Zgornjetriasno izumrtje v družbi »velikih pet«

Tomaž Hitij

The Triassic–Jurassic extinction event
The end of the Triassic was, similar to its beginning, marked by a mass extinction event. The Triassic–Jurassic extinction event was one of the "Big Five" extinction events in the Earth's history (BENTON, 1995; SEPKOSKI, 1996, 1997; KEMP, 1999; LUCAS, 1999; PÁLFY *et al.*, 2002). It was particularly severe in the oceans. More than one fifth of marine families and possibly about half of marine genera became extinct (NEWELL, 1963; SEPKOSKI, 1997). Ammonites, brachiopods, gastropods, and mollusks were severely affected, the conodonts disappeared, and all the marine reptiles except ichthyosaurs and plesiosaurs went missing (NEWELL, 1963, TANNER *et al.*, 2004). We do not know with certainty what caused this Upper Triassic extinction. However, most certainly it was accompanied by massive volcanic eruptions that occurred as the supercontinent Pangaea began to break apart about 202 to 191 million years ago. The Central Atlantic Magmatic Province (CAMP) was formed. CAMP was one of the largest known inland volcanic events since the planet cooled and stabilized (PÁLFY *et al.*, 2001; RETALLACK, 2001; HESSELBO *et al.*, 2002).
A new Jurassic period began and the dinosaurs stepped out of the shadow to rule the Earth for the next 135 million years. 65 million years later, strange mammals conquered the Earth. Just in 100 years they caused the Earth to come close to another "runaway greenhouse" phenomenon. Is this going to be the first time that the "animals" themselves are going to cause a mass extinction event?

Tako kot začetek se je tudi konec triasnega obdobja končal z izumiranjem številnih vrst rastlin in živali. Zgornjetriasno izumrtje sodi med »velikih pet« izumrtij v zemeljski zgodovini (BENTON, 1995; SEPKOSKI, 1996, 1997; KEMP, 1999; LUCAS, 1999; PÁLFY *et al.*, 2002) in označuje mejo med triasom in juro (pred 199,6 milijoni let). Izumiranje je še posebej močno prizadelo življenje v oceanih, kjer je izginilo

22 % družin in približno 50 % vseh rodov (Newell, 1963; Sepkoski, 1997). Izumrli so vsi konodonti, vsi morski plazilci, razen ihtiozavrov in pleziozavrov. Zelo močno so bili prizadeti tudi amoniti, ramenonožci, polži in školjke. Davek pa je izumiranje terjalo tudi na kopnem. Izginili so krurotarsi (veliki arhozaverski plazilci), nekateri preostali terapsidi, večina velikih dvoživk, skupine manjših plazilcev in sinapsidi (razen protosesalcev) (Newell, 1963, Tanner *et al.*, 2004). Med rastlinami so preživele sodobne oblike iglavcev in sagovci, ki so nato zavladali v mezozoiku (McElwain *et al.*, 1999). Številne izmed naštetih skupin so že bile v počasnem upadu proti koncu triasa, nekatere pa so nenadno izginile (Tanner *et al.*, 2004). Vzorki za triasno-jursko izumiranje še niso dokončno razjasnjeni. Omenja se

veliko vzrokov, predvsem vulkanske izbruhe (McElwain *et al.*, 1999; Marzoli *et al.*, 1999; Wignall, 2001; McHone, 2003). Kot mogoč vzrok se omenja tudi padec bolida (Olsen *et al.*, 2002a, b), vendar je jezero Manicouagan krater, ki ga je izkopal bolid, za dobrih 10 milijonov let prestaro, da bi bil lahko padec bolida edini in neposredni vzrok za izumrtje. Za verjetnejšega povzročitelja velja Centralna Atlantska Magmatska Pokrajina oz. CAMP, ki je predstavlja enega izmed največjih kopenskih vulkanskih dogodkov. Nastala je zaradi razpadanja Pangee pred približno 202 do 191 milijona let. Močni odkloni v morskih ogljikovih izotopih kažejo na pomembne odklone v ciklu ogljika na triasno-jurski meji. Zato so prav tako kot pri permsko-triasnem izumrtju, metanovi hidrati, ki so se sproščali iz oceanskega dna, eden od pomembnih osumljencev za izumiranje (model t. i. pobeglega učinka tople grede) (Pálfy *et al.*, 2001; Retallack, 2001; Hesselbo *et al.*, 2002). Najverjetneje pa je izumiranje povzročila kombinacija naštetih vzrokov (Tanner *et al.*, 2004). Prazne ekološke niše so zapolnili dinozavri, ki so Zemlji vladali nadaljnjih 135 milijonov let.

65 milijonov let kasneje pa so Zemlji zavladala nenavadna živa bitja – ljudje. In morala se bodo zamisliti. Kajti, če je model pobeglega učinka tople grede pravilen, ga bodo morala v prihodnosti dobro proučiti in razumeti. Mogoče ne bi smela gledati v nebo, kdaj jih bo zadela velika ognjena skala. Morala bodo ugotoviti, do kakšne mere še lahko naravni mehanizmi vzdržujejo globalno segrevanje, ki ga povzročajo. Mogoče jim bo vendarle uspelo …

Kapelica Marije Snežne na Veliki planini.

The Chapel of Our Lady of the Snows on the Velika planina Mountain.

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