

## Biomarker characteristics of organic-rich rocks from two tertiary basins, west and northwest Turkey

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Organic matter rich rocks, belong to Oligocene aged Hayrettin Formation expanding to the northwest of Acıgöl (Denizli/West of Turkey), Paleocene Kabalar Formation (Göynük/Bolu, North West of Turkey) and Eocene Tokmaklar Formation (Mengen/Bolu, North West of Turkey) were investigated in terms of biomarker characteristics. The dominant rock assemblages of the Hayrettin Formation are sandstones with a different grain size, which alternations conglomerate and mudstone with lignite. The high pristane/phytane (Pr/Ph) ratios (0.79-7.85), low C<sub>35</sub> homohopane index (0.02-0.07) indicates that Hayrettin Formation carbonaceous rocks were deposited in a suboxic environment. High concentrations of C<sub>29</sub> steranes (C<sub>29</sub> > C<sub>28</sub> > C<sub>27</sub>) and C<sub>26</sub>/C<sub>25</sub> tricyclic terpane ratios (1.00 and 1.18) indicate that these samples formed in a peat-swamp environment. On the basis of biomarker maturity parameters, Hayrettin Formation carbonaceous rocks are immature. Paleocene Kabalar formation and Eocene Tokmaklar formation are the hydrocarbon source rocks in Bolu Basin. The Kabalar formation (Göynük/Bolu) is generally composed of shale, marl, mudstone and oil limestones which are rich in organic matter. The Tokmaklar formation (Mengen/Bolu) consists of limestone, marl, claystone, oil shale, mudstone, siltstone, clayey and sandy limestone, sandstone and conglomerate. Limestones and marls are intercalated with thin coal bands and oil shale levels. Pr/Ph (0.65 and 0.3), Pr/nC<sub>17</sub> (0.65 and 0.3), and Ph/nC<sub>18</sub> (14.0 and 16.0) ratios, and the presence of the C<sub>23</sub> tricyclic terpane and gammacerane in some samples, and stable carbon isotope ( $\delta^{13}\text{C}$ ) compositions of the saturated and aromatic hydrocarbon fractions from Bolu (NW of Turkey) oil shales suggests that these shales may reflect the shallow marine depositional environment. The distribution of C<sub>31</sub>-C<sub>35</sub> homohopanes and Ts/Tm ratios of these samples indicate that anoxic-suboxic environment. The maturation degree of the oil shales is immature-early mature stage according to C<sub>30</sub> hopane/C<sub>30</sub> moretane ratio.