhering to the naming principle later on. Özkan and Dinç (2008) defined and examined the unit under the name of Hacıalabaz Formation, as they saw it at the formation level.

The formation, which starts with gray, dark gray, medium-thick bedded, sugar-textured dolomitic limestones containing micritic intermediate levels at the base, passes into gray-colored, medium-bedded limestones towards the top. At higher levels, it continues with dark gray colored, medium-thick bedded, brecciated limestone, and dolomitized intermediate levels at some levels. While the dolomitic levels are composed of euhedral or subhedral dolomite crystals, it has been observed that the limestones are mudstone, wackestone, packstone, and crystalline limestone from bottom to top.

The Hacıalabaz Formation, which overlies the Late Cambrian-Early Ordovician-aged Seydişehir Formation from below with angular unconformity, is overlain by the Late Cretaceous-aged Saytepe Formation with an angular unconformity. According to the 3 measured stratigraphic sections taken from the study area, the Hacıalabaz Formation starts with limestone in some areas and dolostone in some areas at the base (Figure 2). The unit continues upward as limestone-dolomitic limestone-calcitic dolostone and dolostone (Figure 2).

The Hacıalabaz Formation was transgressively developed in a shelf environment that started with carbonate deposition on the Seydişehir Formation.

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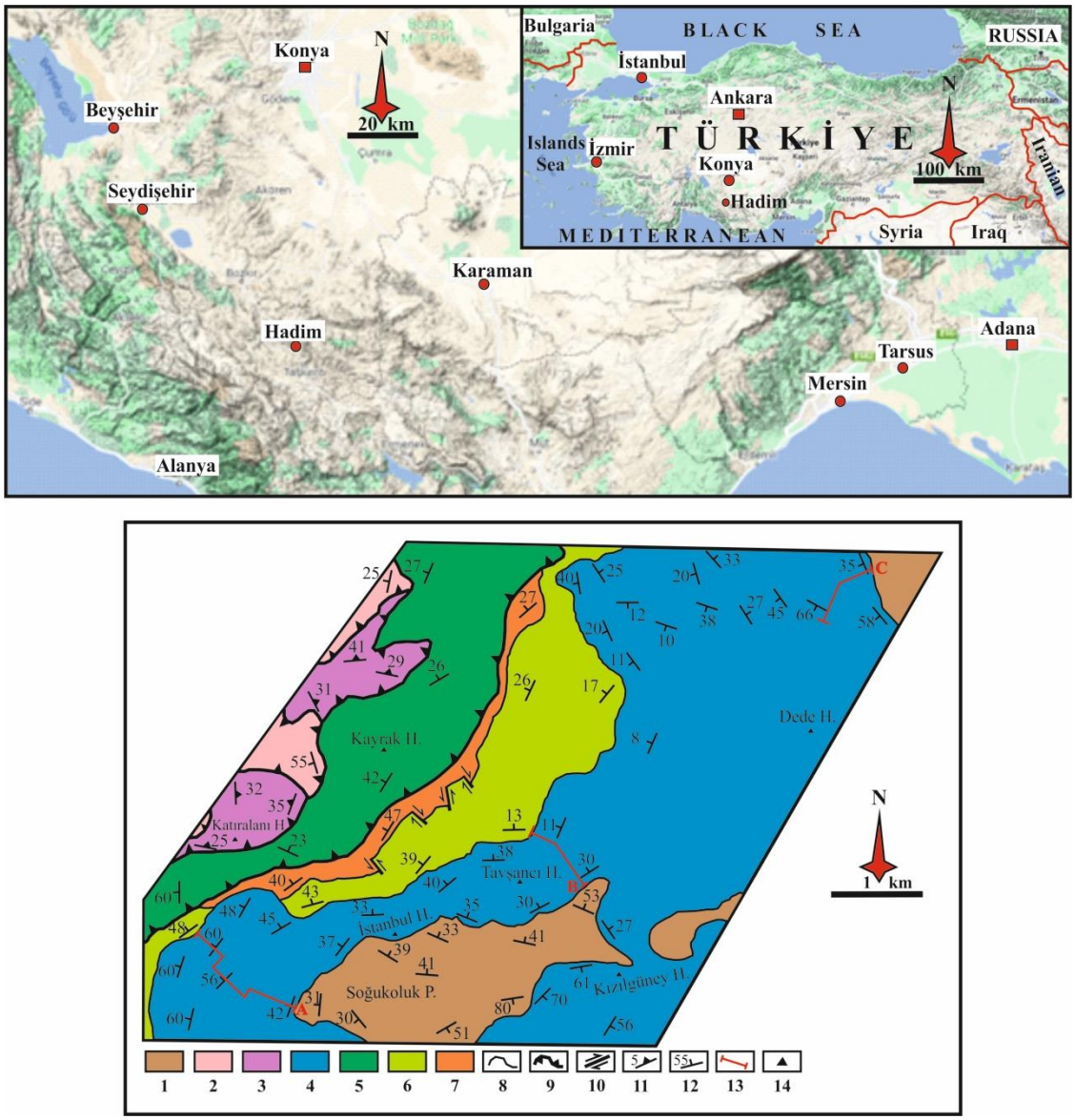

Figure 1. Location (https://www.google.com/maps/@37.5369627,39.5182898,5z/data=!5m1!1e4) and geological map of the study area (modified from Turan, 1990).

1) Seydişehir Formation (Upper Cambrian-Lower Ordovician), 2) Kahtepe Formation (Upper Permian), 3) Zindancık Complex (Triassic), 4) Hacıalabaz Formation (Upper Jurassic), 5) Taşkent Melange (Upper Cretaceous), 6) Saytepe Formation (Upper Cretaceous), 7) Çobanağacık Formation (Lutetian), 8) formation boundary, 9) thrust fault, 10) strike-slip fault, 11) cleavage, 12) bedding, 13) measured stratigraphic section line, 14) hill

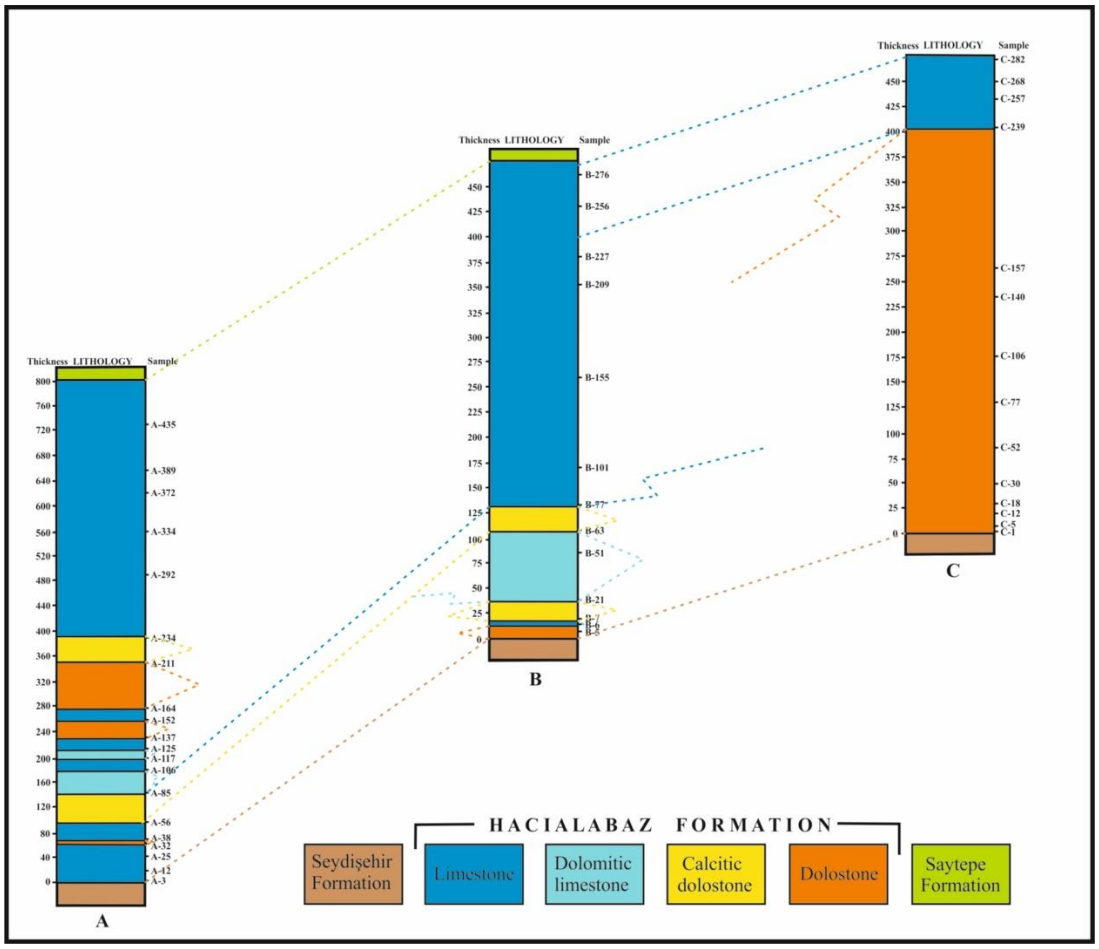

Figure 2. Correlation of measured stratigraphy sections taken from the study area (modified from Özkan and Dinç, 2008)

Results

Petrographic Properties of İstanbultepe Measured Stratigraphy Section (A) Samples

Twenty samples were taken from the measured stratigraphic section taken from the southwest of Istanbul Tepe (Figure 2). 15 of these samples are limestone (2 samples of dolomitic limestone), and 5 of them are dolostone (2 samples of calcitic dolostone). According to Dunham (1962), the limestones begin as mudstone at the base. It transitions upwards to wackestone and continues with mudstone. A thin layer of dolostone (according to Compton, 1962) is located on the mudstone. Packstone, calcitic dolostone, dolomitic limestone, and mudstone overlie the dolostone. Above, dolomitic limestone, packstone, dolostone, wackestone, dolostone, calcitic dolostone, and packstone are found. At the top are mudstone, wackestone, crystalline limestone, and mudstone (Figure 2).

In sample A-3, 3% fossil and 97% micrite were observed and the rock was named as mudstone (Table 1). In mudstones, where high porosity (Figure 3a) and breccia (Figure 3b, c) are observed in places, iron oxide veins were also observed (Figure 3a, b, c).

12% fossil, 81% micrite, and 7% sparry were observed in the A-12 sample (Table 1). Sparrytes are found in the form of void-filling cement, and micrites are found in the form of a matrix (Figure 3d, e). As the fossils are seen as a whole, they are mostly seen as bio-molds (Figure 3d), and green algae (especially *Clypeina* sp.) molds and fossils are common (Figure

3d). Small void porosity and crack porosity were observed in this sample (Figure 3e). Fine veins with iron oxide are also common in this sample (Figure 3e).

Sample A-25 consists entirely (100%) of micrite (Table 1; Figure 3f). A high porosity rate was observed in this sample (Figure 3f).

Sample A-38 contains 37% fossil, 7% pellet, 52% micrite, and 4% sparry (Table 1). Fossils can generally be whole or can be observed as bio-molds (Figure 3g, h, j). Some molds contain the development of dolomite rhombohedra (Figure 3j). Calcite-filled veins, micro-faulting (Figure 3g), and sparry calcite-filled stylolite (Figure 3j) were also observed in this sample.

The wackestone feature was also observed in this sample (Figure 3g). 40% fossil and 60% micrite are found in the A-85 sample, which exhibits wackestone-packstone (Figure 3k, m, n) characteristics (Table 1). Fossils are whole and in the form of bioclasts, dolomites are in the form of disseminated rhombs (Figure 3k, m, n). Sparry calcite veins (Figure 3m, n) and iron oxide stylolites (Figure 3k, m) were observed in this sample.

18% fossil, %5 intraclast, 70% micrite, and 12% sparry were observed in the A-117 sample (Table 1). In this wackestone sample, mostly green algae (especially *Clypeina*; Figure 4b) and fewer bioclasts (Figure 4a, b) are found. In this sample, sparry calcitic veins, sparry calcitic and iron oxide-filled stylolites (Figure 4a, b), and dolomitization along the stylolites (Figure 4a, b) are also observed.

In the packstone sample A-125, there are 38% fossils and 62% micrite (Table 1), and the fossils are observed as whole and as bioclasts (Figure 4c, d). In this sample, iron oxide-filled veins (Figure 4d), stylolites (Figure 4c, d), and crack porosity (Figure 4d) are also found.

20% fossil, 72% micrite, and 8% sparry calcite were observed in wackestone sample A-152 (Table 1). Fossils in this sample are found in the form of whole, bio-mold, and bioclasts (Figure 4e), while sparry calcite-filled stylolites and veins are also observed (Figure 4e).

In the packstone sample A-234, 43% fossils, 7% intraclasts, 10% pellets, and 40% micrite were observed (Table 1; Figure 4f, g). In this sample, mostly green algae (especially *Clypeina*) and fewer foraminiferal fossils and bioclasts are found (Figure 4f, g). The sample also contains sparry calcitic veins and iron oxide-filled stylolites (Figure 4f).

12% fossil, 8% intraclast, 20% pellet, 40% micrite, and 20% sparry calcite were observed in the packstone A-292 sample (Table 1). The fossils in this sample are in the form of unidentified bioclasts. Sparry calcites are in the form of void-filling cement (Figure 4h), porosities are bird's eye and/or fenestra, some of them are empty and some of them are sparry calcite-filled (Figure 4j). Sparry calcite-filled stylolites (Figure 4j) were also observed in this sample.

3% fossil, 2% intraclast, 3% pellet, 89% micrite, and 3% sparry calcite were observed in the mudstone A-334 sample (Table 1). Fossils in this sample are foraminifera and bioclasts (Figure 4k). The porosities are bird's eye and/or fenestra shaped, most of them are empty, and some of them are sparry calcite-filled (Figure 4k). This sample also contains iron oxide-filled veins and stylolites.

15% fossil, 5% intraclast, 75% micrite, and 5% sparry calcite were observed in the wackestone sample A-372 (Table 1). In this sample, in which the brecciated zone (Figure 4m) is also seen, the fossils are mostly in the form of bio-mold (Figure 4m), and thin stylolites with iron oxide (Figure 4m).

6% fossil, 82% micrite, and 12% sparry calcite were observed in the mudstone A-435 sample (Table 1). Fossils in this sample are mostly in the form of bio-mold (Figure 4n). In this

sample sparry calcite veins (Figure 4n), iron oxide-filled thin stylolites (Figure 4n), and stylolitic porosity was also observed.

Table 1. Microscopic properties of samples taken from İstanbultepe measured stratigraphy section

Sample	Calcite %	Dolomite %	Fossil %	Intraclast %	Ooid %	Pellet %	Spar %	Micrite %	Rock name
A-435	100	-	6	-	-	-	12	82	Mudstone
A-389	40	60	-	17	-	-	21	62	Calcitic dolostone
A-372	100	-	15	5	-	-	5	75	Wackestone
A-334	100	-	3	2	-	3	3	89	Mudstone
A-292	100	-	12	8	-	20	20	40	Packstone
A-234	100	-	43	7	-	10	-	40	Packstone
A-211	46	54	6	-	-	-	54	40	Calcitic dolostone
A-164	8	92	-	-	-	-	100	-	Dolostone
A-152	100	-	20	-	-	-	8	72	Wackestone
A-137	4	96	-	-	-	-	100	-	Dolostone
A-125	100	-	38	-	-	-	-	62	Packstone
A-117	80	20	18	5	-	-	12	65	Dolomitic limestone
A-106	100	-	-	-	-	-	10	90	Mudstone
A-85	87	13	40	-	-	-	-	60	Dolomitic limestone
A-56	20	80	-	-	-	-	30	70	Calcitic dolostone
A-38	100	-	37	-	-	7	4	52	Packstone
A-32	3	97	-	-	-	-	92	8	Dolostone
A-25	100	-	-	-	-	-	-	100	Mudstone
A-12	100	-	12	-	-	-	7	81	Wackestone
A-3	100	-	3	-	-	-	-	97	Mudstone

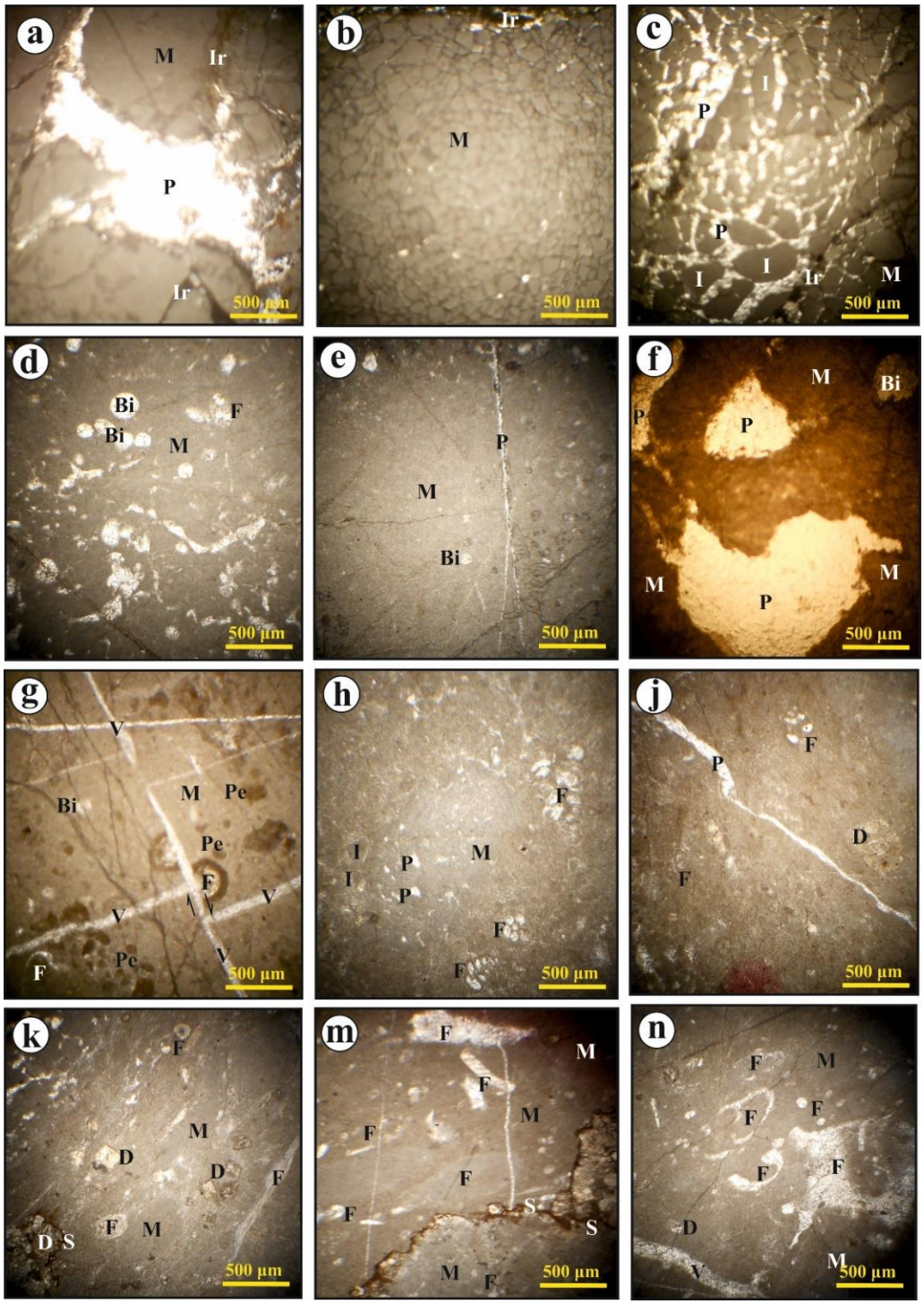

Figure 3. Microphotographs of samples taken from İstanbultepe measured stratigraphy section.

a) Mudstone, micrite (M), porosity (P), iron-oxide veins (Ir) (sample no: A-3), b) brecciated mudstone (sample no: A-3), c) brecciated mudstone, I: intraclast (sample no: A-3), d) wackestone, F: fossil, Bi: bio-mold, (sample no: A-12), e) wackestone (sample no: A-12), f) high-porosity mudstone (sample no: A-25), g) packstone, micrite, fossil, pellet (Pe), sparry calcite vein, arrows: micro-fault (sample no: A-38), h) packstone, micrite, I: intraclast, fossil, porosity (sample no: A-38), j) packstone, micrite, Crack porosity (P), fossil, D: dolomite (sample no: A-38), k) dolomitic limestone (wackestone feature), micrite, fossil, dolomite, stylolite (S) (sample no: A-85), m) dolomitic limestone

(wackestone feature) (sample no: A-85), n) dolomitic limestone (wackestone feature) (sample no: A-85) (All photos were taken in the PPL)

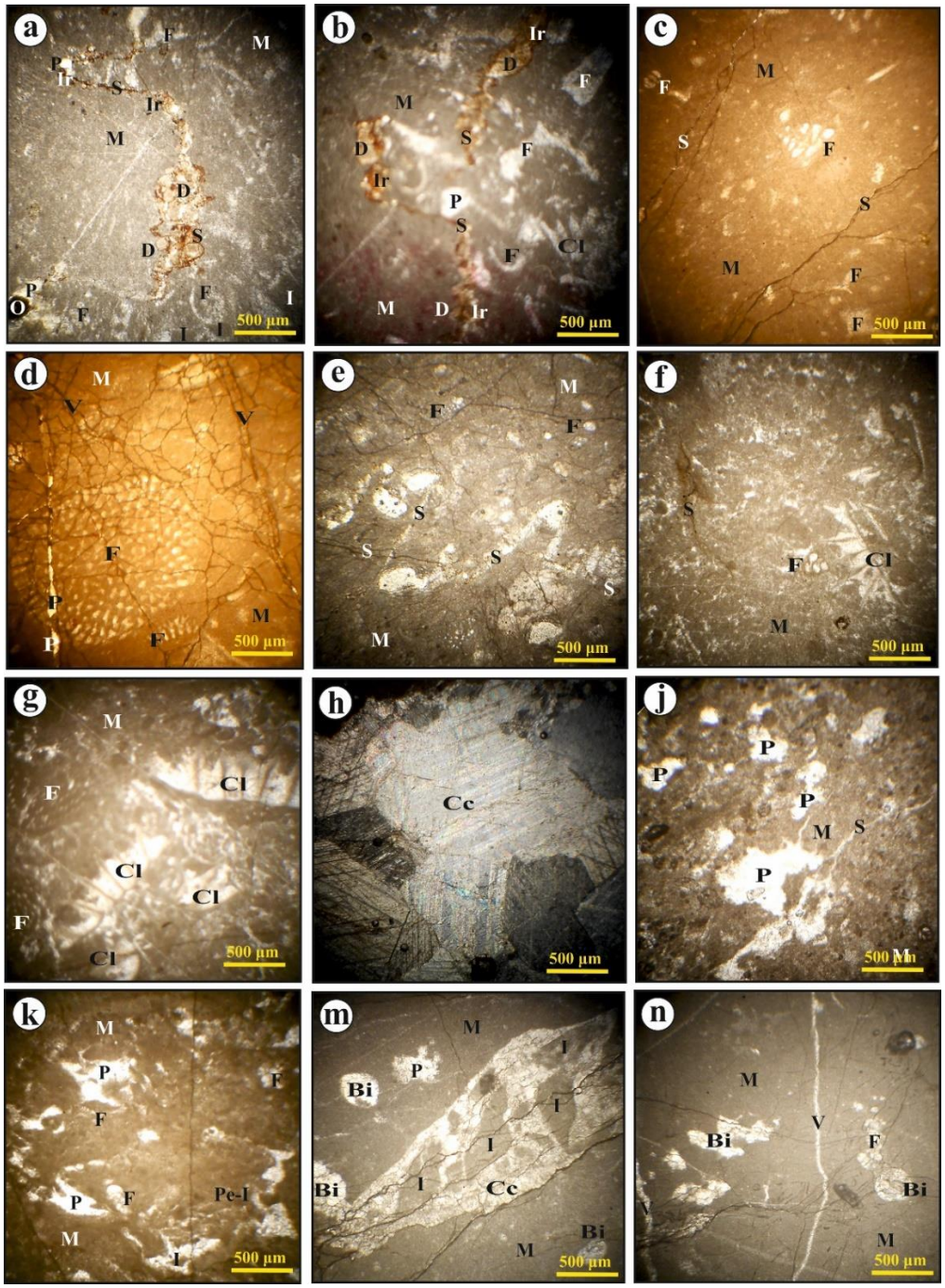

Figure 4. Microphotographs of samples taken from İstanbultepe measured stratigraphy section.

a) Dolomitic limestone (wackestone feature), micrite (M), fossil (F), opaque minerals (O), dolomite (D), stylolite (S) (Sample no: A-117), b) dolomitic limestone (wackestone feature), micrite, fossil, Clypeina (Cl), dolomite, stylolite, iron-oxide (Ir) (Sample no: A-117), c) packstone, micrite, fossil, stylolite (Sample no: A-125), d) packstone, micrite, crack porosity, fossil, vein (Sample no: A-125), e) wackestone, micrite, fossil, stylolite (Sample no: A-152), f) packstone, micrite, fossil, stylolite, Clypeina (Cl) (Sample no: A-234), g) packstone, micrite, fossil, stylolite, Clypeina (Cl) (Sample no: A-234), h) packstone, sparry calcite-cement (Cc) (Sample no: A-292), j) packstone, micrite,

stylolite, porosity (Sample no: A-292), k) mudstone, micrite, fossil, porosity, pellet-intraclast (Pe-I), intraclast (I) (Sample no: A-334), m) wackestone, micrite, bio-mold (Bi), sparry calcite-cement (Cc), porosity (Sample no: A-372), n) mudstone, micrite, bio-mold, fossil, vein (V) (Sample no: A-435) (All photos were taken in the PPL, except h [XPL])

Petrographic Properties of Tavşancıtepe Measured Stratigraphic Section (B) Samples

Thirteen samples were taken from the measured stratigraphic section taken from the southeast of Tavşancı Tepe (Table 2). 10 of these samples are limestone (2 samples of dolomitic limestone), 3 of them are dolostone (2 samples of calcitic dolostone). Carbonates begin as dolostone at the base. According to Dunham (1962), it transitions to mudstone towards the top and continues with calcitic dolostone and dolomitic limestone. Calcitic dolostone, packstone, and wackestone overlie the dolomitic limestone. Wakestone is located at the top (Table 2).

4% fossil, 81% micrite, and 15% sparry calcite were observed in the mudstone B-6 sample (Table 2). The foraminiferal fossils in this sample are whole, and the spar calcite cement developed as a void filling.

10% fossil and 90% micrite were observed in the B-21 sample, which is dolomitic limestone (Table 2). In this example, the fossils are mostly foraminifera and all fossils are in the form of bio-molds and bioclasts (Figure 5a, b, d). The dolomites are in the form of disseminated rhombs (Figure 5a, b, c, d) and stylolitic dolomites (Figure 5b).

8% fossil and 92% micrite were observed in the B-51 sample, which is dolomitic limestone (Table 2). Fossils in this sample are mostly green algae (probably *Clypeina*) and less commonly foraminifera (Figure 5e, f). Dolomites are generally composed of euhedral and less commonly subhedral crystals (Figure 5e, f).

36% fossil and 64% micrite were observed in the packstone B-77 sample (Table 2). Fossils are in the form of green algae, foraminifera, and bioclasts (Figure 5g, h, j, k). In this sample, sparry calcite-filled veins and stylolites are also present (Figure 5h, j).

In the packstone, B-101 sample, 42% fossil, and 58% micrite were observed (Table 2). The fossils are mostly composed of all foraminifera, with fewer bioclasts and green algae (Figure 5m, n).

22% fossil, 43% micrite, and 35% sparry calcite cement were observed in the wackestone sample B-155 (Table 2). Fossils are in the form of whole foraminifera, bioclast, and micritized crinoid discs (Figure 6a). Allochems were bonded with sparry calcite cement and micritic matrix (Figure 6a).

40% fossil, 5% intraclast, 55% micrite, and 3% sparry calcite were observed in the packstone B-209 sample (Table 2). Fossils are in the form of green algae (especially *Clypeina*), foraminifera, and bioclasts (Figure 6b, c, d). In this sample, there are sparry calcite veins (Figure 6b), sparry calcite-filled stylolites (Figure 6d), and void-fill sparry calcite cement (Figure 6c).

In the packstone, B-227 sample, 25% fossil, 20% pellet, 50% micrite, and 5% sparry calcite were observed (Table 2). Fossils are mostly in the form of foraminifera and bioclasts (Figure 6e, f, g, h), sparry calcite cement cavity filling (Figure 6f, g, h), and fossil infill (Figure 6e). In this sample, the alizarin red-s staining technique was used in the section of Figure 6g and it was seen that it was entirely composed of calcite.

18% fossil, 13% intraclast, 7% pellet, 50% micrite, and 12% sparry calcite were observed in the packstone B-256 sample (Table 2). Fossils are in the form of green algae, foraminifera (Figure 6j, k, m), and some fossils show a geopetal structure (Figure 6j). In this sample, iron

oxide-replaced sparry calcitic veins (Figure 6k), sparry calcite, and iron oxide-filled stylolites (Figure 6m) were also observed.

7% fossil, 26% intraclast, 8% pellet, 31% micrite, and 28% sparry calcite were observed in the packstone B-276 sample (Table 2). The fossils in this sample could not be identified, but they were estimated to consist of ostracods and foraminifera (Figure 6n).

Table 2. Microscopic properties of samples taken from Tavşancıtepe measured stratigraphy section

Sample	Calcite %	Dolomite %	Fossil %	Intraklast %	Ooid %	Pellet %	Spar %	Micrite %	Rock name
B-276	100	-	7	26	-	8	28	31	Packstone
B-256	100	-	18	13	-	7	12	50	Packstone
B-227	100	-	25	-	-	20	5	50	Packstone
B-209	100	-	40	5	-	-	3	52	Packstone
B-155	100	-	22	-	-	-	35	43	Wackestone
B-101	100	-	42	-	-	-	-	58	Packstone
B-77	100	-	36	-	-	-	-	64	Packstone
B-63	37	63	-	-	-	-	57	43	Calcitic dolostone
B-51	70	30	8	-	-	-	-	92	Dolomitic limestone
B-21	75	25	10	-	-	-	-	90	Dolomitic limestone
B-7	49	51	5	-	-	-	87	8	Calcitic dolostone
B-6	97	3	4	-	-	-	15	81	Mudstone
B-5	9	91	-	-	-	-	90	10	Dolostone

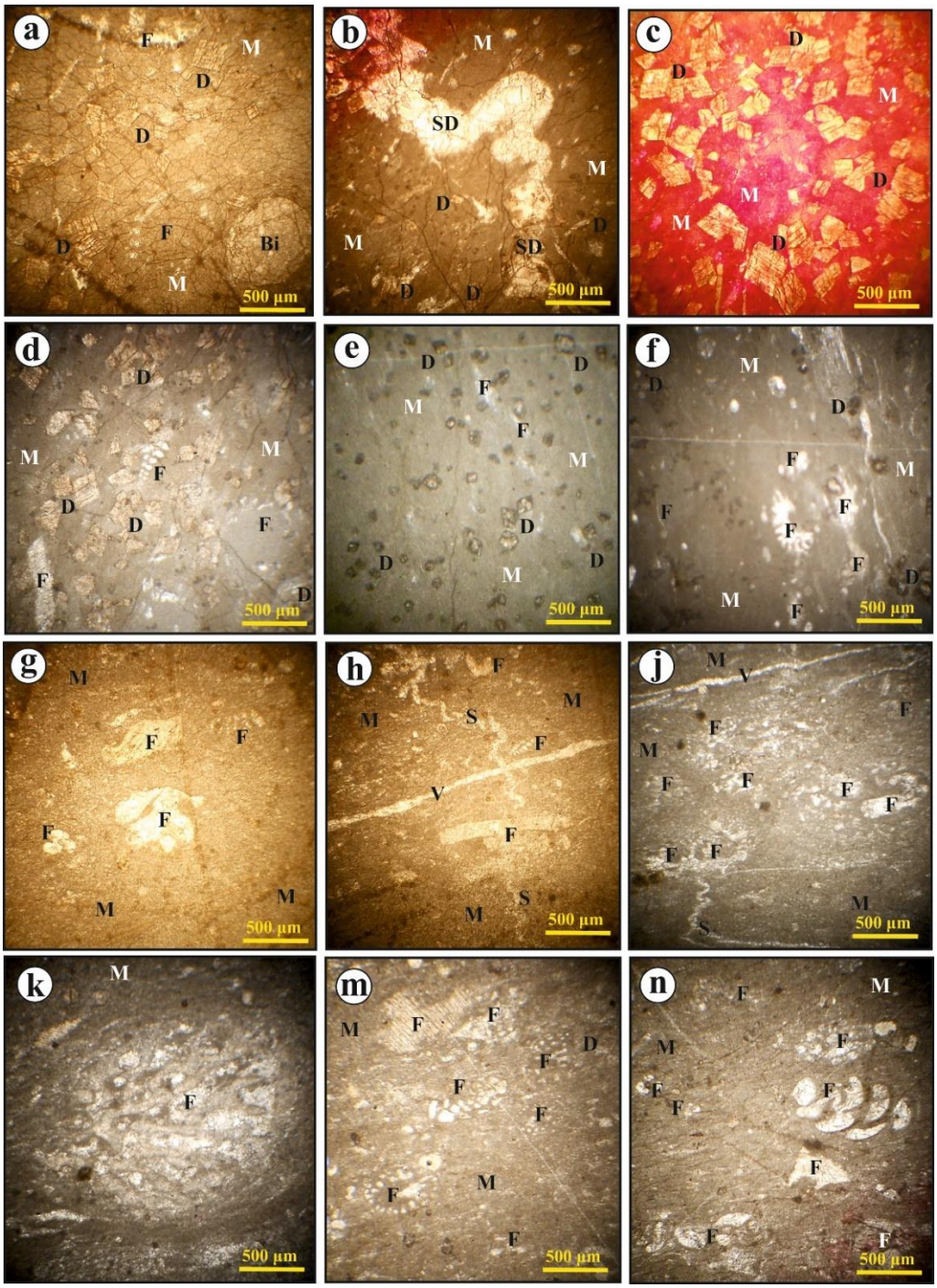

Figure 5. Microphotographs of samples taken from Tavşancıtepe measured stratigraphy section.

a) Dolomitic limestone, micrite (M), fossil (F), bio-mold (Bi), dolomite rhombs (D) (Sample no: B-21), b) dolomitic limestone, micrite, dolomite, stylolitic dolomite (SD), alizarin red-s (upper left corner) (Sample no: B-21), c) dolomitic limestone, micrite, dolomite rhombs (D), alizarin red-s (the whole section is painted) (Sample no: B-21), d) dolomitic limestone, micrite, fossil, dolomite, (Sample no: B-21), e) dolomitic limestone, micrite, fossil, dolomite (Sample no: B-51), f) dolomitic limestone, micrite, fossil, dolomite (Sample no: B-51), g) packstone, micrite, fossil (Sample no: B-77), h) packstone, micrite, fossil, stylolite (S), vein (V) (Sample no: B-77), j) packstone, micrite, fossil, stylolite, vein (Sample no: B-77), k) packstone, micrite, fossil (Sample no: B-77),

m) packstone, micrite, fossil, dolomite (Sample no: B-101), n) packstone, micrite, fossil (Sample no: B-101) (All photos were taken in the PPL)

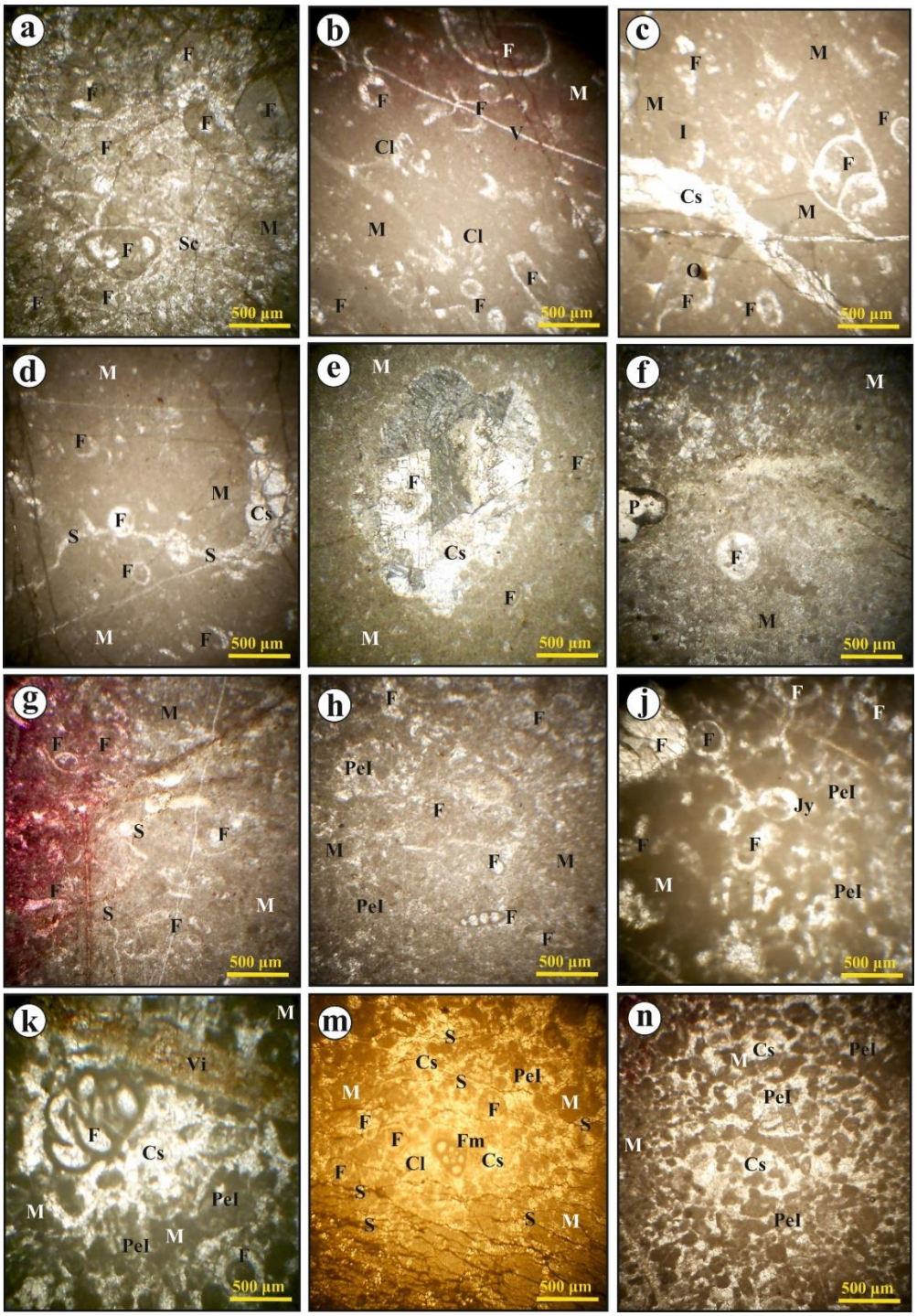

Figure 6. Microphotographs of samples taken from Tavşancıtepe measured stratigraphy section.

a) Wackestone, micrite (M), fossil (F), sparry calcite-cement (Sc) (Sample no: B-155), b) packstone, micrite, fossil, Clypeina (Cl), vein (V) (Sample no: B-209), c) packstone, micrite, fossil, intraclast (I), opaque minerals (O), sparry calcite-cement (Cs) (Sample no: B-209), d) packstone, micrite, fossil, stylolite (S), sparry calcite-cement (Cs) (Sample no: B-209), e) packstone, micrite, fossil, sparry calcite-cement (Cs) (Sample

no: B-227), f) packstone, micrite, fossil, vuggy porosity (P) (Sample no: B-227), g) packstone, micrite, fossil, stylolite (S) (Sample no: B-227), h) packstone, micrite, fossil, pellet-intraclast (PeI) (Sample no: B-227), j) packstone, micrite, fossil, pellet-intraclast, geopetal structure (Jy) (Sample no: B-256), k) packstone, micrite, fossil, pellet-intraclast, iron oxide-filled vein (Vi) (Sample no: B-256), m) packstone, micrite, fossil, pellet-intraclast, Clypeina, miliolid (Fm), stylolite, sparry calcite-cement (Cs) (Sample no: B-256), n) packstone, micrite, fossil, pellet-intraclast, sparry calcite-cement (Cs) (Sample no: B-276) (All photos were taken in the PPL, except e [XPL])

Petrographic Properties of Dedetepe Measured Stratigraphic Section (C) Samples

14 samples were taken from the measured stratigraphic section taken from the northeast of Dede Tepe. 10 of these samples are limestone (2 samples of dolomitic limestone), and 3 of them are dolostone (2 samples of calcitic dolostone). In the measured stratigraphic section of Dedetepe, the units begin with dolostone at the base and continue with calcitic dolostone after a thin mudstone. It transitions to dolomitic limestone towards the top and continues with calcitic dolostone. At the top, there is packstone and wackestone, while at the top there is packstone.

8% dolosparite and 92% micrite were observed in the mudstone sample C-239 (Table 3). The dolomites in this sample are disseminated, anhedral, and micro-spar in size. In this sample, in which no allochem is observed, there is only the micritic matrix as orthochem.

30% fossil, 9% intraclast, and 61% micrite were observed in the packstone sample C-257 (Table 3). The fossils are whole, bio-mold, and bioclasts and could not be identified, but were thought to be foraminifera and ostracod (Figure 7a, b, c, d, e). This sample has stylolitic porosity (Figure 7a) and void porosity (Figure 7d). In addition, sparry calcite-filled and iron oxide-filled stylolites (Figure 7a, b, c, d, e) and sparry calcite-filled veins (Figure 7b) were also observed in this sample.

47% fossils and 53% micrites were observed in the C-268 sample, which has packstone characteristics (Table 3). The fossils are in the form of whole, bio-mold, and bioclast (Figure 7f, g, h, j, k) and consist mostly of green algae (especially *Clypeina*; Figure 7h, j, k) and lesser foraminifera (Figure 7h). Iron oxide-filled stylolites (Figure 7f, g, h, j, k) are common in this sample. In addition, geopetal structure (Figure 7j, k) is observed in some fossils in this sample.

20% fossils, 14% intraclast, 5% pellets, and 61% micrites were observed in the packstone sample C-282 (Table 3). Fossils are in the form of whole, bio-mold, and bioclasts (Figure 7m, n), mostly composed of foraminifera. In this sample, sparry calcite-filled veins (Figure 7m, n) and iron oxide-filled intersecting stylolites (Figure 7m, n) are also present.

Table 3. Microscopic properties of samples taken from Dedetepe measured stratigraphy section

Sample	Calcite %	Dolomite %	Fossil %	Intraklast %	Ooid %	Pellet %	Spar %	Micrite %	Rock name
C-282	100	-	20	14	-	5	-	61	Packstone
C-268	100	-	47	-	-	-	-	53	Packstone
C-257	100	-	30	9	-	-	-	61	Packstone
C-239	92	8	-	-	-	-	8	92	Mudstone
C-157	-	1000	-	-	-	-	96	4	Dolostone
C-140	-	100	-	-	-	-	100	-	Dolostone
C-106	1	99	-	-	-	-	95	5	Dolostone

C-77	-	100	-	-	-	-	100	-	Dolostone
C-52	5	95	-	-	-	-	97	3	Dolostone
C-30	-	100	2	-	-	-	100	-	Dolostone
C-18	-	100	-	-	-	-	100	-	Dolostone
C-12	-	100	-	-	-	-	100	-	Dolostone
C-5	-	100	-	-	-	-	92	8	Dolostone
C-1	-	100	5	-	-	-	95	-	Dolostone

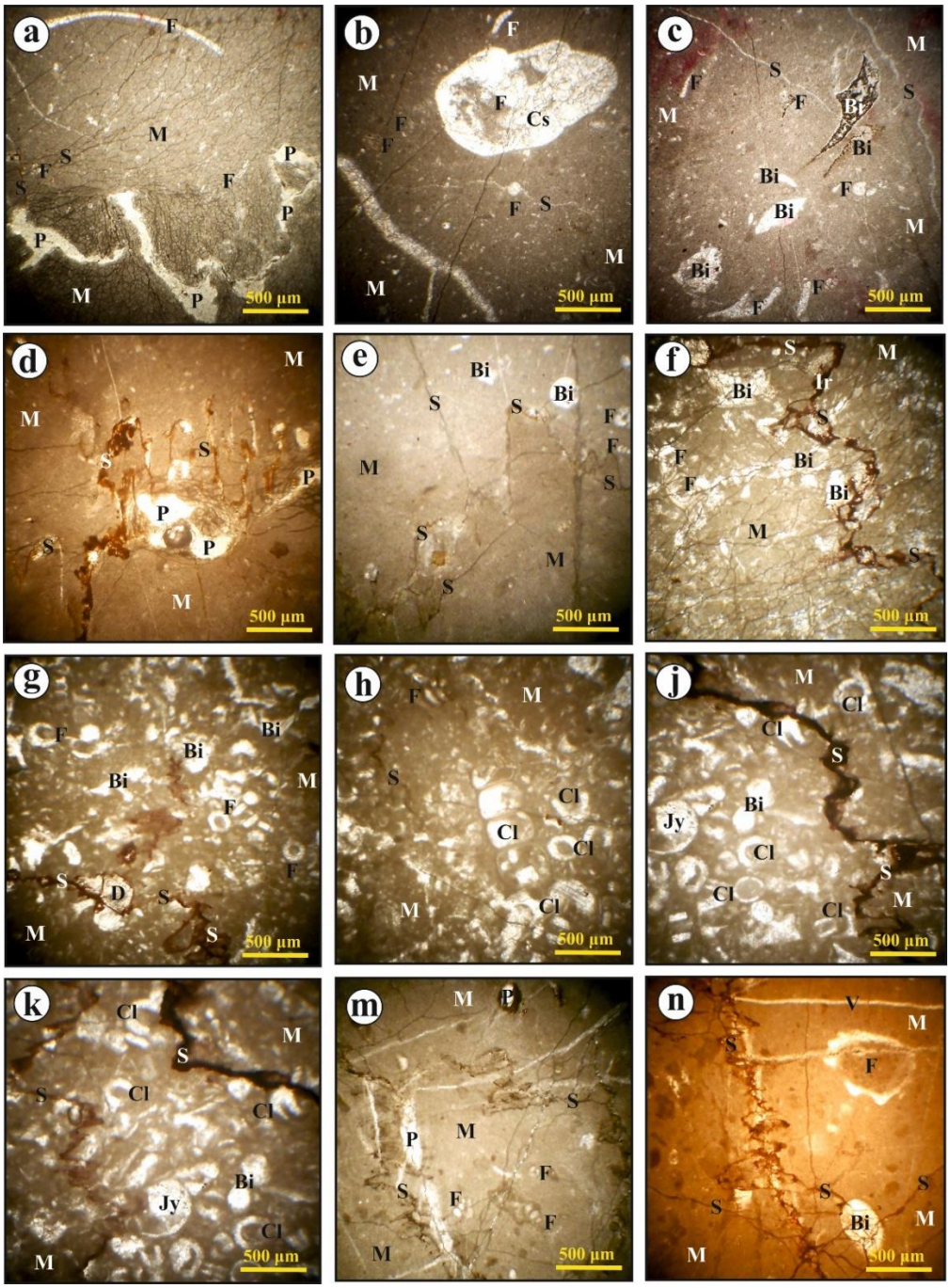

Figure 7. Microphotographs of samples taken from the Dedetepe measured stratigraphy section.

a) Packstone, micrite (M), Fossil (F), stylolite (S), porosity (P) (Sample no: C-257), b) Packstone, micrite, Fossil, stylolite, sparry calcite-cement (Cs), vein (Sample no: C-257), c) Packstone, micrite, fossil, stylolite, bio-mold (Bi), iron oxide (Ir) (Sample no: C-257), d) Packstone, micrite, iron oxide filled stylolite, porosity (Sample no: C-257), e) Packstone, micrite, fossil, stylolite, bio-mold, (Sample no: C-257), f) Packstone, micrite, fossil, iron oxide filled stylolite, bio-mold, iron oxide (Sample no: C-268), g) Packstone, micrite, fossil, iron oxide filled stylolite, bio-mold, dolomite (D) (Sample no: C-268), h) Packstone, micrite, fossil, stylolite, Clypeina (Cl) (Sample no: C-268), j) Packstone, micrite, bio-mold, iron oxide filled stylolite, Clypeina, geopetal structure (Jy) (Sample no: C-268), k) Packstone, micrite, bio-mold, iron oxide filled stylolite, Clypeina, geopetal structure (Sample no: C-268), m) Packstone, micrite, fossil, iron oxide filled stylolite, porosity (Sample no: C-282), n) Packstone, micrite, fossil, bio-mold, iron oxide filled stylolite, vein (V) (Sample no: C-282) (All photos were taken in the PPL)

REFERENCES

Compton, R. R. (1962) Manual of Field Geology. New York: *John Wiley & Sons, Inc*.

Demirkol, C. (1981). Sultandağ kuzeybatısının jeolojisi ve Beyşehir-Hoyran Napı ile ilişkileri, Tübitak Temel Bilimler Araştırma Grubu, Proje no: TBAG-382, 56 s. (unpublished).

Dunham, R. J. (1962). Classification of Carbonate Rocks According to Depositional Texture. *Am. Assoc. Pet. Geol*., *1*, 108-121.

GoogleMaps: https://www.google.com/maps/@37.5369627,39.5182898,5z/data=!5m1!1e4

Özkan, A. M. and Dinç, S. (2008). Hadim (Konya) dolayındaki karbonat kayaçların (Üst Jurasik) sedimentolojisi, *Selçuk Üniversitesi Bilimsel Araştırma Projesi*, Proje no: 05401032.

Turan, A. (1990). Toroslar′da Hadim (Konya) ve güneybatısının jeolojisi, stratigrafisi ve tektonik gelişimi; *Selçuk Üni. Fen Bil. Enst*., Doktora Tezi, 229 s. (unpublished).

Turan, A. (1997). Bağbaşı ve Korualan kasabaları (Hadim-Konya) arasındaki otokton ve allokton birliklerin stratigrafisi; *S.Ü. Müh.-Mim. Fak. Derg*., 12 (1), 46-62.