

## Introduction

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### ALIEN SPECIES IN EUROPEAN WATERS

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#### Abstract

It is evident that the history of introduction of nonindigenous aquatic species into Europe dates back to pre-historic times. In this paper, we review from a historical perspective some of the human activities that have facilitated the potential of alien species from all continents but Antarctica to become established in coastal and inland waters of Europe.

#### 1 Biological invasions: global challenge for new age

Biological invasions associated with human activities, resulting in global mixing of previously isolated biota, are recognised as one of the major elements of the global change. Many natural dispersal barriers for both terrestrial and aquatic species have been weakened, whereby the number of both potential invaders and remote source areas has increased. Geographic isolation of seas and continents as a creator and conservator of global biodiversity was breached several centuries ago and continues to melt down at increasing rate in recent decades (Bright 1998; Dukes & Mooney 1999; Leppäkoski & Olenin 2001).

Results of this global exchange of species are evident in most seas and inland waters of Europe. Much of its present structural and functional diversity is of foreign origin. We have defined this human-mediated addition of nonindigenous species as xenodiversity (Gr. *xenos* - strange) to indicate diversity caused by nonindigenous (non-native, alien, exotic, introduced) species (Leppäkoski & Olenin 2000). In some heavily invaded aquatic ecosystems, xenodiversity tends to reach and even exceed native biodiversity in terms of the number of species and life forms, and strongly affects the rate of ecosystem functions. Even if the receiving ecosystems can become more diverse in terms of species number they also become more similar to the rest of the world.

Biological invasions, one of the top research areas in current days, have a long history. Ancient tribes and their primeval agriculture, nomadism and lifestyle as hunter-