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Biostratigraphy of the Middle and Upper Pleistocene of the Caspian Region

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Biostratigraphy of the Caspian Pleistocene is based on changes in evolutionary patterns and ecological assemblage change of the mollusk genus Didacna Eichwald. The study of peculiarities and patterns in the spatial-temporal distribution of shells of the genus Didacna in the deposits of the middle and upper Pleistocene of the Caspian region showed, that the molluscan fauna represent a complex hierarchical system of assemblages with different composition and at different taxonomic levels: faunas, complexes, subcomplexes, associations, distinguished following particular criteria. Based on molluscan fauna, namely on distinguished faunal units at different hierarchical levels, we built a regional biostratigraphic (ecostratigraphic) scheme of the Middle and Upper Pleistocene (Neopleistocene according to Russian stratigraphic sheme) of the Caspian, supplementing and specifying the exisiting schemes. Caspian Middle and Upper Pleistocene (Neopleistocene) represent a Didacna biozone - deposits encompassing the entire stratigraphic interval of this taxon distribution. Based on temporal distribution of faunas, the zone is subdivided into subzones, which become the biostratigraphic basis for establishment of horizons: Baku, Urunjik, low Khazar, upper Khazar, Khvalynian and New Caspian. From the point of view of palaeogeography these horizons correspond to transgressive epochs with the same names in the Caspian history, which resulted in accumulation of sediment complexes, filled with particular paleontological material – mollusk faunas. Interval-zones, characterized by faunal complexes, are used for distinguishing subhorizons. From the point of view of palaeogeography they correspond to major transgressive stages, separated by regressions, within the transgressive epochs, which is reflected in the sediment structure and presence of distinguishing mollusk complexes. The subhorizons reflect three transgressive stages during Early Khazar epoch, two transgressive stages during Late Khazar epoch, and two stages during Khvalynian epoch. Subcomplexes are used to define beds. We established the lower and upper Baku layers for Baku horizon, the lower and upper Urundjik layers for Urundjik horizon, the lower, middle and upper New Caspian layers for New Caspian horizon. From the point of view of palaeogeography they correspond to divers (for example, the beginning and the end) phases of the transgressions and there stages. Mollusc associations show the facies diversity of all from established subdivisions. The index and characteristic (controlling) species are distinguished for all stratigraphic units.
Type localities for faunas, faunal complexes and subcomplexes were suggested for distinguished stratigraphic units. All of them are located in well stratified sections, available for investigation and previously thoroughly studied. Besides malacofauna they contain other fossil remains (ostracodes, foraminifers, pollen, carpologic material etc.), the data on which, as well as on paleomagnetism, absolute chronology, lithology and geomorphology, were taken into consideration for their selection. The propositional biostratigraphic scheme is the ecostratigraphic and paleoevents scheme too, because the all distinguished stratigraphic units are related to palaeogeographic events at variable hierarchical levels (transgression, stage, phase) in the development of the Caspian Sea.