Abstract: *S. aurata* is a marine fish living along the Atlantic coasts of Europe and the Mediterranean Sea. It is an important food species, so that its production reached 128,943 t in the European aquaculture in 2008. However, little is known on its biology, in particular the effective and census sizes, distribution, spawning grounds and behaviour. Also the species subdivision still needs to be clarified. In this review, studies related with gilthead sea bream populations and problems with the clarification of gilthead seabream population structure in hatchery and wild were reviewed. Also, it was intensified on potential research areas, having importance in determination of population structure of gilthead seabream such as morphology and behaviour in hatchery and wild. Determination of the genetic structure of *S. aurata* populations based on behaviour and morphology will not only contribute greatly to biological clarification of the species but also will help the development strategy for conservation of natural stocks (e.g., protecting the stopover points) and the determination of reference stocks, which is important for the culture of gilthead seabream to use in the genetic improvement programmes.