BULLETIN OF THE MINERAL RESEARCH AND EXPLORATION

Foreign Edition 1995 Number 117

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POSTAL ADDRESS

Maden Tetkik ve Arama Genel Müdürlüğü
Bilimsel Dokümantasyon ve Tanıtma Dairesi
Neşriyat Servis Şefliği
06520 Ankara - TURKEY

Indexed and abetracted in: Current Bibl. of Middle East Geology, Mineralogical Abstracts. Pascal

Publication schedule and subscriptions

The Bulletin of the Mineral Research and Exploration (MTA) is published twice yearly. Each issue appears in Turkish and foreign editions. It covers the whole range of Geology (Paleontology. Mineralogy, Geochemistry) and Mining.

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Maden Tetkik ve Arama Genel Müdürlüğü (MTA)
Bilimsel Dokümantasyon ve Tanıtma Dairesi Başkanlığı, Neşriyat Servis Şefliği
06520 Ankara-TURKEY

by General Directorate of Mineral Research and Exploration (MTA)
ISSN 0026 - 4563

Printed: 1998

The referees for this issue.

Mineral Res. Expl. Bull., 117, 1-4, 1995

LATE TRIASSIC (CARNIAN) UNCONFORMITY IN A BLOCK OF THE LATEST CRETACEOUS VOLCANIC OLISTOSTROME UNIT IN THE IZMIR-ANKARA ZONE

Orhan KAYA*; Walid SADEDDİN**; Demir ALTINER* and Güssun AKAY*

ABSTRACT.- In a huge block within the Latest Cretaceous volcanic olistostrome Unit in the Izmir-Ankara zone, nonmetamorphic epidastic and carbonate Late Triassic (Carnian) strata rest unconformably on metacarbonate. Abundant sand-sized detritus of serpentinite occur in the Late Triassic strata. The unconformity is comparable, with respect to stratigraphic setting, with that in the northerly-lying Late Triassic turbidite-olistostrome zone, between the low-grade metamorphic basement and the Late Triassic sedimentary cover.

INTRODUCTION

The redefined Izmir-Ankara zone is characterized by an outcrop belt of the Latest Cretaceous volcanic olistostrome unit bounded by steepened thrust faults (Kaya, 1992). In the İzmir-Ankara zone,

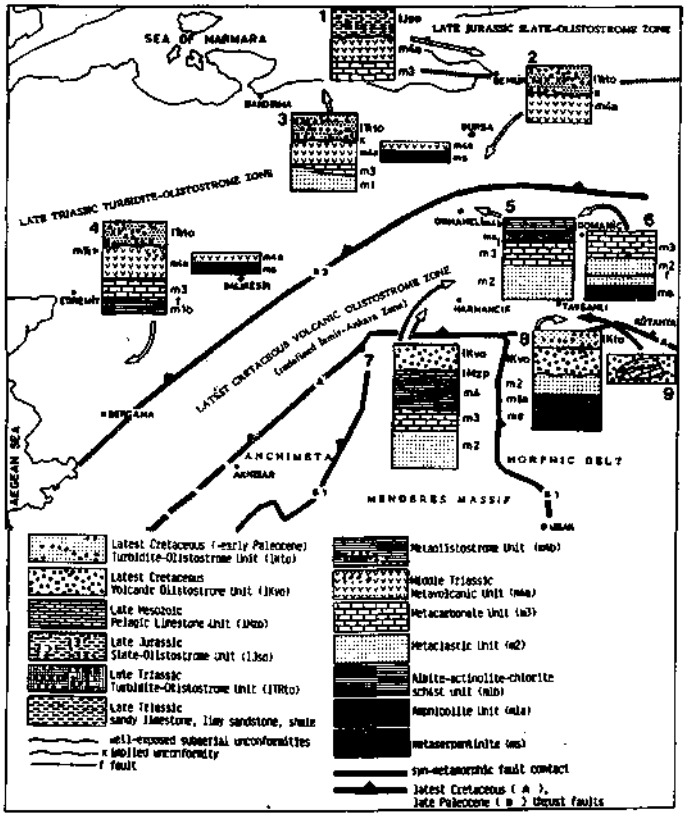

Fig. 1- Structural-stratigraphic settings of the low-grade metamorphic (greenschist and blueschist fades) rocks in the northwestern parts of Anatolia (Kaya 1992). 1- Kaya and Kozur (1987); 2- Kaya Özkoçak and Lisenbee (1989); 4- Kaya and Mostler (1992); 3-8- Kaya in prep.; 9- this report. Arrows indicate the type localities.

the Latest Cretaceous volcanıc olistostrome unit overlies unconformably the low-grado metamorphics and serpentinized ultramafic tectonites, and the faults separating these basement entities. In the northerly-lying Late Triassic turbidite-olistostrome zone, the Late Triassıc turbidite-olistostrome unit rests unconformably on the low-grade metamorphics with an early termination of Middle Triassic (Kaya and Mostler, 1992), and serpentinites.

The objective of this report is to describe the internal stratigraphy of a composite block within the Latest-Cretaceous volcanic olistostrome and to make an approach to its provenance. W. Sadeddin and D. Altıner investigated the conodonts and foraminifers, respectively. Preparatory works were done by G. Akay.

REGIONAL GEOLOGY

Major rock units in the report area (fig.2) include the ultramafic unit, the amphibolite unit and the Latest Cretaceous volcanic olistostrome unit.

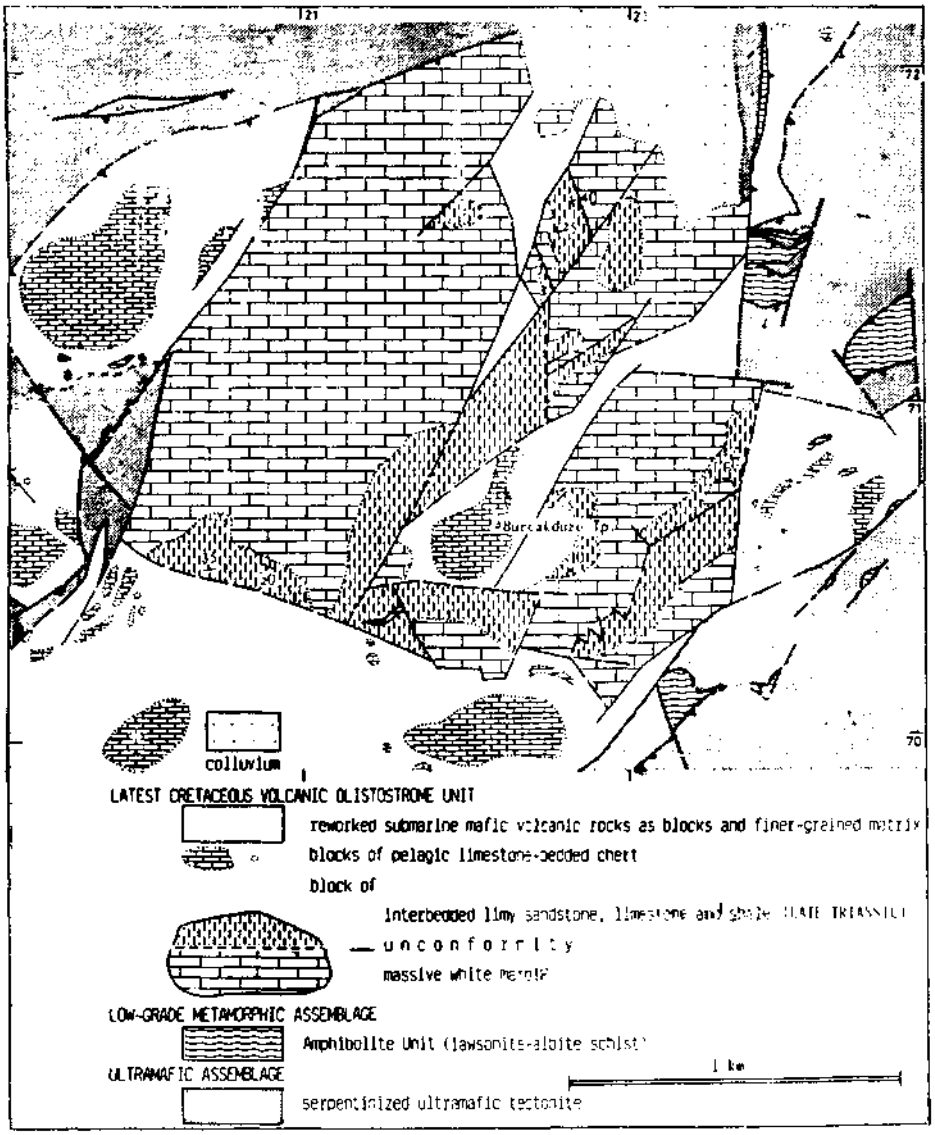

Fig. 2- Geological setting and internal stratigraphy of the studied block in the Latest Cretaceous volcanic olistostrome unit. See Fig. 1, sequence 9. Topographic sheet: J23-a1

Ultramafic unit

The ultramafic rock, are dunite and harzburgite tectonites that are penetratively serpentinized and pervasively sheared. Jasperoid masses, alteration products of the serpentinites, are widespread.

Amphibolite unit

Amphibolites exhibit a well developed layering caused by predominating dark colored laminae and thinner and laterally discortinuous light colored laminae, which are less than a milimeter width. Principle components are barroisitic Ca-amphibole, glaucophane-crossite, chlorite, plagioclase, lawsonite and quartz. Other minerals that may be present locally in large amounts, are white mica, epidote-clinozoisite, garnet, sphene and opaques. An earlier Low-grade greenschist mineral assemblage appears to have retrograded to the blueschist assemblage (Kaya, 1981). The amphibolites occur as thrust slices bounded by serpentinites and their silicified varieties.

Latest Cretaceous volcanic olistostrome unit

This unit consists of green to reddish brown volcanogenic shale and sand to pebble-sized re worked submarine mafic volcanic rocks, and floating or intimately admixed blocks. The blocks include primarily mafic volcanic rocks and subordinately pelagic limestones, bedded cherts, amphibolites, metavolcanic and metaclastic rocks, metacorborates, and in still smaller amounts, platform-type limestones and lithic sandstone-shale magasequences. The supporting matrix rocks are barren of fossils. Unconformable contact between the volcanic olistostrome unit and the underlying ultramafic and low- grade metamorphic rocks is exposed outside the report area. On the basis of rows of blocks of comparable lithologies and long axis orientations of blocks an internal stratigraphy can be established for this unit.

The studied composite block of metacarbonate and Late Triassic sedimentary rocks is closely associated with various carbonate blocks, and bounded from top and sides by the supporting matrix rocks. In the adjoining areas rnetacarbonates acting as basement are absent.

INTERNA STRATIGRAPHY AND AGE OF THE BLOCK

The huge block (Fig. 2) in the volcanic olistostrome unit consists of two parts: (1) the metacarbonate and (2) the unconformably overlying sedimentary assemblage of epiclastic and carbonate rocks. The metacarbonate is light gray to white, massive, ho nogeneous and coarse to very coarse-grained calute-marble Complexely intersecting planar calcity veins up to 0.5 cm in width related to its dynamometamorphic history, are widespread. The sedimentary part of the block consists, in a generalized ascending order, of pale red, thinly and unevenly bedded sandy limestone, limestone pebble conglomerate with clasts of metacarbonates up to 20 cm in size; dark gray to yellowish gray, thinly interbedded shale and sandy limestone with minor pink limestone interlayers; greenish gray and thin to medium-bedded limy lithic sandstone with abundant intrastratal, sinouus feeding traces up to 1 cm in width and 30 cm m length, and, lenticular gray limestone. The lithic sandstones and in parts sandy limestones contain sand-sized detrital sarpentinite, chlontized serpentinite and related opaques. The above stratigraphic horizons show remarkable variation in lateral extent. The basal strata a/6 given in Fig. 3.

The interbedded shale and limestone part of the sedimentary sequence carries abundant severely recrystaliizad algae and foraminifers. The latter include *Aulotortus* sp. and Involutinidae, indcating a

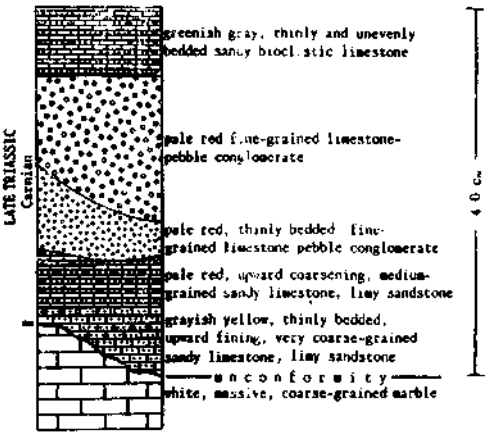

Fig. 3. Well-exposed unconformity between the Late Triassic sedimentary assemblage and underlying metacarbonate (J23-a1, 21.73:71.37).

broad age of Triassic. The conodont fauna comprises *Epigondolella pseudodiebeli* (Kozur), *Gondolella auriformis* Kovacs, G. *noah* (Hayashi), transitional form between G. *noah* (Hayashi) and G. *polygnathiformis* Budurov and Stefanov, *Crathognathodus kochi* (Huckriede), *Enantiognathus* sp. ? Cornudina cf. *breviramulis* and *Gondolella* sp. (plate). G. *auriformis, E. pseudodiebeli and* G. *noah,* as a whole, are indicative of a Carnian age.

POSSIBLE PROVENANCE FOR THE BLOCK

In the Late Triassic turbidite-olistostrome zone (Fig.1),the Middle Triassic (Anisian/Ladinian boundary) early termination of the low-grade metamorphic sequence to the north of Bergama (Kaya and Mostler, 1992), on the ground of conodont evidence, points out to the pre-Carnian stratigraphic setting of the metacarbonate unit (Fig. 1, sequence 4). The Carnian unconformity can be compared with the unconformity between the Middle Triassic and earlier sequence of low-grade metamoiphic rocks and the Late Triassic turbidite-olistostrome unit. The abundant sand-sized detritus of serpentinite in the sedimentary part of the studied block correlates with the metaserpentinites and less affected ultramafics, which occur as structurally concordant and syntectonically metamorphosed thrust slices in the low-grade metamorphic sequence (Kaya, 1988,1992). The turbidite-olistostrome unit contains several blocks of low-grade metaclastics enclosing blocks of metaserpentinite (into block-in-block relationship) supporting the presence of pre-Late Triassic ultramafics (Kaya and Kozur, in prep.).

In conclusion, the metacarbonate part of the studied block may correlate, with respect to its relative age, with the metacarbonate unit to the north of the Izmir-Ankara zone. The sedimentary part may suggest either to have once preceded the Late Triassic turbidite-olistostrome unit, or to be its facies equivalent.

Manuscript received November 19, 1992

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PLATE

PLATE -I

Fig. 1- *Epigondolella pseudodiebeli* (Kozur)
(a) lateral view, (b) lower view, X90

Fig. 2- *Gondolella auriformis* Kovacs
a) lateral view, b) lower view, c) upper view, X160
d) lower view, X220, e) lateral view, X128
f) upper view, g) lower view, X175
h) upper view, i) lateral view, X220
j) upper view, k) lower view, X175

Fig. 3- *Gondolella noah* (Hayashi), juvenile, lateral view, X150

Fig. 4- G. cf. *noah* (Hayashi)
a) lateral view, b) lower view, c) upper view, X150

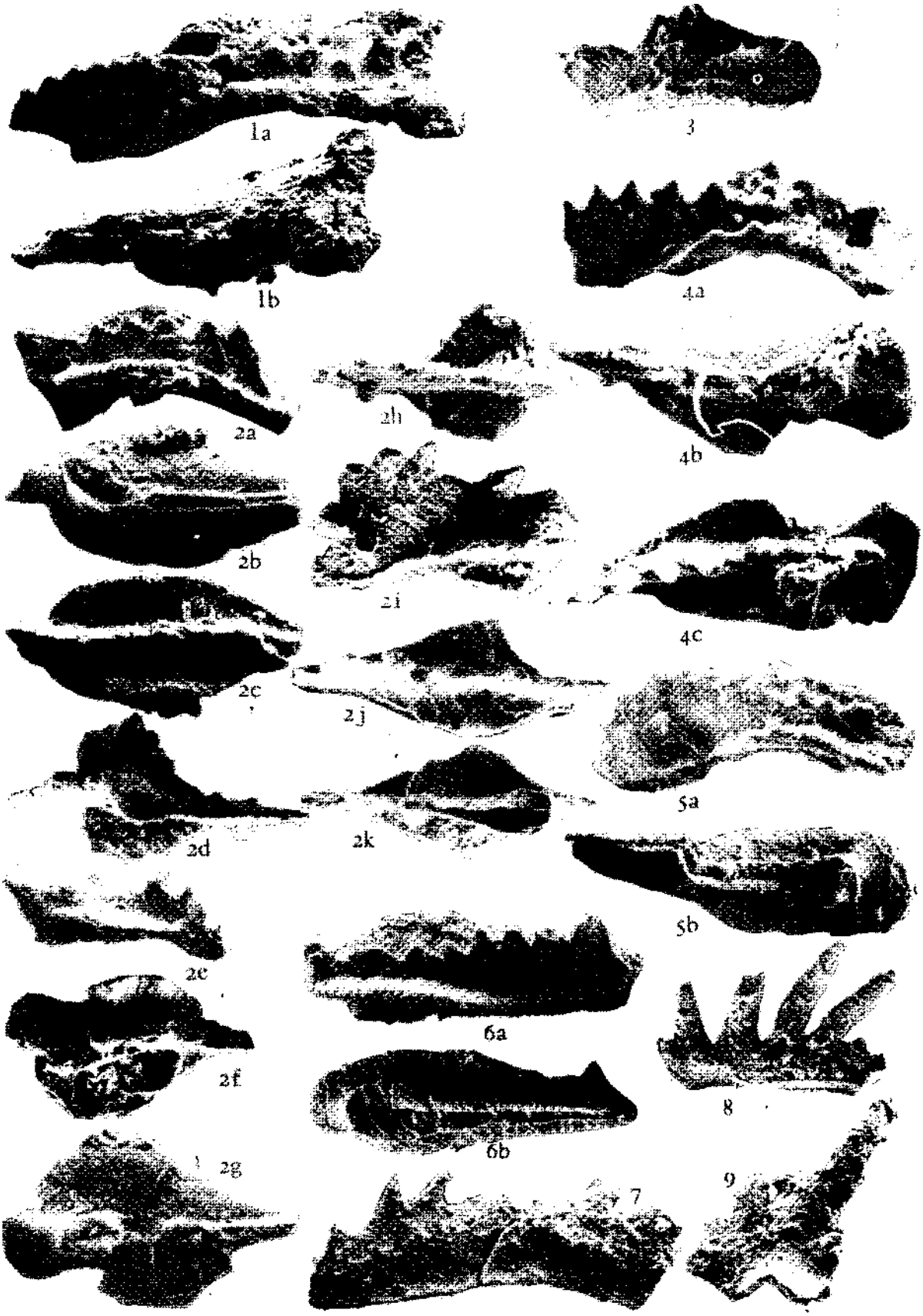
Fig. 5- Transtional form between G. *noah* (Hayashi) and G. *polygnathiformis* Budurov and Stefanov
a) lateral view, b) lower view, X120

Fig. 6- *Gondolella* sp.
a) lateral view, b) lower view, X140

Fig. 7- *Cratognathodus kochi* (Huckriede), X110

Fig. 8- *Enantiognathussp.,X175*

Fig. 9- *? Comudina* cf. *breviramulis,* X145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