

turkish journal of EARTH SCIENCES

http://journals.tubitak.gov.tr/earth/



Published by the Scientific and Technological Research Council of Turkey

TURKISH JOURNAL OF EARTH SCIENCES

Editor-in-Chief Assistant Editor-in-Chief Baochun HUANG, Peking University, P.R. China **VOLUME 31 • ISSUE 5 • 2022**

SCOPE OF JOURNAL

- The Turkish Journal of Earth Sciences is published electronically 6 times a year by the Scientific and Technological Research Council of Turkey (TÜBİTAK).
- It is an international English-language journal for the publication of significant original recent research in a wide spectrum of topics in the earth sciences, such as geology, structural geology, tectonics, sedimentology, geochemistry, geochronology, palaeontology, igneous and metamorphic petrology, mineralogy, biostratigraphy, geophysics, geomorphology, palaeoecology and oceanography, and mineral-deposits.
- The journal publishes the highest quality papers and comprehensive review papers on hot topics of current interest, with high quality illustrations.
- Submitted papers should have regional implications and attract international interest as the journal aims to provide a medium for interdisciplinary papers that would be of interest to many different specialists.
- Specialized papers can be submitted if they illustrate significant progress in that specific area of the earth sciences. In addition to original and review articles, we are also interested in publishing discussions of papers that have already appeared in recent issues of the journal.
- The journal also publishes thematic sets of papers on topical aspects of geology or special issues of selected papers from conferences.
- Short articles (6 printed pages maximum) for rapid publication reporting a significant advance in the earth sciences with regional impact are welcome. Contribution is open to researchers of all nationalities.

EDITORIAL BOARD

- A. M. Celal SENGÖR. İstanbul Technical University. Turkey
- Abdurrahman DOKUZ, Gümüşhane University, Turkey
- Abidin TEMEL, Hacettepe University, Turkey
- Alan COLLINS, University of Adelaide, Australia
- Ali İhsan KARAYİĞİT, Hacettepe University, Turkey
- Alper BABA, İzmir Institute of Technology, Turkey
- Anastasia KIRATZI, Aristotle University of Thessaloniki, Greece
- Anatoly NIKISHIN, Moscow State University, Russian Federation
- Aral OKAY, İstanbul Technical University, Turkey
- Bilal SARI, Dokuz Eylül University, Turkey
- Bing SHEN, Peking University, China
- Cenk YALTIRAK, İstanbul Technical University, Turkey
- Chunming WU, University of Chinese Academy of Sciences, China
- Cüneyt ŞEN, Karadeniz Technical University, Turkey
- Dornadula CHANDRASEKHARAM, Indian Institute of Technology, India
- Ercan ALDANMAZ, Kocaeli University, Turkey
- Ercan ÖZCAN, İstanbul Technical University, Turkey
- Erdin BOZKURT, Middle East Technical University, Turkey
- Erhan ALTUNEL, Eskişehir Osmangazi University, Turkey
- Gültekin TOPUZ, İstanbul Technical University, Turkey
- Gürol SEYİTOĞLU, Ankara University, Turkey
- H. Serdar AKYÜZ, İstanbul Technical University, Turkey
- Hadii Shafaii MOGHADAM, Damghan University, Iran
- Halil GÜRSOY, Sivas Cumhuriyet University, Turkey
- Haluk ÖZENER, Boğaziçi University, Turkey
- Hasan SÖZBİLİR, Dokuz Eylül University, Turkey Iain STEWART, University of Plymouth, United Kingdom
- İsmail Ömer YILMAZ, Middle East Technical University, Turkey
- John D. A. PIPER, University of Liverpool, United Kingdom

ABSTRACTED AND INDEXED

- Science Citation Index Expanded
- Scopus
- Academic Search Complete
- Inspec

- Leigh ROYDEN, Massachusetts Institute of Technology, U.S.A.
- M. Cihat ALCICEK. Pamukkale University. Turkey
- Marco BOHNHOFF, GFZ Helmhotz Centre Postdam, Germany
- Miklos KAZMER, Eotvos University, Hungary ٠
- Muazzez ÇELİK KARAKAYA, Konya Technical University, Turkey •
- Mustapha MEGHRAOUI, University of Strasbourg, France
- Naki AKÇAR, Bern University, Switzerland ٠
- Nilgün GÜLEÇ, Middle East Technical University, Turkey .
- Nuretdin KAYMAKÇI, Middle East Technical University, Turkey .
- Oğuz Hakan GÖĞÜŞ, İstanbul Technical University, Turkey
- Orhan KARSLI, Recep Tayyip Erdoğan University, Turkey
- Osman CANDAN, Dokuz Eylül University, Turkey
- Osman PARLAK, Çukurova University, Turkey
- Özcan YİĞİT, Çanakkale Onsekiz Mart University, Turkey
- Qingiu WU, Institute of Geophysics, China
- Riccardo CAPUTO, University of Ferrara, Italy
- Sanzhong LI, Ocean University of China, China
- Sarah BOULTON, Plymouth University, United Kingdom
- Seda YOLSAL ÇEVİKBİLEN, İstanbul Technical University, Turkey ٠
- ٠ Semih ERGİNTAV, Boğaziçi University, Turkey
- ٠ Sevinç ÖZKAN ALTINER, Middle East Technical University, Turkey
- Spyros PAVLIDES, Aristotle University of Thessaloniki, Greece
- Timur USTAÖMER, İstanbul University-Cerrahpaşa, Turkey
- Uwe RING, Universiitaet Mainz, Germany
- William CAVAZZA, Università di Bologna, Italy
- Yener EYÜBOĞLU, Karadeniz Technical University, Turkey
- Yixian XU, Zhejiang University, China
- Yunpeng DONG, Northwest University, China
- •

CONTENTS

Late Ediacaran inertial-interchange true polar wander (IITPW) event: a new road to reconcile the enigmatic paleogeography prior to the final assembly of Gondwana
A history of <i>Pistacia lentiscus</i> and <i>Pinus brutia</i> trees and their ecological changes in the Güllük Bay (Muğla, SW Turkey) during the last 400 years
Sedimentary records of trace elements contamination in sediment core from the Gulf of Gemlik, Marmara Sea, Turkey: history, contamination degree, and sources
A preliminary account on Devonian trilobites from Arabian Plate, SE Turkey
Shear wave velocity estimation based on the particle swarm optimization method of HVSR curve inversion in Bakauheni district, Indonesia

Ahmad ZAENUDIN, I Gede Boy DARMAWAN, Alhada FARDUWIN Rahmat Catur WIBOWO