
On shell morphology and taxonomy of the microgastropod *Setia* (Gastropoda: Rissoidae) inhabiting the Black Sea basin

Vitaliy ANISTRATENKO

I. I. Schmalhausen Institute of Zoology of NAS Ukraine, B. Khmelnytsky Str., 15, 01601, Kiev, UKRAINE, anistrat@ln.ua or anistrat@rambler.ru

ABSTRACT. Based on the protoconch morphology the taxonomic position of the representatives of the genus *Setia* H. et A. Adams, 1852, inhabiting the Black Sea and the Sea of Azov, is revised. Comparative analysis of shell shape and ornamentation of the embryonic shell suggests that this species is *Setia valvatooides* Milaschewitsch, 1909. Detailed description and SEM documentation of shell morphology is provided. The type material is revised and a lectotype for *S. valvatooides* is designated. Some morphological characters which have been used as a basis for establishing the subfamily Setiinae Anistratenko et Starobogatov, 1994 are discussed.

[e.g. Bandel, 1982, 1991; Riedel, 1993; Kowalke, Harzhauser, 2004; Kaim, 2004]. Protoconch characters are of particular interest in taxa like *Setia*, where the teleoconch is highly variable and/or poor in discriminating characters.

In the present paper the taxonomy and shell morphology of *Setia* inhabiting the Black Sea and the Sea of Azov are revised. A detailed conchological description and scanning electron microscopy (SEM) documentation are provided.

Material and methods

Material for the present study was collected from 1987 to 2004 from several parts of the Black Sea and the Sea of Azov (Fig. 1). Samples were obtained from fresh beach drift, and have been examined and measured under a stereomicroscope. Additional live material was dredged or collected by SCUBA diving. One lot of *Setia* from Odessa Bay has been provided by Mikhail Son, Odessa (Ukraine). A total of about 1,500 shells of *Setia* were studied; all material is deposited at the Institute of Zoology NAS Ukraine (Kiev, Ukraine) abbreviated here as IZ NANU.

Also the type series of *Setia valvatooides* Milaschewitsch, 1909 which is deposited in the Zoological Institute of Russian Academy of Sciences (St.-Petersburg, Russia) (abbreviated here as ZISP) has been studied; it consists of 43 specimens.

Shell characters of the examined material were studied with an optical stereomicroscope. Standard dimensions for shell characters were measured. The protoconch and teleoconch characters of *Setia* specimens have recently been examined from the SEM micrographs as well. The SEM micrographs of two specimens collected in the Karadag Natural Reserve (south-eastern part of Crimea) were performed in the Laboratory of Field Emission Scanning Electron Microscopy and Microanalysis at the Institute of Geological Sciences of the Jagiellonian University, Krakow (Poland). Shells were mounted on holders, sputtered with carbon and then photographed using the digital scanning electron microscope "Hitachi S-4700". Four specimens from the same lot were examined in the Geological-Paleontological Institute and Museum of the University of Hamburg (Germany). There the shells were mounted on stubs, sputtered with gold and then photographed with the digital SEM "LEO 1455 VP". Also four specimens from different localities have been SEM photograp-

Introduction

The Black Sea is a unique marine basin in which the salinity regime has a strong limiting influence on the biodiversity. From a malacological standpoint it is an area where (often endemic) fresh and oligohaline Ponto-Caspian faunal elements co-occur with mostly Mediterranean mesohaline to euhaline marine elements. Because of this particular situation, the taxonomy and systematic position of many Black Sea taxa are controversially discussed.

One of the most prominent cases is the identification of the Black Sea representatives of the rissoid genus *Setia* H. Adams et A. Adams, 1852. In general, the species attributed to *Setia* belong probably to the smallest known recent rissoids and are widely distributed in the Northeastern Atlantic and the Mediterranean [Verduin, 1984]. Although in the Mediterranean over 30 species are recognized [Nordsieck, 1972; Verduin, 1984 (placed in *Cingula*); van der Linden, Wagner, 1987; Hoenselaar, Hoenselaar, 1991; Arduino, Arduino, 2001], their correct identification is extremely difficult due to teleoconch variability and a paucity of diagnostic characters. Moreover, some authors [e.g. Verduin, 1984] consider genus *Setia* to be a subgenus of the species-rich European genus *Cingula* Fleming, 1818, which further complicates taxonomic studies. In the present and earlier papers [Anistratenko, Starobogatov, 1994; Anistratenko, Stadnichenko, 1995] I treat *Setia* H. et A. Adams, 1852 as a separate genus, not a subgenus of the genus *Cingula*.

The importance of embryonic, larval and juvenile shells which in many cases have been used to reconstruct the phylogeny of gastropods is undoubted