

tion of fresh water discharge will decrease the primary productivity and endanger the fishery resources. According to the statistics in early 1990s, there were about 38 billion m<sup>3</sup> of water flowing into the Laizhou Bay<sup>[9]</sup>. In recent years the excessive irrigation projects in the upstream region resulted in the sharp decrease of fresh water discharge from the Yellow River. In 1997, the low stream of the Yellow River dried for 226 d. This will directly affect the productivity and fishery resources in the Laizhou Bay, especially for the estuary fish species. For example in 1950s, estuary tapertail anchovy (*Coilia ectenes*) could go to Dongping Lake<sup>[10]</sup>, but now it is even difficult to find a specimen because the low stream of yellow River dries when estuarine tapertail anchovy (*Coilia ectenes*) spawns. Before 1980s, the crossing-river species, such as large icefish (*Protosalanx hyalocranius*), sharphead icefish (*Salanx acuticeps*), which belong to Salangidae, dominated, but now the dominant species are Andrsson's icefish (*Neosalanx anderssoni*), a kind of estuary species. Therefore, the reduction of the Yellow River fresh water discharge will negatively affect the fish species diversity and fishery resources in the Laizhou Bay, and endanger the fish-

ery ecological system in the Yellow and Bohai Sea.

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## 莱州湾及黄河口水域地理学特征与鱼类多样性

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**摘要:**以历史和调查资料为基础,介绍了莱州湾及黄河三角洲的地理位置及其发育史,指出莱州湾是一个年轻的海湾,而黄河三角洲则是一个不稳定的河口三角洲。莱州湾地质构造复杂,东部为上升区,西部属沉降区;黄河三角洲则属于淤泥岸坡,沉积物呈从东向西,由南向北逐渐细化为特征。其水文特征因地处暖温带北缘,属季风气候区。在陆上气候、黄河冲淡水 and 黄海冷水团交互影响下,本水域形成温、盐季节变化显著,逆时针环流、往复流性质的潮流及以 M<sub>2</sub> 潮汐余流占主要地位的余流特征。出现的鱼类共有 46 科, 96 种,几乎覆盖黄渤海软骨和真骨鱼类的主要科、属及其习见种类,但无地方特有种。与黄渤海 326 种鱼类相比,仍属黄渤海生物区系的贫乏化表现。在适温类型上,仍以暖温种占优势,占 63.54%,暖水、冷温种分别占 20.04% 和 10.42%,无冷水种。其生态分布型,洄游性鱼类占优势,为 56.25%,定居型占 36.46%,河口性鱼类仅占 7.29%。认为现代莱州湾与黄河口水域的短暂发育史难以产生高丰度的物种多样性,同时,该水域的水文特征也不利于生物多样性的发展;还探讨了地质条件与鱼类生物多样性分布关系和黄河径流锐减将危及鱼类生物多样性与渔业资源问题。

**关键词:**莱州湾;黄河口;地理学;鱼类多样性