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To cite this article: G. Parisi, G. Giorgi & D. Michelotti (2007) Quality and quality changes during refrigerated storage in diploid and triploid oysters from Orbetello Lagoon (Italy), Italian Journal of Animal Science, 6:sup1, 815-815, DOI: [10.4081/ijas.2007.1s.815](https://doi.org/10.4081/ijas.2007.1s.815)

To link to this article: <https://doi.org/10.4081/ijas.2007.1s.815>



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Published online: 15 Mar 2016.



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ABSTRACT

The aim of this study was to evaluate the chemical and nutritional characteristics and quality decay during storage of diploid and triploid Pacific oysters (*Crassostrea gigas*) reared in Orbetello Lagoon (Grosseto, Italy), a site subject to high variations in environmental parameters. Specimens of diploid (D) and triploid (T) oysters of commercial size and similar age were sampled from an oyster farm (Soc. Coop. GIGAS) in autumn 2005 and in winter, spring and summer 2006. At each sampling date, D (n=60) and T (n=60) oysters were individually weighed, divided into 4 lots, stored under refrigerated conditions (+4°C), and analysed at different times after harvest (1, 3, 7 and 10 days). Oysters were individually weighed again at the different times, measured for maximum length, width and thickness, and opened. The weight of the soft part and shell and the volume of intervalvar liquor were recorded. pH of soft part, gill and mantle colour (CIE L*, a* and b*, Minolta Chromameter) and chemical characteristics (proximate and quantitative fatty acid composition in pooled samples) of soft parts were also analysed. Turbidity of intervalvar liquor was evaluated (by spectrophotometer). A total of 480 specimens (D+T) was studied. For morphological data, the model utilised for the statistical analysis (PROC GLM of SAS Software) included ploidy, season and their interaction as fixed effects; for parameters analysed during storage, the model included ploidy, storage time, season and the interaction between ploidy and storage time. Triploid oysters had greater average (p<0.001) length (102.1 vs 95.7mm), thickness (34.3 vs 28.4mm) and weight (99.3 vs 77.2g) than those diploid. The latter oysters had an inferior market value due to lower economic condition index [thickness/(0.5*(length+width))] (0.38 vs 0.45; p<0.001) and soft part percentage (8.20 vs 12.04%; p<0.001). Differences were also found in chemical characteristics: T showed greater average (p<0.001) dry matter (19.07 vs 14.90%), crude protein (9.47 vs 7.90% w.w.) and total lipid (1.71 vs 0.91%) contents and higher (p<0.01) percentages of C20:5n3 (10.36 vs 8.18%) and PUFAn3 (35.57 vs 28.15%), and lower MUFA (17.72 vs 19.73%; p<0.01) percentage. During storage, T had a higher average weight to length ratio (0.94 vs 0.74; p<0.001), lower weight loss percentage (8.84 vs 10.10%; p<0.05) and higher turbidity of intervalvar liquor (0.754 vs 0.394 absorbance units; p<0.001). T and D differed in colour, T having higher whiteness (L*) and yellowness (b*) of gills and mantle and lower redness (a*) of mantle. Certain parameters reliably reflected changes in oyster quality during storage: percentage weight loss increased significantly from 0% to 12.42% on days 1 and 10, respectively, like pH (days 1-3: 6.19-6.21; day 7: 6.34; day 10: 6.57; p<0.001) while weight/length ratio decreased (from 0.88 to 0.77 on days 1 and 10, respectively; p<0.05). Colour parameters did not change. During storage, trends of parameters were similar in D and T, the interaction between ploidy and storage time never reaching significance. In conclusion, the results confirmed that like D and T oysters from other areas, those from Orbetello Lagoon differ in market and chemical characteristics. The parameters analysed during storage demonstrated the poor average quality of diploid oysters. Further investigations are needed to elucidate the influence of season, which significantly affected almost all the quality parameters analysed, and to highlight the relation between season and quality decay during storage.